

THIS WEEK: DOWN ON SEVEN METRES (See Page 592)

Popular Wireless

Every Thursday
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INCORPORATING "WIRELESS"

July 23rd, 1932.

DESCRIBED INSIDE

The COSMIC FOUR



Captain
ECKERSLEY
writes on
READERS' PROBLEMS

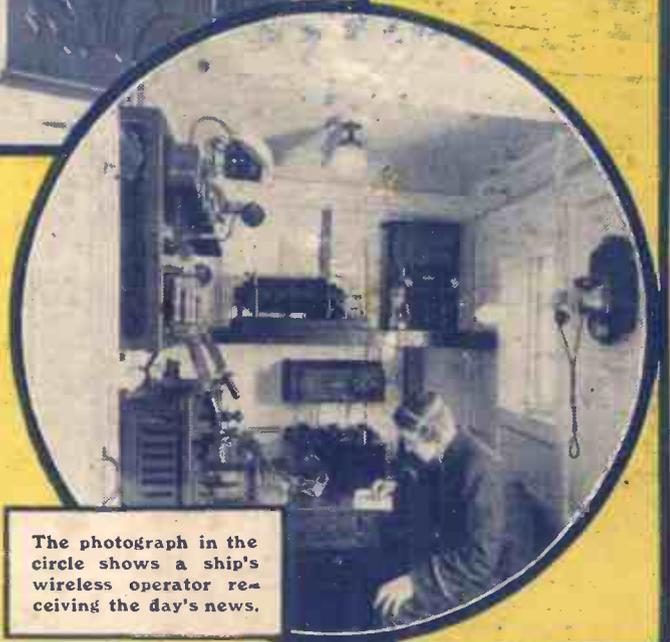
Other Features in This Issue:—

SNAKE CHARMING WITH A PORTABLE!

A NEW REMOTE CONTROL BROADCASTING A CINEMA ORGAN

A TALK WITH A TURKISH LISTENER

WIRELESS IN WAR TIME



The photograph in the circle shows a ship's wireless operator receiving the day's news.

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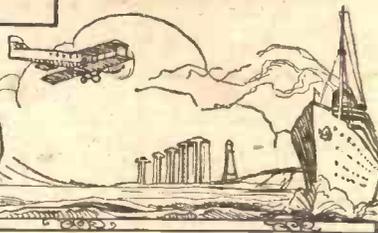
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"P.W." v. OHM ?
 BOUQUET FOR "W.L.S."
 TRAIN TO PLANE
 P.C. ANSWERS

RADIO NOTES & NEWS

FAILURE OF RADIO
 THE POOR FISH
 CROSS-EXAMINATION
 LOOKING AHEAD

"P.W." Versus Ohm's Law ?

W. H. M. (Romford) writes a letter full of figures and horrid twisty posers about milliamps, etc., and implies that in regard to an argument his friend, basing himself on what "P.W." has taught him, falls foul of Ohm's Law. "P.W." wouldn't teach anything contrary to the Law.

I suggest that his friend's 130,000 ohms resistance must have got "shorted" somewhere. Undoubtedly his friend is wrong in saying that no H.T. battery current flows through the valve, and I doubt whether "P.W." ever said that it does not.

Whilst it is true that a valve contains almost a vacuum, the space between filament and plate becomes conductive. No doubt these answers won't give complete satisfaction and the moral is that the queries ought to have been addressed to the Query Department.

Telephony at Sea.

ISN'T it rather wonderful to think that during the recent world cruise of the *Empress of Britain*, passengers could sit in their cabins and call up their friends by radio-telephone? Direct conversations were carried on by passengers with England, Italy, U.S.A., Canada, Australia, Hawaiian Islands and the Philippines.

Radio-telephone communication with Rugby was maintained all the way to Yokohama, and the vessel kept in touch with the U.S.A. by the same means until she passed Colombo, Ceylon.

Bouquet for "W. L. S." Set.

REFERRING to the "W. L. S." Short-Wave One as "a precious thing wrapped up in a small parcel," W. F. W. (Botley, Hants) writes a purple but obviously sincere passage about this little

set. Says he: "It is absolutely amazing what it will do and the distance it covers."

With an aerial hung round his room he receives American stations, and the list of stations positively identified numbers forty-two; it includes Moscow, Saigon, Chicago, Cairo, Winnipeg and Madrid. Not bad globe-trotting!

Congratulations, W. F. W. Now get Rio, Bandoeng and Australia.

Train to Aeroplane Talk.

A FEW technical details about the radio-telephone conversation between the "Flying Scotsman" and the Imperial Airways Liner, both going at high

speed, may be worth recording for future generations to smile at.

The air-liner, "Heracles," a 42-seater, used her normal radio set, a Marconi type (A.D. 6 M.) and a similar set was fitted on the train. The train aerial was inside, suspended below the roof; the aircraft used a 200-ft. trailing aerial.

The train transmitter took its power from a rotary transformer, and the air-liner had the usual wind-driven generator.

Postcard Answers.

N. D. (Luton). Thanks, I never wear straw "boaters," but they would nicely conceal the aerial for a hiker's set!

S. F. G. (Llanberis).—Rotten "screening" round your way, eh? But think of the scenery! That "Pass" was made before your Portable, look you.

L. T. K. (Eastbourne).—Sorry! I go farther afield nowadays. But I have happy memories of the Downs, and, in particular, the inn at Alfriston. Stick to the Morse! You ought to hear plenty of it your way!

R. T. C. (Bootle).—Invitations swarm upon me at this time of the year. The nearest I'll be to you will be Carnarvon—thanks all the same. Love to Radia. What a name to give a baby!

SOMETHING TO SING ABOUT!



From this loud speaker outside a shop in Walworth come the chirps, trills and screams of a great variety of birds, who thus act as their own advertising agents!



Ignorance Qualifies.

THE B.B.C. has the rummiest way of selecting some of its helpers, I must say. It would appear that they choose people who know nothing about the job. I see that Lord Eustace Percy has been appointed chairman of the Central Council for School Broadcasting, and at his inaugural speech he said that he had little knowledge of

(Continued on next page.)

NEWS—VIEWS—AND INTERVIEWS (Continued)

the problems connected with the work of the Council. Frightfully useful! What?

Failure of Radio Waves.

SHORT waves can be used for communication from one side of the earth to the other, and can, in fact, go round and round the globe. They can,



so 'tis claimed, kill mice, chameleons, fruit pests and bacteria. Radio waves in general are said to be able to produce rain, cause fires, cure rheumatism, and make Sir John Reith sing in his bath at Broadcasting House,

using the much-maligned tremolo.

But what I demand is that either Nat. or Reg. shall cause my stock of greenfly to perish from off my roses. Betcha they can't do it!

A Radio-Gram for Six Guineas.

DOES that proposition attract you? Full particulars of how to make the instrument are to be found in "Modern Wireless" for July. In the same magazine appear details of a wonderful "Screen-Stage" adaptor, providing an S.G. stage with detector.

There is also a special supplement of some twenty pages, "The World's Programmes," which is real red meat for the long-distance listener. If you get this "big bob's worth" for a holiday treat by the sea or down on the farm, you will derive better value for your money than if you put twelve pennies into the automatic machines on the pier, or lose the same amount at shove-ha'penny in the village inn.

Pity the Poor Fish.

F. W. (Plymouth) reels up his line to say that he has "gone off wireless for the time and taken to fishing. Pollack are his special victims, it appears.



I am not a natural fisherman, and the only time I ever caught anything besides small crabs was when a school of whiting hung round the boat until I nearly died of the monotony of pulling the idiots up.

No, F.W., the Dartmoor tramp hasn't come off yet, because of a hitch in the holiday arrangements here. But I am beating my wings and hoping to fly away.

Sorry I cannot meet you; outside this office "Ariel" does not exist. Write again when the wireless urge has returned.

Cross-Examination of "Ariel."

CERTAIN friendly but pertinacious enquirers about my listening-in habits are not satisfied with what I revealed to them on July 2nd. They want to know

whether I listen for amusement or instruction.

As to instruction—emphatically no! Broadcasting cannot usurp the midnight oil consumed over the text-book, or the personal attention of the tutor. What I want to know, I dig out of books, or from men I can question.

As to amusement, if there is a good vaudeville programme on I like to listen to it. I rarely miss talks by really well-known people, because I am mightily interested in persons.

But I refuse to be a slave to broadcasting. I am the master of my mental life; not the programme bloke and the cranks of the B.B.C.

"SHORT WAVES"

"I say, old man, I wonder if you can find out what's wrong with my wireless set. I haven't heard anything from it for the last half hour."

"Oh, I shouldn't worry; it's probably quite O.K. Only they're broadcasting the moves of the big chess match that's on just now."

Inhabitants of a certain island are very superstitious about wireless. We understand that they consider it unlucky to break a valve on a Friday.

"Wireless finds Nurse," runs a headline in a provincial newspaper. Some of the programmes certainly seem to need one.

There are ten million wireless listeners in this country—and only half of them from choice!—"Pictorial Weekly."

A LIVE WIRE.

An electrician returned home from work one night to find his small son waiting for him with his right hand swathed in bandages. "Hello, sonny!" he exclaimed. "Cut your hand?"

"No, dad," was the reply. "I picked up a pretty little fly, and one end wasn't insulated!"—"Answers."

"Please, 'm, Muvver says will you give me the valve which you borrowed for your wireless set last Toosday week?"

"Yus, but don't forgit to bring it back!"

More Revelations.

THE secret of a healthy mental life is variety. I welcome anything which the B.B.C. can do for me along the lines on which my individuality is developing.

I am intensely interested in the science of Radio, Arctic and Antarctic Exploration, Nelson, the culture of Alpine plants, biography, travel, big-game hunting, Dr. Samuel Johnson, Kipling, R. L. Stevenson, tobacco, and the Elizabethan era. A pretty catholic taste!

If the B.B.C. offers anything about those subjects I am all attention. But—and a big "but"—may I be hornswoggled if I let the B.B.C. get away with the notion that it has to direct the development of my mind. I've found it out too often; especially the young chaps who produce the "Radio Times"!

The Unknown Terror.

A TERRIFYING phenomenon has reared its head, so to speak, in my home.

The other night, while my set (A.C. mains-driven) was happily chortling, someone switched on the electric light in the kitchen. Immediately the loudspeaker set up the most terrific buzz, such as one would receive from a coil-driven spark transmitter. The man next door got it also.

I switched off, and in two minutes tried again, meantime switching off the kitchen light. The row was still on.

To-night all went well until someone put on the dining-room lamp—and then—G-r-r-r! Am I under a curse, or what? A faulty switch would cause sparking, which would account for the noise. But the noise persists after the light switches are closed!

Radio 15,780 Feet High.

LAST month some scientists, complete with guides, succeeded in giving the first radio broadcast from the summit of Mont Blanc. The guides did the lowbrow stuff—a description of their experiences—and the scientists, one supposes, delighted France with a recitation of barometric pressures and Centigrade temperatures!

Had I been there I could easily have given an imitation of a dying pig (air-balloon type); it would have come quite naturally!

The valuc and interest of such a feat is not easily apparent; it would have been epic had Teddy Brown and his what-itsname accompanied the party.

Looking Ahead.

BEFORE these notes appear in print I shall have shaken off the dust of Tallis Street and shall be treading, blistered, and sudorifically, the slate-strewn passes of North Wales, Snowdon way. A sudden whim has diverted me from Dartmoor to Llanfechangydolch (etc., etc., for several inches). I hope to be able to do my 17 miles a day and discover the causes of Welsh (broadcasting) unrest.

My nailed boots are ready, and I have a new rucksack, all straps and buckles, guaranteed to ensure maximum comfort and a passage of air down the back—my back.

I look forward to observing whether or no radio has penetrated to Puffin Island. Anything of radio interest I shall faithfully report unto you.

Pray for me! I suffer the tortures of the condemned during my tramps—but I wind up as 3s. as a fiddler and twice as fat!

ARIEL.



ON THE OTHER SIDE



A TALK WITH A TURKISH LISTENER

I SEEM to strike lucky in Paris! There I have met a foreign listener friend whose experiences I have already described. Now, after a recent Radio-Paris Sunday broadcast, I was introduced to a French doctor straight from Ankara.

I pressed for news about Turkish broadcasting, never (I must confess) having myself heard a Turkish station. The doctor was inclined to be cynical! Also he was proud of the French influence there. He said that it is really surprising, considering Turkey's adherence to old-world ideas, that broadcasting had ever gained any ground at all.

He Knows a Good Bargain.

"The main reason," he continued, "that it has done so (although perhaps it is an unkind one) is that the Turk knows a good bargain when he sees one; and broadcasting, even when the programmes are bad and the licences are dear, represents a good bargain; it is virtually something for nothing. The fact that licences are dear does not bother him much. He just doesn't pay!"

"You can't altogether blame him. A licence costs £10 a year in Turkish money, and there are only about five thousand people in the whole country who have been pressed to pay. Turkey is a record country for radio pirates.

"The Turks have not done much to develop their own station, and our interests down there are very strong. The one Turkish official who really is keen on wireless and thoroughly knows his job is Haggredin Bey, the Chief (styled Director-General) of Turkish broadcasting.

A Turk in Charge.

"He has offices in the General Post Office building at Galata, and a very palatial establishment he has rigged out for himself, too. There is a small studio for talks and a room about the size of the main Radio-Paris studio for orchestral works. French engineers are engaged on the technical side, but the studio is virtually under one-man control.

"A young Turkish musician, Djemil, is the announcer and musical director. He supervises all the broadcasts of native music. As a matter of fact, this takes up the main programme. The lady announcer whom you sometimes hear is his wife.

"There are supposed to be about 20,000 pirates in the Turkish republic. Two years ago a new law was passed inflicting a fine of over £100 on people who didn't take out licences. Our French authorities also

While on a visit to Paris Our Correspondent met a friend from the Turkish capital, and in the accompanying article he gives his views on the state of broadcasting in the picturesque land of the Fez and the Harem.

pressed for an amendment, enabling the State to fine those who interfered with broadcasting. Neither section of the law seems to have had much effect.

"It is a very bad end of the world for reception. In Asia Minor the atmospherics are almost unbelievable. To a certain extent we in Europe have cut out ships' wireless interference, but the heavy ship traffic in the Black Sea is a blot on broadcast reception.

"The old spark transmitters are still

programme so that a two-hour session of European music is followed by a similar period of Turkish music.

"We Europeans have to put up with gramophone music mostly, although there is a small studio orchestra capable of handling both European and Turkish music. French records, such as Decca and French-made Columbia, are the ones generally broadcast. They are months old before they arrive at the Istanbul station!"

Very Poor Range.

"What is native music like?"

"It is not much good listening in while Turkish is being broadcast. The continual drum beating gets on one's nerves.

"The chief instrument in a native orchestra is a sort of ukulele having three strings. The accompanying instrument is the Ut, a kind of one-stringed fiddle. The station orchestra sit on low stools on the heavily-carpeted floor and the microphone is hung on a cable in their midst."

I asked which was their better station.

"Istanbul, which, as I have told you, is built by our engineers, seems to be the better station.

"It has a range of about 300 miles. Ankara, the Asiatic transmitter, is very poorly heard. Probably this is due to the way the country is planned. The geological conditions aren't even kind to wireless!

"The Istanbul poste, in a low stone building, is not unlike the old Radio-Paris transmitter and the gear which used to be at Clichy. The valve

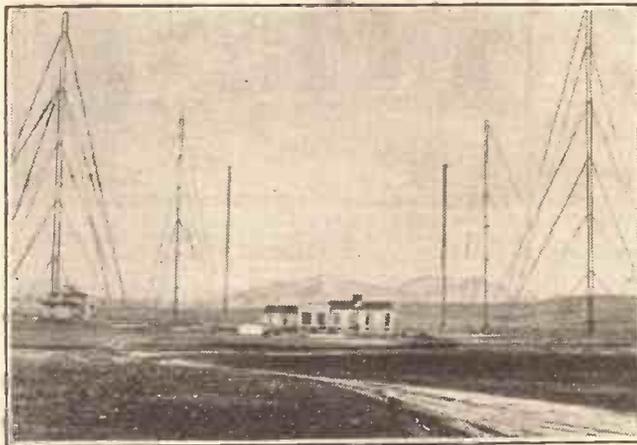
panels are not a bit like those at any of your British or German stations. The modulation is deep so that crystal users, within the 300-mile radius, can get good signal strength.

"There are so few valve sets that it is hardly worth while bothering about the best quality. Most of the good valve sets are French super-hets. which are taken down there by Europeans.

"It is certainly a strange district for reception. I used to do a lot of long-distance listening. Bucharest is the main

(Continued on next page.)

WIRELESS IN THE WILDERNESS



Ankara, one of the two broadcasting stations in Turkey. It is situated out in the wilds several miles from the city, and is run mostly by French engineers. It works on a wavelength of 1,538 metres, which is rather surprising, for atmospheric disturbances on the long waves are pretty bad in that part of the world.

used for the most part, and the almost untuned spark note combined with the blare of static at certain times of the day makes reception anything but a pleasure."

"But for the white population it is worth while, I suppose?" I asked, and he assured me that it is a boon.

"There are the two broadcasting stations at Istanbul and Ankara. Istanbul is on 1,200 metres and has just gone up to 5 kilowatts. Ankara is a 7-kilowatt station.

"I believe 1,538 metres is the exact wavelength. At Istanbul they arrange the

A TALK WITH A TURKISH LISTENER

(Continued from previous page.)

stand-by for Europeans who have long-distance sets.

"Stations which you would think would come in strongly are very disappointing. Your London National can sometimes be heard, but not London Regional.

Bad Spot for Reception.

"The Russian stations down by the Black Sea do not come in unless conditions are very favourable, which is surprising. Vienna and Bucharest can be heard, but in every case it is like fishing for stations two or three thousand miles away.

"A Britisher at Istanbul must feel very out of it. Djemil at the studio speaks a little German and English, as well as French and his native Turkish, but most of the announcements are in French and Turkish.

"His studio call is *Allo, Istanbul Telsiz Telefonou*. Then he breaks into French, starting off with the opening call, *Ici Radio*

law to make him to pay more, and then, by degrees, the programmes will improve. "Keen Turks have been agitating for broadcasts from the famous Sofia mosque, and recently Hagreddin Bey was negotiating for regular once-weekly broadcasts from the Aja Sofia. Lack of money was again the stumbling block, although the broadcasting people said that it was technically impossible.

"Anyway, to sum it all up, a wireless set is a real necessity out there for white people, and I have bought a new super-het. portable to take back with me after my leave. The *parasites* (static) may not be so bad on a frame!"

EDITOR'S NOTE:—The next article in this fascinating series will be "A Talk with a Belgian Listener."

RADIO WRINKLES

Some short items of general interest.

The very wide range of capacities covered by various condensers in a radio set is not generally realised, but may be appreciated when it is noticed that in a set employing a .0001-mfd. and a 4-mfd. condenser the latter is 40,000 times greater than that of the small one.

IN THE STUDIO AT ISTANBUL



This is the main studio at Istanbul, Turkey's second broadcasting station, the only other studio being very small and used for talks. The station announcer is about the most important man at the station and practically runs the whole show, acting as musical director as well.

Samboul, and gives the programme in French and afterwards in Turkish.

"An *ami anglais* of mine at Ankara has an all-metal short-wave set which he brought out with him in order to pick up Chelmsford. Small parties gather at a late hour at his house in order to hear the rapidly fading G5SW signals! It is really extraordinary that stations should come in so badly there, especially as your G5SW is heard well practically everywhere else.

Possibility of Improvement.

"There is, I think, every chance of local broadcasting improving, because the Turkish Government has shown signs of making a serious attempt to get more licence money. There is no money other than that which comes from licence fees, and as these permits are obtained at local tax centres the whole system is very lax.

"Unfortunately the mentality of the Turk is such that he does not realise that he will get value for the money he is compelled to pay. It will need the strong arm of the

If the large condenser (usually 1 mfd.) which is connected between the screened-grid of an H.F. valve and earth becomes disconnected, it will probably result in instability.

When purchasing a three-point switch for wave-changing, remember that the cheap foreign switch is often a snare and delusion, owing to the fact that its contacts become imperfect after a time.

When it is necessary to change a condenser in a piece of smoothing apparatus, or to replace an L.F. smoothing choke, it is often useful to remember that the amount of smoothing obtainable is a product of the capacity and inductance; so that if the capacity is halved, it may be possible to get the same smoothing by doubling the inductance, or vice versa.

When an earthing connection is made to a brass tap, remember that when this latter is heavily lacquered the earth connection will be imperfect.

YOUR POWER PACK

Why not incorporate your mains unit inside the set as suggested in this article?

ALMOST every constructor realises the convenience and usefulness of a mains unit as an alternative to a high-tension battery, and many who are fortunate in having electric lighting in their homes, whether an A.C. or D.C. supply, possess some kind of commercial or home-constructed design.

Most types are, mechanically speaking, detached from the set—usually with long flex leads as a means of connecting up electrically—which is quite a satisfactory arrangement as a method of conveying power, although somewhat unsatisfactory when considering convenience and tidiness.

When Space is Provided.

Some sets are self-contained, and have a battery space where a mains unit can quite easily be placed out of view, such as in a transportable, although a large number are so constructed that the baseboard and panel fit into a standard size cabinet, rendering the inclusion of accessories out of the question.

But why not make the most out of unnecessary space and carry this still further by constructing the mains unit on the baseboard as part of the receiver when you build your set? After all, a mains unit does not take up a great deal of space, and can quite easily be fixed at the L.F. side of your set—an arrangement that would enable the H.T. + 1, H.T. + 2, etc., leads to be taken direct to their various destinations without going via a terminal strip. This would obviate the necessity of flex leads as far as the H.T. supply is concerned, and, furthermore, would give the radio receiver a much neater external appearance.

In doing this, of course, the layout would have to be according to how much space there was to spare, although the actual construction would be similar to that of any other type of mains unit. It must be remembered, too, that the greatest of care should be exercised in screening all the components comprising the mains unit and that particular portion of the baseboard which it occupies. The best type of screen would be tinned sheet iron—being comparatively easy to work with, and effective where low frequency is concerned.

Improved by Screening.

If necessary, a metal case could be made up to completely enclose the mains unit and so ensure perfect screening. Three or four holes should be drilled at the bottom to allow the leads to be brought through; also for an earthing terminal to earth the screen.

If you already have a mains unit there is no necessity to make one, because it can be attached to your baseboard in the ordinary way, or if you do not wish to disturb your set it is surprising how much spare room capable of accommodating the unit there is in your cabinet. The back panel overlooking the baseboard, for instance, can always be utilised. But, one final word, don't place it at the H.F. end!

A.W.Y.

CAPT. ECKERSLEY'S QUERY CORNER



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

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

INTERFERENCE—A DRASTIC REMEDY—CARRIERS AND MODULATION—ABOUT EARTHS—ORIGIN OF ATMOSPHERICS.

Why Not Directional Aerials?

O. P. (Goodmayes).—"I have read that directional aerials are to be employed at the new B.B.C. short-wave station. Why cannot this principle be employed with other B.B.C. stations?"

"For instance, if the London transmitters were situated at the extreme south-east of England and had directional aerials pointing at London, no interference would be caused to Continental listeners who are, I imagine, as much troubled by London Regional as I am by Mühlacker."

You can make a reflector for short waves, but not for long, because the reflector must be of dimensions comparable with the wavelength.

If you have a wavelength of 30 metres length, then the reflector should be at minimum of the order of 30 metres high.

That's around 100 feet, and quite easy. But if the wavelength is 300 metres, that's 1,000 feet high, and pretty expensive—prohibitively so for the gain you would get.

Why not use short waves for broadcasting? Because, even with reflectors, the local steady service range is about five, ten, or twenty miles only, depending upon various factors.

Sink the Ship!

C. N. (Margate).—"I am often troubled with interference from ships passing up the channel. Although I have tried rejectors of various types I still get this morse 'jamming.' Is there no remedy?"

Provided your set is reasonably selective there is no remedy whatsoever except:

(a) Sink the ship.
(b) Write to the P.M.G. complaining of the fact, and pointing out to him that the ship is using apparatus twenty years out of date.

(c) Send a copy of your letter to the B.B.C. and ask it to continue to press for quicker compulsory modernisation of marine apparatus.

(b) and (c) are the remedies that will be the most efficacious, as you get support from others besides yourself.

Double Transmissions?

J. McD. (Edinburgh).—"When a transmitting carrier wave is modulated by a frequency as high as 10,000 does a sort of double radiation occur? If the station's carrier frequency is 1,000 kilocycles it radiates on a wavelength of 300 metres. But 10,000 cycles is 10 kilocycles, which

is 30,000 metres. Does not the station then transmit two waves, one of 300 metres and one of 3,000 metres, when a 10,000-cycle note is being transmitted?"

People do not seem very clear on the fundamental formulæ.

Remember that there is a difference between adding on 10,000 cycles to 1,000,000 cycles and then converting to wavelength and taking just 10,000 cycles as an absolute figure and then converting to wavelength.

When we modulate a carrier wave of 1,000,000 cycles by 10,000 cycles we radiate 3 frequencies, 1,010,000, 1,000,000, and 990,000. But the wavelengths corresponding to these frequencies are (roughly) 297, 300, and 303.

We calculate the wavelength which corresponds to 1,010,000 (for example) and then add it or subtract it. We don't add the wavelength corresponding to 1,000,000 cycles to that corresponding to 10,000 cycles; we must add the frequencies together first and then convert to wavelength.

A Plumbing Mystery.

S. B. (Harrow).—"I have recently been troubled with interference of the crackling type and, while endeavouring to remedy this trouble by alterations of the aerial and earth system, I found that using a very short earth lead of about two feet

(this being taken to damp earth) completely cured the trouble.

Previously the earth was connected by about a 6-ft. lead to a main water pipe, and I am at a loss to see why a comparatively small alteration such as this should have such a considerable effect."

I am also at a loss to give you an absolutely categorical answer. Perhaps the water pipe had a bad earth contact somewhere; perhaps it was badly bonded to other water or gas pipes; perhaps the pipes ran near to some source of interference.

I know of cases where the water-pipe earths are very bad, but are always improved when someone goes into a dark and filthy basement and, lighted by a blow-lamp, solemnly solders a century's plumbing into one electrical mass!

I do not suggest you live above such a basement, but there may be something "loose" somewhere.

Very Mixed Bag!

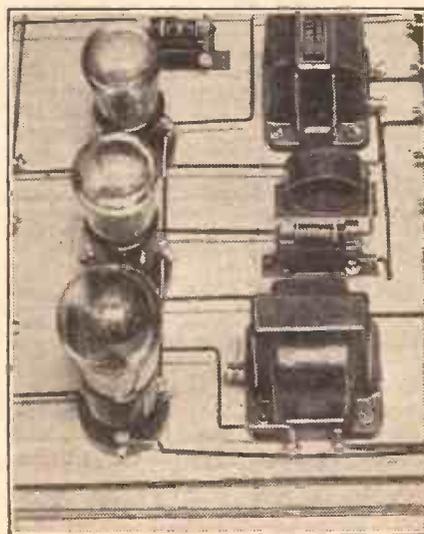
V. T. (Gloucester).—"Has the range of atmospheric disturbances ever been ascertained? When 'X's' interrupt my reception, is their source quite local to my aerial, or can I console myself with the thought that although not very entertaining the noises I receive do originate in the Sahara?"

If truth is consolation you can take it that atmospheric may come from the sky immediately above you, from Ireland, Scotland, Europe, the upper atmosphere, anywhere up to several thousands of miles away, or romantically from Ethel M. Dell's happy hunting ground, the Sahara.

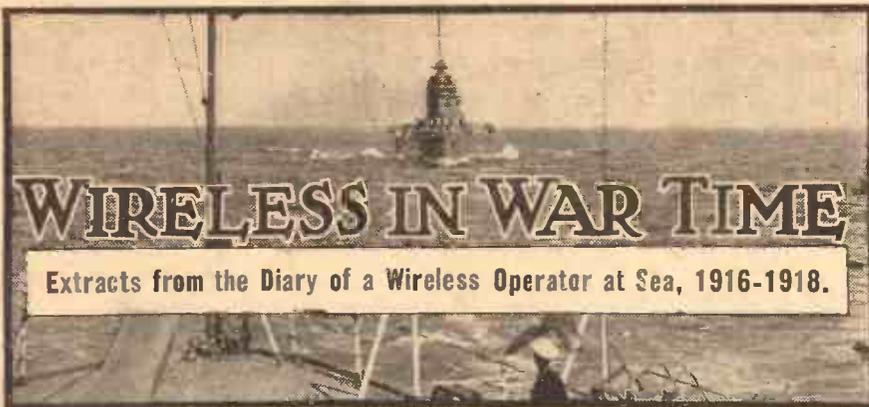
It has been the work of painstaking people to "analyse" atmospheric, and there are those who, listening and looking at records, will immediately recognise Sahara boys or winter thunderstorm girls or the offshoots of cracks in the stratosphere.

I don't know much about it myself, but I can assure you that the source of atmospheric is very mixed!

NEAT AND TIDY



Any effort made by the home constructor to get neat, well-spaced wiring will be amply repaid by the results he obtains.



KEEPING IN WITH THE CAPTAIN—A LECTURE AT ADMIRALTY HOUSE—DUTCH CAPTAIN AND DEAD COW.

FEBRUARY 6TH, 1918.—Arrived again in Port Said to-day in bitterly cold weather. I picked up some remarkably good signals from Aden when in the Indian Ocean. One Press message I received at a distance of 1,750 miles; and when off Aden I picked up Rinella (Malta), 2,500 miles distant.

3 a.m. Listening.

There is something exciting in listening for these messages. Rinella sends out a Press message at three in the morning, and as the hands of the clock approach that hour I put on the 'phones and adjust my detector to Rinella's wavelength, hoping to heaven that the carborundum crystal is not going to play any tricks.

Then, with one hand on the tuning condenser, and the other holding a pencil, I wait. Perhaps an atmospheric or two will give a false alarm. Perhaps I grow impatient, and start fiddling about with the condenser. But suddenly the old familiar note is heard, very weak, yet readable.

Next morning, down to breakfast with a nice batch of Press news for the captain—and the best way to gain popularity with the captain is to keep him well supplied with Press news!

Homeward Bound.

We arrived at Bizerta on the 18th, and left in a convoy on the 20th. We coaled at Gibraltar, and set off on our last lap home on March 1st, one of a convoy of forty-four ships.

Just before we left Gibraltar the port was mildly excited by the arrival of a convoy with a casualty list of two sunk and three in a sinking condition. It appears that a sub. popped up in the middle of the convoy and let fly with all tubes.

The convoy we are in is under the command of a C.O. of the United States cruiser Birmingham. This C.O. is a bit of a card. Before sailing, all captains and chief

wireless operators had to attend a lecture at the Admiralty House. We were seated at little desks, and for about twenty minutes an English naval officer rambled on, trying to give us certain instructions, but I'm afraid he didn't make himself very well understood. At last the C.O. of the Birmingham got on his feet and carried on something like this:

Quite Clear.

"Now, gentlemen, just pay pertickler attention for a minute or two. I'm bossing this convoy, and I want to tell you that I've never lost a ship yet, and, what's more, I don't damn well intend to. If we meet an enemy raider, leave him to me. Get your guns on him if possible, but for Gawd's sake, whatever you do, don't hit me. Keep your guns uncovered

RUN ASHORE TO SAVE HER FROM SINKING



Despite her camouflage, this armed merchantman fell a victim to an enemy submarine off the Cornish coast. Thanks to the prompt action of her commander, the vessel was run ashore on a sandy beach and thus saved from becoming a total loss.

all the time—constant wireless watch—"

Here a Dutch captain plaintively remarked: "But I haf no vireless."

The Yank turned on him like a flash: "Say, you poor mutt," he said, "then that don't apply to you." Continuing, he remarked: "I've got some good guns, and I'll hold 'em off until you get away, which I want you to do above all things.

"In the event of an aerial attack, don't play at anti-aircraft shooting, because it's a thousand dollars to a peanut against your hitting anything up there. But your shells

may come down and hit me. I think that's all, gentlemen. So long, and good luck!"

War Warnings.

We sailed that evening, and later on I picked up a war warning from a ship some miles ahead, reporting a submarine in the immediate vicinity. The American escort had also received this message, and a little later the Yank captain had a flag signal flying warning the convoy to keep a sharp look out and the guns manned.

It must have been about three the next morning when I woke up with a start, the sound of an explosion ringing in my ears. I dashed out on deck, and there was the Yank cruiser blazing away at something astern. Breathless with excitement, we all watched for any possible result.

Presently the firing ceased, and the captain of the escort ran up a signal which read: "Have sunk submarine. Proceed as usual."

At once, another flag-signal was run up by the Dutch captain (who had been ticked off at the conference at Gibraltar), and his message read as follows:

"That was not a submarine you were firing at. It was a dead cow which I just chucked overboard!"

MARCH 9TH.—Another trip on H.M.P.S. — is at an end. No excitement coming home. If we go back to Mesopotamia next trip it will be full summer—and Lord help us all!

Another Voyage Commences.

APRIL 20TH.—At 8 o'clock this morning the pilot came aboard; chief officer and carpenter went forward to the winch and, with a steady rumble, we hauled in our pick. From below came the faint clang of the engine-room telegraph and, at slow speed ahead, we started down channel.

The pilot, having finished his job, gulped his whisky and departed over the port rail into the waiting cutter. The engine-room telegraph sounded again, and the beat of the pistons grew quicker.

Out to Sea.

As we drew out to sea the ship began to roll, and an occasional stinging spray flickered across the deck. In the wireless cabin I put on the 'phones, adjusted the receiver, and sat down to my first watch.

We steamed into convoy position in company with some thirty other ships. At nine o'clock, after a good deal of shouting, flag-wagging, bad language and contradictory orders, we eventually sorted ourselves out into some semblance of convoy order.

Deep Depression.

At tea-time everyone was strangely quiet. The married officers were pessimistically reviewing the lone, weary months ahead, while some of the single ones sighed sentimentally over the memories of the past few days.

(To be continued.)

A NEW REMOTE CONTROL



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

An efficient and inexpensive remote control is now in demand among listeners. Below is described an ingenious and simple scheme for arranging a distant bell-push control for your L.T. supply, which also gives a choice of two programmes.

I BELIEVE that at long last the public is becoming remote-control minded. Anyway, I have recently had quite a number of letters asking for details of remote controls. This is not surprising, because everyone, or nearly everyone, uses loudspeakers these days, and as the prices of these continue to fall an increasing number of listeners indulge in the luxury of each having two or more instruments.

An Old Idea, But—

Of course, the idea of controlling the set at a distance is almost as old as radio itself. And in the past there have been numerous attempts to market suitable devices. Few if any achieved success. Some deserved their failures because they were too expensive or complicated, in any case, though, their chances were small for they were mostly well before their time.

But for some reason or other, remote control seems to have been the main theme song of the amateur inventor during the past four or five years, and this is perhaps due to the fact that anyone with a knowledge of simple mechanism is able to arrange a fascinating little on-off distant-control switch.

Indeed, I am still receiving on the average one specification of this nature per week. But I must say I think nearly all of these badly "miss the boat." When the time comes for a remote control to be radio's best seller (as I am sure it will) the one which will score the greatest success will be something more than a mere filament-switch, but, even so, it must be neither complicated nor costly.

A Chance For Someone.

Now then, Mr. Mass Producer, what about it? I will tell you what I consider we shall need. A simple little gadget, which can be fixed easily to practically any set, and which will enable the set to be switched on and off at any distant point wired for the control. But only one wire above the two needed for the loudspeaker should be necessary and the control should also make it possible to change from one programme to another.

I do not think a remote control which will not control the programme will have the slightest chance of getting over in a big way. And the price? Something between five and ten shillings. Could it be done? I believe it could. I have

schemed out an idea which is perfectly practical, and am here and now offering it to the industry free, gratis and for nothing.

(I would never dare to patent a remote control anyway, for, if I did, at least five-hundred readers who have submitted me plans of their own for such things would charge me with piracy! Being Tech. Ed. of "P.W." certainly cramps one's style as an inventor.)

The device itself consists solely of a magnet-operated ratchet wheel, coupled through simple gearing to a contact wheel which revolves between two brushes. This contact wheel revolves 120 degrees each time the magnet receives a single impulse.

wheel represents metal, and in the position the wheel is now adopting you will see that two things are happening. One, the L.T. circuit of the set is completed via one of the brushes, the metal portion of the contact wheel and the metal spindle. Two, the compression condenser is joined in circuit by means of the other brush. Thus the set is working and giving the higher wave programme.

Just Press the Button.

Someone touches the button at the distant point. The magnet attracts the armature and this pulls down on the ratchet wheel. Through two or four-to-one gearing, the contact wheel is made to rotate 120 degrees in a clockwise direction.

The L.T. circuit is still completed, but the compression condenser is now out of circuit as its brush is resting on the insulating section of the contact wheel. The programme has been changed!

Again, the distant push-button is pressed and again the contact wheel moves round 120 degrees. This time it is the L.T. brush which rests on the insulated portion of the contact wheel, so the set is "switched off."

And the above sequence of operations could be repeated ad infinitum. The mechanism would have to be tiny, as it would be necessary to have the whole thing inside the set in order that the tuning condenser wires could be kept short.

A more robust construction would be essential in the case of a mains set, but it is the constructor, and the battery-set constructor at that, to whom such a device would have the greatest appeal.

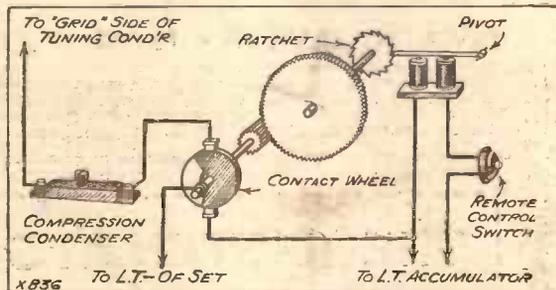
Many Applications.

You will probably wonder why I haven't mentioned reaction, and have taken it for granted that only a simple tuning readjustment is needed. Well, it would be quite possible to make the device alter your reaction, and this might be accomplished merely by joining a small variable between the plate of the detector and the contact brush which already accommodates the tuning-changer condenser—it would depend upon the set's circuit.

But I do not think the question of reaction need worry us, for only a few use reaction for their local regionals these days.

Well, there is the scheme in the barest of bare outlines. I leave it to the industry to fill in the blanks—if they want to.

AS EASY AS IT LOOKS



Here is the complete apparatus as described on this page by "P.W.'s" Technical Editor. Note how the metal part of the contact wheel (shaded in the diagram) is making contact with both L.T. and condenser brushes.

The impulse originates from the L.T. supply of the set itself, for a wire is run out from this to the distant-point where there is a press-button switch as is employed for domestic bells.

Only one wire ought to be necessary, for one of the loudspeaker leads would be employed as the "return" conductor. (A choke-condenser or transformer output from the set is taken for granted where extension loudspeaker leads are used!)

Few Components Required.

The only other item which figures in the system is one of those compression type condensers, and this is switched across the tuning condenser in order to effect the tuning alteration required to bring in the other programme. Two tuning circuits could easily be controlled if necessary.

Now glance at the accompanying diagram. The shaded part of the contact

THE MIRROR OF THE B.B.C.

By O. H. M.

B.B.C. AND THE PRESS! A NEW ATTITUDE?**AFTERMATH OF ROYAL VISIT—OVERSEAS BROADCASTING—THE PERMANENT SHORT-WAVE SERVICE—A SUMMER SERIAL, ETC.**

I HOPE it is my imagination, but I fear it is not. I mean the changing attitude of the B.B.C. to the press.

Or perhaps it would be more accurate to say the appearance of a new influence in these relations. Instead of the traditional desire for amicable cooperation, "the live and let live" policy, there now seems to me to be a kind of challenging antagonism accompanied by a growing reluctance to impart information of any kind.

It will be a sorry day for broadcasting if it seeks an open war with the combined power of the press. This is one of the very few subjects on which the unity of the press could be secured.

Aftermath of Royal Visit.

Round at "B.H." they are still talking about the visit of the King and Queen, which appears to have created a great impression on all ranks. I hear that one result is the introduction of much more ceremony and discipline than before.

The knighting of Admiral Carpendale, the Controller, puts him much closer in authority and influence to Sir John Reith, the Director-General. What is needed now to ease the tension is for the Prince of Wales to drop in unexpectedly and give the "stand-easy" order.

Overseas Broadcasting.

The development of broadcasting in the other parts of the Empire promises to put an increasing strain on the personnel of the B.B.C., as it is called upon to send out nuclei staff here and there. Egypt is the latest place to ask for help in this way.

I understand Egypt wants a prominent B.B.C. official to be a temporary member of the Board of Control of the Broadcasting Service which is now being set up there. Both Australia and South Africa are nibbling, and it is only a matter of a short time before Canada will be bidding.

Broadcasting House should realise that the drain will go on for about ten years. Therefore there must be some reserve of staff constantly available.

The Permanent Short-Wave Service.

I hear that Broadcasting House is wondering whether Captain Cecil Graves, present Assistant-Director of Programmes, will become Director of the new permanent short-wave Empire service. Another very strong candidate is Mr. Beadle, of Belfast.

Captain Graves is nephew to Lord Grey of Fallodon. Mr. Beadle directed the station in Durban, South Africa, for some time.

A Summer Serial.

As I write, no definite decision has been taken as to what will follow the series of "Hazard" talks when it finishes at the end of July, but I understand that a new serial story is likely to be broadcast on Saturday evenings during August and September. There is a possibility that the

story will be one by Francis Iles, author of "Malice Aforethought" and "Before the Fact."

Two Songs at Once.

The growing popularity of Hill-Billy songs in England, which is probably due more than anything to people hearing them in broadcast gramophone record recitals, will be further stimulated on Wednesday,

August 3rd, when Carl Robinson and his Pioneer Hill-Billy Singers make their first appearance before the microphone in this country.

Hill-Billy songs are founded on the traditional tunes of the American ranches and backwoods and are sung to a strummed accompaniment. They have a swinging melody, and generally a moral note in the words.

America got them from the first English settlers, and because of this some of those to be heard on August 3rd will not be altogether unfamiliar to listeners. Carl Robinson is said to have written over two hundred Hill-Billy songs himself, while he has also travelled thousands of miles in search of them and collecting tunes whistled by lumberjacks and cattlemen.

So popular are these songs in America that twenty millions of Carl Robinson's records have been sold in the United States, which again is probably due to the fact that he has broadcast from every radio station in that country. A remarkable feature of Robinson's performance which will be noted by listeners is his ability to whistle two notes in harmony simultaneously.

The Pioneer Hill-Billy Singers consist of Miss Pearl Pickens, and the Mitchell brothers, John and Bill, the latter being ex-cowboys who earned their college fees by broadcasting.

*(Continued on page 598.)***RE-FUELLING-IN-THE-AIR RECORD**

Testing the Marconi aircraft transmitter and receiver installed on a light motor van for the purpose of keeping in touch with the Hon. Mrs. Victor Bruce's aeroplane during her attempt on the duration record in the air. At the time the photograph was taken Mrs. Bruce hoped to remain up for a month.

THE LISTENER'S NOTEBOOK

A rapid review of some of the recent radio programmes.

"The Enchanted Island."

THERE was some very good stuff, I thought, in "The Enchanted Island." Everything was staged with a charming old-fashioned touch. Foster Richardson was the last word in irate pirates.

Bernard Ansell made the very most of a witty dialogue which, together with his singing of "Sleep Pretty Creature Sleep" and his contribution to the "Right Good Health" duet were very D'Oyley Carte-ish. Olive Groves as Inez was unfortunately forced to do some of her best work in a cave where the echo effects were much too efficient.

On the whole, this was a jolly forty-five minutes.

Quite a Lively Affair.

The film critic—film producer fight disappointed because neither side seemed to score, or if it did, it couldn't retain its lead. It was amusing, too, how one caustic remark

by one side was followed up immediately by one from the opposition which had no logical bearing at all on the previous observation.

Miss Lejeune was inclined to let her remarks run away with her, and as champion of the artistic film she wasn't particularly effective. She seemed intent on getting at her opponents, rather than at their policy.

As usual the functions of the critic were discussed, wherein the critic was much abused, and again, no logical conclusion was reached. The matter was immediately dropped, as indeed were all the questions as soon as something like an argument looked like developing.

However, the discussion did provide the listener with something to think about, but I wish the contention of Miss Lejeune that British films all savour of stage rather than screen technique had been thrashed out more fully.

(Continued on page 599.)

It might be thought, since medium-wave wireless reception is admittedly at its best in darkness and its worst in broad daylight, that a steady improvement should be seen directly the shortest day is past.

Well, my enthusiasm for wireless goes back to a long time before broadcasting began and my logs cover a great many years. I don't think that I have ever known a really noticeable improvement in conditions take place much before the beginning of August, and usually it is delayed by a week or two beyond that.

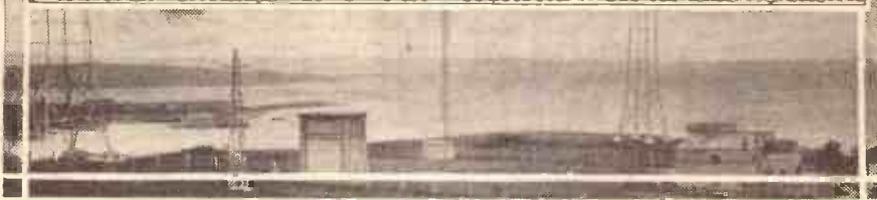
Lagging Behind.

What is rather curious is that actual reception conditions seem to lag a little behind the seasonal changes. When the days begin to lengthen in early summer you don't find an immediate falling off. In the same way, when darkness starts to come earlier some time must elapse before we begin to notice that things are getting better.

The atmospherics from which we have suffered on and off for some weeks now are, I believe, largely due to the queer weather that we have had in 1932. In normal springs we have more or less a steady rise in temperature from about the beginning of April.

This year we had no warm weather at all until well into June and when it did come it came with something like a rush. It has been a summer of violent

STATIONS WORTH HEARING



Up-to-the-minute information for the long-distance searcher.

barometer fluctuations and of phenomenally rapid rises and falls in temperature. These things tend to produce electrical disturbances in the atmosphere, and electrical disturbances in the loudspeaker's output.

At the time of writing reception still remains at summertime low-water mark. An improvement may start at any time now, though no one can say just when it will begin.

But even as things are there is not really a great deal to complain of, for with anything like a set you have a pretty useful number of alternative programmes.

Long-Wave Improvements.

On the long waves Zeesen has shown a remarkable return to form; he is at present completely reliable for loudspeaker reception. On the other hand, Motala is usually quite weak and Kalundborg has been below par on several recent days.

Huizen, Radio-Paris and Warsaw have all been good, though the last mentioned is occasionally heterodyned by a Russian station.

Langenberg, Beromunster and Rome are quite first-rate, and Stockholm is distinctly better than he was. I have logged Lyons la Doua recently, after failing to do so for many weeks; Berlin Witzleben has made a reappearance.

What to Listen for.

Belgrade provides splendid loudspeaker reception on occasional nights, but Katowice is not so good as he was a little time ago.

Both Sottens and Toulouse are stand-by stations, whilst Hamburg and Strasbourg fall almost into the same class now. Frankfurt, though, is having a period of heterodyne troubles.

Brussels No. 2 is now more reliable than No. 1. The Poste Parisien is always ready to oblige, and Goteborg is returning. Breslau is occasionally heterodyned, and Milan varies a great deal. Genoa gives good reception on many nights. Bordeaux has been very good lately, and I can record good reception from Rennes, Gleiwitz, Lille and Leipzig.

Hilversum, Heilsberg, Turin and Trieste are all in splendid voice. R. W. H.

HEAT-WAVES and headphones do not go very well together, but I have managed to "un-melt" myself sufficiently to listen fairly regularly at 11 p.m. or thereabouts. There is nothing startling to report, except that conditions are still quite good.

W 8 X K and W 2 X A F have, if anything, improved. W 2 X A D continues excellent; and the 49-metre crowd, if one waits long enough for them, are all very good.

More News from Bandoeng.

"W. H. R." gives me some further information about the Bandoeng close-down. It is only the musical broadcast that is ceasing; the stations will all be in operation as before, but working commercial duplex telephony. "Duplex," by the way, means continuous two-way phone without either transmitter being switched off during reception. Interruptions and continuous conversation are possible.

The "over to you, old man" type of telephony is hardly used now except by the amateurs and by Croydon and his 'planes.

"W. H. R." also mentions, in the course of a voluminous letter, that W 2 X A D is excellent, W 8 X K on his 19.72-metre wave also being very good, but that V Q 7 L O (Nairobi) is now very poor again.

SHORT-WAVE NOTES



By W. L. S.

Here is "F. K." (Sunderland)—another convert to one valve for short waves. He has tried out all the short-wavers that have been published lately, and seems to think that the single is "last but not least." A queer thing is that he can receive G 5 S W on it, a station that he has never been able to get before!

"Three-Band" Two Coils.

No, "F. K." the coils for the "one" will not serve for the "Three-Band" Two. If you plug them in I won't be responsible for what happens! For an intermediate coil to get the 31-metre stations better I recommend 7 turns grid and 4 reaction, as you suggest.

"C. J. G." (Leigh-on-Sea) turns in a

useful log of distant amateurs heard during June, including all districts U.S.A., Kenya Jamaica, Canal Zone, New Zealand, Peru, etc. "X Z N 2 A" is a ship, at present bound for Australia. I should imagine she is somewhere near the East Indies by now.

"D. R. C.," a thirteen-year-old reader from Romsey, turns in a "one-valver" log that qualifies him for the H.A.C. Club with flying colours. He wants someone to identify a German on about 17.5 metres, and some dance music and singing on 39 metres. Can anyone oblige?

Reception in New Zealand.

"A. A. H.," a New Zealand reader, sends me a remarkable log that almost makes me wonder whether they know some special secrets "down under." It includes Rome, Moscow, G 5 S W, Vatican City, Madrid, Zeesen, Vienna, and all the usual stations that we call DX, but are even farther for him!

On top of this little lot he has logged three 'planes in flight between Chicago and San Francisco, working two-way telephony with the air-ports.

My next journey with the one-valver will have to be in the direction of New Zealand, to take a few lessons!



FROM THE TECHNICAL EDITOR'S NOTE BOOK.

Tested and Found—?



HIGH CAPACITIES.

THE term "electrolytic" as applied to condensers tends to conjure up visions of small tubular boxes having enormous electrical capacities.

This is because the first electrolytics were introduced in an attempt to achieve multi-microfarads in minimum spaces.

Thus a usual value was 2,000 microfarads (which is a capacity four million



COMPACT CONDENSERS

Two of the Dubilier "dry electrolytic" type.

times as great as that of the average tuning condenser!), although the size of the component would seldom exceed that of a small jam-jar.

But there was a snag; those early electrolytics could not stand up against pressures of more than 10 or 12 volts, so they could only be used in L.T. smoothing circuits.

In due course, however, this limitation was removed and high-voltage types produced. This widened their application to a great extent.

Indeed, to-day they are becoming serious rivals of ordinary types for certain classes of work.

For instance, Messrs. Dubilier, who, as condenser specialists, were pioneers in the development of electrolytics, have now started making an 8-microfarad type which can withstand a peak voltage of 450 volts.

And, of course, its dimensions compare most favourably with those of any other variety of condenser.

It is intended for use in A.C. sets, and will,

no doubt, figure in many commercial models this coming season.

A PRICE REDUCTION.

That famous Blue Spot Loud-speaker unit, 66K, has been reduced from 25s. to 15s., a fact which will no doubt be of considerable interest to all constructors. The 66K is an excellent unit, as readers will know, and at the new price should prove even more popular than it has been in the past—if that is possible.

MORE PRICE REDUCTIONS.

J. J. Eastick and Sons announce that the price of their combined Knife-Switch, Lead-in Tube and Lightning Arrester with 6-in. tube has been reduced from 2s. 9d. to 2s., and the 12-in. and 18-in. tube types to 2s. 6d. and 3s. respectively.

STONE CORRECTION.

I have just concluded a series of tests with a Multitone Tone-Control Transformer, and I am bound to say I was considerably impressed by the results.

I must explain that the transformer by itself is a good L.F. transformer, which can be used for all normal purposes with good effect.

In addition, however, a potentiometer can be employed with it, and this combination enables you to obtain a very wide tone control. But it is advisable to have a Multitone Graded Potentiometer.

The tone control is almost uncanny, and correction for either low- or high-note deficiencies is possible merely by adjusting the potentiometer.

Centrally you get even, straight-line amplification corresponding with that given by an ordinary high-class transformer, but at the extreme limits there are quite marked exaggerations of "bass" and "top" with a smooth run from the one to the other through the straight-line condition.

The "Multitone" can be built into any L.F. circuit, and I commend it to the attention of all those desirous of achieving high-quality outputs.

LEKTRITE INSULATED AERIAL.

This is a new product due to Messrs. Ward and Goldstone, which comprises a good quality stranded copper wire covered by a tough, insulating and weather-protecting material.

It is made up in coils of 50, 75 and 100-foot lengths, selling at 1s. 6d., 2s. 3d. and 3s. respectively.

Town dwellers particularly should find this material most attractive, for unprotected wire has a thin time in smoke-laden atmospheres. And if you live near the sea you will be only too well aware that corrosion is an even greater enemy of all unprotected metals, with the exception of a few such as platinum and gold!

And this corrosion not only weakens an aerial mechanically, but also, and much

PLEASE NOTE

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

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

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

more quickly, seriously affects its radio "pick-up" qualities.

I have given Lektrite some chemical tests, and I have no hesitation in saying that I consider it will stand up to its task very efficiently.

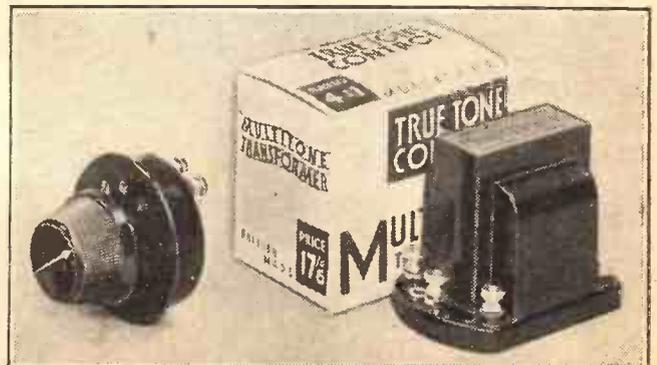
Messrs. Ward and Goldstone are also now making an iron-braided sleeving for the heater leads of A.C. mains sets, the leads to D.C. indirectly-heated valves, etc., etc.

This is an attractive alteration to lead-covered cable, and vastly superior to the employment of unshielded flex.

The wire is tinned to protect it against rust, and there is a close-woven, varnished inner tube to safeguard the wires against accidental short-circuits with the outer metal covering.

The tubing is very flexible and easy to handle. And by providing complete and effective lead screening it is a valuable adjunct to the other shielding in a set in the elimination of "hum." It costs 9d. per yard for the single, and 1s. per yard for the twin type.

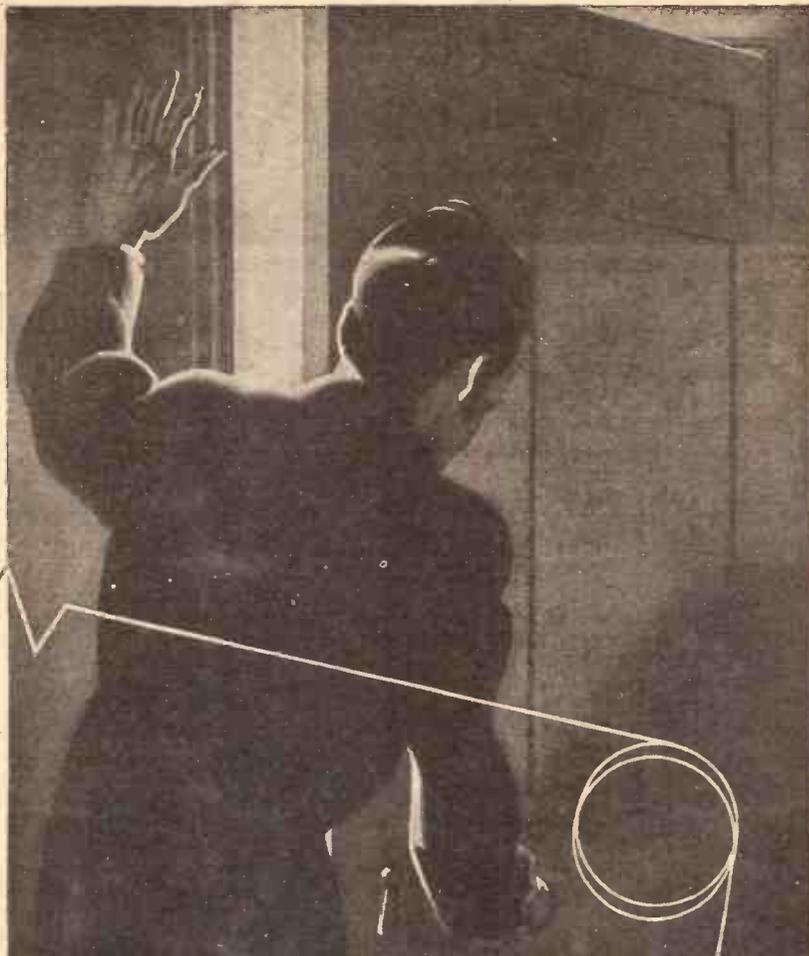
"BASS" OR "TOP" AT WILL



The Multitone Graded Potentiometer and True Tone Transformer.

EVERYTHING **G.E.C.** ELECTRICAL
your guarantee

OSRAM
new automatic cushion
filament springing
ensures
ABSOLUTE CONSISTENCY



SHUT OUT MICROPHONICS



Slam! shake, distortion—Shut out all effects of internal and external vibrations once and for all! The remarkable cushion filament-springing (in the new OSRAM 2-volt battery valves) does it! This big OSRAM advance in valve design solves a great problem. It maintains absolute consistency by never allowing the position of the filament to vary. Neither expansion when heated nor vibration can alter the characteristics of the valve. Can you say this of any other valve?

Osram
2 VOLT BATTERY
Valves
MADE IN ENGLAND
SOLD BY ALL WIRELESS DEALERS

WITH THE WEMBLEY FILAMENT

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



BROADCASTING A CINEMA ORGAN

Playing one of those massive organs which you hear in the cinemas or in the wireless programmes is not so easy as it appears! Below you can read something of the problems with which the organist and the "outside broadcast" engineers have to contend, told in an interview

By QUENTIN MACLEAN.

LISTENERS who have heard the Wednesday broadcasts from the Trocadero Cinema, where Quentin Maclean officiates at the organ, invariably comment on the excellence with which these particular recitals come over, as well as on the excellence of the programmes. Knowing something of the technique of organ-building and playing, I made an appointment with Mr. Maclean in the hope of finding out some facts about "how it is done."

As a result of this very interesting morning I have a greater respect for the organ, organist and the "O.B." engineers. When one considers how very little of the recital is actually lost to the user of a good set with a good speaker, the perfection of modern radio comes home to one.

Highly Complicated.

The average listener probably does not realise that the modern cinema organ is a highly complicated piece of electrical apparatus, besides which the most intricate radio receiver pales into insignificance.

When you listen at noon on Wednesday and hear a single note sounding from the Trocadero organ, you may reflect profitably on what is happening.

First of all the organist has depressed a "stop-tablet," which is virtually a single-pole switch. This has allowed current to flow through a relay, which has eventually had the effect of opening a valve, and allowing air to pass into a wind-chest, on the top of which stand all the pipes for that particular stop.

He has then depressed one note, which, again, is a switch, and this has worked through a system of relays which have eventually allowed the air from that wind-chest to enter the particular pipe that is to produce that note

Remote Control.

The organist is at the console, in the orchestra pit. The pipe sounding the note that you hear is in a box far above him—possibly on the other side of the cinema. In front of that box is the B.B.C.'s microphone, feeding into their amplifier on the premises; this is connected to the actual transmitter by a land-line. And the rest you know!

Now consider that the organist produces that well-known "orchestral" tone by the judicious use of various combinations of stops—of which he has more than a hundred available—and that the organ is divided into two sections, one on either side of the screen, each "boxed" and fronted with closely-fitting shutters controlled by pedals from the console, and you will have some idea of the complications of the instrument.

Every Stop a Switch.

Every stop, every note, every pedal is a perfectly-balanced switch, and in the action-chamber one can see the ends of all the wires from the console and from the relays in the main organ chambers. In addition, there are scores of pistons controlling particular

MAKING A NOTE OF IT!



Here is Quentin Maclean himself at the manual of the giant Wurlitzer organ which you hear broadcast every Wednesday morning from the Trocadero cinema.

groups of stops, all operating in the same way.

When the player performs the simple operation of sounding a single note from a single pipe, that electrical impulse may have to travel 200 feet, and then the sound arrives from a distant part of the building. The result is that you, in front of your loud-speaker, probably hear that note before the organist at the console does himself, for the B.B.C.'s microphone is nearer to the speaking pipe than he is.

Not So Difficult!

I suggested to Mr. Maclean that the "O.B." engineers must have had an extraordinarily difficult job. He replied, "No, not at all! They just asked me to play for a few minutes and then came down and said everything was in order." Apparently even the "divided organ" has no terrors for that department.

Of course, every listener and every cinema-goer knows the intriguing "gadgets" with which these modern organs are equipped. This particular instrument is naturally no exception. In addition to the "legitimate" stops, comprising ranks of pipes giving faithful imitations of the tone of the clarinet, oboe, tuba, saxophone, violin, 'cello, and so on, there are complete xylophones, marimbas, glockenspiels, cathedral chimes, sleigh-bells, and a harp.

A Wonderful Collection.

And in the "percussion" department, so dear to the proud owner of a moving-coil speaker, there are bass drums, snare-drums, "crash" cymbals, tom-toms, Chinese blocks, and all the rest.

For sheer effects there are motor-horns, ships' sirens, "wind-howls," bird-whistles (neat little affairs like a pipette in a bowl of water!) and all the tricks known to the "incidental noises" department of the B.B.C.

Every one of these is, of course, "remote-controlled" by relays, apart from which the huge blowers are driven by electric motors. So that a few watts are spent on giving you your Wednesday recitals.

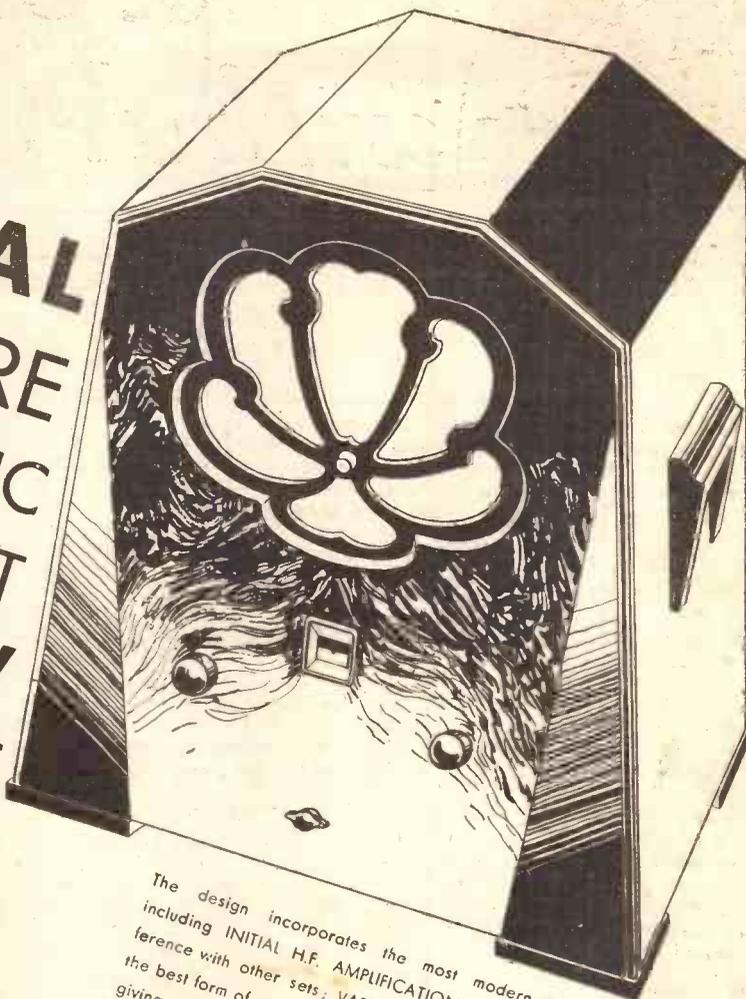
Mr. Maclean told me of a queer experience that they had at the Trocadero in connection with the relaying of the organ recitals to the café and other parts of the building. They have two "mikes" high up for this purpose, but there is a separate single one in the orchestra pit for relaying the orchestra.

Discovered by Accident.

One day the organ music sounded better than usual, and they found that, owing to a mistake, the "orchestra" microphone had been switched in instead of the others. This, of course, is yards away from either half of the organ itself. The success of this position was probably connected with the other queer fact that if one sits in the centre of the house, in certain positions, it is difficult to tell which side the sound is coming from. For recording, incidentally, they use only one microphone placed in the centre.

I ventured to ask Mr. Maclean for his opinions on the subject of radio before we parted. I gathered that he has little time for such diversions, what with broadcast recitals and the rehearsals connected with them, recording, and the ordinary performances, but he had a portable set that was "a bag of tricks"! Compared with that, he regarded the organ as simplicity itself!

TECHNICAL MEN ARE ENTHUSIASTIC ABOUT THIS NEW SET



Widespread interest has been aroused by the introduction of the FERRANTI 7-Valve Super-Heterodyne. Knowing the high quality of FERRANTI components, technical men looked for an altogether outstanding performance from the new FERRANTI Receiver. The definite opinion of these practical-minded listeners is that the FERRANTI Super-Heterodyne is exactly what is wanted for modern radio conditions—an instrument built to standards of precision in every detail, and able to exploit the full possibilities of every kind of broadcast.

The design incorporates the most modern features, including INITIAL H.F. AMPLIFICATION, preventing interference with other sets; VARIABLE MU VALVES, providing the best form of volume control; GANGED CONDENSERS, giving one knob tuning; BAND PASS COUPLING, ensuring high selectivity without loss of high notes; MOVING COIL SPEAKER, for high quality reproduction; TONE CONTROL, to provide sharp or mellow tone at will; ILLUMINATED WAVELENGTH SCALE, giving instant station identification; AUTOMATIC MAINS AERIAL DEVICE, enabling the Receiver to be easily moved from room to room and used wherever an A.C. light or power socket is available; and GRAMOPHONE PICK-UP.

FERRANTI

7-VALVE SUPER-HETERODYNE CONSOLE SET

SEE AND HEAR IT AT STAND **78**
RADIO EXHIBITION, OLYMPIA, AUG. 19th-27th

RETAIL PRICE **22 GNS** Or by Deferred Payments -42/- down and 12 monthly payments of 38/6.

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SNAKE CHARMING

with a PORTABLE

By JULIA CHATTERTON.

Our contributor, who is a well-known composer, has for nine years travelled in Europe and the Near East, in search of folk tunes. Her songs and dramatic recitals are a popular feature of the broadcast Programmes.



WHEN I was first invited by the B.B.C. to broadcast my folk-song compositions, I was doubtful whether they would appeal to listeners. To appreciate the folk song at its true value one must hear it sung in its natural environment, in the fields or at the well, where the peasants employ it as a sort of natural impetus to their work.

There was also the difficulty of finding singers, and translating the song into the English language in order to convey some sort of picture. The style of folk-song singing is so different that unless the performer understands something of the mentality of the original singer and the conditions under which the songs are sung, they lose much of their charm.

When Paul Robeson broadcasts, for instance, he is not just performing in a studio, for the entertainment of listeners—he is sitting in the cotton fields in his torn, ragged clothes, reliving the joys and sorrows of his race through the medium of his art.

To my surprise, however, the transmission was remarkably successful—even the little subtleties which, ordinarily, would not be noticed.

Railway Radio!

When I journeyed to Skoplji, in the extreme south of Jugo-Slavia, by the narrow-gauge railway which runs through wild, mountainous country and up to alarming heights, I discovered all the carriages were fitted with ear-phones, wrapped in microbe-proof paper bags, from which one could hear transmissions, relayed through Prague and Belgrade, of the latest dance tunes.

It was such a strange contrast to the—otherwise—primitive surroundings, it struck one as being curiously artificial.

Then in Skoplji itself, one will often be arrested when walking down the main street, by the strains of an opera issuing from a loudspeaker in the shape of a lamppost, erected outside a cafe, before which a motley crowd composed of pedlars, shepherds carrying sheepskins, laden donkeys, and veiled women, stand listening entranced.

It is hard on the folk-song collector because now that the people have their entertainment provided for them, there is no incentive to make their own music. It is also occasionally embarrassing.

I was once staying in a small Macedonian village miles away from any big town, and in the evening, as was my custom, I visited

a cafe where the peasants had congregated to entertain me with their songs.

At the end of an hour's singing, wishing to compensate them in some way, I brought out the portable wireless set I always carry about with me, fully expecting as I twisted the knob and the strains of a jazz tune issued forth, to see awed looks gather on their faces. Instead of which, the cafe proprietor suddenly disappeared behind a curtain and returned a minute or two later with a much more magnificent set, which he proudly displayed to my exceeding discomfiture.

A Popular Folk Song.

One of the folk songs which has proved most popular with listeners is "Rattle, rattle, water chain, who is in the well," which I discovered being sung by some Bosnian women drawing water at a well.

Nearly all these songs are handed down from generation to generation, and frequently forms an unconscious expression of the sufferings which the people have endured at the hands of oppressors in by-gone days. Hence the undercurrent of melancholy which often runs through them.

A FAMOUS COMPOSER



A charming character study of the authoress.

Although Oriental music may sound barbarous to the untutored Western ear, it is, in a technical sense, far more complete than ours. The tempered Western scale, for instance, upon which our musical education is based, possesses fewer than half the notes of the Oriental scale.

Some of the most attractive melodies I have broadcast are the Bosnian shepherd love songs which are found in the Moslem quarter of Serajevo, the town associated with the outbreak of the Great War. On market days the shepherds, clad in their heavy sheepskins, come down from the mountains to buy their provisions for the week. Here you will find them clustering round the stalls where the pipes, known as the drognica and Swirila, are found, prying over the instruments most suited to their particular repertoire of tunes.

The carpet weavers of South Jugo-Slavia have for centuries solved what seemed an insoluble problem by employing a man to sit aloft and sing to the weavers below the actual pattern and colour of the carpets they are making.

The chant they use generally takes the form of "Oh ye, in the north-east corner, work two rows of green," or "Oh ye, on the left side, alter your pattern now," and so on until the carpet is finished.

This chant I used as a setting for a folk song which was broadcast some time ago.

Earning His Living.

The snake charmer in Egypt earns his living by going round the houses and offering to charm out snakes for a small sum, and also giving entertainments at the roadside. I was once anxious to record the original snake-charmer's chant, and one day I and a party of friends pursued one of these men from one house to another without succeeding in glimpsing even the vestige of a snake.

Tiring eventually of this fruitless sport, we squatted down for lunch in the shade of an old wall, and turned on the wireless. A dance orchestra from Algiers was being relayed, and the music had been going on for some time when, happening to look up I saw, to my horror, a couple of large snakes stealthily emerging, with heads reared and hissing venomously, from out of a crack in the wall.

The expression of mingled disgust and resignation on the old snake-charmer's face as he promptly seized the reptiles and thrust them into his leather bag, quickly restored order.



A "P.W." STAR PRODUCTION

FOR—

All-wave, Long-distance Loud-speaker Reception. It covers Short Waves, Medium Waves and Long Waves without Coil Changing and even without switching between the last two wavebands. Greater Power, Greater Selectivity, Increased Flexibility, Improved Sensitivity Controls—these are but a few of the qualities of this latest member of a famous set series. Even if you are not contemplating the immediate construction of a new set we feel sure you will find some most interesting reading in this article by G. V. DOWDING, Associate I.E.E.

THERE is an old saying which suggests that names count for little or nothing.

If this is true, then it is my privilege to introduce "P.W." readers to a striking exception to the rule.

The name "Cosmic" stands for one of "P.W.'s" greatest set successes, and it is as certain as anything can be that the

popularity of the four-valve version is to a large measure inevitable for that reason.

You see, a "Cosmic" set design must be notable because there are circuit and layout features which are distinctly "Cosmic," and which are found in no other receiver, although we are bound to say

that a few of these are already filtering into the standard practice of 1932.

But in actual fact, the "Cosmic" Four is even more than the "Cosmic" Three with an H.F. valve added, for it has its own individually original characteristics. Additionally, certain of the ideas which

(Continued on next page.)

THE COMPONENTS AND ACCESSORIES WHICH WE CAN RECOMMEND

- Panel, 18 x 7 in. (Wearite, Lissen, Permeol, Peto-Scott, Goltone).
- Cabinet with 18 x 10 in. baseboard (Camco, Peto-Scott, Pickett, Gilbert, Osborn, Ready Radio).
- 2 0005- Extensers with slow-motion dials (Cydon, Telsen).
- 1 0003 solid -dielectric reaction condenser (Telsen, Polar, Ready Radio, Magnum, Ormond).
- 1 0001 solid-dielectric variable condenser (Telsen, or as above).
- 1 00075 solid-dielectric variable condenser (Ready Radio, or as above).
- 2 Cosmic dual-range coils (Ready Radio and R.I., Lewcos, Wearite, Sovereign, Goltone, Peto-Scott, Tunewell).
- 2 Cosmic S.W. coils (Lewcos and R.I., or as above.)
- 1 Moderator coil (Ready Radio, Peto-Scott).
- 1 H.F. choke (Tunewell Universal, Wearite).
- 1 Sovereign vario-choke unit (Sovereign).
- 2 3-pole wave-change switches (Bulgin and Lissen, Ready Radio, Goltone, W.B., Telsen, Wearite).
- 1 2-point on-off switch (W.B., as above).
- 1 Horizontal type valvholder (Lissen, W.B.).
- 3 Normal type valvholders (Lissen, W.B., Telsen, Igranic, Wearite, Bulgin, Clix).
- 1 L.F. transformer (Lissen Hypernik, R.I. Hypermite, Igranic Midget, Varley Nicklet)
- 1 0003-mfd. fixed condenser (Dubilier type 665, T.C.C. type M).
- 1 0003-mfd. fixed condenser (T.C.C., Lissen, Dubilier, Ferranti, Sovereign, Goltone, Igranic, Telsen).

- 1 01-mfd. fixed condenser (T.C.C., or as above).
- 1 1-mfd. fixed condenser (Dubilier type 9200, T.C.C., Telsen, Lissen, Peto Scott, Sovereign).
- 1 2-mfd. fixed condenser (T.C.C.).
- 2 2-megohm grid leak (Lissen, Igranic, Graham Farish).
- 1 1/2-megohm grid leak (Lissen, as above).
- 1 600-ohm resistance (Dubilier 1-watt type) Graham Farish).
- 1 25,000-ohm resistance (Dubilier 1-watt type).
- 1 80,000-ohm resistance (Dubilier 1-watt type, Graham Farish).
- 1 1/2-megohm resistance (Graham Farish).
- 10 Indicating terminals (Bulgin, Belling Lea, Igranic, Elex, Clix).

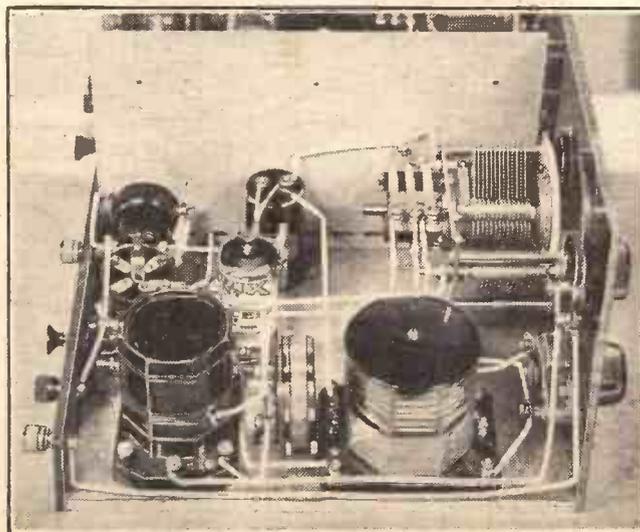
- Terminal strip, 18 x 2 in.
- 1 Standard screen, 10 x 6 in.
- Copper foil, 10 x 7 1/2 in.
- Connecting wire.
- G.S. cell for valve screws, etc.
- LOUDSPEAKERS.—Marconiphone, W.B., Celestion, H.M.V., Blue Spot, Epoch, Ferranti, R. & A.
- VALVES.—S.G.: Mullard P.M.12A, Cossor 220 S.G., Marconi S.22, Osram S.22, Mazda S.215B., Six-Sixty 215S.G., Tungram S.210, Lissen S.G.215, Eta B.Y.6.
- DET.: Cossor 210Det., Mullard P.M.1H.L., Mazda H.L.2, Osram H.L.2, Marconi H.L.2, Six-Sixty 210 H.L., Tungram H.210, Eta B.Y. 1814.
- L.F.: Osram L.210, Marconi L.210, Mullard P.M.1L.F., Mazda L.210, Six-Sixty 210 L.F., Cossor 210 L.F., Tungram L.210, Lissen L.210, Eta B.Y.1814.
- OUTPUT: Mazda 220A., Mullard P.M.202, Marconi P.2, Osram P.2, Cossor 230X.P., Six-Sixty 220 S.P., Tungram 230 S.P., Lissen P.X.240, Eta B.W. 303.

(Smaller output valves may be used to reduce H.T. current.)

- BATTERIES.—H.T. (120 volts, supercapacity), Lissen, Ever Ready, Drydex, Oldham, Pertrix.
- G.B. (Upto 16.5 volts): Lissen, Ever Ready, Drydex, Oldham, Pertrix.
- L.T. (2 volt, 40 amp.): Exide, Oldham.

Mains Unit, giving at least 36 milliamps at 150 volts. (Not advised for short wave operation, Heayberd, R.I., etc.)

THE FIRST "S.G." TRI-BANDER



The "Cosmic" Four is the world's first set to provide tri-band S.G. H.F. amplification without coil-changing and with no switching for ordinary broadcast reception.

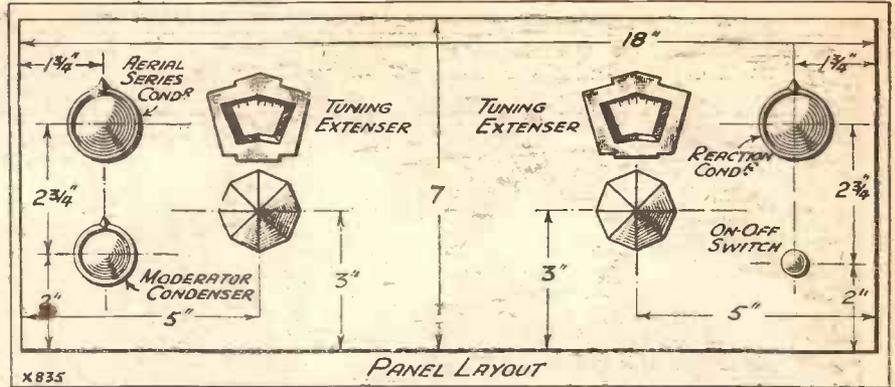
THE "COSMIC" FOUR

(Continued from previous page.)

made their original appearance in the "Cosmic" Three are included in a refined and polished condition. I hesitate to use the word "improved," because that might tend to indicate that we consider that the "Three" now constitutes a raw and undeveloped precursor of the latest member of the "Cosmic" family. But this is decidedly not the case, for the "Three" is still able to maintain its position.

The "Cosmic" Four is an up-to-the-minute tri-bander; it is able to receive short, medium and long-wave stations with equal facility without coil-changing or complicated switching.

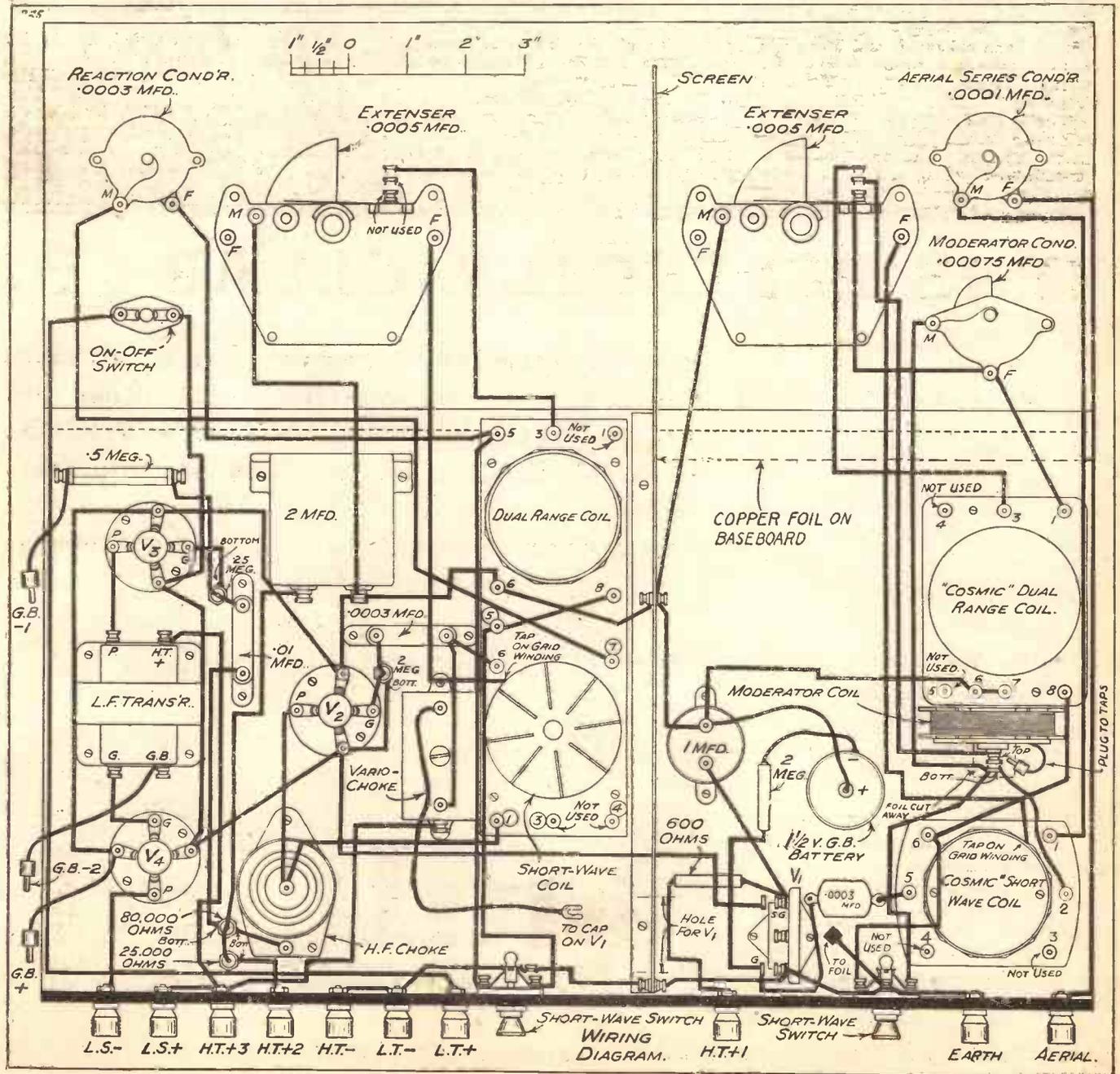
In the top left-hand corner of the above diagram there is the series aerial condenser, and just below this important control is the



Moderator condenser. Next is the first tuning Extenser, followed by the second Extenser. This ingenious component with its automatic wave-range switching has done more to simplify radio than has any other, and rightly deserves the popularity it has

achieved. Then, finally, there is the reaction condenser (top right), and the on-off switch (bottom right). The larger diagram shown below gives all the wiring details you will require when connecting up.

(Continued on page 590.)





IT IS PERFECTLY CLEAR . . .

Pure, undistorted reception and absolute freedom from microphony characterise the P.M.1.H.L. Built with the ANTI-MICROPHONIC CONSTRUCTION, it is designed to meet modern conditions, while its low anode consumption under detector conditions means:

- Improved quality
- Increased stage gain
- Prolonged life of H.T. Batteries.

Price 7/-

MADE IN ENGLAND

OPERATING DATA

Filament Voltage	20V
Filament Current	0.1A
Max. Anode Voltage	150V

CHARACTERISTICS

(At Anode Volts 100; Grid Volts Zero)

Anode Impedance	20,000 ohms.
Amplification Factor	28
Mutual Conductance	1.4 mA/V

Mullard

THE · MASTER · VALVE

THE "COSMIC" FOUR

(Continued from page 588.)

Moreover, it has an S.G. valve to add to its distance-getting qualities and to render still more simple the tuning-in of those trans-ocean, world-encircling short-wave stations.

It develops great power, and a large moving-coil speaker can be operated comfortably and programmes received by the score at, if required, terrific volume.

Using a moderately good outdoor aerial or an indoor aerial of fair dimensions, it should be possible to tune-in up to and even exceeding one hundred stations.

catalogue of tasks for one small control, isn't it?

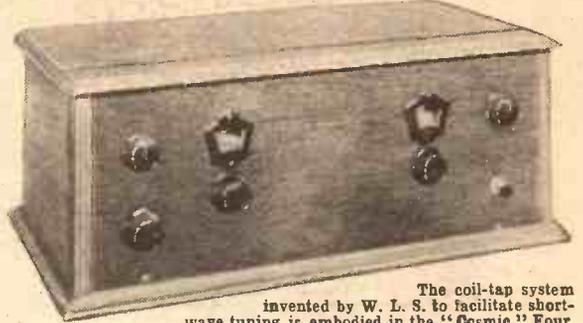
However, you mustn't jump to the conclusion that the "Cosmic" Four is a difficult set to handle—it is very far from being that. As with all "Cosmics" it can be operated successfully by anyone, and the least technical listener should at once get as good or better results with it than with any ordinary "four."

Very Flexible.

With a little experience the set can be "extended" to surprising limits, and I for one would hesitate to predict

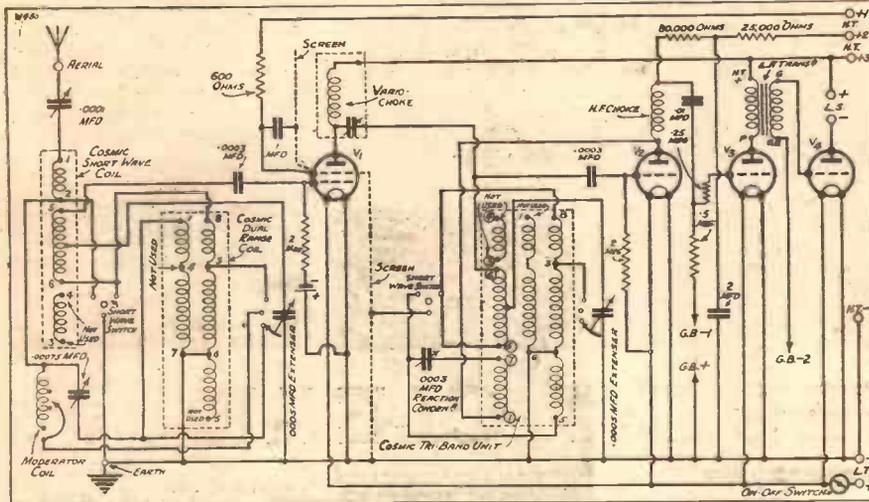
should be used, for the "Cosmic" Four is a high-efficiency set and deserves a discriminate selection of parts.

"SPREAD-OUT" SHORT-WAVE TUNING



The coil-tap system invented by W. L. S. to facilitate short-wave tuning is embodied in the "Cosmic" Four.

AN ENTIRELY NEW CIRCUIT COMBINATION



The now well-known and very efficient "P.W." Moderator system appears in this circuit in combination with a series aerial condenser.

Particular care should be exercised in the choice of coils. There are several first-class branded makes available, but also, unfortunately, there are one or two which are unbranded and of dubious quality. We have had letters from readers who have

NO COMPLICATIONS

It is important to note that the introduction of the third waveband has been accomplished in the "Cosmic" without in any way complicating the tuning controls. In fact, it is true to say that the set would be no simpler to handle if its short-wave potentialities did not exist. So the "Cosmic" Four is a first-class "household" set which is also able to comb the world for short-wave programmes.

been so unfortunate as to buy them for previous sets.

And remember that there are other "key" components, such as the L.F. transformer, which, by being sub-standard in quality, can transform a good set into one that is no better than the average. Stick to the list is a good slogan to follow.

Next week I shall give constructional and operating hints.

Over two hundred have been picked up on a "Cosmic" Three, and at the very least the "four" is that set plus a highly effective H.F. amplifying stage using a screened-grid valve!

A glance at the diagrams and photos will suffice to show you that it is by no means a complicated and costly receiver. And if you study these illustrations in detail, the fact that the wavelength coverable by the set ranges from 20, or so, to 2,000 metres will emerge as a wonderful testimony to the skilful nature of the whole design.

The "P.W." Moderator system of aerial tuning is employed and its application is still further broadened by the provision of a series aerial condenser.

It Does Three Jobs.

This component does three jobs, or, perhaps I should say, it contributes usefully to both the jobs carried out by the Moderator and is also useful on short waves.

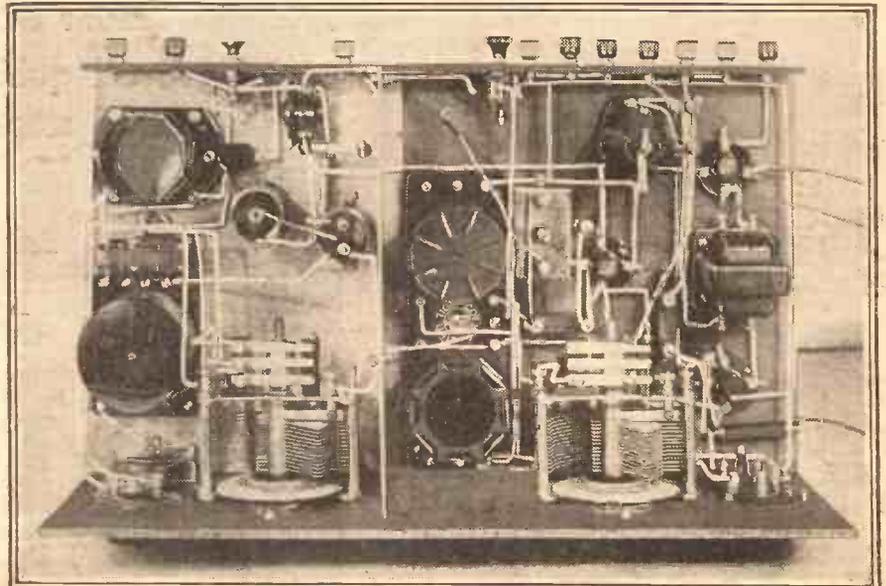
On long waves it supplements the Moderator condenser as a straightforward selectivity control, while on medium waves it renders it possible immediately to adapt aerial conditions to one particular Moderator coil tapping and extends the "Moderation" covered by one tapping so that this can fully accommodate all the medium-wave stations.

Incidentally, it also functions as an excellent "front-door" pre-amplifier volume control. Rather an imposing

what new records of reception it is destined to break.

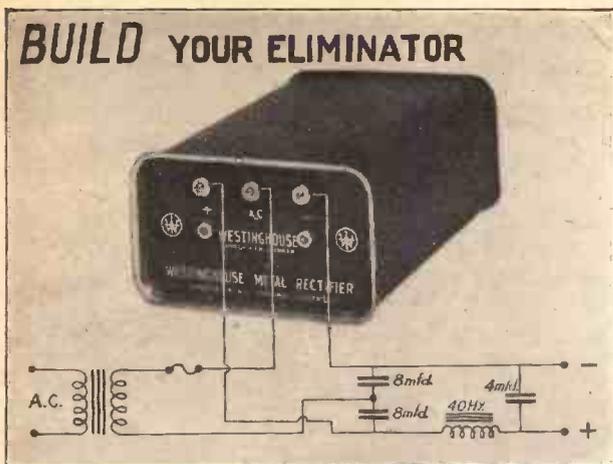
The components should be chosen carefully and only our recommended makes

THE EXTENSERS SIMPLIFY CONSTRUCTION AND OPERATION



The two Extensers, besides unifying the two broadcast groups of dial readings and eliminating switches, reduce the wiring and thus make the construction of the set easier and more efficient.

BUILD YOUR ELIMINATOR



Building an A.C. eliminator for bigger outputs is a very easy matter—if you build it round a Westinghouse Metal Rectifier.

Wiring is extremely simple . . . there is no filament heating to worry about, just straightforward connections between the transformer, rectifier, and smoothing circuit—via the voltage-doubling condensers—and thence to the valves of the receiver by tapplings from the smoothed D.C. output.

Full details, including particulars of the various methods of voltage dropping, decoupling, etc., are given in "The All-Metal Way." A copy will be forwarded you on receipt of your name and address and 3d. in stamps, which should be sent to "Dept. P.W."



METAL RECTIFIERS

THE WESTINGHOUSE BRAKE & SAXBY SIGNAL CO., LTD.
82, YORK ROAD, KING'S CROSS, LONDON, N.1.

SPECIFIED IN EVERY COSMIC SET



FIRST in the Cosmic III Sets, then the Cosmic II and now in the Cosmic IV Sovereign Components have been specified. In fact, the success of this latest and greatest Cosmic Receiver rests on the use of the Sovereign Vario-Choke in the H.F. stage, giving it stability and selectivity. There is only one Vario-Choke made—it is by Sovereign and is one of the greatest component developments for years. Read what the Radio Press says about it.

Complete with wiring instructions, from all dealers, or direct from the manufacturers.

3/6

SOVEREIGN VARIO-CHOKE

Manufactured by SOVEREIGN PRODUCTS LIMITED, SOVEREIGN HOUSE, ROSEBERY AVENUE, E.C.1. Clerkenwell 2788/9.

S.F.B.

for QUALITY OUTPUT

IN THE "COSMIC" 4

The designers of the "Cosmic" Four have produced a set capable, as they claim, of "terrific volume." That mighty volume must be true-toned, pure—and that is why the Lissen Hypernik Transformer is specified!

You cannot get such a good response curve—such fine quality reproduction—from any other transformer at anything like this price.

With a primary inductance of fully 100 henries, the Lissen Hypernik Transformer yet operates perfectly when passing currents up to 5 m/A or more. Its step ratio is 4 to 1 and a stage amplification of more than 100 is obtained. PRICE 12/6



LISSEN

HYPERNIK L.F. TRANSFORMER

LISSEN LIMITED, WORPLE RD., ISLEWORTH, MIDDLESEX

DOWN ON SEVEN METRES!

B.B.C. tests with the 7-metre transmitter installed on top of Broadcasting House have now started, and in this article our Special Correspondent, in an interview with a Research Engineer, tells readers what is going on.



THE B.B.C. 7-metre tests are now commencing, and the engineers have well maintained their reputation for being able to guard a secret when necessary!

A talk with one of the Research Engineers, though, has helped us to clear up several points.

"Why, does the B.B.C. want to keep practical details hushed up for the time being?" I naturally enquired.

Hush-Hush Tactics.

"Hushed up is not quite the right expression," said the Research man. "It is merely that we are not ready yet for amateurs to participate in the tests. We ourselves have yet to be convinced of the utility of 7-metre working, and until we have discovered the best system we are not asking for a lot of heterodyning from unofficial experimenters on these ultra-short wavelengths."

"But still," I pressed, "there must be a lot of technical information which ordinary amateurs could know, without any possibility of causing heterodyning."

I then detailed a number of technical points in connection with the new B.B.C. gear, and this is what I learned.

In the first tests special low-capacity valves will be used, but the internal construction is just the same as that of ordinary three-electrode receiver valves.

Ordinary Coils Used.

In spite of the extremely short wavelength, ordinary coils and air dielectric condensers are used for tuning, and the leads from the coils to the valve electrodes are kept down to a few inches, even in the 7-metre transmitters. The little aerial used is of the Hertz type and is known as a "doublet."

It is an accurately measured length of rod, having a definite ratio to the wavelength. Little parallel feeder wires run from the doublet to the oscillator, and in this respect the aerial system is just like that of any main broadcasting station.

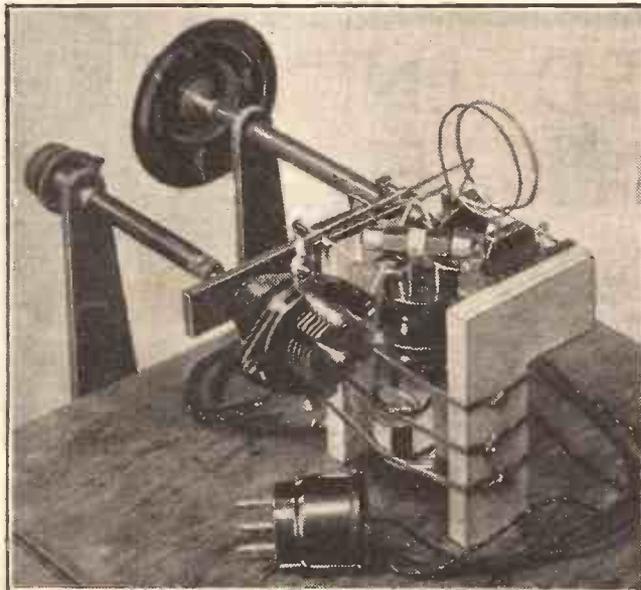
During the next month or so the engineers will be making polar diagrams—miniature contour maps showing in which direction the beam of each short-wave aerial is spreading out.

The meters used for receiving and for giving these polar diagrams are similar to the General Radio 419A Rectifier Wavemeter, which tunes from 15 metres down to nearly 1 metre.

I was told that there are two popular ways of making these ultra-short-wavelengths, either with a valve voltmeter, or directly with a yard stick! When the engineers want to measure the wavelength directly by means of a foot rule, they put up a small aerial system with what are known as Lecher wires.

These are parallel wires connected up to a tuning system so that standing waves are formed on the wires and by moving a sensitive meter or a small bulb along the

"P.W." FIRST IN THE FIELD



The Kelsey 7-metre Adaptor, which was described in "P.W." early this year, was the very first design in a hitherto unexplored field for the set builder. The Adaptor is remarkably simple in construction and operation.

wires, the distance between the peaks of the waves, where the bulb will light or the meter needle flick, can be measured directly with the foot rule.

While the engineers use this method of checking up wave-meters in their research work, they prefer to have a portable valve wavemeter of the 419A type. This is a little box with a carrier handle.

The coils, wound with two or three turns of copper tube, plug into the side, and a

slow-motion condenser control tuning each coil in circuit gives the frequency indication. A D.C. micro-ammeter, reading from 0 to 200, put in the anode circuit of the valve voltmeter, and wired up to the wavemeter circuit, shows the peak of each tuning point.

A Watch on Berlin.

I was told that the B.B.C. engineers have been closely following what the engineers have been doing with 7-metre transmitters on top of the Telefunken building in Berlin. A 1-kilowatt transmitter has been fitted up there, and within the last month or so the German people have managed to control this by a quartz crystal, which has taken them several weeks to grind accurately to the required frequency.

More stages of frequency doubling are needed when quartz controlling a 7-metre transmitter than when regulating a broadcast-band transmitter in this way. The B.B.C. may use a crystal oscillator, or even a tuning-fork vibrator, in connection with the new 7-metre gear.

Wavelength Problem.

I discussed with the Research Engineer a point which has not so far been raised in the 7-metre tests—namely, the authority which the B.B.C. can get for working down below 10 metres. The Naval authorities have a number of wavelengths down about this region, and the Post Office has power to grant the B.B.C. an approximate 7-metre wavelength for experimental work.

Wavelengths below 10 metres are arranged by international agreement, and the lowest broadcasting wavelength agreed upon at the Washington Convention, when Captain Eckersley was present, was 13.9.

If the B.B.C. found 7 metres too low, then it could still come up to 10 metres, if the Post Office cared to ask, internationally, that this band should be given to broadcasting. But then, of course, this country might not have exclusive use of it.

Even down on 7 metres, we are not free from international wavelength squabbles!



RADIOTORIAL

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

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

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

QUESTIONS AND ANSWERS

ADJUSTING THE POTENTIOMETER.

C. G. D. (West Hartlepool).—"The circuit is detector (using 0003-inf. and 2-meg. leak) followed by one stage of transformer-coupled low-frequency. And it is supposed to be specially good on long-distance reception because of the potentiometer across the detector valveholder filament terminals.

"This potentiometer has its slider connected

correct setting of the potentiometer has the important effect of promoting the smooth control of reaction, and as that is all-important in a set of this class used for long-distance reception the finding of the best position for the slider is of considerable importance.

The best way to proceed is to set your tuning condenser somewhere near the middle of its scale, and move the potentiometer round towards the positive end of its travel. (This will be the end that is connected to the positive lead of the L.T. battery.)

Now test the reaction control. (By the way, the test should be carried out when the local station is not on, so that reaction effects are not "blinded" by a powerful transmission, or by neighbours' sets tuned in to an adjacent or the same wavelength.)

You will probably find that when you test the reaction with the slider right round at the positive end, the reaction will be inclined to be "ploppy," going into oscillation with a disconcerting suddenness instead of with that smooth increase from one condition to the other that is characteristic of the set that is in tip-top form for "DX" work.

To cure this tendency to ploppiness you must move the slider round by degrees, towards the negative end of its travel, adjusting the reaction control as you do so.

You will find that it gets smoother and smoother as the slider is advanced farther towards negative, but the disadvantage of proceeding in this way is that the weak programme of a distant station will get weaker still the further round you go towards negative.

Alter High-Tension as Well.

Remember also that the detector anode voltage should be re-adjusted, with the object of finding a setting which enables you to bring the potentiometer towards the positive end again, without spoiling the smooth slipping in and out of oscillation.

Do not be tempted to carry the slider too far towards the positive end. It is certainly when adjusted thus that the maximum sensitivity seems to be obtainable, but sensitivity is no more important than smooth reaction.

You will find that with the ordinary detector valve there is a certain adjustment of the slider, generally on the positive half of the travel, where really smooth reaction can be obtained, combined with great sensitivity to weak programmes, and, of course, once you have found this spot you can leave the slider set, until you change the valve for a different one.

You will note that, in spite of the truth of your

"P.W." PANEL, No. 81.—THE ENGINEERING OF AN OUTSIDE BROADCAST

Outside Broadcasts—or "O.B.'s" as they are generally known—are broadcasts of events outside the B.B.C. premises. The broadcast of a horse race, a Queen's Hall concert, a hotel dance-band's music, the boat race—all these are O.B.'s.

Such events are usually picked up by several microphones—about six for a theatre broadcast, only two for a dance-band, etc. And the inputs from the different microphones are combined and amplified before passing to the transmitter.

The use of several microphones not only minimises the risk of a complete breakdown, but it enables the sounds to be presented with a nice balance between, say, a speaker and the "crowd noises" that form the background.

remark about volume control the slider has an important bearing upon the strength of reception, but it is upon the distant and not the local programme that the effect is experienced.

A GOOD INDOOR AERIAL.

D. M. (Swindon).—"I have had an indoor aerial for some time, and wish to improve this, if possible. At present it consists of a single wire about two inches from the wall of the room, and about four inches from the ceiling. Is this the most efficient?"

The best position for an indoor aerial must be found by experiment, as it chiefly depends upon the local conditions. A good arrangement consists of four parallel wires placed 1 ft. apart about 18 in. from the ceiling, with the lead taken from the centre, or one end of each. Single-strand bell wire, size 18 or 20 S.W.G., is a good size to use, and the four wires should be as long as the space permits.

HOW MANY MFDS.?

L. S. F. (Seaforth, near Liverpool).—"I have been trying to find out how to calculate the total capacity of two different capacities in series, but the only book I have on the subject is not very helpful. It says 'the reciprocal of the total capacity is equal to the

DO YOU KNOW—

the Answers to the following Questions?

There is no "catch" in them, they are just interesting points that crop up in discussions on radio topics. If you like to try to answer them, you can compare your own solutions with those that appear on a following page of this number of "P.W."

- (1) What is a carrier-wave?
- (2) Which link in the "receiving chain"—i.e. what piece of apparatus at your end—is the exact opposite to the microphone at the transmitting end?
- (3) How often are the B.B.C.'s National Lectures broadcast?
- (4) Who is "A. J. Alan"?
- (5) About how many hours of transmitting are done by the B.B.C. in a year?

sum of the reciprocals of the individual capacities.' What does that mean?"

The reciprocal of any number is equal to that number divided into one. Therefore, the reciprocal of 3 is $\frac{1}{3}$, and the reciprocal of 8 is $\frac{1}{8}$, etc. Obviously if you can find the reciprocal of the total capacity, you can then merely wash out the 1 above it and you have the total capacity.

To find the reciprocal of the total capacity you have only to find the sum of the reciprocals of the individual capacities; and to do this all you have to do is to put down the individual capacities underneath a 1 in each case, and add them together, this total being itself then turned into a reciprocal.

Suppose there are two condensers to be joined in series, the capacities being 2 mfd. and 4 mfd. respectively. To find their total capacity you have first of all to convert these numbers to their reciprocals—i.e. $\frac{1}{2}$ and $\frac{1}{4}$ which, added together, = $\frac{3}{4}$.

Finally, you have to find the reciprocal of this, which is merely $\frac{4}{3}$ divided into 1. In this instance the answer comes out at 1.33 mfd., which is the effective capacity of these two capacities joined in series. Any number of condensers and any values can be worked out in the same way.

(Continued on next page.)

HOW ARE YOUR RESULTS NOW?

Perhaps your 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 its unrivalled service.

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to the grid leak, at the end which does not go to the grid of the valveholder, and it does not make any difference to volume whether the slider is pushed in the middle of the travel, or right round at one end or the other (at least, not any difference in volume worth talking about).

"I cannot find anyone who knows how to adjust this slider for best reception, and I should be glad if you can put me wise on that point. Am I right in assuming that it has nothing to do with controlling volume, like a high-resistance potentiometer?"

You are right in your assumption that the primary purpose is to assist long-distance reception. The

RADIOTORIAL QUESTIONS AND ANSWERS

(Continued from previous page.)

THE OUTPUT L.F. CHOKE.

F. G. L. (Devizes, Wilts).—"Will a 20-henry choke be O.K. for output to work a moving-coil loudspeaker? It is a big, well-made choke really intended for ordinary electrical work, but I do not know what its resistance should be, although I suppose it is possible to test this on a milliammeter?"

A 20-henry choke should be O.K. provided its resistance is not more than about 350 ohms. You can easily test this by means of a milliammeter if you connect the instrument in series with the choke. You can place either a 2-volt or 4-volt battery across the arrangement. With a 2-volt battery you should get about a 5-milliamperereading, and with the 4-volt battery about a 10-milliamperereading. From a close reading you can easily calculate the resistance by means of Ohm's law, volts

amperes = resistance.

In this case, with the 2-volt battery, if you get $\frac{2}{5}$ milliamps this will be equivalent to $\frac{2}{0.005} = 400$ ohms.

AN AERIAL PUZZLE.

C. F. E. (Suffolk).—"I tried a 2-mfd. condenser in series with the aerial. It distinctly improved the quality of the loudspeaker reproduction without diminishing the volume. A little more reaction, however, is required.

THE ANSWERS

TO THE QUESTIONS ASKED ON PAGE 593
ARE GIVEN BELOW.

- (1) The (unmodulated) wave emitted by a broadcasting transmitter aerial before the programme sounds which represent the speech and music are allowed to affect it.
- (2) The loudspeaker.
- (3) Three times a year.
- (4) Nobody knows, outside the B.B.C.—except "A. J. Alan" himself.
- (5) About 68,000 hours.

DID YOU KNOW THEM ALL?

"I was surprised to find, however, that the wavelength of the aerial tuning condenser was hardly affected. This was about one degree more. Why is this? (A smaller condenser (.001 mfd.) changes the reading of the A.T.C. about 5 degrees.)"

Every aerial has a certain capacity of its own, and the average aerial capacity is of the order of about .00025 mfd. Therefore, if a condenser is connected in series with the aerial, we can expect the total capacity to alter in just the same way as when one condenser is connected in series with another.

Now if any condenser is connected in series with another one, the total capacity is reduced, and the smaller the condenser which is added the greater is the reduction of capacity. This being so, a large capacity condenser connected in series with the aerial will hardly reduce its capacity at all.

A very small capacity condenser, such as .0001 or a neodyne condenser, will make a very great reduction in the total capacity, and consequently will have a much greater effect upon the wavelength setting of the condenser. Just why condensers should behave like this when joined together is too long a story to go into fully, but the effect you have noticed is one more proof of the rule that when two capacities are joined in series the total capacity is always less than that of the smaller of these.

IT LOOKS WRONG!

F. W. (Hanwell).—"I have got a big L.F. choke and big fixed condenser, with the idea of making a choke output circuit. But the sketch which was given me seems wrong, for it shows the loudspeaker connected to the condenser, so that apparently the current could not flow in it. What are the proper connections?"

In order to provide the choke output, all you have to do is to disconnect the loudspeaker from its terminals on the set and join the choke across them. Now join one side of the large fixed condenser to that side of the choke which now goes (in the set) to the plate of the valve, and the remaining terminal

of the condenser to one side of the loudspeaker. The remaining side of the loudspeaker is now joined to the nearest point of the set's wiring which is connected to the filament of the last valve (probably H.T. negative or L.T. negative, or earth).

If you draw a sketch of this arrangement you will find that the steady H.T. current now passing through the windings of the choke will pass direct from the plate of the valve. There is, however, an alternative path from the plate to H.T. negative via the fixed condenser and the loudspeaker; for although the fixed condenser is an active barrier to any direct current getting through this way, the varying currents caused by the speech or music have great difficulty in "overcoming" the impedance of the choke, and therefore such variations of current find a much easier path through the condenser to loudspeaker.

Being alternating currents, they can "pass through" the condenser if it is a large one without serious loss, and in this journey they operate the loudspeaker just as well as if it were placed direct in the plate circuit of the valve. If you try this method we feel convinced that you will be delighted with the results.

WAS IT A HARMONIC?

JOHNNY (Newcastle).—"Having a bit of fun with tuning coil trouble, I wound a number of separate coil units, and one of them goes as low as a snake's tail! Konigsberg (Germany) comes in at 11, and right at the bottom of the dial are two other stations.

"One is a B.B.C. programme, and is undoubtedly Aberdeen, though I have not heard the word. The wavelength corresponds with that of the new station. Immediately below is 'Budapest,' who is supposed to be up on 550 metres.

"How do you account for that? Harmonic?"

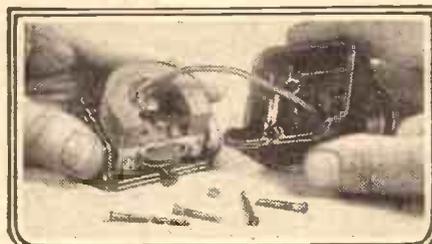
No, we do not think this was a harmonic, as Budapest has recently been relayed on 210 metres by Csepel. This would correspond with your wavelength indications, so you can be sure it was Csepel, which, incidentally, is the site of the great new Budapest station which is due on the air this year.

WHERE TO SEND FOR "P.W."

"NEW CRUM" (Middlesbrough).—"Reading through the letters from other purchasers of 'P.W.' I often see a mention of something I should like to read about if I could get the back number of the book. But the news-agent is not very helpful and says I should have to write to the publishers. Is this O.K.?"

The back numbers of "P.W." (and of "Modern Wireless," and "The Wireless Constructor") which are still in print can be obtained on application to The Amalgamated Press Ltd., Back Number Department, Bear Alley, Farringdon Street, London, E.C.4. The cost is 4d. per copy, post free, in the case of "Popular Wireless," and for "Modern Wireless" and "The Wireless Constructor" it is 1s. 3d. and 8d. respectively.

WHAT'S WRONG?



INSIDE A PICK-UP

The inside of a gramophone pick-up is not usually exposed to view, but this photograph shows a typical arrangement.

Generally speaking the mechanism is too delicate to be adjusted by the set-builder—it is a job for the makers.

There are two small points that should be watched, however, for good results. They are—avoid knocks and mechanical shocks which injure the magnets. And do not let the external nuts or bolts work loose.

TECHNICAL NOTES

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

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

Power-Grid Detection.

MANY people when using power-grid detection are under the impression that it is only necessary to have grid-condenser and leak values below the normal for power detection to be obtained. This, however, is not all that is necessary and merely adjusting these values in this way will not give you power-detection unless the input to the detector is several volts. This, of course, depends upon the valve in question and its operating voltages.

Suppose the grid-leak is, say, a quarter of a megohm and the condenser .0001 microfarad, it may be that power-detection is not obtained owing to a high-ratio transformer and high magnification factor of the valve. In many cases where ordinary power valves are used the total low-frequency amplification is too great for power detection to be properly obtained.

Less Frequency Distortion.

One of the advantages of using values of grid leak and condenser such as those given above is that there is, as a rule, less frequency distortion. This advantage is worth while, but at the same time you want to remember that in order to get the best quality you must have a suitable input to the detector, and the low-frequency circuit must be carefully designed to correspond.

I have had several letters from readers who have not had much luck with power grid-detection but, as I say, it doesn't depend just simply upon making more or less drastic alterations in the values of grid leak and condenser; the input and the other conditions of the circuit must be regulated accordingly.

Variable-Mu Valves.

Variable-mu valves have many advantages over the usual screen-grid types, one important advantage being that they are able to deal with inputs of several volts with very little distortion.

These variable-mu valves first appeared on the American market and their advantages were quickly recognised. A typical valve of this kind has an anode impedance of something over 300,000 ohms, anode voltage 180 and screen voltage 75; with these voltages and a bias of 1.5 a slope of 1 is obtained, this becoming only .005 when the bias is increased to about 40 volts.

The Osram variable-mu screen-grid 4-volt valve (V.M.S.A) is a good example of the A.C. indirectly-heated type and has some improved characteristics; the filament voltage, as stated, is 4 volts, and the filament consumption 1 amp. The anode voltage is rather higher than in the American type mentioned above, being 200 volts with 80 volts on the screen.

(Continued on page 596.)

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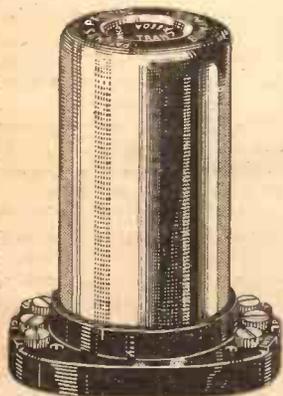
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TECHNICAL NOTES

(Continued from page 594.)

Maximum Conductance.

The maximum mutual conductance can be increased from 1.1 to 2.4 milliamps per volt.

This is a very high efficiency valve and may be used in sets employing one stage of H.F. or in some cases in sets using two stages. In some instances the high efficiency may tend to cause instability, but this can be overcome by adjusting the fixed part of the grid-bias resistance (normally 100 ohms) so as to regulate the maximum conductance to any required value.

Short-Wave Working.

Those of you who go in for short-wave work know full well the extra precautions which have to be taken with regard to the tuning condenser and so on. A tuning condenser which may be perfectly satisfactory for other work will not necessarily do for short-waves.

Some tuning condensers have long wire or spring contacts to the moving plates and become unsuitable for short-wave work for that reason, whilst in some cases a slow-motion arrangement is actually built into the condenser itself, which again is generally unsuitable.

As regards a pigtail connection with the shaft of the moving vanes, this when properly made forms a very good connection and is suitable so far as it goes, but you must take care not to use a condenser in which a large spiral spring is fitted because this, by its inductance, may render

the condenser quite unsuitable for short-wave work; it may, in fact, seriously restrict the tuning range.

Bear in mind that when working with the short waves all kinds of considerations become important which may be negligible over the broadcast and long-wave ranges. It is simply a question of frequency and you want to keep in mind the different behaviour of various components at very high frequencies as compared with medium and low frequencies.

Specified Valves.

There is often a tendency in set design to build a set around a particular group of valves. You will often notice this in the specification of a new design of receiver, and whilst I admit it has some attractive features, I think it also has some important disadvantages as well.

There is now such a bewildering choice of valves that the amateur can well be excused when he finds himself unable to make up his mind which valve to use for any position in his set. If he finds a new design which is built definitely round certain specified valves, he is apt to jump at it because he feels that here at any rate is a case where with specified valves he cannot go wrong.

Alternative Components.

Now it often happens that you have spare valves on hand of various makes, or components of particular types, and I think there is a good deal to be said for a set which really allows you a free choice in the valves and the components. Often enough an amateur will go in for a new type of valve, in the expectation that he is going

to get improved results and, after having laid out his money, he finds that signals are no stronger, sensitivity is not better and possibly selectivity is worse.

You have to remember that it is not merely the valves alone which determine the performance of the set, but the valves taken in conjunction with the components, the layout, the voltages used and many other factors. The set should be so designed and its operation so "elastic," as it were, that there is room for the constructor—using reasonable discrimination, of course—to press into service selected components from the stock which, as we all know, so rapidly accumulates in every experimenter's workshop.

"Elastic" Circuits.

Many designers definitely aim at making an "elastic" type of circuit, so that the constructor is not tied definitely to just this valve in this position and that component in that position. To some extent these attempts are successful, and if the constructor goes and uses altogether "outside" components, the designer can hardly be held responsible.

What I am thinking about more particularly, however, as I said above, is the type of set which is designed for certain precise components and definite types of valve in the various positions. It seems to me that there is not nearly the same interest in building such a set as there is in building one where a choice can be left to yourself.

It reminds you of those electric motors and dynamos that we used to assemble as boys; all the bits and parts were complete in a box, with detailed instructions, and you only had to wind on the wire (which was measured out for you to the last inch) and fit in a few screws, also provided, and the job was done. I used to think it was much more exciting to make up the parts with pieces of old iron and to judge the gauge and amount of wire required and so on.

Although perhaps the result was not quite so "professional" looking and possibly didn't work quite too well, it was at any rate your own—it was a constructor's job and not a mere assembly—and you felt a justifiable pride that what wasn't made out of iron and copper wire was made out of your own head.

Amplification Factor.

Readers are often under the impression that the amplification obtained by using a particular valve is readily judged from the actual magnification factor of the valve. It is true that the magnification factor is one of the factors which enter into the question, but it is by no means the only one. Another important factor is the impedance of the valve, and in addition to this we have to consider the working resistance of the circuit and various other points.

For instance, taking a screened-grid stage as an example, with a very high impedance, say something of the order of a million ohms, and a magnification factor of perhaps 800, and comparing a valve of this kind with another one having an impedance of 250,000 ohms and a magnification factor of, say, 500, you might jump to the conclusion that the first valve, with its much higher magnification factor, would give a greater overall amplification.

(Continued on next page.)

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TECHNICAL NOTES

(Continued from previous page.)

Self-Capacity Effect.

The self-capacity is another point which has to be considered and all these factors must, as I say, be taken not alone but in relation to one another and also in relation to the constants of the circuit with which the valve is to be used. It is very easy to see that, using the above-mentioned valves, the constants of the circuit may be such that the one with the lower magnification factor may give considerably higher overall amplification than one with the higher magnification factor.

This is a point to bear in mind because there is, as I say, a tendency, perhaps a natural one, to make a mental comparison of different valves solely for their magnification factor index, and this may be very misleading when it comes to trying the valves actually in the circuit.

Blame the Wireless!

There has been a good deal of talk in the papers lately on the old question as to whether wireless is affecting the weather, and also of its possible influence on the human nervous system. Both of these questions have been cropping up at regular intervals ever since wireless, particularly broadcasting, began.

As regards the effect of wireless on the weather, no doubt you will expect me to be very sceptical and to say at once that it is utterly impossible for the relatively very small amount of energy radiated from all the broadcasting stations in the world put together to have any appreciable effect on the forces of Nature.

Perhaps you will be surprised when I tell you that, personally, I am by no means sure that the activities of numerous broadcasting stations may not, in fact, be responsible for some appreciable influence upon the weather. It is a strange coincidence that the weather, throughout the world, seems to have "gone to pot" during just about the time that broadcasting has been in vogue.

"Trigger" Effect.

We know precious little about the factors which influence the weather, and we know still less about the effect of electrical radiation of various sorts in turn upon those factors. It is no use arguing that the total energy radiated into the ether is relatively small, because there are innumerable instances known to science where quite small forces, of the appropriate kind, may release and set into operation enormously greater forces.

Phenomena of this kind are broadly classed under the convenient description of the "trigger" effect, the idea being, as you see, that the small energy applied to the trigger of a gun ultimately releases the enormously greater energy of the cartridge.

Turning to the other question of the effect of radio waves upon the nerves of human beings, this again has generally been pooh-poohed, and people who from time to time have complained that the wireless waves have been upsetting them have been regarded with kindly tolerance.

Radio Nerves.

Now I do not think we can be at all sure that some people may be sensitive to radio

(Continued on next page.)

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TECHNICAL NOTES

(Continued from previous page.)

waves. I know in a good many cases the trouble is purely imaginary, but it seems to me quite possible that there may be genuine cases, especially where the alleged effect is due to short-wave radiation.

It is known by definite experiments that very short-wave radiation of sufficient intensity will quickly kill many small animals, and will also produce rapid heating effects in various substances. It is obvious that wireless waves of all kinds, whether short waves or long waves, must produce the same effects in the human body as in a wireless aerial or any other substance, and the extent of the electrical oscillations set up simply depends upon questions of inductance, capacity, resistance and so on.

Therefore, there is no doubt that at every moment electrical oscillations are present in every one of us due to the radiation of wireless waves, and until we know a great deal more about the effect of such artificially produced electrical oscillations upon the human nervous system, it is impossible, it seems to me, to assert that such oscillations may not, in some cases at any rate, produce disturbing reactions.

Radio and X-Rays.

When X-rays were first discovered nobody had the slightest idea of their deadly effect upon the living cells, and it was only when some of the earlier X-ray workers started to suffer from the effects of exposure to the rays that the question came up for investigation. If anyone had suggested, when X-rays were first discovered, that they could have any influence on living tissue, I have no doubt that his predictions would have been treated with scorn by the sort of people who jump too readily to conclusions with little or no knowledge on which to base them.

I am not suggesting that the effect of ordinary radio waves of broadcast wavelength, or anything approximating to such wavelengths, may have any very serious effect; in fact, it is pretty obvious, since broadcasting has now been in operation for many years, that no very serious results are to be expected. But at the same time, as a scientific man, accustomed to rely upon evidence and not upon pre-conceived ideas, I should hesitate very much to say that some suggestions as to the possible influence of radio waves on human beings were necessarily groundless.

Filters and Bass Notes.

I have mentioned more than once the importance of using a filter to separate the direct current of the power supply from the windings of the loudspeaker. This is especially important when a pentode is used, as the output of the set, since the pentode passes a considerable anode current, is seldom less than 20 milliamps, and sometimes a good deal more.

MIRROR OF THE B.B.C.

(Continued from page 580.)

Henry Hall's Strenuous August.

In August, when the majority of people look forward to snatching their annual holidays and spending a week or two, with or without their families, by the briny or rushing about the countryside in motor cars, Henry Hall and the B.B.C. Dance Orchestra will be having the most hectic time of their lives.

There are twenty-seven week-day nights on which late dance music will be broadcast next month and Henry's Band has the heavy task of supplying it on no fewer than twenty-one occasions. The remaining evenings will be looked after by Bertini's Dance Band with programmes relayed from the Tower Ballroom, Blackpool, on five occasions, namely, on the first Friday of the month, and on every succeeding Monday night, while Billy Cotton and his Band complete the list with a broadcast from the studio on the night of August Bank Holiday.

Too Much Of It?

I do not remember that Jack Payne, with all the rushing about he did with his "Boys" between the Savoy Hill studios and some of the London music-halls, was ever called upon to put in so much playing time in one month. The official reason given for this extra work being put on the B.B.C. Dance Orchestra is the scarcity of outside dance bands during August, and that as somebody must provide the late night dance music, Mr. Hall and his men must consider themselves the unfortunate victims of circumstances.

Such a situation has not arisen hitherto in August, and I very much doubt whether all this extra work need have been pushed on to the B.B.C.'s own musicians, apart altogether from which I have a strong feeling that most listeners will get thoroughly tired of hearing them long before the month is out. In my opinion, it would be a mistake to put any one dance band on the air on twenty-one evenings in a single month, and particularly the B.B.C.'s own combination, which cannot be said to be anywhere approaching the popularity of some of the outside dance bands, although listeners have had four months to get accustomed to it since Jack Payne left.

Where They Come From.

I know of many listeners who rather disfavoured Mr. Hall's style of playing dance music in their comparison with the performances of other bands. This is no reflection on Mr. Hall or his players, who have worked like Trojans to build up their repertoire, until they have rehearsed and performed nearly four hundred dance tunes since March 15th.

Sixty per cent of these tunes are British, thirty per cent American and ten per cent Continental.

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THE LISTENER'S NOTEBOOK

(Continued from page 580.)

Never To Be Forgotten.

I shall not forget the night the Hungarian Gypsy Orchestra came to the studio. I only wish they had come alone and left the diners and their meringues behind them.

If they had, I am sure we should have been treated to a unique programme of music. As it was, we had to endure a regular cacophony of shouting, bawling, brawling, whooping, yelling, cheering, hooting, howling, shrieking, squeaking, squawking, snoring and snorting, all M.C.'d by an admirable old bore who just wouldn't shut up.

Colombo and his men supplied the background music. It was all very high-spirited and ideal for a beanfeast, but terribly trying to the listener in need of restful entertainment. The Savoy Hotel Orpheans, who came after them, were a welcome calm after such a storm.

An Unnecessary Cancellation.

I must say I was one of the many listeners who were disappointed at the cancellation of the "U"-boat Commander's talk. With only a moderate vaudeville show, except perhaps for Flanagan and his partner, whose delicious nonsense is always amusing, this Saturday night's programme wasn't a distinguished one.

As regards Commander Hashagen's talk, I can't withhold the urge to say that this feat of opening up old wounds is one which, if taken too seriously, may prevent the presentation of many good things, for, surely, most things remind somebody of something. It might be argued, for instance, that "Flags on the Matterhorn" was a painful reminder to those who had lost friends and loved ones on the Alps, but it would be ridiculous to veto it on that account.

Very Refreshing.

Considering the vast amount of noise that reaches us via the microphone, it is refreshing to hear an item which is characterised by a dignified and quiet interpretation. The reading from "Pride and Prejudice" illustrated what I mean. There must be many listeners who enjoyed Mr. Ronald Watkins, and who make a special point of tuning-in on Tuesdays and Thursdays at 6.50 p.m.

Past visitors to Scarborough were doubtless happy the other Sunday evening to renew acquaintance with Alick Maclean and his Spa Orchestra. Personally, I remember him with real gratitude, as some years ago, it was he who saved my holiday at Scarborough from being a complete wash-out in consequence of fifteen days' continuous rain.

THE ROYAL VISIT TO BROADCASTING HOUSE

Some impressions of the inspection by the King and Queen described by OUR SPECIAL CORRESPONDENT

BRROADCASTING HOUSE really looks very nice in its best bib and tucker. So do its officials. Certainly the London crowds found much to amuse them in the flags, and the ferns, and the flower-pots, and the top hats which greeted the King and Queen on their recent visit to the B.B.C.'s headquarters.

For the first time in the history of broadcasting the Royal Standard flew over Broadcasting House; for the first time members of the Royal Family took tea in the Council Chamber; for the first time junior officials were able to take an afternoon off without fear of the consequences.

"Just a private visit," said the B.B.C. The awning and carpet at the entrance did not suggest a private visit. The advance press publicity might almost have meant a public function. The stringent arrangements for guarding the entrances of Broadcasting House added an air of interesting mystery to the proceedings.

No Prison More Closely Guarded.

A short time ago I visited one of His Majesty's prisons—as a visitor and not as a guest, I would add.

No prison in this country is guarded more closely than Broadcasting House was on this occasion.

Burly policemen stood at the entrances; uniformed commissioners barred the doors; plain clothes detectives in blue suits and bowler hats mingled with the crowds.

What did it matter if an artiste or two should miss his "turn." "No one must enter the building while Their Majesties are here" was the edict.

And so, while Sir John Reith and Admiral Sir Charles Cappendale acted as guides, I stood outside and watched.

I hope that the Controller did not take the Queen to a certain office on the seventh floor, because the clerks spent the afternoon on the roof, disregarding letters and telephones alike. They watched the crowd in the street with as much amusement as the crowd watched them, but I am sure that Sir Charles would not have approved!

In the drawing-room on the ground floor, charts and diagrams illustrative of the work

(Continued on next page.)

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THE ROYAL VISIT TO BROADCASTING HOUSE

(Continued from previous page.)

were first inspected. In the concert hall on the lower ground floor the headquarters staff were assembled, one of the orchestras occupying the platform. After the National Anthem, their Majesties were welcomed by the staff with enthusiastic cheers.

The King and the Queen saw everything and everybody, from the effects studio to the Corporation's civil engineer. They took tea in the Council Chamber. At 4.40 they returned to Buckingham Palace.

At 4.45 men in shirt sleeves carried ferns and flowers and palms out of the building, the Royal Standard was lowered, and Broadcasting House became itself again.

Which was all very pleasant and gratifying for the B.B.C.

Why Disillusion Them?

But I wonder why they thought it wrong for anyone not wearing an official tail-coat to see the Royal visitors? I wonder why it was necessary to disillusion a crowd of admiring licence holders by giving away the fact that the flags and the ferns and the flowers (I had almost added the top hats) were hired only for the afternoon?

And, most of all, I wonder why Mr. Eric Gill, the sculptor, was not among those officials who were presented in the Council Chamber?

Because for me the most impressive sight of the whole ceremony was the beautifully carved figure in the entrance hall—"The Broadcaster"—which Mr. Gill had only finished the day before—more impressive than all the flags, and the flowers, and the tail-coats, and the top hats! P. C.

NOTES FROM SCOTLAND AND IRELAND

From A SPECIAL CORRESPONDENT.

Glasgow—or Edinburgh?

THE old accusation that the B.B.C. in Scotland favours Edinburgh at the expense of Glasgow has broken out anew. Since the Scottish Regional headquarters were moved to Edinburgh certain Glasgow critics have complained that their city has not been given its due prominence in the Scottish programmes.

They have spoilt their latest campaign by overstating the case. They have added up the time occupied by the Edinburgh microphone and compared it with the total time of transmissions from Glasgow studios during the same period.

Routine features such as news bulletins are always given from Edinburgh, and it is only to be expected that the Edinburgh time is much the greater, but surely no normal listener bothers where such items originate. The quality of the material broadcast is what matters, not the time it occupies.

The B.B.C. is on less solid ground in defending itself against those other critics in Scotland whose concern is the poor service given to Northern Scotland. The wavelength situation is such that under present

circumstances the provision of a new service for Northern Scotland is out of the question, but the case against the B.B.C., as expressed by the energetic Provost Murray, of Dingwall, is that the B.B.C.'s Regional Scheme was badly conceived.

He argues that with the National programme confined to a super-high-power Daventry long-wave station there would be no need for the London National, North National, and Scottish National transmitters, and the wavelengths thus released could be used for "neglected" areas, such as the Highlands and Wales.

A Super-High-Power Station.

The B.B.C. intends, in fact, to build a super-high-power long-wave station. By so doing does it render its other National transmitters redundant?

The B.B.C. reply, as expressed to me by a high official, is that until lately permission had not been secured to increase the power of Daventry. When the Regional Scheme was planned this was apparently out of the question.

Which seems to indicate that when the power of 5 X X can be increased the Regional Scheme will become obsolete and extravagant.

The B.B.C.'s postbag with regard to the new Falkirk station shows that the introduction of the Scottish Regional transmitter has caused remarkably little trouble to listeners.

Possible Spot of Bother.

There is yet the Scottish National transmitter to introduce, however, and as this will broadcast on 288.5 metres with only 243 kilocycles separation between its wavelength and that of Scottish Regional there will perhaps be some bother. This separation is less than that between the two transmitters at Moorside Edge (370 kilocycles), and also those at Brookmans Park (304 kilocycles).

In Ireland the temporary transmissions from Athlone have caused renewed interest in radio. In the Free State public interest in broadcasting has for long been far below what it should be.

This has been due partly to the poor system of distribution, but the authorities should also consider whether officialdom has not been partly to blame. They should look to the B.B.C.'s energetic publicity department.

There is nothing of that sort in Dublin, and too often the Press has extreme difficulty in obtaining information regarding broadcasting plans, policy, or programmes.

Athlone is certain to be a revelation to thousands of Irishmen, an even greater surprise than was experienced by British listeners when their new high-power stations were opened, for reception conditions over a wide area of Ireland have been considerably poorer than conditions in most parts of England even before the advent of the Regional stations.

Reception of Athlone in the West.

The change to a high level of signal strength and first-class quality is therefore the more striking in Ireland.

A friend who lives on the far west coast tells me that Athlone has given him reception such as he never dreamt of—immeasurably superior in both volume and quality to such stations as North Regional and Mül-lacker which have previously been his best.

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Next month the Radio Exhibition will be over and everybody will be discussing new models and new designs.

But one thing is clear, whatever the exhibition may bring forth it will produce nothing to equal Blue Spot 100U for either performance or value for money.

Here is a speaker that equals an expensive Moving-Coil Speaker and puts many cheap ones to shame. It reproduces every note, both treble and bass perfectly. It is sensitive to very small inputs—a fact which makes it particularly suitable for battery sets as well as all-mains receivers. It can be used with normal or Pentode valves and no matching transformer is required.

If you are building a set or a radio-gramophone there is no need to wait for the show. Get 100U today—there is nothing better. Write for Catalogue No. P.W. 42U.

**BLUE SPOT
100U 39/6**

If you want a Cabinet Speaker with 100U you should ask your dealer for Blue Spot 100U which has 100U movement housed in a scientifically constructed cabinet of fine quality oak. The price is 57/6



THE BRITISH BLUE SPOT COMPANY LTD

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