

"LAZY" TUNING ON SHORT WAVES

Popular & Wireless & TELEVISION TIMES

FROM
MY ARMCHAIR
By
JOHN SCOTT-TAGGART

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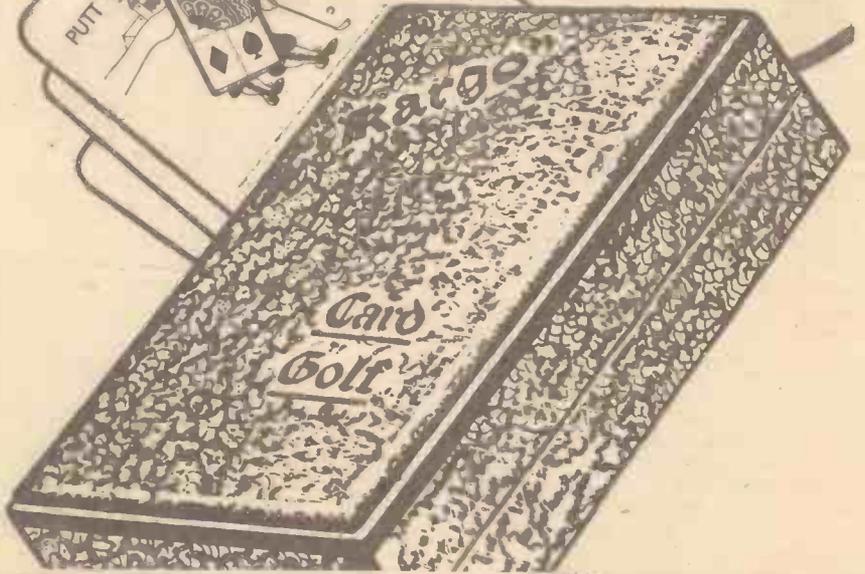
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MORE POWER
IN CAROLINA
EAST GOES WEST

RADIO NOTES & NEWS

EASTERN RADIO
LEEDS FOLLOWS
FLAT SPOTS

The Greeks Have a Word For It
THE Grecian equivalent of the word wireless is now upon the tongue of every go-ahead citizen of Athens, for at last radio in the country has taken a turn for the better.

In Athens itself a studio is being set up, to be connected with a new transmitting station in the suburbs, at Lissia. This station will be called Radio-Athens, and should be on the air this winter, with a power of 15 kilowatts or so. Provision has been made whereby this relatively moderate power can be raised quickly and easily to 100 kilowatts, thereby admitting Athens to the select rank of Europe's high-powered radio stations.

The existing Radio-Thessalonika station, one of the shyest birds on the European ether, is to be gingered up considerably, and the government has also ordered a new short-wave station.

Good News for Short-Wavers

IF there remain any doubters who question the entertainment value of short waves, they will be set back right on their heels when the G.E.C. gets its new super-power short-wave station at Schenectady out of the packing-case.

In the past Schenectady has always been a king-pin station in the estimation of the short-wave enthusiast, for its regularity, reliability, directive aerials and what-not have made it easily tunable in all parts of the world. But its enviable reputation was made when the power restrictions forbade the use of more than 25 kilowatts.

When the transmitter gets going it will pump no fewer than 100 kilowatts into the Schenectady ether, and receiving aerials which formerly had only a nodding acquaintance with the programmes will find that the comparative stranger has developed into a regular caller, loud of voice and with great staying power.

Way Down in Carolina

PRISON reformers will know that I am a fervent champion of more humane treatment behind the bars. But are not some of our American friends almost over-zealous in their care of the convict?

At one prison in North Carolina the radio installation has been replaced by a new

one giving a choice of several programmes, and providing ear-phone reception, because convicts who wanted to read or sleep found that loudspeakers in neighbouring cells formerly prevented their full enjoyment in their own.

All the cells are centrally heated and air-conditioned, with hot and cold running water, and provision for shower-baths outside.

So extensive were the prison alterations that for six months all the executions had

by the B.B.C. and G.P.O. licensing authorities. And if you will kindly read the following extract from a recent Report on wireless development in this country you will understand the "how-come" and "whyfore" of the matter.

"During the past month" says the Report, "there were decreases in the number of listeners in thirty-eight towns. The most surprising fact was that the greatest decline was in Edinburgh, where there was a drop of 181 listeners."

So accustomed have we become to the continued growth in the girth of broadcasting that this sudden tightening of the belt is as surprising as a sandy cat in church.

What does it mean, Sandy?

The East Goes West

INSENSIBLY our radio horizon is broadening. Only a few years ago a "long-distance" and "foreign-station" receiver meant one that would pick up those of the less familiar Europeans. Then North American stations swam into our ken, and the last year or two saw many a set picking up stations in South America, on medium waves.

The coming season should see another continent, Asia, making friends with the European listener. On short waves Japan is already easily received, and so are the various Dutch-East-Indians. And before 1938 is many weeks old the new Indian short-waver at Delhi should take its place among the pukka sahibs who visit the Old Country regularly.

Indian stations should be easily recognisable if the traditional speech prevails—we shall hear all about the tigah, at Quettah, who caught a punkah-wallah, near the verandah, knocked him into a nullah, and fractuathed his tibiah. Poor beggah! The doctah says he may nevah recovah!

India's Awakening

AFTER several hesitant starts India seems now to be settling down to steady progress in radio matters.

Regular readers will remember that not long ago we waved a friendly farewell to Cyril Goyder—whose schoolday feats had

(Continued overleaf.)

★.....★

MY WORD **BY THE EDITOR**

LOUDSPEAKERS

We still receive many letters from readers complaining that they are annoyed by their neighbours' radios.

And we can sympathise with them. But with at least eight million loudspeakers in daily use it is inevitable that the sounds from some of them should percolate through doors, windows and party walls, particularly in flats and crowded residential areas.

We must accept it philosophically as we do the car, motor-cycle and other noises incidental to the travel and transport facilities that we all to some extent share with our fellow citizens.

There are bad cases of overstepping the bounds with blaring sets near open windows, although even in such cases we like to think that the culprits are mostly committing such nuisances unintentionally.

After all, to so many radio is one of the few things that enables an escape to be made from the drab sameness of life. Can there be real bitterness when such escape is made enthusiastically with volume controls blithely turned towards "Max"?

Let us be more ready to make a charge of thoughtlessness than that of wilfully bad citizenship when unwanted dance music floats on the night air through our open windows.

Sometimes we might even try to enjoy the other fellow's programme. That represents the ultimate of tolerance!

★.....★

to be postponed, but they have now been resumed as a reminder that the way of the transgressor is (sometimes) hard, even in North Carolina.

"Auld Reekie's" Relapse

ALTHOUGH the radio-licence situation in Great Britain is generally satisfactory—as my recently given figures have shown—the coming winter season is to be watched with unprecedented interest

SIMPLE "HOW IT WORKS" TELEVISION ARTICLE IN OUR SEPT. 25th ISSUE.

RADIO RECEIVER PUNCTURES WINE-GLASS

often been recorded in "P.W."—on his appointment to be Chief Engineer of All India Radio.

In the brief interval that has elapsed India has forged ahead amazingly. Short-wave stations have been ordered for Calcutta, Bombay, Madras, and (two) for Delhi; and Lucknow, Lahore, Trinchinopoly, Dacca and Madras are all to have new medium-wavers.

When all these are added to the existing stations at Bombay, Calcutta, Delhi and Peshawar—not to mention a new short-waver at Lahore that will be in action before the year is out—India will be well and truly on the broadcasting map.

Remarkable Resonance

IT used to be said of Caruso that his voice was so powerful and true that he could shatter a wine-glass with it by singing at exactly the natural frequency of the glass and thus setting up powerful vibrations in it.



Similarly, a radio set in one corner of a room will sometimes cause a vase or bowl at the other side of the room to "ring" so vigorously that the bowl has to be moved—even at the risk of offending Aunt Alice, the donor.

In an interesting instance reported from Northwood, Middlesex, a listener noticed a tinkle from his sideboard accompanying a sustained and piercing note from his loudspeaker. Upon going to investigate he found that one of the wine-glasses there had been so moved by the radio music that it had committed suicide—it had two neat holes through the bowl, just as though it had shot itself!

Far Eastern Radio

ALTHOUGH "P.W." has in the past given some very surprising figures about the development of radio in the Far East the extent of that development is still generally unrecognised. Here are some figures, however, which will stand a lot of blinking at.



In the next three years the Japanese plan to spend £1,000,000 on the improvement of their radio equipment. Another £2,000,000 will be laid out on new stations. Since £1 will go a long way in Japan, a total of £3,000,000 in three years is going to put a lot of ginger into the radio system there.

It is intended to put a new station up in each of forty-eight prefectures, and to spare no expense to make the short-wave coverage of the 1940 Olympic Games perfect. Finally there is to be no stint of cash for television—a state of affairs that will cause much weepage and gnashage of teeth at Alexandra Palace.

An Unusual Emergency

A CURIOUS instance of the use of radio in an emergency comes from Melbourne, where a widespread outbreak of infantile paralysis is causing great anxiety to parents.

The first cases were reported in June, and within a few weeks one hundred schools in and around the city were closed, either officially or because parents refused to take the risks of infection for their children, and kept them at home.

Since a sudden interruption of education may seriously affect the careers of young students, especially those entering exams with an age limit, the Education Department arranged lessons for broadcasting.

It is estimated that nearly 50,000 children were able to receive these lessons and continue their school-work during the anxieties of the epidemic.

BROADCASTING BREVITIES

Arrangements have been made in the B.B.C.'s autumn schedule of variety productions for "Music Hall," produced by John Sharman, to alternate with "Palace of Varieties," produced by Ernest Longstaffe, as the weekly Saturday night variety show. It has been decided—at least for the quarter from October to December—to cease the experiment of "staggering" the times of these productions. Each will begin at 8 p.m.

Dance Music From Germany and America

British listeners will hear relayed in the Regional programme for half an hour on the night of September 15th dance music from Germany. Eugen Wolff and his Orchestra, playing in Berlin, will have their programme relayed to Britain from the Deutschlandsender station. Immediately the relay ends Germany will take, on the same line, a relay from this country of Henry Hall and his Dance Orchestra. On September 29th, Benny Goodman and his Band will be relayed from New York in the "swing" series, "America Dances."

"Star Gazing" No. 5

The "Star Gazing" series of programmes launched last year is to be resumed for the coming autumn and winter on September 29th on the National wavelength, when, as the fifth programme in this series, the career of the celebrated stage comedian, Huntley Wright, will be featured. The performance will be repeated in the Regional programme on October 1st.

"After Dinner" Cabaret

The third edition of the cabaret show, "After Dinner," which seems to have come very successfully to stay in the Northern programmes, will be heard on September 13th, when the "Three Semis," Henry Reed, Johnny Rosen and his Four Chaps, and Taylor Frame will entertain.

The Listener Hits Back

WITHIN the next few weeks the Newark, New Jersey, station is to make the first trial in radio history of an instrument which can register the amount of success—or failure—achieved by any broadcasting turn. The idea is that every receiving set shall be fitted with a little gadget that records whether the set is switched on or off at the given times, the cumulative effect of all the gadgets being the index of the item's popularity.

In the forthcoming trial not every Newark, N.J., home, but several thousand representative ones, will be using the new device. If its success leads to nation-wide

adoption in the U.S.A. it may cause a hasty reevaluation of radio reputations.

At present the advertisers there pay big sums to the artists they select to broadcast, but they have never been sure of what the listener thinks of those artists. Listener come-back, properly measured, may surprise everybody.

Leeds Follows

HAVING recently received a letter from an irate Yorkshire reader, and opened it in all innocence, I know exactly how it feels to find that a harmless mantelpiece ornament was really an unexploded bomb. The peace of one moment is the shattered and flying debris of the next.



This Leeds chap-who writes to me so forcefully, is not only fed-up with the programmes, but he is appalled by local interference, alarmed by local apathy, and stung to the quick by local oscillators; his neighbours stand their loudspeakers at open windows, and assail his ears with sopranos whom he would like to strangle.

These are but preliminaries; his real grouse is that the North has no television, but that luxury-loving Londoners can lounge, and look, and laugh.

Fortunately for me, the P.O. co-axial cable to Birmingham and Manchester will continue up to Newcastle-on-Tyne, calling at Leeds; and although the B.B.C. admits nothing there is a strong body of technical opinion that says that where the cable goes television will soon follow.

Hot Spots

ONE of the curious jobs at B.B.C. headquarters is that of the man who goes up on to the roof of Broadcasting House every day, and looks at the sun. If visibility is good he untucks a telescope and various gadgets, and counts the number of sun-spots visible.

With graph paper he prepares a kind of solar chart, showing the whereabouts and sizeabouts of the various spots, which paper he delivers to the Empire Broadcasting people, and so to bed!



He has been kept busy this year, for there have been several dozen spots to account for most days, the record bag being between three and four dozen. The information he collects is of but academic interest to listeners in this country, but it is of great importance where the long-distance short-wave transmissions are concerned; every spot on the sun may mean a spot of bother on the Empire Service.

ARIEL

FROM MY ARMCHAIR

This informal contribution by Mr. John Scott-Taggart has proved to be the most "looked-forward-to" feature in "Popular Wireless." Dealing with almost everything of radio interest, it has brought forth tributes from "P.W." readers in every part of the country.



MARCONI dies and the world of radio mourns and honours him. His stature grew with the years. At one time his name was synonymous with wireless. To-day so many have contributed to the art that the word Marconi is not alone on the roll of pioneers. But he will ever remain the genius who really started the snowball of technical development.

The lapse of his early basic patents, and those of the companies that bore his name freed Marconi of the jealousies that a virtual monopoly always creates. He has died honoured by all. The layman thinks perhaps most of those early days of coherers and signals sent across the Atlantic. But Marconi was a pioneer without being a back-number. The commercial exploitation of the short waves and the development of the beam system by the Marconi Company was the direct result of his own personal enthusiasm, foresight and drive. His backing of men like C. S. Franklin changed the face of long-range communications.

So Marconi House becomes Ariel House, and the Air Ministry takes over a building which they used to worry over a good deal. The old 2 L O—was, of course, situated in and on Marconi House before the aerial was removed to Selfr—I mean “a well-known store in Oxford Street,” as the B.B.C. used to call it. Nevertheless, Selfridge’s got a marvellous advertisement out of those towers.

The 2 L O aerial was only a stone’s throw or wavelength away from the Air Ministry’s own aerial at the foot of Kingsway, and Adastral House was worried about the B.B.C.’s 1½ kilowatts so near, not to mention possible harmonics. Any desire for more power on 2 L O’s part would have been coldly received.

“On Invention-Selling Bent”

I have visited them several times on invention-selling bent. In 1919 I was surprised and gratified that one could make five hundred pounds by joining a drawing of two valves with a few lines. Later I found you could get four thousand pounds by altering the lines a little. Not unnaturally drawing lines between valves began to appeal to me—but by then Marconi’s felt I was the last person they wanted to see. I was head of the patent department and second senior engineer of the Radio Communication Company, their new rival, and a brilliantly successful one.

Even to-day I thrill at the thought of those 1920 to 1924 days. They produced a lasting respect for those who fought a battle of tremendous odds against a long entrenched and enormously powerful rival: Major Binyon, who inspired and directed the business; Norman Lea, brilliant chief engineer, now Chief of Test at Marconi’s; R. Ferguson, who was marine superintendent, and acts similarly for Marconi’s marine company; A. Snoaden, the general manager, now of Gambrell’s.

Head of Research and Patents

Marconi’s greatest weapons were patents to maintain their hitherto virtual monopoly. It fell to me to try to evade, warn off, defend against and, if possible, nullify dangerous patents. In Marconi House sat Isaac Schoenberg—formerly directing head of the Russian Marconi Company, and later head of the patent department of the English company. I have spent more time circumventing him than any other man alive.

He is now the very able head of research and patents to the E.M.I.—Electrical and Musical Industries—the combination formed to take over H.M.V. (the Gramophone Company) and Columbia. This is a very big job indeed, and he is very much behind

the television scenes. He went over to H.M.V. when that gramophone company bought the Marconiphone Company—the Marconi company which handled broadcast receivers. H.M.V. paid a million pounds for this ready-made broadcast receiver company with its valuable patent rights. How useful these patents were the H.M.V. company were well aware, for they happened to come to me for their report on the whole Marconi patent situation. All this is some ten-year-old news, so I don’t think I am revealing any secrets.

Yes, there will be many a sentimental thought over the disappearance of the name Marconi House (which, by the way, was once the Gaiety Hotel). I wonder what Captain Round—former chief of research—thinks? He lived for a long time there. Some day someone will recount the great part he played in the technical foundation of broadcasting. Others have had more limelight, but most of those who have developed radio have had scant recognition.

Which reminds me that, on the other hand, “Lee of the Post Office” has been knighted. Sir George Lee is a radio man and considers himself such—even though he is now Chief Engineer of the British Post Office. The P.O. radio department is a great but largely unpublicised enterprise, and to Colonel Lee we largely owe its extent and high degree of efficiency.

I heard of Lee in America on the occasion of my visit this year. He greatly impressed them over there, as much by his personality as by his eminence in the radio world. In a country where high hattery is disliked, where dignity is at a discount, where the President calls all the newspaper reporters by their Christian names, Colonel Lee was described to me as “a great gentleman.”

I happen to know—because he told me—that Sir George Lee feels that radio has remained woefully neglected where public honours are concerned. With a characteristic modesty he feels that his own elevation is some tribute to radio generally.

“A Mystery to All”

Sir John Reith has done well for his own controllers. How honours for merit are decided is a mystery to all, but is it no one’s concern to make recommendations outside their own departments? Are only the B.B.C. and Civil servants to get anything from a knighthood to an M.B.E.? Perhaps Sir George Lee and the new radio aristocracy can prevent all the nation’s appreciation going to other sciences and industries.

A good many years ago I publicly in print declared a hope that Ambrose Fleming would be honoured by the country for his services to radio and
(Continued overleaf.)

2 L O’s ORIGINAL HEADQUARTERS



Courtesy Marconi’s Wireless Tel. Co., Ltd.
The old Marconi House, which the Air Ministry have taken over and renamed Ariel House. It was here where the original 2 L O transmitter and aerial were installed.

FROM MY ARMCHAIR—Continued

electricity. Are there no grades of honours which could show some national appreciation of the great debt that radio owes to such men as Eccles, Howe, Franklin, Round?

Or must radio pioneers exceed eighty years of age—as in Fleming's case—before they achieve a measure of recognition?

* * *

An writing this in bed, having been invaded by a streptococcus and his confederates micrococcus catarrhalis, pneumococcus, staphylococcus aureus, and a few others. Having flu, I naturally listen to the radio more. The first thing an invalid discovers is that there is not enough "talk" in the programmes! This amazing discovery is not new and is not due to any weakening of the mental fibre. It is due to a very genuine surfeit of music.

The person who listens casually wants music the moment he switches on—unless he is wanting definitely the news or variety. The invalid with the set on for hours gets bored to sobs by the dreary succession of bands and organs from Aberdeen to Tooting. Dear old Sir Walford Davies, even if he has not taught me the piano, has served as a pleasant interlude. Probably only a handful listen to him, although he is a pot-pourri of charm and kindness and brilliance, yet invalids prefer him to the cool hand of an ugly nurse.

What we want are interesting talks, short plays (why not some of the excellent one-act plays that have been written?), and short stories. All of which you probably do not want at all. By the way, do not waste any sympathy on me, because by the time this appears I shall be as fit as a Stradivarius.

I meant, ages ago, to congratulate Sir Ian Fraser on his knighthood. He is the blind leader of the blind at St. Dunstan's and one of the best friends radio has had. He was a member of a Government Board of Inquiry into the desirability of granting the B.B.C. a charter. That was long ago, of course; but he has always been interested in radio and is, or was, an active amateur on the technical side.

He came to see me about thirteen years ago in connection with an attack I had made (in a weekly radio journal I edited) on his rebellion in the Radio Society of Great Britain. He had marched out with many others to form an independent society of amateur transmitters.

I entirely agreed with all his views about the R.S.G.B., which had completely lost grip. Its meetings were dull and its attendances negligible. But while I was saying in print what I thought about the R.S.G.B., I also condemned the Fraser rebellion. I urged on him personally and in print to rejoin the R.S.G.B. and effect the desired reforms within that body, which possessed far more prestige than could any newer livelier society.

The result is known. The rebels went back and the R.S.G.B. was immensely strengthened. Sir Ian can, in fact, be regarded as the founder of the present R.S.G.B., which is now completely in the hands of the amateur transmitters.

There are many who regret that there is now no national society for the amateur

study of radio. The coming of broadcasting and home construction dealt a death blow to the radio societies and amateur radio. Presumably it became too ordinary. Yet there is a wonderful technical field for amateur meetings.

At present we have nothing national but the purely professional meetings of the Institution of Electrical Engineers, which are on too high—and sometimes too highly specialised—a level for amateurs. When, however, I read of the meetings of the Croydon and of the Golders Green amateur societies my heart rejoices that the flame of amateur radio can still burn brightly and broadly.

What other societies are there which have a keen following interested in all branches of radio and which have not

SIR IAN FRASER



Sir Ian Fraser, one of the best friends radio has had. Sir Ian has always been interested in radio, and has carried out his own constructional work.

become mere appendages of the American amateur transmitter movement?

* * *

A reader writes: "After your slobbering eulogy of Sir John Reith, I suppose we shall soon be hearing over the air some readings from your works?"

Naturally. I think pages 231 to 287 of "Thermionic Tubes in Radio Telegraphy and Telephony" would go rather well in the A B C of the B.B.C., while Claims 3 to 11 of my patent would brighten up the Music-Hall hour.

But my article was not *all* slobber. There were enough reservations in it to provide ammunition for a good article on "Where Reith is Wrong." Especially if that broadcast does not come off. J. S.-T.

JOHN SCOTT-TAGGART'S
SET DESIGNS AND ARTICLES
APPEAR EXCLUSIVELY IN
"POPULAR WIRELESS"

WE TEST

THE G.E.C. BATTERY "ALL-WAVE 4"

THERE are two novelty features in this set, both of which are directed towards easy station-finding. The first is automatic two-speed tuning. This is quite different from anything we have previously encountered, and we are inclined to think that it is also superior to any other existing method.

There are no "clutches," concentric knobs, or anything like that. You twist the one tuning knob in the one direction and can quickly go round to any point of the dial, but, arrived there, you find that the knob will operate in the reverse direction in very slow motion.

The action is the same in either direction. So what you do in practice is to run a little way past where you expect to find your station, and then you can tune backwards and forwards in the high-ratio until you have it tuned-in exactly.

The slow-motion movement covers a complete band of short-wave stations. One quickly accustoms oneself to the use of this ingenious system, after which the wonder grows as to why the idea, so effective and simple, has not been thought of before.

Economical Dial-Lighting

The other especially attractive feature is the "touch-lighting." This is a dial-lighting switching arrangement. While tuning you can press the fingers of the same one hand that holds the tuning knob against a circular plate situated behind this knob, and in that way switch on the dial illumination. This is automatically switched off the moment you release your hand.

Battery set users will appreciate the value of this device. They will know that dial-lighting eats L.T. current, and that although they can enjoy the benefits of lighting themselves when they are using the set and then switch off the lights by means of a switch, others who use the set may not be so thoughtful!

So most battery sets don't have dial-lighting, and tuning at night, or even during the day sometimes, demands a peering and fixed gaze—or lighted matches and burnt fingers!

But that can't happen on the G.E.C. Battery "All-Wave Four" any more than can any waste of L.T. current. Which reminds us of another thing. This set consumes only 9 m./a. of H.T. for all its sensitivity and output power.

It is a four-valve super, covering 16-50 metres on the short waves as well as medium and long waves.

It is most pleasing in appearance, having a superbly finished walnut cabinet of simple, modern design. There are only the three knobs: on-off and volume, tuning and dial-lighting, and wavechanging.

The chromoscopic dial gives station names closely calibrated, different colours making it easy at once to locate the bands, more especially as the wavechange switch operates a pointer on the dial itself that points to the band inscribed in its appropriate colour.

There is also a pointer for the on-off switching and volume control.

ON THE SHORT WAVES

AMATEUR BAND RECEPTION

By W. L. S.



I THINK I have mentioned quite recently that several readers are getting keen on designing sets for one band alone. The favourite, somewhat naturally, is the 20-metre amateur band, which contains a thicker population per acre, so to speak, than any of the others.

But the question is: What is an amateur-band receiver? What are its special qualifications? Well, it seems to me that there really is only one, and that is ease of tuning. That embraces all the others, such as suitable band-spreading and all that.

You see, nearly everyone misunderstands this band-spreading business. People seem to think that they are all right if a given band crams into ten degrees, so long as the dial is a beautiful slow-motion affair that makes it possible to pick out a signal and hang on to it. But it isn't good enough!

Wide Scales Best

I would sooner have some means of taking a given band and spreading it all over a wide scale, with quite a small reduction-gear in the drive, than one of these super-slow-motion affairs that make the pointer ooze, almost imperceptibly, over a quarter of an inch of scale. The psychological effect is terrific. If you have a wide scale devoted to the band that you are keen on, you mentally divide up the band into sections, and you get to know just whereabouts a given station is likely to come in. Certain stations can be given definite dial readings so that you know *exactly* where to find them. But the chief thing is that you get to know the "feel" of the band, which you will never do on a quarter of an inch of scale, not with all the slow-motion tuning in the world.

Just look at the sketch on this page, drawn from two actual receivers, which were afterwards combined into one by the adoption of two tuning condensers connected in parallel. It used to tune as in the left-hand diagram—from 15 to about 34 metres.

The 20-metre amateur band was just a little chunk that one whizzed through at high velocity in the course of a trip round the dial. All its hundreds of stations were more or less overlooked, unless there happened to be on the band someone so colossally strong that he couldn't possibly be missed.

Now see what the band-spread did for it—it drew out the 20-metre band so that it covered 120 degrees on the dial. One knew that the American phone band spread,

roughly, from 40 degrees to 100 degrees, and that at the two ends were all the C.W. stations which were after serious DX stuff—for no C.W. man in his senses will drop himself right in that U.S.A. phone band.

If one thought in kilocycles—which one always should on these bands—one knew that a station with a frequency of 14,300 would come in at about 30 degrees, and one with a frequency of 14,100 would be on about 110. One knew that those nice little stations that work just outside the band (about 14,420) would be down between 10 degrees and zero. In fact, the band became a happy hunting-ground in which one knew where to look for practically anything that one wanted.

Now it is possible, of course, to do even better, and to spread the band over a full 180 degrees, but it is rather questionable

If you insist, however, one producing not merely a red-hot but a really white-hot receiver for, say, 20 metres alone, then the best thing you can do is to find a coil which, with the normal tuning condenser, goes down to about 22 metres. Then take away your normal condenser and tune that coil with something of the order of 00001, or even smaller than that. You will then find, probably, that you have the 20-21-metre band spread over the whole scale.

You will get down lower, of course, with the small condenser, because its *minimum* capacity will be so much less than that of the normal one.

As a matter of fact, the standard Eddy-stone coil rated at 22-47 metres will just about cover the 20-metre amateur band if tuned with a tiny condenser; and the next coil, rated at 41-94 metres, will just about cover the 40-metre band. Generally speaking, though, you will need to do a good bit of "cut and try" on the coils, but you will eventually hit something that pleases you.

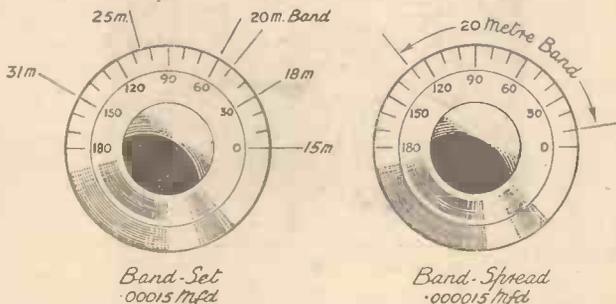
High Efficiency

Efficiency should be very high, because of the tremendously high L/C ratio. Taking the case of the two coils mentioned above—you will be receiving the 20-metre band on the coil that you generally use for 40—that gives you an idea of the change you will have made.

You will need to reduce your aerial coupling to the very loosest that you can manage, or selectivity will be terrible. But you will find that extremely loose coupling will probably give you better signals than did your former tight coupling with the smaller coil.

You can, if you are keen enough and have the time, make up a series of coils, each of them designed to cover one particular band when tuned by the little condenser that you have installed. Seems funny using different coils for 19 and for 20 metres—but it can be done, and you might even decide that it's worth it.

THE EFFECT OF BAND-SPREADING



How band-spreading simplified the tuning on the 20-metre band. Before the band-spreading condenser was fitted the receiver tuned through the amateur band in a few degrees of the dial.

whether this is a good plan. It takes so long to get round the band that it certainly is *not* a good plan for an amateur transmitter, as most of them realise only too well. If you are just a keen receiving man, it probably is worth it.

Not forgetting that this is about amateur-band receivers, I ought to say that this wide spread can be obtained, not by using a band-setter and a small band-spreader, but by designing the coil and condenser so that, between them, they cover just the band you want and nothing else.

Personally, I rather regard this as waste of a good receiver, which might be doing all sorts of interesting things on other wavelengths instead of sticking to one band only. After all, a good band-set and band-spread arrangement is flexible enough, and if you are only interested in one band, then you can just leave the band-setter alone and live on the other one. That's what I do very often.

THE BEST SHORT-WAVE FEATURES
 Are Always to be Found in
POPULAR WIRELESS
 Contributed by
A Band of Leading S.W. Experts.

POINTS from the POST-BAG

W.L.S. Replies to Correspondents

I WAS pleasantly surprised to find in the postbag the other morning a few more applications for "18" Club Certificates and one for a Gold Seal. It was just beginning to strike me that readers were getting a bit slow on their claims for these trophies, and I was wondering whether it was due to the rival attractions of the summer months, or to the fact that we haven't said much about the Certificate lately.

A Station Identified

It now seems to be proved that the station which L. B. (Cardiff) thought was VOTY is really VOGY in Newfoundland. Two or three readers wrote to me about it, and I myself have heard the transmission, which closed with the announcement "Stations VONS and VOGY of the Dominions Broadcasting Company, with studios in the Newfoundland Hotel, St. John's."

The transmission I heard was at the high-frequency end of the 20-metre amateur band, and it was received at R 8-9. Quality was excellent, and there was so little fading that I thought I was the victim of a hoax.

A. K. S. (Louth) writes to tell me that he has scrapped his "Simplex" Two and has built the Three to replace it. He finds it excellent in some ways—no blind spots or hand-capacity—but he can't get the reaction control smooth. I don't know quite what to suggest here, as A. K. S. has used new components throughout and doesn't seem to have done anything that could possibly cause bad reaction. Possibly the detector valve is a little bit "touchy" in its requirements, and would go better with a reduced H.T. voltage. A. K. S. also reports that the set goes better with the 1½-volt negative grid-bias plug taken out, or connected to earth. This seems to point to the L.T. being down—a possible clue to bad reaction.

Finding the Address

There's no harm in leaving that plug connected to earth, though, in the case of a set that really works better that way. To return to A. K. S., he wants to know how to get hold of the addresses of distant broadcast stations, and asks whether he may send QSL cards *via* the R.S.G.B.

If he tries the latter, he will get them returned, I'm afraid. The QSL service run by R.S.G.B. is for its own members, and handles amateur traffic only. The best plan is to subscribe to one of those short-wave clubs which issue monthly publications giving addresses and particulars of short-wave broadcasting stations, or just to try your luck at addressing them by their town only. The latter method generally works, I'm told.

G. B. S. (Manchester) brings up a lot of small technical points in the course of a twenty-two page letter, which took me a good half-hour to wade through. But as he doesn't ask questions all through it I forgive him! He wants to know, first, why it is that the addition of L.F. amplification doesn't seem to improve the performance of

any set appreciably. He had a "hot" one-valver, and thought "surely if I add a valve to this I shall have a Perfect Peach."

But the Perfect Peach was sour, and he went back hurriedly to his Little Apricot, which pleased him much more. He found that the one-valver gave him really comfortable listening, although he had to strain his ears a little for really weak stuff. With the second valve added, however, he found that the background level worried him, and strong signals caused a good deal of physical pain.

A Familiar Process

So G. B. S. then went through exactly the same process that I remember going through a few years back. He put a nice volume control on the two-valver and used it intelligently—that is to say, he adjusted everything so that it gave the best readability, and not the most noise.

After a little of that, however, he discovered, as I did, that the volume level at

THE RIDCO "RANGER"



The latest Ridco "Ranger" short-wave converter. It tunes from 12-60 metres in two wavebands. Further details were given in last week's "Radio Bulletin."

which he habitually set the thing was just about that which he could get from the one-valver going all out. Why use two valves and throttle the second one down if one would do the job? So off came the L.F. stage, leaving its owner rather puzzled.

Personally, I've no use for L.F. on short waves except for loudspeaker work, and for that, of course, it's an absolute necessity. If you're all out for headphone work and are not satisfied with a single-valver, then add a good H.F. stage. Put in an L.F. stage as well, by all means, for loudspeaker listening, but arrange so that your headphones can be plugged into the anode circuit of the detector.

H. J. L. (Caernarvonshire) says that conditions up there never seem to correspond with my reports of what is happening in London. As surely as I talk about a spell of good conditions, he curses inwardly about the rotten week they have been having. Partly, of course, the fault is down at this end, since "P.W." can't be published five minutes after I have handed my notes over to the Editor. We keep the lag as small as possible, but conditions can change completely in the course of two or three days.

Short-Wave News

READERS who like to look out for something unusual might have a go at some of these expeditions that are always running about the world. Most of them take short-wave radio as an integral part of their equipment—and quite right, too!

There are quite a few about at the moment, among them the following: The MacMillan Arctic Expedition, call signs WHFN and W10XH. Frequencies, all over the spectrum, but the most likely ones are 8,280, 11,040 and 16,560 kc. The ship is the schooner Gertrude L. Thebaud, and she should shortly be returning to Gloucester, Mass.

"Amateur" as Operator

The MacGregor Arctic Expedition should be close to the North Pole for at least a year. The expedition's ship is the General A. W. Greely, and the call sign is WAWG. The radio operator is W2QY, who will look for contacts with amateurs and will use, among others, "spot frequencies" of 8,290, 11,050, 12,460 and 16,580 kc. Translate these into metres if you like—I prefer the kilocycles!

The Bowdoin-Kent's Island Expedition, using the call VE1IN, will be active until about September 15th, using several frequencies in the 80-metre amateur band and also the frequency of 14,285 kc.—towards the high-frequency end of the 20-metre band—and this station hopes to relay some of the traffic from the MacMillan Arctic Expedition.

Radio UPOL, the Russian station at the North Pole, has been reported by several readers, but not during the past month or so. I have no information about what is happening up there at present, but I know that the station is equipped for working in the amateur bands. I will try to pass on any information of this sort as soon as I can get hold of it, and I shall also be grateful if readers would let me know, without delay, of any unusual things that they hear on the air.

Those Five-metre Tests

Five-metre tests held late in August were more or less non-productive of results, from what I have heard up to now. It really seems that the age of surprises on this wavelength is over. After all, we have all got accustomed to the fact that that terrible term "quasi-optical" was more or less bunk. Transatlantic contacts have been confirmed beyond any doubt. But when it comes to getting down to things and trying to set up something reliable, on which long-distance results can be repeated at will—well, well!

At last one or two stray "Yanks" have burst through on 10 metres, although at the time of writing the band is not alive. I heard three of them a few nights back, all very weak. But a handful of South Americans came through quite well, and on 10 metres conditions are never right for North and South America at the same time.

W. L. S.

NOW I'M A BAND-SPREADER

SO I came unstuck over the Hartley Circuit. You remember I said I had an idea the effective tuning capacity across the centre tapped coil was half what it would be without the centre-tap. Which, to say the least of it, now appears to be nonsense. It is practically the same.

But the odd thing is that my experiments seemed to bear out my entirely wrong idea. The tuning range of the 12-turn coil seemed to be half what it ought to be—equivalent to a 6-turn coil.

All I actually logged on the Hartley arrangement was Zeesen—and my wavelength check was done by oscillating the one-valver while listening for the "plock" in the loudspeaker of a commercial all-waver.

Working on a Harmonic

What I actually heard on the big set was not, apparently, the fundamental wavelength of the Hartley oscillation, but a harmonic. Thus my fixed idea was wrong—yet it seemed to be right because my method of checking up was also wrong. Two wrongs, in other words, seemed to make a right.

But now "W. L. S." and others have given me the low-down on this Hartley dea—and I am going to have another shot in the near future. Until then, let's talk about band-spreading—and I hope I don't make quite such a howler this time.

In the dark ages when we used to use .001-mfd. tuning condensers—cnormously long things with widely-spaced vanes!—it was common to find a single-plate vernier fitted to the remote end of the moving plates spindle. The elementary vernier device of my extreme youth seems to have developed for short waves into what is graphically called a *Band-spreader*.

As I seem to be taking quite a number of tyros in tow with me, maybe a brief explanation will help. The band-spreader is simply a very low-capacity variable condenser in parallel with the main short-wave tuning condenser. Common value seems to be .000025 mfd. maximum. Compare this with the usual capacity of the short-wave tuning condenser, namely .00016 microfarad.

The band-spreader I have bought has three moving plates and two fixed. It was supplied to me with a small control knob—no form of dial or other calibration device being apparcntly thought necessary.

Spreading Stations Out

Now it is clear that if a short-wave coil will tune from 12 to 26 metres (for example) with a .00016-mfd. variable, the .000025-mfd. variable will—by virtue of its much smaller variation of capacity from max. to min.—tune over only a portion of this total tuning range. Over, in other words, a relatively limited band of the wavelengths normally covered.

But now suppose we fix a 0 to 180-degree scale to the spindle of the band-

After giving it a good tryout, Mr. Chester decides that he is quite "sold" on the most popular method of simplifying short-wave tuning

spreader condenser, it follows that whatever signals are encompassed by the tuning range of the band-spreader condenser will be much more spread out than if the same scale were being worked with the normal .00016-mfd. tuning condenser. For, obviously, a six-degree change in the scale reading on the band-spreader would mean a much smaller change of capacity—and hence of wavelength—than would a six-degree change of scale on the much larger condenser. Hence, band-spreading!

Now it strikes me very potently that a band-spreader is nothing more than a vernier unless it has a reasonably effective slow-motion drive and a nice big scale. It also occurs to me that it might be a good idea to make the band-spreader's

ordinary D.210 type of valve. Just a four-pin coil for tuning and reaction, with a pre-set for aerial coupling, .00016-mfd. tuning condenser and .0002-mfd. reaction.

Note that in parallel with the main tuning condenser—now to be called the *band-setter* condenser, is the smaller capacity band-spreader condenser of .000025 mfd. I won't bother with details of the layout, it is so obvious. Just one little constructional point, though: I have soldered the pre-set direct on to the appropriate tag of the band-setter condenser—so that it is suspended, like the prophet's coffin of old, between heaven and earth.

Trying Out the Scheme

Both band-setter and band-spreader have been fitted with the large 0 to 180-degree Polar slow-motion drives I have used in preceding adventures, with the reaction condenser between them.

Now for what happened when I switched on for my "official" test at about 9 o'clock one evening recently: Using a 12- to 26-metre B.T.S. coil, I quickly found myself hovering around the 19-metre band, which at that hour is most lively.

To begin with, I adjusted the band-spreader to zero, working only on the band-setter. At 99 degrees I found Tokio, J Z K, 19.79 metres, a very good headphone signal. I was rather tickled, by the way, to hear Miss Mary Somerville's voice giving a description of her visit to Tokio, for I happen to know the B.B.C.'s Director of Schools quite well enough to talk to—and her characteristically precise accents came over all that distance as clearly as though she were talking from London.

A Valuable Refinement

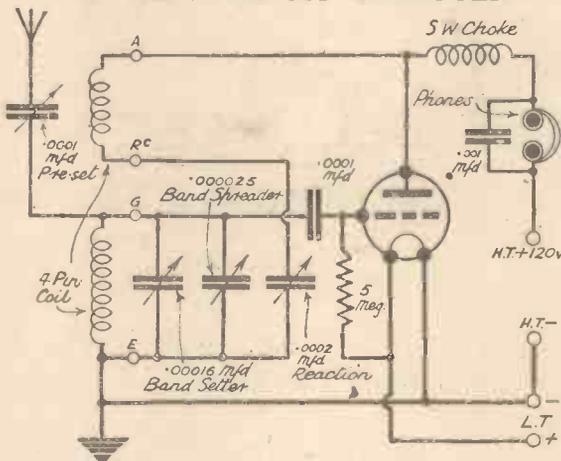
But let's get back to the job—as I did after delaying it to hear what she had to say of the beauties of the "Land of the Rising Sun." I then adjusted the band-spreader to 180 degrees—and sought out the Tokio signals again, finally logging them at 80 degrees on the band-setter. In other words, at this particular part of the scale, the band-spreader gives a 180-degree "spread" for what is only a 19-degree spread on the band-setter.

So you can see its value. If there are a lot of stations normally tunable in that 19 degrees of the main condenser, they can be nicely spread out over a full 180 degrees by the use of a band-spreader condenser. I am convinced the idea is well worth everyone's attention. I myself am completely "sold" on the band-spreader, anyway.

I then elaborated my experiment. First I set the band-setter at a fixed 90 degrees, concentrating my tuning variation entirely on the band-spreader. I found Zeesen, D J L, 19.85 metres, at 100 degrees on the band-spreader. Tokio, J Z K, came in at 96 degrees on the band-spreader;

(Continued on page 19.)

THE TEST CIRCUIT EMPLOYED



Apart from the band-spreading, this circuit shows another refinement tried by Mr. Chester—the .001-mfd. fixed condenser across the phones.

capacity a definite sub-multiple of the main condenser's capacity. In my case the band-spreader's capacity is about one-sixth of the main condenser's.

Another thought—and, I imagine, an obvious one to all except beginners. The spreading out of the scale readings on the band-spreader, while most desirable where signals are normally crowded together—as on the 20- and 40-metre bands—does not in any way affect the inherent selectivity. Or, for that matter, lack of it.

But let me give you the story of my actual adventures with band-spreading: I knocked up a simple one-valver on a metal chassis to conform with the circuit shown. This is, to my mind, the unbeatable circuit if you have only an

THRILLS FOR SHORT-WAVE LISTENERS

The 20-metre Band :: Latest Station News :: Transatlantic Reception

RADIO played its part in an amazing riot at Inagua, near Cuba, recently.

Angered at the arrest of one of their number, natives attacked the police, and the situation became so serious that Mr. Arthur Fields, British Commissioner, raced to the radio station where he was busy scribbling a warning to be radioed to ZFS, Nassau, when rebels shot and wounded him.

Nevertheless, the SOS was broadcast, and then, finding the climate uncomfortably hot (for the natives had fired many buildings), the white population left in a motor-boat, reaching Cuba after much hardship.

Short-wave enthusiasts who heard details from Cuban stations were thrilled to the marrow, but for real thrills, they should have been in the fugitives' shoes!

My Ears Suffer!

The 20-metre band has been playing havoc with my nerves—and ears—lately! At times I've needed all my listening powers to pick up anything, and "Dynamite" (my set) and I have worked overtime in the hopes of picking up something exciting. Then, when I've given up in despair, conditions have generally changed miraculously and stations begun to roar in from all corners of the world. Consequently, I've a fairly presentable log (and a pair of beautiful cauliflower ears!) this week.

My log includes W2ISY, W2BQ, W3SA Y (sez you!), W4ABA, W4EW, W5BOS, W9MB, W9DC, LU4AS, LU4KW, YV2AD, PY5AQ, VE1EU and VE1BV.

Between 7 and 8 a.m. conditions have been amazing, and I've heard J80E, Japan, VK2XU, VK2SU, VK3OT and VK4SY at excellent strength.

Incidentally, when I pick up a station regularly I'm quickly racked with curiosity as to its locality, power, and so on—for I'm as curious as the curiosist cat!—and the regularity with which VK2XU has been coming in turned me into a veritable Sherlock Holmes!

The station operator, Mr. G. Pollock, hangs out at "The Chalet," Medlow Bath, N.S.W., and conducts regular schedules with G6OS from 7.30 to 8.30 a.m. daily. By the way, the power of this station is only 28 watts!

"How's That?"

"Farr" be it from me to make fun of boxing, but a recent trip to the camp of Joe Louis, by the boys of the old N.B.C. brigade, certainly left me chuckling.

Asked by the announcer whether Joe ate much, the cook remarked: "Not as much as he used to." "How's that?" asked the perplexed N.B.C. man. "Well, I guess Joe knows that the more he eats the more he has to train," explained the cook amidst laughter.

Stop Press

Now boys, I've some tips for you. Oh no, not for the 2.30! These are short-wave ones, so be ready for some bomb-shells!

From Argentina we learn that LSX, Buenos Aires, has been replaced by LSY on 16.56 metres and LRK on 31.66 metres, whilst there's promise of many a muddle in the announcement that LR3 will shortly be relayed by Uruguayan stations CXA8 (31.58 metres) and CXA14 (19.7 metres).

Way out at sea, the Normandie has been conducting musical tests with the N.B.C. If you haven't heard them, why not turn to 22.6, 34 or 66 metres, where the liner makes herself heard in no uncertain manner?

A little bird also tells me that the Hawaiian stations KKP, K10 and KKH relay a medium wave station from 5 to 7 a.m. daily, on 18.71, 25.68 and 39.89 metres.

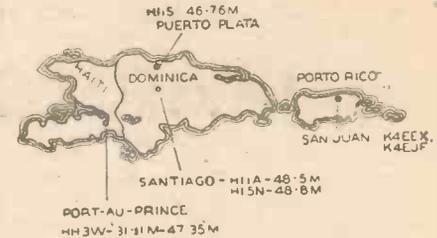
And now for a final item that will send you DX-ers helter-skelter to your sets! The station manager of FZF8, Djibouti, French Somaliland, announces that his station radiates musical test programmes on 17.36 metres from 12.45 to 1.15 p.m. on the first Thursday of each month—what a heaven-sent opportunity to listen to "Darkest Africa"!

Short-Wave Station Identification

THE PHILIPPINE ISLANDS AND OCEANIA

MANILA has sprung into the limelight through the re-birth of a famous old broadcaster, namely KZRM, thus presenting European listeners with an excellent opportunity of capturing their first Philippine transmission, and for the guidance of would-be "capturers" I can supply the following identification notes—listen for it from 22.30 B.S.T. on either 31.38 m. or in the vicinity of 25 m. Announcements are made in both English and Spanish (the islands were originally in the possession of Spain, but were ceded to the U.S.A. in 1899, hence the employment of the K prefix and pronunciation of call as KZeeRM) and a four-chime signal may be heard. The time (seven hours ahead of B.S.T.) is announced "According to R.C.A." and programmes consist of recorded music, news, "Radio Amateurs' Hour," a Spanish session, etc. Their address is Erlanger and Galinger Inc., Importers, Manila.

From Manila a long "jump" is made to the romantic islands of Fiji, where in Suva is found the famous 2-kw. VPD, a station of Amalgamated Wireless Ltd., operating on 31.45 m. where it has on one or two occasions made itself audible in Europe. However, at the time of writing it is extremely unlikely that it will be heard here, since its schedule coincides with that of the powerful local DJN and when the latter is on the air it is practically impossible to log any other weak station transmitting on a neighbouring wavelength. However, in the winter we are more favoured and then "Radio Suva" occasionally



You can hear several of these West Indies stations around 1 a.m.

W2XE Coming Over Well

Lately, I have been listening to the news reports from W2XE, Wayne on 13.94 metres at 12.45 p.m. This station has been surprisingly powerful of late and is well worth attention.

Some little way below W2XE, an American station—presumably W6XKG—has been heard faintly, but I've gone "up dial" to W3XAL (16.87 metres), W2XAD, W8XK, etc., for my entertainment.

The 25-metre band is extremely lively, W1XAL, W2XE and COCX, Havana providing variety entertainment through the night.

But give me the 31-metre band. Here, despite the tremendous number of European stations, DX reception is wonderful. A surprisingly interesting and powerful signal these nights is KZRM at Manila on 31.35 metres. He "takes the air" at 10.30 p.m. and may be heard until the early hours.

COCQ, COCH, PRF5, HJ1ABE (31.58 metres), OAX4J (32.15 metres) and many more Latin-American stations may all be heard as clearly, and regularly, as the rooster next door!

By F. A. Beane

conquers the QRM. When logged it may be recognised by its programme of gramophone records; call "Radio Suva" or playing of "Song of the Islands" or the concluding anthem "God Save the King."

Another worth-while "catch" is FO8AA in the volcanic Tahiti Island in the Society Island archipelago, but so far I have yet to hear of a really authentic report of reception in this country. However, it should be tried for on a Wednesday or Saturday between 04.00 and 05.00, the wavelength used being 42.25 m. The power is 200 watts and they announce as "Radio Club Oceania," the operators being the Papeete "Radio Club Oceanic." French is the language used, and programmes are heralded by the playing of "La Marseillaise" and concluded with "Aloha Oc." Native music comprises much of the programme.

Should you run into an announcement "You are listening to 9MI, the motor vessel Kanimbla," or hear the blast of a ship's siren on a wavelength of either 49.9 m. or 25.62 m., you will know that you are listening to VK9MI of the m.v. Kanimbla, but as it has a power of but 50 watts it is not very likely! Or maybe you may hear "The Ears and Voice of the Tasman" from ZMBJ of T.S.S. Awatea on 33.94 m., a transmitter of 300-400 watts, if you are exceptionally lucky. Travelling in the company of the Kanimbla and Awatea we head for Australia, but our explorations must cease for a while.

MARCONI GOES TO WAR

Marconi on Lusitania when chased by a submarine—Volunteers for Great War—Protecting Marconi from enemy at sea—Radiophone develops rapidly for war purposes—Marconi predicts transoceanic telephony—He buys war supplies for Italy—An inventor becomes a diplomat—What he saw at the Front—He discusses effects of censorship—Marconi outlines radio's function in war—He acts as plenipotentiary of peace—A visit to the United States on war mission—He reveals some war history—Peace pleas and hints of peace negotiations in the air—Broadcasting the Armistice news—Status of wireless at end of the conflict—How Marconi's personality had changed—He feared world economic ruin—Some pressing problems

A DEVASTATING shot was fired on June 28, 1914, in Bosnia. Archduke Francis Ferdinand, heir to the Austrian Empire was slain. A smouldering desire for war was fanned into flames; the battle cries of many nations were wireless like wildfire!

There was no time to be lost. Armies were mobilising along European frontiers. Marconi's invention was rushed into action on land, sea and in the air. Every dot and dash intercepted at listening posts throughout the world pulsed with impending conflict. Every dispatch rang with urgency.

A cryptic flash from the tall German towers at Nauen ordered the S.S. Kronprinzessin Cecile, 850 miles off the Irish coast, to dash for a neutral port; she had £2,000,000 in gold on board. She turned like a frightened cat and dashed towards America. Through the morning mist a few days later the big liner nosed her way into the peaceful Bar Harbour—safe for a while from the enemy.

Laboratories hastened to develop new ideas and devices being nurtured in the incubators of electrical experimentation. Never before had there been such a hectic demand for radio-telephony, direction-finders, vacuum tubes, transmitters and receivers. All were urgently needed in this holocaust. Wireless could cross No Man's Land and the war zone at sea; if intercepted by the foe it would, nevertheless, speed on to deliver its message at the intended mark. It could steal past enemy guns with secrets, which if deciphered might shift battalions and fleets; and change history. Every kingdom, every republic needed this wireless of Marconi, because it was invisible, quick as a wink and it travelled far, despite the fact that it could not be depended upon to stay out of enemy territory; but secrets could be couched in code—and so they were.

Here was news that leaked out later—Marconi was on the S.S. Lusitania when chased by a submarine off the Fastnet in April, 1915. And that was the west-bound voyage previous to the trip when the death-dealing torpedo found its mark.

Recalling the incident, Marconi explained: "Only a few persons were informed that the periscope of a German submarine had been sighted off the rocky island called the Fastnet by Cape Clear, and that the Lusitania with her 22-knot speed had got clean away

before the dreaded commerce destroyer could get near enough to launch a torpedo at her. . . . I think the sinking of the Lusitania a terrible thing."

Marconi had not been long in New York after the big Cunarder was torpedoed, when the calm of the spring air in his native land was disturbed by the rumble of distant guns. Italy joined the Allies in May, 1915, and declared war on Austria. Marconi volunteered to join the Italian colours.

He was in New York, attending the trial in the United States District Court in Brooklyn, of the suit brought by the Marconi Wireless Telegraph Company of America against the Atlantic Communication Company for alleged infringement of patent rights. The Atlantic Communication Com-

Marconi then bade good-bye to Judge Veeder, who came down from the Bench and shook hands with the inventor. After shaking hands with his counsel, Marconi also shook hands with counsel of the Atlantic Communication Company.

Johann Senneck, a German expert who had been called from Belgium to testify, remarked to Marconi that they might still part as friends, as "the Triple Alliance which binds us has not yet been dissolved."

"I suppose it will not be improper for me, too, to shake hands, seeing that the Triple Alliance still holds good," said Frederick Fish, one of counsel for the defendants.

"I shall know more about that when I arrive in Italy," Marconi replied, with a broad smile.

Judge Veeder said the trial would be adjourned for two months. If Marconi was unable to attend at that time, a further adjournment would be ordered by the court.

Prior to sailing on the American liner St. Paul on May 22, Marconi expressed the belief that the Italian Navy would do fine work in the event it was called into action against a hostile fleet.

"The Italian Navy," he said, "is fit and its officers and men are splendidly trained. Since the war in Europe started several new ships have been commissioned, and among them are a number of the Dreadnought type. I have recently met many of the officers and have seen a number of the ships myself, and I can say that everything that could be done has been done to bring the fleet up to a high state of efficiency. The commanding officer of the fleet is the Duke of the Abruzzi;

the Americans know he is a fine and capable type of seaman. Under his direction the fleet has been undergoing a constant training in marksmanship and manoeuvring exercises. Never before has the fleet been so ready as now."

Marconi's eyes sparkled with emotion. He was off to the war.

What a prize for a German U-boat if it could capture the inventor of wireless!

The voyage was uneventful until European shores were approached, and in those waters all eyes were alert for the tell-tale periscope of an enemy submarine. There was intense excitement among a few on the liner, for, according to a London dispatch, the St. Paul was chased by a German

(Continued overleaf.)

EXPLAINING SOME EARLY APPARATUS



The great inventor holds some early experimental apparatus while Mr. G. S. Kemp explains another piece to Lord Wolmer (centre). This photograph was taken at one of the first radio exhibitions held in London.

pany operated the powerful wireless station at Sayville, Long Island, which was equipped with the Telefunken system, a German apparatus.

Marconi had been the principal witness in the suit of his organisation against the company using the Telefunken system, and his sudden departure from the United States halted the trial.

In a brief address to Judge Veeder, Marconi said:

"Your Honour—After consultation with the Italian authorities here, I have decided to return to Italy at once. While war between Italy and her foes has not yet been declared, it seems to be only a matter of a few hours. I shall leave for Italy to-morrow, and I am therefore impelled to cease my attendance here."

MARCONI—THE MAN AND HIS WIRELESS—*continued*

submarine right up to the Bar of the Mersey. The bulletin read:¹

As we approached the war zone rather elaborate precautions were taken to safeguard Mr. Marconi. His name was not on either the regular passenger list or the purser's list. There was a general tacit agreement among passengers that if the St. Paul was stopped by a submarine and Mr. Marconi's person demanded we all would "lie like gentlemen."

Meanwhile Mr. Marconi removed all labels from his luggage, gave his private papers into my care and got into clothes suitable for slipping into a hiding place somewhere down in the bowels of the ship next to the keel, where the chief engineer said the captain himself would be unable to find him.

We had a concert that night at which Mr. Marconi was to preside. The programmes were inadvertently printed with his name as chairman. The captain ordered all programmes destroyed. When the concert began the historian, Mr. Trevelyan, took the chair saying, "We were to have had the pleasure of having Mr. Marconi president, but unfortunately he is not on board."

Sensing the value of radiophone in warfare Uncle Sam lost no time in demonstrating he was fully prepared to take advantage of its possibilities. The naval radio station at Arlington, Virginia, talked by voice with Honolulu 5,000 miles away. Paris, 3,700 miles in the opposite direction, eavesdropped on the conversation. It was all made possible by hundreds of vacuum tubes wired in cascade formation.

Inspired by the news when it reached him in Italy, Marconi exclaimed: "There is not a shadow of doubt that wireless telephony across the Atlantic is assured in the future. It does not matter if for the present such a result is possible only under ideal conditions. The very fact that talking over such a distance as Washington to Hawaii has been possible makes it certain that whatever obstacles may exist at present in the way of a fairly perfect service will be removed after further experiments.

"A year or two ago I said that within a few years arrangements would be perfected so that telephonic wireless across the Atlantic would be established. Had it not been for the war, which has projected our activities in other directions, we would soon have a transatlantic wireless telephone.

"After the war a service will be installed. Europe will be within conversational distance of America. It will undoubtedly be possible for New York to call London as easily as Chicago. Atmospheric conditions, of course, must be taken into consideration. At times disturbances will delay connections and otherwise cause trouble. In the event of terrific storms at sea the wireless telephone will work slower. Constant experiments, however, will do a great deal to remove such difficulties.

"Whether transoceanic telephony will for years to come be anything more than an expensive luxury is another matter," said Marconi. "Millionaires could talk without feeling the pinch. Imperative business conversations might be conducted that way, but I am afraid the general public would find the cost too high. Still, as time goes on, the expense will be reduced, so that the wireless telephone will be a practical means of communication for those having urgent need of it.

"The time will come after the war when a man may take up a telephone receiver in his London home or office, ask the central operator to connect him with New York, and do his talking without any more effort than if he were in conversation over a wire with Paris.

"The wireless telephone messages will be sent through an ordinary telephone station in London, relayed to some coastal wireless station and sent across the Atlantic. The call will be put through to the individual telephone subscriber at the American end without a break. A standard

GUEST OF HONOUR



Marconi chatting with Sir Archibald Weigall during a lunch given in his honour by the Royal Empire Society, in 1933.

telephone instrument as now used could be employed at each end. The voice will be as clear and distinct as if those talking were not separated by the ocean."

The war postponed the reality of this dream. While the conflict was an obstacle to the oceanic "talk-bridge," it nevertheless stimulated the research laboratories to perfect devices, which in the future might be extremely useful in linking the Old and New Worlds with spoken words.

The war continued to put added burdens on the minds of scientists as well as militarists.

Marconi was in London on several occasions to arrange for Italian war supplies and to aid the Allies.

When his native land joined the conflict Marconi was busy scientifically, but his ability and friendship among other nations also made him a tactful diplomat for Italy.

In quest of a secret method of communication he returned to the experiments

of his boyhood—the short waves. He evolved new direction-finders for spotting enemy-sending stations, and these same instruments helped Italian ships to get their bearings by wireless from shore stations.

He worked out a system of narrow-casting, using parabolic mirrors to converge the waves in a beam, just as he had tried to do at Salisbury Plain in 1896. Thus he saved generative power and prevented messages from being diffused or broadcast into the enemy camp.

"I have visited most of the Italian front," he announced while in London, July 22nd, 1915, buying war material for the army. "From an airplane I saw an artillery battle. It was awe-inspiring. The big shells shook the air like a volcano. Our troops got the best of it. Their spirit is splendid, and their ardour and enthusiasm are beyond praise. It is encouraging for Italians to advance into territory which was once Italian, became Austrian and is Italian again. The Italian residents who predominate, of course, are delighted. The Austrians, I suppose, are not, but they are treated with consideration. Italy is full of soldiers in training. The entire nation is united and ready to make any sacrifice."

While Marconi and his associates were striving to make wireless more secretive to prevent the enemy from intercepting the waves, he warned that Press censorship may be carried too far, even in wartime.

"If only favourable news is published and unfavourable news prohibited," he declared, "the ultimate effect is injurious. It is more than that: it is dangerous, for the people resent being misled as to the true state of affairs. They are strong-minded and stout-hearted enough to face facts, however ominous and disquieting the facts may be. Concealment merely breeds rumours and suspicion. . . . Undue optimism, when proved to be unwarranted, is apt to demoralise the public."

While most of the inventive genius of the world was working day and night to develop new engines and weapons of destruction the inventor of wireless called attention to the fact that all the so-called novelties of carnage, about which there was so much talk, including the submarines, tanks, armoured hats, camouflage, hand-bombs, poison gas and flame throwers, were not without a single exception strictly new.

"These war novelties are modern developments of old ideas and devices," declared Marconi. "In the American Civil War, for example, a Confederate submarine sank a Federal vessel. The Greeks used Greek fire in their battles. Poison gas is a more deadly form of the old Chinese stinkpot, which is itself but an application of a natural means of defence possessed by various animals, such as the cuttle-fish and the skunk.

"But aircraft and wireless do constitute new and potent factors in warfare. The Germans dread wireless."

¹The New York Tribune, June 2, 1915.

²The New York American, March 10, 1918

He told the following story to illustrate this point:

While the Anglo-Californian was being chased by a U-boat calls for help were answered by several warships entirely out of sight. The conversation that ensued was one of the most extraordinary ever chronicled. To the requests of one war vessel for indications of the attacked ship's course, speed and appearance, the operator replied, "Hurry up, for God's sake. Submarine firing like blazes."

The warship flashed instructions as to the best course to steer, and, even at one stage, by encouragement of her wireless messages was able to prevent the ship from being abandoned by her captain and crew.

Meanwhile the submarine's bombardment grew heavier and heavier. The operator with his instruments already damaged sent another message, "Cannot hear you. Concussion. Am lying on the floor. Broken glass all around me."

The warship replied, "Keep up your courage, old man. Am firing to scare him. Can you report result?"

The submarine was manœuvring abeam to fire a torpedo. Then a faint trail of smoke was sighted on the horizon, which resolved itself into a fast approaching ship. The frightened U-boat dived.

This spectacular getaway recalled an assertion made before the world conflagration began, "If England and Germany ever come to blows, it will be like a battle between a whale and an elephant."

"But in this war," injected Marconi, "we have seen the curious spectacle of the English whale straining every sinew to become a successful elephant, while the German elephant made great efforts to become a successful whale. Happily, events have shown that it is apparently easier for a whale to change into an elephant than for an elephant to change into a whale."

The flames of war as they licked around the globe did not prevent wireless from extending its domain; in fact, the conflict encouraged the building of new high-power stations. Up to this time the Orient had not been thoroughly linked into the globe-girdling circuit, but on November 15, 1916, the Japanese Marconi plant at Funabashi, near Yokohama, was opened to send messages to the Marconi aeriels at Koko Head, Hawaii. Greetings exchanged between President Wilson and Emperor Yoshihito projected the wireless service two-thirds the way around the earthly sphere.

Marconi stepped out of his rôle as a wizard of science and went to America in the spring of 1917, as a member of a war mission headed by a cousin of the King of Italy, the Prince of Undine. The United States had declared war against Germany in April and was fighting on the side of Italy against the hordes from beyond the Alps.

The Italian Commission to the United States was dined and feted at social functions wherever it went, to spread the gospel of good will between the Allies and the pledge of victory.

In a devout pilgrimage to the tomb of George Washington at Mount Vernon, Marconi spoke as follows:

"The fellowship of America in the struggle is dear and welcome to all the Allies, but particularly to Italy. Italians and Americans both have had to fight and fight hard for their rights and independence. Millions of Italians have enjoyed the hospitality of America, have contributed by their labour to its development, and have been able to appreciate their freedom.

"All of us who have been constrained to

draw the sword, whether in the Old World or the New, are inflexibly resolved that the cause of right shall prevail."

After an extensive trip in a special train through the United States a gala dinner was held in New York in honour of the Commission. A distinguished audience gathered, this time not to hear of wireless exploits, but for first-hand news from the front. War was the big thing of the moment. Everyone wanted to know what was being done to stem the onrush of the Kaiser's troops. Marconi was the main speaker, and alert to what was uppermost in the minds of America promised to reveal some new war history. And he did.

"Let me tell you a few facts concerning the inner political history of those fateful days of July, 1914, when the fate of Europe was hanging in a balance. Germany did not expect Italy to join her in her savage attack on the liberties of Europe; she did not even care much whether we eventually agreed to remain neutral. Her game was a much deeper one. She wanted us to leave France, our great Latin sister, in doubt as to our intentions.

"On the morning of July 30th, 1914, one day before Germany declared war on Russia, and two days before she declared war on France, the Marquis de San Giuliano, who was then our Foreign Minister, unofficially informed

NEXT WEEK

**CHAPTER XIX—A
FLOATING LABORATORY**

Marconi buys the Rowanski—He equips a sea-going laboratory—News of radio progress in America—Broadcasting begins—The ethereal "gold rush"—Seeking the answers to some big questions—The Elettra sails for the United States—Life on board the yacht—Routine of a scientific "skipper"—An inventor's view of various subjects—Someone asks if wireless will reach Mars.

the French Ambassador in Rome that Italy would never side with the Central Powers in war of aggression. This information was immediately wired to Paris, but it was not sufficient to make France feel absolutely certain that Italy's attitude was favourable to her, because there was as yet no official declaration of neutrality on our part.

On August 2nd, 1914, three days before England declared war on Germany, at a Council of Ministers held in Rome, Italy decided formally to declare her neutrality. The news was immediately communicated to our Chargé d'Affaires in Paris, the Ambassador being absent. Without a moment's hesitation, at one o'clock in the morning he went to see Mr. Viviani, the French Prime Minister. It was the middle of the night.

"When he was introduced into Mr. Viviani's presence, the latter turned pale, and drew back, for he was almost certain that nothing but Italy's decision to join Germany would have brought the Chargé d'Affaires there at that hour. The revulsion of feeling when Mr. Viviani read the telegram was such that he could not hide his emotion. Within half an hour orders had gone forth for the mobilisation for service in the north of nearly 1,000,000 men which France would have had to keep on her southern and eastern frontier to guard against a possible attack from Italy.

"The million men helped to stem the advancing tide of the Germans, to win the

battle of the Marne, and save France from being crushed by the heel of German militarism.

"Had there been the slightest wavering, the smallest hesitation on the part of Italy, had any Italian politician been found to do one-tenth part of what Bismarck did when he altered the wording of the famous Ens telegram, and thus brought about the Franco-Prussian war, France would not have dared withdraw a single man from the Italian frontier, and the history of the World War might have been written differently."

The mission of the Italian delegates was completed at this dinner. It was time for them to return to Italy. Prior to sailing, Marconi, mindful that the treacherous, war-plagued ocean stretched out ahead of him, remarked in farewell:

I have been in the United States forty times in twenty years. Some of my best friends are here. I belong to many of America's great scientific bodies, and I had encouragement and help from the United States in the early days of my work when I very sadly needed it.

Applause after one has gained his victory is all very well and may be extremely pleasant, but what counts most is the cordial helping hand held out when one is struggling and cannot achieve without it. That was extended to me by America as heartily as it was from my own country at a time when there was much galling scepticism in all Europe except Italy.

I have always treasured the generous encouragement and support extended by Americans since my first landing in New York.

The American democracy is the greatest in the world. It has the vast material wealth necessary to the conduct of the greatest campaign (World War) ever made by any nation since the start of the history of the world. It has ideals and fights for them. It has developed inventive genius which has given to humanity many of the greatest scientific and mechanical treasures including steamship, telegraph, telephone, airplane and many of the engines of destruction utilised by both sides in this war.

I shall never forget Mr. Edison's laconic comment when the first weak signal vibrated across the ocean—"If Marconi says it's true, it's true." Nothing ever pleased me as those words.

Marconi mysteriously disappeared. His departure for Italy was shrouded in secrecy. The seas were infested with deadly explosives, and submarines lurked like sly monsters of the deep. The war was raging on all fronts. Not even the inventor of wireless, a benefactor of humanity, would be spared a watery grave if one of the sleek torpedoes hit its prey. Every precaution was taken lest a wireless flash went seaward to notify a U-boat to watch for a liner carrying the Italian Commission—for if it did Marconi's own magic might play a part in his destruction.

Asked if he had anything he could say about his own specialty, when he reached London, Marconi smiled and answered:

There will be a lot of surprises after the war. You know what has been accomplished in aviation because you see the bombs falling about you, but you can't tell what is being done in other branches of science.

The war was far from the final shot.

Long streams of dots and dashes told the story day in, day out. Lengthy casualty lists flowed through the air to sadden North America. Intermingled were claims of battles won. The incessant dots and dashes reported how Fate was balancing

(Please turn to cover iv)

"LAZY" TUNING ON THE SHORT WAVES

By J. C. JEVONS

Details of a new scheme for finding the positions of weak stations on short-wave superhets

A LOUDSPEAKER is capable of emitting various sounds which fall short of true music—especially when they come from a neighbour's set. But anything in the nature of a "whistle" is usually recognised as a sign that the set is definitely off-colour. It may be due to carrier-wave overlap, or second-channel interference, or to some sort of unwanted reaction—but, in any case, it is the sort of thing that deserves bad marks.

However, times change and new ideas come along, and presently we may come to welcome a "bit of a whistle" from the loudspeaker as quite a useful sound to hear, particularly when searching for a distant station on the short waves. At least, that is what lies at the back of one of the latest improvements in tuning control.

Helping the Listener

As everybody knows, tuning is a much more ticklish job nowadays than it used to be, partly because the ether has become so overcrowded, and partly because the use of A.V.C.—though a splendid remedy for fading—is rather a handicap when it comes to nailing down a distant station.

It is quite easy, for instance, when working a highly selective set to "overshoot" a low-powered S.W. station—unless one has a sensitive touch on the controls, and is gifted with a quick ear. For this reason the new development, which is designed to help a listener to "spot" short-wave stations with the minimum of trouble, is a useful step in the right direction.

We have all heard the chirrupy sound made by the carrier wave from a distant station, when we have been using too much reaction and the set itself is oscillating. The local oscillations combine with the incoming carrier to produce a beat note or "whistle," which first gets shriller, and then falls off as one tunes through the carrier frequency. And we all know quite well that one should not work a set in this condition, first because it is a source of local disturbance, and secondly because it is impossible to receive intelligible speech or music on a self-oscillating set.

Therefore, in the ordinary way, one does not use an oscillation produced in the set itself, in order to detect the presence of the carrier wave of a station one wants to hear.

The Case of the Superhet

It may, perhaps, be argued that something of the sort happens in the case of a superhet set, but there is a distinct difference. In a superhet the local oscillator certainly beats with the incoming signal, but the beat note, as such, is not heard in the loudspeaker. The oscillator valve is simply used to break down the original signal wave into a supersonic wave of lower frequency, which is more easily amplified in that form. The signals must be separated out from the intermediate frequency wave by the second detector before they can affect the loudspeaker.

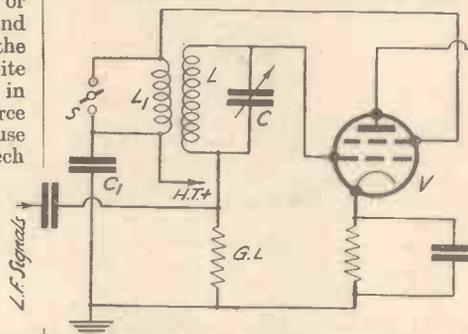
One could, of course, arrange to switch in a special local-oscillator valve for the sole purpose of detecting a distant station by the whistle it produces in the loudspeaker. But as soon as the whistle was

heard the oscillating valve would need to be promptly switched off, as otherwise it would simply swamp out the incoming programme.

Actually, this is the principle of the new tuning scheme. Instead, however, of using a special oscillator valve, one of the low-frequency amplifiers in the set is ingeniously converted into an oscillator during the process of searching. As soon as it has detected the desired station and produced a warning whistle in the loudspeaker, it is automatically switched out of oscillation and restored back to its normal function as an amplifier.

The figure shows a screen-grid valve V which normally acts as one of the L.F. amplifiers in a superhet set. Signal currents from the second detector are applied as shown by the arrow to the control grid via the leak resistance in the ordinary way. It will be seen that the grid circuit contains a high-frequency coil L and condenser C, which, so long as the valve is working as a low-frequency amplifier, do not affect the L.F. input. It will also be noted that the screen-grid of the valve is connected to its high-tension supply through a high-frequency coil L_1 , and through a switch S and condenser C_1 to earth.

THE CIRCUIT PRINCIPLE



One of the L.F. valves is made to oscillate when the switch S is open. The switch is controlled by the tuning knob.

Now so long as the switch S is closed the coil L_1 in the screen-grid circuit is short-circuited to earth, through the condenser C_1 , so that there can be no back-coupling with the control grid. The tuned high-frequency circuit L C is, in effect, put out of action, and the valve operates simply as a low-frequency amplifier.

Let us assume that the intermediate-frequency stages of the superhet are tuned to a fixed frequency of 450 kc. and that the circuit L C is tuned to a slightly higher frequency of 451 kc. If now the switch S is opened, the current taken

by the screen-grid must flow through the coil L_1 , and as this is back-coupled to the coil L in the control grid circuit, the valve V promptly starts to generate oscillations at 451 kc.

As this frequency is far above audibility, nothing will be heard from the loudspeaker until a signal is picked up. No matter what frequency the incoming signal may be, it will be converted by the ordinary superhet action into the fixed intermediate frequency of 450 kc. This at once combines with the 451-kc. frequency generated by the valve V to produce a beat frequency or "whistle" of 1 kc. which is, of course, heard in the loudspeaker.

In operating the set the switch S is manipulated from the tuning control knob. As the listener begins to search for a given station he pushes the tuning knob bodily inwards. This opens the switch S and so starts the valve V oscillating. As soon as a whistle is heard in the loudspeaker the operator knows that he is close to the critical tuning point of the station he wants. He accordingly releases the pressure on the control knob, and the switch S automatically closes by spring action. The coil L_1 is then short-circuited, the valve V no longer oscillates, and the loudspeaker "whistle" ceases. The final setting is easily obtained by fine adjustment of the controls in the ordinary way.

CLUB NEWS

GOLDERS GREEN AND HENDON RADIO SOCIETY

ON September 12th a five-metre competition will be organised in Hertfordshire. "P. W." readers are invited to attend. Prizes will be awarded.

Briefly, the scheme will be divided into two parts. First, four different test words HT+ will be transmitted. Competitors will be asked to record these from different selected positions.

Secondly, competitors will have to find the transmitter.

Fuller details can be obtained from Lt.-Col. Ashley Scarlett, D.S.O., 60, Pattison Road, Hampstead, N.W.2, if accompanied by a stamped and addressed envelope.

* * *

DIRECTION-FINDING COMPETITION

The Twelfth Annual Direction-Finding Competition was organised by the Golders Green and Hendon Radio Society. This year, after a very close contest, there was only a difference of 2 per cent. on the marking of the first and fourth arrivals. The Southall Radio Society, led by Mr. Swan, was the winner. Mr. P. H. Barfield of the National Physical Laboratory deputised for Dr. Smith Rose. After watching the transmitter operated by Mr. Corfield (5 CD) which was crystal controlled, some of the apparatus used by the competitors was erected for his inspection.

This showed, he considered, a very high standard of workmanship, also great credit was due to the elasticity in design, as he understood that the frequency used this year was at very short notice increased from 3,750 kc. to 7,500 kc.

A new type of transmitting aerial was used this year, consisting of a brass rod $2\frac{1}{2}$ in. in diameter and about 30 feet high. A short feeder coupled this to the tank coil.

OLYMPIA What I saw at RADIOLYMPIA

Our Special Representative gives his impressions of a visit to the Radio Exhibition

I WENT to the Radio Show this year with a cast-iron resolution. And this was that I would view it impartially. It was hard to do that. There is always so much preliminary publicity, even ballyhoo, that one is bound to be affected to some extent one way or another.

You know what I mean. At least three weeks before the Exhibition opens cunning rumours about marvellous new things are sent sailing out on the sea of daily broadsheets. Then follow the "working night and day" stuff and tit-bits of information concerning "miles of stands," "thousands of sets," and so on and so on.

One either gets bitten by the enthusiasm virus or becomes faintly cynical. More likely the former, because these Radio Shows at Olympia are *big* and important, and not to be compared with the small shows such as are always being held in London to display the products of the smaller industries.

One of the Foremost Industries

It is a fact that a million or two wireless sets are sold every year. It is a fact that radio ranks among the foremost industries of the country. It is a fact that television is on the point of setting some mighty new wheels in motion.

And it is a fact that Radiolympia is of national significance.

But it is also a fact, and I think it might as well be admitted, that this year's Radiolympia was not from every aspect the "biggest ever." There is plain evidence of a settling down. Not that this need be interpreted as a set-back. Far from it. If there were fewer firms showing, they had more to show that was good.

Sentimentalists may sigh for the days when there were two halls packed with stands and jammed with visitors, but some of those firms were mere opportunists jumping in to take advantage of a new craze.

There are over eight million licence-holders to-day, as compared with a million or two of pioneering enthusiasts.

1937 Radiolympia had the bigness of dignity and the substance of social service.

And I think it was by far the *best* Radiolympia. For one thing, there was an entire absence of

anything remotely resembling the "cheap jack" or "stunting." It was an Exhibition of great interest and fascination with a serious purpose.

In previous years a standardised scheme of stand decoration was insisted upon, and this was a practice which I applauded. I believe it was very necessary in the years of development. The restriction has now been removed and with most gratifying results.

The wide variety of individual colour schemes and stand designs made a fine showing, there being no jarring notes of

garishness or crudeness anywhere. I don't think a more attractively bright, colourful and artistic exhibition would be possible whatever its theme.

Radiolympia has "grown up" in the best possible way.

But I did not think very much of the ambitious "set piece." I would like to see something different from the "flat" "illuminated sign" kind of thing that is fast becoming a Radiolympia habit. A little more enterprise and imagination are, in my opinion, called for. But another habit, that of prominently displaying stand numbers, is one which I am rather sorry to see discarded. However, it was easy enough to find the various stands, providing one had an official guide and good eyesight.

A distinctly commendable feature was the number of cafes, snack bars, tea-rooms and restaurants. There could never have been any difficulty in obtaining refreshments, however many visitors were desirous of so doing. And that, after all, is important.

The stands were very well arranged with wide gangways and never any congestion—while I was there, at any rate.

"Period" Designs

Well, what were my first impressions of the exhibits? They were that as never before radio sets are being designed as pieces of furniture. Not always attractively, though. For example, among the first sets to catch my eye was a range built into ornate, old gold cabinets. In my view they were not pleasing, though I am prepared to admit that many folk might like them.

"Period" designs are not everyone's meat. Nevertheless, I can find only one word to describe the period set and *setting* due to Marconiphone. And that is "lovely." Men with truly artistic sense executed them.

There was a full-sized section of a room decorated and furnished in "old world" style with the wax figure of a gracious lady of the period "listening" to a "period" Marconiphone radio that fitted into the scheme to perfection despite its twentieth-century presence. Handled

(Continued overleaf.)

THE 1937 "RADIO QUEEN"



Miss Elmina Humphreys, who was chosen from more than 2,000 entrants to represent the "Spirit of Radio" at this year's Show.

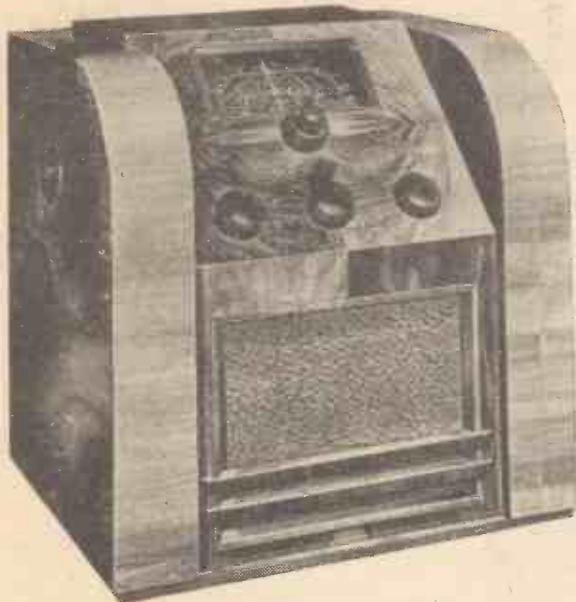
WHAT I SAW AT RADIOLYMPIA

(Continued from previous page.)

with just that little less appreciation of the beautiful or with a lack of artistic imagination and the display would have failed hopelessly and horribly.

I gave full marks to Marconiphone for that quiet and appealing piece of work. But I subtracted a few of them for wasting a page in the official catalogue. In this way: They had two stands, Nos. 53 and 64. A full page was devoted to each. In the first both numbers appeared "53-64." In the second they appeared again "64-53" and the descriptive matter was exactly the same. Quite all right, but—!

However, that is a very small point and in no way reflects on the sets exhibited by this famous concern. What a range! From a three-valve battery outfit to a magnificent "every programme" television installation. The name of Marconi is certainly given full justice. I wish that I could tell you all about these sets, but that would be unnecessary, because you have been given their descriptions in previous



DESIGNED FOR HIGH FIDELITY

This Burndept receiver employs electron-coupled output valves and aural tuning. It is an all-waver going down to 13.5 metres on the short waves.

issues of "P.W." So I will curb my desire to enlarge on individual exhibits and proceed with my pen-picture of the exhibition as such.

Television certainly came right into the open. No tentative displays this time. On the K.B. stand sets were shown. One might have anticipated something of a pioneer, experimental atmosphere about them. There was not. They were sleek, finished instruments every bit as polished and advanced in appearance as ordinary receivers. Not that the K.B.'s were alone in this. That observation applied generally. Television reception starts at where normal radio has arrived.

I think the Post Office rather let us down this year. Or is it that their past efforts have led us to expect too much? In previous

years the G.P.O. exhibit has generally been by far and away the best in the whole of Radiolympia. An exhibition in itself. Working models of mail trains, demonstrations of automatic telegraphy, films, free radiograms to ships and various other such features all presented lavishly on a grand scale have been the usual P.O. contribution to Radiolympia.

I have always congratulated the P.M.G. on such fine efforts and carefully refrained from mentioning that it is only our due as listeners whose licence money is "milked" by the P.O. that a little return should be made in such a manner.

This year the P.O. cut its exhibition contribution right down to just an ordinary stand with a single interference demonstration and an enquiry bureau. A very niggardly and retrograde step which we must heartily deplore.

I looked automatically for a large P.O. enclosure and was extremely disappointed at its absence. However, there was compensation in the television. That alone made a visit to Olympia more than worth while.

No fewer than seventeen firms were showing television sets and fourteen of them were actually giving demonstrations. There was no queueing up for these. There was a series of twenty-minute programmes, nine of them given each day. Tickets for definite "performances" were issued free. One merely obtained a ticket at the ticket office and a seat was assured at the time specified.

You could choose any of the programmes and any of the theatres for which there were tickets left. I selected a K.B. at 9.40. K.B. because I hadn't seen any of their television and 9.40 because "house full" applied to the other times.

The small theatre was provided with a number of comfortable chairs so arranged that everyone could obtain a good view of the screen of one or the other of the two sets in operation.

The programme was transmitted from Alexandra Palace in the normal way and the reception was excellent. Judging from the various observations made I gathered that the pictures were very much better than the visitors expected them to be.

"I thought they'd be like those early lantern slides," said one young woman. What those early lantern slides were like, I don't know. And I wondered what she



ARMCHAIR RADIO

The new Alba "Armchair Console." The radio controls are sunken, so that a tray or cover can be placed on top.

know about them, anyway. But the brilliant black and white television pictures, rock-steady and full of detail were quite above any such criticism as was freely admitted.

But I think the B.B.C. might have given us something better in the way of a programme. It was definitely unexciting. Nevertheless, the technical merits of the transmission and reception made up for the slimness of material.

Just one other point. During the demonstration strains of music and laughter filtered through from the theatre to remind us that here at Olympia the old and the new were in operation side by side. You see, I am one of those who consider that in ten years' time or so "blind broadcasting" will be as dead as the silent film.

Within the space of less than a year



TWIN SPEAKERS

An attractive McMichael all-wave radiogram for A.C. mains. Twin loudspeakers are fitted and the output is 6 watts.

we have seen the prices of television sets drop from one hundred pounds to thirty-five pounds. At that rate they will be down to the kind of figure charged for medium-grade radio sets within another year or two.

Another attractive side show was the "Museum." Here one could touch the microphones used by King George V and inspect the crude apparatus with which Marconi conducted his earliest experiments. There were also many pre-broadcasting receivers, Fleming valves and other such items of an important historical nature.

The "Museum" is certainly a section of Radiolympia which could well be extended on future occasions. Indeed, we are promised that it will be. It was well patronised and can be reckoned an experiment that proved definitely successful.

Novel Presentations

There were numerous novel presentations on the stands this year. Tannoy were showing a fine model illustrating the many applications of their sound equipment. For example, there was a church with loudspeakers in the belfry for reproducing bells from records, a road-house installed with P.A. systems, police radio cars and other such items all included in this model.

H.M.V. had an elaborate model of a television van such as is used by the B.B.C. and full-size Emitron cameras to back up their magnificent show of radio and television sets.

Bush exhibited an application of the Pepper's Ghost principle. In a glass-fronted case you could see some of the components used in Bush sets. While you watched them the cases of these components dissolved away to show the internal construction. Quite a startling effect, especially for those unacquainted with the optics of the illusion.

Ediswans were running a film illustrating



A LUXURY SET

A magnificent ten-valve all-wave auto-radiogram seen on the Marconiphone stand. Intended for use on A.C. mains, and housed in a walnut cabinet of period design, this de luxe receiver provides reception on five wavebands extending from 4'85-2,000 metres. The price is 67 guineas.

the manufacture of Mazda valves. This film, in colour, could plainly be seen by the large group of interested visitors despite the competing light of the Show.

Ediswans also had a fascinating "photo-electric" motor going. The armature of this comprised a photo-electric cell which

generated current for its own rotation in the field of a permanent magnet from the light of a powerful lamp that was shining on it. You could easily prove that this was no fake by holding your fingers in the light beam. This would at once slow down the motion. And if all the light were intercepted the device stopped working altogether.

At the Osram stand I was attracted by a large working picture of a valve. A stream of light particles moved between the cathode and the anode to illustrate the electron stream and the dimensions of this stream could be varied by adjusting grid bias and screen voltage controls.

An earnest-looking gentleman was manipulating these controls with an intent seriousness that commanded my immediate admiration. This, I thought, is how one ought to visit an exhibition—with a determination to glean as much information as possible. It was while I was thinking this that he turned towards me and began a short lecture on the functioning of the thermionic tube. For which I duly thanked him and went on my way. But I still don't know whether he was an Osram employee loyally doing his duty, or a visitor eager to share his knowledge with, as he might have thought, another ordinary visitor. I like to think he fell into the latter category.

All-Wave Designs

We used to get a lot of that kind of thing at the earlier Shows. During the latter years the tone of the Shows has altered—for the better, some of you may think who have experienced button-holding from blithely-enthusiastic experimenters and amateurs eager to exchange experiences. I used to enjoy that.

You are, maybe, wondering when I am going to refer to the all-wave business. I haven't hastened to do so because you must all know by now the extent to which the short waves have invaded broadcasting.

I didn't see one single stand exhibiting



NEW TELEVISION DEVELOPMENT

The Philips big-screen television receiver in which a small cathode-ray tube projects a brilliant picture on to a flat screen measuring 20 in. x 16 in.

any sets at all that did not include all-wave models. The whole ranges of some makes were all-wave throughout.

Quite a few included the television band as well.

In my view, this is more important to the average listener than the ordinary short waves because it provides access to a new alternative B.B.C. channel. There is tremendous fascination for many in short-wave reception, but I cannot help thinking that the average listener would not wander away from his home stations very much.

Bigger and Better Dials

Nevertheless, a set that takes in the short waves must be much more valuable to him by virtue of its potentialities, even if the outfit is used mainly for listening to the B.B.C. and one or two of the Continental stations.

The radio industry has not responded to an urgent public demand in going all-wave; it has done so because of the desire of individual firms, in a spirit of keen competition, to keep on giving more and more. But the result is the same, and all-wavers are selling.

Incidentally, this advance has had indirect reactions as well as direct ones on the general design of radio sets. The adding of a third waveband has created the necessity for bigger and better dials. It would have been quite impossible to crowd in another complete set of calibrations on the small and cramped dials that a year or two ago seemed to be a rule of design having but few exceptions.

The dials of the 1937 Radiolympia are high, wide and handsome affairs, easy to look at and attractively illuminated—

(Please turn to page 21.)

TELEVISION TOPICS—Collected by A. S. Clark

TECHNICALITIES AT THE SHOW

TELEVISION at the Show was a huge success, and we have heard much about the sets for receiving Alexandra Palace, and about the programmes that were seen in the demonstration theatres. But now it is all over, there are one or two technical points worth remembering, and some inferences to be drawn on the general trend of technical development.

First of all, with regard to the television demonstrations, it is interesting that all the various instruments were supplied from one receiving aerial erected on the roof of Olympia, in the best position for a good noise-to-signal ratio. The aerial installation was in the hands of Baird Television, Ltd., and fed to a Marconi-E.M.I. radio-frequency amplifier. We are happy to note this co-operation between two firms in such close competition with one another.

After amplification the currents passed to a special Baird distribution system with thirty outlet lines for rendering to the various theatres.

Big-Screen Reception

The big-screen instruments were, until withdrawn, the centre of attraction, and their similarity of principle—viz., the obtaining of a large picture by projection from a small but bright picture on a high-voltage tube—seems to indicate that this may prove the ultimate solution of the demand for big screens. Of course, the possibilities of mechanical systems cannot be overlooked, but at present we have little in this way on which to draw conclusions.

These projection receivers, with their voltages in the neighbourhood of 25,000, rather seem to have debunked the once-suggested idea that the use of high voltages in a television receiver would militate against their popularity. The makers, at least, seem to feel certain that if one is going to deal in thousands of volts, it does not make much difference *how many* thousands of volts it is.

One thing that the increased detail in the pictures indicates is that to-day's television receiver is making more of the wide band of frequencies sent out from Alexandra Palace. Circuits and components have been improved to take in more of these frequencies without a falling characteristic, and it is also interesting to note that superhet vision circuits still appear to predominate.

An Inexpensive Receiver

In the inexpensive G.E.C. instrument, which is the cheapest one available, cost is cut down considerably by leaving out the speaker, sound power-valve and amplifier.

The sound is reproduced on an ordinary broadcast set by connecting it to the output of a U.S.W. frequency-changer in the television instrument. The principle is similar to that with which so many short-wave listeners are familiar in the

short-wave superhet converter, in which amplifying stages of a broadcast set are made to act as the I.F. stages of the short-wave converter. It is a really ingenious use of a well-known principle.

While on the subject of circuits, it is worth note that the R.G.D. instrument has the large number of thirty-seven valves. Also, the following details of the Philips projection-type receiver will interest many.

The receiver starts off with an H.F. stage which amplifies the sound and vision frequencies together. These are then passed on to two frequency-changers, one for vision and the other for sound.

The sound sequence is then via a single stage of I.F. and a detector valve, which also supplies A.V.C. control. After detection the sound signals are fed to the pick-up input of the all-wave broadcast receiver incorporated in the instrument.

Four I.F. Stages

The vision signals pass from their frequency-changer to four I.F. stages working on a wavelength of about 30 metres. They are then detected and passed to a video-pentode output stage, a separate diode being used to look after the D.C. component of the picture. The synchronising pulses are tapped off the vision output and pass through a pentode amplifier and diode-fed to the time-bases.

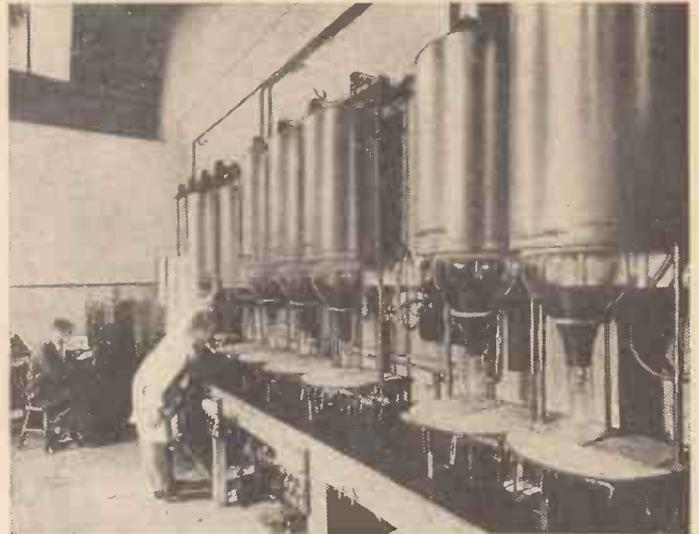
THE NEW COSSOR RECEIVERS

IN addition to the two Cossor television receivers described in POPULAR WIRELESS last week, this firm has introduced two new instruments. One is a table model and the other an all-wave floor model.

The table model 437T is for the reception of vision and its accompanying sound only. This instrument has been produced for those who already have a satisfactory receiver for broadcast radio reception. The picture, though slightly smaller than that given by the console models, is of ample size for home entertainment.

The picture is viewed direct on the cathode-ray-tube screen and there are only two controls additional to those usual for radio reception. The walnut-finished cabinet is 22½ in. high, 14½ in. wide and 25 in. deep, and the price of the instrument 45 guineas. A suitable table to carry it is available as an extra if desired.

The price includes standard television



A row of Cossor 12-in. cathode-ray tubes on the pumping bench. Note the protecting shields which are lowered over them in case one should burst during evacuation.

aerial equipment, maintenance and guarantee for 12 months. The instrument will work on 200–250 volts (adjustable) 50-cycle mains. For use in a D.C. district, a rotary converter is required to provide the necessary alternating current.

Hire-purchase terms are available when required.

The second new receiver, the 337T, is a console model incorporating an all-wave radio receiver. It will be remembered that the receivers in the two models described last week were for medium and long waves only.

Covers the Short-Waveband

The bands covered are 16 to 52.2, 196 to 560 and 900 to 2,050 metres. The design of the cabinet varies from that of Models 137T and 237T, described last week. The screen is larger than the table model, being the same as on the two models just referred to.

Eighty guineas is the price of the 337T, and the cabinet size is 44½ in. high, 21½ in. wide and 24½ in. deep. As before, the price includes aerial equipment, servicing and guarantee for 12 months, and hire-purchase terms are available.

SCENES FROM FILM STUDIOS

THE B.B.C. announces that the mobile television unit will be stationed at the Pinewood Film Studios, Iver Heath, Buckinghamshire, from September 30th to October 5th, to give direct shots of films in the making.

Transmissions from the film stages will be given on three nights, and viewers will obtain a first-hand impression of how a big picture is built up.

During the afternoon transmissions from Pinewood, which will be given daily, viewers will be taken behind the scenes to see the workshops, power house, plasterers' shop and boardroom of the Pinewood Film Studios, Ltd. Other interesting sections to be visited will include the gardens, the model department and the dressing-rooms.

It is hoped that Mr. Alfred Hitchcock, the eminent director, will also face the television camera.

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for WIRELESS APPARATUS

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DON'T SCRAP THE "LITTLE NATIONALS" —YET!

Says Alan Hunter

During certain times of the day listeners are forced to tune to Droitwich for their National programmes. Will the B.B.C. eventually put out all National programmes from their long-wave transmitter and shut down the medium-wave Nationals?

THREATENED people live long, they say. I wonder if the same applies to transmitters? Ever since Droitwich gave us a country-wide coverage for the National programme the "little Nationals" have been threatened with extinction. But, fortunately, most of them are still with us.

Recent developments make me wonder whether we are being educated to tune-in Droitwich as a preliminary to the final closing of the London and North National transmitters.

It is quite an interesting affair, so perhaps you will bear with me through the somewhat tortuous paths that have led to the present position—which, briefly stated, is that London and North Nationals do not come on the air until 5 p.m.

It began when the B.B.C. belatedly separated West from Welsh Regional service. The West National was shut down on July 4th, and left the 261.1-metre National "pool" to take up Scottish National's wavelength of 285.7 metres as the new but temporary West Regional. The existing West Regional on 373.1 metres then became, with the Penmon relay, Welsh Regional.

A Significant Point

Now that meant Scottish National had to join the London and North Nationals on 261.1 metres, which might, one imagines, have been done long ago. It also meant—and here's a very significant point—that West of England listeners had, willy-nilly, to tune up to Droitwich for their National programme. The first group of listeners, if you like, to be forced up to the long waves, whether they cared to or not.

With Scottish National sharing the same wavelength of 261.1 metres as London and North Nationals, a fairly acute programme problem arose. It is essential, as you know, for stations on the same wavelength to do the same programme—and that was the trouble.

For while London and North National wanted to do the schools programmes, which form part of the afternoon National service not only from the "little Nationals," but also from Droitwich, Scottish National wanted to do a Regional programme!

The reason for this somewhat Alice in Wonderlandish state of affairs is really quite simple—when you know. You see, up in Scotland they have high-power stations at Westerglen and Burghead working on the same wavelength. These obviously have a much greater cover-

age than the National transmitter at Westerglen alone, and it is desired that as many schools as possible shall be able to pick up the schools broadcasts.

Reasonable enough, then, that during the afternoon period in Scotland the National programme, including schools broadcasts, should be sent out from the two Scottish Regionals, while the Scottish Regional programme should be sent out from the National transmitter at Westerglen.

But when Scottish National joined the 261.1-metre pool, something had to go, and what went were the transmissions from London and North Nationals. In this way, England was forced up to Droitwich for its National programme, while Scotland, left in sole command for the afternoon of the 261.1-metre wavelength, could proceed along its peculiar way, giving on this wavelength a Regional programme not interfered with by the silent English "little Nationals."

It is somewhat annoying to English listeners to discover that, as there are no schools broadcasts just now, Scottish National has the sole use of the 261.1-metre wavelength until 5 p.m. for its ordinary programmes, while poor old London and North Nationals have to remain silent.

"We know that not all the period until 5 p.m. is taken up with schools broadcasts," explains the B.B.C., "nor do these broadcasts occur in holiday time; but we feel it is less confusing to listeners to shut down the London and North Nationals altogether during this period, rather than open them up at such times as Scottish National does not need the wavelength exclusively."

Since when, I should like to know, has Scotland, with its meagre population and very poor showing of licence-to-population percentage, had any claim to priority on a wavelength that was until recently purely English?

And so it is that, at the present time, the Droitwich transmitter is alone on the air for the National programme destined for England. Here, in other words, is the thin edge of the wedge.



This transmitting and receiving set has recently been installed in the Clacton-on-Sea lifeboat to enable her to keep in touch with her home station when called out to ships in distress. The installation is operated by the first engineer, Mr. W. C. Harding.

Knowing that compared with the listening public as a whole, the subscribers to the afternoon National programme must, in any case, be quite a small minority, would you expect much of an uproar over the change? Obviously, except from a few schools with badly designed sets, you would not.

And that is where the B.B.C., in my opinion, is in danger of taking too complacent a view of the fact that, according to one official I spoke to, very few letters have been received complaining of being forced up to Droitwich.

The danger is that, armed with this lack of objection to the silencing of the "little Nationals" during the afternoon, the B.B.C. will say to themselves: "Well then, why not silence these unwanted stations altogether, and save the upkeep of two high-power transmitters, as well as possibly releasing another wavelength?"

Yet the B.B.C. engineers know, better than we do, how overwhelming are the objections, at the present stage, to the complete shutting down of the medium-wave Nationals. The objections cited at the time Droitwich opened are equally valid to-day, and here are some:—

A Retrograde Step

It would mean that millions—literally millions—of people enjoying good reception within the 20 miles' service radius of London and North Nationals would have to put up with a lower standard of reception; and that, in itself, is surely a retrograde step for a Corporation priding itself on its extensive "A" service achievements.

In the summer, atmospherics always make the long-wave band noisy as compared with the medium-wave band; and, all the year round, man-made atmospherics from

(Continued on next page.)

DON'T SCRAP THE "LITTLE NATIONALS"—YET!

(Continued from previous page.)

every kind of electrical apparatus are very much more prominent on long waves than on medium. Ask any listener living on a tram route!

The only possible argument in favour of shutting down the "little Nationals" is that their service areas are fully covered by Droitwich; and, purely from a field strength point of view, that is probably correct. But no one can pretend that either quality or freedom from noise is as good from Droitwich as from the threatened "little Nationals."

The whole tendency to-day seems to be towards progressively going down in the wavelength scale, not up. One has only to listen to the wonderfully faithful quality from the sound transmitter at Alexandra Palace to realise that.

Maybe the day will come when a national network of ultra-short-wave stations will provide everyone with a high-fidelity sound programme. There seems no reason why the London area should not be so provided right now.

But until that day comes quality fans will certainly not take kindly to the closing-down of the medium-wave National. Eventually, one can visualise these stations being redundant; but they are not redundant just because Droitwich happens to put a healthy signal into their service areas.

Please, B.B.C., don't go backwards, nor up, up, and up!

MY SHORT-WAVE

ADVENTURES

(Continued from page 7.)

Tashkent's horrible picture signals at 86 degrees, Wayne, W 2 X E on 19.65 metres at 83 degrees, and Schenectady, W 2 X A D, on 19.57 metres at 76 degrees.

Here, then, are the usually crowded denizens of the 19-metre band all coming in at quite distinctive scale readings—on the band-spreader, of course. I can quite see how this apparently greater separation gives some people the idea that selectivity is better. The greater separation is real enough, in a physical sense, but electrically there is no improvement, of course.

As an example: I found Tashkent's signals—which always do spread rather badly when that still-picture transmission is on—were slightly encroaching on W 2 X E's signals. Using the band-setter only, the two signals seemed on top of one another, with less than a degree variation on the band-setter to get one or the other. Yet with the band-setter fixed and the band-spreader doing the tuning, there were, as you have already noted, a good three degrees between the two.

But—and this seems to be the relevant point—although it was easier to log W 2 X E on the band-spreader than on the main condenser alone, the degree of background of Tashkent on Wayne was exactly the same in both cases. As, of course, theory dictates it should be.

Well, there it is. While I was on this experiment, I took the chance to do one (Please turn to page 21.)

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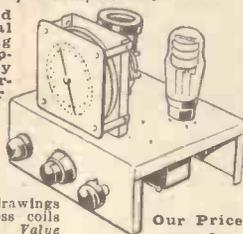
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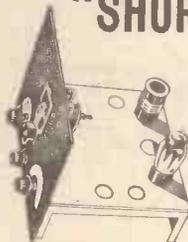
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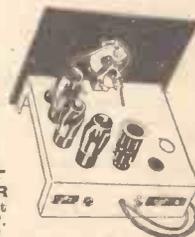
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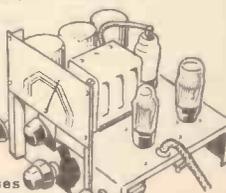
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SEEN ON THE AIR

By L. Marsland Gander

WHY WERE THE BIG-SCREEN SETS WITHDRAWN FROM RADIOLYMPIA? :: "HOUSE FULL" TELEVISION DEMONSTRATIONS :: RECEPTION IN CAPE TOWN

TWO circumstances marred the success of Radiolympia from the televiewpoint. The first was the early withdrawal of the two big-screen sets of Philips and Marconi-E.M.I.; the second was the fact that the fourteen miniature theatres, subsequently reduced to thirteen, could not accommodate the thousands who wished to see television demonstrated.

It came as a last-minute surprise when the Marconi-E.M.I. Company announced that a set with a screen measuring 22 x 18 in. was to be shown. Research on this set had been going on for years, but its sudden appearance was obviously an answer to the Philips set which had a screen measuring 20 x 16 in. Then suddenly, when the widest publicity had been given to their presence, after the lapse of two days both were withdrawn. Why?

All lips are sealed on the subject. It may be that the exhibition of these sets was contrary to some regulations to which exhibitors subscribed before bringing their sets into Olympia. But in having the sets taken out the R.M.A., besides creating a mystery caused some disappointment among visitors. Philips, by the way, continued to show the receiver at their Charing Cross showrooms.

I believe that I was the only Pressman privileged to see the Marconi-E.M.I. set in operation before its sudden removal.

A Bright Picture

The picture is green and black, and the brightness highly satisfactory when viewed from a central position. A curious point is, however, that if the viewer stands at a pronounced angle the brightness dims.

The screen is not of ground glass, but is a special development of the E.M.I. organisation at Hayes. In principle the method of obtaining a large picture is very similar to that employed in the Philips set. The picture starts as a miniature on a tiny tube with a base about 3-6 in. in diameter. It is

then enlarged to size by optical means. It suffered when seen side by side with a small set, as the definition of the smaller screen was conspicuously better and, of course, the black-and-white picture was an advantage. Nevertheless, some of the close-ups on the large screen were incredibly good. I have never seen a better picture of Elizabeth Cowell than one projected on to this large screen from the studio. An expert with whom I was sitting attributed this excellence to the studio lighting, which exactly suited the subject.

Afterwards I saw some "Pets' Corner" pictures on this same set and was most favourably impressed, though to be sure I am not so obsessed with the need for a big screen in the home as some seem to be.

As to the accommodation in the television theatres, each seated about 35 persons. A simple calculation shows that the theatres

could seat only something over 4,000 persons a day at the nine shows. Even on the day of the lowest attendance this represented only about half the total number of visitors to Olympia, yet it is certain that practically everybody went to Olympia with the intention of seeing television.

Time and again the notice "House Full" appeared. One visitor, I was told, had come from Bermuda to see television and had to go empty away.

In spite of the most unfavourable conditions I did not once see the slightest trace of interference. Each of the theatres, by the way, was completely enveloped in protective "rabbit wire" to exclude interference.

As an indication of the improved efficiency of transmissions from Alexandra Palace, I may mention that the signal strength at Olympia was four times as great as last year.

It was at Olympia that I heard a very interesting story on long-distance reception. A South African had been receiving television

Committee will be satisfied with anything short of "doubling up," a process familiar on the sound wavelengths when increases of power have been made.

This means that when the research laboratories have done their work the B.B.C. will probably adopt a definition of 811 lines, with single side-band transmission. I am recklessly plunging into the future now, and it may be a year or two before this is done.

But I am informed that piecemeal changes to the transmitter to bring about this are not impossible, without complete dislocation of the service. What is more, the change would not, at a single blow, throw into disuse all the existing television receivers because (says my expert friend) it would still be possible to get quite good results on 405-line sets.

This is particularly interesting, because I spent a lot of time at Olympia asking various visitors whom I picked out of the crowds at random: what were their views on television. Nearly all of them, while expressing the greatest enthusiasm for the pictures which they saw there, said: "But sets will be better and cheaper still. I remember when valve sets used to cost—" and so on.

Listeners are, to some extent, misapplying the lessons they have learnt with sound radio. Whereas radio progressed in a gradual inclined plane, television in its nature must go by steps. Design of sets is bound up with design of transmitters.

Increasing Sales

However, buying has begun in a trickle, stimulated by the many examples of "baby" sets brought out by manufacturers at Olympia. Soon the trickle will broaden into a stream, then into a flowing river. As my expert friend said: "The B.B.C. had best make its change quickly. At present we have only 5,000 sets to contend with. Soon there will be 100,000."

I saw all the sets at Olympia and was struck chiefly by the uniform excellence of definition,

and the fact that practically unanimously the tubes had gone black-and-white and lost the yellowish, greenish and bluish shades of last year.

Some of the baby sets are showing really excellent pictures. Prospective buyers should not bank too much on further price reductions, I thought before that prices had been cut to the bone. But now manufacturers seem to be scraping the bone itself.

This week there will be television broadcasts from Hatfield Aerodrome of the King's Cup Air Race. The first will be the final inspection at between 3 and 4 p.m. on Thursday, the eve of the race.

The second is between 5.30 and 6.15 p.m. on Saturday, when the winning plane is expected to arrive. Two cameras will probably be used and the link with Alexandra Palace will be by radio.

A GIANT SPEAKER



These two children are very interested in the giant Tannoy loudspeaker, specially made for the Navy. It was shown at Radiolympia.

sound programmes regularly in Cape Town, and had also been picking up the vision signals. He is now in this country and is so confident of getting a respectable picture that he is actually taking back television receivers with him. He intends to erect an ambitious aerial system two hundred or three hundred feet high with suitable reflectors. Shades of Marconi, who can say that he won't succeed, and set the professors busily finding another series of ionised layers of atmosphere!

But I must add that the Radio Corporation of America with all their resources tried to do the trick and failed, though as readers will remember they sent a perfect record of the sound across the Atlantic to the B.B.C.

I have said once or twice in these Notes that the next step in television will be up to a definition of 600 lines or thereabouts. I now have reason to amend that statement. I do not believe that the Television Advisory

MY SHORT-WAVE ADVENTURES
(Continued from page 19.)

other thing that might interest some of you. That '001-mfd. fixed condenser across the phones was added later, when I found that it made signals very slightly louder. True, a little more reaction was needed to get oscillation—but not much more. Tokio (I know this sounds absurd, but it is true) is rather too loud a signal these days on one valve to test critical values—so it was on Wayne that I decided to work with the phones condenser. As I say, it seems to be justified.

One has to guard very carefully against slipshod decisions as to the effect of circuit changes. You have to do the same trick over and over again before you can really be sure whether a gain or loss has been registered.

WHAT I SAW AT RADIOLYMPIA
(Continued from page 15.)

many of them with cunning colour schemes to facilitate reference to individual bands.

Another incidental development is the introduction of better and slower slow-motion tuning controls. These are necessities for really efficient short-wave reception, but they also make medium and long-wave tuning smoother and easier.

One of the best of them all, and one that includes an original principle, is the Ekco "Spin Wheel Tuning." Instead of the usual small knob, there is one that is large enough to be called a wheel. It presents its milled edge to you, and you give it a flick and send it spinning round just as you might a small bicycle wheel. And for each flick it rotates freely a number of times, while an indicator walks laterally across the dial. You can get from one end to the other very quickly. But when the need for very fine tuning arises, then you move the wheel control-fashion, and in that way obtain the most microscopic settings.

It is, of course, a mechanical device, and as such can be criticised—if you can find anything to criticise in it. I couldn't. It does its job just about as perfectly as is possible, and that is that. But what a miracle of precision work! What a marvellous absence of backlash!

There is another way in which the problem of short-wave tuning has been tackled in these 1938 all-wavers. And that is by the magnification of the indication itself. But there must be a good slow-motion of some kind as well, or it would fall down.

I must say I liked the Ferranti "Magnascope" system as well, if not better than any of the several others I saw. It is like an almost endless strip of calibration moving across an aperture, so stretched out is the indicator by an ingenious but simple optical method.

There has been no complication of controls following the introduction of short waves into broadcast sets. Very much the reverse. These 1938 Radiolympia sets are definitely simple to operate. In one or two instances all the controls have been unified in the one knob, while the large majority of the sets have no more than three or four controls.

The superhet reigns supreme among all except the inexpensive battery sets.

There was a notable absence of large valve displays. I should imagine that the reason for this is that valves are these days regarded as replacement articles and that competition between their makers has become a trade rather than a public affair. Just like sparking plugs for motorcars.

A listener desirous of replacing one or more of his valves is not likely to go to another make other than that originally figuring in his set.

Quite a large number of components were shown. Not as many as in some previous years, but still a very healthy display. Such firms as Bulgin, Varley, Ferranti, Wingrove and Rogers, and Benjamin had representative collections on view.

Altogether it was a most interesting Radiolympia and, in view of its all-wave and television attractions, it may well go down in history as the most important one of all.

A RADIO CAREER IN THE ARMY

THE recent increased interest in the possibilities of the Army as a career make it opportune to consider what this Service offers to the young man who is keen on radio.

Radio-telephony and telegraphy are playing a more and more important part in military manoeuvres in view of the increasing use of mechanised arms—such as tanks, armoured cars and mechanised cavalry. Those interested in making a radio career for themselves in the Army would join the Royal Corps of Signals.

Now for the question of pay, and in considering this the question of security with no shadows of possible unemployment must be borne in mind. The pay of a signalman who has finished his recruit's training varies from 15s. 9d. a week to 40s. 3d. a week according to his trade and his growing proficiency in it. This, remember, in addition to free food, accommodation, initial clothing and clothing allowance, free medical and other services.

Non-commissioned officers naturally draw more, and a Warrant Officer can get as much as 98s. a week. All married men over 26 draw additional married allowances.

The basic terms of service are eight years with the Colours and four with the Reserve. A proportion are allowed to extend their Colour service to twelve and subsequently twenty-one years, and it is from these that the higher ranks are chosen.

With excellent training and experience they have obtained there is no difficulty for those leaving after eight years to obtain good employment in radio or as telegraphy operators in civil life.

For those who wish to make the Army a life career the scheme of boy apprentice tradesmen has great advantages. At present about forty-six boys between the ages of fourteen and three months and fifteen years are taken each year for a three years' apprentice course as operators, instrument mechanics, and electricians before joining the ranks as signalmen. The majority of these boys gain promotion and finally extend their service to twenty-one years with the Colours and retire with pensions.

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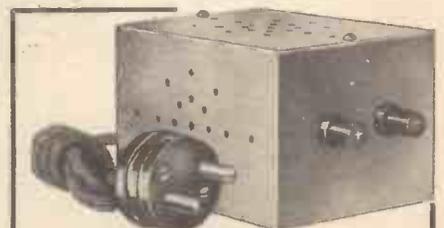
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CONNECTING A DI-POLE AERIAL

B. L. (Eccles).—How do I connect a di-pole aerial to a set with 4-pin plug-in coils?

The di-pole will have to be coupled to the set by means of an inductance. Just a few turns loosely coupled to the 4-pin coil should be O.K. The two wings of the aerial should equal about half the wavelength of the frequency to be received. You can use untuned coupling if you like (Fig. 1), or you can use a tuned coupling in which the aerial is tuned and is coupled to a closed circuit which in turn is coupled to the receiver (Fig. 2). Try which gives the best results, but as you do not discuss the type of set, nor the wavelength you want to cover, it is difficult to advise very accurately.

THE SIMPLER METHOD

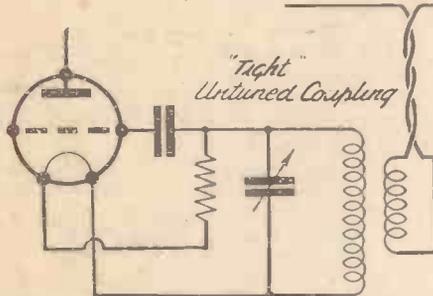


Fig. 1. A simple method of coupling a di-pole aerial to the tuned grid circuit—see reply to B. L. (Eccles).

A SHORT-WAVE SUPER

L. T. D. (Basingstoke).—I have a single-valve reaction short-wave receiver, and someone told me the other day that I could use it as a superhet adaptor with my ordinary four-valve broadcast set. I tried it as he suggested—by connecting the output of the one-valver through a condenser to the four-valve set, and it worked quite well. How is it done?

What you have done is to turn your single-valve detector into what is known as an autodyne oscillator. This is a valve which not only receives the incoming signal and rectifies it, but also provides the oscillations to beat with the signal frequency to form the intermediate frequency. This it hands on from its plate circuit to the H.F. circuits of the ordinary set, which then amplifies them and rectifies them as do the intermediate frequency amplifiers and the second detector of the normal superhet.

I have explained briefly in the past what an autodyne oscillator is. More fully, this is what happens: The incoming signal is rectified by the valve as it is in the normal single-valve short-waver. But at the same time the valve is oscillating gently, due to the fact—which you have not stated, by the way—that you are applying sufficient reaction to make the valve oscillate.

Thus in the grid circuit we get the signal frequency with its modulation and also the oscillator frequency. These two are not the same, though it might seem to you that they would be.

The valve is deliberately tuned away from the signal frequency, a fact you may not appreciate, as in handling it you merely turn the tuning until you hear something. But actually you are tuned either above or below the frequency of the incoming signal when you hear the results in the loudspeaker of your big set.

The amount you have tuned away is the same as the frequency to which the big set is tuned—which no doubt is somewhere on the long waveband. That frequency is the intermediate frequency of the superhet, and it represents the difference between the signal frequency and the oscillating frequency of the single valve.

Obviously, the oscillating frequency must be the one that determines the tuning position of the variable condenser, for you cannot get a valve to oscillate at any frequency other than the one to which it is tuned, though it can receive signals when off tune if those signals are strong enough.

In that last remark lies the main snag of the autodyne—it has to be worked in the most efficient condition or the oscillation, but that also means inevitably that it is not working at its most sensitive tuning for the reception of the incoming signals.

In fact, the autodyne is really a very insensitive arrangement, and is only useful when the signals

coming in are strong enough to spread in the tuning so that they can be detected although the detector is out of tune.

True, the system gives a great deal of amplification, but this is offset in the case of weak signals by the valve noise that is set up by the oscillating valve, which noise often drowns any trace of a weak signal.

If you want to test the scheme, tune-in a station with the detector coupled up to the big set. Then, marking the tuning dial, tune in the set again to the station when using the set as a single-valver with headphones. This will give you a rough idea of the amount the valve was "off tune" when used as a superhet oscillator.

Further, when you have tuned-in the station with the valve acting as a short-wave detector only, try putting the tuning back to the position in which it was when the valve was used as an oscillator—keeping reaction near to spill-over point so that the tuning shall be approximately right—and then listen to your station, noting the difference in strength between it now and when it was properly tuned-in with the same degree of reaction.

Rough and ready is this test, for there are tuning effects that come into the test which throw out the accuracy of the test, but it will give you a good mental picture, and an aural one as well, of how your autodyne is really doing its job.

But don't let me put you off it—it is an inexpensive way of getting loud signals on short waves when the stations are moderately powerful, and it certainly does work on such stations.

D.C. OR A.C.?

"TELEVISIONARY" (Birmingham).—I saw in the paper the other day that the new G.E.C. television adaptor, or some sort of unit, was available at 35 guineas for those who have D.C. sets. The next day it was contradicted, and it was stated that it should have been A.C. and not D.C. Why all this fuss? Doesn't television work on D.C.?

Yes and no. The whole crux of the matter is that for the operation of a television cathode-ray tube you must have a high voltage. The voltage must be in the region of thousands. Now how are you going to get 1,000 volts—let alone the 5,000 sometimes used—from D.C. mains?

Batteries? Rather costly. Vibrator unit? Also costly and not exactly efficient. It would be noisy, too. A generator? Yes, that could be used, but it would not be cheap. Rotary Converter? Yes, that could be used to convert the D.C. into A.C. But that, too, is expensive. Transformer. No, that cannot be used.

In other words, the getting of high voltage from D.C. mains is so expensive and has to be done in such a round-about manner that so far no firm has catered for the D.C. mains owner when supplying a

television receiver. That is why the correction had to be put in the paper referred to, for it must not be thought that television is available for those with D.C. and no A.C., for it is not.

For those with A.C. there are umpteen different television sets and units, and kits of parts. But the almighty snag is that voltage, which must be smooth and clean. It does not have to bring with it any great current—a matter of microamps in many cases, but it sure does have to have the pressure. And that pressure is not forthcoming from D.C. mains without setting up a miniature power station with converters and transformers and what not. That can be done if you like to pay the price. You can get an A.C. television set and run it off D.C.—if you are prepared to have the extra rotary converter needed.

FULLY TUNED

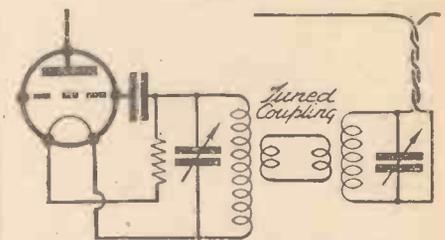


Fig. 2. An alternative arrangement of di-pole coupling. The aerial is tuned and coupled to the grid coil by way of a closed circuit.

VOLTAGE DROP

G. S. W. (Halifax).—I am not quite clear about voltage drop in sets. I understand that when a resistance is in series with a valve anode circuit there is a voltage drop across it and the valve does not get the full H.T. voltage. Is there a voltage drop across the valve too?

Yes, certainly there is. If you have, say, 100 volts of H.T. applied to the anode circuit of a valve, and there is a resistance in it which causes a drop in voltage of 30, then you have 70 volts "across" the valve, or "on its anode," and the voltage drop across the valve is 70.

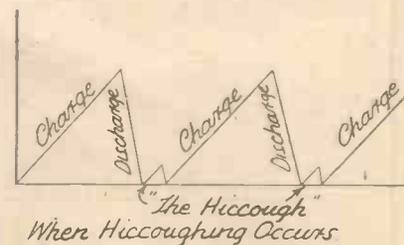
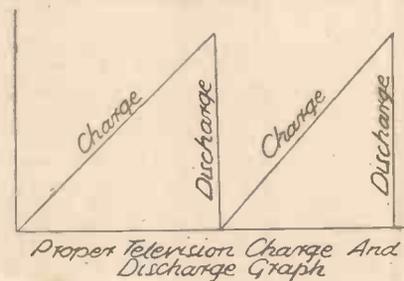
This brings the added point that the ratio of the D.C. resistance value of the valve to that of the resistance is as 70 is to 30, and if the resistance is 30,000 ohms (to choose a simple figure), the

(Continued on next page.)

TECHNICALITIES EXPLAINED—No. 65

"Hiccoughing"

This is a television term used in connection with a fault that sometimes occurs in television time bases which employ the gas-filled discharge valve for scanning. It is a fault that causes bad outline to the picture, causing it to slip, and is often caused by the use of too high a grid resistance in the discharge circuit. The result is that when the charge condenser begins to charge after the valve has discharged it (the valve) immediately "fires" again, causing the "pull" on the picture spot to "slip" and so throw the synchronism out for a fraction of a second. Thereafter the whole of that line will be out of place, for the valve will charge to its proper voltage before discharging again and the time base will be "late." A lower value of resistance will allow the valve to get rid of its full discharge right away and will obviate the "hiccough."



(Continued from previous page.)

valve must have a D.C. resistance in operation of 70,000 ohms. This should give a current of $C = \frac{E}{R}$ or $C = 100$ divided by 100,000 ohms (the total value of the resistances of valve and resistance. The answer is obviously one-thousandth of an amp, or one milliamp. Not the sort of figure you would get in practice, but I have deliberately chosen simple figures to work with.

Wherever there is current there is a voltage drop. Remember that. The higher the current the greater the drop through any given resistance.

Suppose with our 30,000 ohms resistance we increase the current through it (never mind how, now) to 2 milliamps. Then the voltage drop through the resistance will be twice as much. It will be denoted by the resistance of the component multiplied by the current in amps. So we get $30,000 \times \frac{2}{1,000}$, which equals $30 \times 2 = 60$. So we have a 60-volt drop across the resistance now. Obviously the pressure across it has been doubled, i.e. the voltage across it has doubled.

Ohm's Law is a very valuable one. Especially in the case of radio design is that application of the law valuable where one can calculate the voltage drop across a resistance such as I have dealt with. In set designing you know what current a valve should take at the proper anode voltage and grid bias, and you know what value resistance should be used in the anode circuit for decoupling, or for L.F. coupling. What you do not know is what voltage must be applied to the circuit to produce the right anode current—which means the right anode voltage.

So this is what you do: Setting the figure you know down you have: Valve current (anode current in whole circuit) is, say, 10 milliamps when the valve has 200 volts across it. The anode resistance you would like to use for technical reasons is 30,000 ohms. The decoupling resistance you would like to use is, perhaps, 25,000 ohms. What value of voltage will have to be applied to the circuit to drive the 10 milliamps through it?

Out comes the paper and pencil, and you write down $E = C \times R$, which is going to tell us what voltage drop occurs across the two resistances when 10 milliamps pass through them. The answer is $E = \frac{10}{1,000} \times (30,000 + 25,000)$. We have put the current in amps, and have added the two resistance values together.

Therefore $E = \frac{10 \times 55,000}{1,000} = 550$ volts.

So we must apply 550 volts to the circuit to get 200 volts on the anode—or, in other words, to get the 10 milliamps which flow through that valve when it has 200 on the anode.

And if we have only 400 volts available, as is sometimes the case in particular designs, we must either change the type of valve, alter the anode resistance, or alter the decoupling resistance. Often enough it is the latter that is decreased, and to make up for it the decoupling condenser is increased. But that is another story.

Now to secure this wonderful N.T.S. bargain. Stocks are limited. First come, first served. Send immediately.

THE "P.W." RECEPTION TEST
By Leslie W. Orton.

THE July 17th POPULAR WIRELESS reception test was full of surprises for me. From the moment I set foot in the car at Uxbridge to the instant I staggered from it in Wales, it seemed as if I were a marked man—surprises dogged me like an amateur detective!

It was mid-day on a typically summer's day—almost raining!—when I left Uxbridge with the cheers (and advice regarding repairing punctures!) of a few local DX "hounds" ringing in my ears.

By the time I reached Cheltenham summer had begun to show up in its true colours—it was raining cats and dogs! This resulted in the Swindon DX-ers racing to shelter and my passing them accidentally—another wretched bit of luck. And so on to Gloucester, with the monotonous broken by reception of G 6 V Q, Lytham, and G 6 T Z, Coventry, both calling "P.W. test."

"P.W." Stations Heard in Chepstow

Once again I was welcomed by DX enthusiasts. Mr. W. D. Andrews of the

World Friendship Society of Radio Amateurs and Mr. Peter Butler of the British Short Wave League and Junior DX Club met me in the shadows of Chepstow Castle. They had also heard G 6 T Z and G 6 V Q at R8 and R5 (good and moderate) strength.

Readers' Reports . . .

Reception reports of "P.W." test stations came in from far and near, despite the fact that conditions were wretched. A number of readers reported the 40-metre band as being absolutely dead until about 9 in the evening.

A disappointing report comes in from Mr. Arthur Bird, of G 6 A Q. He transmitted at every hour, but was apparently unheard! G 6 A Q, I should perhaps mention, is located in South London.

Jack Hughes of Coventry reports hearing G 2 X T, G 2 I U, G 6 T Z and G 5 G R,

all "P.W." test stations—Jack certainly earned his souvenir card.

G 6 T Z and G 6 D C, both at Coventry, provided two Bristol readers, W. J. Croft and E. L. Late, with thrills. They were picked up at good strength during the afternoon, despite the fact that the ether sounded like a bad boy, the noise was so great.

From M. D. Lipscombe of Sea'ord, Sussex, we learn that he heard G 5 B M, Cheltenham, and G 2 Z T, Coventry—both "P.W." test stations—at good strength during the afternoon.

G 5 B M, Cheltenham, also gave members of the Newcastle Radio Society a thrill—coming in at 4 and 5 p.m. at moderate strength.

Many more reports were received. Several listeners reported "ether dead," but most appeared to hear G 6 A Z at Coventry,

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EST. 1924. **NEW TIMES SALES CO.** 56 (P.W.38), Ludgate Hill London, E.C.4.

The RADIO Bulletin

Up-to-the-minute news concerning the radio industry

BATTERY-SET owners will be interested in the new Oldham "Magna" accumulator. This is a battery of improved design for which the makers claim 25 per cent. greater capacity with no increase in size. It is a particularly neat and workmanlike-looking job, the two terminals being brought out at the sides of the lid instead of projecting well above the top, as in the older types. This new top eliminates the possibility of acid lying upon the lid.

The price of the 2-volt 30-ampere-hour type is 10s., and if fitted with a capacity clock 11s. A carrying handle is provided.

P.A. FOR STOCK EXCHANGE

Trix Electrical Co., Ltd., inform us that they have recently obtained an important contract for a complete amplifying system to be installed in the London Stock Exchange. The equipment includes multiple loudspeaker points throughout the building, with double-channel amplifier and radio and microphone inputs. This company was called upon at less than an hour's notice to provide P.A. equipment in the Stock Exchange on the occasion of the abdication of King Edward VIII. It was the success of this installation that led to the contract for permanent equipment.

NEW PHILCO RELEASE

Philco announce a new de luxe horizontal table set to be known as the A638 Baby Grand. This addition brings the Philco range up to a total of twenty-nine models. This new table model is a six-valve all-wave superhet, fitted with micrometer tuning as well as Philco shadow tuning.

The speaker is an 8-inch energised moving-coil, and sockets are provided for an extension speaker and gramophone pick-up.

The short-wave range extends from 6-18 megacycles, and the set is designed for operation on 200-250 volts A.C. mains. The price is 15 guineas, and deliveries will be available at about the middle of this month.

TEXALOOM SETS

Texaloom Radio, Ltd., have sent us details of the range of radio sets which they are manufacturing, and which were shown at Radiolympia. These sets are so designed that they can be used as useful articles of furniture, in addition to the reception of the wireless programmes.

In one case the woven-fibre cabinet is arranged so that it forms a bookcase, and

there is another design combining a side-board and bookcase.

One of the sets can be used as a cocktail cabinet, and has a sideboard for bottles, cocktail shaker and glasses, and at the side a three-tiered stand for biscuits, snacks, plates, etc.

In this model a six-valve all-wave superhet circuit is incorporated, and the price is 16½ guineas. The material used in the construction of the cabinets is woven fibre.

The de luxe set of the range is the Texaloom all-wave radiogram, with automatic record-changer. The circuit employed utilises six valves, and the coverage on the short-wave band is 16 to 50 metres. A Rola moving-coil speaker is fitted, and the automatic record-changer plays 8-in., 10-in. or 12-in. records. The cabinet is constructed of high-quality woven fibre, is fitted with plate-glass tops and has provision for about 150 records and a shelf for periodicals. The loudspeaker is concealed, and a choice of two colours, either green or gold, is offered. The price of the A.C. mains models is 22 guineas, and the universal mains models is 1 guinea extra.

ENLARGED PIFCO PREMISES

Messrs. Pifco, Limited, we are informed, have removed to Pifco House, 58, City Road, London, E.C.1, occupying there the whole building, which is being fitted out with spacious showrooms to display all the firm's patented electrical appliances. The building comprises four storeys and basement, all of which will be utilised for display, warehouse and offices. Communication to each floor is by an electric passenger lift, and readers are invited to visit this new Pifco home. The London office at 150, Charing Cross Road has been closed down.

A NEW CATALOGUE

The Dubilier Condenser Company have sent us a copy of their latest broadcast catalogue, which contains a representative selection of the wide range of condensers and resistances manufactured by the firm. It includes the most popular standard designs of interest to the constructor and service engineer, together with an extensive selection of condensers suitable for replacement purposes.

Included in the catalogue is a table giving the standard colour code used for resistances, and condensers and a resistance calculator which constructors and service men will find very useful.

THE AVO RANGE

The Automatic Coil Winder and Electrical Equipment Company's catalogue is an elaborate production giving full descriptive details of the various electrical testing instruments made by this firm. Other instruments are light meters and exposure meters, and there are details of the firm's well-known coil-winding machines.

Constructors will already be familiar with the well-known Avo instruments, such as the AvoMinor and AvoMeter. There are, in addition, an Avo capacity meter, the Avo valve tester and AvoDapter. These are fully described in the catalogue, and service engineers in particular will be interested in the informative way in which the catalogue is presented.

A new instrument produced by the firm is the all-wave Avo-oscillator. This is suitable for service engineering or general laboratory work, and six separate coils cover a continuous fundamental frequency band from 100 kilocycles to 30 megacycles, range-changing being accomplished by a simple rotary switch. The dial is directly calibrated in frequencies on all ranges, an extra scale being provided and calibrated to the second harmonics of the highest frequency band, thus extending the signal range into the television band.

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

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RADIO TURNED RADIOGRAM: Electric motor, 25/- Pick-up, 9/- Pick-up Head, 4/3. 5,000 spring motor, 4/6. Dozen 36/- Pedestal radio Anexagrams, £5. Ditto table, 68/-. Gramophones from 12/- Cabinets, Horns, tonearms, soundboxes, needles, springs, gears, accessories, cabinet fittings, violins, cheapest. Established 1903. Trade supplied. Catalogue free. Regentpop, 120, Old Street, London, E.C.1.

S.T.800 Kits, exact to specification, with specified valves, £3/17/6. A.C. versions £8/0/0. Radio goods Lowest prices. Part exchange. Servwell Wireless Supplies, 64, Prestbury Road, London, E.7.

"PARKO" All-wave all-mains chassis from £2/10/. Cabinets, speakers, etc., from 20/-. Lists free. Parko Radio, 24, Terminus Road, Brighton.

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MARCONI—THE MAN AND HIS WIRELESS

(Continued from page 11.)

the scales in the fight to "make the world safe for democracy." It was in the autumn of 1918 that Marconigrams took long-to-be-remembered news across the Atlantic. It was history. Here is a message that sent a ray of hope whirling around the globe on October 6, 1918:

The note transmitted to President Wilson through agency of Swiss Government is as follows: colon quote German Government request President of United States of America to take his hand in restoration of peace comma to inform all belligerent states of this request and to invite them to send plenipotentiaries for the purpose of making negotiations stop it accepts programme presented by President United States of America in message to Congress of eight of January nineteen hundred eighteen and his later declarations comma especially address of twenty seventh of September as foundation for peace negotiations stop in order to prevent further bloodshed German government requests immediate conclusion of general armistice on land water and in the air unquote stop. Berlin (8:58 PM)

Thousands and thousands of words followed this historic message from Nauen's lofty aerial in an effort to re-establish peace; there seemed to be no end to the Morse symbols dispatched over the ocean from Germany and from France. Some were in English, some in German, some in French—and some in secret code destined for the White House.

The wireless men could read between the lines—the fighting was nearly over; on November 11, 1918, they plucked authentic armistice news from the wintry air. But that did not mean that the wireless men could go home. Countless messages had to be tossed back and forth across the sea; there seemed to be no end to the list of casualties. Then the troops began to sail back to America; every soldier had more than one message to send to anxious folks at home. Wireless had never been so busy as in 1919. Words, words, words flowed out from the Peace Conference in Paris. Marconi was there to sign the treaty for Italy with Austria and Bulgaria. He held several important conferences with President Wilson at which the Italian claims were presented, but Marconi was disappointed in the general outcome as far as Italy was concerned.

Looking back across the war days, the inventor of wireless was caught in a reminiscent mood, as he reflected:

"I am grateful Nature gave me a place in science instead of behind a counter. I often thought during the war of the romance of wireless. Messages came to me from Russia, Germany and Austria, intercepted dispatches, and they had come over the Alps, passed through hurricanes of artillery and made their way above all the beauties and miseries of the earth.

"Think of all those millions of words travelling with the speed of light above the earth, day and night carrying with them the destinies of the human race!

"The German talked, and we caught his words out of the ether; and so with the Austrian, and the Bolshevik and everybody else. One sat listening to these words and all the time the world was in flames! It suggests the mystery of existence. It lifts thought to incredible heights."

Marconi had seen the calamity of war. He knew such devastation and death were barriers to progress. As a calm, gentle individual, thoughtful of his fellow-men, he became an ardent advocate of peace.

"I am rather depressed at the condition of things,"³ he said, while visiting in London. "It seems to me very bad after such a war as this that a wave of brutality should be passing over Europe. It makes one not so much afraid—as ashamed—ashamed of civilisation, of Europe, of human nature.

"People like to make out that the Russians are not Europeans, but they are. All this wave of brutality, rising in Russia, Christian Russia, is spreading westward. Think of all the people who are now stirring up disorder.

"I can't help hoping the League of Nations will save us. I am very much in favour of the League. I've met President Wilson and discussed his idea with him, but the rest of the world will have to help him if the League is really to exist.

"If this noble and grand idea fails, the next war will be infinitely more terrible than the last one. Civilians will certainly be much more implicated. Cities could be blotted clean out from the air—I hope men will soon turn their thoughts away from war."

Wireless emerged from this war, that took a toll of 37,494,186 casualties, a thousand-fold more potent than it entered. Necessity had been the mother of invention. Concentration by research experts throughout the world had crowded ten years of scientific development into five years of destruction. The radio telephone, the vacuum tube and short waves came forth from the battle far more effective than they were when the bugles sounded. Wireless spread its tentacles, socially as well as scientifically.

The inventive energy exerted during the conflict overflowed into commercial channels and into peaceful entertainment for millions of home-loving people, who might otherwise seldom hear the best in music, noted educators and authoritative discussions by prominent men and women, covering a multitude of topics from politics to the care of babies.

Wireless changed its name to radio! The idea of using radiated energy, which was practically shaken free from the transmitting station's aerial to travel in all directions, in contrast with conduction through the earth's surface or magnetic induction, inspired scientists to recommend the change in nomenclature.

But it would always be *wireless* to Marconi.

"We still have much to learn," remarked the noted Italian, who by 1918 had talked with Australia from Great Britain. "We cannot to-day even name with certainty the medium through which the electrical waves are transmitted. It is no longer fashionable in scientific circles to speak of the 'ether.' We are forced to fall back upon the vague expression 'space.'"

The Great War had altered many a boundary, many a life and many a thing, whether it was electrical or inanimate. The diplomat, the soldier, the craftsman, the scientist—all were changed. Marconi was no exception. One who met him as a

³ March 10, 1919.

youth in a London lodging-house in the late '90's crossed his path again near the end of the war, and observed a vast difference—a transformation from youth to manhood under the strain of war:

"The pale youth now is tall and of that firm, high-headed carriage which is given by conviction of success of real importance; but his manner is as unobtrusive, almost shy, his voice is as gently modulated and his words are as modestly considered as they were when all the world was wondering whether he was maniac or genius, and when he was wondering about his various experiments."

The same foresight he applied to wireless was applied to world affairs. It was his opinion, if there was to be any freedom to be gained from war, it should be grasped immediately so mankind would no longer be under the yoke of hatred, terror and bloodshed. In the wake of the war came a business slump, and out from Italy in 1921 came a warning from Marconi under the headline, "Only a World Conference of Business Men Can Avoid Economic Ruin."

But the years would flit through a golden era. The bull with his arrogant head tossed high would be worshipped as the symbol of higher prices. Then would come the hurricane of international depression. Money pyramids would crumble, and great empires of business crash like a child's blocks. A humbled world would cry out for new leadership. Marconi in posting the storm warning in 1921 also posted one for 1929:⁵

"Restoration of the world to pre-war economic conditions may or may not ever be possible, but in my opinion a *sine qua non* of any attempt to accomplish it is that it must be entrusted to men whose business experience fits them to approach the intricate problem intelligently. Business men in Europe are not nearly so much concerned about the depreciation of their currency as one might suppose.

"What they do want, what they must have, before they can engage profitably in foreign trade, is a stabilisation of the exchange. . . . Let values be definitely determined and speedily buyers will come back into the markets of the world, and we shall have taken the first step towards a solution of all the problems which, however independently important they may seem, are actually all co-related and dependent on a solution of the major problem.

"European workmen argue that American labour profited hugely from the war; therefore, the only thing for America to do is to make the money sacrifice involved by cancelling the Allied war debt.

"Now there is room for doubt that such action by the United States would work to the advantage of Europe—capital and labour. It is by no means certain that labour in England or Europe would benefit to the extent of getting back to pre-war conditions.

"Let there be arranged a world conference of business men of proven ability in their own spheres of activity. Let each group have a mandate from its own government that will be authoritative and evidence that it has its government's full support. Out of such a conference, in my opinion, would come a practical, speedy solution of this pressing problem—surely the most urgently needed thing in the world to-day."

⁴ Edward Marshall, January 20, 1918.

⁵ *The New York American*, December 18, 1921.