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BRITAIN'S LEADING RADIO JOURNAL

Popular Wireless

AND TELEVISION TIMES

No. 862.
Vol. XXVI.
February 9th, 1935.

"P.W.'s" LISTENERS' SERVICE
★ ★
ON THE SHORT WAVES
★ ★
ANOTHER "EXPERIMENTER" ARTICLE

EVERY WEDNESDAY PRICE 3D

TELEVISION

Special Articles Inside!

POPULAR WIRELESS AND TELEVISION TIMES

MANAGING EDITOR: N. F. EDWARDS. TECHNICAL EDITOR: G. V. DOWDING ASSOC. I.E.E

GOOD FIGURES
ANOTHER "PLAN"?
U.S. ACCLAIM
LINKED BY RADIO

RADIO NOTES & NEWS

THE FARMYARD
THE "GANGERS"
RECORD BROKEN
PARADISE LOST

Heard on the "Waaliss."

IF you fancy that announcing is an easy task you should read the wise words of the B.B.C.'s Advisory Committee on Spoken English. A new booklet, added to the already formidable literature on the subject, contains recommendations to announcers regarding words of doubtful pronunciation.

It is no fancy survey of the Beauchamps or Featherstonehaughs of language, but it reviews mostly the common or garden words in everyday use—words like cinema, Celtic and combat (respectively pronounced sinnema, seltic and cumbat). Sturdy Northerners who think that Southerners may be swanking when they talk about "waaliss" will be surprised at the amount of care and thought given to the subject of pronunciation. The Committee doesn't want quarrels about dialects—their aim is to avoid cumbat.

Many Congratulations!

IN these first few weeks of another year there is an unwarrantable glut of figures about the happenings of the last twelve months—yearly totals, number of records broken and so forth. In general we are afflicted with a surfeit of statistics.

It is, therefore, not without scruple that I invite your attention to the fine, upstanding figure 6,780,570. This represents the number of wireless licences in force when Old 1934 stepped off the calendar and gave place to Young 1935. A portly and imposing figure it is—even when you word it as "over six and three-quarter millions." In hard cash, at half a bar per licence, it represents a spondulic or cash value of £3,390,285.

I intended to congratulate the G.P.O. on collecting such a magnificent sum; but on second thoughts I shall, instead, congratulate old John Listener for coughing it up! Congratulations, John—6,780,570 congratulations!

Slices of Ether.

WHAT is all this about a new method of sharing out Europe's wavelengths?

There is talk of every country getting a wide waveband to itself, on which it can equip numbers of stations—heterodyning themselves to their heart's content—or, instead, it can rely on just a few high-powered programmes.

The only stipulation is that each country must stay in its own slice of the ether, allowing its neighbours to do as they wish on their own "allotments."

The scheme is only in the rumour stage at present, but we shall probably hear a lot of it before 1935 is out.

Top Prices for Bill-Toppers.

THAT prince of good companions, Mr. J. B. Priestley, recently wrote some twinkling words in the "Star" on the subject of an ideal broadcasting system.

He wants to see more money spent on first-class artists.

"I would do it this way," he said. "All the more solemn wireless activities, from symphony concerts to lessons in Spanish, would be restricted to the present B.B.C. I feel that Sir John Reith and his associates are the proper persons to improve us.

"They are not, however, the best persons to amuse us. For this we need a broadcasting concern that blithely sells its time to rich advertisers, as the American ones do, and for which no talent is too expensive."

I wonder! Anyhow, I wish the B.B.C. would entice Mr. Priestley to the mike oftener.

The Human Touch.

AMONG the most-hated and yawn-begetting duties that fall to the lot of a radio scribe is that of reading highbrow reviews of radio developments all over the world. Dry stuff, mostly—all about trends and peak periods and the average level of listener intellect.

Burrowing in this unpromising waste of words, I came across a highly interesting statement about listening in the U.S.A. In summing up 1934 experiences it referred to overseas relays, and then cited the B.B.C.'s Christmas Day programme.

"The simple, unannounced speech of the King and the weaving together of various groups singing 'God Save the King' from all over the British Empire formed, perhaps, *the most impressive programme of the whole year*," said the report.

An astonishing tribute to find concealed in a mass of statistics!

Another Radio Reunion.

THE Germans—with that charming sentimentality of theirs which gave us "Grimm's Fairy Tales" and Santa Claus—make a point of congratulating octogenarians and other old folk on their birthdays.

So it was that old Herr Milhardt, of Oldenburg, listened and chuckled when they saluted him on his natal day over the air. He is 80, and it was a great day for him.

And then, to the old chap's astonishment, the loudspeaker went on to compliment *another* Herr Milhardt on reaching the age of 90. The address was given, so the first old chap wrote to the second and discovered that he was an elder brother—thought to be dead long before the war broke out!

They are both in grand health and boyishly excited about this new-fashioned wireless craze!

(Continued on next page.)

THE B.B.C. MAKES A CLEAN SWEEP OF IT.

Latvia's Latest.

LATVIA'S latest—or perhaps I should say earliest—is a farmyard "Good-morning" signal to tell listeners that a new radio day has begun.

One of the French stations, and Prague, have tried out a cock-crow introductory signal; but Latvia has gone one better and introduced the whole farmyard. Pigs, geese, cows and even old watch-dog Rover add to the brightening of Latvia's morning ether. Who said there were no good ideas for interval signals left to try?

Picture the Weather.

THAT is what the French are now doing—picturing the weather. Taking cinema films of it, not to show in public, but with the serious and scientific intent to forecast coming weather conditions.

The scheme was developed from the British experiments at Slough and Leuchars, during which radio atmospherics were regularly recorded, their direction ascertained and their connection with coming weather established.

The French want to extend the idea to assist aviators and others. So they propose to maintain stations for the purpose in the South of France, Tunis, Rabat and other favourably situated spots to back up the Paris observations. The North African stations are particularly proud of the fierce and outlandish atmospherics they can pick up—even their quieter periods sound like a Foreign Legion mix-up in a thunderstorm, with tom-tom accompaniment under heavy fire!

In Old Madrid.

DID you hear about the two men in Madrid who were stopped by the police, in the dead of night, when carting away a huge wireless set?

Asked to explain what they were doing with a very burglarious-looking kit of tools, they replied that these were for ganging the set! The police didn't know much about radio, but they knew a lot about up-to-date jemmies; and when the suspects reached the police station an inspector decreed that they should be placed in *cells* and *charged*. He felt *positive* the set was stolen. And so it proved!

Court News.

AT Tower Bridge Police Court the magistrate recently had before him a witness who bore upon his jacket the device "B.B.C." Obviously interested in this, the magistrate asked him if he was employed by the B.B.C.

The man replied: "Yes, sir."

And then ensued the following dialogue:

Magistrate: "What do you do?"

Man: "I'm a road sweeper."

Magistrate: "What do the B.B.C. want with road sweepers?"

Man: "The Bermondsey Borough Council employs a lot of road-sweepers!"

"POPULAR WIRELESS" TELEVISION BUREAU

A valuable New Service for Readers

"Popular Wireless" realises, in view of the prominence into which television has jumped, and the conflicting reports and rumours extant concerning it, that there are thousands who desire authoritative advice concerning television matters which they have been unable to obtain. To meet this need "Popular Wireless" is inaugurating a

QUICK-REPLY FREE-ADVICE SERVICE

Such questions as

Will my set work a televiewer?
What would television cost me?
Where can I obtain the necessary apparatus?
Why am I unable to obtain steady pictures? etc.

can only be dealt with in a very general sense in articles, and really require individual answers taking into account the particular local conditions.

ASK "POPULAR WIRELESS" ABOUT IT

should be your slogan where all television matters are concerned. No matter what You Want to Know, We are in a Position to Help You with Sound and Up-to-date Advice.

Just address your letters to "Television Bureau," "Popular Wireless," Tallis House, Tallis Street, London, E.C.4, and enclose a stamped addressed envelope.

IN NO CIRCUMSTANCES CAN PERSONAL INTERVIEWS OR TELEPHONE CALLS BE ENTERTAINED.

The Old Rooters.

THE Old Original Rooters, of Hyde, Cheshire, to whom I have referred in past notes, are still going strong. And if their annual balance sheet is anything to go by they are rooting to right good purpose.

Having given a helping hand to all sorts of deserving cases, they are now hoping to continue the good work, in 1935, from their headquarters at the Star, George Street, Hyde. Moreover, they have made me a full-blown Rooter, though I must admit that the card of membership states that:

"ARIEL
has qualified himself for admission
to the Club
by the great interest he takes in
OTHER PEOPLE'S BUSINESS!"

In sooth, a two-edged compliment. But Rooters don't care.

Warning to Bargain Hunters.

FEARING that you may forget the admonitions already given, I should like to remind you that it is *not* good practice to buy a wireless set in a sealed carton, at a ridiculously low price, from a plausible stranger.

You may find, on taking the wrappings off the prize, that instead of being "all mains" it is all bricks or some old petrol tins with sand inside! Heed the gipsy's warning.

Announcer's Dilemma.

TO keep cool, calm and collected when the slings and arrows of outrageous fortune are flying is the job of the announcer the world over. A German announcer once had the misfortune to drop a gramophone record just as his eager audience were waiting to hear it, but he rose to supreme heights of quick wittedness.

With his heart in his boots he looked at the wreckage on the floor of the studio, and went on suavely announcing. "This beautiful work," he said, "is in two parts. They now lie before me on the studio floor, so I must perforce put on *another* record, and you will now hear . . .," etc.

Although he broke one record, he surely set up another—for quick thinking!

Trouble in Paradise Street.

WE all know that some people are unreasonable about very loud loud-speakers working at all hours of the day and night. But who would suppose that such a state of affairs, culminating in open threats, would be tolerated in *Paradise* Street?

Yet so it is. I cannot divulge the town for obvious reasons, but one of these Paradisal sufferers asks me: "What would you do if the chap threatened to 'knock your block off' unless the aerial came down?"

All very difficult — especially if "the chap" looks pugilistically proficient. One doesn't want to retreat with undue timidity, but there is sometimes a lot to be said for an attitude of "*Home, James, and don't spare the horses!*"

ARIEL.

EXPERIMENTER

"DOWN UNDER" WITH THE KELSEY ADAPTOR

MY weakness is gadgets, if you want to know. That is why I "toned" the original Kelsey short-wave adaptor last week. I wanted to see how it would convert a perfectly straight screened-grid pentode three into a short-wave superhet.

This, then, is a record of how it worked the oracle. Armed with the adaptor and a copy of "P.W.," I trotted down to the cottage, cleared the bench and hooked it up.

"More Haste . . ."

There was a stray wire. I must tell you this because it gave me a painful moment before I actually got the thing going. In fact, I was beginning to get all cynical about short-wave units in general and the Kelsey adaptor in particular.

Having confessed that heretical thought, I feel better. It was one of the twisted flexes that had come adrift from the filament terminal of the valve holder.

Not very surprising, at that. I don't know at what speed G. T. K. drove to work with the adaptor. But I do know that I went home pretty quickly. That only one wire came adrift speaks volumes for the thorough workmanship of whoever actually made up the unit I tried out.

If you look for a moment at the top diagram on page 640 of the Jan. 19th issue you will see that one of the valve-holder terminals is blank. I put the stray wire on that by mistake. And heard precisely nothing.

It all seemed hopeless. The set was alive, but the unit dead as mutton. Then I went over every wire, comparing with the diagram. The last thing I looked at was the filament connection—and with a whoop I transferred the straying wire to its right place.

There's a moral somewhere. Don't ask me what. Just go on reading, for we are coming to the milk in the coconut.

A Voyage of Exploration.

As it was evening I put in the two larger coils, which I gathered from the "dope" in "P.W." were the ones for the 30- to 50-metre band. Sure enough, there were all the familiar Morse signals of the entire world. I was on short waves again!

As my maximum supply was only 120 volts I plugged H.T.+2 and H.T.+3 into the 120-volt socket, placing H.T.+1 in the 70-volt socket just for luck. The flexes I took to the two-volt accumulator. The remaining flex to the aerial terminal of the set.

The aerial lead was connected to the nice large terminal near the top of the unit. I didn't worry about an earth.

Oh, yes, I switched the set over to long waves, pushing the knob up to just above Huizen—or is it Hilversum? Anyway, to the top of the long-wave band. Also I moved up reaction on the set just short of the oscillation point.

Everything seemed "oke," so I twiddled. It was lively enough, I can assure you. Leaving the small tuning control at the top severely alone, I got busy with the slow-motion knob of the lower condenser.

What a motion! Quite the best short-wave control I've handled. Silkily smooth—and oh, so slow!

Another good point I appreciated is the 180-degree dial, with its hair-line cursor moving over the only possible divisioning for short-wave work — degrees. Your wavelength and station calibrations don't mean a thing on the shorts.

CAN BE USED WITH ANY SET

How the completed Kelsey adaptor looks from the front. The lower condenser knob tunes the oscillator circuit and the upper knob the aerial circuit.

It was a voyage of exploration. In which I learned many things. Not only about short-wave conditions on that particular evening, but about the adaptor's funny little ways.

Let's get the funny little ways over and done with first. That top condenser, for example. As the designer rightly says, it is more of a vernier than a real tuning control.

You can wander 50 or so degrees on the main tuning scale without worrying to re-set the top condenser dial. I don't say it doesn't make any difference. It wouldn't be there if that were true. But its adjustment, I found, could be safely left as an afterthought. No fear of losing a signal because it was not exactly adjusted.

Personally I like a lot of noise when I'm tuning in. Perhaps that is why I instinctively pushed the set's reaction over the top, so that I actually put a little intermediate-frequency oscillation into action.

It is well worth while. The whole combination of set and unit literally leapt to life. Besides, all those clicks and plops resolve themselves into pleasing chirps of Morse.

It Makes Tuning Easier.

Then again it is easier to locate telephony with the set's reaction going strong. You can quickly come off the oscillation point when anything is actually located. I don't know that this is orthodox—but why worry about that, anyway?

Another little stunt I found useful. Using the set's tuning, which is normally fixed at the top of the long-wave band, as a sort of vernier. For some of the tricky signals a slight flick on this control worked wonders. Added to which, of course, there was not the slightest trace of any hand-capacity effect.

Again not quite "the thing," perhaps, but who cares? The great idea is to make the most of this wireless, not to pander to text-book axioms.

Before I forget, I really must say how quiet the combination was in action. Practically no background at all. Even passing cars did not unduly disturb me. Yet signals were romping in—it wasn't a question of the whole outfit being dead.

I did not get America. It was a dud night. The designer warned you there were such things. I might not have believed him had I not experienced dud nights myself.

European S.W. Giants.

Then, too, I had by me an 11-valve short-wave superhet of enormous range. Even that could not resolve a "sausage" from America. Verily a dud night!

It is curious how, when the Yanks are so dead, the Europeans simply roar in. I mean the short-wave Europeans, which now form an imposing galaxy of genuine alternative programmes—an aspect of the short waves all too often underrated.

With my large coils in circuit I got what I imagine must be H A T, Budapest, on 165 degrees. This gave me the 55-metre point, and I groped down slowly to find another key station.

It came at 151 degrees, when I ran right into a tremendous signal from Zeesen on 49·83 metres. Just a fraction below, on 149 degrees, was Daventry G S A—the 49·59-metre stalwart.

(*Continued on page* 764.)

THE B.B.C. AND TELEVISION

LATEST NEWS FROM THE "BIG HOUSE"

THE B.B.C. is setting up a special new department to cope with television. It seems likely that the head of the department will be Mr. Gerald Cock, the Outside Broadcast Director, whose work there will devolve on his second-in-command, Mr. Schuster. If Mr. Cock accepts the new appointment he will have to create a considerable staff, incidentally absorbing the Television Section now in existence under Captain Eustace Robb, late of the Coldstream Guards.

* * *

The New Censorship.

The new censorship is much discussed both inside and outside the B.B.C. There is, in fact, nothing new about it. The standards which are being applied now were laid down by Sir John Reith in the earliest days of broadcasting, but they had become a dead letter.

Programme builders seemed to forget that their stage was the firesides of millions of homes up and down the country; their thoughts were of the music-hall, and the burlesque theatre. Now the standards have been redefined and are being enforced. There may be good reasons for changing or modifying the standards, but as long as they exist it is only right that they should be applied.

* * *

Queen Not to Broadcast.

I am able to say authoritatively that the Queen will not broadcast in connection with any programme being prepared to celebrate the Jubilee of the King. His Majesty is expected to appear at the microphone in some appropriate setting, the particulars of which have not yet been decided.

Professor Harold Temperley, who helped the B.B.C. in the production of the 1914 programme, has accepted the invitation to collaborate in the preparation of the main B.B.C. programme in Accession Week. This will be given on Monday, May 6th.

* * *

Search for New Talent.

Eric Maschwitz, the B.B.C. Director of Variety, is sending out special scouts to look for new material. He feels that the light programmes are getting into a rut, and that the best way to extricate them is to find new talent. The scouts will cover the whole country.

* * *

Mr. Eckersley's Mission.

For years Mr. Roger Eckersley, the Director of Entertainment of the B.B.C., has been a consistent opponent of Regionalism. His view has always been that it was better to spend money in London than at Regional centres. But he has now accepted the situation that there is no chance of centralisation being established permanently. What chance there was for centralisation disappeared with the appointment of Mr. Gladstone Murray as Acting Controller of Programmes. He has always been a determined advocate of Regionalism, and his view has prevailed.

So now Mr. Eckersley is busying himself with plans for strengthening the Regional programmes. During this year he will visit all parts of the country and will work out plans for extensions that will require between £50,000 and £60,000 of new expenditure. This is a good move and will be welcomed everywhere.

* * *

Everybody has heard of Paul Whiteman, the famous American Dance Band conductor and "King of Jazz." Here he is (centre), with two other members of this musical family. Paul Whiteman, junior, who had his own Band at Manhattan Beach last summer, is on the left, while Wilberforce J. Whiteman, who is head of an American school of music, is on the right.

"The Chocolate Soldier."

In order to simplify the action of the plot, only seven of the original principal characters will be heard in the broadcast version of "The Chocolate Soldier," the famous comic opera by Oscar Straus, which is to be heard by National and Regional listeners on Tuesday and Wednesday, February 19th and 20th respectively.

* * *

Shakespeare Gains Ground.

Correspondence shows there to be a large following for the monthly Shakespearean plays. The next to be given on Sunday, February 10th, will be "Troilus and Cressida," produced by Val Gielgud.

* * *

Dr. Boult in Birmingham.

Wednesday, February 27th, will be an important date for music lovers in Birmingham, when the full B.B.C. Orchestra of a hundred and nineteen players will make the third of its four visits to provincial cities to give a concert, under the direction of Dr. Adrian Boult, in the Town Hall of that city. Dr. Boult will be fresh from his triumphant American tour.

The programme has been specially chosen to allow full advantage being taken of a larger body of players than can usually be heard out of London. Brahms, Schönberg, Busoni, Delius and Ravel are the composers represented in the programme.

* * *

Sixteenth Century Madrigals.

A group of sixteenth century madrigals by Gesualdo, Prince of Verona, which have never been broadcast in this country will be included in a broadcast to be given by the Newcastle Bach Choir from the Newcastle studios on Tuesday, February 19th.

This choir was formed in the early part of the war, but in recent years it has extended the scope of its activities to include works by British and other Continental composers. Actually its programme on February 19th will include nothing by Bach.

* * *

"Concert in Camera."

A sequel to the programme broadcast from the West at the beginning of last September, and described as an evening of select music in the drawing-room of Mr. and Mrs. Carruthers at Clifton in the year 1880, will be heard on Thursday, February 21st, under the title of "Concert in Camera."

Since then Maud has married the business man, Mr. Albert Bassom, and has been asked by the Vicar to arrange a concert in the parish hall. Her friend, Miss Wiffin, has consented to help her out, and listeners will hear a rehearsal of what it is proposed to present, with a relay from her drawing-room.

The programme is being prepared and will be produced by David Kean, who was responsible for "A Modish Musicale" in September. * * *

A Welsh Feature.

The Rev. W. H. Harris, a member of the staff at St. David's College, Lampeter, and a life member of the Gorsedd (bardic name of Arthau) which is closely associated with the National Eisteddfod of Wales, is giving the third talk in the series "Religion and Belief" for Welsh listeners on Tuesday, February 19th.

Mr. Harris says that a creed is the intellectual experience of religious experience and that the higher the religion the more developed will be its creed. Thus the historic creed of Christendom represents an official summary of the essential elements of the Christian faith.

(*Continued on page* 762.)

From Next Week's Programmes:

MIDLAND REGION: Monday, February 11th: A popular concert by the Rushden Temperance Band, conducted by Thomas Young. Raymond Green will entertain at the piano.

WEST REGION: Tuesday, February 12th: A relay of the pantomime "Dick Whittington and his Cat" from the Prince's Theatre, Bristol. This is the second relay of this pantomime, and on this occasion listeners will hear a comparison of styles: first of all, Dick Whittington and his Cat as performed thirty-three years ago, and after that the same pantomime as presented to-day.

NORTH REGION: Thursday, February 14th: "The Northern Music-Hall Parade," the most ambitious variety broadcast ever projected. Variety items are to be relayed from five different theatres.

NORTHERN IRELAND: Monday, February 11th: George Gordan's high-speed revue, "Trailers." The technique of this revue is founded on the arrangements of the short films which advertise next week's attractions in cinemas. The revue will also be heard by Regional listeners on February 14th.

TWO YEARS of EMPIRE BROADCASTING

Alan Hunter talks with J. Beresford Clark, the Empire Programme Chief of the B.B.C., about the famous short-wave broadcasting station at Daventry.

ON December 19th, 1932, the long-projected Empire Service got under way from two 20-kilowatt short-wave transmitters at Daventry. It hardly seems two years since I stood on that bleak hill of Northamptonshire, a plateau spread-eagled with directional and omni-directional aerials for the five "zones" of Empire.

Much more comfortable, I thought, to sit with Mr. J. Beresford Clark, the Director of Empire Programmes, in his cosy room at Broadcasting House, London.

Growth of Correspondence.

"The year 1933 was, of course, very largely experimental," he began, "but 1934 has been much more significant. From letters and reports received from distant listeners, as well as from visitors to this country from overseas, we now feel that the programme service is making headway."

"You go very largely by the letters received?" I asked. "Yes, that is one of our most valuable means of finding out what is wanted," admitted Mr. Clark.

"We receive a great number of letters, you know. Up to the end of 1933 we had 11,250 letters from overseas. In 1934 the total was 13,500 letters—a growth, as I have worked out, of from 36 to 37 letters a day."

"And has any definite policy emerged from all these letters?" I wanted to know, for it is obvious that the B.B.C. pays great attention to these Empire letters—more so, perhaps, than to letters from nearer parts.

"Well, during the experimental period we tried everything—music, talks and feature programmes. Big Ben is still the star turn—and the Bow Bells interval signal is also very popular.

Short Items Preferred.

"The main lessons we have learned are that items of short duration are the most acceptable overseas. Talks, for instance, of 15 to 20 minutes. Plays of not more than half an hour's length, with as few characters as possible.

"On the whole, too, it is true to say that light entertainment is what is wanted—especially in the tropical parts of the Empire. But there is also a strong demand from other parts for more serious music.

"Canada, which has so much local jazz and light music to choose from, wants more chamber music as a contrast. There is an intense liking for tuneful stuff as distinct from jazz—Canada and the West Indies especially."

One of the difficulties of this Empire Service is the time lag between letters and the items they refer to. For instance, Mr. Clark tells me that the subject at the moment is the Royal Wedding, which to most of us seems a long way off. But, then, so are the Empire listeners who heard it.

"The Wedding was probably the most widely distributed programme we have yet done," said Mr. Clark. "Practically every country in the Empire rebroadcast the ceremony, including Canada, South Africa, Australia, New Zealand, Ceylon, Kenya, Shanghai and Hong Kong. All these apart from the U.S.A. and South America."

Some idea of the efficiency to which the Daventry stations have been brought is shown by the fact that only South Africa took the beam—all the rest were able to make use of the Empire transmissions."

The famous Columbia and National Broadcasting Systems both regularly make use of the Daventry short-wave transmissions—another proof of their high level of programme value.

Everywhere there seems to be a growing use of the material sent out from Daventry. Colombo, Ceylon, is a good example, rebroadcasting practically every day some item or another.

In Australia, farthest and most difficult point of contact, a good deal of rebroadcasting is also done. There they have the advantage of Post Office control. Signals are picked up at Melbourne and sent over land lines to stations interested.

At Ottawa, Canada, a special rebroadcasting station has been opened quite recently. Other Government-inspired links with the Daventry transmissions are to be found at Sierra Leone, Accra and Nigeria.

A Special Government Exchange.

At Sierra Leone, I gather, a Government wireless exchange was put into operation with the hope that 500 subscribers would be forthcoming. Within six months there are already over 700.

This quickening of overseas interest is having its effect on the morale at home. Already the staff has been increased to cope with Empire demands. A Music Director has recently been appointed.

Eric Fogg, who took up this job in October, now has the satisfaction of putting over the Empire Orchestra, which made its début the first week in December.

"How are you coping with the time factor?" I next asked, for that has always seemed to me to be something of a problem.

"Largely with electrical recordings," was the reply, "although we aim to introduce more and more flesh-and-blood artists.

"For sporting events—there is an insatiable thirst for these by the way—recordings are, of course, invaluable. Especially when you realise that Western Canada is 8 hours behind G.M.T., and New Zealand, when observing summer-time, is 12 hours ahead.

Bilateral Programmes Proposed.

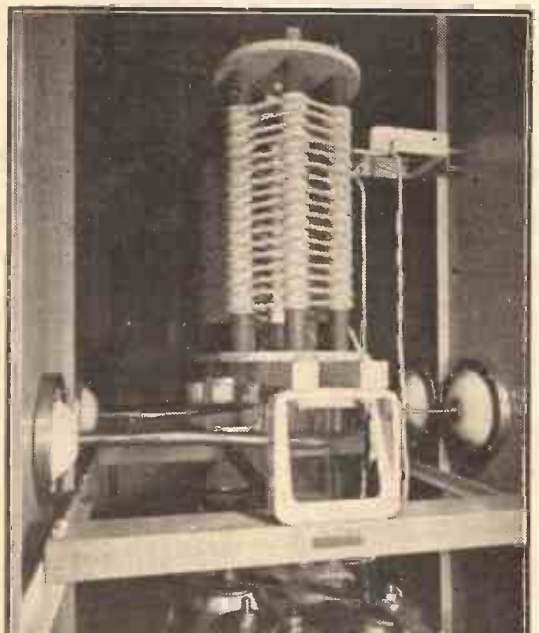
"In an attempt to meet this wide difference in time from one part of the Empire to another we now broadcast 16 hours out of the 24."

Finally, Mr. Clark emphasised a point about this Empire broadcasting all too often overlooked.

"We are most anxious," he said, "to make our service what I might call bilateral. That is to say, we want to develop our overseas contacts. Programmes like Empire Exchange are on the lines I am thinking of.

"We want to make Daventry a sort of clearing house—a programme exchange, as it were—for the various parts of the Empire."

LINKING THE AERIAL



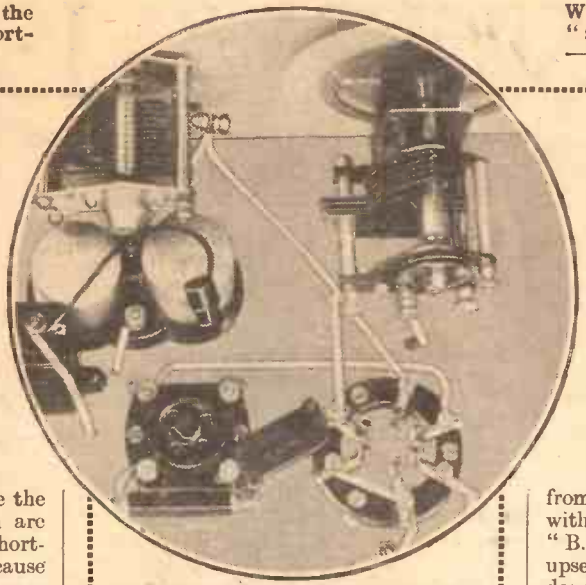
With the long-waver at Daventry relieved of its duties by the new Droitwich Station, the giant masts are ready for use by the short-wave transmitters. Here is part of the Droitwich giant—the "transducer" coils that link the aerial feed lines and transmitter together. The "transducer" reduces attenuation of the higher audio-frequency side-bands.

MORE ABOUT THE "B.C.L." TWO

BY W. L. S.

Some further details about the operation of the famous short-waver.

Why short-wave tuning is "sharp"—Capacity coupling—Listening to weak stations.



The detector portion of the "B.C.L." Two. The method of wiring the grid condenser and leak should be followed closely.

AT the risk of being told that I'm never going to stop writing about this set I want to say a few more words about the handling and general treatment of my latest baby, the "B.C.L." Two. As this set represents a definite attempt to interest thousands of folk who, hitherto, have never turned their hands to short-wave reception I must explain a few points that may seem elementary to the experienced short-wave man, but may be very puzzling to the novice.

I often hear people say: "Short-wave tuning is so sharp!" or "Short-wave sets are so selective!" I hope the latter statement is correct, but both are the result of misapprehensions. Short-wave tuning isn't "sharp" just because you're dealing with some new and strange kind of radio wave. It appears to be sharp simply because you are covering a much wider band of frequencies with one swing of the tuning condenser than you have been accustomed to.

Dividing Up Into 1,000 kc. Bands.

If you divided the whole of the short-wave spectrum up into bands the same width as the medium-wave broadcast band (roughly 1,000 kc.) by using a large number of different coils and a very small condenser, tuning wouldn't be any sharper than it is on a broadcast receiver.

If you look at a few representative "chunks," each 1,000 kc. wide, taken out of the entire expanse of short waves, you will see how impossible a business that would be. For instance, you'd have one coil to cover 23·08 to 25 metres (13,000 to 12,000 kc.); another for 30 to 33·3 metres (10,000 to 9,000 kc.); another for 50 to 60 metres—and these are only "occasional ones" picked out at random.

You would require 27 coils to go from 100 metres to 10 metres in 1,000 kc. slices, and would be spending more time plugging coils in and out than listening.

A Compromise Necessary.

Obviously, we simply *must* arrive at a compromise, and we do this by neglecting most of the waves above 50 metres and everything below about 13. The remainder we can cover with three coils if we don't mind bandwidths of about 5,000 kc. and tuning about five times as critical as on the broadcast band. That, and that only, is the reason why short-wave tuning first strikes you as akin to handling a very selective set.

The diagram on this page shows the connections for yet another make of short-wave coil—the B.T.S. four-pin variety. It is *important* to note that the B.T.S. and Eddystone four-pin coils cannot be interchanged in the same set without damaging something! Although they both fit the standard four-pin valve-base, the winding connections are different.

Last week I showed the connections for the four-pin Eddystone; this week the B.T.S. Watch this point very carefully—it's better to be sure than sorry, even if valves *are* fairly cheap these days.

Now I must raise a point about these capacity-coupled aerial schemes. It is one that even the old hand will do well to watch. If your aerial is capacity-coupled to the set (as in the diagram), and if the set is very prone to hand-capacity effects, then it's ten to one that you are using an unsuitable length of aerial.

I am always saying that I *prefer* inductive coupling, as a general rule; but I know many people don't, and I've got to cater for them just the same. Keep your capacity coupling as loose as possible, and don't forget, if you get hand-capacity troubles, do at least try the simple expedient of adding ten feet to, or chopping ten feet off, the aerial.

It is regular commercial practice to use an untuned screened-grid stage before the detector for short-wave work, not with any thought of improving selectivity or sensitivity, but simply to act as a "buffer stage" between the aerial and the set. A carefully designed detector can be made to work perfectly without this precaution, but a bad one can't. Now, from the point of view of design (I say it without blushing!) the detector of the "B.C.L." Two is O.K. But it *may* be upset when some ham-handed person screws down the aerial-coupling condenser, says "Aha, that's made him *louder!*" and leaves it screwed down. Don't do it!

Receiving Weak Stations.

The next point to bring up is this: that listening to really weak stations is an art, but one that it pays to cultivate. You will never hear anything frightfully interesting if you just prick your ears up when you hear a strong station and settle down on it. On the other hand, if you try to get something out of the most impossibly weak carrier-wave, you may have found a station that no mortal man has ever heard before.

This "B.C.L." Two has a most beautifully silent background (at least, mine has, and I hope yours is as good), and one really can listen to weak stuff. Another thing to notice is that with the narrow short-wave broadcast bands a really interesting station, on the weak side, may be almost hidden "beneath the shadow" of a stronger one that everyone knows.

When you de-tune from your W 8 X K or your W 2 X A D, don't go slithering off down the scale like falling downstairs, but look over each degree and each half-degree on either side. There's probably some new station in Mbonga-Mbonga-land, or somewhere, within a few kilocycles of him.

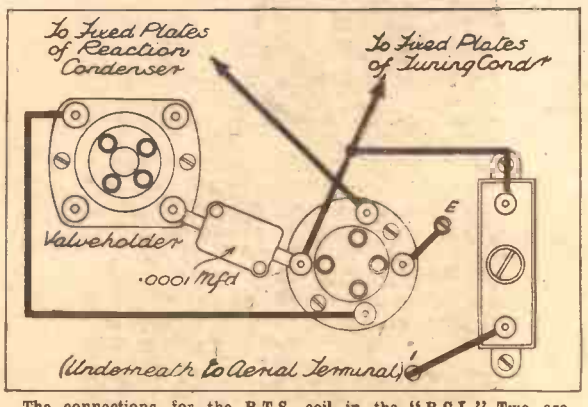
Patience Will Be Rewarded.

Don't forget, either, that a weak station may be only temporarily weak. He may have faded down nearly to inaudibility when you happen to catch him, and your patience in waiting on him may be rewarded. (This cuts both ways, unfortunately, and the strong station you tune in may disappear just as you are waiting for an announcement!)

It is important that you should play about with the H.T. voltages until you find the screen voltage that gives you the

(*Continued on page* 761.)

WIRING FOR THE B.T.S. COIL



The connections for the B.T.S. coil in the "B.C.L." Two are shown above. It should be noted that the B.T.S. and Eddystone coils are not interchangeable in this set.

ON THE SHORT WAVES

Conducted by W.L.S.

AMONG THE AMATEURS

Some notes about the amateur transmitter who so often provides much interesting reception material for the short-wave listener.

READERS of these notes seem to be showing a lot of interest in amateur transmissions these days, and I have been asked repeatedly to say a little more about the "hams"—who they are, what they do and how they do it.

Every owner of a short-wave set must have heard amateur telephony at some time or other, and some of the jargon used is admittedly rather puzzling until one is "in the know."

The amateur transmitter is simply a short-wave enthusiast who has advanced sufficiently far along technical lines to convince the licensing body of his country (in our case the G.P.O.) that he is qualified to handle low-power transmitting apparatus. In this country he has to advance very good reasons for his desire to transmit; he has to pass a Morse test (sending and receiving); and he has to give proof of his technical qualifications.

Frequency Stabilisation Essential.

All this having been done, he is allowed to use a power of 10 watts and to transmit within certain narrow frequency bands allotted expressly to amateurs. He has to use some form of frequency stabilisation for his transmitting apparatus, to ensure that he does not stray out of those bands. He also has to take all due precautions to avoid causing interference with any other services, including broadcasting.

In short, he has to be quite a reliable, technically sound short-wave expert before he can hope to obtain a transmitting licence. All of which is just as well; if it were not so our all-too-narrow frequency bands would be crowded out with bad signals transmitted by people who had no particularly good reason for putting out a signal at all.

So much by way of preamble. In various countries the regulations governing amateur transmissions are widely different. In this country the amateur is forbidden the use of the general call "C Q"; he is not allowed to deal with private messages of any kind—in other words, all that he is supposed to discuss "over the air" with other stations is the experimental work in hand.

The Wavebands Allotted.

Telephony is allowed unreservedly on all the frequency bands allotted. These bands, incidentally, comprise roughly the following wavelengths: 150–170 metres; 80–85 metres; 40–42 metres; 20–21 metres; 10–10·7 metres and 5–5·35 metres.

Each of these wavebands exhibits characteristics of a different kind from all the others, so that a really enthusiastic "ham" can carry out six completely different types of work by using all the bands. By the way, permission to use *all* bands is not granted automatically—one must advance good reasons for wanting to transmit on 80, 10 and 5 metres; the others are generally granted right away.

Let us deal with each band in turn and look at its particular properties. The 150–170-metre band is used mostly for working within the British Isles. Stations are not usually licensed for more than 10 watts on that band, but a good 10-watt transmitter will cover the British Isles on telephony (at night, at any rate).

Telephony is generally used, and London listeners can hear plenty of activity, especially on Sunday mornings before broadcasting starts up.

"HYPNOTISM" BY RADIO

Leslie W. Orton alighting from an aeroplane after taking part in the "Hypnotism"-by-radio experiments recently mentioned in these columns.

The 80-metre band has better "D X" properties, and yet is still excellent for short-distance work. One might expect to hear most of Europe on this band after dark; in the early mornings the Americans come in quite well; and yet it is an extremely good band for working within this country on telephony.

A station 200 miles distant would almost certainly be stronger on 80 metres for a given input than on 160, although contact might not be quite so reliable.

Back in the days when we used to think of 80 metres as a really short wavelength practically all parts of the world were worked on that band. In 1924 the first contact with New Zealand was made; and Australia, Asia, South America and all the other "D X" spots were successfully contacted.

Nowadays the real long-distance work is mostly confined to the other bands, although at least one transmitter in this country has worked with New Zealand on 80 metres during the past year.

A Much-Used Wavelength.

"40" is a real "D X" wavelength. Practically anything in the world may be heard here if one chooses the right time. The early morning is best for New Zealand and most of the U.S.A.; the afternoon shows up the Asiatic stations; and the evening brings in South Africa and Australia. It is a most exciting band, used very extensively by British amateurs.

The one great disadvantage of "40" is the enormous number of European stations that make use of it. Unfortunately, a large percentage of them are using apparatus of the most primitive kind, turning out so-called telephony that spreads literally over hundreds of kilocycles.

The 20-metre band holds even better "D X" possibilities, but is more of a daylight wave. Its chief advantage is that the skip distance is much greater than that of 40 metres, and accordingly one does not hear all the European stations—not at any strength, at all events.

On that band the best times for Australia and New Zealand are in the morning from 7 till 9 a.m., and again from about 11.30 a.m. till 1 p.m.

Television Transmissions.

Ten metres is the "Cinderella" of the amateur bands. In 1929 it was possible to make contact with the U.S.A. on 10 metres; but as the eleven-year cycle progressed it became less and less reliable, until in the last two years it has only been used for local work.

The one point that I have omitted to mention is that amateur television is allowed on a special band just below 10 metres, the existing band being used for "sound" and the lower one for "vision."

ON THE SHORT WAVES—*Page 2.*

H. J. B. (Manchester), who has not been quite such a constant writer these days, explains that he has less time for short-wave work owing to a job with long hours. But he has found that even vaudeville palls on one, and has gone back to his old love again, even after a hard day's work!

He finds—just as I do—that the 16- and 19-metre bands are excellent; 25 and 31 metres poor; and 49 metres pretty good. The only bright spot about 31 metres just lately is the fact that the Australians—VK3LR on weekdays and VK2ME on Sundays—come over excellently.

The Most Popular Coils.

More about coils! Several more readers have sent in their "votes"—still all in favour of the valve base (four-pin) type. Quite a few of them have asked me to give wiring details, so they are reproduced here-

METHOD OF WINDING

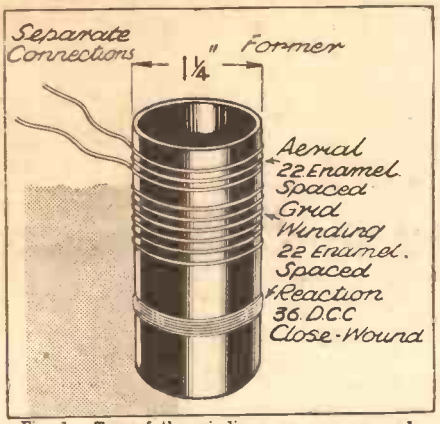


Fig. 1. Two of the windings are space-wound, while the third, the reaction, is close-wound.

WHAT READERS ARE SAYING

with. Fig. 1 shows the disposition of the windings.

The reaction winding is at the bottom, and is wound compactly with thin wire. It is connected to the plate pin and one of the filament pins of the coil holder. The grid winding comes next, and is space-wound with thicker wire. This is connected to the grid pin and the remaining filament pin. The two low-potential ends (i.e. those connected to the two filament pins) should be adjacent—in the middle.

If you want a separate aerial winding and find four-pin formers convenient I suggest that you take off separate connections, as shown in Fig. 1. Generally speaking, however, I find that there is a distinct preference for using a capacity-coupled aerial. The system is perfectly satisfactory so long as you don't insist on making the coupling too tight, as so many people do.

Wiring of the Base.

Fig. 2 shows my suggested connections to the pins, looking up at the *coil former from underneath*. These, as a matter of fact, happen to coincide with the connections to Eddystone four-pin coils.

Just remember this: Place the coil former (looking at the bottom) so that the grid pin is "north." Then the grid winding goes across "north" and "east" and the reaction across "south" and "west." The connections to the valve holder into which the coil plugs will, of course, be reversed in one plane.

Looking down on your valve holder, with the grid pin pointing north, grid winding is north and west, reaction being south and east. All clear? I hope so.

Just listen to G. W. G. (Ipswich): "I'll bet you, W. L. S., that within a few years we shall all be using dual or triple-range coils for short waves. Then you will say 'Way back in '34 we all used low-loss coils, but these new coils seem just as good.' But in those days the whole family will hear Australia and think nothing of it."

The Question of Wavechange Switching.

G. W. G. adds that we all said, once upon a time, that wavechange switching would ruin the efficiency of a broadcast coil, but nobody uses plug-in coils for broadcast nowadays. All the same, the problem really is much more acute on short waves. Yes, G. W. G., JHB is a "Jap" right enough.

W. L. (Thames Ditton) is also worth quoting: "When I first hooked up my new aerial (66 ft.) I found it impossible to make the set oscillate at the top of each coil; so I rooted the coils out and replaced them about two inches from the tuning condenser, and the set is now very snappy.

CONNECTIONS TO THE PINS

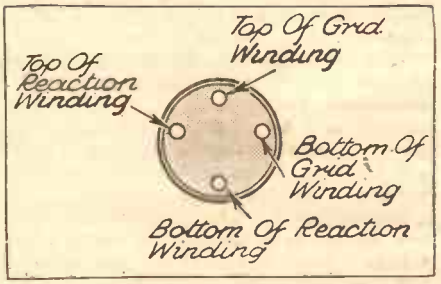


Fig. 2. This diagram indicates the suggested connections looking at the coil base from underneath.

What have I been preaching all these years? I've confirmed it time after time. Half the short-wave troubles are due to long leads in bad places.

THE season of tests is under way, and the biggest amateur radio event of the year has already commenced. I refer, of course, to the 1935 B.E.R.U. Contest, in which most of the active stations in the British Empire Radio Union are taking part.

Two separate contests, Senior and Junior, are being run. The Senior event, which started last week-end, extended from 5 p.m. on Saturday, Feb. 2nd, to the same time on Sunday, Feb. 3rd, and continues for the same twenty-four hours on Saturday, Feb. 16th, and Sunday, Feb. 17th. Powers up to 250 watts are allowed for this section of the contest.

The Junior contest runs during the other two week-ends—Feb. 9th–10th and Feb. 23rd–24th, with powers of not more than 25 watts being allowed.

The Scoring System.

All readers who can copy Morse will find a phenomenal amount of "DX" on the air during the period of the contests, as there seem to be hundreds of amateur stations within the Empire who just wake up for the B.E.R.U. Contests and then go to sleep for the rest of the year!

An interesting point is the scoring system adopted this year. One point is allowed for every contact with an Empire station not actually within the competitor's own zone. Thus, for a station operating from Great Britain, the same credit is allowed whether a contact be with Malta, Egypt or New Zealand. In previous years points have been granted with the distance of the other station as a basis—10 for Australia, 6 for South Africa, 4 for India and so on.

That system has not been quite fair, owing to the fact that contacts with Australia are considerably less difficult to obtain than contacts with, say, India or Hong Kong, both of which would have scored fewer "marks."

This year the total number of points will be multiplied by the number of different "zones" contacted.

In March the A.R.R.L.'s world-wide tests will be run. Although these are organised by the American Radio Relay League, stations all over the world take part in them, and the U.S.A. and Canada are regarded as one unit with which the rest of the world has to get into touch.

So much for tests. Now for some past events. According to reports from readers, December, 1934, was one of the most consistent months for DX reception that we have yet had. Twelve readers claim to have received all continents during December—referring, of course, to short-wave broadcasts only, since one can receive amateur signals from all continents practically any day.

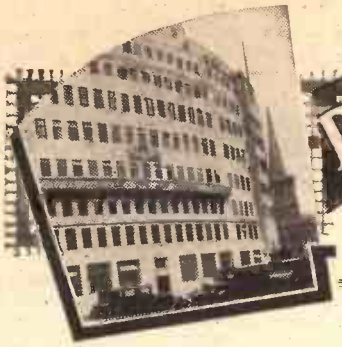
January opened well, and remained good. We had one or two days that were reminiscent of the good old times of 1927–8. It really looks as though that sun-spot cycle is turning round at last.

I predict that February will be excellent, March slightly poorer and April and May very good again. Correct me if I'm wrong.

More South Americans.

Still more South American stations are announced. One of the latest is Venezuelan YV6RV, Valencia, on 49·7 metres. The Maracaibo station YV5RMO has moved from 49·34 metres to something just about 50, according to my calibration. All to the good, as I still want to hear the Bolivian station CP5 on 49·34 metres!

American police stations on various wavelengths between 60 and 100 metres are being logged over here every day. I actually logged one of their 172-metre stations a few nights ago! His 'phone was coming over quite well at about 11·30 p.m. They certainly seem to believe in making their "cops" hear things over there.



P.W.'s LISTENERS' SERVICE

The most comprehensive weekly guide to modern receivers

TO MARK A GREAT OCCASION

SUITABLY to mark the great occasion of his Majesty the King's forthcoming Jubilee, Marconiphone are introducing immediately a new and magnificent range of instruments to be known as the "Jubilee" models.

It is particularly appropriate that a firm of such long standing and with such distinguished associations as Marconiphone should have taken this enterprising step, for it is evident, even from a cursory examination of the new models, that they are indeed worthy of the occasion.

It may truthfully be said that each of the new models is outstanding in its own particular sphere, but perhaps the one that will be of especial interest to "P.W." readers is the "Jubilee" Model 287—a luxury radiogram at an everyday price.

Exactly how Marconiphone has been enabled to produce this remarkable design to sell at such an economical figure is a secret known only to them. Perhaps the answer is to be found in Marconiphone's mastery of mass-production methods as applied to radio.

But, secret or no secret, the fact remains that the opportunity is open for listeners to acquire a real luxury instrument at the almost incredibly low price of 22 guineas, and that is all that need concern us here.

A Triple-Test Report.

One of these new models is at present undergoing tests in our laboratories, and it is hoped to be able to publish in this section of "P.W." a complete Triple-Test report within the course of the next few weeks.

In the meantime, it would perhaps be as well for us to confine our remarks to generalities in attempting to give you a few details of the set in question, although we make no secret of the fact that our present eulogistic observations are not entirely unconnected with what we have already learned from our tests!

The circuit employed is that of an advanced five-valve, seven-stage band-pass superhet for operation on A.C. mains, with an electron-coupled non-radiating heptode frequency changer. The main controls are four in number, consisting of tuning, volume, tone and master switch.

There are, in addition, two subsidiary controls, consisting of a variable "quiet-tuning adjustment and a switch for cutting out the inter-station noise-suppression scheme, thereby ensuring absolutely maximum sensitivity.

It is hard luck to be left out of the team during its Cup-fighting days, as these two popular Tottenham Hotspur players have been. But life for Arthur Rowe and Billy Hall, the centre-half and inside-left respectively, might have been very much more tedious during their convalescence had not the Ekco Model 95 transportable provided them with such unlimited entertainment.

The POPULAR WIRELESS Listeners' Service exists to help you. Not only does it serve to keep you in touch with all the latest developments in commercial-receiver technique, but it provides you with authoritative guidance upon the choice of the receiver most suited to your particular requirements. The "P.W." Triple-Test service has been hailed by manufacturers and listeners alike as the most searching and the most convincing test scheme that has ever been inaugurated for commercially built receivers, and it is the only service of its kind that is available. When in doubt consult the Listeners' Service, and you will not be likely to go very far wrong!

The giraffe-necked women, who appeared in Bertram Mill's Circus at Olympia, showed great wonderment upon being introduced to the marvels of Cossor. The only redeeming feature of this type of neckwear is that it might make a very good aerial in case of emergency!

A NEW MAINS SUPERHET BY G.E.C.

CONCURRENT with a reduction in the price of the A.V.C.5 table-model superhet to 12g, the G.E.C. announces the release of an entirely new five-valve (including rectifier) superhet which is to be known as the "Droitwich Super 5."

This new receiver is a particularly interesting addition to an already famous range, and, consistent with the price of 12½ guineas at which it is to retail, it represents remarkable value for money.

Perhaps the greatest sales argument in its favour is that it does not *look* like a cheap set! So many of the modern 12-guinea instruments almost shout their value by the finish—or perhaps we should say by the lack of it—in the cabinet work. Not so the "Droitwich Super 5."

The general design and finish of the cabinet of this set is in keeping with all the best modern ideas, and the style is thoroughly modern without being "hard."

Appearance, to most listeners these days, is an important consideration, and on this score alone the new "Droitwich Super 5" is likely to make a very strong appeal. But appearance is not the only feature which is likely to carry the balance of favour towards this latest G.E.C. effort.

Many Refinements Incorporated.

The design generally is full of refinements that will make an instant appeal to the ordinary listener, and perhaps the most interesting is the inclusion of the new G.E.C. "Shadowband" tuning device—still another form of visual-tuning indicator. The actual indicator of the device consists of a shadow which is ingeniously projected on to a scale, the shadow being broadest when no station is being received and narrowing as a station is tuned in.

The circuit, which is for operation on A.C. mains, consists of a heptode frequency changer, a variable-mu pentode I.F. amplifier, a double-diode triode and a pentode output valve. Delayed and amplified automatic volume control is carried out in accordance with best modern practice.

To facilitate station identification the dial of the "Droitwich Super 5" is calibrated in both station names and wavelengths, and the controls have been kept down to the lowest minimum possible consistent with the attainment of completely satisfactory results. An inter-station noise-suppression switch is provided.

"A WONDERFUL EXAMPLE OF RECENT PROGRESS"

What a typical listener thought of the R.I. "Ritz-Airflo."

UNTIL a few minutes before this week's test began I had never had an opportunity of examining the "Ritz-Airflo"—the new design by Radio Instruments, Ltd.—and it was with unusual interest, therefore, that I awaited the arrival of the critic who was to test and comment upon it.

The set stood in a corner of the room, plugged in to the mains, but not switched on; a rather haphazard-looking indoor aerial was already attached, the idea being to see how the set would behave in strange hands under rather unfavourable conditions.

Soon after the appointed hour there was a ring at the door-bell, and our visitor was shown in—Mr. F. E. Dean, of Shirley, Surrey. He was cold and wet—for it was a dreadful night—but he eyed the set with great interest while warming up by the fire.

"I've done all sorts of jobs in my time," said Mr. Dean, who is an engineer, "but acting as a wireless critic is quite a new one! What is it I'm expected to do?"

I told him the scheme in a few words. All he had to do was to imagine himself a critic, testing the set in front of him to see how it fulfilled his ideas about wireless reception.

He could work it himself, listen to what stations he fancied, ask any questions that occurred to him, and test it in any way he desired.

"With a nod he walked over to the set and began a methodical examination.

"Perfectly Steady Reception."

"Cabinet's first class. Anyone can see that," he commented. "And speaking of a matter of personal taste, this shape of set, with no controls or ornamentation on the front and no loudspeaker circle, is just what I like. However, actions speak louder than looks—so tell me what the knobs are for."

As the set has only four, they were soon explained. One for tuning, and below it a knob for wavechange or "gramophone"; another for volume, and under that a "mystery" knob. "If you don't mind I'll explain that one after you have been working the set without it," I said.

"That's O.K. by me," said Mr. Dean. "Let's try the others first."

When he switched on, the dial lit, and after commenting upon the clear scale and markings for the different wavelengths and stations, he tried the tuning.

Inside five minutes he was not merely satisfied, but definitely delighted. "By Jove! Just think of this, compared with the very finest that radio could do only four or five years ago," he said.

"Only the one knob, and perfectly steady reception of any programme you like. No interference, no fading—and, by the way, how much does it cost?"

The "Mystery" Control.

On learning that the price was sixteen guineas he whistled and said, "I should have thought much more." Then he got interested in a powerful talk in a foreign language which he had tuned in, finally pronouncing it as a Russian station.

"I know a bit of Russian—picked it up from prisoners of war in Germany," he explained, (promising to tell me more about that when business was over—but that's another story).

Remembering the "mystery" control, Mr. Dean asked about that; and I explained that it was an inter-station noise suppressor and pre-selector control, of unique design, that would reject all the weaker stations and give a perfectly silent background, at whatever predetermined sensitivity level the set owner wanted. In a few minutes Mr. Dean was testing it for himself, and was completely enthralled by it.

He found he could adjust it so that the set was absolutely silent right round the tuning range, except just at the predetermined level of strength, when the stations that were selected came in with magnificent volume and clarity. And he could arrange it to exclude as many stations as he wished, thus making what he called "a perfect receiver for the home during office hours."

"It makes it just as easy to handle as you want it to be, as suitable for wives as for their husbands, I should think," was his final comment on this. And then he went back to hear again how easily it brought in the distant foreigners—in fact, he was quite fascinated by the tuning.

When he commented on the performance on such a poor aerial he found there were two gadgets on the back of the set he had not noticed, and learned these were a tone control and a mains aerial—both of which proved very effective in use.

"There's only one thing more I want to say," said Mr. Dean. "If things go as I am hoping I shall be getting myself a set before long. And now I know what kind. It will be one like this!"

P. R. B.

SIR HAMILTON HARTY WITH HIS RECEIVER

Sir Hamilton Harty, the famous conductor, comparing the musical score with a record being played on his Marconiphone radiogram.

"MUSIC WAS CLEAR AND WELL BALANCED"

—Our Music Critic.

THE week-end during which I was asked to try the R.I. "Ritz-Airflo" was bitterly cold, with snow and ice smothering everything outside. Inside, however, was warmth, pleasing music and plenty of enjoyable entertainment. The R.I. "Ritz-Airflo" stood in the corner of the room, its cabinet forming a happy match with the rest of the furniture, and its voice bringing in the latest news of the cold snap in a warm, confidential manner.

Speech on this instrument was particularly fine, and was a pleasure to listen to, a statement that certainly cannot be made in many cases of modern radio design. Music was clear and well balanced, with absence of stridency, yet being devoid of "mellowness." This, by the way, holds good for the gramophone as well as radio reproduction, and is a particularly marked feature in the model I heard. By that I presume that it is also to be found in every other model of the same set.

"Really Good Reproduction."

The bass is adequate for most purposes and the high notes are balanced in good proportion with the lower register. From the average listener's standpoint I should say the set is pretty well ideal, for it will give really good reproduction from an astonishing number of stations, while in the view of a musician I would say that the set is an almost ideal companion.

It is sufficiently clean cut in its reproduction to allow the orchestral score of all but the largest orchestras to be followed in detail, and in the big symphony broadcasts very few instrumental parts seem to be missed.

It is often difficult to pick out some of the wood-wind instruments, even in the orchestra *au naturel*, and so it is not fair to expect every note of every instrument to be clear and distinct on a radio set. The R.I. "Ritz-Airflo" certainly does well in this respect, however, and makes musical listening a real pleasure.

I have one criticism to make—I do not like the name. Perhaps it is because I do not know its history, but it does not suggest anything musical or pleasant. Perhaps in this cold weather it is too reminiscent of draught and chilliness—quite the opposite to the sense of comfort that the receiver actually brings into the household.

MEN WHO HAVE TO LIVE IN THE FUTURE

DEEP down in the bowels of the earth below Radio House, the famous headquarters of Marconiphone, is situated a fair-sized room. This room is always locked, even when occupied by those who use it, for secrets are in that room with its barred door—secrets that a large number of people would give quite a lot to learn.

The work that goes on in this room concerns a subject which is very far from the thoughts of you and me at the moment.

While we shiver in our thick overcoats and ponder longingly on the delights of long, hot summer days with their attendant blessings, such as lazy hours on the river and by the seashore, picnics and cricket, men in that underground chamber are thinking and planning with all the energy at their command for next season's National Radio Exhibition at Olympia!

The Chief of the "Stunts" Department rings on the 'phone and asks the Manager if he can spare a moment in Studio "S," as this room is called. On his arrival the "Stunts" man shows the Manager his latest idea for putting over to the vast crowds at Olympia a selling message or a new method of display.

The Manager ponders and makes one or two remarks—"O.K." or "No good." If the O.K. is given the "Stunt" Chief knows that the idea is worthy of consideration and files the papers. If the "No good" verdict is passed the whole thing is immediately scrapped.

In a month or two a general meeting is called of all chiefs of departments, and the ideas passed as O.K. are brought up for general discussion. A snag arises—one of several, in fact; perhaps the cost of this item or that is much too heavy—ways and means are sought to bring it down, and so it goes on until the whole agenda is dealt with.

Always Work to be Done.

The Manager then shuts the door of his office, closes the windows, stirs the fire into a nice comforting blaze, and settles down to think out a really reliable method of—keeping cool. As the Radio Show takes place in August, it is always a safe bet that the weather will be sufficiently warm to make the offices and show places intolerably hot.

Then the day dawns when everything may be considered to be ready; every detail carefully thought out.

August is here—the Show opens; the Manager walks round and grimly surveys the tired countenances of his workers. "Yes," he murmurs under his breath, "not bad, not bad at all. But I *do* wish I could get a really first-class idea for our Christmas campaign!" M.C.

TECHNICAL TESTS

NUMBER FOURTEEN

THE R.I. "RITZ AIRFLO" RECEIVER

IF one of your friends suddenly confronted you with the fact that he had bought a Rolls-Royce you would not have to ask him what sort of a car that was. You would know. You would know simply because the name itself stands for the highest possible standards of automobile engineering.

Prestige creates confidence. With no matter what you buy, if it is reliability that you are after, then the name is one of the biggest selling factors in its favour. A firm with a long-standing reputation for high-quality products cannot under any circumstances afford to turn out anything but the best, for from the moment it turns out an article of doubtful value its traditions of years are smashed. To break faith with one's customers is the shortest route to Carey Street.

We do not imagine that you will have any difficulty in piecing together the connection between our preamble and the set we are about to review. It is a fact, and a well-known one, that the name of R.I. in the radio industry, like that of Rolls-Royce in the car world, carries the traditions of years of successful enterprise.

Years before broadcasting started R.I. were famed for their skill in matters electrical. Little wonder, therefore, when broadcasting came along, that they were at such a tremendous advantage and that they were able immediately—and on merit alone—to leap into prominence.

From that day to this R.I. has never looked backwards, and to-day, no less than at any time in their history, their products reflect the policy which has been the guiding light from the start—*quality*.

If you could but take an R.I. set to bits you would find no straggly ends, no roughly stamped metal work, no shoddy workmanship and no parts of doubtful efficiency. Down to the smallest screw R.I. sets are built like the proverbial battleship, because therein lies the secret of *lasting* reliability.

Real Prestige.

Perhaps in some respects R.I. are at a disadvantage in submitting a set to us for test, for the plain truth is that we have learned to expect so much of them that we should probably be horribly disappointed if it hadn't that "little something which some others haven't got"! That is what prestige has done for them!

But we have never been disappointed yet, nor for that matter are we ever likely to be. As for the "Ritz Airflo," which is the subject of the present series of tests, we frankly admit that it is a masterpiece—well thought out and then well built.

Upon the technical aspects of this superb instrument we shall have more to say later. In the meantime we would particularly commend to your notice the cabinet work.

A modern radio set is as much a piece of furniture—or should be—as a piano or a sideboard. And that is where so many modern manufacturers are apt to miss the boat. The finest set possible housed in a cabinet of quite ordinary design is likely to fall as flat as a pancake in the estimation of the public to whom it is intended to appeal. And, alas, so many manufacturers seem to labour under the impression that the "works" are all that matter. They are wrong.

They are wrong because they have the feminine point of view to contend with, and the average Eve cares not a rap for technical efficiency. With her it is appearance that counts every time.

The ideal, then, would be to appeal to the mere male on the score of technical efficiency and subtly to captivate the ladies by the appearance of the cabinet. Cunning, perhaps, but logic all the same, for you have never seen a Rolls-Royce with shoddy coachwork.

All this is by way of leading up to the fact that R.I. has done the *only* sane thing to be done to achieve the ideal in this respect. They have given the cabinet design the care and attention which its importance in a successful design warrants—with what result we are content to let you judge for yourself. So far as we are concerned, we know of no instrument with a more dignified and distinctive-looking cabinet than that which houses the "Ritz Airflo." It is a superb piece of work, worthy absolutely of the firm from which it emanated.

On the technical side the "Ritz Airflo," as may well be expected, is a most advanced design. The circuit comprises a combined first detector and oscillator (which is preceded by a two-stage aerial filter circuit), an intermediate-frequency amplifying stage, a triple-diode triode and an output pentode. There is, of course, the usual rectifying valve, for the set is designed for operation on A.C. mains.

Technically, the set is bristling with ideas, all of which provide evidence of the thoroughness with which R.I. sets are designed. Of these perhaps the most ingenious is the utilisation of a triple-diode triode in such a way as to provide demodulation, amplified automatic volume control, L.F. amplification *and inter-station noise suppression* all in one valve.

Ordinarily, automatic volume control systems are apt to suffer from the disadvantage that when the set is detuned slightly the reduction in rectified current produced by detuning causes an increase in the sensitivity of the receiver; and when no station is being received at all the sensitivity of the set is at its maximum.

Consequently, the gaps between stations are apt to sound like miniature bombardments. But not so with the "Ritz Airflo," for by the ingenious scheme incorporated, and for which R.I. are deserving of every credit, the set can be adjusted to provide absolute silence between stations.

But that is not all. This inter-station noise suppressor can also be adjusted to reject *automatically* all stations below a predetermined volume level. That in itself is a tremendously important asset and one of which the value to the ordinary listener should not be underestimated.

Even so the set is the very last word in simplicity, so far as operation is concerned, and the ease with which countless distant stations can be tuned in by the absolute novice is exemplified by the observations of our chance-chosen critic (see the previous page).

Like all other sets which are submitted to us for test, the R.I. "Ritz Airflo" was subjected to a series of tests with our synthetic transmitter and output-measuring instruments, and we have no compunction at all in saying that we think the maker's sensitivity claim of 1½ microvolts for the standard output to be very modest indeed. Our figures show not only that this claim is easily justified, but that the "Ritz Airflo" is, in fact, distinctly above the average superhet of its type.

Selectivity, too, is of a very high order, and all but the stations that are initially heterodyned can be separated with ease.

Lifelike Quality.

No review of this fine set would be complete without at least some reference to its lifelike quality of reproduction. It is perhaps the first thing that strikes you from the moment the set is switched on, and it is the most vivid recollection that remains when the set is finally switched off.

In so far as the quality of reproduction of radio programmes is concerned, there is little doubt that the pre-selector idea is a great benefit. It is difficult for the ear alone to judge in an instant whether a given transmission is up to real "programme value," but with the ingenious scheme which is one of the outstanding features of this design, there can be no possible doubt about it, because the set "does the choosing."

All that the user has to do is to decide the volume below which stations are not worth hearing, and the set will then do the rest.

We congratulate Messrs. Radio Instruments upon the production of what is undoubtedly a magnificent receiver. It is an instrument that would take a lot of beating, irrespective of price.

TECHNICAL SPECIFICATION

GENERAL DESCRIPTION.—All-electric five-valve (including rectifier) table-model superhet for operation on A.C. mains.

CIRCUIT ARRANGEMENT.—An advanced type of superhet employing the valve sequence of combined first detector and oscillator, intermediate-frequency amplifier, triple-diode triode (for demodulation, automatic volume control, L.F. amplification and inter-station noise suppression) and output pentode. First valve is preceded by a 2-stage aerial filter circuit.

CONTROLS.—Four in number, consisting of main tuning, volume (with which is combined the "on-off" switch), pre-selector and wave-change switch. Provision for tone control is also made in the design. All main controls are placed on the right-hand side of the instrument.

SPECIAL FEATURES.—Inter-station noise suppressor, station pre-selector scheme, overall sensitivity, quality of reproduction and superb cabinet work.

MAKERS.—Messrs. Radio Instruments, Ltd., Purley Way, Croydon, Surrey.

CASH PRICE AND HIRE-PURCHASE TERMS.—16 guineas, or £2 3s. 6d. deposit and fifteen monthly payments of 22s.

A complete German television receiver of Loewe make.

"EFFECTS" IN TELEVISION

By A. S. CLARK

We are all familiar with the variety of sound effects that are introduced into the production of broadcast radio plays, but what of television? In this article the author looks ahead to the time when "effects" may play as important a part in this new sphere of entertainment.

IT was not long after short plays began to make their appearance in broadcast programmes that the Effects Studio came into being. Its object was to produce realistically, either by artificial means or natural processes, the various background noises required by the action of the particular play being produced.

In a similar way, looking ahead to the time when television reaches that variously defined state of giving "real entertainment value," we may expect television effects to play quite as important a part in the new technique.

Inserting Archways.

Already, even with the present development of television programmes, certain effects which are not actually to be seen in the studio are seen in the television viewer. Such items as an archway over a performer have been introduced to improve the scenic appearance of some stagings.

Such an archway can be inserted by means of a separate little scanning machine synchronised with the main scanner. The picture of the arch is drawn on a card and inserted in the subsidiary scanning machine just as a caption or the familiar B.B.C. Eye is inserted.

Reverting for a moment to sound effects. These are often found to be most realistic when produced in ways quite different from the actual thing. It is quite on the cards that a similar state of things will exist with television effects.

The Use of Miniatures.

At the same time it must be admitted that it is not likely to be the case so often. When it is we may expect to find it mostly in connection with the production of effects in miniature. For instance, the burning of a house could best be produced by a small model of cardboard and iron burnt with the assistance of paraffin.

(It must be admitted that in this particular case the real thing would be somewhat out of the question in any event! But it serves to illustrate the point in question.)

A while ago there was a certain amount of outcry against listeners being taken in by speeches, presumably being given at the time in the studio, but actually reproduced from records made previously. Those who feel that the advent of "perfect" television will rule out such a possibility should be warned.

Should the occasion ever arise to do this sort of thing again with television it is quite likely that the transmission of films will be so advanced that the "looker" could be taken in with them just as much as the listener was in the past with records.

Talking about the use of films, it is quite likely that they will play a very big part in the production of televised plays. They will no doubt be extensively used for producing elaborate indoor backgrounds and for outdoor-scene effects.

All that will be necessary will be a back sheet with a projector designed to work from the side, or possibly from behind, on to a translucent screen.

Nowadays, of course, sound effects are seldom actually originated at the time they are required in a play. Instead, they are recorded, and the sounds are faded in just at the right time by the producer in charge of the control panel.

By the time television has reached the advanced stage of which we are thinking, recording, either by sound tracks or light variations on film, will have improved to a sufficient extent for television scenes to be recorded also.

It will thus be a simple matter to feed in the necessary impulses to produce all sorts of superimposed effects. One instance in which this scheme would be very effective would be when a ghost of the transparent variety was required.

Those Film "Fakes."

And this leads one to think of the thousand and one fakes that are employed in the making of films. There seems no reason why any one of them should not be employed or adapted for television in the future.

On consideration there seems no end to the possibilities of television effects, and instead of making electrical entertainment less artificial the new science will tend to completely rout the old adage that "seeing is believing." But, after all, what does it matter? Our reactions are governed by what we *think* things are, and so long as the entertainment is good, why should we quibble if our entertainers take a few short cuts?

AN IMPROVISED LENS HOLDER

A suggestion for the television experimenter.

WHEN conducting television and photo-electric experiments in the home laboratory it is often a matter of difficulty to find a suitable means of supporting bull's-eye and condensing lenses which it may be necessary to include in the path of the light beam.

It is difficult to fix up a clamp for an unmounted lens, and even if a metal clamp could be provided there is always the danger of the metal jaws of the clamp scratching the soft optical glass of the lens.

A bar of soap provides a good means of supporting a lens. Despite the simplicity of this method, it is one which is not despised even in optical laboratories.

Make a small crosswise slit in the soap bar and thrust the edge of the lens down into it, using a firm but gentle pressure. The lens will be held quite securely and the bar of soap will provide a firm and adequate base which will prevent the lens from being inadvertently knocked over.

Moreover, the soap, although it will grip the lens firmly, will not scratch it, and at the conclusion of the experiments the small amount of soap adhering to the edge of the lens can readily be removed with a damp rag.

J. F. S.

Nothing more elaborate than an unused bar of soap is employed in this makeshift lens mount.

TELEVISION

A SPECIAL PRACTICAL SERIES FOR ALL READERS

By L. H. THOMAS

The mirror-drum televiewer is an advanced instrument, but one in which all readers are interested, and so Mr. Thomas deals with some of its more important practical aspects this week.

READERS of "P.W." have always had a reputation for making themselves heard, and those who follow this Television series are no exceptions. Several of them have written to remind me that I have as yet said nothing about the mirror drum, generally regarded as the most advanced of the mechanical systems of scanning.

I had not forgotten it—not by any means—but had left it alone up to the present, as this series was intended to be entirely practical. Anyone can buy, assemble and use a disc kit, but the mirror-drum kit is a different business, both as regards price and skill required.

Thrown on Ground-Glass Screen.

It *is* time, however, that we said something about mirror drums before we pass on to electrical scanning systems. The diagram on this page gives an excellent idea of a completely assembled mirror-drum scanning unit shorn of its cabinet.

The pictures are actually projected from the drum on to a ground-glass screen, which would normally be in a vertical position along the front edge of the unit—immediately above the little tilted mirror in the extreme foreground. This ground-glass screen is integral with the cabinet housing the gear, and has therefore had to be left out of the illustration.

To anyone who understands the simple 30-hole disc as a scanning device the mirror drum and its operation should be perfectly clear. Leaving out the question of introducing the television signals into the light source, it is easy to see that a plain spot of light directed on to the revolving drum may be made to go through the well-known scanning performance.

Brilliant Illumination.

Each little mirror is mounted, circumferentially, at an angle of 12 degrees with its neighbour—corresponding exactly with the 12 degrees angular displacement of the holes in a disc. Each mirror, also, is tilted to make a different angle with the light spot, so that, as the drum is rotated slowly, the "streaks" of light formed on the screen by the mirrors are just adjacent to each other—neither overlapping nor admitting a black space between them.

Thus, when the drum is rotating at the correct speed, you will have your light area (in the proportion of 7 to 3 if the design is correct) covered by the rapidly moving spot of light, which starts "bottom right" and finishes "top left."

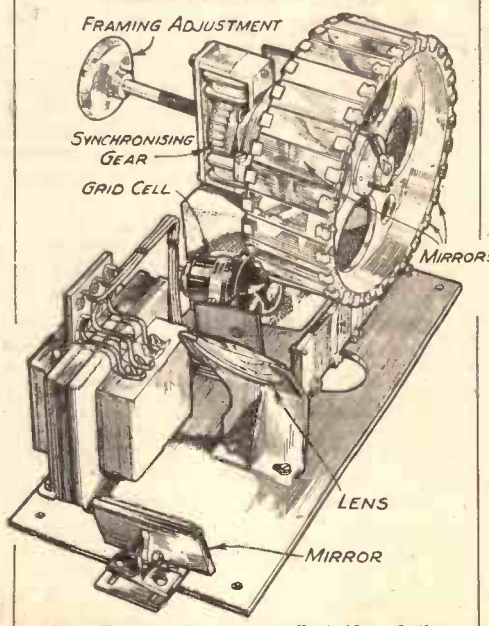
The advantages of this method over the disc are almost too obvious to need stressing. The size of the picture may be 7 inches by 3 inches, or even larger; the illumination is brilliant; and the picture is black and white.

An ordinary high-candle-power filament lamp is used as the light source, and instead of modulating the actual source of light, as we do a neon tube, we have to introduce our modulation in such a way that it *interrupts* the light.

The beam from the projection lamp is concentrated on a pair of "Nicol prisms," between which is placed a Kerr cell, which is the most important link in the whole chain of mirror-drum scanning.

The original beam of light, as everyone knows, consists of transverse vibrations, in *all* directions at right angles to the direction of the beam. The combined action of the Nicol prisms and the Kerr cell is to interrupt or modulate these vibrations in such a way that the amount of light that passes through the combination is almost exactly proportional to the strength of the signal applied across the cell.

A COMPLETE UNIT



This diagram gives an excellent idea of the general arrangement of a complete mirror-drum television outfit.

The whole "chain" is as follows: light source, lens, Kerr cell unit with prisms, inclined mirror, lens, mirror drum, screen.

Now we must go still further back and investigate the method of applying the output of our television receiver to the Kerr cell. This, fortunately, is quite convenient, the only possible objection being that a fairly high voltage is required. This, however, is no greater than it is in the case of "White-Line" or "T.I." lamps, being of the order of 500 volts or thereabouts.

The last valve of the receiver is generally provided with an anode resistance of about 4,000 ohms, the cell being fed through a 2-mfd. condenser and connected across the H.T. supply, in series with a variable resistance. If a 1 : 1 output transformer were used the circuit I gave recently for using "White-Line" or "T.I." lamps, in conjunction with a separate high-voltage supply, would be suitable, except that the value of the variable resistance should be higher.

Drum or Disc?

I will give a complete output circuit for mirror-drum receivers in a later issue. Incidentally, it is by no means certain that mechanical scanning systems will be completely useless on the high-definition transmissions that everyone is waiting for!

The mirror-drum principle, of course, is extensively used for television *transmission*. More than one amateur transmitter, I know, uses the principle for illuminating a small "studio," which may consist only of a brightly lighted sheet of cardboard, in front of which is placed the object to be televised.

Rumours come from the U.S.A. of a 240-line mirror-drum equipment that works with the greatest reliability, although it is the fashion over there to think of a perfectly punched disc as the best possible means of scanning *mechanically*, even for high-definition transmissions.

The H.F. Test Card.

And now, finally, I want to deal with one or two queries received from readers concerning the reception of the 30-line transmissions. One complains that he has been absolutely unable to receive the "high-frequency test card" satisfactorily. This is the card with the horizontal "cone" composed of separate thick lines, which has been radiated in several programmes recently by the request of "lookers."

All that I can tell him is that he isn't up against a television problem at all. It simply means that his receiver is deficient in "top" to such an extent that it can't possibly be giving good production, even on sound.

Another is receiving "television echoes"—a kind of double fringe round the edge of the picture. This, again, is probably a form of distortion, most likely to be found in the H.F. circuits of his set. I can produce the effect beautifully myself by overloading the detector (easily done in my location with a good H.F. stage before it). "Off-set" ganging will probably do the same.

TELEVISION.—*Page 2.*

TELEVISION JOTTINGS

Some notes on short-wave high-definition transmissions.

FORGIVE me if I am so unfashionable that I don't talk about the Television Committee's report! It is rather about future developments that I want to write at the moment, particularly in the light of special points that have been worrying readers.

One gentleman brings up a point that I haven't seen raised before. He writes: "We have all been prepared for the fact that high-def. transmissions will have to be carried out on short waves. Will the *sound* channel be on short waves, too? In other words, shall we all have to equip ourselves with *two* short-wave receivers?"

The answer, of course, is: "I don't know—wait and see." Not very helpful, perhaps, but perfectly honest! Personally, I shouldn't think it at all likely that the sound channel will be on short waves, but there is no knowing.

A Home-Constructor Proposition?

Another reader wants to know "whether the short-wave receiver for high-definition transmissions will be a home-constructor proposition." Here I can be more definite, for I certainly don't see any reason why it shouldn't be. I have never seen why a short-wave superhet should be any more difficult to construct than a broadcast-wave superhet. One man I know has been receiving the experimental high-definition transmissions on ultra-short waves for months. He uses home-constructed gear of the very simplest kind.

His receiver consists simply of a detector, separate oscillator, four I.F. stages, second detector and pentode output. The I.F. stages are "offset" to provide the necessary bandwidth, and he has never had a moment's trouble with the gear.

The Tricky Part.

The most tricky part of his equipment is the cathode-ray tube and its associated time-base circuits; but plenty of guidance in this direction will be available for the home constructor long before regular transmissions commence.

In passing—The Week's Great Thought. Believe it or not, the non-technical Press is still telling us that "Television is just round the corner," although one writer so far forgot himself as to assert that "Television is Here." Well, where the dickens did he think it was, anyway?

It is still fashionable, too, to say of television that "something is still missing." I wonder what that something is. There hasn't been much missing in the demonstrations of high-definition stuff that I have seen recently.

My tongue is tied as regards details, but I can mention one fact—that in a televised version of a "close-up" from a well-known film I was able to distinguish the separate eyelashes of the heroine—and I *think* they were natural ones and not the knobby variety!

Although this next item is more in the line of my colleague "W. L. S.," I think I should just mention it here. The 10-metre amateur band, which has been "dead" since 1929 or 1930, as far as long-distance signals are concerned, has been showing signs of life this year, and transatlantic signals have once more been heard.

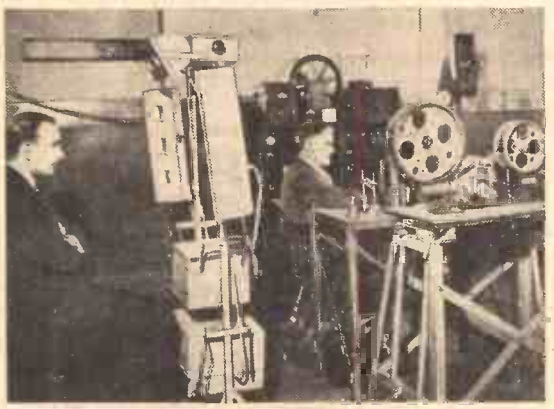
This, surely, is an incentive to get short-wave and ultra-short-wave receivers going without waiting for the new television transmissions to start.

One of the troubles that is going to crop up when these "high-def." transmissions start is that of motor-car ignition interference. If you live close to a main road and listen on 10 metres you will know what an atrocious racket it can be.

The use of special aerials with matched-impedance feeders is capable of reducing the trouble quite a lot, and doubtless we shall get over it in time. However, it remains to be seen what will happen.

L. H. T.

AMATEUR TELEVISION TESTS



Mr. H. Bailey, of Denton, Manchester, has an experimental television transmitting licence. His station is G 2 U F, and the picture shows him at the controls, with an artist before the televising cells prior to a test transmission.

ROUND THE RECORDS

Recent Gramophone Releases

IF things go on as they are at present they will be giving records away. Decca have thrown several bombshells into the gramophone market in the past; now they have exploded another—Panachord records at 1s.

A new series has been launched, with such stars as "The Street Singer," Joe Loss and his Kit-Cat Band (I wonder how this is managed with "Octacros" still publishing his records), Eve Becke, Brian Lawrence, Billy Reid and Sydney Kyte.

That is a big enough bomb for most people to go on with, but a second detonation from the same camp is the reduction of the dance section of the Brunswick records to 1s. 6d. from 2s. 6d. These new records will have red labels and will be known as the Red Label Brunswick series. On them are such old favourites as Guy Lombardo, Casa Loma Orchestra, Ted Lewis, Isham Jones, Club Carolina, Dorsey Brothers with Bob Crosby (Bing's brother), Abe Lyman, and others of the cream of American dance-band leaders and their bands. This coincides with a similar reduction in price of H.M.V and Columbia dance records—now 1s. 6d. instead of 2s. 6d.

PRICE. REDUCTIONS

And the quality of these records remains unimpaired—that is an important point to remember. I've heard some of them, and they're as good as ever.

* * *

Listeners to the Rome or Milan broadcasting stations may, ere very long, be surprised to hear *When Day is Done*, the famous signature tune of Ambrose and his Orchestra. For Ambrose has been invited by the Italian Government to take the whole of his band to Italy for six weeks for daily broadcasts, and to instruct Italians in the interpretation of modern dance rhythm.

I believe negotiations are still in progress, and we may have to lose Ambrose and his band—and, I presume, Elsie Carlisle and Sam Browne—for a couple of months.

And, talking of *When Day is Done*, a twelve-inch record has been made of the number in concert arrangement. The recording is due to the fact that recently Ambrose re-orchestrated his signature tune and started to commence all his broadcasts with the new concert version. Letters from fans began to pour into the Decca offices asking for a record of the number, and K745 is the result.

At the time of writing news has reached me that Kitty Masters, Henry Hall's croonette, is leaving the B.B.C. for wider spheres, though she will sing with the B.B.C. Dance Orchestra at irregular intervals in the future. It's a pity, Kitty, and the radio public will miss you.

Regal Zonophone records will help to fill the gap for fans of that popular lady, however, and her *Stay as Sweet as You Are* will be gladly welcomed among the favourites of the gramophone. It is on Regal Zonophone MR1537, together with *Little Girl, What Now?*—two most fitting farewell titles, though we are not bidding Kitty Masters farewell except in its literal and correct sense. Well, here's good luck to her!

* * *

Song of Paradise and *Alone* are two songs that you should hear, especially if you are a follower of Fred Hartley's Quintet. The records hold the voice of one who has often entertained us with that famous light orchestra—Cavan O'Connor, a tenor whose charm is evidenced with every note he sings. You should certainly hear Regal Zonophone MR1536.

WELL WORTH HEARING

* * *

I wonder when someone will record a barrel organ duet—or, better still, a massed barrel-organ band. There are few recording novelties that have yet to be introduced to the gramophone public, for we have had the re-recording of Caruso, Layton and Johnstone singing a quartet, a cinema-organ duet on two organs miles apart, mouth-organ bands, massed 'cellos and the eight-piano symphony, and the ground has been fairly well covered.

It is wonderful how the last-named combination has caught on—for its records are popular and the stage appearances have been well received. Personally I am not enthusiastic about the rendering of *Rustle of Spring* by eight pianos—when one would be ample. I do not care what the multi-keyboard fans say, the effect is not as clean as it should be in that type of composition. I agree with the publicity dope writers that "there is something sensational in hearing these massed concert grand pianos . . . pouring forth their sonorous volume." Naturally, it would be sonorous, but we don't want it to be sustained. Multi-pianos are never crisp in their effect on records, and the *Rustle of Spring* should be neat, lively and almost elf-like; volume is surely not the be-all and end-all of the present day's musical tastes. However, I commend the record to your notice; I may be the only one of the army in step, as it were. (Columbia DB1481.)

* * *

And now a few words for "celluloid fans"—lovers of the cinema screen.

Two records of songs from films, both sung by the original artists, will be much sought after. Victoria Hopper, whose latest film, "Lorna Doone," has recently been "premièred," is heard on H.M.V. B 8249 singing *Love's Wisdom* and *Lorna's Song*, which were written especially for the film. These songs are a pleasant relief from the ordinary type of music one hears in the cinema, for they are reminiscent of Purcell, and this record should be in great demand.

SONGS FROM FILMS

"The Merry Widow" continues its success in film form, and consequently H.M.V. have issued another record by Jeanette MacDonald of *To-night Will Teach Me to Forget*, coupled with a song from one of her earlier films, *Try to Forget*, from "The Cat and the Fiddle," on H.M.V. B 8251.

Musical experts prophesy that the biggest hit of any from new films will be *The Continental*, an intriguing foxtrot which is included in "The Gay Divorce." It is recorded on H.M.V. B 6554, and is a particularly good bargain because it is coupled with *The Waltz Song* from "The Merry Widow" played, by Paul Whiteman and His Orchestra. Incidentally, Ruth Etting (Brunswick) can be heard singing *The Continental* and also Ambrose (Decca F 5317) playing it. This latter is extremely good!

K. D. R.

The ALL-WAVE SUPER on A.C. MAINS

Some further details of the All-Wave Four-Valve Superhet, showing how it can be turned virtually into an " all-mains " receiver. Incidentally, the two units described here can be used for practically any battery receiver for operating it from the mains.

Designed and described by K. D. ROGERS.

THERE will probably be many who will like to take advantage of the fact that they have A.C. lighting supply to operate the All-Wave Four-Valve Superhet from the mains. Others there may be who would like a new mains unit suitable for working a fairly large set and with provision for Class B output if desired, while, again, there are many who will welcome the design of a neat L.T. charger by means of which they can say good-bye for ever to their charging troubles.

Whether you belong to the first, second or third-mentioned groups of peoples you will find what you require in the two units illustrated on these pages.

"Squeggering."

But before I go on to describe the units, I want to bring forward one more operating detail of the All-Wave Superhet described last week. It will be remembered that it uses Kelsey (K4) short-wave coils in the oscillator section of the first heptode. These coils are perfectly efficient, but in this design, with its Cossor heptodes, I found that with full H.T. (120–150 volts) there was a tendency to " squegger " on the lower ends of the short-wave condenser scale.

The noise is a cross between a hiss and a growl, and is a sign that the oscillator portion of the heptode is reacting too strongly — it is squealing. The remedy is obvious. I found about two to three turns could be removed from the reaction winding of the No. 2 coil and a couple from No. 1 with good effect all over the band.

Removal of Turns.

If your valve does not " squegger " there is no need to alter the reaction windings; but if it does I should take off a turn at a time, commencing at the end nearer the grid winding. It is an easy proceeding, and instead of soldering during the test of the winding you can just wind the end of the reaction-coil wire round its appropriate valve-pin—the wire is thin and easily fixed.

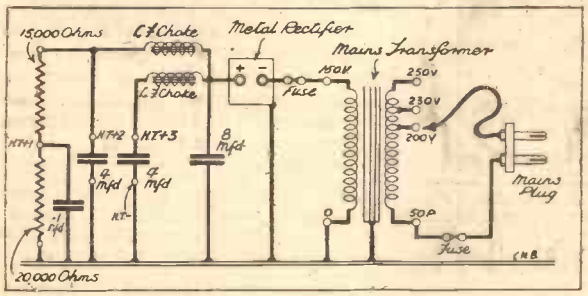
And now for the two power packs. The H.T unit, as I said before, is so designed that it can be used on other receivers than the All-Wave Super, but it was primarily built so that owners of that set who have A.C. mains can get the very last ounce out of the receiver.

Economy.

It is obvious that it is more economical to use mains H.T. supply than battery if possible, for then a higher voltage can be attained without substantial increase in cost. With the super the full 150-volts H.T. can be used with great increase in sensitivity and in the power output, if a mains unit is employed; with battery H.T. such a voltage is admittedly expensive in primary cost and also in the running.

(Continued on next page.

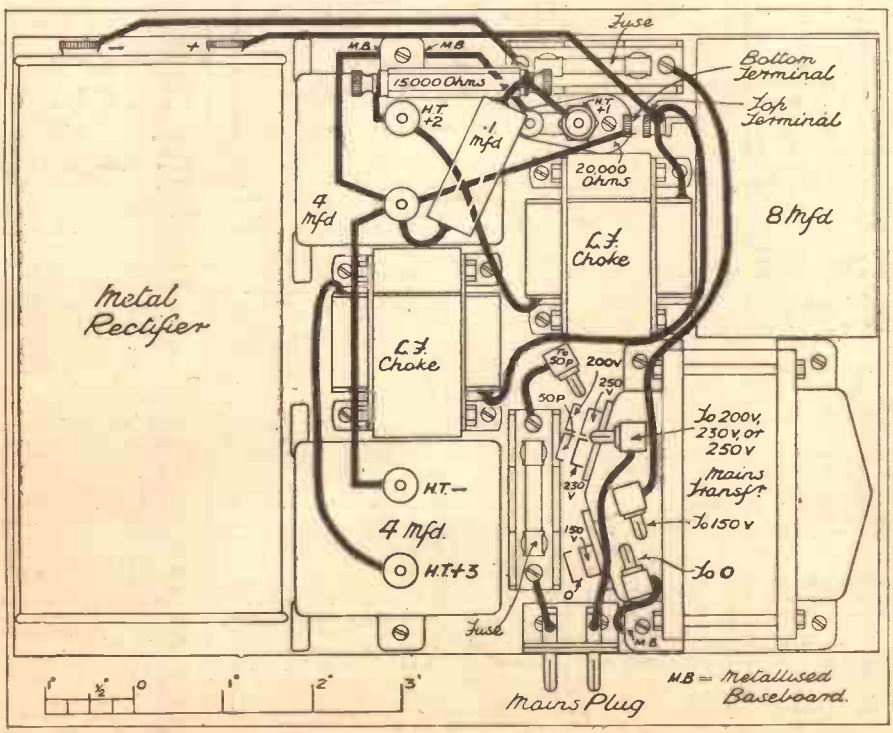
THE H.T. POWER PACK



The circuit is simple but the unit is effective, not only on the All-Wave Superhet, but on other battery receivers as well.

COMPONENTS FOR THE H.T. UNIT

1 Heayberd mains transformer, type W.42.
2 Bulgin L.F. chokes, type L.F.14S.
2 T.C.C. 4-mfd. condensers, type 61.
1 T.M.C.-Hydra 8-mfd. condenser, type 40.
1 Dubilier ·1-mfd. condenser, type 4403.
1 Westinghouse metal rectifier, type H.T.13.
1 Graham Farish 20,000-ohm " Ohmite " resistance in vertical holder.
1 Graham Farish 15,000-ohm " Ohmite " resistance.
2 Bulgin fuse holders, type F.12.
1 Bulgin mains plug, type P.33.
1 Peto-Scott " Metaplex " baseboard, 9¾ in. x 7 in.
1 Coil B.R.G. " Quikon " connecting wire.
Screws, etc.



The assembly of the parts for the H.T. unit is shown above. The 8-mfd. condenser is mounted on its side, the fixing of the base flange being to the edge of the " Metaplex " baseboard.

THE ALL-WAVE SUPER ON A.C. MAINS

(Continued from previous page.)

So that the unit shall have good voltage regulation for Class B a separate tap has been incorporated for the output valve, with a separate smoothing circuit. This tap gives the same voltage as the other "maximum" (H.T.+2); but the voltage drop through the smoothing choke is reduced by the separation of the anode currents of the rest of the set from that of the output stage.

This fact also makes it more convenient for those who desire to use the unit on sets not having Class B, for then the Class B circuit can be omitted entirely without the slightest upseting of the rest of the unit. In fact, such a case is an advantage in that a choke and a 4-mfd. condenser are saved from the list of components required, with an appropriate reduction of cost.

THE CHARGER PARTS

1 Heayberd mains transformer, type W.36.
1 Westinghouse metal rectifier, type L.T.4.
1 Heayberd 0-6-ohm regulating resistance.
1 Bulgin fuse holder, type F.12.
1 Bulgin mains plug, type P.33.
1 Peto-Scott "Metaplex" baseboard, 7 in. x 7 in.
2 Clix accumulator spades.
Insulated connecting wire, screws, flex, etc.

The construction of the unit is perfectly straightforward, and will take only half an hour or so. It is built on a piece of "Metaplex" baseboard, and the wiring diagram is quite self-explanatory.

No Terminals Required.

As the unit is primarily intended for the superhet, and is meant to go in the cabinet with the rest of the receiver, no terminals are used for the connection of the unit to the set. The three H.T. feeds for the positive side and the negative connection are made to various points in the unit itself, being taken off terminals on fixed condensers, with the exception of that for H.T.+1, which is taken from the top of the 20,000-ohm "Ohmite" in the vertical holder.

Switching.

No on-off switch is incorporated, for it was felt that the position of this is best left to the individual, though in the case of the superhet it can conveniently be situated on the side of the cabinet. It must not be forgotten, however, that the H.T. will have to be switched on and off as well as the L.T. when using the mains unit, otherwise the mains will be left on all the time, with consequent waste of energy.

The unit fits alongside the set behind the speaker, and it is advised that a piece of unmetallised wood be placed between the unit and the speaker so that no short circuit shall occur against the speaker frame.

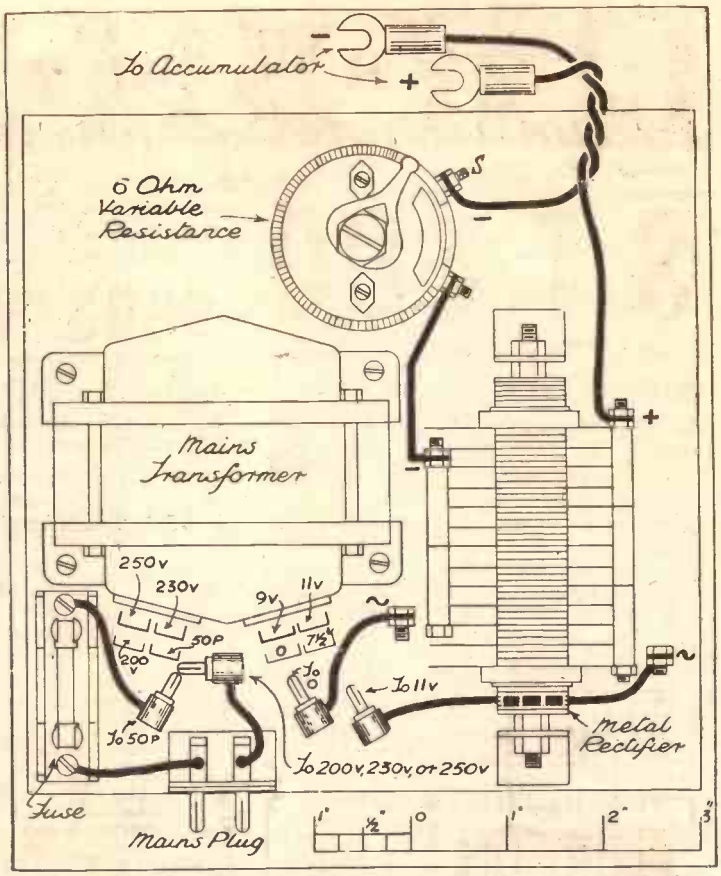
The accumulator fits beside the speaker, while the grid-bias battery is fixed by a clip to the inside of the top of the cabinet.

As regards the charging unit, this is designed to charge at a rate of 1 amp., and is not intended as a trickle charger. It is better for the battery to be partly run down and then recharged at a good rate once or twice a week than that it should be kept up to full charge with a trickle charger that is often left on, whether the battery needs replenishing or not.

I have seen too often batteries that have been thoroughly ruined by over-charging by their being left on charge day and night without the sets being used enough to reduce the charges in the batteries.

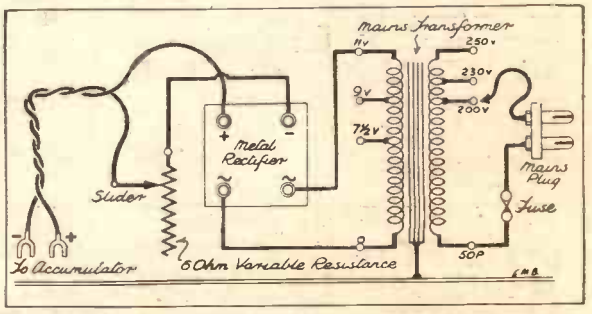
Such a state of affairs is completely eliminated by the use of a charger of the type illustrated here, while another important safeguard is also introduced. This is the removal of the deleterious effects of the spraying of the accumulator while charging. In the superhet the accumulator is placed in the cabinet near both set and speaker, and to have the battery charged while *in situ* would be very bad. The wet acid-carrying gases would soon attack the set and the speaker, and it would not be very long before trouble with both would be experienced.

(Continued on page 761.)



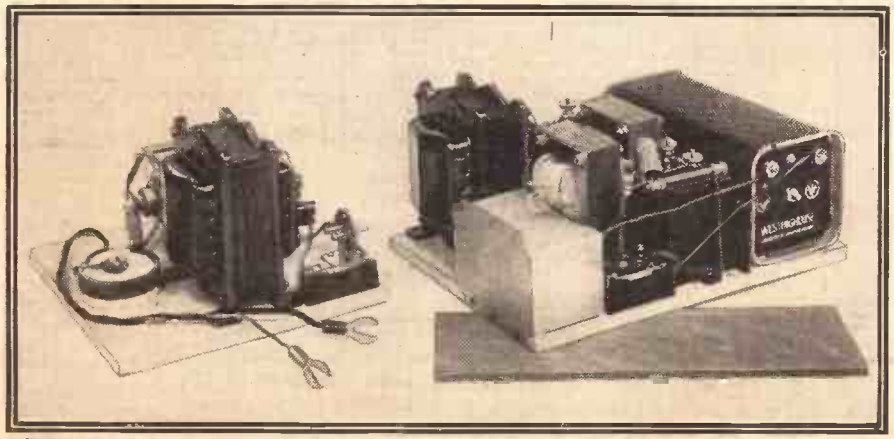
About half an hour should suffice for the construction of this unit—built like the other on a metallised baseboard. "S" is the slider of the 6-ohm resistance.

FOR HOME CHARGING



The variable resistance controls the charging rate of this easy-to-build home charger.

COMPACT AND EFFICIENT UNITS



Here are the two units ready for use. On the left is the L.T. charger. The piece of plain wood lying by the side of the H.T. unit is positioned against the unit when in place in the set as described in the text.

The Robot Raider

Details of an ingenious, electrically controlled model warship which numbers among its many fascinating features guns that fire automatically.

Built and Described by
G. V. DOWDING, AssociateI.E.E.

THE knowledge of circuits and the use of simple tools gained from the home construction of radio sets equip the constructor with the ability to do many other useful and interesting jobs. Models, for instance; and if you ask me what is useful in a model I'll say that I know of nothing more stimulating to one's technical imagination or restful than the building of models.

I have always been very keen on it, especially the construction of ship models, and I fancy my latest adventure in this direction has resulted in something rather unique. It is an automatically operating electrical craft with various fascinating controls.

How It Manœuvres.

It is only about three feet six inches in length, but it develops a quite considerable speed for its size. The automatic controls can be set in any sequence. A favourite sequence of mine is as follows:

The little vessel starts off at full speed, and, after running straight ahead for about fifteen seconds, the propelling motor slows down to half speed.

Then it speeds up again, and the ship turns in a full circle to the left. Full speed ahead again, and one gun fires with a convincing muffled boom and a puff of smoke.

Follows a turn to the right at half speed, the ship darts off again on a straight course, the searchlight comes on and the other gun fires. Finally, there is a half-speed turn to the left, a sharp turn right at full speed and the whole sequence repeats itself, except for the gun firing.

All the controls are electrically operated, and each in turn comes into action in accordance with the position of its plug in the sequence sockets. These sockets are connected to a fixed commutator, around which slowly sweeps a contact, driven through gearing by the propelling motor.

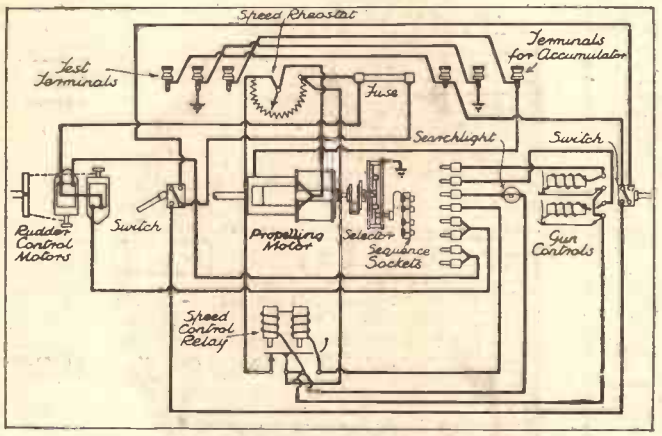
The guns are operated by trip relays, which fire off mixtures of percussion caps and sulphur. Steering is controlled by two small motors, and the speed control is carried out by a relay which shorts the rheostat out of circuit until its "selecting" impulse arrives.

Some of the plugs can be connected together so that two operations such as slowing down the speed and rudder turns can be operated together. As a matter of fact, an almost endless variety of sequences is available.

Other features of the little craft are as follows: The anchor can be let down or hauled up by a small winch affair in the bows. There are a number of portholes fitted with glass. The small guns in the bow and the stern are switches so that the ship can be started or stopped from either end.

In constructing the hull I first built up a framework with quarter-inch phosphor bronze for the keel and thin brass rod for the ribs.

This framework was then neatly covered with tin plate. No wood at all was used. The gun-firing mechanism is mounted on sorbo rubber. There is a buoy which would rise if the vessel should ever sink, and this would mark the spot. But it is also attached to the ship by fishing line, so that salvage would be an easy matter!



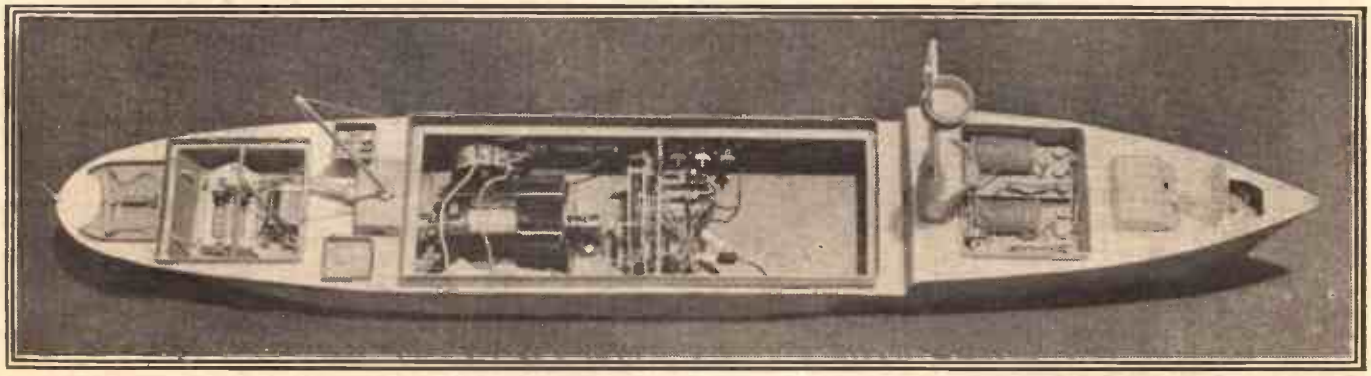
The circuit of our Technical Editor's all-electric model boat.

Water-tight Compartments.

I doubt very much if such a disaster will ever occur, for the craft is well compartmented. The steering motor and gun-control wells are water-tight compartments, and although the cover of this first and the main hatch cover fit tightly there are intervening plates which are fixed in position with adhesive tape before each trip.

The purpose of the three accumulator terminals is so that the six-volt battery can be connected across the outer pair for speed trials. The automatic controls are then inoperative until the two right-hand terminals are linked.

It is a fascinating sight to see this miniature war vessel manœuvring by itself on a large pond.



A view of the little ship with all its hatches and covers removed. From left to right you can see the rudder-control gear which is operated by two small motors, the external test terminals, the self-rising buoy and the rear "gun switch," the propelling motor with rheostat at one side and relay at the other, the fuses, the gearing which works the sequence-selector contact, the searchlight (in front of the forward mast), the gun controls, the forward gun switch and the hatch giving access to the anchor winch.

RADIOTORIAL
QUESTIONS & ANSWERS

LIKELY CAUSES OF LOSS OF VOLUME.

F. J. (Measham).—"I use a three-valve set running from batteries, and it is very satisfactory on the whole, except that it seems to be getting weaker.

"I get a lot of stations, foreign and B.B.C. But when I first had the set, back in January, 1933, it seemed much stronger than it does now. What can I do to make it louder again?"

As you have given us so few details about the set we can only suggest, in general terms, what would be likeliest to produce a fall-off in strength such as you describe.

Loss of emission by one or more of the valves is one possibility. In non-technical language it means that the valve is wearing out.

Such loss of emission is liable to occur after a valve has been in use for a considerable time; or it may occur with comparatively new valves if they have been run with incorrect grid bias, or with wrong H.T. or L.T. applied to them.

The valve suspected can usually be tested quite easily for this fault by a dealer.

Aerial deterioration. If your aerial contains any twisted joints, or if there is a poor connection between the aerial and the lead-in, the result might easily be as you describe. A switch with corroded contacts in the aerial circuit should also be suspected.

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

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

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

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

The best aerial system is one in which the wire extends without a break from the farthest insulator to the aerial terminal on the set—any joint between these two is liable to give trouble in time.

The earth connection. If you use a buried earth make sure that there is no break underground. If the connection is made to a water-pipe see that the clip is tight and that the surfaces at the joint are clean. Any break or poor connection in the earth system is liable to cause a loss of volume.

Incorrect voltage. Run-down and neglected H.T. and L.T. supplies are sure to result in loss of strength. Get your batteries tested with a good voltmeter—while the set is running, if possible.

The above-named are all likely causes, so each should be considered carefully.

If no improvement can be effected on these lines you are probably up against an out-of-the-ordinary fault, and we can help you to trace this only if you can give us more precise details of the symptoms—times of occurrence, whether continuous or intermittent, whether affected by new batteries or traceable from any alteration to set, such as the fitting of new parts, and the like.

FITTING A LOCAL-DISTANCE SWITCH.

B. S. O'L. (Cowdenbeath).—"Would it be possible to fit a 'local-distance' switch, such as the new sets use, on an ordinary battery set?

"I must wait for automatic volume control and the other big technical improvements until I can afford a mains set; but the convenience of a simple cut-down for everyday use by a switch seemed so desirable that I hoped I might be able to fit one for myself to the set I am now using."

It is usually quite an easy matter to fit a local-distance switch to a battery set—or, indeed, to any kind of set.

The parts needed are an ordinary on-off switch and a resistance. And all that need be done is to wire these as follows:

One side of switch to earth terminal. Other side of switch to one side of resistance. Other side of resistance to aerial terminal.

The only little difficulty that arises is in deciding what value of resistance should be used. Upon this value will depend the extent of the reduction in volume which is achieved when the resistance is switched in ("local" position).

The lower the resistance the greater the reduction will be. And since it is impracticable to forecast the effect in most cases, any values of resistances on hand may be tried to gain some idea of the individual requirements; or a variable resistance may be used to find a suitable degree of "softness" for the local station's programme.

A value of a couple of hundred ohms or so is a rough guide to average requirements.

TRACKING CRACKLING.

R. L. (Chatham).—"Can you give me any information about getting rid of crackling, which spoils reception?"

The first thing to do is to try to determine whether the noise is due to the set or is being picked up by the aerial-earth system. Take off both aerial and earth leads and listen carefully to see if the crackles cease.

If so the set itself is probably in order. So examine the aerial and earth wires throughout their length to see if there is a break, broken insulator or other fault to account for the noises.

Failing to find anything, try first the aerial and then the earth, joined to the set, to see if the fault can be localised to *one* of these.

Either may be picking up the noises, and if one is proved to be the source of the interference try to move it, or replace it, to get out of the noisy area.

Thus, if you suspect an aerial that is placed north and south, try another, running east and west this time. An alteration of position may reduce or cure the trouble.

Often, however, crackles appear to be but little affected by aerial and earth removal from the set,

(Continued on next page.)

RADIOTORIAL QUESTIONS & ANSWERS

(Continued from previous page.)

indicating that the trouble is not being picked up by them, but is inside the set itself, or coming along the mains if it is an electrically-driven set.

Almost any poor connection in the set or in the associated leads can give rise to crackles, so an expert overhaul is needed in such instances.

Defective components, too, are likely to give rise to the trouble. And since the quick tracing of the fault depends upon noting exactly how it displays itself, it is essential to get someone of experience to listen to the set in order to determine what is likeliest to be wrong with it.

It is almost impossible for the set owner without experience of fault-tracing to find the fault for himself without the risk of damage to the set.

S.G. VALVE AS DETECTOR ON SHORT WAVES.

J. W. E. (Walton-on-the-Naze, Essex).—"If an S.G. valve is tried out as detector with an ordinary home-made set of short-wave coils (2, 4, 6 and 8 turns), what sort of resistance value (grid leak) and condenser values should be employed?

"It is to be just a two-valver, for experiment, the second valve being an L.P.2, coupled through a resistance-capacity stage arrangement and working loudspeaker or 'phones."

The fact that an S.G. valve is to be used as detector does not necessitate wide departures from standard practice in two-valve short-wave working.

We should try a 3-meg. leak and ·0001-mfd. grid condenser to start with. But watch for any hints that may be given by W. L. S. in "On the Short Waves," since valves and other items vary from time to time, and the last ounce can only be gained from a short-waver by experimentation.

Condenser values would be about ·0001 mfd. for tuning and reaction; and a ·0001 mfd or thereabouts in the aerial circuit if this method of aerial coupling is used. Don't forget that a big condenser, say 1 mfd., will need to be connected in an ordinary circuit from the S.G. screen to earth.

A CONDENSER'S IMPEDANCE AT HIGH FREQUENCIES.

"Studious" (Malvern).—"I have been trying to work out the reactance of a condenser when placed in series (for coupling) in low-frequency and high-frequency circuits. The formula I used for both was:

$$\text{Reactance} = \frac{1}{2\pi f C}$$

where π is 3½, f is the frequency and C capacity in farads.

"This seems to come out right on low frequencies, but not on the high.

"Is this formula right for both high and low? And, if so, where have I gone wrong?"

The formula is suitable for both high and low frequencies. But for your high-frequency examples perhaps you have misinterpreted "f." That factor represents the *frequency* of the currents applied to the condenser; but if in your working of the H.F. examples you have given the wavelength figures instead of the frequencies, the formula will not be correct. For all the given wavelengths it is essential to convert the figures to the corresponding frequencies.

It is easily done, since frequency in kilocycles is always to be found by dividing the wavelength (in metres) into 300,000.

Thus a wavelength of 150 metres represents a frequency of $\frac{300,000}{150} = 2,000$ kilocycles (i.e. two million).

If you proceed in this way, changing the wavelengths to the corresponding frequencies, you will find the formula will come out right for high as well as for low frequencies.

CHOKE-FEEDING A TRANSFORMER-COUPLED LOUDSPEAKER.

W. A. (Long Melford).—"As I could not get much satisfaction out of the loudspeaker people, I wrote to ———'s, telling them I had used their valve in the output stage, and asking for any suggestions.

"They proved very helpful, but I do not see what is meant by the following in their letter:

"'To remove the last trace of L.F. oscillation it may be necessary to choke-feed the output transformer by treating the input terminals of this as though they were a pair of loudspeaker terminals.'

"Can you enlighten me as to what this means, as I do not want to keep troubling them? I am willing to pay for a diagram, so if this is necessary please say how much."

It can be explained in a few words without a diagram.

At present you have your loudspeaker connected to an output transformer's "L.S." terminals. The + and P (or A) terminals of this transformer are joined respectively to H.T. + and to the valve's plate terminal. (That is where the two terminals on the set will be found to lead.)

The suggestion is that you should use a choke and condenser for coupling the transformer, in the way that they are commonly employed to connect a loudspeaker to a set.

The Connections you should make.

All you have to do is the following: procure a 2-mfd. condenser and an output choke of a type suitable for use with the output valve that you are using.

Undo the two leads from the set to the output transformer and join the new output choke to the set instead.

You will find that one end of the choke is then connected to H.T.+, and the other end of the choke is wired (inside the set) to the last valve holder anode terminal.

Mark this latter choke terminal, to distinguish it from the one that goes to H.T. +. And then run a lead from the marked choke terminal to one side of the new condenser. Join this condenser's other terminal to the + terminal of the transformer.

Finally, join the P (or A) terminal of this to the L.T. — terminal, which completes the alterations.

You will note that the transformer remains connected to the loudspeaker itself as before. But you now have the choke to carry the valve-plate current, and it feeds only the L.F. currents to the transformer through the condenser.

It is a method often recommended to prevent instability or L.F. feed-back.

The L.F. choke keeps the low-frequency pulses of the output valve from varying the H.T. voltage and thus causing feed-back, via the anode-current supply of a previous value, to the grid of the output valve.

THE ALL-WAVE SUPER ON A.C. MAINS

(*Continued from page 756.*)

With the charger shown it is necessary to remove the battery from the set for re-charging, and to connect it up to the charger, which can be situated in any convenient place. This is no hardship on the owner of the set, whether of the superhet or any other battery receiver, for the battery will need charging but once or twice a week, and this can be done overnight if required. There is no need to let the battery run right down, but naturally the frequency with which the battery needs recharging depends on its capacity and the amount it is used.

The rate of charge is controlled by the taps on the transformer, but I advise users of the unit to keep to the 1-amp. rate, and to keep the plug marked in the wiring diagram "to 11 volt" in the 11-volt socket on the transformer.

Adjusting the Charger

A variable resistance is used to enable two-, four- or six-volt batteries to be charged. In the case of two-volters the resistance should be all in—that is, the slider should be moved from the off position till it makes contact with the resistance wire.

For a four-volt battery the resistance should be reduced to about two-thirds, and for a six-volter it should be reduced to about one-third. That is all the adjustment that has to be made, and otherwise the charger is perfectly proof against over-charging.

It is suggested that, in the case where the power pack for H.T. is to be used with a set that does not allow of the unit being incorporated in the receiver cabinet, it should be fitted with a wood or metal cover. The charger should certainly be so fitted unless it is used in a position where "unofficial" hands cannot come into contact with it. Nobody wants an electric shock, and it is always best to take precautions against accidents.

When the battery is not being charged the charger should be disconnected from the mains.

A WELCOME BROADCAST

Our Radio Critic Reviews the Recent B.B.C. Programmes

GOOD-BYE, Mr. Chips! I liked the book when I read it. I liked the play that was made out of it. I like the author's restraint, which is always obvious to the reader. With James Hilton nothing is rubbed in; there are no irrelevances. The play preserved this feature and profited thereby. There were also other things that made me like the play. First and foremost there was Richard Goolden's magnificent acting as Mr. Chips. I was amazed at the clever gradations of his voice with his advancing years. There was a very definite alteration in the timbre for every new phase of life. He did full justice to a fine libretto, particularly in the speeches. He also understood the special brand of humour. Richard Goolden should never play a small part again. He has now shown his worth.

* * *

I liked Mrs. Chips. Her voice was beautiful, and she had beautiful lines to say. They were all too short, perhaps, but I do not blame the cutter. The cutting was excellent, everything hanging round Mr. Chips, as it should do.

I liked the humour and the amusing tilt at Latin's new pronunciation. I liked the effects: they were successful because they were not obtrusive. I liked the class-room scenes, especially the laughter of the boys. Crowd scenes on the wireless sometimes irritate me. The small boy (was it Lauri Lane?) always made the laughter sound real and spontaneous. I liked a good deal more, too, but I have said enough. On second thoughts I might add that I even liked the sentimentality of the story. I don't always like sentimentality, but as I have already said, James Hilton can practise restraint.

* * *

From time to time dance bands are attacked, but you will notice that the displeasure they cause is on account of the stuff they sometimes play. Dance bands as a type have always been accepted, and particularly on the air. I think they have an ideal medium in radio for their particular function. I think a reason for this is to be found in their size. As bands go, dance bands are small. Big orchestral music never broadcasts quite so well as dance music does. Neither does big chorus singing. On the other hand, the Gershom Parkington Quintet always broadcasts well, and it is small. I am no authority on the question of sound transmission, but experience in listening to all sorts of music has made me come to the conclusions I have regarding dance bands and the success of their broadcasts.

* * *

The biggest laugh of the week was provided by a Charlot's Hour turn. I laughed uproariously over that sketch that ridiculed some of our modern language teachers and their methods.

* * *

It was a pity that Jeanne de Casalis signalised her return to the mike, after an absence of eight months, with another "Mrs. Feather" episode. I had hoped she would be striking fresh ground, for she is such a good broadcaster.

* * *

I liked the "Queries in Quatrains" stunt. I couldn't have solved all the queries without the help of the voice and the effects. But with this help things took a different turn.

* * *

A revue by Du Garde Peach is always an occasion for interest. He always gives us something to think about afterwards; sometimes it is something to discuss. His collaboration with Ernest Longstaffe, who has already written a lot of tuneful music for broadcasting, was a happy one, and their "Our Town" will remain in our memories for some long time. I thought Ernest Longstaffe's contribution this time was particularly distinguished.

C. B.

MORE ABOUT THE "B.C.L." TWO

(*Continued from page 746.*)

best reaction control on the detector. Individual valves may not vary much in their paper characteristics, but sometimes they are incredibly variable in their behaviour as detectors.

Finally, let me advise you very strongly to keep your "externals" neat and tidy. I have always had a hatred of floppy battery cords, Heath-Robinson aerial lead-ins, and all the rest of the things that so often spoil the performance of a good set.

Do avoid them all like the plague, and try to get the short-wave corner of your den as tidy as the drawing-room. Don't leave tools lying about near the set; they make an appalling row when they shift. Don't have boxes of loose wire about the place; even that can kick up a marvellous racket.

If you take all this advice and aren't pleased with the results from your "B.C.L." Two, then it really *will* be the fault of the set, but I don't anticipate that.

THE ROMANCE OF THE RAILWAYS

A wonderful book on the greatest system of transport in the world

RAILWAYS in the first half of the nineteenth century held the place as a scientific wonder that wireless has held in the first part of the twentieth century.

Indeed, the history of this wonder of rapid transport was in character remarkably like the development of wireless. The railway, like wireless, began in a small way that caused wonder, and then developed rapidly till in a few decades it had covered a great part of the earth.

The romance of the railway, with its mighty locomotives, its marvellous system of signalling and its penetration of new and almost unknown lands, is a really fascinating story, and it is told in enthralling style in a new work just published.

Full-Colour Plates.

This is called RAILWAY WONDERS OF THE WORLD, and the title is really descriptive of the book. Every phase of railway marvel and romance is dealt with.

It is profusely illustrated from beginning to end with a remarkable series of photographs gathered from all parts of the world, and in addition to the half-tone pictures there are pages and pages of photogravure, with a large number of plates in full colour, Never has there been a book dealing with the railway so profusely and wonderfully illustrated.

Such a work, issued immediately in volume form, would be expensive and beyond the reach of most people; but RAILWAY WONDERS OF THE WORLD will be available for all, for it is to be issued in weekly parts at sevenpence, and the first part is on sale at all bookstalls and newsagents. To avoid disappointment an order should be placed at once so that there may be no delay in delivery.

No reader of POPULAR WIRELESS should miss the first part of RAILWAY WONDERS OF THE WORLD, price sevenpence, which can be obtained from your newsagents.

THE B.B.C. AND TELEVISION

(*Continued from page* 744.)

Scottish Poets.

Because it is the last of the series of programmes that began more than four months ago as a survey of Scottish poetry—a series which, incidentally, has proved of great interest to all types of listeners—I should like to mention that on Wednesday, February 20th, references will be made to and readings taken from the works of Lewis Spence, John Buchan, Rachel Annand Taylor and Alexander Gray.

To some extent the completion of the series will leave a gap in the Scottish programmes, but listeners can rely upon the ingenuity of Mr. Moray McLaren, the Scottish Regional programme director, to fill it with something equally acceptable.

* * *

Lincolnshire To-day.

Lincolnshire of to-day—and that means a lot—will be the subject of a special programme from the Midlands on Monday, February 11th. In arranging and presenting it the Birmingham staff of the B.B.C. is having the co-operation of the Lindsey Rural Community Council, whose chairman, Lord Heneage, will speak in the course of the broadcast.

A farm labourer and a male-voice quartet will sing some old Lincolnshire songs, and there will be a number of short talks dealing with farming, draining, warping—which is a form of land reclamation—in the Isle of Axholme, and with village history. That truly characteristic feature of the country, the windmill, will also be represented in the programme.

* * *

B.B.C. Orchestra for Brussels.

My information from the Continent is that the greatest interest is being shown in the forthcoming visit of the B.B.C. Symphony Orchestra to Brussels for the concert it is giving on Tuesday, March 12th, at le Palais des Beaux-Arts, under the baton of Dr. Adrian Boult.

That non-musical England should possess the largest and one of the finest orchestras in the world would have been regarded as a joke a few years ago, but to-day continental listeners are just as familiar as are British listeners with the playing of the B.B.C. orchestra, which they are also anxious to see performing. There is a strong possibility that this visit to Brussels will be the forerunner of future continental tours by the orchestra.

* * *

An Unemployed Concert.

Unemployed miners and steel workers constitute the majority of the members of the Ebbw Vale and District Male Voice Choir, which will be heard in the course of an hour's relay from a concert at the Palace Theatre, Ebbw Vale, for West Regional listeners on Wednesday, February 13th. The choir is this year competing for the first time at the National Eisteddfod, which is to be held at Caernarvon.

The programme on February 13th will include items by Isobel Baillie (soprano) and Vera Thomas (pianoforte). The latter artist was a "National" winner at Neath last year and also at Wrexham in 1933.

* * *

"Hearts Are Trumps."

Two performances of the operetta "Hearts are Trumps," in which L. du Garde Peach and Victor Hely-Hutchinson collaborated, will be given in the Midland programmes on Saturday, February 16th, the first in the Children's Hour and the second at 9.30 p.m.

The cast will include Alex Penney, Alfred Butler, Geoffrey Davis, Helmar Fernback, Harry Saxton and Doris Nichols.

O. H. M.

A READER PRAISES THE "B.C.L." TWO

The Editor, POPULAR WIRELESS.

Dear Sir,—In regard to the "B.C.L." Two I have made up this short-wave set and it works well. The easy control of reaction is its most dominating feature.

Those of your readers who have made this set need not sit up every night to get America. I have just received W 3 X A L from half-past two to three p.m., and have not missed a word on the "B.C.L." Two.

W 3 X A L operates on a frequency of 17·780 kc. every Thursday and Friday afternoon, from 2.30 p.m. to 3 p.m. This station can be heard at 8 p.m. on the above wavelength, and also on 49·18 m. every Thursday and Friday, conditions permitting, of course.

G. RIDDLE.

12, Pitman Avenue, Trowbridge, Wilts.

MIRROR-SCREWS FOR HIGH DEFINITION

Some notes on an interesting German television receiver designed for 180-line transmissions.

By Dr. ALFRED GRADENWITZ

ALL television schemes shown at last year's Berlin Radio Exhibition, with one exception, were based on the use of cathode-ray tubes at the receiving end. Only Messrs. Tekade, of Nuremberg, retained the optico-mechanical principle, using the mirror-screw scanner which they were first to introduce into television practice.

Inasmuch as their apparatus only employed 90 lines, they, of course, failed to come up to the high quality of the rest of

Fig. 1. The combined 180-line mirror-screw television receiver referred to by Dr. Gradenwitz.

the television pictures at the Exhibition, all of which are built up of 180 lines.

Now, however, they are coming out with a 180-line mirror-screw receiver giving high-definition television. Fig. 1 shows the combined receiver cabinet, which comprises two ultra-short-wave superhets and a Kerr cell serving to modulate the light beams at the receiving end, as well as the optical system.

The set is extremely handy in operation, being set working merely by turning the two switch-knobs visible on the right and left respectively (which serve to switch on the two ultra-short-wave sets) and the controlling knob in the centre. Two small windows above the switch knobs show, by means of the two luminous letters "B"

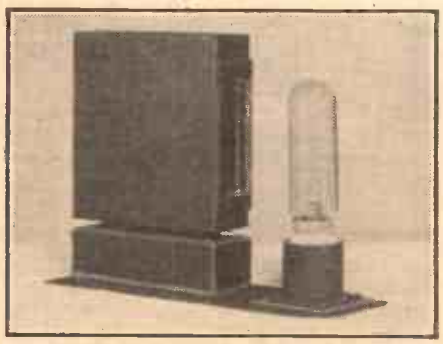


Fig. 2. The Kerr cell unit with its projection lamp used in the receiver shown above.

and "T" appearing there, whether the picture and sound receivers respectively are in operation.

The central knob regulates the potential applied to the Kerr cell unit, which is shown in Fig. 2. Inasmuch as an ordinary incandescent lamp serves as source of light, television pictures are extraordinarily bright, appearing in black and white.

S.T.600 COILS

An important explanation.

IN our issues dated the 19th and 26th of January we published articles by Mr. John Scott-Taggart relative to his famous S.T.600 receiver, in which, it will be remembered, our distinguished contributor summarised one or two of the pitfalls into which constructors had fallen, and explained the ease with which the troubles could be overcome.

Unfortunately, in one or two quarters some of the statements contained in those articles, and intended to be absolutely of a constructive nature, have been misconstrued as being a condemnation of certain of the parts employed.

We therefore wish most emphatically to impress upon those readers who have misinterpreted the facts that the references are not intended as any reflection upon the parts in question. The troubles in almost every case are due entirely to purely local conditions and have nothing whatsoever to do with the overall efficiency of the S.T.600 or of any of the parts used in it.

In this connection the following extract from a letter from Messrs. Wright & Weaire, Ltd.—to which we gladly give publicity—clearly defines the position.

THE EDITOR.

"We do not for one moment believe that Mr. Scott-Taggart realised when these statements were made the effect that it would have on the public mind, but in actual fact we are receiving cancellation of orders, the reason given being that in POPULAR WIRELESS it is stated that the "breakthrough" on our coils is more pronounced than on those of other makes.

"We wish to make it perfectly clear that the coils have been wound and adjusted to Mr. Scott-Taggart's specification. They have been tested and approved by him, and every individual coil unit which has been sent out by us has been accurately matched and conforms to the standard supplied to us by Mr. Scott-Taggart.

"As we understand that Mr. Scott-Taggart is at present abroad, we are not able to discuss the matter with him, and we should feel grateful if you would publish this letter in order to reassure the public who are interested in the purchase of our components that they are receiving the standard unit as recommended by the designer."

Yours faithfully,
For WRIGHT & WEAIRE, LTD.,
A. ROTHSCHILD,
Sales Department.

THE 1935 BROADCASTER ANNUAL

WE recently received a copy of the "1935 Broadcaster Annual," or, to give its full title, "The Broadcaster Radio and Gramophone Trade Annual." It is published at 5s. by "The Broadcaster and Wireless Retailer," 29, Bedford Street, London, W.C.2.

The varied data contained in this work make it a most valuable book of reference. The 30 pages devoted to radio servicing contain information of great assistance to all servicemen. There is also a special feature giving quick tests for nearly one hundred standard types of receivers.

Other items include radio designing, a valve section dealing with every kind of valve on the market, and an index to the electric supply in nearly 5,000 districts.

Then there are reference sections dealing, among other things, with manufacturers names, addresses and telephone numbers.

Although we have only mentioned specifically a few of the contents, we have given sufficient to indicate the wide scope of this publication. It is available to all servicemen and others connected with the radio trade.

NEW W.B. SPEAKER

Details of the latest "Stentorian" Baby Cabinet model.

THOSE listeners who do not employ extension loudspeakers fail to use their radio to full advantage. It is all wrong to think of a radio outfit as a kind of fixed centre of entertainment, although it is easy enough to understand why this attitude is adopted.

The piano, American organ, mechanical gramophone, in fact everything in the nature of home entertainment which preceded radio, had to operate as a "fixed centre," and so there must obviously be a tendency to regard radio as having the same kind of inherent limitation.

But, of course, it hasn't. You can "lay it on" all over the house in the same way as gas or electric light is distributed, and so have it available just where it is wanted. Perhaps even in two or more rooms simultaneously.

By this means the fullest use and enjoyment of broadcasting can be obtained. When the radio is confined to the one room it will inevitably not always be available for easy use when it is wanted, especially in the winter. Maybe the room in which it is contained is not being employed; there is no fire.

Again, it is a very arbitrary arrangement which insists that those who wish to listen must gather in the one room. Anyone who has to be in some other room, perhaps to undertake some vital domestic task, will be penalised.

This new W.B. speaker will handle up to two watts and costs only 29s. 6d. The cabinet is of walnut veneer.

There is no reason at all why the set itself should not be tucked away in the one room, or even prominently exposed in it, if it is of good appearance. In fact, that is the best method, for it enables good permanent aerial and earth and, if available, power connections to be made.

But there can be extension speakers serving any room in which it is desired to listen. Practically any set will operate two or more loudspeakers, and it is quite a simple matter to run wiring for extra speakers.

The Whiteley Electrical Radio Co., of Victoria Street, Mansfield, Notts., have probably done more than any other concern to make extension loudspeakers simple and satisfactory and to render them an attractive proposition.

For one thing, with their "Stentorian" principle they created a new standard of sensitivity for the permanent-magnet type. Those W.B. "Stentorians" really are surprisingly sensitive, and two or three can be run from a set of the most modest pretensions and give full-bodied results.

And the prices! Let us tell you about the very latest W.B. loudspeaker. It is a moving-coil instrument and is built into a walnut-veneered cabinet of handsome appearance. At the back there are plugs and sockets enabling it to be used either as a principal speaker or as an extension speaker, of either low or high impedance, to suit the conditions.

It will handle as much as two watts, though, because of its great sensitivity, it will satisfy most with very much smaller inputs than that.

What, we wonder, would readers regard as the "natural" price for such a proposition as this? Two or three guineas? Actually the retail price is 29s. 6d.!

This is truly bringing first-class reproduction within the reach of all. Moreover, it is making it possible for practically all to enjoy at their best the benefits of extension loudspeaker working.

The W.B. "Stentorian Baby" is a first-class speaker and the results it gives are out of all proportion to its price. As we have said, the sensitivity is well above normal. There is also a clearness and complete adequacy of the high notes, giving characteristically clear sound definitions.

In short, it is the loudspeaker for the connoisseur at a popular price, and we strongly recommend it to all our readers.

"DOWN UNDER" WITH THE KELSEY ADAPTOR

(*Continued from page* 743.)

Then I started at the bottom of the dial and worked upwards. I soon hit other good signals. Zeesen on 31·38 metres, was logged at 55 degrees, and not far below that, on 50 degrees, I had located Madrid E A Q—the Spaniard on 30·43 metres one could hardly fail to hear.

And so it went on, as I filled in all the short-wave familiars. Nary a sign of America, though.

Next night was Sunday. I switched on about midnight and twiddled around 30 metres. Dropping down a peg, I heard an unmistakable Yankee accent. I grabbed everything and brought up the signal to really decent loudspeaker strength.

It was a religious talk. At the end came the clear announcement: "W I X A L, of Boston, Massachusets." Now the interesting point is that this is not one of the stalwarts of American short-wave reception, being a mere 5-kilowatter.

But if that 5-kilowatter could be heard so well on the unit and three-valve set it is a moral certainty that, given better conditions, such stations as Pittsburg and Schenectady would tend to "bust" the loudspeaker.

By the way, all the signals come in twice—this being a short-wave superhet. My readings are for the higher of the two settings. Don't go by them too much, because there are so many factors tending to make your own readings different from mine.

This is the goods, this unit. For hooking on to a broadcast set with a stage of high frequency it is ideal. I hand it to the designer—he's done it again.

"The Experimenter"

RUNNING EXTENSION WIRES

And Other Jottings of Interest to All Set Users.

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

I SUPPOSE all of us at some time or other find the need for running wires around a room or from one room to another. It may be the wire for an indoor aerial or it may be extension leads to a distant loudspeaker.

During the past three or four years there have been two or three different kinds of "strip" leads—that is, wire leads secured into a strip which are convenient for fixing to the wall or to the floor. These strips are either adhesive or adapted to be tacked in position easily.

Running Leads Under Carpets.

An addition to this line of components, and a very efficient one, too, is the new Goltone ribbon-flexible. This was tested recently by the Research Department of "P.W.," and an account of it was given several weeks ago. I only mention it here to tell you that I have just lately been using a length of this strip and found it excellent and very convenient to manipulate.

The two stranded leads are embedded in a stout and very tough rubber strip, and one of the great points about it is that it will stand all kinds of rough handling, even treading on, twisting and so on, without apparently any damage being done. It goes under carpets in the easiest way, and, instead of that awful ridge, which you feel when walking over the carpet with ordinary electric-light flex under it (and which, in time, wears a line across the carpet), you hardly notice the strip conductor at all. In fact, you would have a job to guess whereabouts it was under the carpet.

I can strongly recommend this to all of you when you next have the job of running indoor leads, especially under carpets.

Arranging the Knobs.

It has often been suggested that the control knobs on radio sets should be standardised—I mean not so much the *type* of knob as the *position*. If you have handled a number of different types of set, especially commercially built sets, you know how much the positions of the controls vary. Unless they are marked, or the owner of the set puts you wise, you have to do quite a bit of fiddling about before you know where you are.

The bottom right-hand corner is the usual place for the reaction control, but in one of my sets this is in the *top* right-hand corner, whilst in another it is in the bottom *left*-hand corner. So there's only one place left before it's been all round the map! The volume control is generally on the right-hand side, but again I have another set in which this is on the *left*-hand side.

H.F. on the Left.

One gets into the habit of thinking of the high-frequency side of the set on the *left* and the low-frequency on the *right*, and this is the way that a circuit is invariably laid out in a circuit diagram. It would be extremely unusual to draw a circuit diagram starting with the high-frequency part at the right.

Accordingly, those controls that relate to the H.F. part of the set seem to belong rightly to the left, whilst the low-frequency controls fall naturally to the right. The tuning, of course, takes its natural place in the centre.

Where Does the "Wavechange" Go?

According to this scheme, the reaction control ought to be at the left, but, as I say, one generally finds it in the bottom right-hand corner. The tone control and volume control are usually on the right, which fits in with the scheme, whilst the wavechange switch would seem to belong to the left.

I confess right away that in one of my own sets the wavechange switch is on the right, but the volume control is also on the right and the reaction on the left. The on-off switch, being relatively small, can be placed at any convenient position—it is often put on the left-hand side of the panel.

A Lack of Uniformity.

There seems to be a complete lack of uniformity amongst manufacturers on this point. I think it would be a good thing if some regular plan were adopted, and, after all, there seems to be no serious practical reason against it.

Some manufacturers also stick to the very small knobs that were used in the early days of wireless. A small knob is all right for an on-off switch, but, for the other controls, I must say that I like to get hold of something really substantial. Nothing is more irritating than pettifogging little knobs, like buttons, that jump about 20 degrees the moment you touch them.

How Many Controls?

A question about which there has been a good deal of discussion during the last two or three years is whether the controls on a set should be reduced to one knob or two or three, or whether a much larger number of controls should be provided.

Other things being equal, it is obvious that the more the number of outside controls can be reduced the better, and I think everyone will agree that it is not so much the question whether a large number or a small number of controls should be used, but only whether the same efficiency can be obtained with a smaller number of controls as with a large number. There is obviously no advantage in itself in having an unnecessary number of controls.

Speaking of reducing the number of controls reminds me of the old question of whether ganging reduces efficiency.

Does Ganging Reduce Efficiency.

Some people maintain that ganging greatly reduces the efficiency, at any rate under ordinary conditions of ganging. In other words, they believe that unless the

(*Continued on next page.*)

RUNNING EXTENSION WIRES

(Continued from previous page.)

coils are very accurately matched and the condenser very accurately ganged, you will lose heavily on the ganging principle.

On the other hand manufacturers have now so improved their coils and condensers that it is possible to get ordinary mass-produced components, at a reasonable price, which match or gang to a remarkable degree of accuracy.

It is cheaper to build a set with separate tuning condensers and many home constructors prefer to do this rather than pay somewhat extra for ganged components. Another point is that a ganged condenser is generally a little more difficult to mount on the panel than the ordinary simple disc-dial type.

It has to be admitted that although the ganging principle has great advantages, it *does* involve a certain loss in efficiency, in cases where the ganging is not perfect throughout the whole of the two wave-bands.

Wavechange Switching.

If the set is of fairly high power a slight loss of efficiency is not of very great importance and the simplicity of tuning probably far outweighs it.

A small set with, say, one stage of high-frequency amplification, can be made to give results which are out of all proportion to its size, if it has separate tuning controls and is handled by an expert. On the other hand, if it is used by the average listener it will probably be no better than a small type of set having properly arranged ganged tuning.

Some people again like to see a set with knobs and controls all over it. They feel that they have every part of the receiver available for accurate adjustment and that there is no "averaging" for simplicity.

There are certain ways in which ganging can be used where it does not affect the efficiency of the set—wavechange switch ganging, for instance. The extra cost here is negligible and this is a case where ganging seems to be worth-while.

Permeability Tuning.

I suppose it is the best part of a couple of years now since we first heard of permeability tuning. Great things have been predicted for this system of tuning, and all readers will be particularly interested in the announcement on this page of a special permeability-tuning receiver for home construction.

The first thing that led to permeability tuning being considered was the introduction of the iron-cored coil. Iron-cored coils have got on quite a lot, and the idea of permeability tuning is really a more or less natural outcome of this.

You no doubt know that permeability tuning consists in altering the wavelength or frequency of a coil by moving an iron core nearer to the coil or farther away from it. It is quite easy in this way to vary the wavelength, to which the coil responds, over the necessary range.

Iron-cored Coils.

The genuine iron-cored coils have the cores made in a special way, which is essential for the efficient working of the coil and which took many years of experimental work to perfect. Unfortunately, there have been a number of spurious coils put on the market which have not been made on proper lines, and these have naturally not given results that were expected.

The genuine coils, however, are very efficient, and there seems to be no doubt that they have come to stay. You will see that I am drawing a distinction between the use of iron-cored coils and the use of the same principle for permeability tuning.

Along with the introduction of the iron-cored coil, ordinary air-cored coils, having been put on their mettle, as it were, have also been improved in efficiency and reduced in size, which has to some extent detracted from the advantage which the iron-cored type would otherwise have enjoyed.

Superhet Coils.

Another point is that the superheterodyne type of receiver has greatly increased in popularity lately, and in this type of receiver the advantage of the iron-cored coil is not so marked as in an ordinary straight receiver, largely due to the fact that the superheterodyne circuit is of itself extremely selective and does not, therefore, need the extra selectivity derived from the iron-cored coil. In the majority of superhet receivers ordinary air-cored coils are used with perfect satisfaction.

Personally, I think we shall see the iron-cored coil, including permeability tuning, continue to increase in favour with set manufacturers.

NEXT WEEK

All about the

"NU-TUNE" THREE

Full details for building this most up-to-date receiver which employs

Permeability Tuning

ORDER A COPY TO-DAY

A Radio Report of 1934.

The Report on Broadcasting for 1934 has been issued and makes very interesting reading. One thing which is particularly noteworthy is that the Empire broadcasts have proved a great success, so much so, in fact, that wireless exchanges are being set up and re-broadcasting facilities provided in many further parts of the Empire, including Ceylon and the West African Colonies.

It is interesting also to note that over two thousand applicants were given trials in the audition department, but not more than 2 per cent of these were found to be suitable for immediate engagement.

Economics of Broadcasting.

Those of you who are dissatisfied with what you get from the B.B.C. for your 10s. a year should bear in mind that the B.B.C. only gets a comparatively small part of

(Continued on next page.)

RUNNING EXTENSION WIRES

(Continued from previous page.)

the 10s. The amount varies a little, but a recent audit showed that the B.B.C. got 4s. 7d. out of each 10s., the other 5s. 5d. going to the Post Office, the Treasury, Income Tax and General Government Revenue in the proportions respectively of 1s., 3s. 5¾d., 5d. and 6¼d.

The principal B.B.C. expenditure out of its less than half of the 10s. is actually devoted to artists' fees, performing rights, orchestras, news and all the various matters connected with supplying entertainment to listeners.

CURING ELECTRICAL INTERFERENCE

WHAT has happened to that big committee which was formed to investigate electrical interference? Formed over a year ago, wasn't it? Ah, yes, we remember, a month or two back there was something in the nature of an interim report. Just to let us know that it was still there, we presume!

But, of course, it is faced by many very difficult problems, and we expect that not the smallest is for individual members to find the time to make their individual contributions to it, for they are all responsible officials or leaders of various active branches of industry and have other vital duties to perform.

At any rate, still joking aside, the interim report showed that a vast amount of preparatory work had been accomplished and that the multifarious problems were being well and truly aligned.

In the meantime, individual listeners know to their cost exactly what this electrical interference is. It is experienced in varying degrees and sometimes assumes quite intolerable dimensions.

There are several methods of dealing with the trouble, and quite successfully, too; but those which call for internal alterations to the set cannot be applied by any but an expert, for mains sets must not be tinkered with by those who are not either experienced constructors or servicemen.

It is for this reason that we predict a great success for the new Bulgin Mains Interference Suppressor. No alterations to the set or to its wiring are needed to apply this useful article.

The Bulgin Interference Suppressor utilises a scheme recommended by the G.P.O.

It is designed as a simple plug-socket adaptor for use in conjunction with all two-pin 5-amp standard fittings.

You merely plug it into the power socket, plug the plug on the set's connecting cable into the adaptor and join a wire from a terminal on the adaptor to the earth terminal of the set.

The Bulgin Suppressor deals with all interference coming in via the mains. It employs the well-known and well-tested two-condenser scheme. There are two ¼-mfd. fixed condensers joined in series across the mains, the junction between the condensers being connected to the terminal for the earth connection.

Absolutely Shockproof.

This scheme is one which the Post Office recommends. It should be mentioned that the Bulgin Mains Interference Suppressor can be used effectively at the source of the interference if this is accessible.

The component is provided with a neat but strong bakelite casing and is absolutely shockproof, and so can be used by anyone without fear of getting a "stray packet." Its insulation is first class, and the condensers are able to handle up to 250 volts under working conditions, so that there is also no likelihood of the mains being shorted or in any other way affected deleteriously.

The price is 5s. 6d., and that is very reasonable, many will agree that it is no price at all to pay for immunity from mains-borne noises.

Miscellaneous Advertisements continued on next page.

MISCELLANEOUS ADVERTISEMENTS

(Continued from previous page.)

BIRMINGHAM RADIOMART.

RADIOMART offers following at sensational prices. Perfect goods and a square deal guaranteed.

RADIOMART. Radiophone short-wave condensers, all brass on Stealite bases (the finest made), offered ¼ list. Single ·00016, 3/6 ; 2-gang ·00016, 5/6.

RADIOMART. British Radiophones fully screened 2-gang, ·0005, top trimmers, latest compact type, 5/11.

RADIOMART. Radiophone 3-gang as above, 7/6. Radiophone 4-gang superhet, 9/6, all boxed.

RADIOMART. British Radiophone 2-gang as above, but fitted Uniknob trimming ; wavelength moving-scale dials, 8/3.

RADIOMART. Radiophone latest Full-Vision Dials, illuminated, handsome escutcheon, 3/9 (list 7/6).

RADIOMART. Radiophone I.F. transformers 110 kc., top trimmers, 2/6. Also few 117 and 126 kc.

RADIOMART. Utility super 2-gang ·0005, ball-bearing, fully screened, with trimmers 5/11; with disc dial, 6/11.

RADIOMART. Utility 3-gang as above, straight or superhet, 6/9 ; with dial, 7/11.

RADIOMART. B.T.H. 7-in. latest 2,500-ohm, with transformer, moving coils, humbucker 4-watt model, 12/6.

RADIOMART. Sonochorde super-sensitive P.M.'s Class B or Universal (ideal battery sets), 16/6.

RADIOMART. Push back, the wire used by set-makers, ready tinned and sleeved, 6 yds., 9d.

RADIOMART. Screened flex H.F. or pick-up, single, 6d. yd. ; twin, 9d. yd.

RADIOMART. Resin-cored solder, 3 ft., 6d. Bulgin lamp fuses, 2d. Bulgin twin fuseholders, 4d.

RADIOMART. Non-inductive tubulars 1,500v, ·0003, ·002, 4d. ; 0·01, 0·02, 0·04, 0·05, ·1, 6d. ; 0·2, 0·25, 8d. ; 0·5, 9d.

RADIOMART. Differentials : Telsen ·0001, ·00015, 1/- ; Polar ·0003, 1/3 ; all with knobs.

RADIOMART. Igranic Non-inductive condensers, bakelite case, 700 v. terminals, maker's cartons, 1 mfd. 1/4 ; 2 mfd. 1/8.

RADIOMART Brand new condensers, eminent maker's, 500 v. working 4-mfd., 3/6 ; 2-mfd., 1/10 ; 1-mfd., 1/6.

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