

RADIOLYMPIA—Complete Guide to the Show

A
NEWNES
PUBLICATION

Edited by
F.J.CAMM
Vol. 14. No. 362.

Practical Wireless *and*

3!

EVERY
WEDNESDAY
August 26th, 1939.

★ PRACTICAL TELEVISION ★

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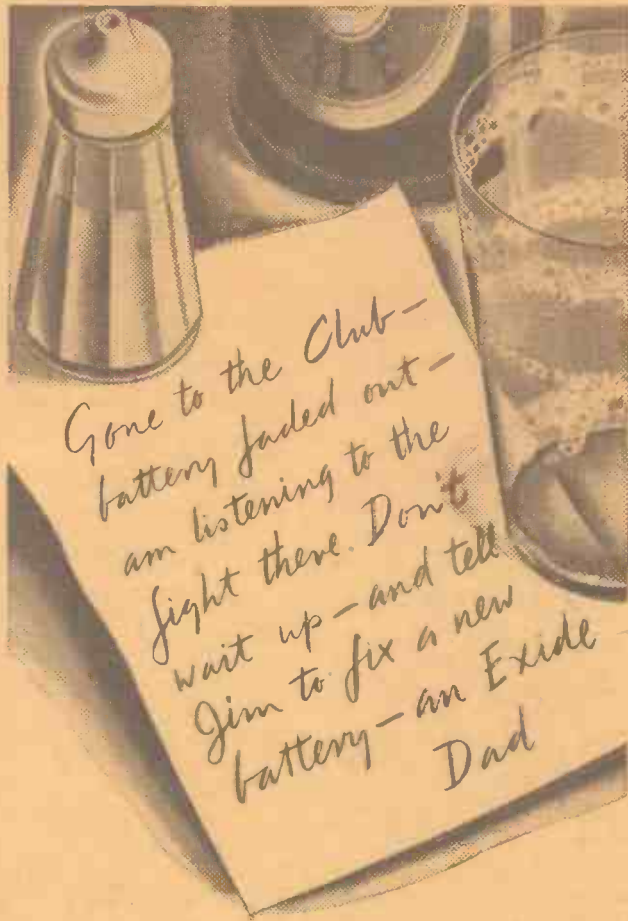
★ The 1940
"AIR-HAWK" 9

WIRELESS TRANSMISSION FOR AMATEURS

Edited by F. J. CAMM.

This book explains not only how to build amateur transmitting sets, but also how to learn the morse code and obtain the licence. It deals with the subject in a simple yet fascinating way, and the text is rendered even more lucid by the use of many practical and easily understood diagrams.

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R. 88

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are

AT THE SHOW!

Varley designers and technicians will be available to discuss technical problems. Included in the full range of products shown will be the VARLEY DRY ACCUMULATOR.

STAND 108

The EXPERT'S HAND

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0-30 "	"
0-120 "	"
VOLTAGE	
0-6 volts	"
0-12 "	"
0-120 "	"
0-240 "	"
0-300 "	"
0-600 "	"
RESISTANCE	
0-10,000 ohms	"
0-60,000 "	"
0-1,000,000 "	"
0-3 megohms	"

In case, complete with instruction booklet, leads, interchangeable crocodile clips and testing prods. **45/-**
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BRITISH MADE

Visit

RADIOLYMPIA

Aug. 23rd—Sept. 2nd

1939

Special Attractions

for the technically minded amateur

This year's Radiolympia will have considerably more interest for the techni-fan

Model Factory

The model factory, working under actual practical conditions, will show almost every process of radio manufacture—such as coil winding, wire covering, wire joining, grid making, spring making, R.F. Coil adjusting, resonance test, impedance comparison, inductance comparison, ganged condenser testing, cutting and forming wires of tubular condensers, engraving, test and assembly and dry battery manufacture. Experts will be in attendance to explain these processes, and to deal with any difficulties, such as interference, "fading," etc., to the serious-minded amateur. In addition, there will be a revolving drum, showing the complete chassis of many of the leading manufacturers' sets.

Technical Conventions

Technical conventions are being held in the Convention Hall on the four days August 28th to August 31st, inclusive.

The following subjects will be discussed by experts, and the meetings will be open for general discussion.

- (a) Short-wave technique.
- (b) High quality reproduction.
- (c) Television.
- (d) General technical topics.

Many distinguished visitors will attend and address these meetings.

Radio Theatre

The radio theatre at Olympia, specially built at a cost of over £5,000, is a replica of the famous "bowl" theatre at Hollywood, and is the *first theatre in the world* to be designed and constructed expressly for broadcasting AND TELEVISION.

Broadcasting and Televising Every Day

See the batteries of cameras and microphones at work in the hands of the full staff of B.B.C. experts.

TELEVISION

Television is the keynote of Radiolympia 1939. Apart from the 64 sets constantly working in "Television Avenue," literally HUNDREDS of sets will be receiving continuously throughout the exhibition . . . This is the greatest demonstration of television the world has ever seen.

Come and Be Televised Yourself

Special facilities for organised technical parties

Please apply to Secretary for particulars of reduced price tickets, Convention tickets, etc.

Radio Manufacturers' Association

59, Russell Square, London, W.C.1

Telegrams : OI DARION, Westcent, London

Phone : MUSEum 4031

Practical Wireless

★ PRACTICAL TELEVISION ★

EVERY WEDNESDAY.

Vol. XIV. No. 362, Aug. 26th, 1939.

EDITED BY
F. J. C. AMM

Staff:

W. J. DELANEY, FRANK PRESTON
H. J. BARTON CHAPPLE, B.S.

ROUND THE WORLD OF WIRELESS

The New "Practical Wireless"

AS announced last week, this issue marks the first of the new series of PRACTICAL WIRELESS. It will be noted that it appears in a new and more attractive cover, and that many new features are to be introduced. We have considerably augmented our staff of contributors, with the object of still further improving the service we provide for our readers. A large proportion of our space this week is devoted to that important event Radiolympia, and thus many of the new features are unavoidably held over.

The great success of this journal since it was introduced seven years ago is one of the romances of journalism. It entered a field in which there was fierce competition for the readership of keen and intelligent experimenters all over the country. We introduced the solus policy of specifying only those parts actually used in receivers described; we backed up our claims regarding our sets with a guarantee of free service; we undertook to answer readers' letters free of charge; we produced a series of practical volumes dealing with all aspects of wireless construction to make good the lamentable omission which existed prior to the publication of this journal. In these and many other ways we leapt into the lead and remained there.

Most of our competitors in the particular field for which we cater have gone. For so many old established competitors to have fallen by the wayside, and for the last in the field to remain, is an almost unparalleled romance of Fleet Street.

The improvements it is our intention to effect are a gesture to those many thousands of loyal readers who have faithfully joined our ranks and remained there. We shall continue our policy of catering for the keen experimenter; we shall continue to service sets and to answer readers' queries free of charge; the editorial

policy will be enlarged to cater for the many new aspects of radio and television which have come into existence during the past five years. The price of this journal and its publishing day remain unchanged—three pence every Wednesday.

Thus, for the same price readers of PRACTICAL WIRELESS will receive a greatly improved and even more attractive journal—an even better technical and news service. We ask our readers to help us to make this important change known by telling their friends about it.

Please write and tell us what you think of PRACTICAL WIRELESS in its new form.

Indian Broadcasting

AN increase in the number of licensed listeners in British India is reported. At the end of May the figures were 75,524, representing an increase of over 21,000 during the year.

High Efficiency Mark

THE S.P.I.R. of France has announced a scheme to give purchasers an indication of the standard of receivers on sale. Those which obtain a required standard of efficiency in selectivity, sensitivity, and power and tonal quality will in future be given a special "quality" mark.

Editorial and Advertisement Offices:
"Practical Wireless," George Newnes, Ltd.,
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Phone: Temple Bar 4363.
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Registered at the G.P.O. as a newspaper and for
transmission by Canadian Magazine Post.

The Editor will be pleased to consider articles of a practical nature suitable for publication in PRACTICAL WIRELESS. Such articles should be written on one side of the paper only, and should contain the name and address of the sender. Whilst the Editor does not hold himself responsible for manuscripts, every effort will be made to return them if a stamped and addressed envelope is enclosed. All correspondence intended for the Editor should be addressed: The Editor, PRACTICAL WIRELESS, George Newnes, Ltd., Tower House, Southampton Street, Strand, W.C.2.

Owing to the rapid progress in the design of wireless apparatus and to our efforts to keep our readers in touch with the latest developments, we give no warranty that apparatus described in our columns is not the subject of letters patent.

Copyright in all drawings, photographs and articles published in PRACTICAL WIRELESS is specifically reserved throughout the countries signatory to the Berne Convention and the U.S.A. Reproductions or imitations of any of these are therefore expressly forbidden. PRACTICAL WIRELESS incorporates "Amateur Wireless."

European Exchange

A EUROPEAN exchange of old airs and dances between Sweden and Scotland will be broadcast on August 30th. Scotland's contribution will be made by the Strings of the B.B.C. Scottish Orchestra, led by J. Moulard Begbie and conducted by Kemlo Stephen. These European exchanges have become more and more a feature of current broadcasting. Only a month ago the Stockholm Y.M.C.A. Male Voice Choir broadcast from Edinburgh. As a rule, nationals and friends of nationals living in Edinburgh are invited to come to the studio to see and hear the broadcast. Such broadcasts have excellent entertainment and cultural value and should help, in time, to develop friendliness between countries.

Jack Wilson and His Versatile Five

ON Saturday evening, September 2nd, Jack Wilson and his Versatile Five will play light music. Solo parts will be taken by Jack Wilson (piano) and Fred Adcock (violin). Formed over four years ago, this combination has had many broadcasts for Midland, National and Empire; and several of its members are also well known on the air as solo broadcasters.

Variety at Home

DAVID PORTER is producing another "Variety at Home" programme for Northern listeners on August 28th. It will include songs written and rendered by Diana Morrison, accompanied on the piano by Norman Whiteley; Roy Davey, the boy xylophonist; Taylor and Sharp (songs in harmony); and Les Crossley and his Harmonica Rascals. Henry Reed's Miniature Variety Orchestra will, as usual, provide the incidental and linking music.

A Concert of Elizabethan Music

A CONCERT of Elizabethan Music will be broadcast on September 1st (Regional) in which the B.B.C. Singers, under their conductor Leslie Woodgate, and Audrey Rowton (harpsichord) will take part. The programme includes madrigals from "The Triumphs of Oriana," sung by the B.B.C. Singers, and harpsichord pieces by William Byrd and John Mundy.

Motor-cycle Grand Prix

THAT legion of listeners who are motor-cycle enthusiasts will have an opportunity, on August 26th, to hear described the thrilling race for the motor-cycle Grand Prix, run over the road course at Donington Park. In this enclosed circuit, which possesses all the characteristics of a road, many of the most famous motor-cycle competitors will take part for the "blue riband" of the motor-cycling world.

ROUND THE WORLD OF WIRELESS—Continued

Belgian Medium-waver on Two Channels

RADIO ARDENNES, a small privately-owned broadcasting station at Libramont, in the Ardennes, transmits programmes in the French language daily from B.S.T. 07.00-09.00 on 267.4 m. (1,121.6 kc/s), and from B.S.T. 17.00-19.00 on 208.6 m. (1,438 kc/s).

Finnish Life-savers Use Radio

ON the seaside beaches in Finland the Government has installed loud-speakers for the broadcast of radio entertainments; they are also brought into action to warn bathers who may be seen venturing too closely to the breakwaters or, if non-swimmers, who are likely to get out of their depth.

An Interesting Tour

MR. H. V. KALTENBORN, one of the foremost representatives of the Columbia Broadcasting System, is reported to have started out from New York on an aeroplane tour of the most important Western and Central European cities. He is due to be back in America on September 1st. In the meantime, he proposes to visit London, Paris, Brussels, The Hague, Berlin, Danzig, Warsaw and Geneva, for the purpose of securing microphone interviews with leading statesmen in the individual countries. The conversations will be transmitted to the United States, and relayed throughout the network of the Columbia System, including the short-wave stations.



Lucerne Broadcasts to the World

ON the occasion of the Lucerne (Switzerland) Music Festival the concerts will be rebroadcast by Great Britain, Belgium, Denmark, Estonia, Finland, Hungary, Lithuania, Luxembourg, Norway, Poland, Sweden and the National Broadcasting Company of America. Listen to them on August 23rd, 27th and 29th.

"Let the People Sing"

THE speaker chosen to read the second and nine subsequent instalments of J. B. Priestley's specially commissioned novel, "Let the People Sing," is Kevin Fitzgerald. Mr. Fitzgerald has made

frequent appearances at the microphone; in addition to giving readings, he has prepared and broadcast several amusing talks, including a series entitled "Domestic Dramas." The first instalment of the novel will be read on September 3rd by the author, who will also read the final instalment on November 19th.

Flying to the Cape

AFTER learning to fly five years ago, Joan May Parsons, of Leamington, flew to the Cape and back last summer, taking three months in all. She had many adventures. Having to land at Victoria West on the outward flight, she hit a barbed wire fence which tore the plywood and wrapped itself round the propeller shaft; the plane had to go to Capetown for overhaul. On the return she lost her way and had to come down in the middle of an African forest. Her talk on August 28th (Midland) is recorded for repetition the following afternoon.

The North Stars

VIOLET DAVIDSON will present the North Stars, a programme of reminiscences of the old Beach Pavilion, Aberdeen, on September 2nd. Taking part in the pro-

men before its own destruction in a Great War air raid. Even after that, it continued to haunt the railroad, and its sudden apparition one day almost, though not quite, caused a large-scale accident.

"Cabarette"

ARTISTS in "Cabarette" to be broadcast on Tuesday, August 29th (Regional), will be: George Sheering, "Syncopating pianist," Evans and Monelle, "In original songs at the piano," and

Motor tuning control units being tested at the Ekco works.



Arnie Kitson, "Xylophone and marimba." The programme will be presented by Leslie Bridgmont.

Organ Music from Bristol

REGINALD FOORT will be heard at the organ of the Colston Hall, Bristol, in the Western programme, on Sunday, August 27th.

Variety at Home

DAVID PORTER is producing another "Variety at Home" programme for Northern listeners on August 28th. It will include songs written and rendered by Diana Morrison accompanied on the piano by Norman Whiteley, Roy Davey, the boy xylophonist, Taylor and Sharp (songs in harmony); and Les Crossley and his Harmonica Rascals. Henry Reed's Miniature Variety Orchestra will, as usual, provide the incidental and linking music.

Melodies from the Comedies

EARLY on Sunday evening, August 27th, Martyn Webster compères another of the "Melodies from the Comedies" series in which he and Reginald Burston, who conducts the Midland Revue Orchestra, co-operate. The artists for this one are Marjorie Westbury, Ronald Bristol and one other vocalist.

The Tourist Trophy Race

THE Tourist Trophy Race at Donington Park now annually attracts the greatest drivers in the world, and from a broadcasting point of view provides, owing to its restricted circuit, and admirable field for commentary.

In any one circuit there is seldom a time during which the listener cannot hear a competitor racing around this difficult natural track at very high speeds.

The track has outstanding features, which have clear names, and by this means commentators keep listeners posted as to progress, approach and passage of competitors.

.....
The "Twin Miracle," something new in portables introduced by Pilot Radio. It automatically changes from mains to battery working without a break in the programme!
.....

gramme will be Dan Williams, comedian, Juliette McLean (soubrette), Willie Johnson (tenor), Billy Gordon (musical entertainer), Robertson and Pirie (cross-talk), The Albury Singers, Flossie Davie at the piano and Violet Davidson herself.

Phantom Engine

A SHORT story by a new radio author, Alfred C. Lamb, of Hebden Bridge, Yorkshire, will be broadcast by W. B. Mercer in the Northern programme on August 27th. The story, called "Locomotive No. 832," is about a "rogue" engine—a murderous machine which brought about the death or injury of a score of railway

An Open Letter to Our Readers and the Trade

GENTLEMEN,

You have earned my congratulations, because of the efforts you have made collectively and individually to make Radiolympia not only the best of the series, but *different*. My knowledge of what you have done assures me that the Exhibition will be successful from every aspect. You will not deny that previous exhibitions have been waning in popularity. In the boom years you relied too much upon the novelty of radio to sell your sets, and too little upon encouraging public confidence.

In those days your successes were of the same order in which a good horse makes a good jockey. Many firms flattered themselves that they were Big Business Men because the public would purchase almost anything. The Captains of many of these industries have, however, departed to the obscurity whence they came. The inevitable law of supply and demand and saturation point has purged your industry of the undesirable elements and cleansed the Augean stables. Your industry is largely dependent upon a replacement market, for most people by this time own a wireless set. It may not be so easy to persuade them to scrap a set which is a few months old; the public to-day will buy new sets purely on merit. I am quite satisfied that your industry is now running on sound, business-like lines, for only the fittest survive, and you have survived the vicissitudes of the past five years, largely brought about by the exploitation of adventurers who believed in anything for money instead of value for money.

You have tackled the job of organising Radiolympia this year on extremely sound and business-like lines. You have, I understand, issued instructions that announcements are not to be sent to the Press giving fantastic sales and attendance figures. Some of the stories, indeed, which appeared in the newspapers in previous years must have done your industry grave harm, for they were just stupid prevarications, which would not mislead a schoolboy.

You have reinstated the cabaret show. In previous years I have questioned the wisdom of this, because I have felt that it attracted the wrong type of visitor to the Show. It is one thing to attract a gate, and another to create sales. This year, however, I waive my objections because the new layout of the Show, the imminence of television throughout the country, and the many other innovations at Radiolympia, render it imperative for you to attract to Radiolympia the largest possible number of visitors. I believe that many will go to the Show to see the Cabaret and be so interested in the exhibits that they



By THE EDITOR

will see the Show. You are justly proud of the world-wide pre-eminence of television, and you want the public to see it. You are equally proud of the high standard of merit which your wireless receivers have attained. I believe that you will attract to this Show all those who relinquished their annual visits to it about five years ago. I am glad to know that you have provided adequate seating accommodation, and that the catering arrangements are to be adequate. It pleases me to think that radio has gravitated towards standardisation as far as standardisation is possible in an industry of wizardry. You are not producing new sets just for the sake of producing them. Your policy is not to institute changes until such are necessary. Your customers will appreciate the fact that to take care of the wavelength changes, which will occur in March, 1940, you have already instituted arrangements to supply dials which align with the new wavelength allocations.

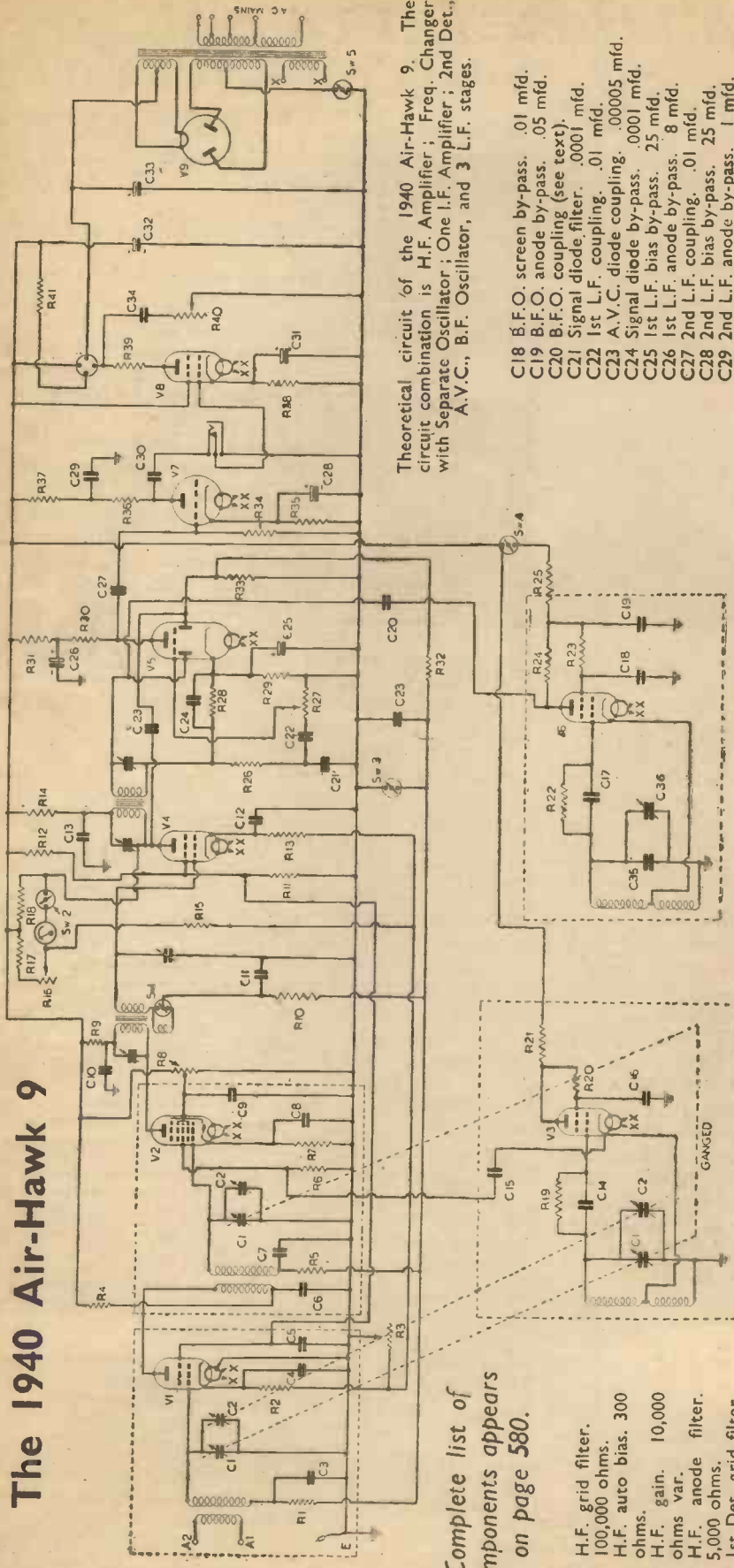
I am glad to observe that you have not neglected the experimenter and constructor, for I am certain that you are not unmindful of the services these rendered to you when your industry was but a foundling laid at your doors by Providence. You wanted people with a knowledge of this new science, and it was from the ranks of experimenters that you found them. Most of your important positions are occupied by those who were originally keen amateurs. It was not right that as in previous years you should bite the hand which fed you. This year, I see, you have catered specially for the constructor, and I thank you for it. The new presentation in which this journal appears should convince you that the constructor market is not dead, for publishers, like wireless manufacturers, are business people who do not fan lost causes. I hope as a result of the interest which will undoubtedly be displayed in the technical section of Radiolympia, and also because of the confidence which the proprietors of this journal repose in the future of the constructor market, many of your members may be persuaded to return to a market which they have sadly neglected. You are making a special appeal to women to visit the Show. I think again that you are wise in your generation in doing this, for motor manufacturers realised years ago that man proposes and pays, but it is the woman who chooses.

I welcome the encouragement you are giving to dealers and others to form parties, and your formation of a Bureau operating from 59, Russell Square, London, to handle that. A good move! Your literature this year, including your posters, leaves no room for reproach. The success which you earned will be yours.

Yours faithfully,

F. J. CAMM

The 1940 Air-Hawk 9



Theoretical circuit of the 1940 Air-Hawk 9. The circuit combination is H.F. Amplifier; Freq. Changer with Separate Oscillator; One I.F. Amplifier; 2nd Det., A.V.C., B.F. Oscillator, and 3 L.F. stages.

Complete list of components appears on page 580.

- R1 H.F. grid filter. 100,000 ohms.
- R2 H.F. auto bias. 300 ohms.
- R3 H.F. gain. 10,000 ohms var.
- R4 H.F. anode filter. 5,000 ohms.
- R5 1st Det. grid filter. 500,000 ohms.
- R6 H.F. oscillator filter. 100,000 ohms.
- R7 1st Det. auto bias. 600 ohms.
- R8 1st Det. screen pot. 15,000 ohms.
- R9 1st Detector anode filter. 2,500 ohms.
- R10 I.F. grid filter. 100,000 ohms.
- R11 H.F.-I.F. screen filter. 30,000 ohms.
- R12 H.F.-I.F. screen filter. 20,000 ohms.
- R13 I.F. auto bias. 300 ohms.
- R14 I.F. anode filter. 1,000 ohms.
- R15 S meter bridge. 50,000 ohms.
- R16 S meter balancing. 1,000 ohms var.
- R17 S meter bridge. 1,000 ohms.
- R18 S meter bridge. 2,000 ohms.
- R19 H.F. osc. grid leak. 100,000 ohms.
- R20 H.F. osc. screen filter. 100,000 ohms.
- R21 H.F. osc. anode filter. 10,000 ohms.
- R22 B.F.O. grid leak. 50,000 ohms.
- R23 B.F.O. screen filter. 100,000 ohms.
- R24 B.F.O. anode. 15,000 ohms.
- R25 B.F.O. anode filter. 50,000 ohms.
- R26 Signal diode filter. 50,000 ohms.
- R27 L.F. gain. 500,000 ohms pot.
- R28 Signal diode load. 250,000 ohms.
- R29 1st L.F. bias. 1,500 ohms.
- R30 1st L.F. anode. 100,000 ohms.
- R31 1st L.F. anode filter. 50,000 ohms.
- R32 A.V.C. filter. 1 meg.
- R33 A.V.C. load. 1 meg.
- R34 Second L.F. grid leak. 250,000 ohms.
- R35 Second L.F. bias. 800 ohms.
- R36 Second L.F. anode. 50,000 ohms.
- R37 Second L.F. anode filter. 10,000 ohms.
- R38 Output auto bias. 100 ohms.
- R39 Output stabiliser. 100 ohms.
- R40 Tone control. 50,000 ohms var.
- R41 Series H.T. filter. 300 ohms.
- C1 H.F. grid filter. .1 mfd.
- C2 H.F. anode by-pass. .1 mfd.
- C3 1st Det. screen by-pass. .1 mfd.
- C4 H.F. bias by-pass. .1 mfd.
- C5 H.F. and I.F. screen by-pass. .1 mfd.
- C6 H.F. anode by-pass. .1 mfd.
- C7 1st Det. grid filter. .1 mfd.
- C8 1st Det. screen by-pass. .1 mfd.
- C9 1st Det. anode by-pass. .1 mfd.
- C10 I.F. grid filter. .1 mfd.
- C11 I.F. bias by-pass. .1 mfd.
- C12 I.F. anode by-pass. .1 mfd.
- C13 H.F. osc. grid. .0001 mfd.
- C14 H.F. osc. coupling. .0001 mfd.
- C15 H.F. osc. screen by-pass. .1 mfd.
- C16 B.F.O. grid. .0001 mfd.
- C17 B.F.O. grid. .0001 mfd.
- C18 B.F.O. screen by-pass. .01 mfd.
- C19 B.F.O. anode by-pass. .05 mfd.
- C20 B.F.O. coupling (see text).
- C21 Signal diode filter. .0001 mfd.
- C22 1st L.F. coupling. .01 mfd.
- C23 A.V.C. diode coupling. .00005 mfd.
- C24 Signal diode by-pass. .0001 mfd.
- C25 1st L.F. bias by-pass. 25 mfd.
- C26 1st L.F. anode by-pass. 8 mfd.
- C27 2nd L.F. coupling. .01 mfd.
- C28 2nd L.F. bias by-pass. 25 mfd.
- C29 Output L.F. coupling. .002 mfd.
- C30 Output bias by-pass. 25 mfd.
- C31 H.T. mains filter. 8 mfd.
- C32 H.T. filter. 8 mfd.
- C33 Tone control. .04 mfd.
- C34 B.F.O. padder. .0001 mfd.
- C35 B.F.O. tuner. 65 mfd. var.
- C36 I.—Variable Selectivity.
- C37 2—Meter on/off.
- C38 3—A.V.C. on/off.
- C39 4—B.F.O. on/off.
- C40 5—Stand-by.
- V1 H.F. amplifier.
- V2 1st Det.
- V3 H.F. oscillator.
- V4 I.F. amplifier.
- V5 2nd Det., A.V.C. and 1st L.F.
- V6 B.F. oscillator.
- V7 2nd L.F. amplifier.
- V8 Output stage.
- V9 Rectifier.

RESISTANCE AND CONDENSER LIST

- C1 .00016 mfd. tuning.
- C2 .000015 mfd. band spread.
- C3 H.F. grid filter. .1 mfd.
- C4 H.F. bias by-pass. .1 mfd.
- C5 H.F. and I.F. screen by-pass. .1 mfd.
- C6 H.F. anode by-pass. .1 mfd.
- C7 1st Det. grid filter. .1 mfd.
- C8 1st Det. screen by-pass. .1 mfd.
- C9 1st Det. anode by-pass. .1 mfd.
- C10 I.F. grid filter. .1 mfd.
- C11 I.F. bias by-pass. .1 mfd.
- C12 I.F. anode by-pass. .1 mfd.
- C13 H.F. osc. grid. .0001 mfd.
- C14 H.F. osc. coupling. .0001 mfd.
- C15 H.F. osc. screen by-pass. .1 mfd.
- C16 B.F.O. grid. .0001 mfd.
- C17 B.F.O. grid. .0001 mfd.
- R1 .00016 mfd. tuning.
- R2 .000015 mfd. band spread.
- R3 H.F. grid filter. .1 mfd.
- R4 H.F. bias by-pass. .1 mfd.
- R5 H.F. and I.F. screen by-pass. .1 mfd.
- R6 H.F. anode by-pass. .1 mfd.
- R7 1st Det. grid filter. .1 mfd.
- R8 1st Det. screen by-pass. .1 mfd.
- R9 1st Det. anode by-pass. .1 mfd.
- R10 I.F. grid filter. .1 mfd.
- R11 I.F. bias by-pass. .1 mfd.
- R12 I.F. anode by-pass. .1 mfd.
- R13 H.F. osc. grid. .0001 mfd.
- R14 H.F. osc. coupling. .0001 mfd.
- R15 H.F. osc. screen by-pass. .1 mfd.
- R16 B.F.O. grid. .0001 mfd.
- R17 B.F.O. grid. .0001 mfd.
- R18 B.F.O. screen by-pass. .01 mfd.
- R19 B.F.O. anode by-pass. .05 mfd.
- R20 B.F.O. coupling (see text).
- R21 Signal diode filter. .0001 mfd.
- R22 1st L.F. coupling. .01 mfd.
- R23 A.V.C. diode coupling. .00005 mfd.
- R24 Signal diode by-pass. .0001 mfd.
- R25 1st L.F. bias by-pass. 25 mfd.
- R26 1st L.F. anode by-pass. 8 mfd.
- R27 2nd L.F. coupling. .01 mfd.
- R28 2nd L.F. bias by-pass. 25 mfd.
- R29 Output L.F. coupling. .002 mfd.
- R30 Output bias by-pass. 25 mfd.
- R31 H.T. mains filter. 8 mfd.
- R32 H.T. filter. 8 mfd.
- R33 Tone control. .04 mfd.
- R34 B.F.O. padder. .0001 mfd.
- R35 B.F.O. tuner. 65 mfd. var.
- R36 I.—Variable Selectivity.
- R37 2—Meter on/off.
- R38 3—A.V.C. on/off.
- R39 4—B.F.O. on/off.
- R40 5—Stand-by.
- R41 H.F. amplifier.
- R42 1st Det.
- R43 H.F. oscillator.
- R44 I.F. amplifier.
- R45 2nd Det., A.V.C. and 1st L.F.
- R46 B.F. oscillator.
- R47 2nd L.F. amplifier.
- R48 Output stage.
- R49 Rectifier.

The 1940 "Air-Hawk" 9

An Improved Version of the Communications-type Receiver
Which was Introduced Last Year - - By W. J. DELANEY

MANY visitors to Radiolympia last year showed considerable interest in the 9-valve amateur receiver which was on view on our stand, but from the remarks which were passed during the exhibition period, it proved that there was a demand for a still more elaborate type of circuit—especially among amateur transmitters. Accordingly, when the Air Hawk was described in November last year, we stated that the receiver would be "hotted up" at a later date, and the accompanying illustrations and circuit show the new version of this popular receiver.

As will be seen from the circuit, the main arrangement has been retained, but the improvements consist in the introduction of A.V.C., signal meter, variable B.F.O. adjustment and slight changes in the remaining circuit details. The introduction of A.V.C. was requested by many listeners, although on the higher frequencies a satisfactory A.V.C. circuit is not simple to find. On 20 and 40 metres the arrangement used does, however, compensate for normal QSB, but in the case of bad or high-speed fading, very little advantage is obtained. However, as A.V.C. has to be cut out when the B.F.O. circuit is in use, a switch has been provided, and it is a simple matter to cut out the A.V.C. circuit, with a slight gain on very weak stations.

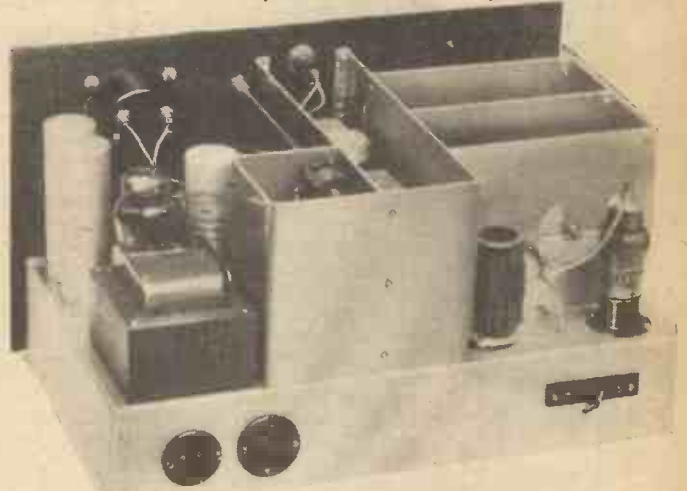
Circuit Arrangement

The first valve is used as a straight R.F. amplifier, and is of the variable- μ type. The first detector is also of the variable- μ type, but the regenerative circuit previously employed has been dispensed with so that A.V.C. can be applied to this valve for improved results. The I.F. stage is also a variable μ , and these three valves are all

in the B.F.O. stage by a 65-mfd. midget variable, operated through an extension rod from the panel. This provides a very extensive variation in note—from below 1,000 c.p.s. to above 5,000 c.p.s., and is most effective in use. By using the numbered dial provided with the condenser pre-arranged settings may be obtained if desired for test purposes. The second detector is a double-diode-triode of the low-gain L.F. type, and the maker's recom-

a quality receiver. Some idea of the sensitivity of the receiver may be gained when it is stated that during one week when the receiver was in use in a North-west London suburb, every continent was covered, and VE's, VK's, all W divisions, and ZL's ('phone) were tuned in direct on the loudspeaker with the L.F. gain-control advanced only one-third. This was on the 20-metre band and between the hours of 6 p.m. and 3 a.m. As the 'phones are included

A three-quarter rear view of the receiver showing the B.F.O. condenser and extension operating rod.



mended circuit has been adopted. Instead of coupling this stage to the output valve, as in most commercial models (in which a second I.F. stage is generally employed), a low-gain L.F. stage is interposed, and this provides the necessary increase in gain on weak signals without providing the noisy

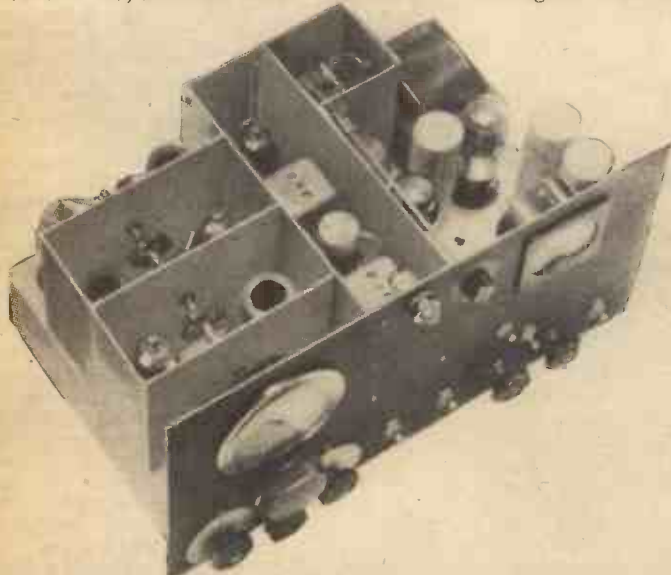
after the first L.F. stage, they may be worn for searching purposes without risk of damage to your ear-drums should you strike a powerful station, but if a weak station is picked up, it may generally be put on the speaker merely by removing the 'phone plug. In most cases, provided the signal is audible in the 'phones, it may be put on the speaker for better readability.

The signal meter arrangement finally adopted is a bridge circuit with the meter fed from the I.F. anode. It will be found that powerful short-wave broadcast stations will send the needle right over and thus care is needed when scanning the band. As, however, the meter would be damaged if left in circuit when the set is first switched on, due to the excessive current flowing through the bridge until the valves have heated up, a switch has to be included to open the meter circuit. Care should therefore be taken always to have this off unless a reading is required. The remaining switches are for the B.F.O., selectivity, A.V.C., on/off and stand-by.

Constructional Details

If you have the original model and wish to bring it up to date a new panel will have to be obtained, as the speaker has now been separated so that maximum output may be obtained without risk of microphonic feed-back. The connections to the 2nd detector valveholder must all be removed (with the exception of the heater) and new connections made to suit the D.D.T. valve. The top-cap lead from the I.F. transformer is not now needed and must be cut off, with a new hole drilled in the chassis to take the lead to the top cap of this valve—which is now the grid of the triode section of the D.D.T. The selectivity switch is trans-

(Continued on page 580)



A view of the chassis of the Air-Hawk showing the effective screening arrangements.

controlled from the A.V.C. line. In addition, a separate gain control is joined in the cathode circuits of the R.F. and I.F. stages and thus it is possible to use manual control on these when required. The use of this control will be explained later on. The H.F. oscillator remains as before, as also does the B.F.O. The original pre-set condenser has, however, now been replaced

background which is obtained with excessive I.F. gain.

Results Obtained

As a result the receiver is very quiet in use, and if the R.F. gain is adjusted to avoid overload on powerful stations, it is possible to listen in perfect comfort to American amateur stations almost as well as locals on

A CONSTRUCTOR TOURS RADIOLYMPIA

The Writer of this Article Conducts You to Those Stands of Special Interest to the Constructor, and Pleads for More Support From the Radio Industry. By L. O. SPARKS

THE advance details of the exhibits at Radiolympia are always awaited with the greatest interest and anticipation. The general listening public shows, on the whole, more than a passing exhibition enthusiasm. Their interest each year is, no doubt, rekindled by the publicity given to Radiolympia, and the rather intriguing, if not always technically perfect, descriptions given by some of the newspaper reporters and columnists of the outstanding features of the new season's programme.



One of the new types of Dubilier condensers.

It is left, however, to the constructor—by which I mean the listener who would rather construct his own equipment than buy a complete commercial receiver—and his co-partner the amateur transmitter, to show the technical interest, and the keenest appreciation of even the most minute improvement in all apparatus and accessories associated with his hobby. Many would have us believe that this enthusiasm on the part of the amateur is no longer with us. That the constructor movement is as dead as the dodo, and that the introduction of the low-priced receiver, having in most instances a remarkable specification, has tolled the death knell over those who would construct a receiver at home.

While admitting that there are quite a number who would not shed tears if such misconceptions were true, it becomes really amazing to think that anyone who has any connection at all with the radio industry can blind himself to the most obvious signs that the constructor movement is very much alive. Fortunately this year the R.M.A. has taken steps to interest the constructor.

Licence Figures

According to the latest figures available, it is estimated that there are 9,009,750 licensed listeners in this country. This figure does not necessarily include all those who buy component parts. If one assumes that, say, only 10 per cent. of those people are constructors, and that they spend the very conservative sum of £5 per annum on their hobby, well, that amounts to £4,500,000, which, in the idea of the writer, seems to represent a contribution to the radio industry worthy of, at least, some little consideration and trouble.

It will, no doubt, be stated most emphatically that this amount never reaches the pockets of the British manufacturers. That the figures look very well on paper, but beyond that they do not exist in hard cash so far as the industry is concerned. To such remarks I must agree, provided that the manufacturers will take off their dark glasses through which they appear to examine the constructor market, and admit that the reason why they don't get

the business is simply due to the fact that the thousands of would-be buyers of British components have been forced to buy imported products, due absolutely to the short-sightedness of a few to whom the constructor looked to supply their wants.

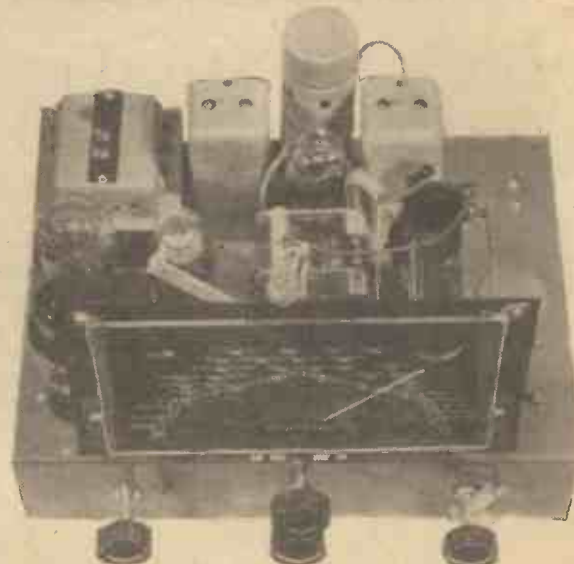
Constructor Movement Activity

The progress of PRACTICAL WIRELESS is but one indication that sustained support is available from the constructor movement to those who offer, consistently, the right goods at the right price, and back them with a service worthy of the name in its truest sense. Many are now doing so.

The examination of the list of the exhibitors at this year's Radiolympia is not, so far as enthusiasts are concerned, a very cheering proposition. One cannot help being struck by the number of absent ones when one compares the list with that of, say, 1937, or even last year. Many names, names well known in the constructor world, no longer appear on the list, and I am sure that they will be missed by thousands who used to take the keenest interest in their products. The fact that they are not exhibiting does not mean that all of them are no longer in business; but the fact that they are not there to meet us is due, no doubt, to individual reasons and, perhaps, being too busy with Government contracts.

Supposing we start from the stand which will be the meeting point of all enthusiasts, namely, No. 9.

All Constructors Should Visit Us on Stand No 9, Ground Floor.



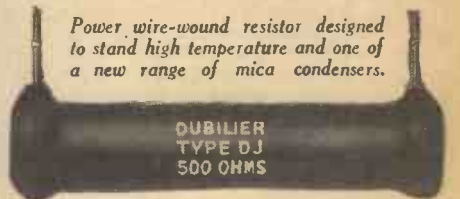
An example of Armstrong's chassis-built receivers.

Turning right from here to Stand No. 10, Messrs. Antiference, Ltd., have quite a number of items of particular interest to those who are interested in the design, construction and erection of efficient dipole receiving aerials, suitable for television and ultra-short-wave reception.

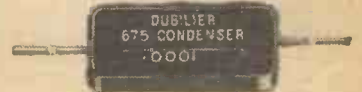
Servicing Equipment

Servisol, Ltd., on No. 11, will attract the attention of all interested in servicing and associated equipment at most reasonable prices, while next door, on No. 12, the range of items produced and offered by Norman Rose (Electrical), Ltd., are really too numerous to mention, but many items of interest to the amateur and professional will tempt one to linger a while.

For all information about Erie resistors, fixed and variable, or all types and sizes, one



Power wire-wound resistor designed to stand high temperature and one of a new range of mica condensers.



need not go farther than to the next stand, namely, No. 13, before being attracted by the Admiralty stand, No. 15, on the other side of the gangway.

Doubling back in our tracks, we soon come to No. 17, which displays the products of Ferguson Radio Corporation, Ltd., and, speaking from past experience, a halt will have to be made here to examine all the items exhibited, before turning down the intersecting gangway to pay a visit to the makers of the Westinghouse Rectifiers on Stand No. 30. Here will be found all

the standard lines of this company and, of course, quite a large percentage of them will appeal in particular to the constructor. By the way, don't forget to get a copy of their latest booklet before leaving to go over to No. 19, Messrs. Goodmans Industries, Ltd., to have a good look at their most interesting range of loudspeakers, baffles, and flares or horns.

Continuing down the main side gangway we shall come across No. 22 and, at the back of that, so to speak, we shall find No. 28, which will most certainly take up a goodly portion of our allotted time. On that stand will be found all the numerous items produced by those famous condenser people, Messrs. Dubilier, Ltd. It would be hopeless to try to enumerate all the various types, sizes, and ratings of their condensers, let alone the

fixed and variable resistances. Some of the new types are particularly interesting, and the increase in operating voltages of certain kinds is really amazing.

Loudspeakers

The island forming Stands 23, 24, 25, and

(Continued on page 589).

ON YOUR WAVELENGTH



The Show Is Here!

THE publication of this *new* PRACTICAL WIRELESS coincides with the first day of the Show. Radiolympia is going to be a staggering affair, and attendances will be enormous. I hope that every reader of this journal will make a point of visiting the Show at least once, and taking at least one friend with him—or her! A suggestion has been made that readers should get together parties and visit the Show in groups. This is usually a more interesting method of visiting an exhibition than to go solus. There is pleasure in discussing the exhibits, talking about old times, and having a sort of annual lunch or dinner at the Show.

If you are one of those who last visited the Radio Show some years ago, you must come this year to note the vast difference.

The constructor this year has not been ignored, as he was in connection with previous shows. You will not have to delve amongst odd corners to find the components. The experimenter has been catered for in a special section, and this year for the first time Radiolympia is to have a model factory showing various processes of manufacture being carried out under working conditions. You will be able to see coil winding, wire joining, grid making, helical coil spring making, R.F. coil adjusting, test and assembly of receivers, resonance tests, impedance comparison, inductance comparison, engraving, chassis wiring, gang condenser testing, wire covering, cutting and forming wires of tubular condensers, dry battery manufacture, and in addition there will be a battery of 16 revolving drums showing the complete chassis of many of the leading manufacturers' sets.

Make a Party of It

A SPECIAL Party Bureau to be run in conjunction with this year's Radiolympia has been inaugurated by the R.M.A. at their headquarters at 59, Russell Square, London, W.C.1, to help dealers and others to organise parties to the Exhibition. Considerably reduced fares by road and rail are obtainable for both large and small parties; catering and hotel accommodation are also obtainable

By *Thermion*

at reduced rates, and special party tickets are being issued at half price. Also, wherever possible the Bureau is arranging seats in advance for suitable performances in Radiolympia's broadcast and television theatre.

The Radio Theatre

FOR the first time in the history of the world a theatre has been specially built for broadcasting and television. It has been designed and constructed as a replica of the famous Bowl Theatre in Hollywood at a cost of over £5,000, with a semi-circular revolving stage that will hold over 300 performers, and an auditorium to enable 2,500 visitors to hear perfectly and obtain a clear and uninterrupted view of every part of the stage. The auditorium partly encircles the stage.

The new Hammond Organ will be seen for the first time in this country at Radiolympia.

Come and be Televised

YOUR one opportunity of being televised will be provided at Radiolympia. All you have to do is to go to the Television Studio between 11 a.m. and noon and ask them to televise you—and they will. Bring your friends too, and ask your friends at home, if they have a television receiver, to see how you "come over."

Miss Radiolympia

I AM certainly keenly looking forward to seeing Miss Radiolympia, just to satisfy myself that the judges have picked the right type of girl! Visitors at many leading coast resorts this year have been assisting the R.M.A. in selecting a girl with a perfect radio and television personality to be presented at the Exhibi-

tion. The finals will have been held in London, Birmingham, Folkestone and Nottingham before you read these notes.

Architect Designed

THE Exhibition itself differs from any of the preceding shows. It has been architect designed. One end of the Exhibition represents the television tower at Alexandra Palace, and the other Broadcasting House. There is ample room, adequate seating and catering accommodation, and most of the personalities of radio will be there. There will be television demonstrations on dozens of stands, and every reader who has not done so, if for no other reason, should visit Radiolympia to witness the high state of perfection which television has reached.

So you must go to the Radio Show!

Wireless Licences

THE Post Office issued 363,114 wireless receiving licences during July, 1939. This figure represents a net increase of 20,640 in the number of licence holders during the month after making allowance for expired licences and renewals.

The approximate total number of licences in force at the end of July, 1939, was 9,030,950, as compared with 8,657,100 at the end of July, 1938, an increase during the year of 373,850.

During the month there were 495 successful wireless prosecutions.

Poetic Piffle

ONE or two readers have written regarding my justifiable criticism of Tennyson's and Gray's tripe, suggesting that I should make due allowance for poetic licence. The only thing which I would do to all poets is to take their licences away. They are nearly always lazy individuals who explain their laziness away by stating that they are waiting for the divine afflatus. No man who does so little worthless work has a right to be considered famous. One reader thinks because I do not enjoy poetry and crooners (I put them in a class together) I can only enjoy something hard and cold such as calculus and geometry.

Another quotes a poem about the deep deep sea. Perhaps you can tell me how deep is a deep deep sea, and how it differs from a shallow deep sea, or a deep shallow sea, or a shallow shallow sea. The rhyming word in nearly every case provides the thought in poetry, and having composed some snivelling line the poet finds some word which will rhyme with its last word. I still hope that some variety artiste will make a speciality sketch with suitable "noises off" of some of the alleged epic poems.

The New Wavelength Allocations

THE new wavelength allocations take place in March, 1940. The manufacturers have agreed on a policy concerned with changing receiver dials to suit the new wavelengths. Procedure as to how the new dials will be fitted, supplied and charged for, falls under three main heads, and it will be seen that this relates to the age of the receiver. It has been agreed that all sets supplied after January 1st, 1940, will be fitted with new dials, or with a dial as spare. In the latter case, the old dial will be changed free of charge by the dealer at the appropriate time. The dealers are to be supplied with new dials for 1939-40 sets, in readiness for the change.

Sets supplied in the autumn of 1939 will be charged for at the rate of 2s. 6d. per dial plus the cost of fitting by the dealer. All sets prior to the 1939 Exhibition catalogue will have dials available back to those listed in the 1937 Exhibition catalogue, and the charges will be 4s. for 1938-39 sets, and 5s. 6d. for 1937-38 or earlier sets. In each case if these dials are fitted by a dealer an extra charge will be made and fitting prices have not yet been standardised.

Press-button Receivers

THE readjustment of sets provided with push-button tuning has also been considered, although it has not been found possible to standardise prices. The readjustment of such receivers should be a comparatively simple matter.

Radiolympia Television Broadcasts

SPECIAL television transmissions from Radiolympia will be radiated daily by Alexandra Palace, and thus dealers should be able to provide on their demonstration screens a useful advertisement for the Show. The programmes will be taken from the Radiolympia theatre and also from a special studio. It is proposed to interview visitors to the Show in

Notes from the Test Bench

Test-bench Layout

WHEN a great deal of receiver servicing has to be carried out, various meters are called for. In most cases these are stacked on a shelf and taken down as required. Multi-range meters have to be adjusted according to the range required, and thus test work is not exactly simple and straightforward. A suggestion has been made to facilitate this work by mounting all meters permanently and using extension leads, external switches and sockets or flex leads attached to the bench top. A number of sockets could be wired in parallel and sunk flush with the bench top and lengths of flex lead provided with clips and/or plugs could then be connected to the appropriate parts of the circuit, plugged into the sockets and the meter thereby introduced. The appropriate range selector could be placed on the bench, and where a large 0-1 milliammeter could be obtained and mounted on the back of the bench, the single dial would be suitably calibrated and testing simplified.

Mounting Components

WHEN mounting components on some types of receiver, nuts and bolts have to be employed, but difficulty is experienced in attaching the nuts to the bolts owing to the proximity of components. Box spanners are, of course, invaluable in such cases, and where these are not available, makeshift spanners may be made by taking a length of thin tubing and hammering it round a nut of the size required. The tubing may not remain very rigid, but if a shakeproof washer is placed over the screw the nut will not have to be turned very tight and the spanner may thus be used with satisfactory results.

Leading in Devices

WHEN leading the aerial lead into a room, the usual scheme is to drill the window frame. For transmitting purposes, however, greater insulation is required and the window glass itself is usually drilled and special lead-through insulators fitted. To avoid the trouble of drilling the glass, however, a good idea is to lower the window, where the ordinary sash type of window is fitted, and place a length of board along the upper part of the window. This may be drilled and the insulators mounted in the usual way. Where ordinary casement windows are found, however, the alternative is to remove the glass pane and replace with a shorter pane and a length of wood.

the latter, and an hour's transmission will be provided every morning from 11 a.m. to 12 noon in place of the film.

The Flying Announcer

MICHAEL HINN, WLW announcer, circled his 'plane over Watson Airport, Cincinnati, recently and waited for the arrival of an ambulance and the fire department. The landing gear on his machine was broken.

Hinn has been flying for three years and only last month purchased his own 'plane. The other night he took his 'plane for a trial spin before taking his friends aloft. Just as he left the ground there was a sharp report of snapping steel, and Mike felt the 'plane take a slight dip down. Safely off the ground he began to look around for the trouble and sickened at the sight of only one wheel on his landing gear.

Airport officials kept him aloft while they summoned the fire department and an ambulance, for Hinn's 'plane lands at high speed. But the service of neither was necessary. Hinn came down unhesitatingly, slowed his landing speed below normal, touched the good right wheel to the ground, cut the ignition switch, pushed up his goggles, covered his face with one arm and held the stick with the other hand. The 'plane came straight down the field, lost speed quickly, dipped to its injured side until the wing tip touched the ground, then nosed up slightly, stopped and settled back.

"The landing was distinctly to Hinn's credit as a flyer," declared airport officials. "I felt funny waiting up there for the ambulance," said Hinn.

"Bon Voyage"

BETWEEN eighteen months and two years ago, while Stanford Robinson was touring the operatic centres of Europe to study technique and production methods, he heard a performance of Kunneke's "Gluckliche Reise" and liked it so much that he decided to arrange a broadcast of the work, one day, to British listeners.

Now, as Music Productions Director of the B.B.C., he is to fulfil the promise he made to himself, for he has scheduled the work for production on September 5 (National) and September 6 (Regional). The title has been translated to "Bon Voyage," and the performance will be produced by Gordon Crier, who is being "lent" by the Variety Department to the Music Productions Section for the occasion.



Advanced Listening in 1940 with

"HIS MASTER'S VOICE"

34 Models in New Range

By achieving perfect naturalness in the reproduction of every word, note and sound "His Master's Voice" technicians have provided radio enthusiasts with "advanced listening" for 1940 . . .

Important "H.M.V." technical advances enable you to derive greater enjoyment from broadcast transmissions, and to elicit from your favourite records a tonal realism hitherto unrealised . . . Beautiful cabinets combine accurate acoustic matching with the appeal of good furniture.

In high definition television, too, "H.M.V." offer you at popular prices, more vivid and reliable reception. Ask for a demonstration at your dealer, and/or post the coupon.



POST THIS COUPON NOW

To "His Master's Voice," 98-108, Clerkenwell Road, London, E.C.1.

I should be pleased to receive a copy of your coloured booklet illustrating the complete new range of "His Master's Voice" * } Radio Instruments.
Television Receivers.

NAME.....

ADDRESS.....

* Cross out item not required.

PRACTICAL TELEVISION

Aug. 26th, 1939.

Vol. 4.

No. 166.

Film Transmissions

IN the original B.B.C. schemes for transmitting talking films by television, advantage was taken of the storage principle exhibited by the signal plate of the electron camera. That is to say, the pictures of each individual film frame were projected on to the mosaic and the electrical potential acquired by each small element was then analysed by the scanning beam during the period when the optical picture was cut off. After a long period of trial and much adverse comment, this method has now been abandoned and Mechau film projectors installed, so that by an ingenious cam-operated mirror mechanism the picture has continuous movement in lieu of a shutter device. The Americans realised quite early that the storage principle had drawbacks, and devoted a considerable time to research into non-intermittent motion systems. Rocking mirrors and other devices were tried, but serious optical and mechanical difficulties were encountered so that ultimately a reversion to intermittent motion was made by the R.C.A. A modified form of a standard projector was used, however, and in actual practice the film picture, focused on to the mosaic, is chopped sixty times per second by a rotating shutter in order to make the apparatus conform to the American television picture standard of 60 frames per second interlaced to give 30 pictures per second. In the case of the Columbia Company, however, a non-intermittent film scanner was developed, employing an image dissector tube together with electronic compensation, and the only moving component is a slotted shutter. A form of chasing motion is employed, and the prime

difficulty seems to be associated with variable film shrinkage, but this is compensated by lens focus adjustment which is scaled in terms of shrinkage.

An International Conference

DURING the first two weeks in September an international physics conference is to be held in Zurich, when eminent physicists from all over the world

auspices of the Physical Society of Zurich, and the Swiss Ecole Polytechnique Fédérale, and everything will be sectionalised. Naturally, the subject of television is being given due prominence, and the arrangements so far concluded show that papers will be presented by Dr. Zworykin of R.C.A., A. D. Blumlein of E.M.I., Dr. Muller, of Fernseh, Barthélémy of France, Dr. Okolicsanyi of Scophony, Dr. Schroter, of Telefunken, and Prof. Kapfnuller, of Siemens Halske. This international interchange of ideas and opinions on television is an admirable scheme, and it is a pity that some of the learned societies in this country do not adopt a similar policy.

High-voltage Precautions

THE use of high voltages in cathode-ray tube receivers, especially those employed in big screen projection work, calls for certain precautions in order to obviate picture defects arising from corona



Girls in the latest bathing dresses posing while being televised recently at the Rochampton Club' swimming-pool.

are expected to be present. The work of organisation is being undertaken under the

discharges or scanning distortion due to an accumulative charge on the inner coating of the glass bulb. This, of course, is additional to the normal precautions undertaken to prevent any voltage shock due to mishandling of the equipment. For example, all sharp edges or points are reduced to the barest minimum to prevent any corona or spark discharge. In one case where there is an inner metallic or colloidal graphite coating, a perfectly smooth guard-ring is incorporated in close proximity to the sharp edges, and contact is maintained with the coating by springs. In this way corona discharge is eliminated. Any spark discharges evidence themselves on the picture screen as light splashes, bearing some resemblance to motor-car ignition interference. Any accumulation of charge on the tube's internal coatings will bow the scanning lines so that they take up a curved path instead of the required straight one. Deflection of the field so that it loses its picture mask centring can also occur, and such charges have to be neutralised to restore the picture to normality.



The television transmission room at the Berlin-Witzleben station, the transmissions from which can be picked up with the new television set which was shown for the first time at the Berlin Radio Show.

SPECIAL NOTE.

Owing to pressure on our space many of our Regular Features are held over this week.

The 1940 All-wave Three

An Efficient 3-Valve Receiver designed for Four-wave-band Reception,
Built On Our New Transparent Chassis!

THERE is always a great demand for an efficient receiver which will receive a reasonable portion of the short-wave transmissions plus the usual medium- and long-wave programmes which are invariably required for home entertainment. To satisfy this demand would not be difficult were it not for the fact that many other

but it is not convenient when the receiver has to fulfil the dual requirements of home entertainment and short-wave listening.

In the 1940 All-Wave Three, wave changing is merely a matter of a turn of the special Bulgín switch which enables one to cover 15 to 35 metres, 30 to 85 metres, 200 to 550 metres, or 1,000 to 2,000 metres at

selectivity; therefore, to improve matters in this direction, alternative aerial sockets are provided, which enable the .002 mfd. variable condensers to be brought in series with the aerial if so desired. Under normal conditions, and providing an aerial of reasonable length is used, the degree of selectivity is quite satisfactory; in fact, it is surprising what separation can be obtained by judicious use of the aerial series condenser and reaction control.

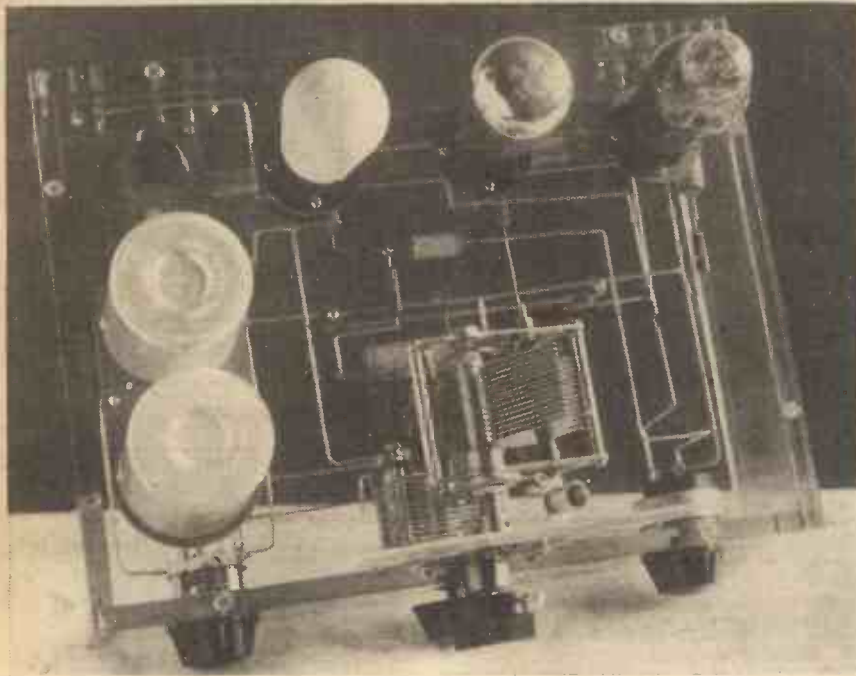
Speaking of the reaction control brings into prominence the fact that the coil is so designed that the reaction winding is increased or decreased, by the same switch as that used for wave changing, according to the waveband being covered, thus allowing a very smooth reaction control to be obtained over the complete wave coverage of the circuit.

A standard leaky grid detector employing a triode valve is used as this, together with two stages of L.F. amplification, was found to provide ample volume and sensitivity.

In place of the usual H.F. choke in the anode circuit, a 10,000-ohm resistance has been used as an H.F. stopper, adequate by-passing of the H.F. currents being provided by one section of the differential reaction condenser.

The L.F. Side

The anode load for this valve is formed by the 50,000-ohm resistance which receives its H.T. via a further 20,000 ohms inserted to obtain, together with the 2 mfd. condenser, a satisfactory degree of decoupling to prevent undesirable feed-back through the H.T. supply. The output from the detector is fed to the grid circuit of the first L.F. via a coupling condenser of .01



Plan view of the receiver, which has been built on Catalin to reveal all details.

requirements are always specified. For example, the receiver must be simple to construct and operate, low in price, free from complicated adjustments and, according to the majority, for battery operation.

To satisfy all the requests, therefore, it becomes necessary to produce a design which, while being quite simple, must have a reasonable degree of efficiency over the wavebands concerned. A superhet or H.F. type of circuit is ruled out of the question on account of controls and costs, so one is only left with a straight arrangement to secure satisfactory range and volume. With the receiver about to be described, we have limited the valves to three, and followed a perfectly orthodox arrangement of detector followed by two stages of L.F. amplification.

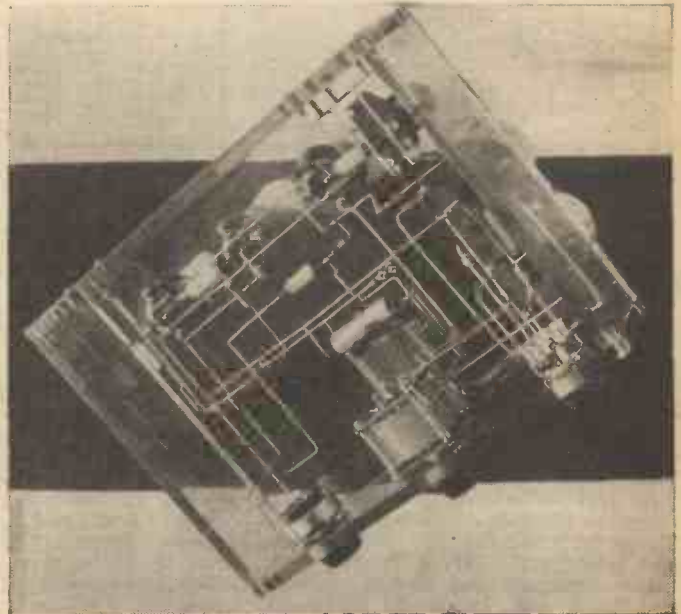
This, in itself, may not seem particularly striking, but by embodying the Bulgín coil type No. 56 and by using resistance-capacity coupling throughout, we have been able to obtain a circuit which gives four distinct wavebands and a high degree of tonal quality with ample volume for normal domestic requirements.

In many all-wave receivers of the simple type the wide waveband usually associated with that type of receiver is often obtained by using plug-in coils. This certainly eliminates switching problems and wiring,

will, and, owing to the design of the coils and switch the wiring is reduced to a minimum and all the troubles usually associated with such switching completely eliminated.

The Circuit

An examination of the theoretical circuit on p. 566 will reveal the fact that the aerial circuit is formed by a simple single tuned grid coil, the aerial being connected to the top end. As many readers are no doubt aware, such an arrangement does not give one an exceptionally high degree of



Another view of the completed receiver.

THE 1940 ALL-WAVE THREE

(Continued from previous page.)

mfd. and an H.F. stopper of .25 megohms.

As it is highly probable that the first two valves would overload the 220HPT when receiving a powerful signal, a volume control has been provided in the form of a variable grid leak for the first L.F. valve.

The remaining L.F. coupling is secured by the normal resistance capacity method plus an additional H.F. stopper in the grid circuit of the 220HPT, and to correct the tonal response of the pentode a simple fixed tone corrector is connected between the anode of the output valve and the common negative earth line.

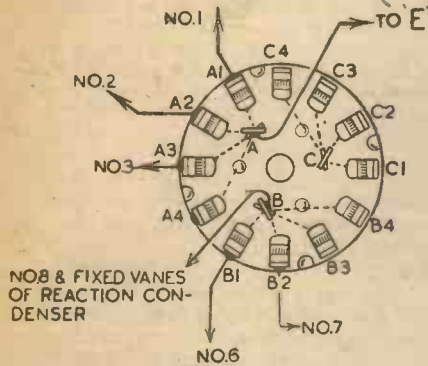
By a careful selection of components, and through using R.C. coupling, the actual

as it is not possible to fit a switch or coils of the types specified with terminals.

Cost

An item which is quite worthy of attention is the very low cost of the essential

components of this receiver, and when it is realised that the complete kit of components, less chassis and valves, can be purchased for £2 7s. 3d., it will be appreciated that it is not a costly matter to obtain an efficient all-wave receiver.



Wiring of the switch contacts. Note A1 and A2 do not refer to aerial sockets.

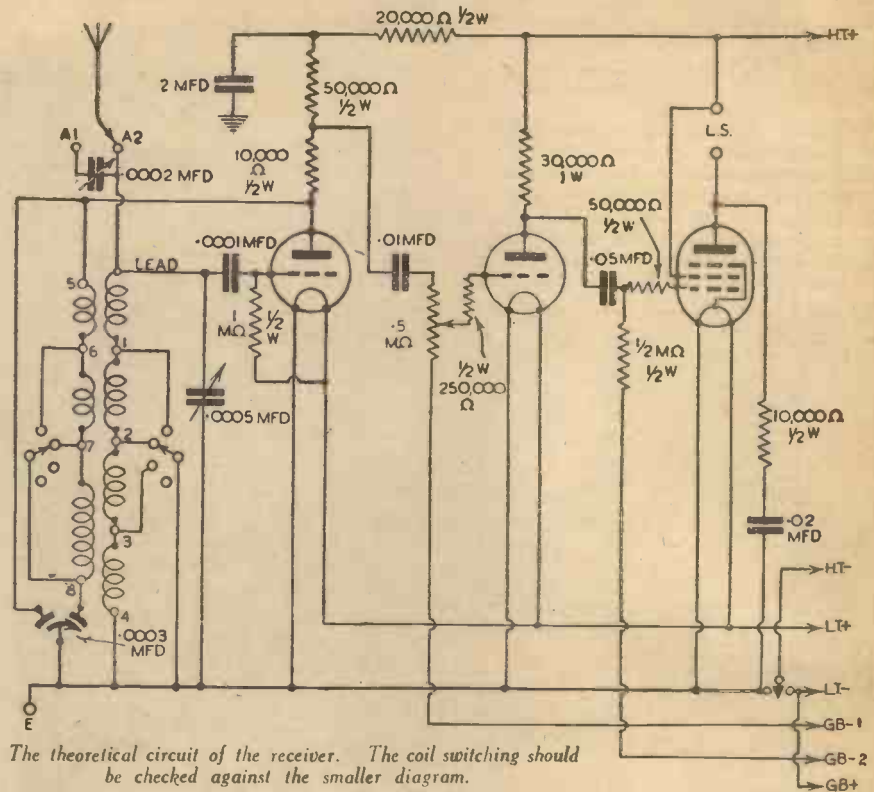
wiring of the receiver is reduced to a minimum and rendered very simple and thus easy to follow.

Construction

It is not possible in this issue to give the constructional details of the receiver, owing to space limitations, but such details will be given in next week's issue, together with a complete plan drawing showing all wiring.

When examining the photos of the receiver it will be noted that for exhibition purposes the set has been constructed on a glass-like chassis which enables every wire and connection to be seen at a glance, but it must be appreciated that this form of chassis is not intended for normal constructional work. An ordinary Metaplex chassis, which can be obtained from Messrs. Peto-Scott, is quite satisfactory.

One other item connected with the construction and which should be duly noted is the fact that it is really essential for the majority of the connections to be soldered,



The theoretical circuit of the receiver. The coil switching should be checked against the smaller diagram.

LIST OF COMPONENTS FOR THE 1940 ALL-WAVE RECEIVER

	s.	d.		s.	d.
One variable condenser .0005 mfd. J.B. Popular Log	5	6	One 2 mfd. Type No. F.T.	2	3
One variable condenser .0003 mfd. J.B. No. 2,048.	4	9	Resistances (Erie). All 1/2 watt type:		
One variable condenser .0002 mfd. J.B. No. 2,095	2	6	One 20,000 ohm. (3d. each)		
One slow-motion dial. J.B. Type No. S.L.3	5	9	Two 50,000 ohm. (3d. each)		
Two four-pin valveholders. Clix Type No. X.111	0	10	Two 10,000 ohm. (3d. each)	2	0
One five-pin valveholder. Clix Type No. L.111	0	6	One 1 megohm. (3d. each)		
One A.1, A.2, and E socket strip. Clix No. X.382	0	6	One 1/2 megohm. (3d. each)		
One L.S. socket strip. Clix No. X.380	0	5	One .25 megohm. (3d. each)		
Fixed condensers (T.C.C.):			One 0.5 megohm potentiometer with switch (Eric)	4	0
One .0001 mfd. Type No. 300 (1s.)			Coil, four-range. Type No. 56 (Bulgin)	10	6
One .01 mfd. Type No. 300 (1s.)			One wave-change switch. Type No. S.203 (Bulgin)	2	9
One .02 mfd. Type No. 300 (1s.)	4	0	One 210 H.F., one 210 H.L., and one 220 H.P.T., valves (Cosmor).		
One .04 mfd. Type No. 300 (1s.)			Chassis, 12 x 9 x 3 inches, Metaplex (Peto-Scott).		
			Batteries—one 9-volt G.B. and one 120-volt H.T. (Drydex); one 2-volt accumulator (Exide).		
			Speaker: P.M. moving-coil (W.B.)		

RECORDS that will be eagerly sought after this month are two new recordings of this year's Aldershot Tattoo. The first record—H.M.V. C 3108—opens with the reception given to General Gamelin when he visited Aldershot. Other items that have been snapped in sound on this record is a stirring rendering of the "Marseillaise" and Schubert's "Serenade" played by the massed bands.

The other Tattoo record—H.M.V. C 3109—starts off with such popular songs as "The Lambeth Walk" and "The Chestnut Tree" and passes on to a recording of the re-creation of Queen Elizabeth's visit to Tilbury in 1588; the part of the Queen being played by Miss Marda Vanne.

Peter Dawson's deep baritone voice is particularly well suited to an organ accompaniment and the ballads he has recorded this month, "Drink to me Only"

IMPRESSIONS ON THE WAX

and "Roses of Picardy," are really excellent—H.M.V. B 8932.

On the lighter side attention must be drawn to the playing of Alfredo Campoli's Orchestra of an old American dance tune "Turkey in the Straw," and Ronald Gourley's "Dicky Bird Hop" on H.M.V. BD 724.

Louis Levy and his Orchestra play "Smilin' Through" and "Smoke gets in Your Eyes" in most attractive arrangements which should give these melodies a new lease of popularity—H.M.V. BD 723.

Although the Bickershaw Colliery Band from Leigh, in Lancashire, was only formed

a few years ago, they have won 350 prizes and broadcast many times. Last year they were runners-up in the National Brass Band Festival. They have chosen two popular marches, "Blaze Away" and "Washington Greys," for their latest recording on H.M.V. BD 726.

Reginald Foort is in great form on his Moller Concert Organ. He plays the famous "Wee Macgregor Patrol" and couples it with "Rustle of Spring" on H.M.V. BD 725.

Songs from the Films

Dorothy Lamour, who starred in "Hurricane" with great success, has followed it with a film called "Man About Town." The two hits from this film, "Strange Enchantment" and "That Sentimental Sandwich" have been recorded by her on H.M.V. B 8940.

TROPHY "6" NEW

COMMUNICATION

Receiver — You must see

your Dealer about it **NOW**

All-British!



A HIGH-EFFICIENCY ALL FEATURE RECEIVER PRICED AT ONLY 9 1/2 GUINEAS

Other TROPHY Successes

TROPHY 8.—Communications-Type receiver for serious short-wave work. Principal features: 8 valves, 5 Bands 7 to 550 metres, R.F. on all Bands, continuous Bandsread tuning, separate Oscillator, switchable B.F.O. and A.V.C. Pitch Control, Doublet or Single-wire inputs, Send-Receive switch, speaker and 'phone sockets. A.C. mains 200/250v. Price 12 Gns. High-fidelity Speaker in cabinet to match, 2 Gns. extra.

TROPHY 3.—This supremely efficient receiver of the regenerative type brings short-wave listening within the reach of all. Very simple tuning. Specification and performance unsurpassed. Wave-range 6.2 to 550 metres. Built-in speaker. One user states: "... the most amazing Short-wave receiver I have ever handled ... sensitivity extraordinarily high."

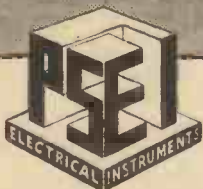
A.C. mains model: 8 Gns.
BATTERY model: £5 15/-, less batteries.
Supplied with self-locating inductors for 12 to 52 metres.

2-Stage PRE-SELECTOR.—A Radio Frequency Amplifier with "E" series valves and a continuous wave-range of 7 to 550 metres. For use with existing receivers where it is desirable to provide increased range, selectivity, sensitivity and—for the superheterodyne—reduction to a minimum of second-channel interference. Two R.F. stages provide an exceptionally high gain, and in operation the Pre-selector is both positive and noise-free. PRICE £8 15/-.

THIS new All-British Junior Communication A.C. Receiver is of interest to the Amateur Transmitter and all Short-wave Listeners. The TROPHY "6" has a wave-range of 6.5 to 545 metres and incorporates all essential refinements for efficient operation. In its class, the TROPHY 6 is the finest receiver obtainable for general use and wherever dependable all-World reception on the high-frequency bands is desired.

Specification includes 6 Valves, Separate Dial Electrical Bandsreading, Directly Calibrated Frequency Scale, A.V.C. and Beat Frequency Oscillator On-off Switches, Send-Receive Switch, Single-wire or Doublet aerial inputs, Built-in Speaker and 'Phone Socket. A set which merits the complete confidence of every short-wave enthusiast.

GUARANTEE! All TROPHY instruments are covered by a special 12 months' guarantee, which includes all valves. All models available on Deferred Terms.



Manufacturers of Short-wave Receiving and Transmitting equipment to H.M. Government.

● **TROPHYS** are obtainable from all good Dealers

Scottish readers note:
All TROPHY Short-wave instruments are available from Messrs. **CLYDESDALE SUPPLIES**—all branches

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To PETO-SCOTT ELECTRICAL INSTRUMENTS (Holdings) LTD., Pilot House, Stoke Newington, Church Street, London, N.16.
Telephone: Clissold 5000
Please Post Me FREE TROPHY Details

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ADDRESS

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Cut Out and Post Now!

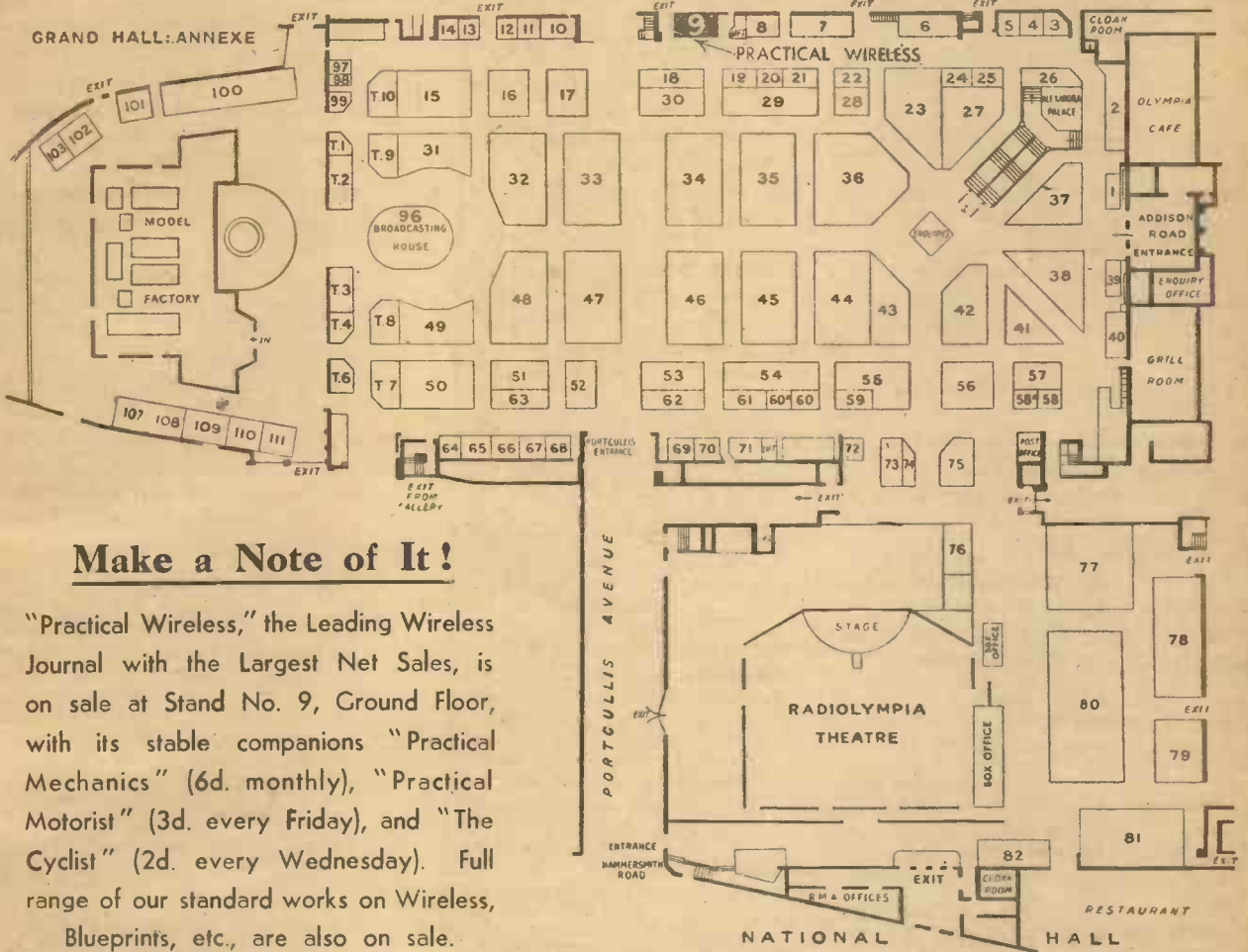
Visitors' Guide to the Exhibitors

Arranged Alphabetically for Your Convenience. The Exhibits are Similarly Reviewed in this Order on pages 570-578. For List of Specialised Non-proprietary Exhibits, see page 573

Name and Address	Stand No.	Name and Address	Stand No.	Name and Address	Stand No.
Aerialite, Ltd. , Castle Works, Stalybridge, Cheshire ...	60	Erie Resistor, Ltd. , Carlisle Road, The Hyde, N.W.9 ...	13	Radio Gramophone Development Co., Ltd. , Globe Works, Newtown Road, Birmingham ...	29
Antiference, Ltd. , 176, Wardour Street, W.1 ...	10	Ferguson Radio Corpn. , 105-109, Judd Street, W.C.1 ...	17	Reproducers and Amplifiers, Ltd. , Frederick Street, Wolverhampton ...	111
Armstrong Mfg. Co. , Walters Road, Nags Head, N.7 ...	69	Ferranti, Ltd. , Radio Works, Moston, Manchester, 10 ...	41	Norman Rose (Electrical), Ltd. , 43, Lambs Conduit Street W.C.1 ...	12
Balcombe, A. J., Ltd. , 52, Tabernacle Street, E.C. ...	37	Garrard Eng. and Mfg. Co., Ltd. , Newcastle Street, Swindon, Wilts ...	56	R. A. Rothermel, Ltd. , Rothermel House, Canterbury Road, N.W.6 ...	71
Baird Television, Ltd. , Crystal Palace, Anerley Hill, S.E.19... 27	27	General Electric Co., Ltd. , Magnet House, Kingsway, W.C.2 ...	35	Scophony, Ltd. , Thornwood Lodge, Campden Hill, N.W.8 ...	49
Belling and Lee, Ltd. , Cambridge Arterial Road, Enfield, Middx. ...	3, 26	Goodman's Industries, Ltd. , Lancelot Road, Wembley, Middx. ...	19	Scott Insulated Wire Co., Ltd. , Queensland Works, Westmorland Road, N.W.9 ...	103
Brit. Insulated Cables, Ltd. , Prescott Lincs ...	20	Gramophone Co., Ltd. , 108, Clerkenwell Road, E.C. ...	46, 53	Henri Selmer and Co., Ltd. , 114, Charing Cross Road, W.C.2 ...	99
Brit. Pix Co., Ltd. , Pix Works, Lillieshall Road, S.W. 4 ...	64	F. C. Heayberd and Co. , 10, Finsbury Street, E.C.2 ...	57	Servisol, Ltd. , 74, Renshaw Street, Liverpool ...	11
Brit. Rola, Ltd. , Minerva Road, Park Royal, N.W.10 ...	24	Holsun Batteries, Ltd. , Neville House, Page Street, S.W.1 ...	40	Siemens Electric Lamps and Supplies, Ltd. , 39, Upper Thames Street, E.C.4... ...	52
A. F. Bulgin, and Co., Ltd. , Abbey Road, Barking, Essex... 62	62	Imhof, A., Ltd. , 112, New Oxford Street, W.C.1 ...	70	Steatite and Porcelain Products, Ltd. , Stourport-on-Severn, Worcs ...	61
Burndept, Ltd. , Light Gun Factory, Erith, Kent ...	54	Invicta Radio, Ltd. , St. Andrews Road, Cambridge, and at 203, Old Street, E.C.3... 16	16	Sterling Batteries, Ltd. , Sterling Works, Dagenham, Essex ...	65
Bush Radio, Ltd. , Power Road, Chiswick, W.4 ...	34	McMichael Radio, Ltd. , Wexham Road, Slough, Bucks ...	38	Taylor Electrical Instruments Ltd. , 45, Fouberts Place, Regent Street, W.1 ...	101
Car Fastener Co., Ltd. , Nottingham Road, Stapleford, Notts ...	66	Marconi-Ekco Instruments, Ltd. , Electra House, Victoria Embankment, W.C.2... ...	109	Telegraph Condenser Company , Wales Farm Road, Acton, W.3 ...	63
Celestion, Ltd. , London Road, Kingston-on-Thames ...	25	Marconiphone Co., Ltd. , 210 Tottenham Court Road, W.1 ...	36	Telegraph Construction and Maintenance Co., Ltd. , 22, Old Broad Street, E.C.2 ...	22
Chloride Elect. Storage Co., Ltd. , 231, Shaftesbury Avenue, W.C.2 ...	2	Mercantile Credit Co., Ltd. , 39-45, Finsbury Square, E.C.2 ...	67	Ultra Electric, Ltd. , Western Avenue, Acton, W.3 ...	43
E. K. Cole, Ltd. , Ekco Works, Southend-on-Sea, Essex ...	47	Mullard Radio Valve Co., Ltd. , Century House, Shaftesbury Avenue, W.C. ...	55	Vacuum Science Products, Ltd. , 166, Weir Road, Balham, S.W.12 ...	18
Cosmocord, Ltd. , Cambridge Arterial Road, Enfield, Middx. 72	72	Murphy Radio, Ltd. , Broadwater Road, Welwyn Garden City, Herts ...	33	Varley (Oliver Pell Control), Ltd. , 166, Weir Road, Balham, S.W.12 ...	18
A. C. Cossor, Ltd. , Cossor House, Highbury Road, N.5... 48	48	New London Electron Works, Ltd. , East Ham, E.6 ...	59	Vidor, Ltd. , West Street, Erith, Kent ...	51
Decca Radio and Television, Ltd. , 1-3, Brixton Road, S.W.9 44	44	NEWNES, GEO., LTD., TOWER HOUSE, SOUTH-AMPTON STREET, W.C.2... 9	9	Waverley Book Co. , 96, Farringdon Street, E.C.4... ...	8
Dubilier Condenser Co. (1925) , Ducon Works, Victoria Road, North Acton, W.3 ...	28	Philco Radio and Television Corpn. of Gt. Britain, Ltd. , Perivale, Greenford, Middx. 31	31	Westinghouse Brake and Signal Co., Ltd. , 82, York Way, King's Cross, N.1 ...	30
Dynatron Radio, Ltd. , Perfecta Works, Rayleigh Road, Maidenhead ...	1, 39	Pilot Radio, Ltd. , 31-33, Park Royal Road, N.W.10... ...	42	Wingrove and Rogers, Ltd. , Mill Lane, Old Swan, Liverpool ...	110
W. G. Eavestaff and Sons, Ltd. , Autoplayer Factory, Ashfield Road, N.4 ...	73	Philips Lamps, Ltd. , Century House, Shaftesbury Avenue, W.C. ...	45	Wright and Weaire, Ltd. , 740, High Road, Tottenham, N.17 ...	102
Econasign Co., Ltd. , 92 Victoria Street, S.W.1 ...	14	Plessey and Co., Ltd. , Vicarage Lane, Ilford, Essex ...	68		
Edison Swan Electric Co., Ltd. , 155, Charing Cross Road, W.C.2 ...	23	PRACTICAL WIRELESS ...	9		
Gordon Elf, Ltd. , 55, Rathbone Place, W.1 ...	21	Pye, Ltd. , Radio Works, Cambridge ...	32		
E. M. I. Service, Ltd. , Sheraton Works, Hayes, Middx. ...	100				

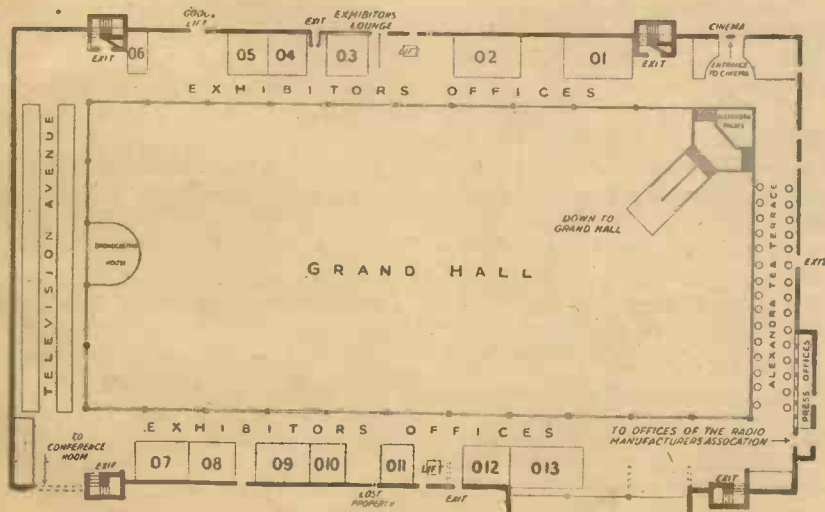
Complete Guide to Radiolympia

For Detailed Guide to Each Exhibit, See Pages 570 to 578



Make a Note of It!

"Practical Wireless," the Leading Wireless Journal with the Largest Net Sales, is on sale at Stand No. 9, Ground Floor, with its stable companions "Practical Mechanics" (6d. monthly), "Practical Motorist" (3d. every Friday), and "The Cyclist" (2d. every Wednesday). Full range of our standard works on Wireless, Blueprints, etc., are also on sale.



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Complete Stand-to-
Stand Report. All
the Latest News and
Notes of the Trade.

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NOW!



AERIALITE, LTD., Castle Works, Stalybridge, Cheshire. **STAND No. 60.**

THIS exhibit will consist of various types of aerial, aerial wire, and similar items. Special types of aerial of the dipole variety, developed to give improved results on the short waves, and for use with all-wave receivers, will be seen.

ANTIFERRECE, LTD., King's Yard, Bayham Place, N.W.1. **STAND No. 10.**

ON this stand there will be twelve different types of television aerial. These cover every conceivable type of mounting including one wall-mounting dipole for only 16s. 6d. These aerials are available with steel or aluminium rods, and with or without reflectors.

An ABC Guide to the Exhibits

In a few cases details of exhibits have not been released at the moment of going to press.

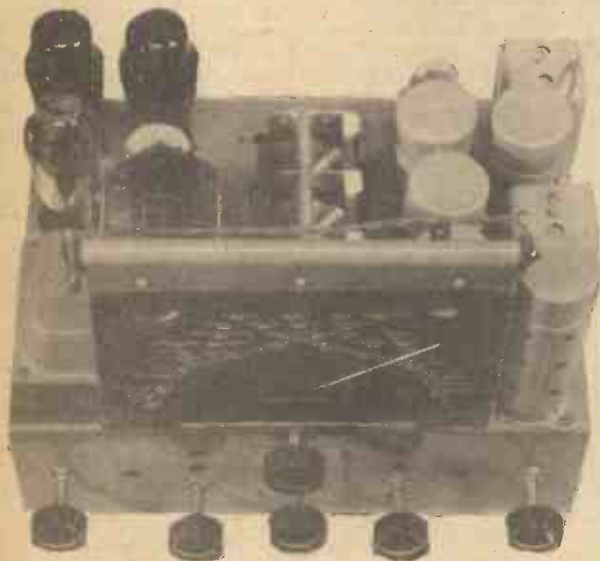
BAIRD TELEVISION, LTD., Crystal Palace, Anerley Hill, S.E.19. **STAND No. 27.**

THE television receivers exhibited on this stand are of the cathode-ray type and are notable for the brilliance of the received picture. Among the popular models are T.25 at 47 gns. and T.26 at 40 gns. The form r is a combined all-wave radio and television receiver, giving radio on three wavebands, 16 to 51, 198 to 560 and 850 to 2,000 metres. Model T.26 is for television only, and has only two controls. The

guineas. Among other models to be seen are a 4-valve A.C./D.C. superhet transportable, table models, and radiograms.

BELLING & LEE, LTD., Cambridge Arterial Road, Enfield, Middlesex. **STANDS Nos. 3 and 26.**

MANY small items, primarily for the manufacturer, but also of great use to the home-constructor, will be seen here, together with the special Sky-rod aerial. This is intended for use in restricted areas, and for districts where there is considerable interference. It is mounted on the chimney stack or roof.



ARMSTRONG MFG. CO., Walters Road, Nag's Head, Holloway, N.7. **STAND No. 69.**

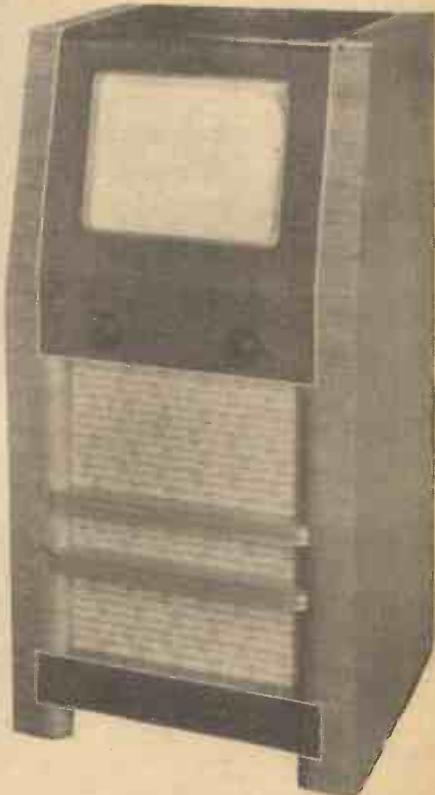
THIS firm specialises in receivers in chassis form and a representative selection will be seen on their stand. All-wave chassis in various valve combinations will be featured, including all the latest refinements.

A fine example of an Armstrong chassis. This is a 10-valve (including cathode-ray) superhet - straight all-wave radiogram at £12 12s.

most noticeable feature is the high quality of reproduction.

A. J. BALCOMBE, LTD., 52-58, Tabernacle Street, E.C.2. **STAND No. 37.**

A WIDE range of receivers will be seen on this stand under the name Alba, and of these the 3-valve battery portable at 6 gns. is probably the most popular at the moment. At the other end of the range is an 8-valve "Prestotune" superhet radiogram, providing 16 watts undistorted output and costing 28



The Baird 40-guinea television console, giving television (sound and vision) programmes only.

Floor plan appears on page 569.
Complete Show Report Next Week.

BRIT. INSULATED CABLES, LTD., Prescott, Lancs. **STAND No. 20.**

IN addition to various types of cable and wires, this exhibit will also include meters, condensers, and solder. A new flux-cored solder is a special product, and contains a patented non-corrosive flux. The range of condensers is increased by a special tropical type condenser, hermetically sealed in a moulded tube and designed to operate satisfactorily in extremely arduous conditions of tem-



perature and humidity. Four sizes are available in various capacities and working voltages. Some "Dwarf" condensers will also be on show.

BRITISH PIX CO., LTD., Pix Works, Lillieshall Road, London, S.W.4. **STAND No. 64.**

THE range of Pix products to be seen on this stand includes resistors, paper and electrolytic condensers, the self-fitting Gripon aerial, the Pix aerial device and Pix valves. The Gripon aerial will be seen in a new and improved form, but the original Pix remains unchanged. A snail holder is available for fixing the Pix to a receiver or window-ledge. Among other exhibits on this stand will be the Pix metallised earth, Modula armchair control, a lightning arrester, and the well-known Pix aerial of the adhesive "tape" type.



A "Tropical" condenser designed and produced by Brit. Insulated Cables to avoid troubles in extreme climatic conditions.

BRITISH ROLA, LTD., Minerva Road, Park Royal, N.W.10. **STAND No. 24.**

ON this stand will be 28 models of the popular Rola speaker, ranging from 5in. to 12in. units. The speakers will be seen in permanent-magnet and energised types, and also in cabinets designed for extension listening purposes. Prices of the Rola speakers range from 19s. 6d. to £5 5s., and the new models embrace the 5in., 6in. and 12in. dustproof designs. The G.12 model which has retained its popularity for a long time will be seen, and should be inspected by all who are interested in quality reproduction.

BROWN BROS., LTD., Gt. Eastern Street, E.C.2. **STAND No. T.8.**

THIS is a Trade exhibit, and among the wide range of commercial apparatus exhibited will be the special range of

accumulators marketed under the firm's trade name "Duco." These accumulators are available in celluloid or glass containers.

BULGIN, A. F., & CO., LTD., Abbey Road, Barking, Essex. **STAND No. 62.**

CONSTRUCTORS need no introduction to this firm, and as in previous years the exhibit will consist of an extremely wide range of constructor aids. Among the many new items which are being introduced and which will be seen for the first time are television aerials, pilot bulbs, anti-break-through choke, unit coils from 7 to 2,600 metres, turntables, new fuses, connector strips,

New Belling-Lee all-wave receiver mains connector for suppression of interference.

signal lamps, bushes, etc., etc. A new catalogue will be introduced at Olympia, and including nearly 300 new articles, and every constructor should obtain a

copy and inspect the wide range of components.

BURNDEPT, LTD., Light Gun Factory, Erith, Kent. **STAND No. 54.**

MESSRS. BURNDEPT will be showing a wide range of receivers of all types, including portables, table models and radiograms. As usual, the receivers will be of specialised design and possess many attractive features.



One of the Duco accumulators marketed by Brown Bros.

BUSH RADIO, LTD., Power Road, Chiswick, W.4. **STAND No. 34.**

THE receivers to be shown on this stand will be of the all-wave type, with push-button tuning and other attractive modern features. Large open tuning scales and rapid tune devices will enable the operator to locate any desired station quickly and with certainty.

CARR FASTENER CO., LTD., Stapleford, Nottingham. **STAND No. 66.**

PRIMARILY of interest to the manufacturers, this exhibit will display various types of mounting strip and soldering lugs and similar items intended for chassis-mounting by means of rivets. In addition the range of Benjamin valveholders will be on view, and these include chassis-mounting types for English and American valves.

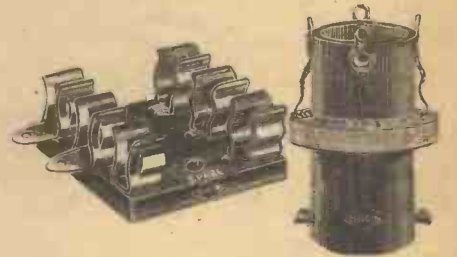
CELESTION, LTD., London Road, Kingston-on-Thames. **STAND No. 25.**

THE wide range of Celestion speakers, extending from small portable models to public address units, will be seen on this stand. Many new features will be seen in the speakers, and there is a model for

practically every need. The speakers are available as chassis models, or in cabinets for separate use.

CHLORIDE ELECTRICAL STORAGE CO., LTD., 231, Shaftesbury Avenue, W.C.2. **STAND No. 2.**

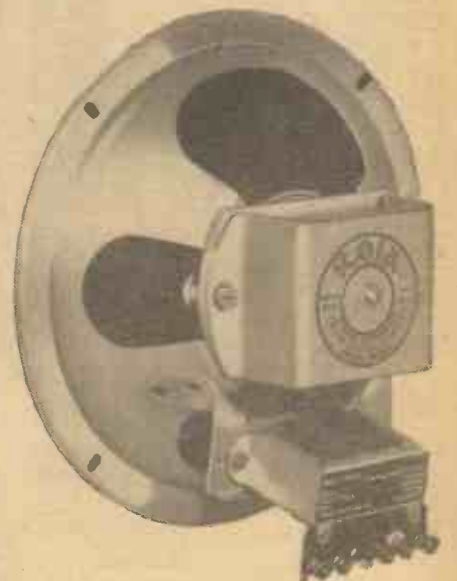
THE popular range of Exide accumulators, and the Drydex batteries will be seen on this stand. Accumulators are available in all types from the small celluloid models for portable and deaf-aid apparatus, to the large glass containers used for power work. H.T. accumulators in block units may also be seen. In the Drydex range there are all types from small 1.5 volt units up to large H.T. blocks for the most powerful receivers. Among the new lines are the special batteries used for portable receivers incorporating the dry-battery L.T. supply.



Two new Bulgin lines—on the left, a fuse-holder with clip for spare fuse, and on the right, one of the new unit coils for covering from 6 to 2,600 metres.

COLE, E. K., LTD., Ekco Works, Southend-on-Sea, Essex. **STAND No. 47.**

THE range of Ekco receivers to be seen on this stand features the new high-speed "radio brain" and solo-touch press-button tuning. Big improvements are to be noted in the mechanical and electrical details of the receivers as well as some new receiver models. Particular attention has been paid to cabinet design and the L.F. circuits to improve the quality of reproduction. On the television side some new add-on units for television reception will be found, including one model at 22 gns. An unusual feature of these receivers is the chassis design, built up on a tubular steel scaffold.



One of the new season's Rola P.M. speakers Model 8Z 6.5.

COSMOCORD, LTD., Cambridge Arterial Road, Enfield, Middlesex. STAND No. 72.

THERE will be seen pick-ups, pick-ups and tone-arm assemblies, and gramophone units for use with existing receivers. Full details of the range have not yet been released.

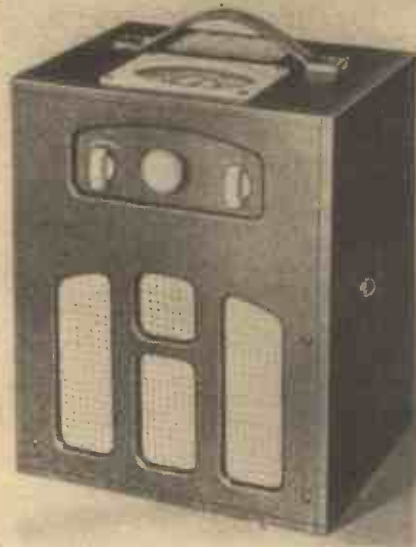
COSSOR A. C., LTD., Cossor House, High-bury Grove, N.5. STAND No. 48.

A LARGE part of the Cossor exhibit consists of receivers of all types, and the rest of their exhibit consists of valves and C.R. tubes, together with various servicing test apparatus. In the receiver ranges are table models and console designs, ranging from a 3-valve battery to a 5-valve A.C. console. A new 4-valve battery portable is included, and push-button tuning is featured on several of the receivers. The new Cossor Car Radio receiver will also be seen, and in the television receivers the most interesting model is undoubtedly Model 1210 in which a picture size of 12in. by 10in. is provided direct on the end of a C.R. tube. This receiver provides a brilliant flickerless picture having an area of 120 sq. in. and incorporates also an all-wave de-luxe superhet radio chassis. At 53 guineas this will undoubtedly be one of the main attractions on the stand. The extensive range of valves will also attract considerable attention on the part of constructors.

DECCA RADIO & TELEVISION, LTD., 1-3, Brixton Road, S.W.9. STAND No. 44.

IN the range of receivers to be seen here, a novelty is the simple-to-adjust push-button mechanism, whereby stations may be changed merely by manipulating the push-button. A push-button portable will be seen, and the receivers include battery

and mains models. Two television receivers will also be seen, one model providing television only and the other including



This 4-valve Portable by Cossor is a battery receiver with single knob tuning, auto grid bias, and employs a straight T.R.F. circuit arrangement.

radio in the form of an all-wave push-button chassis. The picture size in both models is 10in. by 8in.

DEPARTMENT OF OVERSEAS TRADE, 35, Old Queen Street, S.W.1. STAND No. 74.



A useful electric soldering-iron produced by A. C. Cossor, Ltd.

DEW, A. J., & CO., LTD., 33, Rathbone Place, W.1. STAND No. T.10.

THIS is a trade exhibit, and as such will display a representative collection of proprietary lines, with special attention to television.

DUBILIER CONDENSER CO. (1925), LTD., Ducon Works, Victoria Road, North Acton, W.3. STAND No. 28.

A COMPREHENSIVE selection of the wide range of condensers and resistances manufactured by Dubilier will be found on this stand, including many new and interesting developments to meet modern requirements. Ceramics, paper, electrolytics and special mica condensers will be seen, as well as the popular insulated metallised resistances in various types. Volume and tone controls, and mercury switch relays and similar items complete the exhibit.

DYNATRON RADIO, LTD., Perfecta Works, Ray Lea Road, Maidenhead. STANDS Nos. 1 and 39.

AS in previous years this exhibit will embrace really high-quality apparatus, in which Dynatron Radio specialises. Performance is considered before price in these receivers and some of the interesting details are being kept secret until the show opens. A television receiver with a 12in. tube will be seen, and every receiver to be shown incorporates a whistle filter. The



The Ekco Add-on television unit, giving a picture 7½in. by 6in.

most comprehensive model on view is the Ether Emperor IV, a television radiogram utilising 45 valves and delivering 18 watts output. It includes an autochanger and costs 175 guineas.

EASTICK, J. J., & SONS, 118, Bunhill Row, E.C. STAND No. T.7.

THIS is a Trade exhibit.

EAVESTAFF & SONS, LTD., W. G. Autoplayer Factory, Ashfield Road, N.4. STAND No. 73.

THE miniature piano is the main feature of this exhibit.

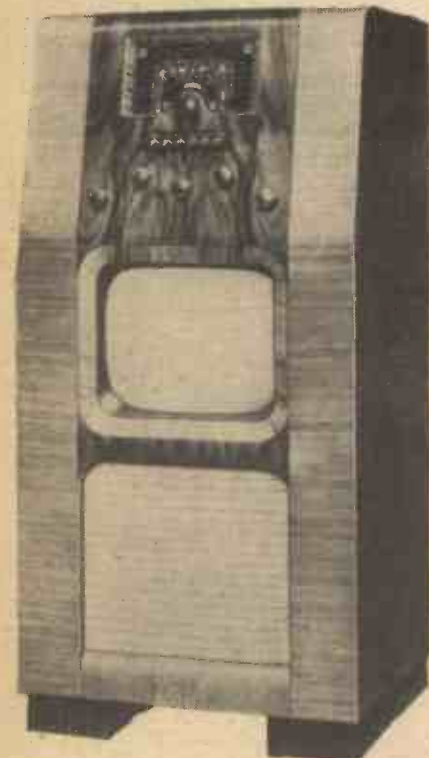
ECONASIGN CO., LTD., 92, Victoria Street, S.W.1. STAND No. 14.

EDISON SWAN ELEC. CO., LTD., 155, Charing Cross Road, W.C.2. STAND No. 23.

MAZDA cathode-ray tubes, television valves and radio valves are shown on this stand and a special feature is the new Mazda battery valve for dry-cell operation. All have the Mazda octal base. A novel feature of the stand is the "Electroencephalograph," which may be described



The Ekco "Pick-me-up" portable—an 8-stage superhet setting a new standard in portable performance.



A press-button all-wave radio and combined television receiver by Decca at 46 guineas. Picture size is 10in. by 8in.

popularly as a receiving set for tapping in to the brain activity. In addition to television there will also be seen here the B.T.H. R.K. speakers, headphones and pick-ups.

All the Ferguson models give a high standard of performance on the short waves.

FERRANTI, LTD., Radio Works, Moston, Manchester, 10. **STAND No. 41.**

ON this stand will be featured broadcast receivers, car radio receivers and television apparatus. Several new models are to be seen in the receiver range, and included in these is a dry-battery model, in which the usual accumulator for L.T. has been dispensed with. The car radio is of the two-unit type, and requires no suppressors of similar apparatus. Two types of car aerial will be seen. In the television range the T.8 is probably the most interesting model, providing a picture 10in. by 8in. and using an 8in. speaker with special arrangements to deliver the best quality obtainable on these high frequencies. Only three controls are provided, and the price is 40 guineas.

GARRARD ENG. & MFG. CO., LTD., Newcastle Street, Swindon, Wilts. **STAND No. 56.**

HERE will be seen a comprehensive display of automatic record changers, radiogram units and motors (spring and electric), together with tuning motors and selector units designed for push-button tuning purposes. A particular feature will be the new record-changers R.C.10 and R.C.50, the former a popular-priced unit and the second a modified version of the original R.C.4 playing mixed records.



This Dynatron television receiver has a 12in. tube, and has been installed satisfactorily in various counties.

ELF, GORDON, LTD., 55, Rathbone Place, W.1. **STAND No. 21.**

E.M.I. SERVICE, LTD., Sheraton Works, Hayes, Middx. **STAND No. 100.**

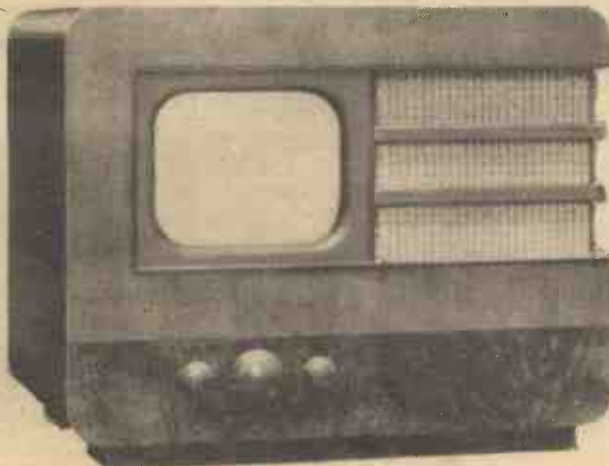
THIS exhibit will comprise dealers' service equipment, television aerials and accessories and special products such as deaf-aid apparatus, bell-chiming apparatus, L.F. distribution systems, etc.

ERIE RESISTOR, LTD., Carlisle Road, The Hyde, N.W.9. **STAND No. 13.**

HERE will be seen the wide range of ceramic resistors with wire ends, available in various ratings and in all values. In addition the popular volume-controls in all types and patterns, with special models for dealers and servicemen's use, will also be seen. Special kits of the Erie components are made up for dealers and greatly simplify distribution.

FERGUSON RADIO CORPORATION, LTD., 105-109, Judd Street, W.C.1. **STAND No. 17.**

THE range of Ferguson receivers, which are of the all-wave type, includes push-button tuning, and a feature of these models is the high-quality output. By using push-pull stages, in conjunction with a good speaker and special cabinet design, the receivers are capable of a really fine output, even in the small table models.



A table television by Ferranti, giving a 7in. by 5½in. picture. This gives television only—sound and vision.

THERE are 59 of the latest television receivers in Television Avenue all working at once.

THERE are hundreds of others throughout the Exhibition. Don't just look in at the Exhibition. Go there to "look in."

THE Royal Navy, the Army, the Royal Air Force, and the Post Office Exhibits will consist of actual working models showing the way these national institutions are making use of radio.

AND you must be televised. You merely go to the television studio in Radiolympia between 11 a.m. and noon, and they will televise you free of charge. You must bring a few friends to be televised, too, and ask those at home to see how you "come over."

THERE are four performances daily in the theatre, providing you with an opportunity of seeing Mr. Middleton, the Kentucky Minstrels, Harry S. Pepper, Doris Arnold, C. Denier Warren, Leslie Mitchell and Joan Millar, Adelaide Hall, Murray and Mooney, Ike Hatch, Scott and Whaley, Nomo King and Hubert—to mention but a few of the celebrities who will be there.

FAMOUS bands, too, are well represented in the Radio Theatre. Bobby Howell and his band of 11, Troise and his Mandoliers (playing banjos!), plus the Kentucky Minstrels.

THE girls are peaches! The singing and dancing will be taken in hand by the Gordon Ray Radiolympia Eight, while Miss Radiolympia 1939 will give you an idea of what the people of this country, as well as the judges (well-known radio critics, actors and actresses), think is the perfect radio and television personality. All of these appear daily in the Radio Theatre.

EACH performance lasts a little over an hour, and almost every day at least one performance is to be broadcast or televised by the B.B.C.

THE performances start at 2.30, 4.30, 6.15 and 8 o'clock, and full details of each individual performance will be found in the Souvenir Programme which is on sale at the theatre at the price of 3d.

THE four programmes are arranged each day into an half-an-hour fashion parade, half-an-hour of the Television Picture Page, an hour of variety, including Charles Austin's version of the B.B.C. feature "I Want to be an Actor," an hour of the Kentucky Minstrels, with a repeat performance later in the day of either the Kentucky Minstrels or the Variety Performance. There may be slight variations from day to day.

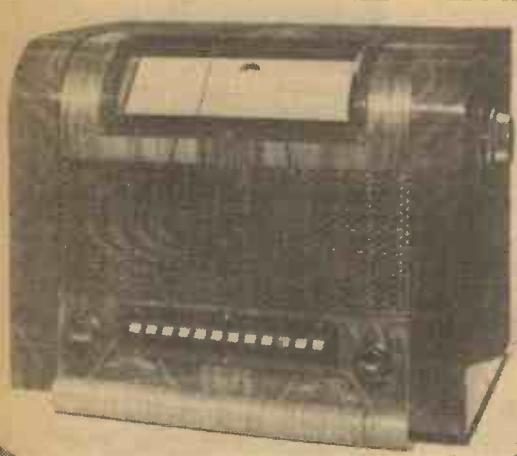
OVER 1,000 seats are available, at 1s. 3d. each, there is comfortable standing room for over 500 visitors at 6d. each, while a few front stalls may be specially reserved at 2s. 6d. and 3s. 6d. each.

NON-PROPRIETARY EXHIBITORS	
NAME	Stand No.
Admiralty	15
B.B.C.	76, 78, 79, 96
Brit. Railways, Ltd., Euston House, Eversholt St., N.W.1	4
G.P.O.	80
R.A.F.	50
War Office	77

GENERAL ELECTRIC CO., LTD., Magnet House, Kingsway, London, W.C.2. STAND No. 35.

IN addition to the wide range of receivers in table and console types to be seen here, the well-known Osram valves and the wide range of G.E.C. batteries will also be

chargers, incorporating metal rectification range from the Tom Thumb battery-charger which charges a 2v. cell at $\frac{1}{2}$ amp., price 12s. 6d., up to large multi-circuit models for installation in large service stations. An outstanding feature on the Stand will be a range of A.R.P. Emergency Lighting sets. for lighting industrial and public shelters. The rectifying equipment displayed covers a wide field and illustrates the growing use of this means for A.C. to D.C. conversion. The transformers shown range from small



displayed. Full details of their exhibits have not yet been released.

GOODMANS INDUSTRIES, LTD., Lancelot Road, Wembley, Middlesex. STAND No. 19.

GRAMOPHONE CO., LTD., 108, Clerkenwell Road, E.C. STAND Nos. 46 and 53.

HERE will be seen the extensive range of H.M.V. broadcast and television receivers. The broadcast models include popular-priced radiograms, table models, a battery portable, and at the other end of the scale elaborate auto-radiograms. In the television models the new large screen console model at 45 guineas will no doubt prove an attraction. A simple television receiver of the table type giving vision and sound and having only two controls is available at 31 guineas.

F. C. HEYBERD & CO., LTD., 10, Finsbury Street, London, E.C.2. STAND No. 57.

ON this stand is shown a comprehensive range of battery-chargers, rectifying equipment, and transformers. The battery-



One of the popular Heyberd chargers—Model A03.

This H.M.V. table model incorporates push-button tuning and wavechange, cruiser tuning, and other refinements, and is rated at 10 watts output. It costs 19½ guineas.

models for kit construction and conversion of mains, up to models with a current carrying capacity of 7.5 kva.



Above is the 4-valve AC/DC Midget straight receiver in the Invicta range.

On the right is the novel Imhof packing for the long-playing needle.



HOBDAV BROS., LTD., 21, Great Eastern Street, London, E.C. STAND No. T.6.

THIS is a trade exhibit.

HOLSUN BATTERIES, LTD., Neville House, Page Street, S.W.1. STAND No. 40.

IMHOF, ALFRED, LTD., 112, New Oxford Street, W.C.1. STAND No. 70.

ON this stand will be featured the special I.M. long-playing needle designed to prevent record wear. They are sold in boxes of 10 for 2s., and 10 needles play 500 records.

INVICTA RADIO, LTD., 203, Old Street, London, E.C. STAND No. 16.

A WIDE range of receivers will be seen here, and push-button tuning is featured on some of the models. An interesting point is the large open tuning scale, and model A.46/PB is a four wave-band model with a special trawler band indicated on the tuning scale, which is a six-colour glass assembly.

LUGTON & CO., LTD., 203, Old Street, London, E.C.1. STAND No. T.9.

THIS is a trade exhibit.

McMICHAEL RADIO, LTD., Wrexham Road, Slough, Bucks. STAND No. 38.

AMONG the many new receivers to be shown by McMichael, the table radiogram at £14 17s. 6d. in which a seven-stage all-wave radio chassis is incorporated will undoubtedly prove the most interesting. Full details of the remaining range have not yet been released.

MARCONI-EKGO INSTRUMENTS, LTD., Electra House, Victoria Embankment, London, W.C.2. STAND No. 109.

THIS exhibit consists of specialised instruments developed for specific technical work.

MARCONIPHONE CO., LTD., 210, Tottenham Court Road, W.1. STAND No. 38.

THE Marconiphone range of receivers includes battery, table, console, and radiograms, as well as specialised models and television receivers. Push-button tuning is featured together with a specially developed tuning circuit to ensure that accurate adjustments are made when the push buttons are manipulated. Another novel feature is the automatic dial selection for manual operation. A point of interest in the receivers is that the short-wave range tunes down below 15 metres on some of the models. The television receivers are available in several patterns and these include the simple sound and vision unit as well as combined television and radiogram apparatus.

MERCANTILE CREDIT CO., LTD., 39-45, Finsbury Square, E.C.2. STAND No. 67.

MULLARD RADIO VALVE CO., LTD., Century House, Shaftesbury Avenue, London, W.C.2. STAND No. 55.

HERE can be seen the extensive range of Mullard valves and cathode-ray tubes amongst which the specially developed E series of valves will no doubt create wide interest. The special "silent" H.F. valve is used in a number of commercial receivers for short-wave reception. In the cathode-ray tubes the small 3in. tube is now being extensively used for oscillographs and other similar test equipment.

MURPHY RADIO, LTD., Broadwater Road, Welwyn Garden City, Herts. STAND No. 33.

THE main feature of the Murphy range of receivers is the particularly pleasing cabinet designs in both the broadcast and television ranges. A push-button unit is available, and one of the console receivers has a sliding loud-speaker "fret."

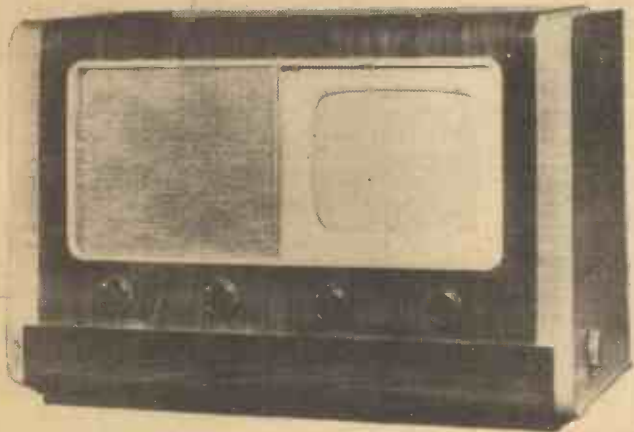


A distinctive cabinet design in the Murphy range of receivers.

NEW ERA PUBLISHING CO., LTD.,
12, Newton Street, London, W.C.2.
STAND No. 5.

NEW LONDON ELECTRON WORKS, LTD.,
East Ham, London, E.6. STAND No. 59.

A WIDE range of wire and specialised aerials may be seen here including a special dipole for use with all-wave receivers which is both simple to erect and low in price.



SOME interesting developments have been made in the new Philips broadcast and television receivers. The push-button

A new table television in the Philips range. Picture size is 7½ in. by 5½ in. and the price 32 gns.

mechanism is very ingenious and operates in conjunction with the newly developed "push-in" spiral tuning condenser. A

small tool is kept in an accessible position on the rear of the cabinet and it is only a moment's work to change stations, and in the case of three of the buttons, to change the wave-range (medium to long). The Philips MotoRadio will also be on view.

NEWNES, LTD., GEO., Tower House,
Southampton Street, Strand, London,
W.C.2. STAND No. 9.

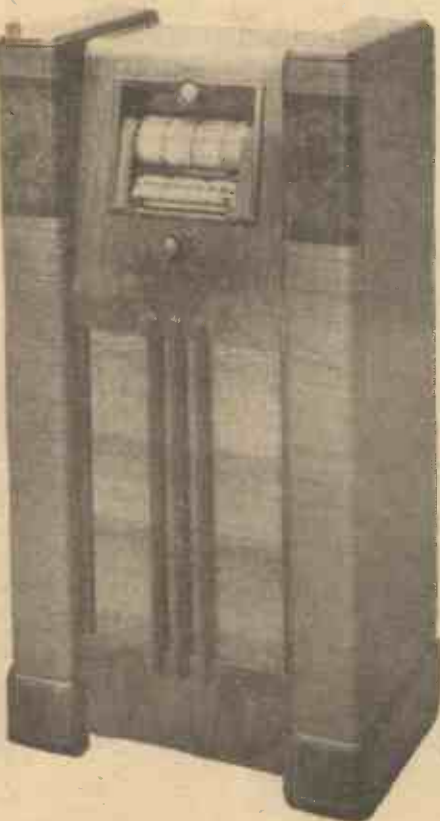
WE shall be showing on this stand our complete range of technical and wireless books. In addition to the various books on sale, blueprints for almost any type of receiver may be obtained. PRACTICAL WIRELESS, *Practical Mechanics*, *Practical Motorist* and *The Cyclist* are a few of the leading journals which will be on view. Our comprehensive range of handbooks, including the "Wireless Constructor's Encyclopaedia," "Everyman's Wireless Book," "Television and Short-wave Handbook," "Sixty Tested Wireless Circuits," "Wireless Coils, Chokes and Transformers," "Practical Wireless Service Manual" and "Wireless Transmission for Amateurs" will be on sale, and models of the receivers described in this issue will be available for inspection. Mr. F. J. Camm and the technical staff will be available to answer readers' queries free of charge. Call and see us.

PHILCO RADIO AND TELEVISION CORPORATION OF G.B., LTD., Perivale,
Greenford, Middlesex. STAND No. 31.

ONE of the most interesting receivers on the Philco stand will be Model A.7, a 15-guinea seven-valve all-wave superhet for A.C. use. This incorporates a built-in wavetramp on long and medium waves, audio-degeneration with push-pull output, push-button tuning, corrugated cone speaker, and the usual refinements found in a luxury instrument. All the other receivers on view will repay inspection.

PILOT RADIO, LTD., 31-33, Park Royal
Road, London, N.W.10. STAND No. 42.

ON this stand Messrs. Pilot will be showing one of the British midget mains receivers of the type which has proved so popular in the U.S.A. Weighing only 8lb. the Little Maestro measures only 7½ ins.



This view of the Pilot receiver shows the novel rotating full-vision dial which is a feature of the Pilot receivers.

DON'T forget to visit the Model Factory showing various processes of manufacture including coil winding, wire jointing, grid and spring making, coil adjusting, test and assembly, resonance test, impedance and inductance comparisons, engraving, chassis wiring, gang-condenser testing, wire covering, dry-battery manufacture, etc.

DON'T omit to visit Stand No. 9, which is our stand—same site as last year. On it you may inspect a full range of standard wireless books, current technical periodicals, also the new receiver built on the Catalin transparent chassis.

THERE will be a battery of sixteen revolving drums showing the chassis of many of the leading manufacturers' sets.

READERS and dealers wishing to organise a party may take advantage of the catering and hotel accommodation at reduced prices, the reduced fares by road and rail, and the special party tickets issued at half price. Full details from the R.M.A. Party Bureau, 59, Russell Square, London, W.C.1.

THE Bureau will also undertake to book seats for suitable performances in Radiolympia's Broadcasting and Television Theatre in advance.

THIS year, for the first time, the exhibition has a special export section. Overseas visitors should obtain one of the special export catalogues issued in connection with this section.

AN exhibit of special interest to listeners without mains supply is the vibrator, a small, self-contained component which enables the user to step up a D.C. battery supply of anything over 2 volts, to anything up to 250 volts A.C. It is not only intended for use for motor-car receivers, but for battery users and those with private country-house lighting plants of 24 or 32 volts D.C.

THOSE troubled with interference from run motors, refrigerators, etc., should examine the claims made for the numerous noise suppressors and anti-interference aerials on show. Some of these will not only eliminate most of the interference, but will extend the range of the set very considerably.

THIS is the first time in the history of the world in which a theatre has been built specially for broadcasting and television. The Radio Theatre at Olympia is a replica of the famous Bowl Theatre in Hollywood. It has cost £5,000 to build, and has a semicircular revolving stage that will hold over 300 performers.

THE auditorium will enable each of 2,500 visitors to hear perfectly, and obtain an uninterrupted view of every part of the stage.

IF in doubt on any problem, call at our Stand No. 9 and consult the Editor or a member of his staff.

PYE, LTD., Radio Works, Cambridge. **STAND No. 32.**

THE new Baby Q portable will attract considerable attention here, and will have as a rival the Mite, which is a tiny A.C./D.C. receiver even smaller than the Baby Q. Push-button tuning is featured on some of the remaining Pye models and the international console which incorporates bandspread tuning in an eight wave-band circuit, will undoubtedly be a



The Pye Baby "Q"—a 4-valve battery superhet at 8½ guineas.

highlight of the stand. All the principal short-wave stations are actually named in their correct positions on the dial and can be tuned as quickly and accurately as the locals.

RADIO GRAMOPHONE DEVELOPMENT CO., LTD., Globe Works, Newtown Row, Birmingham. **STAND No. 29.**

THE range of receivers here embraces six- and fourteen-valve models, priced from 16 guineas to 110 guineas. The latter is a fourteen-valve auto-radiogram with a fourteen-way motor-driven push-button tuning system. A cruising device facilitates manual tuning. All of the R.G.D. receivers



In the R.G.D. range, this console has some interesting points. All controls are hidden when the cabinet is closed.

are in the luxury class. An all-wave aerial at 35s. will also be on view on this stand.

REPRODUCERS AND AMPLIFIERS, LTD., Frederick Street, Wolverhampton. **STAND No. 111.**

THIS stand will consist merely of an office and shop window as Reproducers and Amplifiers are now concerned solely with the manufacture of speakers, etc., for set makers.

ROSE, NORMAN (ELECTRICAL), LTD., 43, Lamb's Conduit Street, W.C.1. **STAND No. 12.**

THIS firm specialises in service equipment, and accordingly the exhibit will consist of service aids and test equipment. In the former class will be various replacement components.

R. A. ROTHERMEL, LTD., Rothermel House, Canterbury Road, London, N.W.6. **STAND No. 71.**

ON this stand will be an extensive range of small items such as Piezo-electric microphones, pick-ups, etc. Various types of volume controls and small items suitable for home constructors will also be seen, but full details of the exhibit have not yet been released.

SCOPHONY, LTD., Thornwood Lodge, Campden Hill, London, N.W.8. **STAND No. 49.**

SCOTT INSULATED WIRE CO., LTD., Queensland Works, Westmoreland Road, N.W.9. **STAND No. 103.**

VARIOUS types of wire will be seen on this stand, including a new material marketed under the name "Manganamron." This is a British drawn-wire embodying the essential characteristics of Manganin.

SELECTA, LTD., 81, Southwark Street, S.E.1. **STAND T.2.**

THIS is a trade exhibit.

SELMER, HENRI & CO., LTD., 114, Charing Cross Road, W.C.2. **STAND No. 99.**

IN addition to certain electrically amplified musical instruments on this stand, some portable amplifiers, suitable for hand-repeating or public address work, will also be seen.

SERVISOL, LTD., 74, Renshaw Street, Liverpool. **STAND No. 11.**

ASPECIAL servicing aid for cleaning switch contacts and similar moving parts will be prominently featured on this stand, together with other service aids.

SIEMENS ELECTRIC LAMPS & SUPPLIES, LTD., 39, Upper Thames Street, E.C.4. **STAND No. 52.**

FULL O' POWER radio batteries and Tungram valves are the main items to be seen on this stand, and in the former range are types for all purposes, from an inexpensive 120-volt H.T. unit at 6s. to super types for powerful multi-valvers. The new all-dry combined L.T. and H.T. batteries will also be on view, together with torch and similar cells. Of outstanding interest in the valve range are the new 1.4 volt economy battery valves, which enable the L.T. accumulator to be dispensed with and dry batteries used for the L.T. supply. A new type of valve in the "E" range is the E.F.M.1 which is a combined variable-mu L.F. pentode and Magic-Eye Tuning



This television receiver in the R.G.D. range has a 9in. tube, and the picture is inclined for easy viewing.

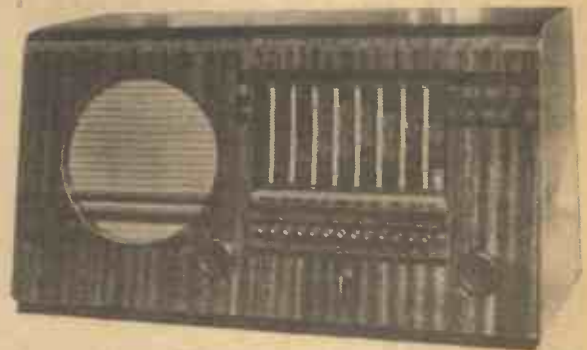
indicator. The E.L.L.1 is a combined push-pull double pentode for vibrator supply sets, and is also of interest.

STEATITE & PORCELAIN PRODUCTS, LTD., Stourport-on-Severn, Worcs. **STAND No. 61.**

HERE will be seen the many developments in steatite production, valveholders, coil formers and the various other items used in modern H.F. apparatus.

STERLING BATTERIES, LTD., Sterling Works, Dagenham, Essex. **STAND No. 65.**

A WIDE range of batteries for all modern radio purposes may be seen on this stand.



The Pye International Model—an 8 waveband superhet at 16½ guineas.

TAYLOR ELECTRICAL INSTRUMENTS, LTD., 45, Fouberts Place, Regent Street, London, W.1. **STAND No. 101.**

COMPREHENSIVE service test equipment such as signal generators and universal meters will be seen on stand No. 101. A de luxe valve tester, which gives accurate measurements of mutual conductance on any type of valve and which incorporates 15 different valveholders will also be seen. This valve tester also measures cathode leakage up to 10 megohms and checks all valves for short-circuits. Other items include cathode-ray oscilloscopes, and a comprehensive range of meters.

(Continued on page 578.)

MATCHLESS PERFORMANCE *and* VALUE!

TROPHY ALL-BRITISH COMMUNICATION Receivers



IMMEDIATE DELIVERY

Short-wave listening with a Trophy means satisfaction and thrills not to be missed. Trophy, at a great saving, gives World contact whenever you please. Trophy is always first choice. See about *your* model NOW.



"A highly satisfactory receiver."
—K. JOWERS—G5ZJ.

TROPHY 6

- 6 VALVES.
- WAVE-RANGE 6.2 to 545 METRES.
- ELECTRICAL BAND-SPREADING.
- AVC, BFO AND SEND RECEIVE SWITCHES.
- BUILT-IN SPEAKER.

Yes, here's the most sensational value! A real Amateur's junior A.C. communication model with *all* essential tuning refinements. The performance is amazing. Note the features: 6 valves, 4 bands, 6.5-545 metres continuous. Separate dial electrical bandspreading. Frequency calibrated scale. AVC, BFO and Send/Receive switches. Pitch control. Built-in speaker. Phone jack. And remember—you choose an all-British receiver when you choose the TROPHY 6. For A.C. mains 200/250 volts.

12/6
DOWN

9 GNS. **TERMS:** 12 s deposit and 18 monthly payments of 12/3



"A good all-round receiver."
—A. FORSYTH—G6FO.

TROPHY 8

continuous bandspreading. Send/Receive switches. Speaker and 'phone sockets.

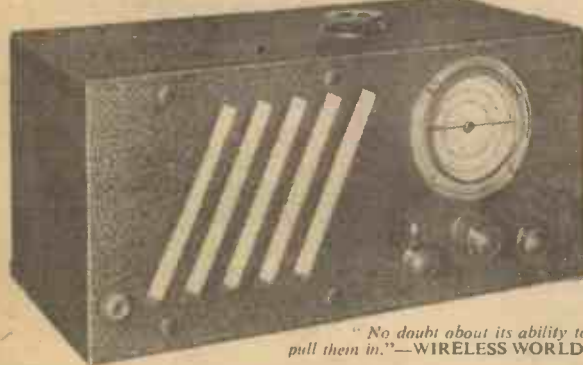
A.C. 8-valve communication receiver confidently recommended for serious short-wave work. Wave-range 7 to 550 metres. RF on all 5 bands. Continuous bandspreading. Separate Oscillator. AVC, BFO and Pitch control. Doublet or single wire aerial inputs. For A.C. mains 200/250 volts. TROPHY Guarantee.

12 GNS.

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TROPHY 8 CABINET SPEAKER TO MATCH 2 Gns. extra



"No doubt about its ability to pull them in."—WIRELESS WORLD.

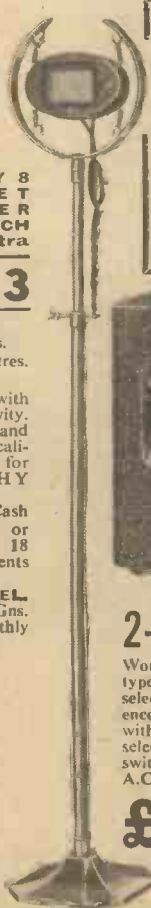
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- 3 Valves
- A.C. and Battery models.
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Regenerative type 3-valvers with an amazing degree of sensitivity. Employ self-locating coils, and scale is metre- and band-calibrated. Supplied with coils for 12-52 metres. TROPHY Guarantee.

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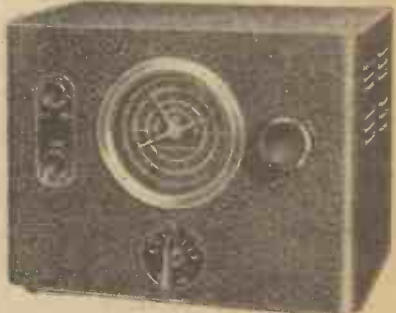
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These highly sensitive transverse current microphones are ideally suitable for transmitting work, P.A. or for home broadcasting for use with any amplifier or existing radio. Supplied complete with separately housed transformer and 25ft. lead.

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Worth its weight in gold when used with any type of receiver. Increases signal strength, selectivity, range. Reduces 2nd channel interference to a minimum. Wave-range 7 to 550 metres with spread tuning. Band selector and Send/Receive switches. Self-powered for A.C. mains 200/250v.

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Please send me Cash/C.O.D./H.P. Cash enclosed £.....
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ADDRESS

WEST END SHOWROOMS: 41, High Holborn, London, W.C.1. Est. 1919. Tel. HOL. 3248.

TELEGRAPH CONDENSER CO., LTD.,
Wales Farm Road, Acton, London,
W.3. STAND No. 63.

HERE may be seen fixed condensers of every description, including paper, mica, wet electrolytics in aluminium cans, dry electrolytics in cartons, metal boxes and aluminium cans, low and high voltage electrolytic types in tubes. Non-inductive paper tubular condensers and moulded mica condensers, etc., for use in radio receivers, amplifiers, telephone and telegraph circuits. High frequency and high voltage smoothing condensers for transmitting stations and jelly impregnated condensers for television circuits. Static



The Vidor self-contained all-battery portable, employing the latest 1.4 volt valves.

condensers for power factor correction. condensers and special units for suppression of interference with radio reception, including special types for use in vacuum cleaners, refrigerators, electric sewing-machines, hair dryers and similar apparatus. Suppression condensers for car radio work. Special ranges of condensers for use in high temperatures incurred in the tropics. Ignition condensers. Silvered mica precision condensers and in ceramic materials, and an air spaced trimmer having straight line adjustment and low temperature coefficient suitable for pre-set push-button sets.

TELEGRAPH CONSTRUCTION & MAINTENANCE CO., LTD., 22, Old Broad Street, London, E.C.2. STAND No. 22.

THOMPSON DIAMOND & BUTCHER, LTD., 34, Farringdon Road, London, E.C. STAND No. T.3.
THIS is a trade exhibit.

ULTRA ELECTRIC, LTD., Western Avenue, Acton, W.3. STAND No. 43.

PUSH-BUTTON tuning will be featured on the Ultra receivers to be seen on this stand, and all-wave tuning is a prominent point in certain models. Full details have not yet been released.

VACUUM SCIENCE PRODUCTS, LTD., 166, Weir Road, Balham, London, S.W.12. STAND No. 18.

HERE may be seen various types of photo-cell and similar types of apparatus used for television and associated equipment.

VARLEY (OLIVER PELL CONTROL), Cambridge Row, Burrage Road, London, S.E.18. STAND No. 108.

ALL the well-known Varley components will be open for inspection on this stand and at the time of going to press no details have been received of any new lines for the home constructor. The Varley range includes, of course, tuning coils in all patterns, wire-wound resistances, power potentiometers, L.F. chokes, mains transformers, and thermal delay switches.

VIDOR, LTD., West Street, Erith, Kent. STAND No. 51.

THE "Good Companion" portable will be the high spot on this stand, and will, no doubt, vie for popularity with the Vidor Model 320, which is a portable employing the new Economy valves operating with dry battery L.T. supply. In addition to other receivers, Messrs. Vidor will be showing batteries for practically every type of receiver, as well as small cells for cycle lamps, etc., and a number of domestic electric appliances.

WAVERLEY BOOK CO., LTD., 96, Farringdon Street, E.C.4. STAND No. 8.

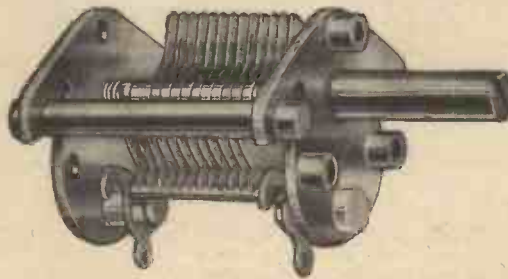
HERE will be seen a range of technical, educational, and standard publications.

WESTINGHOUSE BRAKE & SIGNAL CO., 82, York Way, King's Cross, London, N.1. STAND No. 30.

A FULL range of Westinghouse metal rectifier units for all purposes in radio and television will be on view. These include the high tension and low tension types for mains units, battery charging, and loudspeaker field supply; "Westectors"—the high-frequency rectifiers for detection, automatic volume control, battery economy, etc.; "H" and "J" types for television purposes—H.T. supply to cathode-ray tubes, time base, picture shift circuit, etc. A full range of commercial battery chargers will be on view, one of which, the R.G.C.10, will be working to demonstrate the flexibility and ease of operation. All the standard models of this year will again be available for the coming season. In addition, there will be interesting exhibits of metal rectifiers, large and small, as supplied for broadcasting and other telecommunication purposes, such as those supplied in large quantities to the G.P.O. for amplifier equipment, etc.

WINGROVE & ROGERS, LTD., Mill Lane, Old Swan, Liverpool. STAND No. 110.

IN addition to the majority of the Polar and Polar-N.S.F. components, which



A miniature U.H.F. condenser in the Polar range. Ideal for transmitters or receivers.

are already well known, a number of short wave condensers, suitable for transmitting and receiving, will also be on view on this stand. These condensers will be available in single or gang types designed for working up to 1,500 volts. The Polar-N.S.F. range of volume controls, resistors, and condensers

will also be on view along with the Polar drives, gang condensers, trimmers, etc.

WRIGHT & WEAIRE, LTD., 740, High Road, Tottenham, London, N.17. STAND No. 102.

THE exhibits of this stand fall into three main classes, namely, coils, transformers, and switches. Amongst the coils, special attention should be paid to the permeability press-button tuners available in several types, and in the switches the ceramic type of switch is also well worth attention. The transformers are available in various patterns for all branches of radio construction, and input voltage selectors are fitted now as an integral part of the covers.

SHOW SNIPPETS

YOU must make a special visit to Television Avenue whether you live in the present Television reception area or not. You will be astonished at the degree of perfection attained by modern television receivers.

THE theatre auditorium is built in a semi-circle around the stage on the Bowl or Saucer principle.

THERE is a special section of interest to constructors—a veritable knob-twiddlers' section.

THE new Hammond Organ will be seen for the first time in this country at the Radio Theatre. It is capable of producing 800 different effects, such as a symphony orchestra of 30 players, and a full band of Hawaiian steel guitars, mandolins, violins and banjos.

ADD to this a staff of nearly 400 people including world famous radio stars, television camera and microphone operators, lighting engineers, stage and front-of-the-house staff, and a salary bill of over £6,000 a week. The lighting bill is larger than that of half of London's West End theatres put together.

IF you are interested in "radio" novelties, don't fail to visit Stand No. 23 and see the "Electroencephalograph." This was designed by Mr. Grey Walter, a physiologist, who has spent many years in special study of the brain. There is a "clinic" on the stand and working models to tell you all about it.

WHAT happens when you ring up a friend in some part of our far-distant Empire? This and other secrets of the Post Office radio system will be revealed in their special exhibit. They will also show you how they track down unlicensed transmitters and receivers.

HOW is the picture obtained inside the cathode-ray tube? This is a mystery to many of our non-technical friends. Take them to Radiolympia and show them "how it works."

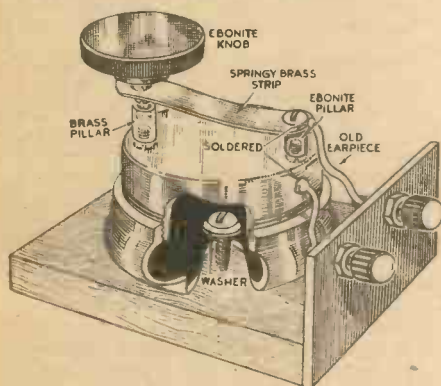
HAVE you tried to tune-in stations on some of the receivers fitted with very high-geared dials? All the tedious knob-turning has been done away with in some of the new season's models, and a motor turns the control for you whilst you stand by ready to push a switch and stop the dial when the station you want has been reached. This is not push-button tuning, but "cruiser" tuning.

Practical Hints

A Simple Tapping Key

RECENTLY I have become interested in the subject of amateur transmitting, and as I needed a key to practise the morse code I made one as shown in the accompanying sketch.

I removed the magnet and coil from an old earphone case, and screwed a brass pillar on the chromium top, at one end, and an ebonite pillar at the other. Then I fastened a springy brass arm at one end into the ebonite pillar and soldered a wire



An old earphone case is used as a base for this simple tapping key.

to it. This went to one of the two terminals on the terminal strip. At the other end was fixed an ebonite knob. A wire was then soldered to the metal part of the case and taken to the second terminal on the strip. These were then connected up in series with a battery and buzzer.—H. SPEED (Tollerton).

An Adapted Slow-motion Driving Head with Extension Rod

BEING in need of a low-ratio slow-motion head for driving the tuning condenser of a tuned high-frequency stage in my short-wave receiver. I pressed into service an old all-brass air-spaced Ormond variable condenser complete with integral slow-motion device, large degree-marked control knob and smaller slow-motion driving knob. The sketch shows how the adaptation was successfully accomplished. The condenser was first entirely dismantled, the fixed-vane assembly being removed complete, and the moving vanes wrenched out with pliers from the slots on the moving spindle. Only the front frame of the condenser with the bush, moving-spindle assembly and slow-motion device were retained for use. The necessary pressure of the steel balls in the large moving-vane spindle against the inside of the circular metal casing of the slow-motion device was achieved by holding the assembly in the left hand, exerting a firm inward tension of the moving spindle with the left thumb, and soldering two small blobs of solder on diametrically opposite surfaces of the main spindle in front, close to the front edge of the fixing bush. The tension was then further increased, and in the small space between the front edge of the bush

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SPECIAL NOTICE

All hints must be accompanied by the coupon cut from page 584.

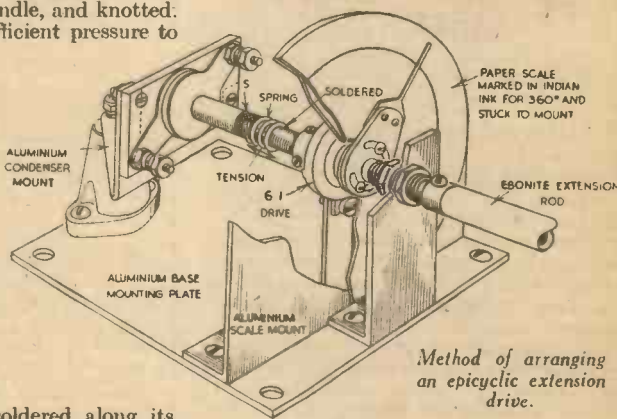
and the blobs of solder ordinary black cotton thread was wound tightly several times round the main spindle, and knotted. This resulted in quite sufficient pressure to operate the slow-motion device. An extension-rod assembly was next attached to the large rear moving spindle by taking a short length of 1/4 in. diameter dowel-rod and bending round it a short length of sheet tin, securing the latter to the rod by a bolt and nut through holes drilled in the tin and the rod, and to the moving spindle by soldering. The junction of the piece of sheet tin was soldered along its length as shown in the sketch. Finally, a length of 1/4 in. diameter dowel-rod was forced into a hole drilled in the back of the 1/4 in. diameter rod and secured with a trace of glue and two small screws. The extension-rod assembly was then painted with grey "Bakelite" enamel to give a finished

appearance. The drive is connected to the tuning condenser by the usual insulated flexible coupler, and is working with complete satisfaction.—GORDON BIRRELL (Angus, Scotland).

An Epicyclic Extension Drive

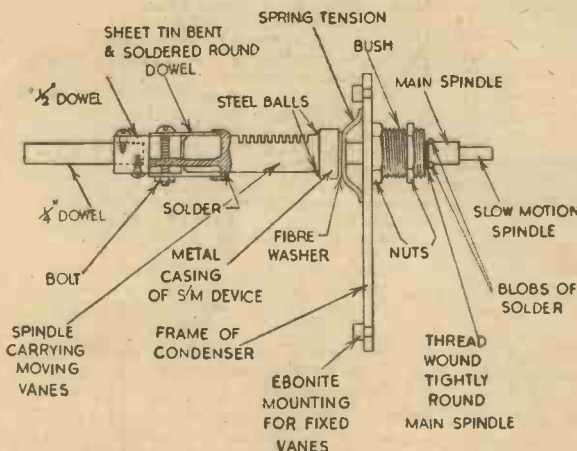
REQUIRING a means for determining various adjustments of pre-set condensers employed in neutralising series aerial and padding circuits, etc., I devised the simple but effective arrangement illustrated. It will be seen that coupling to the ebonite screw adjuster on the condenser had to be made so that during the rotary action of the drive the screwing action, as indicated by the arrow under the spring, would be effective.

To this end, then, I used a medium-tension spring, one end of which I bent in to engage in the slot "S" of the condenser adjusting screw, the other end of the spring being soldered to the short



Method of arranging an epicyclic extension drive.

length of quarter-inch brass rod fitted into the end of the epicyclic drive. Aluminium of 16 S.W.G. is used throughout for the mounting, but to prevent the capacity of the condenser being exceeded, this mounting bracket, as depicted by the dotted lines, does not cover the back plate of the condenser. The rest of the details are, I think, self-explanatory. — R. L. JEFFERSON (Forest Gate).



An adapted slow-motion driving head and extension rod.

Practical Wireless Service Manual

296 pages, 221 illustrations

5/- or 5/6 by post.

From GEO. NEWNES, LTD., Tower House, Southampton Street, Strand, W.C.2.

Leaves from a Short-wave Log

New Uruguayan Stations

THE *Servicio Oficial Difusion Radio-electrica* of Montevideo (Uruguay) announces that the construction of its 5-kilowatt short-wave stations is nearing completion, and that very shortly they will carry out their initial tests. They are CXA4, 48.98 m. (6.125 mc/s), which has already been reported to be working; CXA10, 25.22 m. (11.895 mc/s), and CXA18 on 19.61 m. (15.3 mc/s).

W6XBE Extends its Broadcasts

THE 20-kilowatt transmitter W6XBE installed at San Francisco (Cal.) is now working to the following time schedule: B.S.T. 05.00-09.00; 13.00-16.00 with a transmission to Asia on 31.48 m. (9.53 mc/s), and from B.S.T. 00.30-04.00 to South America on 19.57 m. (15.33 mc/s).

Another Station for Manchukuo

ACCORDING to reports from the Far East the Japanese are erecting a new 10-kilowatt transmitter near Shinkyo (Hsinking), the capital city of Manchukuo; it will work on 49.98 m. (6.125 mc/s); 31.73 m. (9.454 mc/s); 60.73 m. (11.66 mc/s), and 19.74 m. (15.2 mc/s).

No More League of Nations Broadcasts!

IN view of the fact that the Schwarzenburg (Switzerland) short-wave transmitter was destroyed by fire, negotiations are taking place between the Federal Government and the League of Nations to take over the latter's stations situated at Prangins. If, and when, the sale is carried into effect, they will be used for the re-broadcast of the special Berne, Zurich and Lausanne programmes destined to Swiss nationals overseas.

Another Mexican Station Logged

XEXA, Mexico City, on 48.92 m. (6.133 mc/s), 100 watts, was recently heard relaying a programme from the medium-wave studio XEDP in that city. The station opens with a melody, *The March of the Toys*, and is on the air daily between B.S.T. 14.30-16.30; 20.30-22.30, and from 01.00-06.00 on weekdays, and on Sundays from B.S.T. 01.00-06.00 only. Address: Estaciones XEDP y XEXA, Departamento Autonomo de Prensa y Publicidad, Mexico City.

Radio Signals from Newfoundland

G8XY and G8XZ are the call-signs of a transmitter established by the Expedition of the Public Schools Exploring Society at the southern end of Grand Lake, Newfoundland. Transmissions will be made daily until September 6th on two channels, namely, 42.22 m. (7.104 mc/s) and 117.55 m. (2.552 mc/s), between B.S.T. 22.00-24.00.

Sunday News Bulletin from Denmark

AT B.S.T. 19.00, every Sunday, OZH2, Skamlebaek (Denmark), broadcasts a news bulletin and talk in the English language; the channel is 19.58 m. (15.32 mc/s).

Will Italy Broadcast Outside the Band?

LISTENERS state that they have been hearing tests of musical broadcasts from IRW, Rome-Torrenova (Italy), a 30-kilowatt commercial transmitter usually operating on 15.37 m. (19.52 mc/s).

More 50-kilowatts for Japan

RECEPTION of broadcasts from Dairen (Kwantung), China, has been made in the British Isles through the new 50-kilowatt Tokio transmitters JVZ and JVZ2 on 25.39 m. (11.815 mc/s) and 25.37 m. (11.825 mc/s) respectively.

CHILDREN'S HOUR

MIDLAND provides the second part of Children's Hour for all regions on Friday, September 1st. The programme will consist of folk songs and country dances; and the contributors will be the Norris Stanley Sextet, Bob Arnold, the Farmer's Boy from Oxfordshire, who was first discovered in one of the "Roving Reporter" series; and the Castle Bromwich School Bamboo Pipe Band, which, under its conductor, A. H. Blewitt, has given some twenty-five demonstrations in the Midlands.

THE "AIR-HAWK" 9

(Continued from page 559)

ferred to the underside of the chassis to facilitate connections and balance the panel layout, whilst the R.F. gain control is transferred to a position between the two band-set controls. The meter balancing control is mounted on the chassis near the tuning dial, where it is easily placed and adjusted, a slot being cut in the spindle end for this purpose before mounting. The lead for the R.F. gain is taken round the chassis edge and under each of the screens, and to save dismantling the chassis the corners of the screens are simply forced out by means of a screwdriver and the screened cable threaded through.

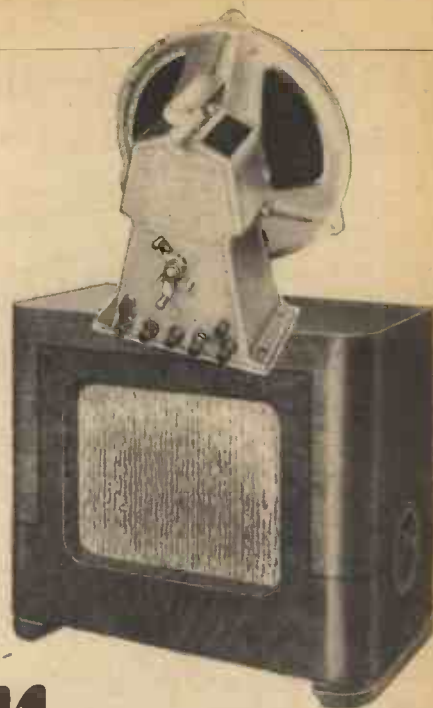
To enable an existing cabinet to be used to house this particular model, the original top screens all had to be cut down, but, of course, if the receiver is just being made up, the sizes of the screens should be selected accordingly. They will be given next week. The larger size of panel now specified enables this particular cabinet to be used. The signal light has been fitted to avoid the risk of leaving the set switched on when not required, the silencing switch being rather a snare in this direction. When the latter is in the "off" position the set is silent, although the heaters are all on. Consequently, there is a risk of leaving the set in this condition unless some visible indication is provided. The signal light is the new type, visible from all positions, and is wired to the heater circuit, and thus shows instantly whether the set is switched on or off. A complete list of components is attached and next week we will give details of the chassis and screen constructional work.

LIST OF COMPONENTS FOR 1940 "AIR-HAWK" 9

- | | |
|---|---------------|
| Three .00016 mfd. Trolitol condensers, Type Tro. 160 (Premier). | } (Dubilier). |
| Three .00015 mfd. ditto, Type Tro. 15 (Premier). | |
| Two Epicyclic Drives (Premier). | |
| One Mains Transformer, Type A.C.9 (Premier). | |
| One Model 21, 0-1 milliammeter (Premier). | } (Dubilier). |
| One full-vision Dual-speed drive, Type 1070 (Eddystone). | |
| Three couplers, Type No. 1009 (Eddystone). | |
| Three extension controls, No. 1008 (Eddystone). | |
| One six-pin coil holder, Type 964 (Eddystone). | } (Dubilier). |
| Two miniature dials, No. 1099 (Eddystone). | |
| Two stand-off insulators, No. 1028 (Eddystone). | |
| Set of coil formers, four and six pin (Eddystone). | |
| One Midget condenser, Type 1013 (65 mmfd.) (Eddystone). | } (Dubilier). |
| Five switches (four Type S.80T and one Type S.81T) (Bulgin). | |
| One Mains connector, Type P.20 (Bulgin). | |
| One top-cap connector, Type P. 20 (Bulgin). | |
| Five top-cap connectors, Type P.96 (Bulgin). | } (Dubilier). |
| One shaft-coupler, No. 2005 (Bulgin). | |
| One shaft-coupler, No. 998 (Bulgin). | |
| One pointer knob, Type K.58 and reducer to 3-16th in. (Bulgin). | |
| One 9in. length of round rod, 3-16th in. (Bulgin). | } (Dubilier). |
| Panel bush 2007 (Bulgin). | |
| Panel bush 1048 (Bulgin). | |
| One signal lamp, Type D.45, and bulb BL630 (Bulgin). | |
| Two four-pin ceramic valve-holders (B.T.S.). | } (Dubilier). |
| One component mounting bracket (B.T.S.). | |
| One B.F.O. coil, Type P. (Wearite). | |
| Two I.F. transformers, B.P.122 and B.P.124 (Varley). | |
| Four volume controls, 1,000 ohms, 10,000 ohms, 50,000 ohms and .5 megohms (Erie). | } (Dubilier). |
| One 100 ohm 1 watt resistor | |
| Two 300 ohm 1 watt resistor | |
| One 500 ohm 1 watt resistor | |
| One 500 ohm 20 watt resistor, Type PR2 (Bulgin). | } (Dubilier). |
| One 600 ohm 1 watt resistor | |
| One 800 ohm 1 watt resistor | |
| Two 1,000 ohm 1 watt resistors | |
| One 1,500 ohm 1 watt resistor | } (Dubilier). |
| One 2,000 ohm 1 watt resistor | |
| One 2,500 ohm 1 watt resistor | |
| One 3,000 ohm 1 watt resistor | |
| Two 10,000 ohm 1 watt resistors | } (Dubilier). |
| One 15,000 ohm 1 watt resistor, Type PR12 (with extra clip) (Bulgin). | |
| One 20,000 ohm 1 watt resistor | |
| One 30,000 ohm 1 watt resistor | |
| Six 50,000 ohm 1 watt resistors | } (Dubilier). |
| Seven 100,000 ohm 1 watt resistors | |
| Two 250,000 ohm 1 watt resistors | |
| One 500,000 ohm 1 watt resistor | |
| Two 1 meg. 1 watt resistor | } (Dubilier). |
| One .00005 mfd. Type 690W. condenser | |
| Six .0001 mfd. Type 690W. condensers | |
| One .002 mfd. Type 4601/S condenser | |
| One .05 mfd. Type 4602/S condenser | } (Dubilier). |
| One .04 mfd. Type 4601/S condenser | |
| One .01 mfd. Type 4601/S condenser | |
| Three .01 mfd. Type M condenser (T.C.C.). | |
| Twelve .1 mfd. Type 4603/S condensers | } (Dubilier). |
| One 1 mfd. Type 4609/S condenser | |
| Three 8 mfd. Electra. Condensers, Type 0281 | |
| Three 25 mfd. 25 v., Type F.T. (T.C.C.). | |
| Nine Octal valve holders, Type X.128 (Clix). | } (Dubilier). |
| One A1, A2, E Socket strip, Type X.382 (Clix). | |
| One chassis type four-pin holder, Type X111 (Clix). | |
| One aluminium chassis, 16 S.W.G., 16in. by 10in. by 3in. (Peto-Scott). | |
| One black crackle panel, 17in. by 9½ in. (Peto-Scott). | } (Dubilier). |
| One metal cabinet, Type T.8 (Peto-Scott). | |
| Nine valves—one X.64, two W.63, two Z.63, one DL.63, one L.63, one KT.63 and one U.50 (Osram). | |
| Supply of 16 S.W.G. aluminium sheet for screens. Connecting wire, nuts, bolts, shakeproof washers, flex and screening sleeving. | |
| One plug and jack (Igranite Electric Ltd.). | } (Dubilier). |
| One special energised loudspeaker, 1600 ohm field, Type A.C.9 (W.B.). | |

For that little extra sensitivity—
and that little extra top response—
that slight extra 'forwardness'—
that slight extra smoothness—
which add so MUCH to your set's value,

**FOLLOW MR. CAMM'S EXAMPLE
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Stentorian

The Universal Permanent Magnet Speaker

WHITELEY ELECTRICAL RADIO CO., LTD., MANSFIELD, NOTTS.

	CHASSIS	CABINET MODELS
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"Handy X"	—	19/6
Baby	23/6	29/6
Cadet	—	*39/6
Junior	32/6	*49/6
Senior	42/0	*63/0
Regent	—	*105/0
Emperor	—	*147/0

* These models have constant impedance (3 windings) volume control, with push button for Long Arm Remote Control.

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The TRIO-PEN THREE

An Efficient Short-wave Receiver Using a New Circuit

THE advantages in short wiring, low admittance capacity and H.F. losses realised in the use of a triode-pentode valve for the combined functions of an untuned R.F. stage and detector circuit, prompted the writer to carry out the various improvements on the original triode-pentode short-wave receiver detailed in the November 12th and 19th, 1938, issues of PRACTICAL AND AMATEUR WIRELESS in this new three-valve triode-pentode circuit.

In the first place it was intended that the basis of the design should be such that more accurate tuning and logging should be possible, regardless of the number of panel controls.

The same circuit sequence is employed, but on referring to the circuit diagram in Fig. 1, it will be seen that advantage is taken of the variable- μ characteristic in the pentode portion of the TP230 in the conventional manner; consequently, owing to the appreciable gain developed prior to the detector, quite a useful degree of sensitivity control is obtainable by the potentiometer P1.

Owing to the direct connection of the aerial pillar to the top cap, which is the grid of the pentode, it will be apparent that an efficient aerial input is obtainable.

Variable capacity coupling is provided in the earth end of the aperiodic winding of the coil, instead of the anode feed end, the 100 mmfd. condenser control being brought out to the front panel. This method provides a greater degree of H.F. stability and more effective control.

Leaky grid detection is employed, and freedom from aerial resonance and the silky reaction obtainable is quite marked.

Owing to the use of a copper bus-bar for all earth returns, and due to all moving vanes of the variable condensers being at earth potential, the operation of the receiver is completely free from noises and hand-capacity effects.

Bandspreading

For bandspreading, a precision Eddystone instrument dial and drive was chosen. The provision of vernier adjustment with this dial facilitating operation considerably; the correct use of this vernier movement will be dealt with later.

For band-setting an 18 mmfd. condenser was decided upon, a reduction drive of the 6:1 ratio epicyclic type, and a modified Eddystone dial providing absolute ease of adjustment.

Owing to the complete freedom from backlash and slip in the bandspread control, it will be found possible, after a little experience, to tune-in accurately otherwise difficult signals without at times resorting to the use of the bandsetter, but on the higher-frequency bands this condenser will be found essential for logging.

Resistance capacity coupling is employed between the detector and the first L.F. stage, volume control, necessary when using the phones, being effected in the normal manner.

A further stage of L.F. amplification was desirable for both speaker reproduction and as a means for extending DX. logs. Filter-feed coupling is again used between the two L.F. stages, and owing to the by-pass capacity being provided between the first L.F. anode and earth through the transformer winding and G.B., it was found unnecessary to include a further resistance or choke for grid stopping in the output stage.

The complete freedom from any H.F. component straying into the L.F. circuits



A three-quarter front view of the Trio-pen Three, showing the controls.

results in the stability of operation previously referred to, and it was found unnecessary to include a further by-pass condenser in the output stage, the anode choke HFC4 sufficing in this respect.

Again, for logging purposes, another modified Eddystone dial and epicyclic drive is used for the reaction condenser control, whilst the variable- μ bias potentiometer P1 and the aperiodic coupling condenser C6 provide both extra fine adjustment and appreciable gain control.

Chassis Layout

It will be apparent that very short wiring is facilitated by the two functions in the TP230 (V1), a comparatively simple component layout being achieved.

The coupling condenser C6 only is fitted with a flexible coupling and a $\frac{1}{2}$ in. x $\frac{1}{2}$ in. diameter brass rod, this rod protruding through a large diameter clearance hole in the front panel and being fitted with an Eddystone fluted control knob of the miniature pattern.

Both bandset and variable coupling condensers C4 and C6, respectively, are fitted to an aluminium mount: this was necessitated by the relationship of the condensers on the front panel, and extra rigidity is provided by fixing this mounting bracket to both chassis and front panel.

The 6BA countersunk bolt securing the mounting plate to the front panel is hidden from view by the bandset condenser dial. Both potentiometers are furnished with 2 in. shafts, and these lengths were retained in order that the wiring could be kept reasonably short.

Bulgin universal brackets of the E.H.9 type were employed for fixing the potentiometers, but they required cutting down to $1\frac{1}{2}$ in., so that they could be accommodated under the chassis. The shafts in each case pass through $\frac{3}{16}$ in. brass bushes which also serve to clamp the front panel to the front chassis runner.

The key-switch likewise clamps the front panel and runner, and a point can be waived here with regard to the type of on-off switch desired, the drilling being the

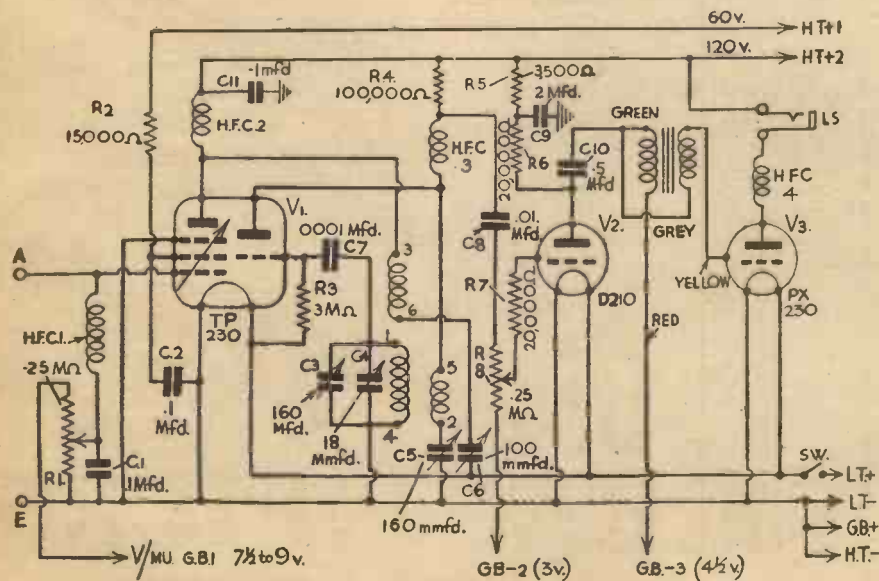


Fig. 1.—Theoretical circuit diagram of the Trio-pen Three.

(Continued overleaf)

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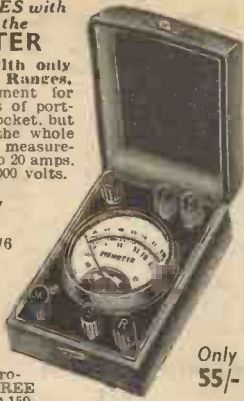
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PRACTICAL WIRELESS, 26/8/39.

THE TRIO-PEN THREE

(Continued from previous page)

same for the more usual toggle-type Belgin switch.

The copper bus-bar comprises simply a 3/4 in. strip of thin copper foil folded over once or twice, and 6 1/4 in. in length; the ends being soldered finally to one bolt securing the reaction condenser mounting bracket and one of the bandsread condenser mounting bracket-fixing bolts.

FULL-SIZE BLUEPRINTS OF ALL OUR RECEIVERS ARE AVAILABLE



Rear view of the Trio-pen Three, will be given in our next issue.

Chassis

Construction

18 S.W.G. aluminium is used throughout, but to obtain rigidity the front panel as well as the chassis is flanged. This gauge will be found far easier to "work" than 16 S.W.G., and full construction and operating details

LIST OF COMPONENTS

- RESISTORS (Fixed) (A. F. Bulgin & Co. Ltd.):**
 One type HW8, 3,500 ohms, 1/2 watt.
 One type HW17, 15,000 ohms, 1/2 watt.
 One type HW19, 20,000 ohms, 1/2 watt.
 One type HW25, 100,000 ohms, 1/2 watt.
 One type HW35, 3 megohms, 1/2 watt.
- POTENTIOMETERS:**
 Two type "M", 25 megohm. (Erie Resistor Co.)
- CONDENSERS (Fixed):**
 One type CM4 .0001 mfd. (mica). (A. F. Bulgin and Co., Ltd.)
 One type 451 .01 mfd. (tubular). (T.C.C.)
 Three .1 mfd. (tubular). (Polar N.S.F.)
 One .5 mfd. (tubular). (Polar N.S.F.)
 One 2 mfd. (paper). (T.C.C.)
- CONDENSERS (Variable) (Stratton & Co., Ltd., "Eddystone"):**
 One type 1094, 18 mmfd. (max.).
 One type 1130, 100 mmfd. (max.).
 Two type 1131, 160 mmfd.
- H.F. CHOKES:**
 Three type 1010. (Stratton and Co., Ltd.)
 One type CHP. (G5NI "Raymart").
- VALVEHOLDERS (B.M.P. "Clix"):**
 One No. X147 9-pin, with soldering terminals.
 Two No. X147 4-pin, with soldering terminals.
- REDUCTION DRIVES:**
 Two type ERD (Epicyclic). (G5NI "Raymart").
- INSULATING PILLARS:**
 Two lin. type SS. (G5NI "Raymart.")
- DIALS AND KNOBS (Stratton & Co. Ltd., "Eddystone"):**
 One type 1085 (Dunte) precision slow-motion.
 One type 1027 (Osko) dial, complete with drive.
 One type 1097 (DINJP) and Vernier. (Direct drive dial.)
 One fluted control knob (1 1/4 in. dia.) only.
 One 2 in. dia. knob as for TRIMT unit.
 Two type K92 instrument knobs (A. F. Bulgin and Co., Ltd.)
 One type IP8 dial. (A. F. Bulgin and Co., Ltd.)
- JACKS:**
 One jack (midget). (Igranic Elec. Limited.)
 type P71
- JACK PLUGS:**
 One type P38. (A. F. Bulgin and Co., Ltd.)
- COILS (G5NI "Raymart."):**
 One type CA, 11 to 25 metres.
 One type CB, 20 to 45 metres.
 One type CC, 44 to 100 metres.
 One type CD, 80 to 180 metres.
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 One IP230.
 One D210.
 One PX230.
- TRANSFORMER:**
 One type LF33. (A. F. Bulgin and Co., Ltd.)
- SWITCH:**
 One type S24. (A. F. Bulgin and Co., Ltd.)
- BATTERY CABLE AND WIRING (A. F. Bulgin and Co., Ltd.)**
 One type BC5 battery cable.
 Two yards twin flex.
 One 3ft. coil (WS2) screened flex.
- BRACKETS:**
 Two type EH9 universal. (A. F. Bulgin and Co., Ltd.)
 Two type 1007 insulated brackets. (Stratton and Co., Ltd.)
- PLUGS AND SPADES (B.M.P. "Clix"):**
 Seven No. 3 Master plugs (engraved): H.T.+1, H.T.+2, H.T.—, G.B.+1, G.B.—1, G.B.—2, and G.B.—3. Type MP1
 Two No. 14 spade terminals (large), red, black. Type R415
- FLEXIBLE COUPLERS:**
 Two type FC. (G5NI "Raymart.")
- BATTERIES:**
 One 120v. H.T. battery. (Exide Ltd.)
 One L.T. accumulator (2v.). (Exide Ltd.)
 One 9v. grid-bias battery. (Ever-Ready or Exide)
- LOUDSPEAKER:**
 One W.B. Junior cabinet speaker. (Whiteley Elec. Radio Co.)
- PHONES:**
 One pair of Brown's type "A" headphones (S. G. Brown, Ltd.)
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Open to Discussion

The Editor does not necessarily agree with the opinions expressed by his correspondents. All letters must be accompanied by the name and address of the sender (not necessarily for publication).

A Reader's Den

SIR,—I enclose two photographs and a short description of my gear, which may prove interesting to other readers. The receiver on the left-hand side of the window is a 2SG-v-1, built in three units. The first is a two-stage pre-selector, consisting of two fully tuned H.F. stages using Hivac SG220 S.W. valves. The centre unit is the detector stage, using a PM2DX. The L.F. amplifier is on the right, the valve being an HL2, biased at 1 1/2 v. Various four- and six-pin S.W. coils (Eddystone) can also be seen in this photograph.

The other photograph shows the apparatus on the right-hand side of the window. The original "Simplex Three" is on the left, with the log-book, mike, key, and 'phones by the side of it. The transmitter in the rack is just a C.O.-P.A. (crystal frequency 7,048 kc/s). The P.A. is anode modulated by means of a two-stage modulator. I am only using battery valves at the moment (with a mains unit), but I've got an APP4G and an 0.15/400, so I'm hoping to get a mains TX going very shortly. My power now is only about 1 watt, so there's room for improvement!—S. E. JONES (Croydon).

listening to be between 07.00 and 09.00 B.S.T. in the morning, and 18.00-20.00 B.S.T. in the evening.

QSL cards have recently been received from TG5JG, VP1WB, VK7CL, ZS3F, (for reception in December, 1937), VE5DD, TI2LR, all 20-m. 'phones, and from D4FND W7GPT, TF5M for 20-m. C.W. Also from W3GZZ, C.W. on 40 m.

The aerial in use here is a very ordinary inverted L, 40ft. long, 20ft. high, E.-W., but I hope to put up something a little more efficient in the near future, probably



Two views of Mr. S. E. Jones's wireless den.

a directional beam, thanks to your article! The receiver is a battery-operated 0-v-2 with headphones, and has brought in a total of 107 countries on the amateur bands, with 99 on telephony. Every band is covered from 1.7 mc/s-28 mc/s.

Any S.W.L.s who might care to correspond with me can be sure of an early reply.—L. SINGLETARY (6, Verdun Road, Wisbech, Cambs).

An Efficient S.W. Set for the Beginner

SIR,—I am a new reader of your excellent journal and I have made many of the smaller articles described in its pages. I am only a beginner and I am not yet very far advanced in the science of radio. I have always been interested in short-wave work and I should like to build a small short-wave set. I would, like many other readers I know, be very grateful if you could start us on short-wave reception with a one- or two-valve. Being unable to get much elaborate apparatus, the simpler the set the better, and it should employ home-made coils of the plug-in type. I would also like to add that I have just finished making your S.S. one-valve, and I am very proud of its performance.—J. K. SMITH (Droitwich).

[The Simplest Short-wave Two, using a home-made coil, and described in the April 3rd, 1937, issue, should suit your requirements.—Ed.]

A 20-m. Log: Correspondents Invited

SIR,—I append my log on 20 metres, being the best DX heard here during the past month.

CM2WD; K4DUZ, 5AG, 6BAZ, CGK, LKN, NYD, PHD, PLZ; OQ5AU, AV, PK1OG; UK5HA; VE4GN, 5AAD, AHF, AZ, GI, GC, HR, VO; VK2ACX, IE, UD, 3BC, DP, VJ, XB, QK, RC, CZ, VU, WL, 5LL, VR, TX; VQ3HJP; VQ2AG; VU2FO; 70 W6's, including QQL (Nevada), PFL and QAP (Arizona); 18 W7's; ZE1JI; ZL2CI, QY, 3DJ, 4AQ.

At present I find the best times for DX

Prize Problems

Problem No. 362

PETERS made a four-valve battery set and decided that 'phone plug-in connections should be used. After trying the set and finding it to work satisfactorily, he purchased a standard type plug and jack, and mounted this on his panel so that 'phones could be used as desired. When he switched on, however, he was surprised to find that he could not obtain signals, although the connections from the anode circuit of his output valve to the jack appeared to be quite in order. What was wrong? Three books will be awarded for the first three correct solutions opened. Entries should be addressed to The Editor, PRACTICAL WIRELESS, Geo. Newnes, Ltd., Tower House, Southampton Street, Strand, London, W.C.2. Envelopes must be marked Problem No. 362 in the top left-hand corner and must be posted to reach this office not later than the first post on Monday, August 28th, 1939.

Solution to Problem No. 361

When Hinks made his circuit modifications he omitted to complete the cathode circuit of his detector stage, thus preventing this valve from functioning. The following three readers, successfully solved Problem No. 360 and books have accordingly been forwarded to them: N. Alison, 149, S'wington Road, Maida Hill, W.9; W. H. Godfrey, Elwin Road, Tip-tree, Essex; R. L. Evans, Gerlan Farm, B&heada, N. Wales.

Criticism, Chat and Comment

Promenade Concerts

Our Music Critic, Maurice Reeve, Discusses the Week's Concerts

I WILL start off my article this week in a slightly different format, which will make it read something like the menu at one of London's most patronised restaurants. When we pick up the said menu in the said haven of appeasement, we find this notice staring at us from its midst: "The Chef's own Lunch." And whether we like it or not, we give it our most careful consideration through the very force of circumstances. Therefore, here are the "chef's own lunches," or, in more reverent language, the works that your correspondent will make special endeavours to listen to next week:

MONDAY.

Good Friday Music (Parsifal) and Siegfried's Journey to the Rhine ("Twilight of the Gods"): Wagner.

TUESDAY.

Two Pianoforte Concertos, Mozart in C minor, and Schumann. Pianist: Solomon.

THURSDAY.

Richard Strauss's Symphonic Poem, "Ein Heldenleben" ("The Life of a Hero").

FRIDAY.

Beethoven's sixth (Pastoral) Symphony and Coriolan Overture.

SATURDAY.

Beethoven's fourth Pianoforte Concerto, pianist, Myra Hess. Another of Strauss's Symphonic Poems, "Till Eulenspiegel's Merry Pranks"; Elgar's Sea Picture Songs, sung by Mary Jarred; and César Franck's Symphonic Variations for pianoforte and orchestra, also played by Myra Hess.

Piano Concertos

The week is particularly rich in piano concertos. It is as impossible to say whether Mozart's C minor is greater than the one in A as it would be to choose between Beethoven's fourth and fifth. As a matter of fact, they form two very interesting pairs for comparison. Whilst Beethoven's fifth, or Emperor, can be considered his "Hamlet," the fourth is most certainly his "Midsummer Night's Dream." He never wrote anything more brilliant, sparkling and teeming with pianistic virtuosity. The slow movement is one of music's miracles. The Mozarts are the other way round. The A major is the brilliant, dazzling favourite, but the C minor has a strain of wistful sadness which is entirely captivating. The third movement is a beautiful theme and variations.

The Schumann needs no recommendation from me. Not only is it the only work of its kind that he wrote, but it is universally considered his finest composition. Following the precedent founded by Beethoven in his fourth, it opens with a very dramatic passage for the solo instrument which ushers in the principal subject, on the orchestra. The resources of the piano are exploited to their fullest limits and the ear is charmed with a succession of beautiful melodies treated with the utmost skill.

The Franck Variations are in many ways unique amongst works for a solo instrument and orchestra. Their title conveys that

they are a set of variations on a given theme within the framework of a symphonic movement and not separate movements. The form of the work is precisely the same as that of any classical "first movement." There is no brighter and more vivacious work in the pianist's repertory, and it abounds with the Gallic musical genius at its best. After eight bars of orchestral introduction, the piano states the principal theme—one of the utmost charm tinged with sadness. Listen to it most carefully, and try to spot it as it recurs throughout the work in its various guises and metamorphoses. In its final representation—in what corresponds to the recapitulation section of a first movement—it is jazzed, or syncopated, with the most delightful effect. You will be intrigued when you realise how many ways a tune can be served up, and how different it can be made to appear each time. This culminating section is of dazzling brilliance, and never fails to arouse the greatest enthusiasm. Myra Hess is sure to give it handsome justice.

Beethoven's Symphony

The Pastoral Symphony is Beethoven's great hymn of praise to Nature. Designed as a piece of programme music, he himself said it was "the expression of feelings rather than painting." The titles of the movements are, in themselves, sufficient description of the spirit that pervades throughout this exquisite work: 1. Awakening of happy feelings on getting out into the country. 2. By the brook side. 3. Merry gathering of the country folk. 4. Thunderstorm. 5. Shepherd's song: happy and thankful feelings after the storm. Retractors say that the representation of the cuckoo,

nightingale and quail, at the end of the third movement, are difficult for the native countryman to recognise, and that, in the thunderstorm, the thunder sometimes precedes the lightning. Programme music was never meant to be other than impressionistic, and, as the two passages in question are monumental in their musical and constructional significance, those who expect Beethoven to give them a sixth-form natural history lesson are rather exceeding their commissions. We get up from listening to this great symphony better and refreshed, and entertained. I wouldn't recommend anything that didn't entertain, at least, not without specifying it.

These are the "chef's own lunches" for the week. Let us now briefly run through the remainder of the programmes. Elgar's "Sea Pictures" are glorious visions of Britannia's Realm, "Where Corals Lie" being my favourite. "In Haven" and "Sabbath Morning at Sea" are the others. Mary Jarred sings them on Saturday. Schumann's fourth symphony—Tuesday—is, I should say, for the musical archaeologist, rather than he who seeks entertainment. Wednesday is the Bach night again. You should enjoy the Brandenburg Concerto for Strings and the Piano Concerto in D minor. Both are in the old man's brightest vein. The fourth suite in D, the Violin Concerto in E and the church cantata, "All Praises to the Lord," are also among the tit-bits for that evening. Ravel's Spanish Rhapsodie—Thursday—is a classic example of the modern school of the exotic and sophisticated, whilst Saturday's programme, in addition to what has already been signalled out, has Wagner's "Rienzi" overture, and the ever-popular "Largo al Factotum," sung by Dennis Noble.

R.S.G.B. EXHIBITION

THE following companies have accepted an invitation to take part in the R.S.G.B. Exhibition to be held at the Royal Hotel, Woburn Place, London, S.W.1, during the period fixed for the 14th Annual Convention (September 21st-23rd).

- | | | |
|-------|-----|-------------------------------------|
| Stand | 1. | Webb's Radio. |
| " | 2. | Stratton and Co., Ltd. |
| " | 3. | Peto-Scott Co., Ltd. |
| " | 4. | Radiomart G5NI (Birmingham), Ltd. |
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| " | 5a. | Inglis and Rogers, Ltd. |
| " | 6. | Hamrad Wholesale, Ltd. |
| " | 7. | |
| " | 8. | N. E. Read. |
| " | 9. | The General Electric Co., Ltd. |
| " | 10. | Voigt Patents, Ltd. |
| " | 11. | Denco. |
| " | 12. | The Quartz Crystal Co., Ltd. |

The chief events fixed for the Convention are as follows:—

Thursday, September 21st.—Visits to (a) Broadcasting House, (b) Dollis Hill G.P.O. Research Station, (c) Alexandra Palace Television Station. Music-hall performance in the evening, followed by Code Contest.

Friday, September 22nd.—Visits to (a) Radio Research Station, Slough, (b) Alexandra Palace Television Station, (c) Tatsfield B.B.C. Station. Conversazione, Technical Discussions, and Code Contest in the evening.

Saturday, September 23rd.—Meetings in the morning, Technical Lecture in the afternoon. Annual Dinner in the evening.

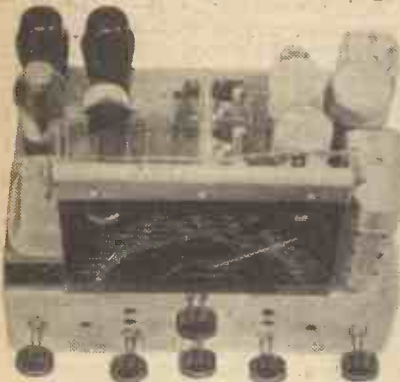
THE FOUR FEATHERS

PETER CRESWELL, who will produce this first broadcast version of A. E. W. Mason's famous thriller, has been busy adapting the book as a radio serial, the first instalment of which will be broadcast on September 3rd. The recent film version stressed the story's elements of adventure on a grand scale, but there is in addition a more intimate side to the story which may be somewhat lost on the big canvas of a screen epic but to which broadcasting can do ample justice. It is on this aspect that Peter Creswell has decided to concentrate, though that is not to say that adventure has been neglected.

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MODEL SS2B. 10-valve "SUPERHET-STRAIGHT" 2-waveband High Fidelity Radiogram chassis. This model has all the outstanding features of the SS10, the circuit being identical in every respect, except that the chassis is designed for broadcast bands only, no provision being made for short waves. It has the same extremely lively performance on "Superhet" and high quality reproduction on "Straight." Price 11 gns.

MODEL AW38. 8-valve All-wave Superheterodyne chassis. This All-wave Radiogram chassis has resistance capacity coupled push-pull output capable of handling 6 watts, and gives good quality reproduction on both radio and gramophone, for an economical price of 8 gns.

MODEL AW125PP. 12-valve 5 Waveband Radiogram chassis; two I.F. stages with variable selectivity. Continuous waveband coverage from 12-550 metres and 1,000-2,000 metres.

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Radio Clubs and Societies

Club Reports should not exceed 200 words in length and should be received First Post each Monday morning for publication in the following week's issue.

Special Notice: Will club secretaries please send in reports in the form they appear on this page.

SLOUGH AND DISTRICT SHORT-WAVE CLUB

Secretary: 16, Buckland Avenue, Slough, Bucks.
Meetings: Alternate Thursdays at 7.30 p.m.

At the last meeting held on Thursday, August 3rd, the chief item was a very interesting talk by Mr. Paine (G6PR) on "Building and Operating a Station for National Field Day." It was decided that a series of lectures should be given on "Measuring Instruments and Test Gear for the Amateur." We are still searching for a new QRA for the Club due to the continuous growth in membership.

The agenda for the next meeting includes a demonstration of a super-regenerative receiver designed and operated by Mr. Paine (G6PR). A junk sale will be held in addition to all the usual features.



Members of the Ashton-under-Lyne and District Radio Society, who took part in the 56 mc. contest on July 30th at Cown Hill, nr. Glossop, Derbyshire, 1,250 ft. above sea level.

THE MEDWAY AMATEUR TRANSMITTERS SOCIETY

Headquarters: Naval Wives' Club Hall, Dock Road, Chatham.

Meetings: Tuesdays, 8.15 p.m.

Asst. Sec.: R. Nicholson, 8, Pine Road, Strood, Rochester, Kent.

The M.A.T.S. is still forging ahead, and now boasts an active membership of nearly fifty, and twenty-one of these hold transmitting licences. General club activity is at the moment rather low due to the summer holidays, but an interesting programme of experimental work, lectures, etc., is now in preparation for the autumn and winter sessions.

A number of members are active on 56 mc/s, and a portable station was on the air during the R.S.G.B. Field Day.

It is hoped to hold a 1.7 mc/s D.F. field day towards the end of August, and preparations for this are well in hand. The weekly meetings continue, and are proving very interesting for those members able to attend during summer, as some very lively informal debates and discussions have been taking place, as well as Morse and technical instruction.

A cordial invitation is extended to everybody in the district interested in radio to come along and meet the local hams on Tuesday evenings.

ASHTON-UNDER-LYNE AND DISTRICT AMATEUR RADIO SOCIETY

Headquarters: 17a, Oldham Road, Ashton-under-Lyne.

Mon. Sec.: K. Gooding (G3PM).

Work is progressing smoothly with the new club room—it has been redecorated, and by the time this note appears the antenna will have been erected. The power pack for the club receiver has been built, and the design for the receiver having been decided upon, steps are being taken to get it finished as soon as possible. Mr. A. Wilkie reports that he is now licensed as 2HMA, and Mr. J. Phillips (2CPP) is now awaiting his full ticket.

The 56 mc Field Days have stimulated new interest in this band, and several receivers are under construction. Mr. Simpson (2HAP) has volunteered to assist G3FF by taking over the Morse instruction class held on Friday evenings.

Mr. W. Taylor is arranging for a visit to the Aerialite Works very shortly, and members are again requested to watch the Notice Board!

NORTH MANCHESTER RADIO AND TELEVISION SOCIETY

Mon. Sec.: R. Lawton, "Gratton House," Whalley Road, Whalley Range, Manchester, 16.

The above society this year is again having a stand at the Manchester Radio Exhibition, to be held in the City Hall, Manchester, from September 26th to October 7th. Much short-wave gear and amateur constructed receivers and transmitters, etc., will be displayed on the stand, and also the society is endeavouring to make a display of as many photos and snaps as possible of amateur transmitters, and listening corners, shacks, etc. Anyone who has a photo of their listening corner, or transmitter, etc., they would like included in the display, should send it at once direct to the secretary. Although it is yet too early to make any definite statements, the society hopes to be able to arrange two or more lectures, etc., on amateur radio and short-wave radio, etc., to be given either in or near the Exhibition Hall during the exhibition. Further details will be given at a later date in the next issue of this journal. Up-to-the-minute details will also be available from the secretary of the society after September 1st.

GLOSSOP AND DISTRICT RADIO SOCIETY

The last meeting of the above society was held at the new headquarters, 152, Station Road, Hadfield, Manchester. There was a full attendance of members of the society, which has been in existence ten months. At present there are five A.A.'s in the Society—2AJP, 2DXA, 2FLI, 2FXW and 2HBX. Regular Morse instruction is a feature of the society, and is given weekly by 2FLI. A lecture was given at this meeting by 2FXW on the subject of "Artificial Aerials, Their Purpose and Methods of Coupling." A series of lectures has been arranged for the winter months. The society would welcome visits from any neighbouring ham. Communications should be addressed to the secretary, K. C. Sidebottom, at the above address.



A group of members of the Glossop and District Radio Society at a meeting held in 2FLI's shack on July 2nd.

**A CONSTRUCTOR TOURS
RADIOLYMPIA**

(Continued from page 560).

27, cover at one sweep, Messrs. Edison Swan, who have an exhibit well worth seeing—if you can get near it; Messrs. Baird, of television fame; Messrs. Rola and Celestion, both of which will be tempting all of us with their new loudspeakers. Personally, I never go to a show without wanting far more speakers than, apparently, I shall ever be able to secure. When you hear about the characteristics of the latest models, it always makes one doubt if the quality of reproduction of one's own speaker is as perfect as it might be.

When you have been able to get around or away from No. 26, the Alexandra Palace stand, pop over to No. 2 and see what Exide have to offer you—and they have some new lines—before working your way round to No. 41, which houses all the Ferranti temptations, ranging from tele-

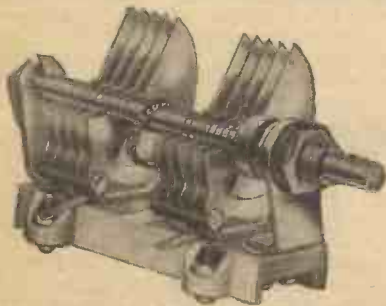


New black bakelite highly polished engraved instrument knobs by Bulgins.

vision and ordinary receivers, to a most extensive range of meters, which, I think, are items dear to the heart of every constructor. Opposite this stand will be found Heyberds, No. 57, and their display of charging and mains equipment certainly warrants a stop to examine the sound construction of all of their products, which are obviously built to give service without sacrificing finish and appearance. Continuing along the same aisle, as fast as the attractions and crowds will allow, Mullards, No. 55, and Cossors, No. 48, at the other end, so to speak, will supply you with all the information and leaflets you require concerning their valves. With the numerous types now available, it behoves all constructors to keep their valve literature right up to date, so don't miss this opportunity.

Bulgin Components

When you have rested awhile, pass into the next gangway, that is the one nearest the side of the hall, and make your way to No. 62 where you will find a very old supporter of the constructors' movement, namely, Messrs. Bulgin. I am not going to try to mention their items as, for one



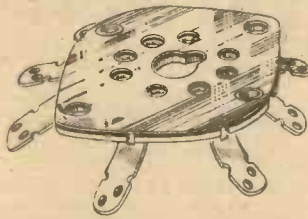
S.W. enthusiasts will find many interesting variable condensers on Polar's stand.

thing, they are too well known and, secondly, they are far too many to talk about; besides, they can supply such a wonderful catalogue that there is no need for you to forget what you see on their stand when you get back home.

In this same gangway will also be found Messrs. T.C.C. stand, No. 63, so once again you can settle any queries you have about condensers of every size and type.

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In reply to your letter

Reaction Effects

"I recently built a one-valve set of the straightforward type. The set works quite well, with one exception. When I tune to a very distant station it is naturally very weak, and as soon as I adjust the reaction to bring up the strength the station goes. I can find it again, however, by adjusting the tuning control. Does this indicate that the set is not working properly?"—L. F. (Barnsley).

WITH quite a number of reaction arrangements, adjustment of the reaction circuit does affect the tuning setting. This is on account of the fact that the damping on the grid circuit is changed, and accordingly the tuning characteristics of the coil are also changed. In other cases the trouble may be due to the fact that the reaction coil is so placed in relation to the grid winding that capacity coupling is rather large. The ideal arrangement is, of course, inductive and not capacitive coupling. Therefore, you may be unable to modify the effect in your case without changing the coil.

Loudspeaker Design

"I have an old balanced-armature speaker in a box, and this seems to me to give all that I require in the way of quality. I have been told, however, that a moving-coil speaker would be a great improvement, but I hesitate to spend extra money if this is not likely to be the case. Could you please confirm or otherwise?"—M. Mc. F. (Carlisle).

WHILST it is quite true, as a general rule, that a moving-coil speaker of modern design will give much better reproduction than an early type of moving-iron speaker, it must be borne in mind that the speaker only delivers an output dependent upon its input. That is to say, you might buy the best speaker in the market but it would not give any improvement on your present speaker, due to the fact that the general circuit design of your receiver is such that the quality is not very good. The main feature of the modern speaker is the improved bass response, but if this is lacking in the receiver there is no object in using a speaker to reproduce it.

Microphony

"My receiver is a commercial model, 6 valves, with self-contained speaker. I find, however, that on the local stations before I can get maximum volume out of it there is a terrible howl which comes up and grows in volume till I have to switch off. Can you tell me how to cure this?"—D. W. E. (Barnsley).

THERE may be no actual fault in the receiver, as the trouble mentioned could be caused by endeavouring to push volume beyond the capabilities of the output stage. You may find that the output stage is overloaded before the howling point is reached and therefore should not advance the gain control beyond the distortion point. On the other hand, a microphonic valve can give rise to the trouble, but it would no doubt be present

on certain distant stations also where a fair volume was obtained. Tap the valves gently and see if any particular one gives off a ringing sound, and if so, have it tested in case it is faulty.

Prefixes

"I am a newcomer to radio, and am rather confused by some of the terms used. I am not quite clear concerning the microhenry and the millihenry, and should be glad if you could tell me what the prefixes mean, as I see that they are also used in conjunction with other standards used in modern apparatus."—L. van F. (Hove).

THE prefix "milli" means one-thousandth, and the prefix "micro" indicates one-millionth. A milliamp is,

RULES

We wish to draw the reader's attention to the fact that the Queries Service is intended only for the solution of problems or difficulties arising from the construction of receivers described in our pages, from articles appearing in our pages, or on general wireless matters. We regret that we cannot, for obvious reasons—

- (1) Supply circuit diagrams of complete multi-valve receivers.
- (2) Suggest alterations or modifications of receivers described in our contemporaries.
- (3) Suggest alterations or modifications to commercial receivers.
- (4) Answer queries over the telephone.
- (5) Grant interviews to querists.

A stamped addressed envelope must be enclosed for the reply. All sketches and drawings which are sent to us should bear the name and address of the sender.

Requests for Blueprints must not be enclosed with queries as they are dealt with by a separate department.

Send your queries to the Editor, PRACTICAL WIRELESS, George Newnes, Ltd., Tower House, Southampton Street, Strand, London, W.C.2. The Coupon must be enclosed with every query.

therefore, one-thousandth of an amp. In modern condensers a capacity rating of so many micro-microfarads is often used, and this is generally expressed mathematically as follows: $\frac{1}{10^{12}}$

Valve Characteristics

"I have found in my spares box a valve marked Pen1340. I have lost the slip of details, and should be glad if you could tell me what the valve is and its working data."—G. E. (Lowestoft).

THE valve is a D.C. output pentode with a 13-volt 0.4 amp. heater. H.T. anode and screen voltages are 200, and the grid-bias is 7.45 volts. The normal anode current is 31mA., and the optimum load resistance is 5,800 ohms. The rated output is 2.5 watts. The valve is, of course, a Mazda product.

Voltage Adjustment

"I wish to carry out a number of experiments with S.G. and similar valves, but find great difficulty in arriving at the voltage used on the screens. I have already made a few tests, with ordinary potentiometers,

but the trouble is to measure the actual voltage, or the value of the tapping on the pot. after the tests have been made. I only have simple measuring instruments and wonder whether you can offer any suggestion for carrying out the idea more effectively without undue expense."—R. S. A. (N.W.1).

PROBABLY your simplest method is to obtain a calibrated potentiometer. If your existing component is of the simple type you could make a sub-divided scale having equal divisions and thereby gauge the amount of resistance on each side of the arm. A better plan would be to obtain one of the Bulgin 60-watt indicator resistances, available in values of 0 to 10,000 ohms and 0 to 50,000 ohms. These have a sliding contact running on a calibrated bar and thus enable you accurately to calculate the resistance in use. The price is 11s. 6d. each in either value.

Top-cap Connections

"I have just tried out a circuit published in your pages, but it does not work. I have checked and re-checked all connections, which are soldered, and have had practically every component tested by friends who have sets. I enclose a diagram of my wiring, and wonder if you can suggest why it fails to work as you claim."—P. E. (Bedford).

THE diagram appears quite in order, but there is just one likely point which is causing all your trouble. The valve has a top cap, and in some makes of valve this is a grid, whilst in others it is the anode. You have not indicated the type of valve you are using, and we think it most probable that you are using a valve of the opposite type to that originally used. Check the connections to the top cap by reference to the valve-maker's data sheet.

Coil Connections

"I have an old dual-range coil by Telsen, type 76, and should like to try this in a set I am making up. Could you give me the connections to the 8 terminals on the base please?"—G. B. (Wealdstone).

THE aerial may be joined to either terminal 1 or 2, the latter bringing into circuit a small condenser mounted on the coil for aerial damping adjustment. Earth should be joined to terminals 7 and 6; grid to terminal 8; reaction condenser to terminal 5, and a 3-point wavechange switch should be joined to earth and terminals 4 and 3. The tuning condenser is, of course, joined across 8 and 6. In the event of any medium-wave breakthrough at the lower end of the long-waveband, connect a .0003 mfd. fixed condenser across terminals 4 and 7.

50/- All-wave Three

"I am about to construct this receiver, described in the issues of March 18th and 25th. On looking over the wiring diagram I cannot see any indication of an L.T. lead, although it is, of course, shown on the theoretical diagram. May I take it that if I make a connection on to the wire which connects valves 1 and 2 to R3 it will be correct?"—W. J. H. (Rhyl).

YES, the connection will be in order. In our issue dated April 1st—page 64—we published a corrected diagram of the circuit, showing the L.T. lead and also a modification in the connection to condenser C11. You should obtain this before wiring the receiver.

The coupon on page 584 must be attached to every query

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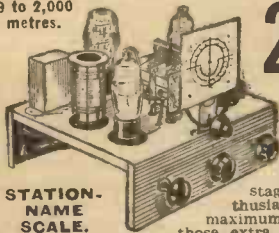
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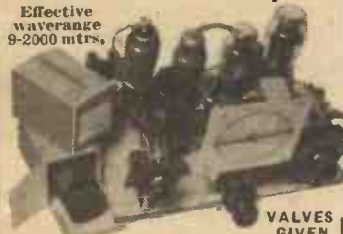
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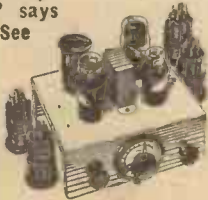
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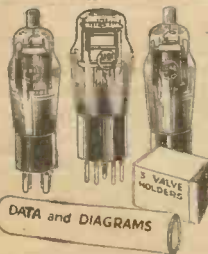


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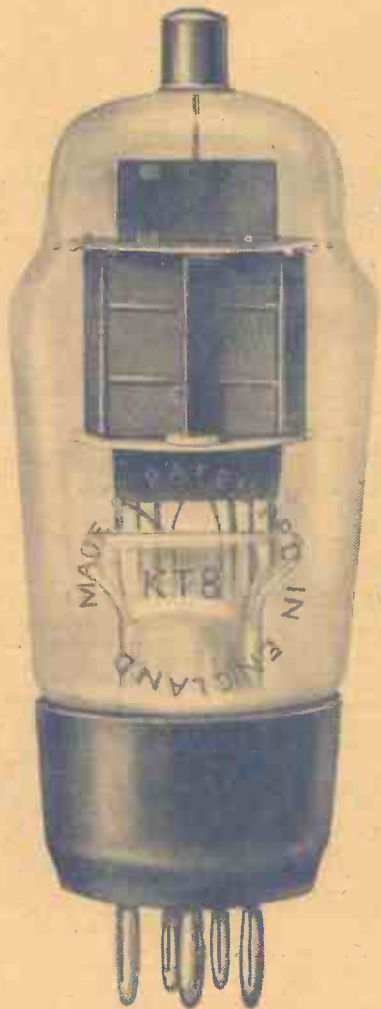
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