

30 FINE FEATURES FOR HOLIDAY READING

Wireless Magazine

NO 79

AUGUST, 1931

**SIMPLIFIED
SUPER-HET
BUILDING**

*Full
Details
Inside*



IS A PENTODE CRAZE COM-
ING? :: THE HOME AND GARDEN
PORTABLE :: CONDENSER TESTS—
SOME SURPRISING RESULTS ::

A BIGGER AND BETTER "RADIO
PARIS" :: REVOLUTIONARY PICK-
UP PRACTICE :: A NEW BAND-
PASS THREE :: RECORD REVIEWS

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(Regd)

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THE LONDON ELECTRIC WIRE COMPANY AND SMITHS LIMITED CHURCH ROAD, LEYTON, LONDON E.10

Editor:

BERNARD E. JONES

Technical Editor:

J. H. REYNER,

B.Sc. (Hons.), A.M.I.E.E.

Wireless Magazine

The Best Shillingsworth in Radio

Vol. XIV :: AUGUST 1931 :: No. 79

Research Consultant:

W. JAMES

Assistant Editor:

D. SISSON RELPH

NO apology is necessary to my readers for bringing to their attention the details in this issue for the construction of a simplified version of the Super 60. Although the original set, which was specially designed for WIRELESS MAGAZINE by W. James, was published six months ago, there is no falling-off in the interest that it has aroused.

I am certain that the new model, which can be assembled with approximately twenty fewer wires than were required for the original receiver, will appeal to thousands of prospective constructors, who want to start now on a really fine set for use in the autumn.

SUPER 60 HINTS

In this issue you will also find some general operating hints by Mr. James which will prove of great help if you have already built one or other of the Super 60 sets that have been described in our pages during the past few months.

Writing of the Super 60 brings to my mind the question of high-power broadcasting stations and in this connection I should like you to turn to Alan Hunter's article on Radio Paris. He is able to disclose plans for a new high-power transmitter for this popular station, which will be put in use as soon as the necessary landlines become available.

Two other articles this month which will appeal to all listeners, whether set-builders or set-buyers, are "How to Criticise the Programmes—and How Not To!" and "New-style Auditions." You will find both particularly interesting, and some of the examples from the B.B.C.'s postbag are certain to amuse you.

"TRUTH" ARTICLES

You will remember that last year J. H. Reyner contributed to our pages a special series of "truth" articles dealing with high-frequency chokes. His disclosures created considerable interest among wireless people everywhere. In this month's issue he begins another "truth" series, this time dealing with variable condensers.

I am sure you will find the first article of really practical

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value, for the information he gives will enable you to check up the results you are getting with your present condensers. A further article of the series will appear next month.

GRAMO-RADIO DISCOVERY

Captain Barnett has made a discovery of importance to all gramo-radio enthusiasts and I feel sure that we shall hear more of "Featherweight on the Needle," which is the title under which his article appears.

Our constructional features this month include details of a new band-pass screen-grid three-valver; a simple and inexpensive three-valve portable, which you can use indoors or out in the garden; and a special mains unit that enables you to get high tension for your Super 60 from the electric-light supply.

The band-pass three-valver, which we have called the Ether Marshal, is of special interest in that it incorporates some particularly efficient coils that have only just made their appearance on the market.

My readers can rest assured that the WIRELESS MAGAZINE Technical Staff is fully alive to its job, and tries out every development that comes along with a view to getting the best from it for the home-constructor. In the case of these new band-pass coils, the result has been a particularly happy one, as I am sure you will agree if you build up the set.

PENTODE POPULARITY

J. H. Reyner is of the opinion, as you will learn from an article of his that appears on page 61, that the pentode is due for a great rise in popularity. Whether you agree with him or not, you will be interested in the figures he advances. I hope that in our next issue we shall be able to give details of many other valve developments that the manufacturers are getting ready for the autumn.

In conclusion, may I remind you that I am always very happy to hear from readers who have suggestions to make regarding any radio matters, so drop me a line if you have any interesting ideas.

THE EDITOR.

NEXT MONTH: A FOUR-VALVER FOR D.C. MAINS

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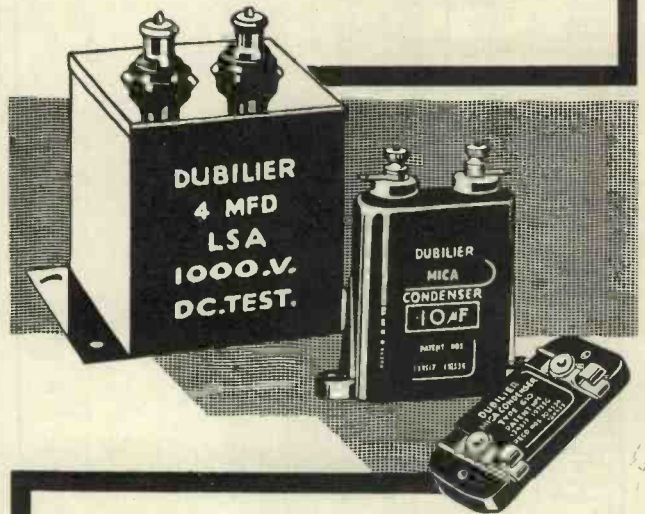
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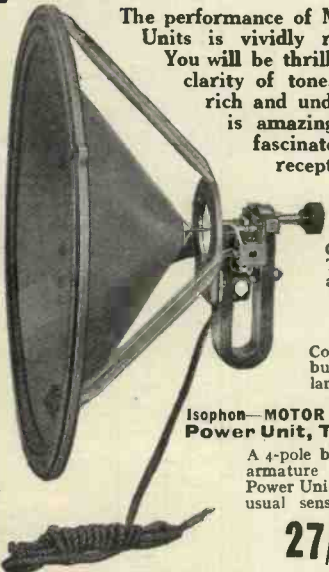
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VALVES TO USE IN YOUR SET

Make	Type	Impedance	Amplification Factor	Filament Current	Mutual Conductance	Anode Current at 120 volts	Grid Bias at 100 volts	Grid Bias at 150 volts
Two-volt Three-electrode Valves								
Mazda	H210	59,000	47	.1	.8	.5	.5	1.0
Lissen	H210	58,000	35	.1	.6	1.1	—	1.5
Cossor	210RC	50,000	36	.1	.72	1.5	—	1.5
Tungsram	R208	50,000	35	.1	.7	1.0	—	1.5
Six-Sixty	210RC	45,400	50	.1	1.1	1.0	—	1.5
Mullard	PM1A	41,600	50	.1	1.2	.75	1.5	1.5
Marconi	H2	35,000	35	.1	1.0	.5	—	1.5
Osrnm	H2	35,000	35	.1	1.0	1.0	—	1.5
Six-Sixty	210HF	25,000	19	.1	.75	1.5	—	—
Eta	BY2023	23,000	20	.12	.85	2.0	—	—
Tungsram	H210	25,000	25	.1	1.0	2.0	—	—
Mullard	PM1HF	22,500	18	.1	.8	1.0	3.0	4.5
Lissen	HL210	21,000	18	.1	.85	2.2	1.5	4.5
Mazda	HL210	21,000	26	.1	1.25	3.0	1.5	3.0
Cossor	210HF	20,000	22	.1	1.2	3.2	1.5	3.0
Marconi	HL2/c	20,100	22	.1	1.1	1.5	—	—
Osrnm	HL2	20,000	22	.1	1.1	1.5	—	—
Mullard	PM1HL	18,500	28	.1	1.5	1.2	1.5	3.0
Marconi	HL2	18,000	27	.1	1.5	—	—	—
Osrnm	HL2	18,000	27	.1	1.5	—	—	—
Six-Sixty	210HL	17,200	26	.1	1.5	2.0	—	1.5
Eta	BY1814	14,000	18	.12	1.3	3.0	—	—
Cossor	210Det.	13,000	15	.1	1.15	2.5	—	—
Six-Sixty	210LF	12,500	10.6	.1	.85	3.0	4.5	7.5
Cossor	210LF	12,000	10	.1	1.1	3.5	3.0	4.5
Mullard	PM1LF	12,000	11	.1	.9	3.0	4.5	7.5
Six-Sixty	210D	10,600	13.1	.1	1.6	4.0	3.0	4.5
Eta	BY2010	10,000	20	.12	2.0	4.0	1.5	3.0
Lissen	L210	10,000	10	.1	1.0	3.5	3.0	7.5
Marconi	L2/b	10,000	15.5	.1	1.55	4.0	—	—
Mullard	PM2DX	10,000	17	.1	1.7	2.0	3.0	6.0
Mazda	L210	10,000	15.5	.1	1.55	5.0	2.5	4.5
Tungsram	LG210	10,000	10	.1	1.0	4.0	—	—
Six-Sixty	220P	4,800	7.2	.2	1.5	5.0	7.5	12.0
Lissen	P220	4,700	7	.2	1.5	5.0	9.0	15.0
Mullard	PM2	4,400	7.5	.2	1.7	4.0	7.5	12.0
Cossor	220P	4,000	8	.2	2.0	7.5	4.5	9.0
Osrnm	215P	4,000	9	.15	2.25	7.5	3.0	7.5
Eta	BW1304	4,000	13	.2	3.2	6.0	1.5	4.5
Marconi	LP2/c	4,000	8	.2	2.0	10.0	—	—
Osrnm	LP2	3,900	15	.2	3.85	10.0	—	—
Mazda	P220	3,700	12.5	.2	3.4	11.0	3.0	6.0
Six-Sixty	220PA	3,700	13	.2	3.5	10.0	3.0	6.0
Mullard	PM2A	3,600	12.5	.2	3.5	12.0	1.5	4.5
Tungsram	P215	3,300	5	.2	1.5	12.0	—	—
Six-Sixty	230SP	2,750	5.5	.3	2.0	13.0	9.0	15.0
Eta	BW303	2,700	3	.32	1.1	11.0	15.0	25.0
Marconi	P240	2,500	4	.4	1.6	12.0	15.0	24.0
Osrnm	P240	2,500	4	.4	1.6	11.0	16.0	24.0
Tungsram	SP230	2,500	5	.3	2.0	15.0	—	—
Osrnm	P2	2,150	7.5	.2	3.5	15.0	—	—
Lissen	PX240	2,000	4	.4	2.0	14.0	12.5	22.5
Eta	BW602	1,900	6.5	.32	3.4	12.0	4.5	12.0
Mazda	P240	1,900	7	.4	3.7	18.0	6.0	13.5
Mullard	PM252	1,900	7	.4	3.7	14.0	10.5	12.0
Six-Sixty	240SP	1,900	6.6	.4	3.5	16.0	4.5	13.5
Marconi	P2/b	1,850	6.5	.2	3.5	15.0	—	—
Cossor	230XP	1,500	4	.3	2.3	18.0	12.5	22.5
Two-volt Screen-grid Valves								
Tungsram	S210	430,000	300	.12	.8	—	—	—
Mazda	2155SG	400,000	450	.15	1.1	—	1.5	1.5
Cossor	2155G	300,000	330	.15	1.1	—	—	—
Eta	BY6	300,000	300	.15	1.0	2.5	—	—
Six-Sixty	2155G	220,000	190	.15	.87	2.0	—	—
Mullard	PM12	212,000	200	.15	.94	—	—	—
Cossor	220SG	200,000	320	.2	1.6	—	1.5	—
Lissen	SG215	200,000	180	.15	.9	—	1.5	—
Marconi	S215	200,000	170	.15	.85	—	—	—
Osrnm	S22	200,000	350	.2	1.75	—	—	—
Two-volt Pentode Valves								
Lissen	PT225	64,000	90	.25	1.4	7.0	3.0	6.0
Six-Sixty	230PP	64,000	80	.3	1.25	10.0	6.0	12.0
Mullard	PM22	62,500	82	.3	1.3	10.0	6.0	12.0
Marconi	PT240	55,000	90	.4	1.65	9.0	6.0	9.0
Osrnm	PT240	55,000	90	.4	1.65	9.0	6.0	9.0
Lissen	PT240	22,500	45	.4	2.0	12.5	9.5	10.5
Cossor	230PT	20,000	40	.3	2.0	15.0	6.0	7.5
Mazda	230Pen.	—	—	.3	1.8	13.0	9.0	9.0
Four-volt Three-electrode Valves								
Cossor	410RC	60,000	40	.1	.66	1.0	—	1.5
Marconi	H410	60,000	40	.1	.67	.5	—	1.5
Osrnm	H410	60,000	40	.1	.66	.35	—	1.5
Lissen	H410	60,000	40	.1	.66	1.6	—	1.5
Six-Sixty	4075RC	58,000	37	.075	.64	1.35	1.0	1.5
Mullard	PM3A	55,000	38	.075	.66	.3	1.5	1.5
Marconi	HL410	30,000	25	.15	.83	1.0	2.0	3.0
Osrnm	HL410	30,000	25	.1	.83	1.25	1.5	3.0
Lissen	HLD410	21,000	25	.1	1.2	2.5	1.5	3.0
Cossor	410HF	20,000	20	.1	1.0	1.75	1.5	4.5
Mullard	PM3	13,000	14	.075	1.05	2.0	3.0	6.0
Six-Sixty	4075HF	12,500	13.5	.075	1.1	3.0	3.0	4.5
Cossor	410LF	8,500	15	.1	1.76	3.2	3.0	6.0
Lissen	L410	8,500	15	.1	1.8	3.5	1.5	4.5
Marconi	L410	8,500	15	.1	1.76	3.0	2.0	4.5
Osrnm	L410	8,500	15	.1	1.77	3.5	3.0	4.5

Make	Type	Impedance	Amplification Factor	Filament Current	Mutual Conductance	Anode Current at 120 volts	Grid Bias at 100 volts	Grid Bias at 150 volts
Four-volt Three-electrode Valves—Continued								
Mullard	PM4DX	7,500	15	.1	2.0	2.0	3.0	6.0
Six-Sixty	410D	7,250	14.5	.1	2.0	4.0	3.0	6.0
Marconi	P410	5,000	7.5	.1	1.5	6.0	6.0	10.5
Osrnm	P410	4,500	9	.1	2.0	6.0	6.0	12.5
Lissen	410P	4,100	7.8	.1	1.9	7.5	7.5	12.0
Six-Sixty	410P	4,000	8	.1	2.0	17.5	4.5	9.0
Cossor	PM4	4.0	8	.1	2.0	5.25	7.5	10.5
Marconi	P425	2,300	4.5	.25	1.95	14.0	9.0	16.5
Osrnm	P425	2,300	4.5	.25	1.95	14.0	9.0	16.5
Lissen	P425	2,250	4.5	.25	2.8	28.0	12.5	19.5
Cossor	415XP	2,000	4	.15	2.0	18.0	12.0	22.5
Cossor	425XP	2,000	7	.25	3.5	—	6.0	13.5
Mullard	PM254	2,000	4.2	.18	2.1	10.0	13.5	22.5
Six-Sixty	420SP	2,150	6.5	.2	3.0	15.0	12.0	22.0
Marconi	P425	1,950	3.5	.25	1.8	26.0	14.0	26.0
Cossor	4XP	1,100	3	.6	2.75	20.0	15.0	30.0
Marconi	PX4	1,050	3.5	.6	3.3	30.0	13.0	23.0
Osrnm	PX4	1,050	3.5	.6	3.3	30.0	13.0	23.0
Four-volt Screen-grid Valves								
Mullard	PM14	230,000	200	.075	.87	—	—	—
Six-Sixty	4075SG	220,000	190	.075	.87	3.0	—	—
Cossor	410SG	200,000	200	.1	1.0	—	—	1.5
Marconi	S410	200,000	180	.1	.9	3.5	1.5	1.5
Osrnm	S410	200,000	180	.1	.9	3.5	—	—
Lissen	SG410	200,000	180	.1	.9	—	—	1.5
Four-volt Pentode Valves								
Six-Sixty	SS4Pen.	53,000	83	.275	1.55	17.0	10.0	14.0
Marconi	PT425	50,000	100	.25	2.0	8.0	4.7	7.5
Osrnm	PT425	50,000	100	.25	2.0	8.0	4.0	7.5
Mullard	PM24	28,000	62	.15	1.75	16.0	6.0	12.0
Six-Sixty	415PP	27,000	60	.15	2.2	—	6.0	10.5
Mullard	PM24A	25,000	50	.275	2.0	15.0	6.0	21.0
Lissen	PT425	22,500	180	.25	2.0	15.0	7.5	10.5
Cossor	415PT	20,000	40	.15	2.0	14.0	6.0	9.0
Mazda	425Pen.	—	—	.25	2.0	14.0	14.0	14.0
Six-volt Three-electrode Valves								
Mazda	H607	90,000	40	.07	.45	1.0	.8	1.5
Marconi	610RC	60,000	50	.1	.8	1.0	—	1.5
Lissen	H610	60,000	40	.1	.66	1.0	—	1.5
Marconi	H610	60,000	40	.1	.7	.35	1.5	1.5
Osrnm	H610	60,000	40	.1	.7	.35	—	3.0
Six-Sixty	6075RC	58,000	42	.075	.7	1.1	1.0	1.5
Mullard	PM5B	53,000	40	.075	.75	2.5	1.5	1.5
Marconi	HL610	30,000	30	.1	1.0	1.0	1.5	1.5
Osrnm	HL610	30,000	30	.1	1.0	.9	1.5	3.0
Marconi	L55B	25,000	20	.8	.8			

SPECIFIED & USED IN THE "HOME & GARDEN" 3

Described in this Number

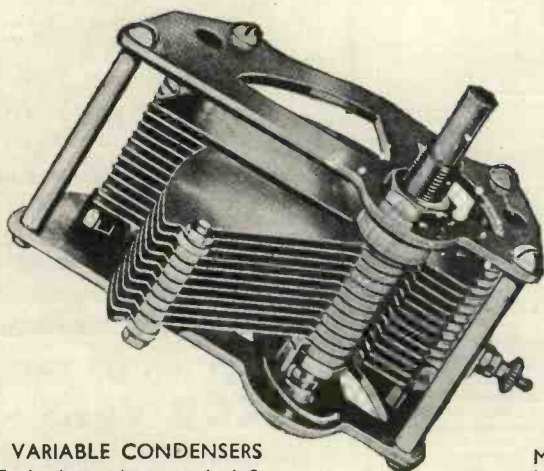
Far too many receivers of excellent design are spoiled by the inclusion of unsuitable or faulty components. Full efficiency is only secured by using those components the designer has proved the best by experiment.

In the "Home & Garden" 3 Set, LOTUS Variable and Reaction Condensers are actually used and specified by the designer. Be sure to ask your dealer for the LOTUS Variable Condenser, Type L.C.8, price 5/9, and the LOTUS Reaction Condenser Type R.C.2, price 5/3.

The LOTUS range includes many other components suitable for the "Home & Garden" 3. Ask your dealer for illustrated list and in case of difficulty write direct to:—

LOTUS RADIO LTD., MILL LANE, LIVERPOOL

LOTUS COMPONENTS



VARIABLE CONDENSERS

Truly logarithmic and definitely to the capacity stated. Ballbearings and brass vanes and end plates.

·0005 5/9; ·00035 5/7;
·0003 5/6; ·00025 5/3;
·00015 5/-.



REACTION CONDENSERS

Moving and fixed Vanes interleaved with bakelite discs of highest possible dielectric qualities, all brass parts chemically treated.

·00007 4/9; ·00013 5/-
·0002 5/3; ·00027 5/3
·00034 5/6.

YOU CAN ALWAYS RELY ON

LOTUS COMPONENTS

From the early days of radio LOTUS Components have won an increasing reputation for reliability. While their efficiency and finish make them worthy of the most expensive receivers, modest cost brings them within the reach of every constructor.

The LOTUS range comprises Transformers, Condensers, Dials, Valve Holders, Jacks, Plugs, Switches, Remote Controls, Coils, Coil Holders, etc.

Get a fully illustrated list to-day either from your dealer or from the makers.

VALVES TO USE IN YOUR SET—Continued

Make	Type	Impedance	Amplification Factor	Filament Current	Mutual Conductance	Anode Current at 120 volts	Grid Bias at 100 volts	Grid Bias at 150 volts
Six-volt Screen-grid Valves								
Six-Sixty	SS6075SG	210,000	190	.075	.9	—	—	—
Cossor	610SG	200,000	200	.1	1.0	—	—	1.5
Mullard	PM16	200,000	200	.075	1.0	—	—	—
Osram	S610	200,000	210	.1	1.05	4.0	1.5	—
Six-volt Pentode Valves								
Marconi	PT625	43,000	80	.25	1.85	10.0	6.0	15.0 (at 250v.)
Osram	PT625	43,000	80	.25	1.85	—	—	—
Six-Sixty	SS617PP	28,500	54	.17	1.9	35.0	8.0	14.0
Mullard	PM26	25,000	50	.17	2.0	—	9.0	15.0
Lissen	PT625	24,000	60	.25	2.5	14.0	7.5	15.0
Cossor	615PT	20,000	40	.15	1.5	14.0	—	—
A.C. Screen-grid Mains Valves								
Six-Sixty	SS4SGAC	1,330,000	1,000	1.0	1.0	1.5	—	—
Mullard	S4V	909,000	1,000	1.0	1.1	—	—	—
Eta	DW6	800,000	1,000	1.0	—	—	—	—
Mazda	AC/SG	800,000	1,200	1.0	3.0	5.0	.5	.5
Cossor	MSG/HA	500,100	1,000	1.0	2.0	2.0	—	—
Marconi	MS4	500,000	550	1.0	1.1	2.2	1.5	1.5
Osram	MS4	500,000	550	1.0	1.1	2.2	—	—
Mullard	S4VA	430,000	1,500	1.0	3.5	1.7	—	—
Cossor	41MSG	400,000	1,000	1.0	2.5	2.0	—	1.5
Mullard	S4VB	257,000	900	1.0	3.5	4.0	1.5	1.5
Eta	DW2	200,000	240	1.0	—	2.5	—	—
A.C. Three-electrode Mains Valves								
Eta	DW4230	23,000	40	1.0	1.75	2.5	—	1.5
Cossor	M4IRC	20,000	35	1.0	1.75	2.4	1.5	3.0
Tungsram	G150	20,000	10	.5	.5	—	—	—
Tungsram	R150	18,000	25	.5	1.4	1.5	—	—

Make	Type	Impedance	Amplification Factor	Filament Current	Mutual Conductance	Anode Current at 120 volts	Grid Bias at 100 volts	Grid Bias at 150 volts
A.C. Three-electrode Mains Valves—Continued								
Six-Sixty	SS4GPAC	14,500	35	1.0	2.4	3.0	—	3.0
Cossor	M41HF	14,000	32	1.0	2.3	2.5	1.5	3.0
Tungsram	AR4110	14,000	33	1.0	2.0	1.5	—	—
Mazda	AC/HL	13,500	35	1.0	3.0	4.5	1.5	3.0
Mullard	354V	11,700	35	1.0	3.0	2.0	2.0	3.0
Marconi	MHL/4	8,000	20	1.0	2.5	5.0	3.0	6.0 (at 200v.)
Osram	MHL/4	8,000	20	1.0	2.5	5.0	3.0	6.0
Tungsram	AC4100	8,000	16	1.0	2.0	3.0	—	—
Cossor	M41LF	7,900	15	1.0	1.9	4.5	4.5	6.0
Eta	DW1508	7,500	15	1.0	2.0	5.0	3.0	6.0
Six-Sixty	SS4D.st.	7,000	16	1.0	2.3	7.5	3.5	8.0
Mullard	164V	6,650	16	1.0	2.4	5.0	4.5	6.0
Cossor	M41P	5,000	10	1.0	2.0	6.5	4.5	7.5
Eta	DW704	4,500	7	1.0	1.5	10.0	6.0	13.5
Tungsram	L190	4,200	10	.9	2.4	8.0	12.0	16.5
Eta	DW1003	3,300	10	1.0	3.3	12.5	7.5	13.5
Marconi	ML4	3,000	9	1.0	2.0	9.0	10.0	22.0 (at 200v.)
Osram	ML4	3,000	9	1.0	2.0	9.0	10.0	16.0
Six-Sixty	SS4PAC	3,000	10	1.0	3.3	10.0	5.0	8.0
Mullard	AC104	2,850	10	1.0	3.5	—	—	10.0
Mazda	AC/P	2,650	10	1.0	3.75	14.0	6.0	12.0
Tungsram	P190	2,500	6	.9	2.4	8.0	—	—
Eta	DW702	2,250	7	.23	3.2	18.0	10.0	17.0
Eta	DX502	2,100	5	1.5	2.4	12.0	4.5	15.0
Cossor	M41XP	2,000	4	1.0	2.0	15.0	12.0	19.5
Mazda	AC/P1	2,000	5	1.0	2.5	25.0	15.0	25.0
Mullard	AS064	2,000	6	1.0	3.0	15.0	9.0	14.0
Eta	DW302	1,800	3.5	1.07	1.95	33.0	—	20.0
Mullard	AC044	1,150	3.4	.7	3.5	17.0	16.5	28.0

Preserve your copies of the "WIRELESS MAGAZINE"

The July issue was the last of volume Number XIII.

THE ideal way of keeping your copies of the WIRELESS MAGAZINE is to have them bound into volumes, each with its appropriate index, in the handsome grey-tinted stiff covers which are obtainable, at 2/6 each (inclusive of the index for each volume of six copies), plus postage, 3d. from the publishers.

BERNARD JONES PUBLICATIONS LTD.,
58-61 Fetter Lane, London, E.C.4.

LET RADIO EXPERTS BUILD YOUR SET

Sets described by WIRELESS MAGAZINE and other receivers are scientifically constructed to specification without delay. Accuracy in every detail is a great point of our service and another great point to remember is that our prices are very moderate considering the high standard of craftsmanship. We will also modernise, repair or overhaul your present receiver. Scott Sessions and Company, the Leading Radio Doctors of Great Britain, will diagnose your most intricate radio trouble and offer you the simplest and most inexpensive solution.



Write for list giving prices for building the following sets described in this issue—

- "The Simplified Super 60"
- "The Ether Marshal"
- "The Home and Garden Three"

G. SCOTT SESSIONS & CO. Maxwell Hill, London, N.10. (Phone: Tudor 5328)

"RADIO & POWER SWITCHES"

LYONS "B.A.T." "Q.M.B." SWITCHES ARE THOROUGHLY RELIABLE



Latest model illustrated. Easily breaks 3 amps. at 250 volts. Q.M.B. action. Indicating. Live parts are insulated from lever. One hole fixing. Nickel finish. Small. Neat. Guaranteed fully.

- No. 728 with Soldering Tags . . . 2/- each
- No. 730 with Screw Terminals 2/3 each
- No. 729, 2-way Type . . . 2/6 each
- No. R.671, S.P. 4-way . . . 3/9 each
- No. 156, D.P. Model, 5 Amp . . . 3/6 each
- No. D.56, D.P.D. Model . . . 5/3 each

MANY OTHER TYPES

Send for Free Booklet "Switches for Radio and Power," with 20 new circuits.

CLAUDE LYONS LTD.
76, OLDHALL ST., LIVERPOOL
40, BUCKINGHAM GATE, S.W.1

HAVE YOU BUILT THE "SUPER 60" YET?

MICROMETRIC RESISTANCE!

THE CLAROSTAT IS THE ORIGINAL MICROMETRIC RESISTOR. NOTHING TO WEAR OUT. NOTHING TO WORRY ABOUT. JUST FIT.

CLAROSTAT



REDUCED PRICES
Send for 48 Page Wonder Book. Many New Circuits FREE & POST FREE

CLAUDE LYONS LTD.
76 OLDHALL ST - LIVERPOOL
& 40 BUCKINGHAM GATE, S.W.1.

A CABINET "DE-LUXE" for your RADIO-GRAM SET!

HUGE REDUCTIONS for ONE MONTH!

- £12 12s. reduced to £8 8s.
- £7 7s. reduced to £4 18s.
- £3 3s. reduced to £2 15s.

(Cash or deferred)

The Superior QUALITY delights! A fine charm of style that people desire. Advantages also of PIANO-TONE Baffle and sound chamber (no distortion, no drumming).

Quite new—as supplied to leading experts, B.B.C. and Radio Press. You may have ON APPROVAL and return at OUR expense if you wish to part with it! This bargain offer is open for ONE MONTH.

Photographs and full details FREE.

PICKETTS, Radio Furniture Works (M.G.)
Albion Road, Bexleyheath, Kent.

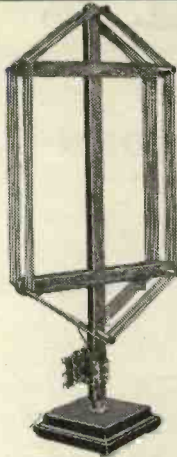
GET RID OF THE COBWEBS!

NOW IS THE TIME TO HAVE YOUR SET OVERHAULED FOR NEXT SEASON

Quotations free

WILL DAY LTD.

19 LISLE STREET, LEICESTER SQ., LONDON, W.C.2 Phone: Regent 0921.2.



EVERYTHING FOR SUPER-HETS

CENTURY FRAME AERIAL

As illustrated, with three-way lead and six spacers. Each strand of wire is enamelled and covered overall, which ensures maximum results. Correct centre tap. The only Frame Aerial complete with wave-change switch and base. **£1**
SENT C.O.D., PAY POSTMAN, OR FROM YOUR DEALER

SUPER 60 FRAME AERIAL

Chosen by Mr. James for his Super 60. With polished mahogany top, base and spindles, ebonite spacing washers, turned centre bearing and bush, wave-change plugs and ready-wound. Complete **27/6**
Sent C.O.D. Pay the Postman
Kit for above, packed flat for home assembly, 17/6. Sent C.O.D. Pay the Postman.

TRADE NOTE Peto-Scott Frame Aerials and other Super-het Equipment available to the Trade. Terms upon application.

ORIGINAL SUPER 60

As described in "Wireless Magazine"
KIT "A" (Less valves, Cabinet and Frame). You Pay the Postman. We pay all C.O.D. charges. (Or 12 monthly payments of 11/-) **£6-0-0**
Cabinet, handsomely french polished, oak or mahogany, Cash with order, **17/6**
6 Mullard valves. C.O.D. Pay the Postman **£3-16-0**

FINISHED INSTRUMENT
Super 60, including valves (less **£13-10-0** battery). Royalties Extra, **£1-10-0**

SUPER 60 PORTABLE

KIT "A" (Less Valves, Cabinet and Frame). You Pay the Postman. We pay all C.O.D. charges. (Or 12 monthly payments of 11/-) **£6-0-0**

CASH or C.O.D. ITEMS

Wearite or Lecwoc Super-het Coils. Set of 4 coils. As used by the designers and included in Pilot Radio Kits **£2.10.0**
Cash or C.O.D.

Short-wave kit for Super-hets: Complete Kit—Coil, Holder, Neutralising Condenser, Flex, Spare Tags, etc. Cash or **7/6**
C.O.D.

We can supply kits or separate parts for any "W.M." set, Cash or C.O.D. Post free if order is over 10/-

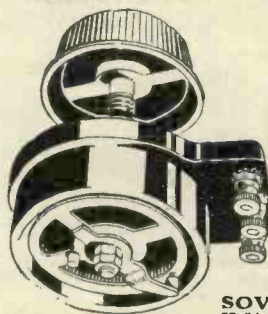
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SPECIFIED IN SIMPLIFIED SUPER 60 AND SUPER 60 A.C. UNIT



VOLUME CONTROL



This famous component in TWO leading "W.M." features scores another great triumph for Sovereign quality and reliability. The Press recommends it, experts use it, the public acclaim it. There is no reason at all why you should not use a Sovereign Potentiometer too, the ideal control for modern radio.

Bakelite case, nickelled fittings, etc., in values of 50,000, 100,000 and 500,000, ohms and 1 and 2 megohms each **4/6**

SOVEREIGN PRODUCTS, Ltd.
52-54 Rosebery Avenue, London, E.C.1

Used and specified by the designer of the "ETHER MARSHAL"



Type C.P.S.

A new addition to the famous range of "ATLAS" Radio Components this Pentode Output Choke provides more tappings for matching different speaker impedances with maximum efficiency and accuracy than any other.

The windings are ample, even for the output of 2 Pentode Valves in parallel, and the inductance with 60 m/A D.C. is 30/35 H. The six Tappings provide no less than 9 alternative ratios varying from 1-1 to 5-1.

Type C.P. (Plain)

17/6

If your dealer cannot supply, write direct to the makers for full descriptive leaflet.

Type C.P.S. (shrouded)

21/-

Everlasting High Tension for any Set for 59/6 - -

The finest A.C. Mains Unit ever produced at the price, the "ATLAS" A.C. 244 provides continuous H.T. from the Mains for a matter of a few pence per year. Suitable for all the popular 2-, 3- and 4-valve Sets; it is fully guaranteed for 12 months and incorporates the Westinghouse Metal Rectifier. Ask your dealer or write direct for leaflet.

"CLARKE'S ATLAS"

HIGH EFFICIENCY COMPONENTS

H. CLARKE & CO., OLD TRAFFORD, MANCHESTER
LONDON OFFICE: 60 Chandos Street, Strand, W.C.2.
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Advertisers like to know you "saw it in the 'Wireless Magazine'"

Broadcast Identification Sheets

For the benefit of readers we are publishing each month a series of panels specially compiled for the WIRELESS MAGAZINE by Jay Coote.

In these, readers will find a ready means of identifying foreign stations. To prevent any confusion in a.m. and p.m., the times are given on the Continental twenty-four-hour system. Example: 8 a.m.=8.00; 8 p.m.=20.00.

In the event of alterations in wavelength, power or call, a special panel bearing the alteration will be published at the earliest opportunity.

These identification sheets should be cut out and filed either alphabetically or in order of wavelength as they appear.



224.4m
(1,337 kc.)

Power: 1.5 kw.

CORK
(6 CK.)

(Irish Free State)

358 miles from London.

Standard Time: Greenwich Mean Time.

Announcers: Man and woman.

Opening Signal: Tuning note.

Call (in Irish): *Glaodhach radio Corcaighe é séo*; (in English) *Cork calling*. When S.B. with Dublin: *Sé Séo radio Ath Cliath Agus radio Corcaighe* (Dublin and Cork calling).

Main Programme: Relays Dublin except on Sundays, when Cork provides its own programme. B.S.T. 13.30, time, weather, news, gramophone records; 15.00, relay of athletic sports (Sun.); 18.00, gramophone records, childrens' hour; 19.20, news, time signal, educational talk; 20.00, main evening entertainment; 22.30, time signal and news. Sponsored concerts are broadcast at regular intervals from both Cork and Dublin.

Closes down with Irish Free State National Anthem.



233.8m.
(1,283 kc.)

Power: 2.2 kw.

LODZ
(Poland)

835 miles from London.

Standard Time: Central European (coincides with B.S.T.).

Announcers: Man and woman.

Call: *Hallo! Hallo! Raadjo Polskie Lodz* (phon.: *Woodsh*).

Interval Signal: The letter W (Warsaw) in morse (. —) and metronome. When relaying Warsaw the call is: *Hallo! Raadjo Polskie Warszawa* (phon.: *Var-schavva*), followed by names of stations taking the capital programme.

Language: Polish, but announcements are frequently made in the French language.

Main Programme: Relays Warsaw (q.v.). Closes down with the Polish National Anthem.



312.8m.
(temp.)
(959 kc.)

Power: 1.5 kw.
(temp.)

GENOA
(Italy)

840 miles from London.

Standard Time: Central European (coincides with B.S.T.).

Announcer: Woman.

Language: Italian only.

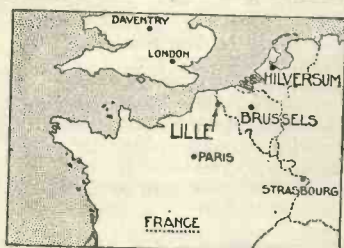
Opening Signal: Chimes with orchestra and organ (gramophone record).

Call: *E.I.A.R.* (phon.: *Eh-yar*) *Radio Genova* (phon.: *GENN-ova*).

Interval Signal: As Milan and Turin (q.v.).

Main Programme: B.S.T. 08.15, news, gramophone records; 10.15, news, sacred service, gramophone records (Sun.); 12.15, concert (Sun.); 17.30, relay of dance music; 19.50, gramophone records; 20.00, main evening transmission, concert, relay of opera, etc.; 23.00, news and dance music (except Sundays).

Relays: Milan and Turin, also occasionally Rome broadcasts. Closes down with: *Buona notte a tutti*, Fascist hymn and Italian National Anthem.



338.2m.
(887 kc.)

Power: 20 kw.

BRUSSELS
(No. 2)
(Belgium)

(Velthem-Louvain) 218 miles from London.

Standard Time: Greenwich Mean Time (Belgium adopts B.S.T.).

Announcer: Man.

Language: Flemish only.

Call: *Hier Brussel*, followed by the initials of the association responsible for the broadcast, e.g., K.V.R.O., VLANARA, SAROV, etc.

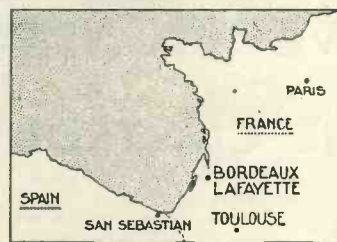
Opening Signal: Chimes.

Interval Signal: Metronome.

Main Programme: B.S.T. 17.00, concert, dance music (relayed from Antwerp or Brussels); gramophone records; 17.35, news; 20.00, main evening transmission; 22.00, news.

Closes down with *La Brabançonne* (Belgian National Anthem) and on some nights with *l'Internationale*.

Good Night: *Goede Nacht*.



453.2m.
(662 kc.)

Power: 0.6 kw.

SAN SEBASTIAN
(EAJ 8)
(Spain)

570 miles from London.

Standard Time: Greenwich Mean Time.

Announcer: Man.

Language: Spanish and Catalan.

Call: (phon.) *AY-ah chota ocho oon-ee-own-ay radio San Sebasti-yaan*.

Main Programme: Mainly relays Madrid (EAJ7) but on some evenings broadcasts gramophone records from 21.30 or 22.00 B.S.T.

Closes down with a peal of bells at 01.00 (midnight G.M.T.), followed by *La Marseillaise* and the words *Buenas noches, Señores*.

A BIG SUCCESS—A BIG DEMAND NOW A BIG REDUCTION IN PRICES OF **Drydex**



In some instances the reduction is slightly over 20% and in some slightly under.

SOME OF THE NEW PRICES.

Makers of world-famous Exide offer greatest Dry Battery value!

RED TRIANGLE	GREEN TRIANGLE	ORANGE TRIANGLE	BLUE TRIANGLE
60 volts 5/6 • 66 volts 6/-	60 volts 8/6 • 66 volts 9/6	Triple Capacity • 60 volts 12/-	For portable sets • 63 volts 7/6
99 volts 9/- • 120 volts 11/-	99 volts 14/- • 120 volts 16/9	105 volts 21/- • 120 volts 24/-	99 volts 11/6 • 108 volts 13/-

For Grid Bias: Red Triangle. 9 volts—1/- . 16.5 volts—1/9. Green Triangle. 9 volts—1/6. 16.5 volts—2/6.

Prices of Torch, Bell and Flash Lamp Batteries also reduced.

Obtainable everywhere from all good dealers.

Exide Batteries, Clifton Junction, near Manchester. Branches at London, Manchester, Birmingham, Bristol, Glasgow, Dublin and Belfast.

DE 31

There is news in the "Wireless Magazine" advertisements

WAVELENGTHS OF THE WORLD'S BROADCASTERS

Wave-length	Name of Station	Dial Readings	Country	Wave-length	Name of Station	Dial Readings	Country
206	Antwerp...		Belgium	363.4	Algiers ...		North Africa
214.2	Warsaw ...		Poland	364	Trondelag ...		Norway
216	Radio Conférence Brussel		Belgium	366.1	Frederikstad ...		Norway
217	Königsberg ...		Germany	368.9	Seville (EAJ5) ...		Spain
218	Salzburg ...		Austria	367.2	Radio LL (Paris) ...		France
	Flensburg ...		Germany	372	Hamburg ...		Germany
219.9	Béziers ...		France	376.4	Glasgow ...		Great Britain
221	Helsinki ...		Finland		Lvov ...		Poland
224.4	Cork ...		Irish Free State	381	Radio Toulouse ...		France
	Cologne ...		Germany	385	Frankfurt ...		Germany
227	Münster ...		Germany	390	Bucharest ...		Roumania
	Aachen ...		Germany	394	Midland Regional ...		Great Britain
230	Malmö ...		Sweden	398.9	Sötterns ...		Switzerland
232	Kiel ...		Germany	403.5	Katowice ...		Poland
233.8	Lodz ...		Poland	408	Dublin (2RN) ...		Irish Free State
	Kristianssand ...		Norway	413	Radio Maroc ...		North Africa
235	Fécamp ...		France	416	Berlin ...		Germany
238.5	Bordeaux-Sud-Ouest ...		France	418	Madrid (EAJ7) ...		Spain
239	Nürnberg ...		Germany	424	Kharkov ...		Russia
240	Oporto ...		Portugal	426.3	Belgrade ...		Yugoslavia
242	Stavanger ...		Norway	430.5	Stockholm ...		Sweden
242	Belfast (2BE) ...		Ireland	436	Rome ...		Italy
244	Basle ...		Switzerland	441	Paris (Ecole Sup. PTT) ...		France
244.1	Wilno ...		Poland	447	Danzig ...		Danzig
245	Schaerbeek ...		Belgium	452	Klagenfurt ...		Austria
246	Cassel ...		Germany	453	San Sebastian ...		Spain
247	Linz ...		Austria	453.2	Porsgrund ...		Norway
247	Trieste ...		Switzerland	457.5	Bolzano (1BZ) ...		Italy
249	Juan-les-Pins ...		France	459	Beromuenster ...		Switzerland
250	Prague ...		Czechoslovakia	465.8	Tartu ...		Estonia
253.4	Gleitwitz ...		Germany	466	Lyon-la-Doua ...		France
255	Toulouse (PTT) ...		France	473	Langenberg ...		Germany
257	Hörby ...		Sweden	479.2	North Regional ...		Great Britain
259	Barcelona ...		Spain	487	Prague ...		Czechoslovakia
259	Leipzig ...		Germany	487	Cesky Brod (testing) ...		Czechoslovakia
261.3	London National ...		Great Britain	493	Bergen ...		Norway
263.8	Moravska-Ostrava ...		Czechoslovakia	501	Milan ...		Italy
265	Lille (PTT) ...		France	508.5	Brussels (No. 1) ...		Belgium
266	Valencia (EAJ13) ...		Spain	517	Vienna ...		Austria
269.8	Bremen ...		Germany	525	Riga ...		Latvia
272	Rennes ...		France	533	Munich ...		Germany
276.5	Heilsberg ...		Germany	540	Palermo ...		Italy
279	Bratislava ...		Czechoslovakia	542	Sundsvall ...		Sweden
281	Copenhagen ...		Denmark	550	Budapest ...		Hungary
	Magdeburg ...		Germany	559.7	Kaiserslautern ...		Germany
283.6	Stettin ...		Germany	566	Augsberg ...		Germany
	Berlin ...		Germany	570	Hanover ...		Germany
283.9	Innsbruck ...		Austria	574.7	Freiburg ...		Germany
284.6	Montpellier ...		France	587	Ljubljana ...		Yugoslavia
287.1	Radio Lyons ...		France	680	Hamar ...		Norway
	Swansea (5SX) ...		Great Britain	690	Lausanne ...		Switzerland
	Plymouth (5PY) ...		"	720	Porl ...		Finland
	Aberdeen ...		"	760	Moscow ...		Russia
288.5	Edinburgh (2EH) ...		"	770	Geneva ...		Switzerland
	Dundee (2DE) ...		"	800	Ostersund ...		Sweden
	Bournemouth (6BM) ...		"	824	Kiev ...		Russia
	Newcastle (5NO) ...		"	937.5	Sverdlovsk ...		Russia
290.5	Lisbon ...		Portugal	1,000	Leningrad ...		Russia
291	Tampere ...		Finland	1,053	Scheveningen-Haven ...		Holland
291	Viihuri ...		Finland	1,071	Oslo ...		Norway
293	Kosice ...		Czechoslovakia	1,108	Moscow Popoff ...		Russia
296	Tallinn ...		Estonia	1,153	Kalundborg ...		Denmark
296	Turin ...		Italy	1,200	Reykjavik ...		Iceland
299	Huizen ...		Holland	1,216	Istanbul ...		Turkey
299	Radio Idzerda ...		Holland	1,229	Boden ...		Sweden
301	North National ...		Great Britain	1,249	Vienna (testing) ...		Austria
304	Bordeaux (PTT) ...		France	1,250	Tunis Kasbah ...		North Africa
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Are You Filing the Broadcast Identification Sheets Each Month?
(see page 8)

REDUCED IN PRICE

bulbs
torches
batteries

FROM JULY 1st the world's finest batteries, bulbs and torches will cost you less than ever! Ever Ready products have always offered the greatest value—in length of life and in quality of service. Now, owing to the fall in the cost of materials, these famous British batteries will be available at reduced prices. The Ever Ready guarantee is still your assurance of complete satisfaction. Every Ever Ready battery is still made entirely by British labour. The finest wireless reception is still provided for you by the makers of batteries for over 29 years—but you will now pay less for it!

Every time you buy Ever Ready batteries, torches and bulbs you are assisting to bring about further reductions in price and you are enabling more British Labour to be employed. Every increase in the volume of Ever Ready Sales means a corresponding reduction in production costs and an eventual lowering of retail prices.

HERE are three examples of the reductions in Battery prices:—

- Ever Ready "Winner 60"
previously 6/6 - now 5/6
- Ever Ready "Popular Power 60"
previously 13/6 - now 12/-
- Ever Ready "High Power 60"
previously 15/6 - now 15/-

**FROM
JULY 1st**



New Price List now available at all dealers or direct from:

THE EVER READY CO. (GREAT BRITAIN) LTD., HERCULES PLACE, HOLLOWAY, LONDON, N.7

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IN TUNE WITH THE TRADE

FETTER LANE'S Review of Catalogues and Pamphlets

SEND TO US FOR THESE CATALOGUES!

Here we review the newest booklets and folders issued by five well-known firms. If you want copies of any or all of them just cut out this coupon and send it to us. We will see that you get all the literature you desire.

Just indicate the numbers (seen at the end of each paragraph) of the catalogues you want below.

My name and address are:—

Send this coupon in an unsealed envelope, bearing ½ d. stamp, to "Catalogue Service," WIRELESS MAGAZINE, 58/61 Fetter Lane, E.C.4. Valid till Aug. 31.

A FINE NEW CABINET

IT is really surprising what a big difference a pleasing looking cabinet can make to a wireless set. There is, I suppose, some psychological effect about the better appearance of an old set in a new cabinet.

Whatever may be the reason, it certainly does exist. I do think you should see the new Lock Magnafour pedestal cabinet which has been specially designed for the Osram Music Magnet four-valver, but which, of course, is suitable for any other set of approximately the same size.

A leaflet has just been sent me which describes the Magnafour cabinet and which gives details of other cabinets which, in somewhat the same design, can be supplied to fit other popular sets on the market. The set, of course, fits in the top part of the cabinet, and there is a space below for the speaker and batteries or eliminator.

The Magnafour has a baffle board with a 9-in. hole placed behind the grille opening, the back being in one piece and covered in fabric to avoid resonance.

It is the fact that little technical details like these are considered which makes Kabilok cabinets of particular interest to home constructors. **201**

THE LATEST VALVES

PROBABLY the side of radio which is developing more than any other is that which concerns valves of all kinds—no matter whether it is for battery or mains drive. Almost every month heralds the introduction of some new valve designed for a particular purpose.

For this reason nobody who has a valve set can afford to disregard current progress and the only difficulty experienced is in keeping pace with it! Of course, you will find the valve chart published each month in the WIRELESS MAGAZINE a great help in this respect.

Osram are also out to help valve users, for they have just produced a catalogue of the clip-in index type, in which you

can place the latest sheets of Osram valves as they are issued.

Through my free catalogue service you can obtain a copy of this, filled in up to date, with all the new battery and mains valves. Then it is an easy matter to add the loose-leaf sheets as they are issued periodically and you need never be afraid of falling behind with regard to the latest valve developments. **202**

TUNEWELL MAINS PARTS

TUNEWELL, having won a name in the coil world, are turning with great success to the manufacture of eliminators and mains components of all kinds. Here I have a little book giving details of the latest mains components and complete units. Mains units are available with either valve or metal rectifiers, and D.C. jobs are also included in the range.

Tunewell make some useful power transformers for high tension and filament heating, and there are also a number of smoothing and output chokes. These are all very convincing-looking jobs with aluminium frames and stout laminated cores. A useful gadget, which you might like to incorporate in a home made mains unit, is the Tunewell safety fuse holder, a useful method of protecting the set from high-tension short-circuits.

If you are contemplating making up any mains unit then I advise you to write for a copy of this Tunewell catalogue; you will find it full of interest. **203**

BIG BATTERY CHARGERS

MOST people who use accumulators are satisfied with a trickle charger which gives half an ampere or so, but there are occasions when it is a great advantage to have a much larger charging supply.

Therefore, I feel you will be interested

to have a copy of the Tungar charger catalogue which I have just received from the Edison Swan Electric Co., Ltd.

The smallest in the Tungar range is suitable for charging 6- or 12-volt accumulators at approximately 5 amperes. This, of course, is ample for the largest radio battery and is suitable for "freshening up" the car battery. Even larger chargers are available, and these will interest set users who have to charge a number of accumulators.

The smallest 5-ampere job gives full-wave rectification on A.C. mains supplies and is, of course, of the valve type.

The price is very low, considering the generous output and I feel sure that, to many people, a charger of this kind would be in the nature of an investment. **204**

THAT SUMMER APPEARANCE

WHEN you look at a set the first thing that strikes you is the method of control. This fact, like the controls, may be obvious, but is nevertheless true! If the knobs are unsightly or are of the wrong colour to match up with the panel and cabinet, then the whole appearance of the front of the set will be spoiled even though the layout may be symmetrical.

As it is such a simple matter to change unsuitable knobs and dials I should like to draw your attention to the very fine control knobs in the range produced by George Robinson & Son, Ltd.

I have just received from this concern, which markets Isoluno, Isopress, Iso-primo dials, and so on, a useful folder giving dimensions and full particulars of each of the dials available. This same concern also markets Isopress valve holders, which have many technical features to recommend them.

Why not give your set that summer appearance by fitting more artistically suitable control knobs? **205**

CAMCO "MELODEE" CABINET



A NEAT CABINET

The Camco "Melodee" cabinet, illustrated above, is roomy enough for mounting almost any type of loud-speaker unit and chassis

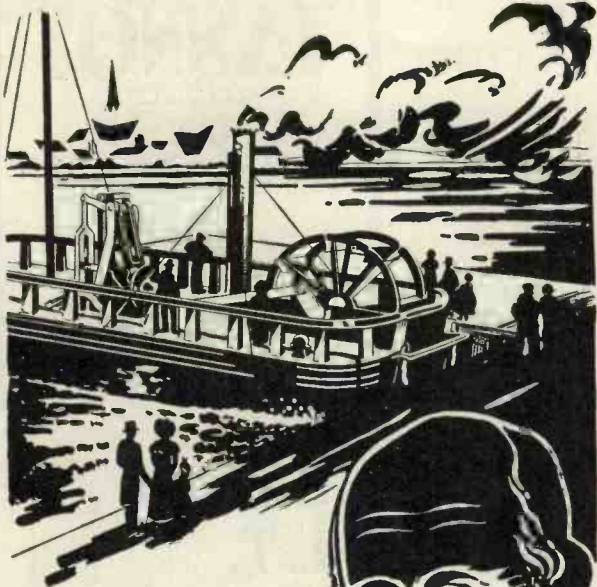
WE have recently tested the Camco "Melodee" cabinet marketed by the Carrington Manufacturing Co., Ltd., of 24, Hatton Garden, E.C.1.

One important point noticed in the design of the cabinet was the unusual thickness of the front, thus enabling any chassis to be screwed to it without marring the outward appearance by projecting screw-ends. The inside dimensions are 15 1/8 in. high by 15 1/8 in. wide by 10 1/4 in. deep.

Results obtained, using a balanced-armature unit and chassis mounted in the cabinet, were surprisingly good.

The detachable back has five good-size circular holes, each 3 in. in diameter, which helps to prevent the boxy effect so frequently obtained when a cabinet of this type is used. The price is 30s. in oak and 33s. in mahogany or walnut finish.

LITTLE STORIES OF GREAT MOMENTS



"Stop!
She will
break
the canal!"



Because William Symington, the son of a Lanarkshire workman, decided to become an engineer instead of going into the ministry, the World was given the first practical steamboat. So successful, in fact, was his invention, that the Clyde authorities refused to allow it on the canal because they feared its wash would break the banks, and, tragically, Symington never lived to see the final triumph of a lifetime spent in doing one thing and doing it well.



It is this same spirit of endeavour which has made the great T.C.C. organisation. That is why T.C.C. have never made anything but Condensers, and that is why T.C.C. Condensers are unmatched—for accuracy and dependability.

One of the many types is shown here. It is the T.C.C. 1 mfd. type (for maximum working voltage of 2500 D.C. Peak value.) Price 28/-



TELEGRAPH CONDENSER CO., LTD., N. ACTON, W.3.

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Vestinghouse
Metal
Rectifiers
are reduced
in price. . . .

From July 1st, prices of constructors' Metal Rectifiers are as follows:

	Old Price	New Price
H.T.5 ..	15/-	12/6
H.T.6 ..	17/6	15/-
H.T.7 ..	21/-	17/6

. . . . and a
new unit is
added
.. the H.T.8

with a D.C. output of 250 volts, 60 milliamps, meeting the requirements of the majority of three- and four-valve receivers.

The H.T.8 is priced 21/-

This will be available shortly.

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

Telephone - North 2415

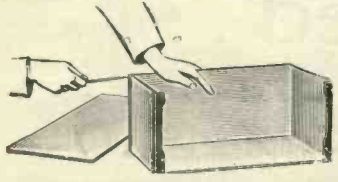
For BETTER Reception



WITH YOUR "SUPER" 60

Worth 40/-
Sold for 20/-
to popularise
Eelex
Products.

Frame Aerials have come into their own; and are rapidly taking the place of unsightly outdoor aerials. The "Super" 60 is specially adapted for this type of aerial. The Eelex Frame Aerial has been specially designed for Super-Heterodyne receivers, and can be employed in any circuit with or without centre tap. Maximum Output. Definite Minimum silent point. ROBUST Construction. **PLEASING DESIGN. PRICE COMPLETE 20/-**

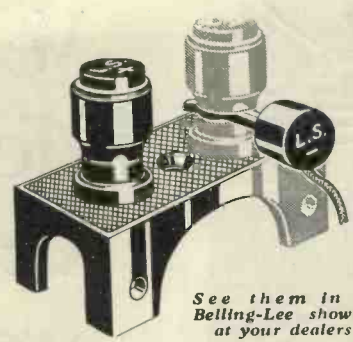


BYLDURONE CABINETS.

WHY NOT MAKE YOUR OWN CABINETS?
The corner and hinge difficulty is solved by "BYLDURONE." Corners are always square no matter if you cut the wood badly. "Byldurone" added to ordinary cabinets improves their appearance and adds to their strength. You can finish the cabinet to your special liking with wood veneer or leather covering, or staining and polishing. So simple yet you can make a craftsman's job of your cabinet with "BYLDURONE."
Write for list P88.

J.J. EASTICK & SONS.
EELIX HOUSE.
118, BUNHILL ROW, LONDON, E.C.1.
Phone: Metropolitan 0314/5/6

AN IDEAL COMBINATION



See them in the Belling-Lee showcase at your dealers.

A BELLING-LEE TERMINAL MOUNT fixed anywhere, vertically or horizontally—on baseboard, window ledge, wall or skirting. *Price 8d. each.*
BELLING-LEE TERMINALS securely fixed in the Terminal Mount, all-insulated, with clearly engraved non-rotating heads. *Price 6d. each. Other models 4d. and 3d.*
BELLING-LEE SPADES holding the Terminal stems in a spring grip, and held themselves by the massive Belling-Lee Terminal heads—the neatest and the most secure form of connection. *Price 2d. each.*

"Radio Connections"
Handbook 2d. Post free.

BELLING-LEE FOR EVERY RADIO CONNECTION.

Advt. of Belling & Lee, Ltd., Queensway, Ponders End, Midd'x

TANNOY PRODUCTS

MAKE YOUR SET COMPLETELY ELECTRIC

for **9/2**

and 11 payments of 8/8
Cash Price £4 15s.

TYPE G.B.1 Prov. Pat. 1642/31
150 v. at 15m/a. or
120 v. at 20m/a.
Also S.G. and Det.
Tappings.
H.T. 3 Tappings up to
12 v.
G.B. Independent of
H.T.
L.T. 2-, 4- or 6-v
Trickle Charger
(Westinghouse Rectifiers)



Write for illustrated list

The **ONLY** mains unit for portables incorporating independent G.B.

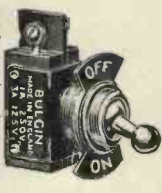
DALTON ST., WEST NORWOOD, S.E.27

Faraday House reports

that during laboratory tests a standard Bulgin Type S80 "On-Off" Toggle Switch successfully broke a current of 8 amps. at 250 volts,—far greater than the demands of radio work, and

DOUBLE ITS RATED CAPACITY

Toggle "On-Off" Switch Equally suitable for all mains and battery operated sets. Fully insulated, snap action.
Type S80 **1/9**



Toggle 2-way Switch: As S80, but with extra connections for changing over, as for H.T. to L.T. Trickle Charger.
Type S81 **2/-**

Toggle D.P. Change-over Switch available shortly.

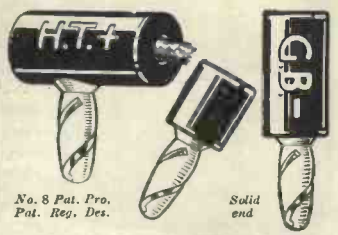


Send 2d. postage for 60pp. Illustrated Catalogue and Manual.

A. F. BULGIN & CO., LTD.
9-16-11 Cursitor St., Chancery Lane, London, E.C.4.
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CLIX

H.T. & G.B. WANDER PLUGS
Specified for the
"HOME & GARDEN" THREE



No. 8 Pat. Pro. Pat. Reg. Des.

Solid end

"SPRINGSCREW" WANDER PLUG
The Perfect Plug for Portables, Horizontals, Vertical or special short insulator. 2d. each.
THREE CLIX VALVE-HOLDERS ARE ALSO SPECIFIED FOR THIS RECEIVER
From all dealers. If any difficulty order direct.
LECTRO LINX LTD.
254, VAUXHALL BRIDGE ROAD, S.W.1

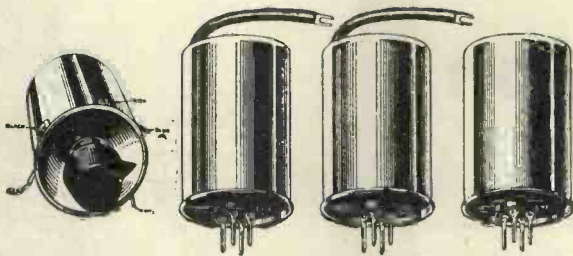
BUY Amateur Wireless
Price 3d. Weekly

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WEARITE LEADS THE WAY . . .

The introduction, by Wright & Weaire, Ltd., of the matched Band-Pass Super-Het coils enabled the "Wireless Magazine" technical staff to introduce the now well-known "Super 60" and kindred sets.

These coils were supplied to the designer by Wright & Weaire, Ltd., and no other coils were used or recommended.



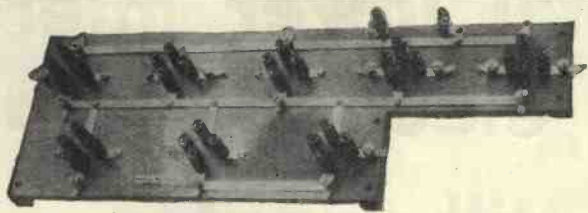
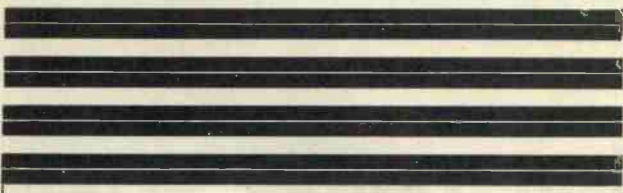
The set which has proved so popular is the "Super 60" designed and described by Mr. W. James, in the "Wireless Magazine," and the original coils used, which are now covered by Patents, were supplied exclusively by Wright and Weaire, Limited.

We claim that any other make of coils now offered in the market were instigated by those supplied by Wright & Weaire, Limited, and we would draw attention to the fact that the coils we have been supplying are covered by various European Patents and British Patents No. 349403 which has now been accepted.

Supplied packed in our standard carton. Price of complete set of four coils **50/-**

Write for Free Illustrated List.

WEARITE
COMPONENTS
 WRIGHT & WEAIRE, LTD.
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WEARITE COMBINED COIL and VALVE HOLDER CHASSIS

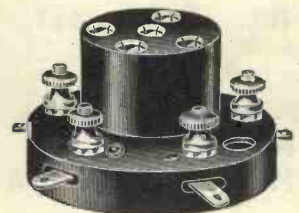
In order to simplify wiring and construction, a special WEARITE Chassis has been evolved for the "Super 60" and "Century Super" Portable. The Chassis replaces all the coil and valve holders with the exception of the oscillator holder. Fifty per cent. of the wiring is already done! Complete with grid-leak clips, the Chassis sells at the competitive price of **7/-**

WEARITE THREE-POINT SHORTING SWITCH



A simple Switch with a host of potentialities. Originally specified for wave-changing schemes in tuned circuits, the G.23 Switch has now been commissioned for the "Super 60," "Century Super," "Century Super Portable," etc. The third contact allows the H.T. lead to be broken to avoid waste of H.T. current through the 50,000-ohm potentiometer. Price . . . **1/6**

WEARITE A.C. VALVE-HOLDER



Suitable for use in the A.C. "Super 60," price 1/3 each. (Please specify Sl. A.C. type when ordering.)

A standard solid Valve Holder of the above description, but having four sockets for battery-type valves, is available also at **1/3**

The sockets on these Valve Holders are split in four places and are, therefore, ideal for the new solid pins fitted to modern valves.

Mention of the "Wireless Magazine" will ensure prompt attention

Still lower inter-electrode capacity —still greater effective amplification

Cossor Metallised Valves are available in the following types at standard list prices:—

BATTERY OPERATED:

- | | |
|-----------------|-----------------|
| 215 S.G. | 220 S.G. |
| 210 H.L. | 210 DET. |

A.C. MAINS VALVES

- | | |
|-----------------|-----------------|
| MSG - HA | MSG - LA |
| 41 MSG | 41 MH |
| 41 MHL | MS/PEN-A |

THE latest Cossor development—Metallised Valves—is a matter of the utmost importance to every user of a long-range Receiver.

The process of metallising, i.e., the depositing of a metal coating on the exterior of the glass bulb, forms an efficient screen and, in addition to reducing still further the very low inter-electrode capacity of the Cossor Screened Grid Valve permits even greater effective amplification.

At the same time selectivity is considerably improved due to the elimination of direct pick-up and of couplings between the valve and near-by components. This feature is of marked importance to users of super-heterodynes as it ensures freedom from stray couplings that frequently give rise to instability.

Cossor Metallised A.C. Mains Valves, in addition to the advantages outlined above, possess the further important



quality of reducing the tendency towards mains hum.

Cossor Metallised Valves in both Battery operated and A.C. Mains Types are obtainable from any Wireless Shop.

COSSOR

METALLISED VALVES

♥ 8500

To Messrs. A. C. Cossor Ltd., Highbury Grove, London, N.S.
Please send me, free of charge, Leaflet L.51, giving interesting technical information on Cossor Metallised Valves.
Name.....
Address.....
W.M. 8/31

When replying to advertisements, please mention "Wireless Magazine"

How to — CRITICISE— the PROGRAMMES And How NOT To!



LISTENING TO HIS OWN VOICE

Christopher Stone listening to a record of his own voice broadcast from Radio Paris

By FRANK ROGERS

SOME little time ago I was permitted by the courtesy of the B.B.C. to examine their programme correspondence methods, and so give listeners a few hints as to how to frame their criticisms in order to obtain the maximum benefit from their efforts.

Recently the method of dealing with letters has been improved with a view to giving all such remarks a more definite bearing. Formerly a week's programmes were divided into sections according to type, such as drama, vaudeville or talks.

Individuality Lost

Although this gave a certain classification, individuality was to a large extent lost because a group of songs, to take an example, on, say, a Tuesday, was combined for this purpose with another on Thursday. Thus a record of the week's letters might show a great appreciation of songs solely on account of one successful group and, of course, vice versa.

To obtain a finer classification all remarks are now registered on a daily sheet as votes for or against the item

they mention. This scheme, however, cannot be operated efficiently without the co-operation of listeners. It is essential that all letters should give the date and time of the item or items, they allude to. It is also very desirable that everyone should write fairly early in order to avoid possible confusion.

The kind of letter most likely to achieve its object is one which selects a definite part of a programme, and goes on to state clearly and unmistakably why it was, or was not, enjoyed. The kind of letter most likely *not* to achieve its object is the following:—

Dear Sir,

Excuse me for writing these few lines. Don't you think it is about time you put on some better programmes? You ought to get ten years for announcing them and the one who puts them together ought to get hung. They are getting worse instead of better. All I hope to hear is they have put him in a mad house. We pay to keep you lazy dogs. I shall think twice before I pay my 10s. Show this to your Programme Producer.

The Radio Dance Band sounds like

a lot of grunting pigs. I know about twenty who enjoy free programmes. Can you blame them? I shall be the next, I give you my word.

A lover of good programmes, not a lot of rot, and I am not one of those grumblers.

Of course, a letter like this would inevitably get no answer because it bore no home address. Moreover, as it is almost unintelligible, it goes straight into the Mad File, where it reposes with others couched in a similar strain.

Personal Opinions

Correspondents must realise that they can only speak for themselves. Having voiced a personal opinion they must not expect to see an immediate alteration. Nevertheless, they can rest assured that whatever they have said has been passed on to the proper quarter.

Those who have no wish to drive the B.B.C. officials into mental homes will not send them puzzles like this:—

We think the broadcasting grand, except the new rule that has lately come out, that all listeners using headphones must be chained down while

In this exclusive article listeners are let into the secrets of the B.B.C. correspondence department. Here are first-hand examples of how—and how not—to write your programme criticisms.

HOW TO CRITICISE PROGRAMMES—Cont.

using them, as if they move at all they cause oscillation and get switched off altogether. I suppose if the set was loud enough to work a loud-speaker it would be alright, as it would never have to be moved.

Poetry at Savoy Hill

Neither can I imagine poetry being very well received at Savoy Hill. Maybe some budding Shakespeare could put his opinions into intelligent verse, but an official getting letters in piles a foot high at a time would prefer something briefer, sufficiently well labelled for him to be able to put it into its right category without delay.

touch with lost relatives and friends. This is not so. All applications should be made to New Scotland Yard, or any police station.

One lady wrote most pathetically about her fourteen-year-old son who had mysteriously disappeared. I suppose she was trying every human device to find the lad, but she could have saved herself the trouble of writing to the B.B.C.; they only act on the advice of the police in the case of missing persons.

At the risk of being accused of straying from my subject I must show you a letter from a young woman on the far side of the Atlantic.

Bulgaria, Roumania, Switzerland, Greece, Belgium, Denmark, Italy, Spain, Portugal, Russia, Persia, Sweden, Holland; aviators, radio-operators, fishermen, hunters, explorers, tourists, athletics, actors, prize-fighters, real estate owners, brokers, dealers, bankers, opera hotel restaurant owners may write, vaudeville players, western showmen, musicians, singers, lawyers, poets, writers, doctors, architects, presidents, foremen, managers, men from different lodges, cowboys, ranchers on old plantations, bull-fighters, mine owners, oil and gas men, timber and mill owners, gypsies, all classes of people from as far away from here as I can hear from, cavalrymen, soldiers, in navy and marines, Roman Catholics, Presbyterians, anyone in Africa, where the tropical fruits, flowers and nuts grow, palms, bananas, oranges, lemons, grape fruit cocoanuts, and all such as that grow cotton, spices, poppytea, rice, coffee, tobacco, shipowners, policemen at museums, taxidermists, and all please have a lot of folk write me, detectives, publishers of papers.

From ———,
French born, violin, violincello, harp, bagpipe player, band accordion, yodlers.

Every Consideration

It is always open to ask the B.B.C. to broadcast a particular item, or bring a particular person to the microphone. Listeners' requests are invariably given every consideration, since they form some guide to public taste, but not all of them can be taken seriously. Here is a case in point:—

Dear Sir (or shall I say, Gentlemen):
Will you kindly broadcast on the wireless for two or three nights.

Only God with His Almighty Power can save the ——— Railway Company as they are facing the grave situation of being ruined if something is not done to protect them. God says he will protect them if the Company will take notice of my husband and be ruled by him. As he says he is the only man willing to do his duty to the Railway Company and all men, and for that reason He will stand by him and uphold him in all that he says and does. To save the Railway Company as it would affect such a large body of men should the Company be brought to ruin, through the Managers not doing their duty to save the Company, but only to save themselves . . .

Needless to say, a prayer to save this railway company was not broadcast, as the request was quite out of the question. But a letter asking, say, for a re-appearance of Tommy Handley, would be handed over at once to the vaudeville section, who would take due notice of the suggestion. If a batch of similar letters arrived I have little doubt they would

ELEGY ON A CITY MAN

(After Gray)

The sun goes down to mark the close of day,
Each laden 'bus crawls by with dignity,
The city man plods homeward on his way
And lets his mind dwell on the B.B.C.

He turns the wireless on when he has dined,
And mutters "Silence!" when his wife would speak;
But she, poor soul, is utterly resigned,
He listens nightly thus throughout the week.

Yet from the house next door, yclept The Towers,
A peevish neighbour often does complain
Of wireless working overtime for hours—
"There is that beastly chap at it again!

"There lives a meek and inoffensive man,
At least he was when Science was unknown,
But, since he has become a wireless fan,
A listening complex marks him for its own!"

LESLIE M. OYLER

If, however, you *must* send poetry, avoid making it satirical. If you happen to be acquainted with the author of the specimen below, and value his continued existence, please persuade him not to repeat the offence:—

Forced for weeks to be a sitter I've
been listening to the twitter
Of your Springles and your High-
brows, your half-ishers and some
more,
Till I think it would be fitter to em-
ploy if you could get her
The old dear who chars and washes
for my lot of half a score.

There are still some people who think the B.B.C. can put them in

I think you will agree with me that it is priceless.

Will you please broadcast my name and address. I get rather lonesome sometimes and would love to get interesting letters and pictures to help pass the time away. I would rather hear from married ladies or girls, but men may write if they wish. I would rather hear from missionary workers, preachers, Y.W.C.A. workers, Christians from different churches. I would rather hear from poor people with very good education, but would like to hear from wealthy people with college education, such as knights of olden times, sheiks, kings, lords, earls, princes, marquises, dukes, English people from Scotland, Wales, Ireland, Iceland, Spitzbergen, Algeria, Austria,

SECRETS OF THE B.B.C.'s POSTBAG

result in the familiar Lancashire voice being heard once again.

There is nothing to be gained by writing to the programme section offering them inventions, however confident you may feel concerning them. One gentleman caused much merriment at Savoy Hill by sending this:—

Having been invited to make money in spare time through radio I have long since conceived the idea of inventing musical bells hanging on the trees which will be put in motion by the wind. It would certainly be the work of intelligent mechanics and I, having no tools or materials, or, in fact, not knowing how to find such, I am lost for want of assistance.

I have all the idea planned out, and I have thought of offering the idea to the U.S., as they have such nice parks there. Of course, you may have such-like in London, but I have never been there. Should you care to give this invention a consideration it is certainly worth honours to any country, and is a future prediction that your parks are to resemble Paradise.

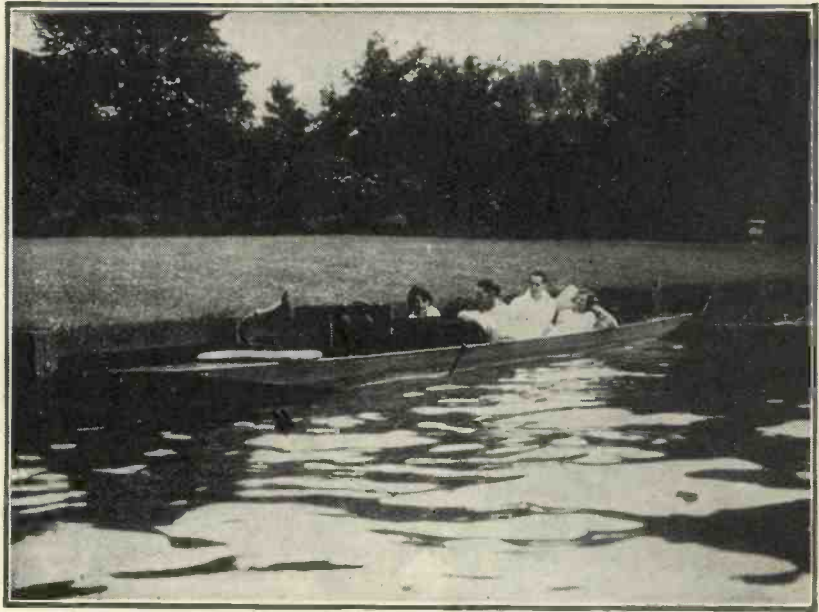
I hope Royalty will assist and patronise my invention.

Yours respectfully,

P.S.—Further information will be given by contract. All rights reserved.

Incredible though it may sound, the B.B.C. has received more than one demand for payment for "having been broadcast." Such letters find their way into the Mad File in company with the others I have quoted.

One writer styled himself Baron Kensington and cited as a witness of his claim a royal princess. A second,



MUSIC IS ALWAYS POPULAR ON THE RIVER

A radio set is much more convenient than a gramophone—why not try one when you next go punting?

a lady this time, took the bull by the horns and lied gloriously, if indeed ineffectively:—

Dear Sirs,

On Friday, the — of —, I was staying at the — Hotel, —. Some gentleman unknown to me put me on to sing to you with a small machine he had with him. If you remember I gave you the song entitled "The Merriest Girl That's Out," after which you asked me to speak to you through the telephone. I gave you my name and address.

Perhaps you failed to grasp it.

I heard you distinctly say you would allow me £25 for the song. If this is not correct please let me know, and also return me the two photographs I am enclosing. I should have written before but have not been well enough to do so.

Yours truly,

I could go on quoting from this Mad File almost indefinitely, but perhaps the selection I have made is sufficient to illustrate the kind of letter which it is only a waste of time to put together.

After all, intelligent people only write letters when they have a purpose to accomplish, and the programme section cannot cater for any others. They are very gratified when their efforts call forth correspondence of a helpful, even if critical nature. All remarks are carefully scrutinised, more particularly when they are repeated from different parts of the country.

Exact Details Needed

The chief difficulty of the officials responsible is to divine the precise meaning of a writer, to point with certainty to the item he refers to. If therefore, listeners want to obtain the fullest satisfaction, they must give the date and exact time when their part of the programme was given. That done, they must try to make their criticism as plain as possible—not an easy task, as professional critics will readily admit.



TRY ROADSIDE RADIO THIS SUMMER!

A happy group of motorists enjoy broadcasting in a countryside setting

SIMPLIFIED SUPER-HET BUILDING

A SIMPLIFIED SUPER 60

LET us make it clear at the outset that the receiver illustrated in these pages is practically identical with the original model; that is to say, the circuit is the same and the majority of parts are identical with those employed for the Super 60 described in the March WIRELESS MAGAZINE.

The only difference, indeed, is the use of a special base, which takes the place of eight of the nine valve holders normally required. The use of one of these special bases considerably simplifies the building of a Super 60 for the reason that many connections between the various sockets are already made.

Less Connections

In the original Super 60 there were sixty connecting wires, but the use of one of the special bases enables the constructor to build the set with approximately twenty fewer wires.

It will therefore be obvious that this new version of the Super 60 is not offered to those listeners who have already assembled the original model. It is, however, of considerable

interest to those who are preparing to build the set during the course of the next few weeks.

Although it was originally published six months ago, the Super 60 still retains the interest of the radio public, and many hundreds are being built each week.

For the benefit of those who have

only recently made acquaintance with this receiver, we recapitulate in the following paragraphs some of the main features of the design :—

(1) The set can be built, complete with frame aerial, valves and cabinet, for about £12.

(2) The use of two intermediate amplifiers of the screen-grid type, coupled by accurately matched band-pass filter units, ensures a very high degree of stable amplification.

Three-range Oscillator Coil

(3) The special oscillator unit employed covers three ranges, namely from approximately 20 to 45 metres, 200 to 600 metres, and 900 to 2,000 metres.

(4) Although six valves are used, the anode-current consumption is of the order of 12 to 15 milliamperes only, and a standard double-capacity high-tension battery will give satisfactory service.

(5) Amazing results are obtained with the set, but it is no more difficult to operate than any ordinary three- or four-valve receiver; there are only two main tuning controls, a wave-change switch and a volume control.

Apart from the fact that a special eight-way base is used in the simplified version in place of eight separate valve holders, the components are identical with those originally specified. It will be clear, therefore, that the circuit remains the same, and the simplification in no way affects the efficiency of the set.

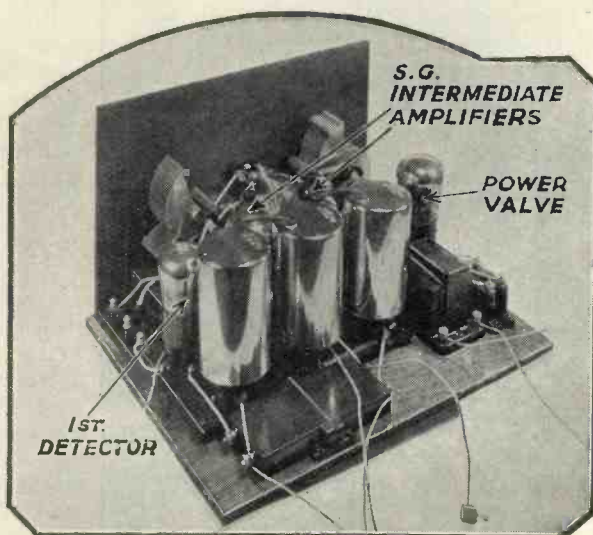
Although we have been referring to the simplified version of the Super 60, actually the constructor has the choice of two models. Two firms make special eight-way bases, but these differ slightly in their detail arrangements, and therefore we have produced two models of the set.

Obtaining a Blueprint

Wiring diagrams of each are reproduced in these pages at quarter scale, but if required full-size blueprints can be obtained in the ordinary way.

One of the bases available is a Wearite product, and costs 7s.; the other is made by Lewcos, and is priced at 9s. Both bases incorporate eight holders (for five of the valves and the three intermediate coils).

The higher price of the



UNBEATABLE AT ITS PRICE

For approximately £12, the Super 60 is the best value for money that has ever been offered to the home constructor. Here is the complete set with a Wearite eight-way base

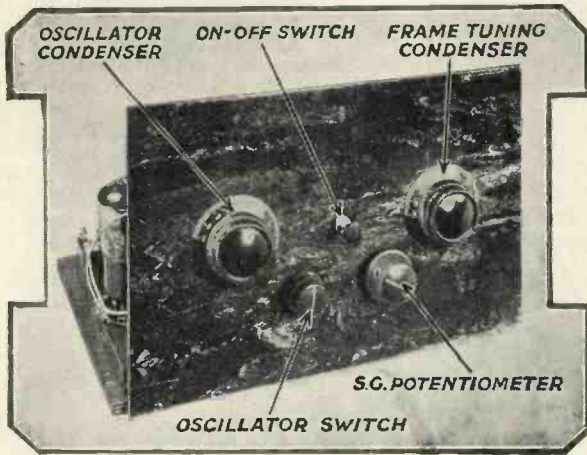
Lewcos base is occasioned by the fact that it includes, wired in the appropriate leads, the grid leak and grid condenser associated with the second detector valve. The Wearite base omits these parts, but includes a grid-leak clip.

From these details it will be clear that there is no essential difference between the two bases, and the final choice must be a matter for the individual constructor to decide for himself.

Twenty Fewer Wires Than Original Model

In practice, the Wearite base necessitates one more lead than does the Lewcos model, but either enables the constructor to assemble the Super 60 with *approximately twenty fewer wires than were needed for the original model.*

A wiring guide for the Wearite base appears on page 22 and a full-size blueprint can be obtained for half price (that is, 'd., post free), if the coupon to be found on the last page of this issue is used by August 31. The connections for the Lewcos base are shown on this page;



SIMPLE PANEL CONTROLS

There are only two main tuning dials, a wave-change switch and a potentiometer besides the standard on-off switch. The set is as easy to operate as an ordinary two- or three-valve

a full-size blueprint is available for this also.

Address your order to Blueprint Department, WIRELESS MAGAZINE, 58-61 Fetter Lane, London, E.C.4. Ask for No. WM249 if you are going to use the Wearite base, and for No. WM251 if you intend to use the Lewcos base.

Construction Details

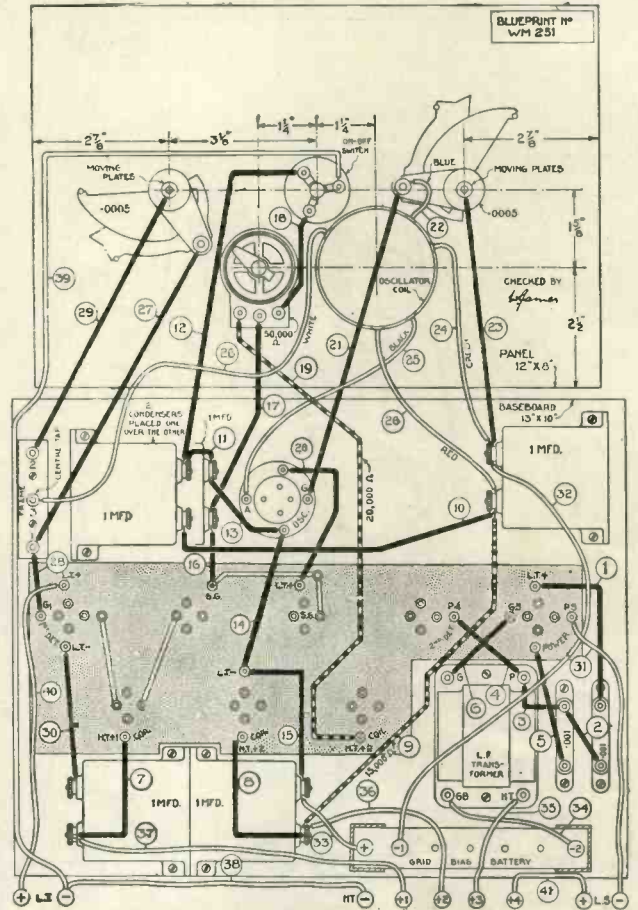
We do not intend, in this article, to go into a lot of details regarding the Super 60, but on page 22 will be found a complete list of all the articles dealing with it that have appeared up to date.

Although the Super 60



YOU CAN BUILD IT IN THREE HOURS

With the Wearite eight-way base the Super 60 can be assembled with approximately twenty fewer wires than were needed for the original version



WIRING OF THE LEWCOS EIGHT-WAY BASE

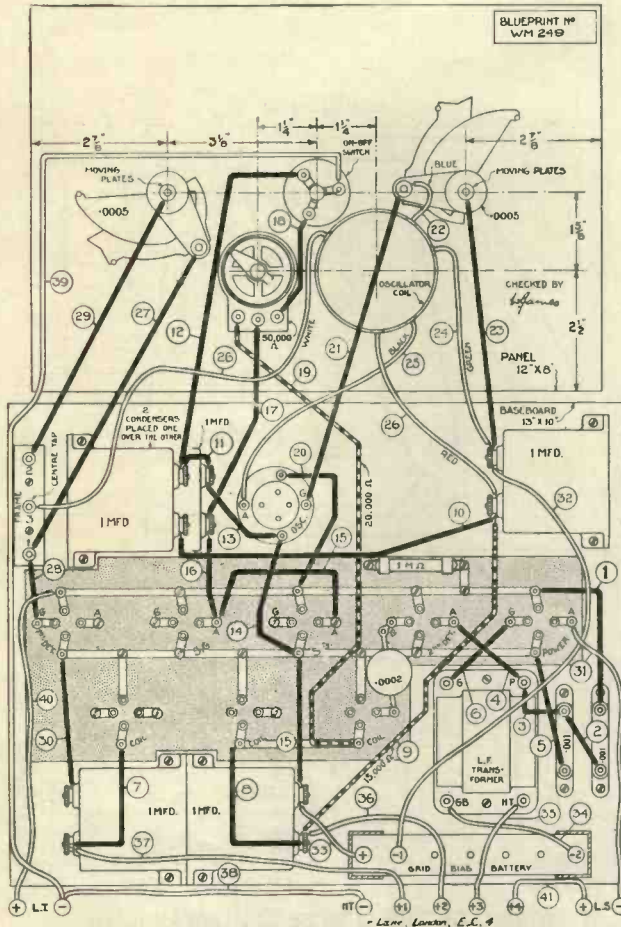
This diagram is reproduced at quarter scale, but a full-size blueprint is available at half price (that is, 'd., post free) if the coupon on page 104 is used by August 31. Ask for No. WM251

was originally designed for economical running with ordinary high-tension batteries, it can, if desired, be worked quite satisfactorily from a mains unit. Almost any standard commercial unit will be suitable, provided it gives 20 milliamperes at 120 volts, but it must incorporate a potentiometer for connection to the high-tension lead associated with the first (anode-bend) detector valve.

Suitable Mains Unit

For those who prefer to make their own mains unit, we are describing elsewhere in this issue a suitable A.C. model which will be found particularly satisfactory in use. One advantage of running the Super 60 from the mains for high tension

SIMPLIFIED—



WIRING OF THE WEARITE EIGHT-WAY BASE

This diagram is quarter scale, but if desired a full-size blueprint can be obtained for half price (that is, post free), if the coupon on page 104 is used by August 31. Ask for No. WM249

is, that a larger power valve can be used than is economical when dry batteries are utilised.

It will be found, when operating

with best of frame aerials this effect is not obtained—nor is it necessary for satisfactory results.

As the original set was published

the Super 60, that the tuning of the oscillator (left-hand dial) is very much sharper than the tuning of the frame aerial (right-hand dial). This effect is quite normal, and need occasion no qualms that the set is not working properly. Even although the frame tuning is in most cases broad, there will be no difficulty in separating stations on adjacent wavelengths by means of the oscillator tuning condenser.

This point is mentioned because some readers have been under the impression that the frame tuning should be as sharp as the oscillator tuning, but even

THE "SUPER 60"

MARCH

- "The Super 60" (original description), page 134.
- "Touring Europe with the Super 60," page 140.

APRIL

- "More Practical Points About the Super 60," page 248.
- "Points That Are Asked About the Super 60," page 254.
- "Building the Super 60 with Alternative Parts," page 256.
- "Test Reports on the Super 60," page 322.

MAY

- "The Super 60 Portable," page 357.
- "Short Waves on the Super 60," page 374.
- "What the Daily Express Said About the Super 60, and What 'W.M.' Readers Are Doing with It," page 396.
- "The Super 60" (reprint of original article), page 409.

JUNE

- "The A.C. Super 60," page 470.
- "The Triumph of the Super 60" (test reports), page 514.
- "Super 60 Questions," page 516.
- "Constructors' Experiences with the James Super 60," page 518.

JULY

- "The A.C. Super 60" (simple table model), page 574.
- "Super Power from Your Super 60," page 594.
- "More Super 60 Questions," page 596.
- "Super 60 News," page 619.
- "Valves for the Super 60," page 633.
- "Readers' Tests of 'W.M.' Sets," page 642.

A limited number of these five issues of WIRELESS MAGAZINE is available for 1s. 3d. each, post free. Address your inquiries to the Publisher, WIRELESS MAGAZINE, 58-61 Fetter Lane, London, E.C.4.

COMPONENTS NEEDED FOR THE "SIMPLIFIED SUPER 60"

COILS

- 1—Set of four Super-het. coils, £2 10s. (Lewcos or Wearite).

CONDENSERS, FIXED

- 1—Formo .0002-microfarad, 6d. (or Ormond).
- 2—T.C.C. .001-microfarad, upright type, 3s. 8d. (or Dubilier, Telsen).
- 5—T.C.C. 1-microfarad, type 50, 14s. 2d. (or Dubilier, Franklin).

CONDENSERS, VARIABLE

- 2—Ormond .0005-microfarad slow motion, type R426, 12s. (or Polar, Jackson).

EBONITE

- 1—Red Triangle panel, 12 in. by 8 in., 6s. (or Becol, Lissen).

HOLDER, COMBINED COIL AND VALVE

- 1—Lewcos eight-way, 9s. (or Wearite, 7s.)★

HOLDER, VALVE

- 1—Telsen, four-pin type, 6d. (or W.B., Lotus).

PLUGS AND SPADES

- 8—Belling-Lee wander plugs, marked: H.T.+4, H.T.+3, H.T.+2, H.T.+1, H.T.—, G.B.+ , G.B.—, G.B.—2, 2s. (or Clix, Ealex).
- 2—Belling-Lee spade terminals, marked: L.T.+ , L.T.—, 9d. (or Clix, Ealex).

RESISTANCES, FIXED

- 1—Magnum 15,000-ohm, spaghetti type, 1s. 6d. (or Bulgin, Lewcos).
- 1—Magnum 20,000-ohm, spaghetti type, 1s. 6d. (or Bulgin, Lewcos).
- 1—Lissen 1-megohm grid leak, 1s. (or Dubilier, Watmel).

RESISTANCE, VARIABLE

- 1—Sovereign 50,000-ohm potentiometer, 4s. 6d. (or Regentstat).

SUNDRIES

- Tinned-copper wire for connecting.
- Lengths of Sistollex sleeving.
- 1—Set of Cortabs de Luxe.
- 1—Ebonite strip, 2½ in. by ½ in.
- 3—Small brass terminals.

- 1—Pair Bulgin grid-bias battery clips, type G37, 9d.

SWITCH

- 1—W.B. three-point, 1s. 3d. (or Bulgin, Pioneer).

TRANSFORMER, L.F.

- 1—Ferranti, type AF8, 11s. 6d. (or Telsen, Igranic Midget).

ACCESSORIES

BATTERIES

- 1—Ever Ready, type PP120, £1 7s. 6d. (or Drydex, Pertrix).
- 1—Ever Ready, 9-volt, grid-bias type, 1s. 3d. (or Drydex, Pertrix).
- 1—Exide 2-volt accumulator, type ICZ3, 11s. 6d. (or C.A.V., Pertrix).

CABINET

- Byldurone, Camco, Peto-Scott.

FRAME AERIAL

- 1—Dual-range frame aerial (Ready

- Radio, Eastick, Lewcos, Peto-Scott, Wearite).

VALVES

OSCILLATOR

- 1—Marconi L2/b, 8s. 6d. (or Mullard PM1LF, Osram L2).

FIRST DETECTOR

- 1—Marconi H2, 8s. 6d. (or Mullard PM1HF, Osram H2).

S.G. INTERMEDIATES

- 2—Cossor 215SG, £2 (or Mullard PM12, Osram S215).

SECOND DETECTOR

- 1—Marconi HL2/c, 8s. 6d. (or Mullard PM1HF, Osram HL2).

POWER

- 1—Mullard PM2, 10s. 6d. (or Cossor 215P).

★ If the Lewcos base is used, omit the Formo .0002-microfarad grid condenser and Lissen 1-megohm grid leak

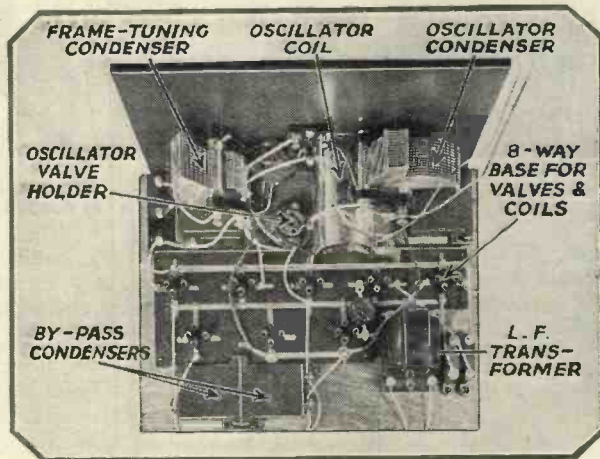
The prices mentioned are those for the parts used in the original set; the prices of alternatives as indicated in the brackets may be either higher or lower

— SUPER-HETS—Cont.

six months ago, it will be obvious that the results obtained during the original tests were better than can be expected in the middle of the summer, and constructors must not be surprised if they do not receive more than twenty or thirty stations at good strength during the next few weeks.

Improved Results in the Autumn

When the autumn comes, the results will be every bit as good as those originally claimed. Those who build the set now will have a pleasant surprise in this respect during the winter months, for no receiver will give anything like as good a performance during the hot weather as it will when the days begin to draw in.



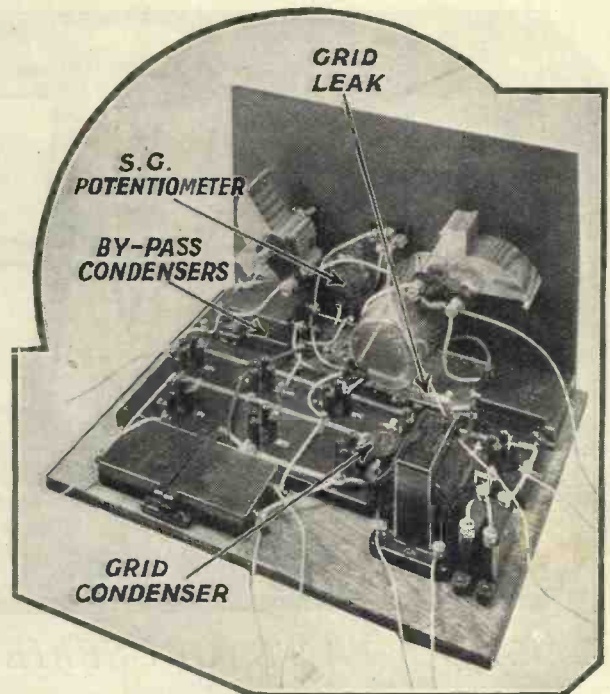
MORE LIKE A "THREE" THAN A "SIX"

This plan view of the Super 60 with a Wearite base shows that it is easier to assemble than are many three-valve receivers

In view of the fact that other super-hets are now available to the home-constructor, we particularly wish to emphasise the simplicity of the Super 60, both as regards construction and operation. We know from reports received from readers that many beginners can assemble the set completely in three hours and the simplicity of the controls will be obvious from the photograph of the front panel that appears on page 21.

Oscillator Adjustments

Before switching the set on, the oscillator should be adjusted for the desired waveband. The oscillator switch has three positions. When turned to the left, the set is adjusted for ultra short-wave reception (for



BASE PARTLY WIRED ALREADY

This photograph shows a simplified Super 60 with a Wearite eight-way base. Already the parts are wired up, when obtained from the manufacturer

further details see page 374 of the May issue); in its centre position the oscillator gives medium-wave reception; and when turned to the right, the set is adjusted for the long waves.

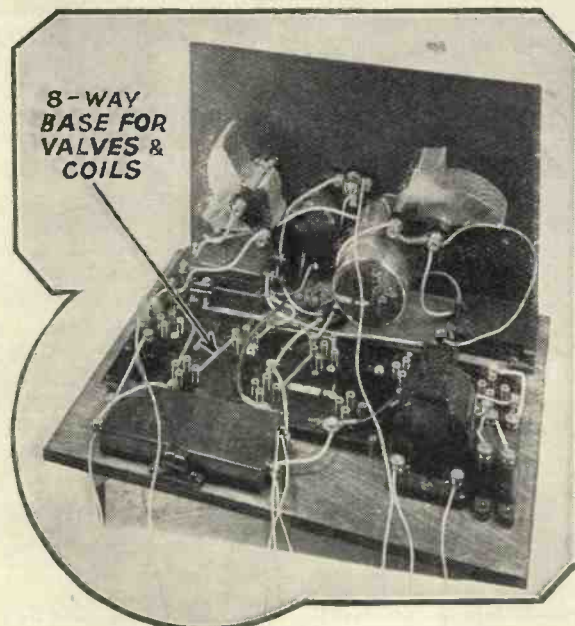
Apart from the two tuning dials, then, there is only the screen-grid potentiometer to be adjusted. To start with, the knob of this should be set to its half-way position, and then turned to the left or right to decrease or increase the volume as desired.

Shielded Valves

Since the original set was first described, metal-coated valves have made their appearance and although no valve screening is really necessary, some readers may like to try valves of this type in the screen-grid and two detector stages. There is certainly no need for the oscillator or power valves to be shielded.

We have arranged with Selfridge's that one of these simplified Super 60's will be on show in their Somerset Street windows during the currency of this issue of WIRELESS MAGAZINE.

Readers living near London will, no doubt, avail themselves of seeing this receiver for themselves.



THIS BASE IS WIRED UNDERNEATH

Another simplified Super 60, this time with the Lewcos eight-way base, which is already partly wired up underneath



A RADIO FAN'S CAUSERIE CONDUCTED BY BM/PRESS

Beam Wireless

YESTERDAY, in the course of a motor-tramp through Devon and Cornwall, I passed the masts of the Bodmin beam station, which gives direct communication with South Africa and Australia, if my memory serves me right.

When I left London two days ago for a fortnight's camping holiday, I had no idea of going so far west as Bodmin or I would have approached Marconi's for a permit to go over the station.

I am glad to have seen the aerials full size. Up to now my impressions have been based on photographs, and I had no idea they were so large.

Each separate vertical wire, which forms part of a "beam" grid, seems to have its own feeded box. The supporting masts were much higher than I had anticipated and the station looked quite impressive.

No Portable Set

As far as I am concerned, this is going to be a non-wireless holiday and, apart from writing these notes, I do not intend to have anything to do with radio. A busman's holiday makes no appeal to me.

You will not be surprised, then, to learn that we have not even brought

a portable set with us. All we have in the entertainment line is a very small portable gramophone that I have borrowed from the ever-obliging Mr. Twells, of the publicity department of the Columbia Graphophone Co., Ltd.

We have been so late pitching camp each night so far, that we have not yet had any occasion to use it. Still, it is good to know that we have some music on tap if we should feel like it—and the programme can be of our own choosing.

Good Old 5XX

We had lunch yesterday in a little café at Truro, under the shadow of the cathedral. It was towards two o'clock and they had a radio set going.

I did not investigate further—did I not say this is no busman's holiday—but I noted that the station being received was good old 5XX at Daventry.

The programme seemed to be pretty poor and there were occasional atmospheric. All the music was from records and a number sounded as if they would have been better for a little "hotting-up."

A Lightning Flash

Last night we pitched our tent

at the top of a hill overlooking Mevagissey. In the distance we can see the entrance to Fowey Harbour and all night I could see out of the tent door flashes from the Eddystone lighthouse near Plymouth.

About ten o'clock we walked down into the village and on the way saw many flashes of lightning that came from a heavy cloud across the bay.

We passed a house where a loud-speaker was working at full blast—yes, "blast" is the word—and heard a terrific crash at the same time that we saw an extra brilliant flash of lightning.

But it was all a false alarm; the storm came nowhere near and for once it did not rain during the night!

All on Holiday

If you are on holiday yourself as you read this issue of WIRELESS MAGAZINE you will be specially interested to know that a number of "W.M." staff people are also taking a breather before the autumn rush.

The Editor, for instance, has taken his car over to Germany and is probably now somewhere in the Black Forest. Mr. James is in Little Holland, near Clacton, with his family. He, by the way, has taken

BM/PRESS on Holiday :: 5XX Reception in Cornwall :: Improved Valve Characteristics :: An Unusual Fault :: An Aerial Discussion

the original *Amateur Wireless Portable Century Super* away with him.

Mr. Reyner is also with his family at Burnham, in Somerset, and Alan Hunter is touring Devon and Cornwall by car on his own.

◆ ◆ ◆
Valve Reductions

It must be obvious to you that a paper the size of WIRELESS MAGAZINE, which is printed in several sections, must go to press some time before publication, so it will be no surprise to you to learn that I heard of the reductions in valve prices just as I came away.

I have no details with me, but you will agree that the reductions are in no way spectacular. I did hope that some reduction would be made in the 8s. 6d. series. Frankly, I expected to see a 7s. 6d. "ring" valve.

However, on reflection I suppose things are squared up to some extent owing to the greatly improved characteristics we shall get for the next season. It seems as if there will be a special development in the way of screen-grid valves and pentodes.

◆ ◆ ◆
Spare Parts

Is the time coming when radio-set manufacturers will have to carry a stock of spare parts as motor-car manufacturers do?

The idea occurred to me when I saw a portable set recently that had a broken switch. The switch was of a

type made specially for the set, which was some years old, and no similar type could be obtained anywhere. Two alternatives faced the owner. Either he could have the set rebuilt by a dealer so that it would accommodate a standard type of switch or he could scrap it altogether and buy a new model.

The latter course did not appeal to him. The set had originally cost about £25 and until the switch failed had given satisfactory service for three or four years.

◆ ◆ ◆
The Industrious Ant

Writing of portables reminds me of an experience that befell a portable enthusiast. I got the story from a friend who called on the manufacturer a few days ago.

It appears that the set was taken away on holiday and worked well for a few days. Then reception came to an end. The owner was at a loss to account for the trouble, for the high-tension battery was new and he had had the accumulator charged before going away.

As soon as he returned to town he took the set in to the manufacturer, thinking that some major fault must have developed.

The maker began to pull the "innards" out of the box and, to his amazement, found it to be chock full of ants.

Picnickers with portables will at once see the moral of this.

A Correction

Last month I said that Mr. J. Joseph, of Radio Instruments, was at one time in partnership with Mr. Handley Page, the aircraft designer.

That was wrong and I wish to correct the statement. Actually, Mr. Joseph and Mr. Page, when they were both young men, worked for the same famous firm of scientific instrument makers, but they were never in business on their own together.

By the way, if ever you meet Mr. Joseph ask him to tell you the story of how he wrote a textbook for a famous technical correspondence course. Unfortunately, this is not the place for such intriguing disclosures!

◆ ◆ ◆
Aerial Efficiency

How many of the aerials you see dotted all over the country are really efficient and worth keeping?

A man at Watford told me the other day that his aerial had come down in a recent storm, but he had not realised it for some days, for it had made no difference at all to his reception.

He asked me to account for the phenomenon. All I could suggest was that the actual lead-in had always been broken and that the aerial had never really been used.

He seemed disinclined to agree, but what other explanation can there be?
BM/PRESS



SWITZERLAND'S BIG NOISE

Here you see a photograph of the transmitting gear and control panels at Sottens, the new Swiss high-power station

On the Crest of the Waves

By JAY COOTE

ACCORDING to a variable rota, the German stations individually broadcast a special late transmission on one night each month. The concerts are timed to start at 12.30 a.m. B.S.T., and usually last one hour.

The Helsinki (Finland) transmissions are now available to foreign listeners through the Lahti high-power station and through Viipuri (Viborg), a recently installed 13.2-kilowatt working on 291 metres. "The Land of the Thousand Lakes" does not intend to erect giant transmitters, but proposes to add a chain of some twelve smaller relays to its existing system.

At the end of the day's programme both Brussels No. 1 and No. 2 simultaneously broadcast, almost nightly, a short recital of gramophone records. Discarding the conventional good-night greetings, as a closing item the studio concludes with *Love's Dream After the Ball* (H.M.V. C1844) in which the last words, "Good-night, Princess, sleep on," take the place of the announcer's voice. Suggestion to the B.B.C.: Why not play this record after the talks?

In the little Dutch village of Jutphaas, near Utrecht, the old-fashioned firebell has been replaced by a wired radio installation. A wireless receiver has been installed in the home of each member of the fire-brigade and the instrument is connected to the street fire-alarms in various parts of the district. Should an outbreak occur, a morse signal is automatically transmitted simultaneously to every instrument and in this manner the volunteer brigade is quickly mobilised. It was found that tolling the fire-bell and thus waking the entire village with a consequent crowd of onlookers, hampered the efforts of the fire-fighters.

The Moscow Trades' Unions propaganda broadcasts in English, French, Dutch, German and Italian are also re-transmitted through powerful short-wave

stations working on 46.6 and 50.1 metres, the latter is rated at 100 kilowatts!

As the western districts of France are at present badly served by the official stations, the French Ministry of Posts and Telegraphs has decided to erect a powerful transmitter in the region of Nantes. Studios are to be installed in that city as well as at Rennes and Angers.

Within the next few months listeners will be given an opportunity of hearing the United States broadcasts through a number of European stations, for arrangements are now being concluded between London, Paris, Berlin, Rome and Warsaw for a regular interchange of programmes with New York and other American cities.

It would appear that the Turks on the western side of the Bosphorus still favour the old school, for apart from a few gramophone records broadcast daily from the Istanbul station, their interest is mainly confined to

oriental music; on the other hand, Ankara, the new capital influenced by more modern ideas, regularly transmits concerts of works by German, Italian and French composers.

Prague has adopted a new opening and interval signal, consisting of a short musical phrase from Smetana's opera *Libussa*. It will be used when the new Czesky-Brod high-power transmitter is launched over the ether. The wavelength adopted for the station is the same as at present used, namely 486 metres.

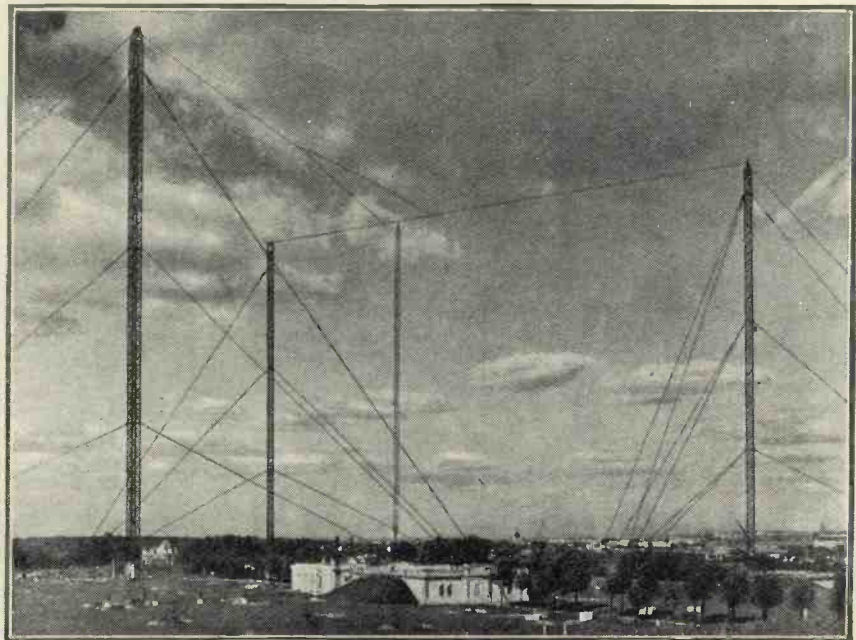
The Danish short-waver at Skamleback which daily relays the Copenhagen programmes, also works in conjunction with stations at Blaavand (Jutland), Thorshavn (Faroes) and Julianehaab (Greenland) on a medical service to ships at sea. On 31.51 metres you will now and again pick up a message referring to a sick case on board some seafaring craft. Most of the medical consultants are good linguists and broadcasts are made in several European languages.

Another station offering a similar service, but operating on 160 metres, has been opened at Cuxhaven (Germany). The call is: *Elbe Weser Radio*. Failing a No. 9, no longer need a puzzled skipper give a member of his crew a No. 4 or a No. 5, or alternately a No. 6, a No. 2 and *owe him one!*

Lille PTT has declared itself independent of the Ecole Supérieure, in respect to relays of topical events from the French capital. The station has opened its own studio in Paris in order to be on the spot when anything takes place which may be of interest to its local listeners.

Austria is taking an active part in the War of the Kilowatts; she has placed an order with a German firm for the installation in the neighbourhood of Vienna of a high-power transmitter equal to that now working at Warsaw-Raszyn.

Although in many foreign countries requests have been made by listeners to be given opportunities of hearing their parliaments in session,



HUGE MASTS FOR VIENNA'S PROGRAMMES

No wonder Vienna is received well in this country! Here is a view of the masts at the Rosenhugel transmitting station

Spain, up to the present, is the only European state which has granted its nationals their wish. On several occasions political debates have been relayed from the Senate at Madrid.

By the autumn of 1932, Juan-les-Pins, which is still beyond the reach of many wireless receivers in the United Kingdom, will probably be included in many logs, for authority has now been obtained to increase liberally the power of the transmissions; alternatively, the owners of this private installation may decide to erect a larger station in the immediate neighbourhood of Nice.

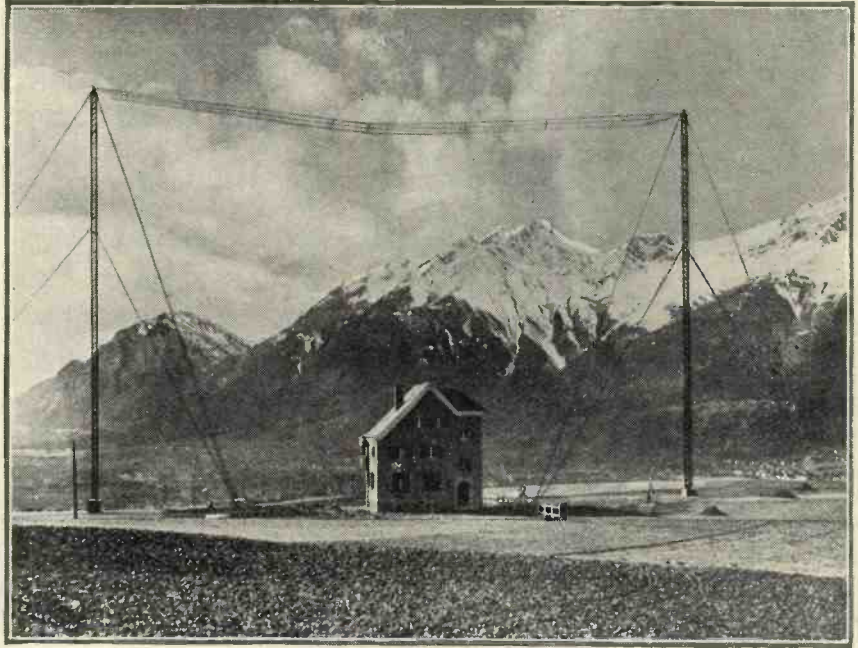
Instead of granting a special annual subsidy for the privilege of including regular operative relays in the programmes, the Berlin authorities contemplate the purchase of the Kroll Opera House in that city with a view to running it for the benefit of their subscribers.

Interference with both the Mühlacker and London Regional transmissions was traced to a Russian source; it was caused by a station working at Tiraspoli on the border of Bessarabia, which had been erected by the Soviet Government for the sole purpose of broadcasting subversive propaganda over Roumania. As the wavelength chosen was 358 metres the transmissions caused trouble to both Germany and England.

Probably the most powerful station in Europe will be that now nearing completion at Noginsk, near Moscow. According to broadcasts made by the Trades' Unions of Russia the new transmitter will reach the 200-kilowatt mark.

Notwithstanding the fact that Sweden operates roughly thirty broadcasting stations she possesses only 518,000 registered wireless listeners the majority of whom reside in the Stockholm, Malmö and Göteborg districts.

At present there is only one broadcasting station in Portugal and it is privately owned. "Estacao Radio CT1AA, Lisboa" is the call put out on Mondays, Wednesdays and Saturdays between 10 p.m. B.S.T. and midnight on 290.5 metres. Announcements are made in



ANOTHER AUSTRIAN BROADCASTER

A picturesque photograph of the Innsbruck station in Austria, which is set in the heart of the mountains

Portuguese, French, German and English and special concert transmissions are made for South American listeners. On Thursdays, towards midnight, the station broadcasts a musical programme on 42.9 metres.

Relays of restaurant orchestras by the Strasbourg (France) studio were considered by the proprietors of these establishments to induce their patrons to enjoy them from their own homes. For this reason permission was refused to install a microphone in any hotel or café. As a substitute the Strasbourg station now transmits military concerts from the Esplanade at Metz and dance music from the Municipal Kursaal at Niederbroon-les-Bains, a popular watering resort.

From May to September is the "close season" for opera houses in Italy. Many artistes taking their holidays in other countries supplement their incomes by appearing before studio microphones. The Rome and Milan studios, for the performance of these musical works, have engaged their own cast of singers and chorus.

"Poste Colonial" is the call of the French overseas station at Pontoise, near Paris. With a view to its broadcasts being made useful to inhabitants

of the French Colonies and Protectorates three transmissions on different wavelengths are made every day, namely, from 4.30 to 6.30 p.m. B.S.T. on 19.68 metres; on 25.63 metres from 7.30 to 9 p.m., and again from 10 p.m. until midnight on 25.2 metres.

Owing to complaints made by listeners on the coast of Holland regarding the interference caused by the Scheveningen-Haven (Holland) commercial transmissions steps are being taken to transfer the service to Kottwijk, near The Hague. As Oslo now regularly uses the 1,071-metres channel the Dutch broadcasts are carried out on 1,053 metres.

France will shortly be brought into the special telephone net for the relay of international concerts and simultaneous broadcast in several countries. She has completed the laying of her first pupinised cable destined to link up Paris and Marseilles, and which within a few months will be extended to Nice. Suitable land-line connections are to be established shortly between Bordeaux and Toulouse and to complete the scheme a cable is to be laid between Paris and Brussels. The French capital will also be joined up to London.

Béziers (France), now working on about 219 metres, has adopted the crowing of a cockerel as an interval signal. It is not quite clear why this call should have been adopted as poultry raising is not an industry of the district. The number of broadcasts in which the local vinegrowers boost their products clearly demonstrates the *raison d'être* of the transmitter.

Since the Spanish revolution both San Sebastian and Radio Barcelona close down their programmes with the playing of *La Marseillaise*. This step has been taken pending the adoption of a Spanish Republican anthem.

Wilno is the only Polish station which departs from the conventional "Hallo" in its announcements. The word *Uwaga* is used to preface the call given out by a woman. As the station is now transmitting with a power of some 16 kilowatts, the cuckoo interval signal is heard very clearly. It should not be mistaken for that of Ljubljana.

Throughout the summer months, broadcasts from Radio Alger are being relayed by the French official stations in connection with special transmissions from the Paris Overseas Exhibition.

READERS' TESTS OF "W.M." SETS

BROOKMAN'S THREE

(October, 1929)
HAMMERSMITH (London).—I built the Brookman's Three last October and, although I have been constructing sets at the rate of one every three months, I have yet to find a receiver that will beat it. Selectivity is amazing. I can completely cut out the big Daventry station and receive Zeezen at great volume on the loud-speaker. Daventry vanishes completely within 5 degrees.

WIGAN (Lancs).—I can receive eleven stations on the long waves, sixty-eight on the medium, and eight American stations, all identified by speech from the loud-speaker. Headphones not used.

FIVE POINT FOUR

(November, 1930)
BLACKHEATH (London).—In all I have received fifty-two stations on the medium-wave band (on Sunday evenings), all of which have been what I should describe as full loud-speaker strength. Tuning is remarkably sharp, Barcelona and Algiers can both be received clear of London Regional. Performance on this waveband leaves little to be desired.

INVITATION FOUR

(July, 1930)
ALDRSHOT (Hants).—It is really a wonderful set. I have logged twenty-eight medium- and nine long-wave stations, besides the English stations, all giving enjoyable loud-speaker reception. I have still the short-wave field to explore.

NEW BROOKMAN'S THREE

(November, 1930)
BEDFORD.—The volume and quality of this set is of a very high degree. The average evening log is usually from thirty to forty-five stations, all being heard at good loud-speaker strength.

ST. ALBANS (Herts).—At present I have logged over forty stations—I haven't finished yet!—and those with the horizontal portion

From the reports that appear below prospective builders of "Wireless Magazine" sets will be able to see what eight different designs accomplish in twenty localities. The names of sets are arranged in alphabetical order so that anyone interested in the capabilities of any particular set can easily refer to it. All constructors of "Wireless Magazine" receivers are invited to send reports for the benefit of other readers.

of the aerial indoors under the roof. It is the first set I have come across where one can bring in stations over the whole tuning scale. I have logged Karlskrona at 2 degrees, and Budapest at 97 degrees, on the tuning dial.

NEW LODESTONE THREE

(August, 1930)
WANSTEAD (Essex).—The set is very selective and separates Stockholm from Rome, Langenberg from Midland Regional, and Toulouse from London Regional, not using the .0003-microfarad aerial pre-set condenser in the circuit.

REGIONAL A.C. FOUR

(December, 1930)
CARDIFF.—What a wonderful set it is! I found it very simple to build and it is very selective. I have received over fifty stations with ease, also a few American stations at loud-speaker strength. The reproduction is very good and takes some beating.

SUPER 60

(March, 1931)
BRISTOL.—American stations come in well on the short-wave coil and the medium waves bring in more stations than I can count. Many thanks for the perfect wireless set.

CARMARTHEN (North Wales).—Its performance from the first time I switched on has been remarkable. I have never handled anything to equal it for selectivity, combined with

sensitivity and good quality reproduction. Several enthusiasts around here have heard my Super 60 and are astounded at its performance.

EARLSFIELD (London).—My first test was to separate London and Muhlacker. I have never in my life had an easier task, positively 1 degree—one in and the other out—and not a trace of overlap.

I fully endorse that you have in no way overstated the possibilities of this set.

HANWELL (Middlesex).—I am more than satisfied with the "station getting" of my Super 60, having received every station claimed by W. James in the March issue of the WIRELESS MAGAZINE. I have received seven stations on the ultra-short waveband, making a total of seventy-three stations in all on the loud-speaker, fifty-seven of which have been positively identified.

HASTINGS.—I say, without hesitation, that it is the best set that I have ever handled. Stations seem to come in at every degree, and are all good to listen to.

IPSWICH.—The results are wonderful. The easy way of finding stations, and the controls were so simple and far easier than anything I have had before (I have had many).

LEIGH-ON-SEA.—I have had many sets in the past, but never kept one for long, having it rebuilt for something else, striving for better results and, above all, selectivity, but in the Super 60 I have come to a full stop, much to the relief of my family.

(This is from Cliff Lester, the well-known entertainer.)

LLANDUDNO (North Wales).—This set is by far superior to any I have had or heard. Its performance is simply wonderful—stations rolling in with the slightest touch of the dials. Fifty-seven medium-wave stations of real good entertainment—this can be considered excellent for this district.

NEWCASTLE-ON-TYNE.—There are three of my friends who are now proud possessors of the Super 60. We are all delighted; in fact amazed. It cuts out our local station (a mile away) in 1 degree without using the frame aerial. It is the set—got 'em all whacked!

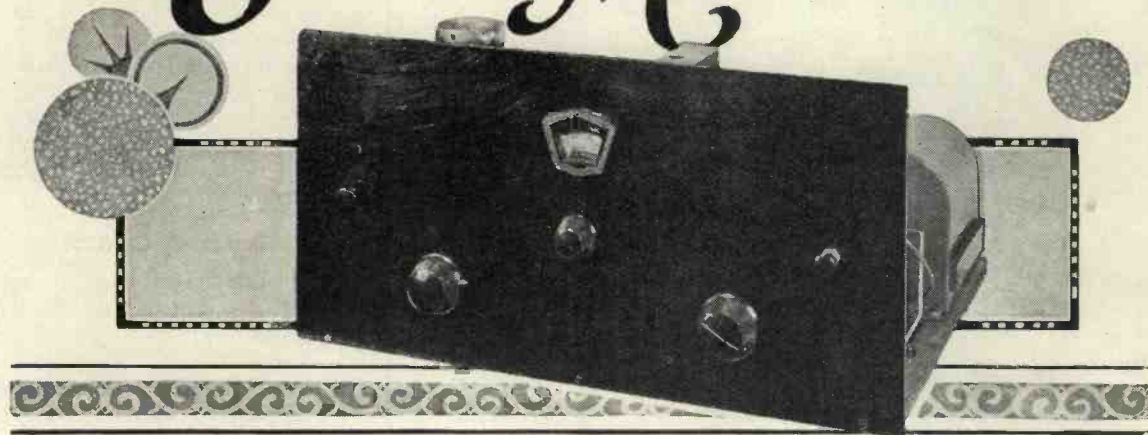
SOFIA (Bulgaria).—I have made up an ordinary Super 60 set here and it is working extremely well. The question was whether, in Bulgaria, it would be possible to obtain the same selectivity as obtained in England, and I must say that most of my friends who have wireless sets here did not believe that it would be possible to get London between the large stations on the Continent, which always interfere on their sets. When the set was working the results were extraordinary.

WEST DRAYTON (Middlesex).—Without a doubt this set is the finest I have yet heard or seen, both in selectivity and sensitivity, and to me is simply a revelation. I trust this set will receive the publicity it so highly deserves.

BROOKMAN'S THREE-PLUS-ONE

(April, 1931)
BOLTON (Lancs).—I have built several of your sets, including the well-known Touchstone Four, but consider the Brookman's the best for quality, quantity, selectivity, and sensitivity. This district is well known as being a screened area, but I have no difficulty in bringing in station after station (English and Continental) at good loud-speaker strength every few degrees of the dial. The set is easy to manipulate, even by the merest novice.

The Ether Marshal



A SCREEN-GRID THREE WITH NEW COILS DESIGNED BY THE "W.M." TECHNICAL STAFF

BAND-PASS tuning is undoubtedly becoming more popular. Last month we described the construction of a band-pass screen-grid three-valver utilising standard two-contact plug-in coils, which has aroused considerable interest. Here we present details of a more elaborate and ambitious band-pass receiver, using special coils recently developed by a well-known firm of radio manufacturers.

Circuit Arrangement

In essence, the circuit remains the same. There is one stage of screen-grid high-frequency amplification, a leaky-grid detector and a transformer-coupled power stage. As WIRELESS MAGAZINE readers well know this combination is the best and most satisfactory for a three-valve receiver.

In this set only the aerial tuner is of the band-pass type, the high-frequency coupling being a tuned-grid coil. Even

so, the selectivity of the Ether Marshal is of a very high order, and the strength from many distant stations is a revelation of what a well-designed band-pass filter unit can accomplish.

We have found it possible to gang up the tuning coils, and tune them with a three-gang condenser quite satisfactorily. This point will appeal to a very large number of listeners, for it means virtually that the set has a one-knob-tuning control.

With the particular dial used, it is

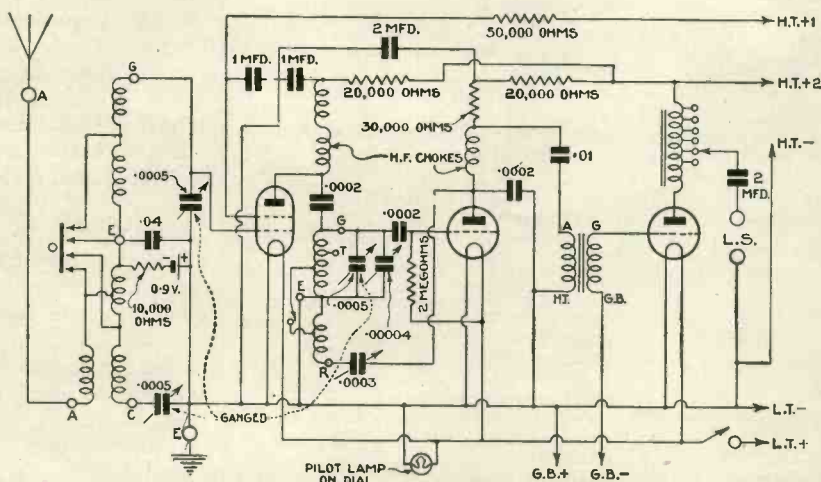
possible to obtain a very neat panel layout, as will be evident from the photograph that appears in the heading of this article.

An Efficient Design

The design of the set has been kept as simple as possible, but at no point has efficiency been sacrificed to simplicity. Every refinement necessary for stable and satisfactory operation under all normal conditions has been included. For instance, in order to get the maximum efficiency from the

screen-grid valve a .9-volt cell is included in the grid circuit.

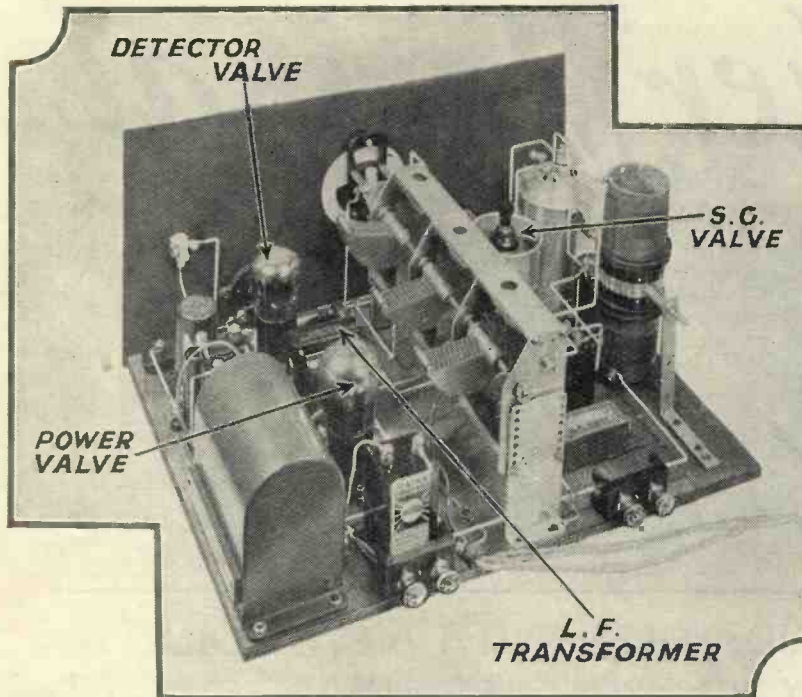
In order to prevent any possibility of motor-boating, a 50,000-ohm resistance is included in the screen circuit; with this is associated a 1-microfarad by-pass condenser. The anode circuit of the screen-grid valve is also decoupled by means of a 20,000-ohm resistance and a second 1-microfarad condenser.



AN EFFICIENT BAND-PASS THREE-VALVER

The circuit consists of a screen-grid high-frequency amplifier, leaky-grid detector and transformer-coupled power stage. Every device needed to ensure complete stability of operation is incorporated

THE ETHER MARSHAL—Continued



A FINE SET WITH GREAT POSSIBILITIES

Excellent results are certain to be obtained with this receiver, because of the high efficiency of the band-pass coil incorporated. Great selectivity with fine quality is the keynote of the design

Also in the screen-grid anode circuit is a high-frequency choke; for good results it is essential that this

should be of high inductance and low self-capacity. The screen-grid anode circuit is coupled to the detector grid

circuit by means of a .0002-microfarad fixed condenser, followed by a tuned grid coil.

The wavelength of this is adjusted by one section of the three-gang condenser, but it is also provided with a trimming condenser of .00004-microfarad capacity.

Normal values of grid leak and condenser are employed in conjunction with the detector, the leak having a resistance of 2 megohms and the condenser a capacity of .0002-microfarad.

Reaction Control

Coupled to the grid coil is a reaction winding, the amount of feedback being controlled by .0003-microfarad variable condenser.

Further to improve the efficiency of the detector action, a .0002-microfarad fixed condenser is connected from the anode to the negative side of the detector-valve filament.

In order to get the maximum efficiency from the low-frequency transformer, it is arranged on the parallel-feed system with a 30,000-ohm resistance and a .01-microfarad coupling condenser. This arrangement retains the primary inductance of the transformer at its highest value and materially improves reception.

The detector valve is also provided with a decoupling device, which in this case is a 20,000-ohm resistance used in conjunction with a 2-microfarad by-pass condenser.

The efficiency of the set at the output stage is maintained by the use of a special tapped output choke used in conjunction with a 2-microfarad by-pass condenser.

From these brief details, it will be appreciated that very great care has been taken in the design of the Ether Marshal and those who want the very best form of band-pass three-valver cannot do better than build it.

Obtaining a Blueprint

All the essential details for construction are included in these pages, but those who desire it can obtain a full-size blueprint for half price, that is 6d., post free, if the appropriate coupon on page 104 is used before August 31.

Address your inquiries to Blueprint Department, WIRELESS MAGAZINE, 58-61 Fetter Lane, London, E.C.4, and ask for No. WM247.

Little need be said regarding the

COMPONENTS NEEDED FOR THE ETHER MARSHAL

CHOKE, LOW-FREQUENCY

- 1—Atlas, type CPS, £1 1s.

CHOKES, HIGH-FREQUENCY

- 1—R.I. dual astatic, type FY1, 7s. 6d. (or Lewcos, Watmel DX3).
- 1—British General, 5s. 6d. (or Lewcos, Watmel DX3).

COILS

- 1—Varley Square Peak, 15s.
- 1—Varley H.F. Intervalve, 8s. 6d.

CONDENSERS, FIXED

- 3—Dubilier .0002-microfarad, type 620, 5s. (or T.C.C., Telsen).
- 1—Dubilier .01-microfarad, type B775, 3s. (or T.C.C., Telsen).
- 1—Dubilier .04-microfarad non-inductive, 2s.
- 2—Formo 1-microfarad, 5s. (or Telsen, T.C.C.).
- 2—Formo 2-microfarad, 6s. 6d. (or Ferranti, T.C.C.).

CONDENSERS, VARIABLE

- 1—J.B. .0005-microfarad three gang, type 1072, £1 3s. 6d.
- 1—Telsen .0003-microfarad reaction, 2s.
- 1—J.B. .00004-microfarad Midget, 4s.

DIAL

- 1—J.B. illuminated vernier type, 5s.

EBONITE

- 1—Becol 16 in. by 8 in. panel, 7s. 8d.

HOLDERS, VALVE

- 3—Lotus, type VH/31, 2s. 6d. (or Telsen, W.B.).

PLUGS AND TERMINALS

- 5—Eelex wander plugs, marked: H.T.+2, H.T.+1, H.T.—1, G.B.+ , G.B.—, 10d. (or Clix, Belling-Lee).

The prices mentioned are those for the parts used in the original set; the prices of alternatives as indicated in the brackets may be either higher or lower

RESISTANCES, FIXED

- 1—Magnum 10,000-ohm, flexible type, 1s. 6d. (or Lewcos, Bulgin).
- 2—Magnum 20,000-ohm, flexible type, 3s. (or Lewcos, Bulgin).
- 1—Magnum 30,000-ohm, flexible type, 1s. 6d.
- 1—Magnum 40,000-ohm, flexible type, 1s. 6d.
- 1—Lissen 2-megohm grid leak, 1s. (or Telsen, Watmel).

SUNDRIES

- Glazite insulated wire for connecting.
- One Siemens 9-volt S.G. cell, 1s.
- Two Belling-Lee terminal blocks, 1s. 4d.
- Length of rubber-covered flex.

SWITCH

- 1—Wearite on-off, type G22, 1s. (or Readi-Rad, W.B.).

TRANSFORMER, LOW-FREQUENCY

- 1—Lewcos constant-inductance, ratio 1 to 3 type 22, 12s. 6d. (or Ferranti, Igranic).

ACCESSORIES

BATTERIES

- 1—Siemens 120 volt, type V8, £1 7s. 6d. (or Ever Ready, Lissen).
- 1—Siemens 9-volt grid bias, type G2, 1s. 6d. (or Ever Ready, Lissen).
- 1—C.A.V. 2-volt accumulator, type 2AG7, 11s. (or Exide, Lissen).

CABINET

- 1—Pickett table model, 18s. 6d. (or Camco, Lock).

LOUD-SPEAKER

- 1—Blue Spot, type 81R, £4 4s. (or Amplion, Edison Bell).

VALVES

- 1—Cossor 215SG, £1.
- 1—Cossor 210Det, 8s. 6d.
- 1—Cossor 215P, 10s. 6d.

A NEW BAND-PASS THREE-VALVER

actual construction of the receiver, and no difficulty will be experienced if use is made of a full-size blueprint. It is best to start by fixing the three-gang condenser in position, and then screwing the rest of the parts down on the baseboard.

Wiring Hints

As soon as all the parts have been firmly fixed into position, wiring up can be started; it is at this stage that a blueprint will be found of special convenience, for on it every wire is clearly numbered in the best order of connection. Start with wire No. 1 and carry out the connections in their proper numerical sequence.

The connections shown as solid black lines can be made with Glazite, bare copper wire and Sistoflex sleeving or rubber-covered flex, as desired. The wires shown in outline must be flexible and should be cut to convenient lengths for connection to the batteries. The wires shown as alternate black and white strips are actually flexible resistances.

The Ether Marshal is not at all critical regarding valves, and any ordinary types for the respective stages will give satisfactory results.

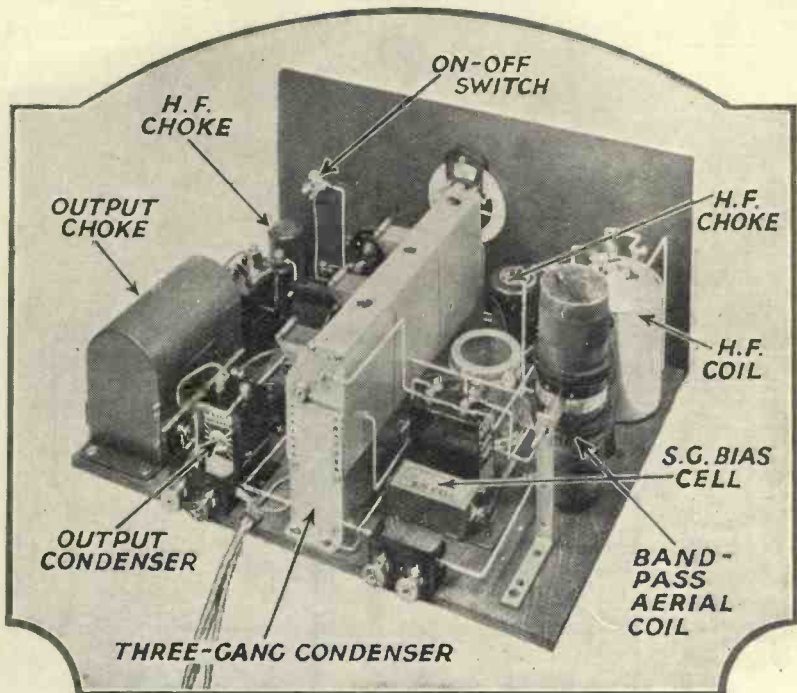
The detector should be of the medium-impedance type, and the power valve should, of course, have the lowest impedance possible consistent with an anode-current consumption within the capabilities of the high-tension supply to be utilised.

From the photograph at the heading of this article it will be seen that there are five panel controls in all. The small knob at the left is the wave-change switch; it is pushed in for medium-wave reception and pulled out for reception on the long waves. Next is the knob of the tuning condenser, while the main tuning control is in the centre, immediately under the window for the gang condenser dial. To the right of this, and in line with the knob of the trimming condenser, is the reaction control, with the on-off switch on the extreme right.

High-tension Leads

It will be seen that the set is provided with only two high-tension leads. That marked H.T.+1 feeds the screen grid, while H.T.+2 supplies the anodes of all three valves, and should therefore be tapped on to a supply of 120 to 150 volts.

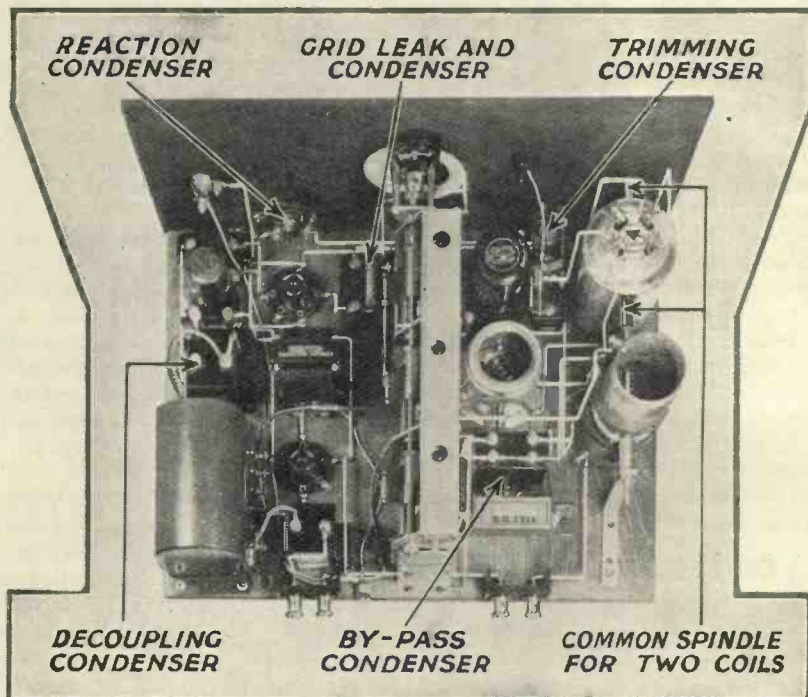
When connecting up the set for the



THERE IS ONLY ONE TUNING KNOB

The Ether Marshal is particularly simple to operate, for there is only one main tuning control; in conjunction with it is a small trimming condenser that gives the final adjustment

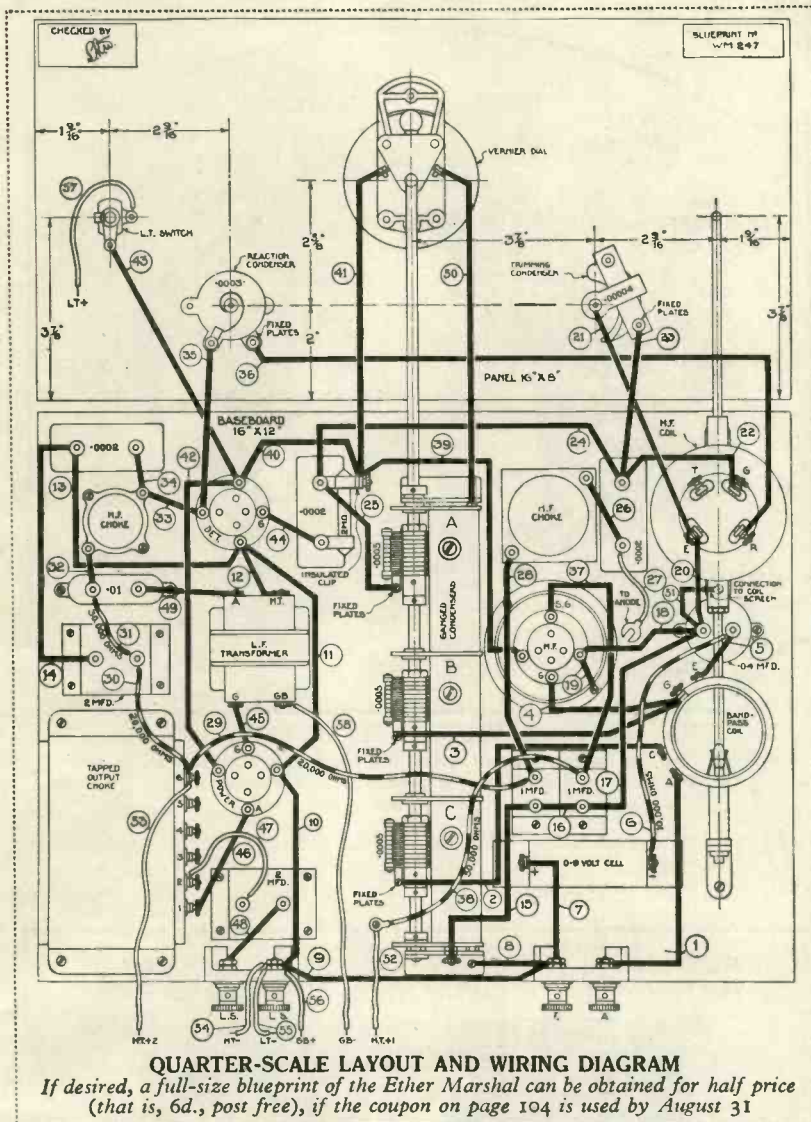
first time, take particular care to makers for the particular value of the apply to the power valve the value high tension used. of grid bias recommended by the To get the best results from the



EVERY PART IS EASILY ACCESSIBLE

This plan view of the Ether Marshal shows clearly that, although the design is compact, every part can be got at without difficulty. There are no snags in the construction or wiring

THE ETHER MARSHAL—Continued



set, the operator must be prepared to spend some little time in adjusting the gang condenser. The best method is to proceed as follows:

Push in the wave-change switch for medium-wave reception and pull out the knob of the on-off switch. Then adjust the trimming condenser (which is not provided with a stop, by the way) to its minimum capacity, that is, with the vanes right out of mesh.

Ganging the Condensers

Next, tune in a fairly weak station towards the top end of the medium waveband. To do this, it may be necessary to apply a little more reaction than would be used for normal reception.

Now loosen the lock-nut that holds

the fixed vanes of condenser in the section of the three-gang assembly marked A on the blueprint and in the reduced-scale reproduction on this page, and move the vanes round bodily until the maximum strength is obtained from the station already tuned in. After this, re-lock the fixed vanes firmly in position on the shaft.

Final ganging adjustments are carried out by means of the three small trimming condensers in sections A, B, and C of the gang condenser. They should be adjusted in turn by means of a screwdriver when the main condensers are adjusted for a station towards the lower end of the medium waveband.

The tone of reproduction, and to some extent volume, is controlled by varying the tapping of lead No. 47 on

to the output choke. Normally, this lead should be connected to the terminal No. 2, but it can be tried on any taps between No. 1 and No. 4.

When the set has been properly ganged and the best output choke tapping has been decided upon no further internal adjustments should be necessary unless an alteration is made in the construction or some parts are changed.

Results on Test

Tuning is done on the main condenser control only, but the small trimmer to the left of this on the panel should be turned for the best possible results.

Prolonged tests on a hook-up of the Ether Marshal have proved beyond doubt the good qualities of the Varley band-pass aerial coil. An almost perfect square-peak effect was obtained, and there was no suggestion of double humping, except when reaction was forced beyond its normal limit.

On test in the WIRELESS MAGAZINE laboratories at Fetter Lane the Ether Marshal proved to be particularly efficient, and there is no question that the strength obtained from the Varley Square Peak Coil is greater than that from any other band-pass arrangement yet tested.

In broad daylight the London National and Regional transmissions and the Midland Regional programme have been picked up at really great volume with the reaction condenser at its minimum setting. This does not sound very startling, but is particularly good in view of what other sets accomplish under similar conditions at this time of the year.

On an experimental set using the Varley band-pass coil, but without any high-frequency stage, more than twenty stations were received at good strength thirty miles east of London and the Ether Marshal, with its screen-grid high-frequency amplifier, can be relied upon to put up an even better performance.

Readers living near London will have an opportunity of seeing the original set for themselves if they are sufficiently interested in it for we have arranged that, during the currency of this issue of the WIRELESS MAGAZINE, it will be on show in the windows of the Varley showrooms at 103 Kingsway, W.C.2.

It will be worth while having a look at it if you can possibly arrange to do so.

UNDER MY AERIAL

HALYARD'S Chat
on the
Month's Topics

Specially Illustrated
by GLOSSOP

Outdoor Difficulties

WHAT special difficulties have you run up against this summer in the use of your wireless out of doors? George says his answer to that question is rain and a super-saturated earth and, as usual, he is not so far wrong. We have had some wet weather here this summer, and it has not been easy to get a reasonable amount of outdoor wireless work done.

However, I had in mind technical difficulties, and not the weather, when I asked the question. From the restricted amount of wireless work I have been able to do in the open this summer so far, I seem to have found reception conditions more difficult than I did last year. I wonder if you have found the same thing.

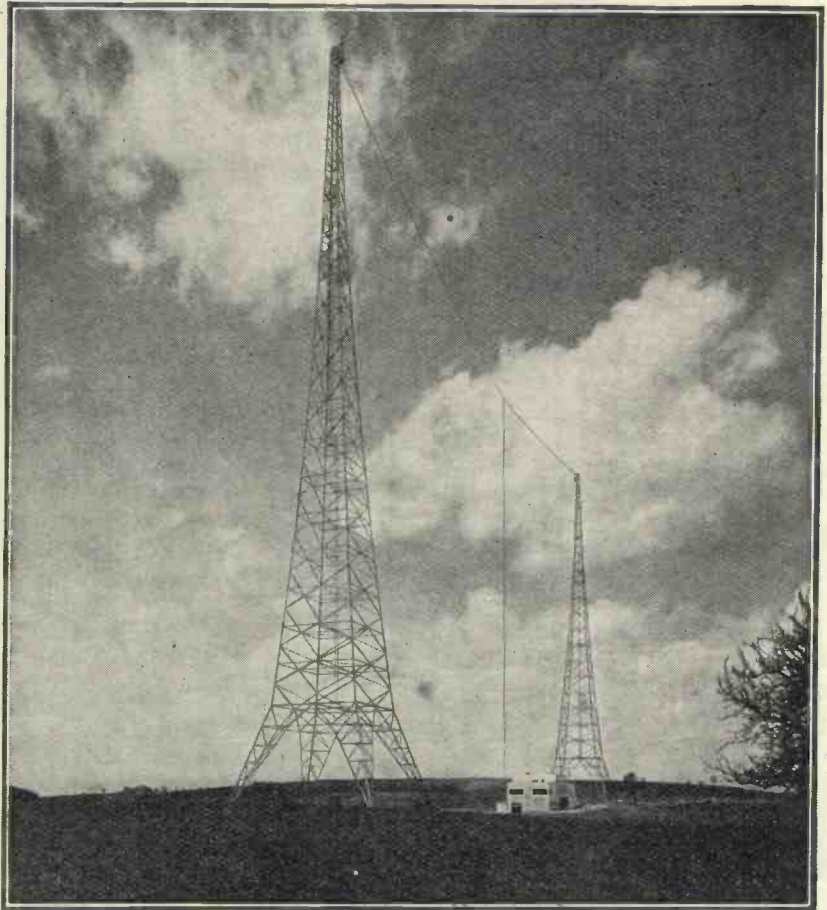
Noises in the open have been more intense this summer than last. It isn't my imagination, for several of my wireless friends have noticed the same thing, and my meteorological friend says that it is probable that the apparent increase in the intensity of sound out of doors may be due to the abnormal clearness of the atmosphere after so much rain.

Even in my own garden my loud-speaker has not seemed to be as powerful as it was last summer. Voices in my neighbours' gardens have appeared to carry farther than last year, and other noises have been more of a nuisance when I have wished to concentrate my attention on wireless.

However, it is not too late to hope for a change this summer. Perhaps



Noises in the open



HAVE YOU HEARD SOTTENS?

A fine photographic study of the new Swiss regional station. Being on an adjacent wavelength to Midland regional it is a cause of interference to some British listeners

when we all get back from our holidays we shall find reception out of doors as good as ever it has been in the past.

Regional Masts

One of the most interesting features of the twin-wavelength regional stations is the way the number of aerial masts is being reduced. At Brookman's Park, the first of these twin stations, there are four masts, two for each aerial. When the Northern Regional station at Moorside Edge was built, the number of aerial masts was reduced to three. The two aerials at Moorside Edge have a mast each to themselves, and they share the third mast.

Now comes the news that, at the Scottish Regional station, the num-

ber of aerial masts will be further reduced to two. Will it be possible for this mast-reducing economy to be carried a step further so that the new Western Regional station will have one mast only? I wonder.

The interesting thing about all this is that, at Daventry, two masts only are now in use. When 5GB was working on a wavelength of 479 metres, the transmitter had its own aerial and two masts. Since the wavelength of the old 5GB transmitter has been 399 metres, the aerial has been a new one slung in the form of a vertical V, the point of the V to the ground, between the masts which carry the horizontal aerial of 5XX.

The success of this new Daventry aerial scheme, using two masts only

UNDER MY AERIAL—Continued



Efforts of the B.B.C. engineers

for the two aerials, has made it very likely that there will be two masts only at Falkirk.

When you read about these efforts of the B.B.C. engineers, don't you admire their courage? How would you like to try new dodges with your aerials, knowing that, if you made a mistake, a million or more broadcast listeners would be deprived of their programmes?

Seen at Last

Here is a real bit of wireless news for you. One of those mysterious pirate-catching vans of the Post Office has been seen in a town some twenty miles away from my summer home.

I have been so mystified by those boggy vans of the Post Office. I have even doubted their existence, but all my doubts are now dispelled. The van, or a van, has actually been seen by a member of my household. Funnily enough, a member of George's household saw the van in the same town on the same day. So now I know there is at least one van. There may be more.



A campaign of violent oscillation

George and I are not in the least disturbed by the undoubted appearance of this boggy van some twenty miles away from us two days ago. Oh! no, and we are not even disturbed at the thought that the van may be a good deal nearer to us to-day. Our wireless consciences are serenely dormant. We both have our wireless licences, and we neither of us have been known to oscillate, no, never.

Far from being disturbed, George has just actually proposed that we should start a campaign of violent oscillation, in order to see whether

the van can really track down an oscillator. I might almost have agreed to the plan had not George suggested the oscillations should go out from my aerial, because if I were caught I could plead ignorance, whereas if he were caught, he couldn't.

Holiday Valves

If you are thinking of taking your portable set away with you on holiday, let me urge you to examine that set and make sure of the valves a good week before you leave home. Should one of the valves be on the doubtful side, don't leave the replacement of that valve until the day before your departure. Get the new valve in plenty of time and test it before you go away.

Why I am urging this is because of an unfortunate experience I had over my early holiday this year. The day before I went away to the seaside I decided to buy a new power valve for my portable set. I went to my usual dealer and it so happened that he had none of that type of valve in stock.

However, with his usual obliging nature, my dealer said he would arrange to have the valve sent on to me at my holiday address at the earliest possible moment. The valve arrived the day after I reached my destination. I placed it in the vacant valve holder in my portable set and thought no more of it until I switched on the set in the evening.

Not a sound came from my set, so I took out the new valve and examined it. I saw immediately that the filament was broken. The break was visible just above the anode. Probably the filament had been broken in the post. All the shops were closed at that hour of the evening, and I had to wait until the next day before I could get a new valve and so enjoy using my portable set.

I missed a night's wireless and, worse than that, I was a valve to the bad. See to it that the same sort of



Not a sound came from my set

thing does not happen to you, won't you?

Moo-o-o-o

"Any news?" asked George, as he sat down in the vacant deck-chair in my little garden tent.

"There is a very strange wireless story here, George," I replied, as I looked at my technical adviser over the top of my evening paper.

"True story?" asked George.

"Quite true," I replied. "It concerns a farm in Lancashire."

"Are there farms in Lancashire?" asked George.

"Of course there are. Listen to the story, George, of a Lancashire farm on which the cows are provided in their shippens with wireless music from loud-speakers."

"That's an old yarn, my boy."

"It's new to me."

"That yarn started in France three



Where is the loud-speaker, Jacques?

years ago. Why! it's even found its way into the French books in our schools. 'Where is the loud-speaker, Jacques? It is that it is in the cow-barn of my aunt, mon père.'

"Anyhow, George, I think this Lancashire story is a very likely one. The observant farmer noticed that, when he had a portable wireless set in his garden, the cows in the adjacent field stood and listened to the music."

"And walked away for the talks."

"I quite believe the story, George. Many a time when I have been out in the country with my portable set cows have followed me across the fields."

"And you think, of course, that those cows followed you to listen to the music."

"Yes, George."

"Shall I tell you exactly why those cows followed you?"

"Er—yes, George."

"Because they jolly well thought your portable set was a box of food. See?"

Still Third

Our own country is still third on the list of European countries placed

HALYARD'S CHAT

according to the number of wireless licences per thousand population. Denmark is first on the list and Sweden second. Although we have made progress in Great Britain and the number of wireless licences per thousand population has increased from sixty-seven in 1929 to seventy-seven in 1930, we have not made



Giving listeners what they want

enough progress to displace Sweden from second place. Denmark, of course, still holds a long lead.

Why is it, do you think, that Denmark and Sweden have greater proportions of wireless listeners than we have? Is it because those two countries have better broadcasting services than we have? I hardly think that is so in the case of Denmark, for that country has but two broadcasting stations, Copenhagen and Kalundborg, and these sent out the same programmes.

The most likely reason why Denmark holds pride of place is that the broadcasting authorities in that country go to great trouble in finding out exactly what listeners want in their programmes, and, having found out, take equal trouble in giving listeners what they want.

Sweden holds second place probably because of the excellence of its relay system. The main broadcasting stations in Sweden are Stockholm and its high-power relay stations, Motala and Göteborg; Sundsvall and Boden. In addition there are no less than twenty low-power relay stations.

It would be contrary to the policy of the B.B.C. to establish as large a number of relay stations as Sweden has done, but the B.B.C. might follow Denmark's lead in trying to find out what listeners want in their programmes, and then giving it.

Such a course would at least put Great Britain into second place.

Points from Chicago

I have not yet seen anything very striking in the descriptions of the

big wireless trade show held at Chicago this summer. Sometimes these big American wireless exhibitions give us useful pointers regarding our own autumn exhibition at Olympia and subsequent developments over here.

If you had had the opportunity of going round the recent Chicago wireless show what would you have looked for in particular? Probably you would have paid special attention to television, as I should have done.

Well! in the Chicago exhibition there were complete television receivers, but there was another type of television exhibit which would have attracted you, the Jenkins television kit.

This new type of television apparatus consisted of a complete set of parts for building a television receiver at home. But I wonder what could be seen on a home-built television receiver, even in America?

Amongst other Chicago exhibits, I should like to see and use one of the "interference locators," in which no less than four stages of high-frequency amplification are employed. From



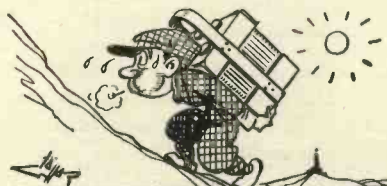
Special attention to television

the little I know of multi-stage high-frequency amplifiers, I should imagine there is a fair chance of interference being located in the locator itself.

Judging from mere numbers in the Chicago show, the most popular receivers in America are still the midget or mantelpiece receivers.

Holiday Dreams

When you are on your holiday this year, choose a warm, sunny afternoon



Up a mile-long hill

TWO DATES TO REMEMBER

Although the great success of the Super 60—which is being discussed enthusiastically by constructors and dealers all over the country—has proved that there need be no summer slump in radio when the public is offered something really good, there is no doubt that there will be a great increase in wireless interest in a few weeks, time when some of the autumn developments become known.

There will be a greatly increased demand for this very reason for the Sept. and Oct. issues of "W.M." and readers should make a note of the publication dates to avoid disappointment through newsagents being sold out.

Note that the Sept. "W.M." will be out on Friday, Aug. 21, and that the Oct. number—which, as usual, will be a much enlarged exhibition issue—will be published on Friday, Sept. 18, to coincide with the opening of the National Radio Exhibition

and take a comfortable chair on to the sands by the seaside, or into the old farm orchard, or by the side of the river, as the case may be. Fix yourself comfortably in the chair, put your head well back, shut your eyes, and allow yourself to dream of the future of wireless—daydream, I mean.

Suppose we all of us could do this during our summer holiday, what would our wireless dreams be? Some of us would dream of television, and our minds would form pictures of a wonderful "camera obscura" in which we could see the world's greatest events actually as they happened.

Others of us would be content to dream of better and better broadcasting, better receivers at lower prices, better loud-speakers and better valves. A few of us would dream of a short-wave wireless future, and perhaps the most serious amongst us would dream of a great and new international understanding brought about by wireless.

As for George, when I propounded my holiday dream scheme to him, he said:—

"Not for me, thank you."

"Why, George?" I asked.

"My dream," replied George thoughtfully, "might be one in which I was carrying a hundredweight accumulator up a mile-long hill with a slope of two in one, only to find there was no charging station at the top."



A year ago considerable interest was aroused by a series of articles by J. H. REYNER, B.Sc., A.M.I.E.E., dealing with high-frequency chokes. In this new series the Technical Editor will discuss the efficiency of various types of condenser. This month he deals with air-spaced variable condensers such as are ordinarily used for tuning a radio set

NOT long ago a friend brought me a set which he said had no "go." It worked after a fashion but he felt sure that he was not getting the proper results from it. I had a look at it and informed him without any

right from a mechanical point of view. What more could there be in a condenser anyhow? When I told him that the high-frequency resistance of a condenser could be as much as that of the tuning coil itself, he was quite certain that I was pulling his leg.

I thought a practical demonstration would be best, so I took his condensers out and replaced them with a make which I knew to be good. His surprise at the result was quite touching.

This little episode set me thinking. I asked questions among my friends and I

idea that a tuning condenser has any high-frequency resistance is quite novel to most people, yet the resistance of even the best condensers is not negligible by any means.

Fig. 1 shows the resistance of a good tuning condenser. The figures indicated are actually those for the best condenser tested, and they represent very nearly the best that can be obtained. By very careful construction the loss may be reduced a little, but the general run of condensers on the market have losses up to two and three times as great.

How Resistance Varies

It will be seen that the resistance is lowest at the maximum setting of the condenser, and that it increases towards the minimum setting slowly at first and later with increasing rapidity until over the last few degrees on the dial the resistance is several ohms.

The actual values are .3 ohm at 500 metres, rising to .45 ohm at 400 metres, and 1.7 ohms at 250 metres! Of this, about .1 ohm is due to the actual resistance of the plates, the remainder being due to the high-frequency losses in the material

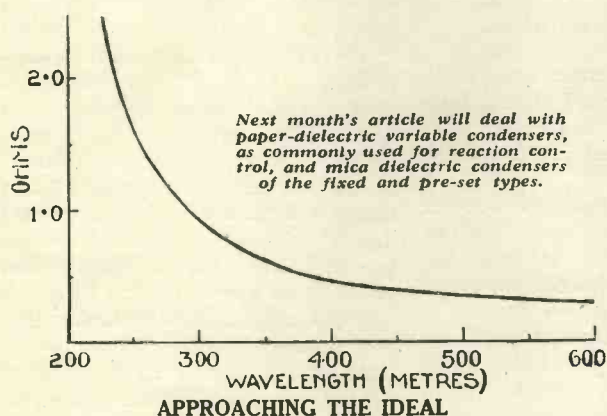


Fig. 1.—Resistance of a good condenser with air dielectric

further ado that his condensers were unsuitable. This rather mystified him and he looked at me as if he thought I were joking.

He pointed out that the condensers tuned all right and they worked all

found that, almost without exception, the average radio user regards his tuning condenser as a negligible factor in circuit design.

As long as it has the requisite capacity he is quite satisfied. The

used to insulate the fixed plates from the frame. The resistance of the plates should be small (although in some condensers tested it was over 1 ohm), the majority of the resistance being due to the insulating material.

Reason for Rapid Rise

The reason for this rapid rise in resistance towards the minimum of the condenser can easily be understood.

When the condenser is in its maximum position, nearly all the electric field is distributed between the fixed and moving plates, which are separated by air. Air is a practically perfect dielectric and introduces no measurable losses into the system.

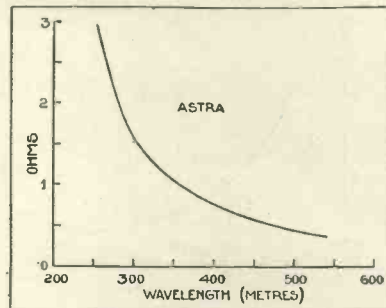
At the minimum position, on the other hand, all the electric field has to pass through the solid insulation which is employed to keep the fixed and moving plates apart. Any solid

know what effect any variation in the resistance is likely to produce.

First of all let us see what other resistances there are in the circuit. The coil is responsible for the greater part, and the best plan is to take a typical example. An average coil of 2-in. diameter wound with seventy turns of No. 28 gauge D.S.C. wire unspaced will have a high-frequency resistance at 400 metres of about 5.5 ohms. Such a coil would tune over the medium waveband with a .0005-microfarad condenser and may be taken as representative of average practice to-day, where compactness and simplicity are accounted for greater righteousness than super-efficiency.

The resistance would not be constant but would vary with frequency, somewhat in the manner shown in Fig. 2. Thus at 250 metres the resistance would be a little over double the value at 400 metres, a variation which, though considerable, is not so serious as that in the condenser.

Added to this is the resistance of the leads—only a small fraction of an ohm in a well-designed circuit—and the losses introduced by the valve, including dielectric losses in the holder and cap. In many cases this is quite small, if the valve is



ASTRA MID-LOG LINE
This condenser has a resistance of 3 ohms at 250 metres

working under correct conditions, and the equivalent series resistance should not be more than one or two ohms.

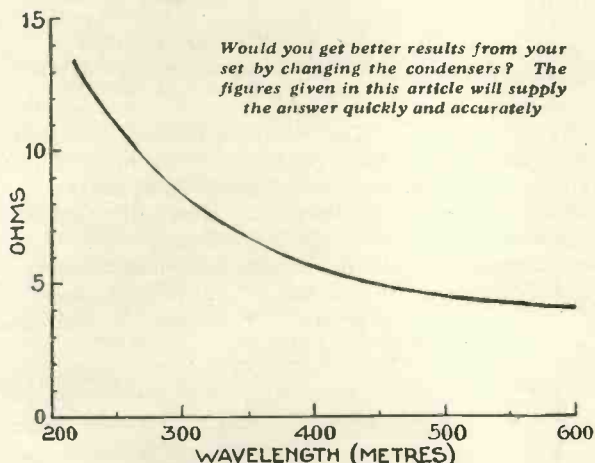
The exception to this is the detector, where the valve is taking grid current and in doing so reflects very heavy damping on the tuned circuit preceding it.

Effect of Resistance

So much for the order of resistance. The effect of resistance is well known. It causes what we call "damping," a term which describes the result admirably. The tuned circuit tries to amplify the signals to which it is tuned out of all proportion to those neighbouring signals to which it is not tuned.

It succeeds to some extent, but it is held back all the time by the resistance and the larger the resistance the less can the circuit do its duty. Thus resistance controls both the signal strength and the selectivity.

The object of the designer is thus to keep the resistance down at all costs. True, there is a limit beyond which the quality suffers, but we are considering practical cases with simple coils, and the resistance in such circuits



Would you get better results from your set by changing the condensers? The figures given in this article will supply the answer quickly and accurately

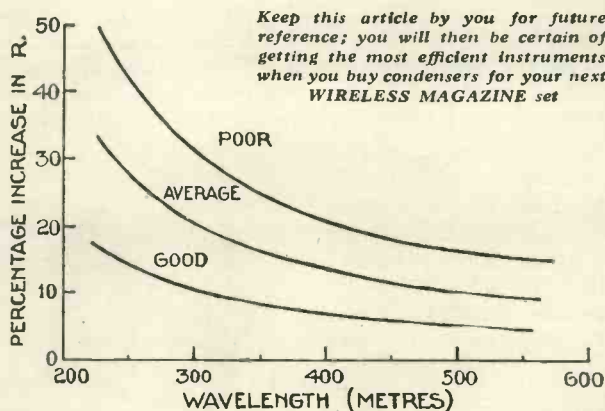
ILLUSTRATING COIL RESISTANCE

Fig. 2.—Curve showing resistance of a typical tuning coil

dielectric introduces loss into the circuit, and the skill of the condenser designer consists in using a small amount of solid insulating material of a high quality. The loss is then minimised, although we cannot entirely get rid of it.

The condenser quoted previously is an excellent example of condenser design, yet it will be seen that a resistance of 2 ohms is obtained towards the bottom of the scale.

A knowledge of the actual resistance, however, is of little use unless we have something to compare it with, and unless we

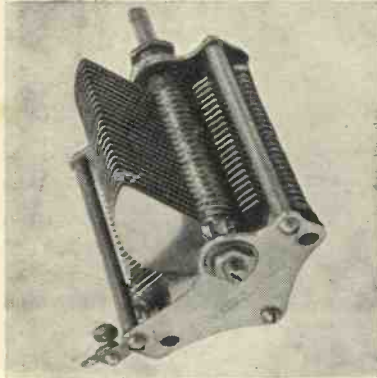
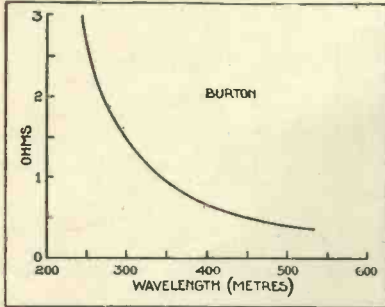


Keep this article by you for future reference; you will then be certain of getting the most efficient instruments when you buy condensers for your next WIRELESS MAGAZINE set

CONDENSERS AND RESISTANCE

Fig. 3.—Curves showing the increase in resistance caused by different condensers

THE TRUTH ABOUT—



tances three times that shown in Fig. 1. The same circuit would then have a resistance of over 17 ohms, the condenser having caused an increase of 42 per cent. in the resistance.

Comparative Figures

The effect will be clear from Fig. 3, which shows the percentage increase in resistance due to the condenser in the case of a good, average and poor condenser, based on figures equal to those shown in Fig. 1 for a good sample and twice and three times these values respectively for the average and poor condensers.

In order to acquaint WIRELESS MAGAZINE readers with the state of affairs obtaining in the market to-day, a series of careful measurements has been undertaken.

BURTON MID-LOG

At 250 metres the resistance of this condenser is 2.7 ohms (see illustrations on left)

is well above the limit at the best of times. If our condenser is to introduce further considerable loss into the circuit the care expended on the coil is largely wasted.

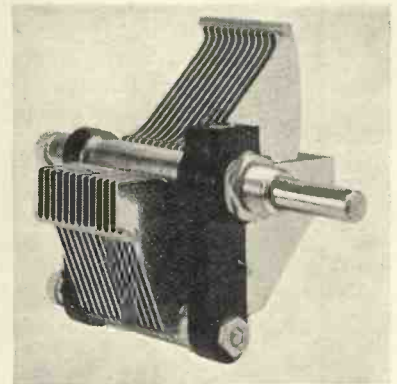
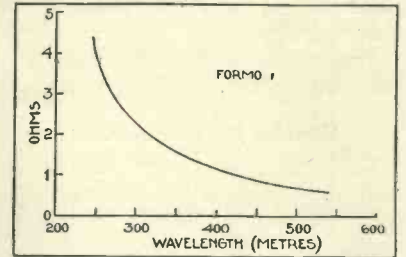
Let us consider the effect of tuning the simple coil described with the condenser of Fig. 1. We will assume 1 ohm extra loss due to the valve, giving 6.5 ohms at 400 metres. To this the condenser will add .45 ohm, an increase of about 7 per cent., which is not likely to perturb us.

At 250 metres, however, the total resistance is 13.7 ohms, of which the condenser contributes 1.7 ohms or 14 per cent., and this is more serious. If we could eliminate this the increase in signals would be noticeable, but we cannot, for the condenser in question represents the best commercial practice.

Effect of Poor Condenser

Such being the case, the effect of a poor condenser will easily be understood. Some condensers have resis-

tent and reliable to allow the experiment proper to be started. The method adopted is to measure the high-frequency resistance of a circuit consisting of a standard coil and the condenser under test.

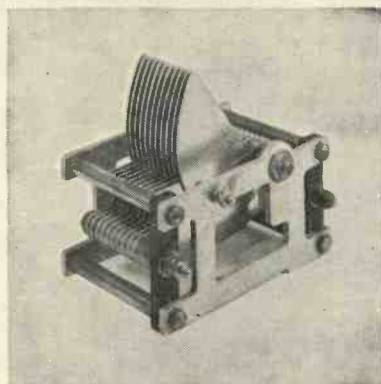
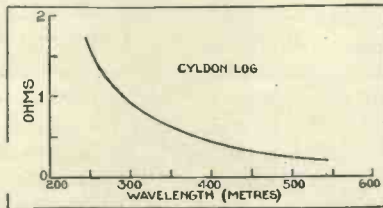


FORMO MID-LOG LINE

At 250 metres the resistance of this condenser is 4.2 ohms.

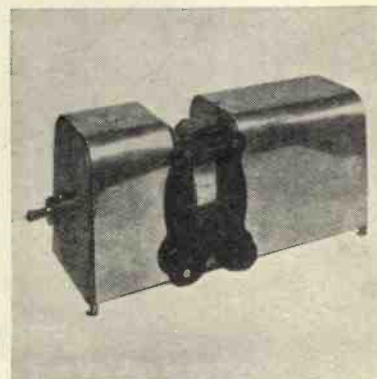
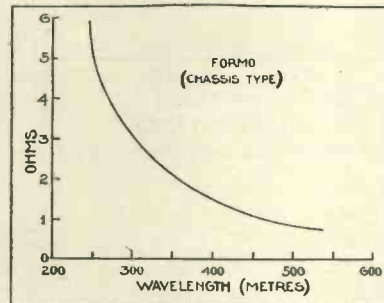
The measurement of condenser resistance is not an easy matter. The arrangement of the apparatus took the best part of a fortnight before the results were sufficiently consis-

The resistance of the coil must be known beforehand, having been measured by other methods (in this case by N.P.L. calibration). The next step is to measure the resistance of the leads, for although these are only a few inches in length, they have an appreciable resistance at high frequencies.



CYLDON LOG MID-LINE

The resistance of this condenser at 250 metres is only 1.7 ohms



"Just So"

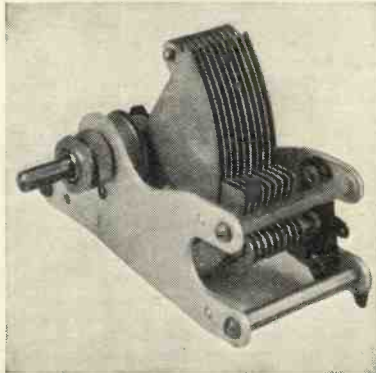
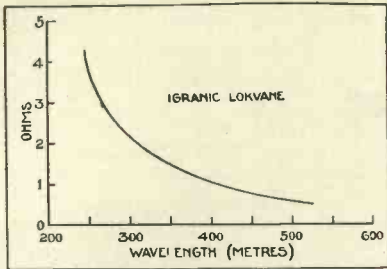
The remaining resistance left in the circuit is that of the condenser, and as this may be only a fraction of an ohm, it is necessary to have everything else in the circuit "just so." Indeed, I could write a whole article on the difficulties we encountered.

Until the layout has been reduced to its correct form,

FORMO TRIPLE GANG

This condenser has a resistance of 6.1 ohms at 250 metres (see illustrations on left)

CONDENSERS—Continued



IGRANIC LOKVANE

This model is of the square-law type and has a resistance of 4 ohms at 250 metres

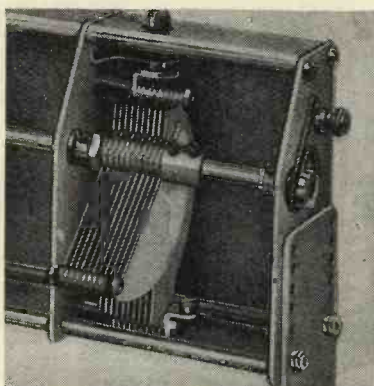
a trivial alteration of the position of the connecting wires will upset the results entirely. Needless to say, a state of affairs such as this is quite useless, and careful experiments had to be made until the right layout was found, when the relative positions of the wires had no appreciable effect on the accuracy. Various cross-checks were made by adopting different methods of arriving at the same result, until measurements made by all the various methods checked up accurately.

Actual Tests

This desirable result was finally arrived at, and a series of tests was made on a number

JACKSON TINY

At 250 metres the resistance of this condenser is 2.4 ohms (see illustrations on right)



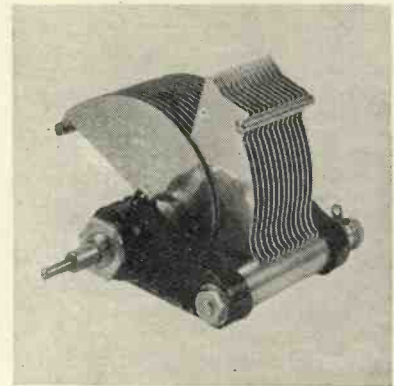
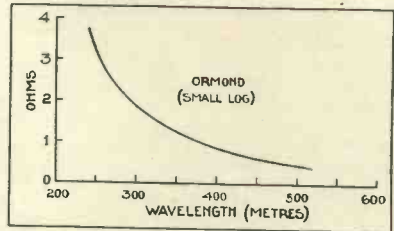
of representative air condensers on the market to-day. The resistance was measured at various wavelengths and the results plotted in the form of a curve for each condenser. The general variation is of the type already discussed, namely a gradual rise as the condenser setting is reduced, becoming very rapid at the minimum of the condenser.

Minimum Wavelength

The minimum wavelength with the circuit used for the test was 200 metres, the actual condenser settings

ORMOND No. 4 LOG

This condenser has a resistance of 3.4 ohms at 250 metres (see illustrations on right)

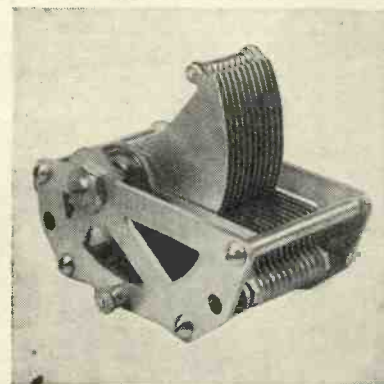
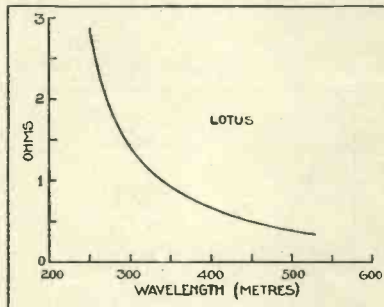


being approximately as shown below, subject to minor variations due to the different construction of the various types:

Metres Dial Setting

250	39
300	52
400	71
500	90

In many receivers a coil of slightly larger inductance is employed, requiring a smaller setting of the tuning condenser to tune to a given wavelength. This



LOTUS LOGARITHMIC

At 250 metres the resistance of this condenser is 2.7 ohms

does not invalidate the results. Actually the resistance of the condenser would be even higher than that shown in the curves so that the method I have adopted shows the condensers in a

favourable light.

I think the results will surprise many readers who have hitherto neglected this factor. Some of the condensers tested showed still greater losses, but it was not thought desirable to include them.

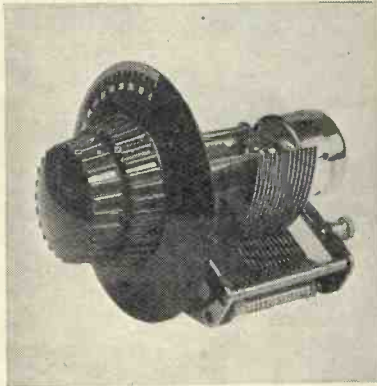
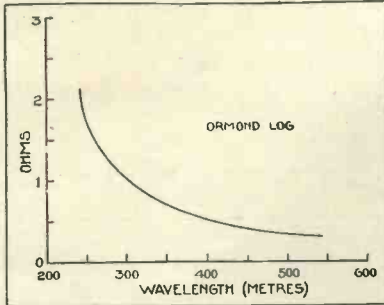
Long Waves

The position on the long waves is similar. It is not really the change in wavelength which causes the rise in resistance, but the setting of the condenser which includes progressively more solid dielectric towards the minimum position. Actually

the loss tends to decrease as we reduce the wavelength, otherwise the resistance would rise even more rapidly than it does. With a given coil, however, which is the practical case, the net effect is a marked increase in high-frequency loss as the wavelength is reduced.

Where the coil is changed, on the other hand, the condenser setting remaining the same, the H.F. resistance increases as the wavelength

CONDENSERS—Continued



ORMOND LOGARITHMIC
 This condenser, type R/207, has a resistance of only 1.9 ohms at 250 metres

increases. Thus on the long waves an exactly similar state of affairs is obtained, the condenser resistance increasing as we go from the maximum to the minimum, the only difference being that the actual resistance will be between three and four times as great at each setting of the condenser.

The coil resistance also increases in similar fashion, so that the relative effects are much the same as on the medium waves.

Double Loss

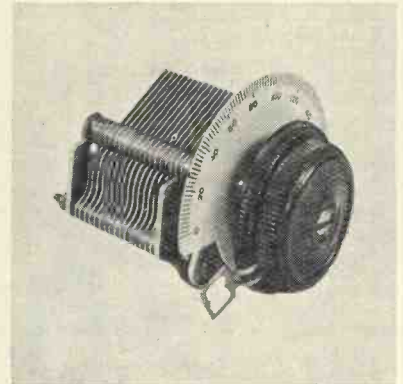
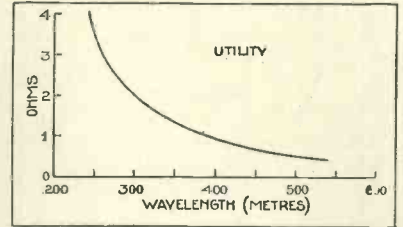
Remember that the effect is cumulative. A 20 per cent. loss in a single circuit means a 40 per cent. loss where two circuits are used, the efficiency of the overall circuit being the product of the efficiencies of each circuit.

It is this which causes the effect of bad condensers to be so noticeable and I have had several instances of simple three-valve sets having one stage of high-frequency only, where a change of condensers has altered the set almost out of recognition. Where we are dealing with a plain detector circuit, the effect of a bad condenser

CONDENSER RESISTANCES

The following values (in ohms) are for .0005-microfarad condensers tuned with a 180-microhenry coil to 250 metres:

Astra Mid-log Line ..	3.0
Burton Mid-log ..	2.7
Cyldon Log Mid-line ..	1.7
Forno Mid-log Line ..	4.2
Forno Triple Gang ..	6.1
Igranic Lokvane ..	4.0
Jackson Tiny ..	2.4
Lotus Logarithmic ..	2.7
Ormond No. 4 Log ..	3.4
Ormond Logarithmic (R/207) ..	1.9
Polar Ideal ..	2.4
Ready Radio ..	4.7
Utility Mite ..	3.8



UTILITY MITE
 This model has a resistance of 3.8 ohms at 250 metres

is not noticeable, being usually masked by the damping imposed by the detector valve.

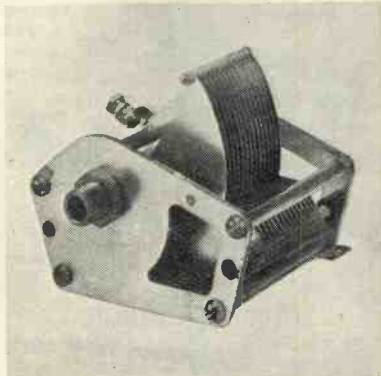
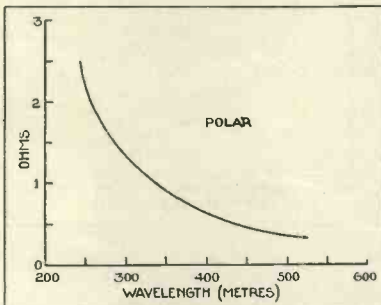
It may be argued that any additional loss

due to condensers may be made up by reaction. This is only true in the detector circuit and even here it is well known that a circuit having a good coil and condenser to start with is capable of better performance than a poor one, even though reaction is applied in both cases.

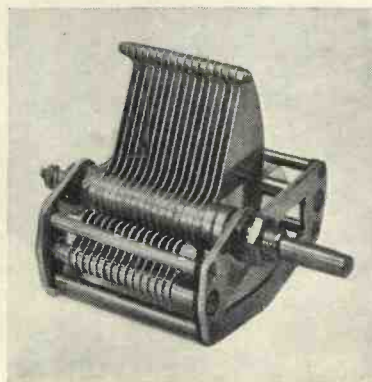
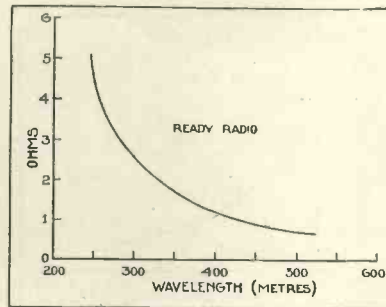
Where one or more H.F. stages are used, particularly with band-pass coils, the performance of the set depends entirely on the tuning circuits and condenser resistance is not negligible.

Nothing has been said about the paper-dielectric condenser. This type of condenser is often used for reaction and sometimes for tuning. It is a serious offender in this matter of high-frequency resistance.

This branch of the subject, however, is too large to discuss in a few words and I shall have more to say about it in another article next month.



POLAR IDEAL
 At 250 metres the resistance of this condenser is 2.4 ohms



READY RADIO
 At 250 metres this condenser has a resistance of 4.7 ohms

RADIO IN REVIEW

By **MORTON BARR**

IT is fashionable nowadays to replace the ether by a peculiar kind of four-dimensional space invented by Einstein. Whether this is the real truth of the matter or not, it is, perhaps, impossible to say in our present state of knowledge. But, at all events, it is very useful, when one is trying to understand how wireless messages pass from point to point in "space," to imagine that there is some kind of "medium" through which they travel.

Electron Movement

The same applies to the light which reaches us from the sun and stars across vast and seemingly empty stretches of space. Although its wavelength is much shorter, light is essentially the same kind of energy as wireless radiation. They both travel at the same speed, and both are created by the rapid movement of electrons.

So, as a working theory, it is convenient to imagine them to be due to waves set up in an electromagnetic ether.

In order to distinguish one from the other, the comparatively long wireless disturbances are often referred to as Hertzian waves, after Heinrich Hertz, a German scientist who is commonly given the credit of having first produced them. Actually that honour belongs to a British scientist, Professor David E. Hughes, the centenary of whose birth is being celebrated this year.

Professor Hughes demonstrated the use of wireless waves in his own laboratory to a number of distinguished scientists, including Sir William Preece and Sir William Crookes, as early as 1879. This was roughly six years before Dr. Hertz started his own researches into wireless radiation, and nearly eight years before he published his results to the world at large.

Hertz Anticipated

Unfortunately, Hughes was dissuaded, at the time, from making his own discovery public, although the fact that he anticipated Hertz is now well established.

The moral is that fame is seldom to be gained by hiding one's light under a bushel. Fortunately Professor Hughes had other strings to his bow.

Amongst other contributions to electrical science we owe to him the invention of the microphone and a telegraphic type-printer which brought him in a fortune of nearly half a million sterling.

Turning to one of the minor problems of the present day, anyone who happens to have an ordinary telephone installed either in the same room, or within range of his loud-speaker, will know only too well that it is usually necessary to cut off the loud-speaker before attempting to carry on a telephone conversation with any success.

An American inventor has tackled this difficulty in a simple and effective manner. He inserts a volume-control resistance either in the input or output circuit of the radio set, and then connects it up to the telephone instrument in such a way that it is automatically brought into action when the telephone receiver is lifted off its hook.

A Mere Whisper

In the ordinary way, the volume control is inoperative, but directly the telephone earpiece is raised, in answer to a call, the loud-speaker is immediately cut out or else reduced to a mere whisper.

It is curious what different opinions people have regarding the future of broadcasting. Some will tell you that we have reached a point where very little further progress can be made, and that it is safe to count upon the present methods of transmission and reception remaining standardised for at least another ten years.

On the other hand there are those who maintain that wireless is merely in its infancy, and that before long we shall have programmes re-radiated locally on ultra-short wavelengths in every big town in the country. They see no other cure for the increasing interference and overlap in the ether.

As a matter of fact, it is extremely difficult to foresee what developments the next few years will bring forth. The manufacturers would, of course, prefer a period of stability, so that

they can get down to mass production. But if new stations continue to be built at the present rate, something drastic must be done, or else the position will become impossible.

Ultra-short Waves

The remedy may be found in the use of the ultra-short wavelengths, or it may be that some new and revolutionary discovery will offer a way out.

One can hardly expect to gain much insight into the future by looking backwards, but at the same time it is curious to see how erratic the march of progress has been. The thermionic valve, for instance, was left more or less in obscurity for ten years after it was first invented, and then it suddenly swept the field.

Take the history of short-wave working. Amateurs were signalling to America and the colonies on wavelengths well below 100 metres long before the big companies started to exploit this type of transmission on a commercial scale. In fact, the very latest development in this direction is a "throw back" to still earlier days.

The first wireless waves ever produced were only a few inches long. They were cast aside as useless at the time, and for many years afterwards, but we are now astonished to hear of messages being sent across the English Channel on a 7-in. carrier, transmitted and received on aerials less than an inch in length.

Super-het Revival

The recent revival in the use of the super-het is another illustration of the way the pendulum swings to and fro. Of course, when the superheterodyne circuit made its first appearance, some ten years ago, there was not the same demand for razor-edge selectivity that exists to-day. The merits of the circuit, in this respect, were accordingly overshadowed by the difficulty—and expense—of running from eight to ten of the old bright-emitter valves.

The modern low-consumption type of valve has solved the problem of maintenance, and the keen listener looking for selectivity, not exactly at all costs, but combined with reasonable quality, has now discovered that the super-het receiver can give him exactly what he wants.



A Bigger and Better RADIO PARIS

Radio Paris is one of the most popular Continental broadcasting stations heard in this country. Here, ALAN HUNTER describes a visit to the Radio Paris studios

The top photograph shows the large studio for orchestras at Radio Paris. On the left is the English announcer at the microphone—T. St. A. Ronald.

MONSIEUR GAUBE, the large and genial Secretary-General of Radio Paris, shrugged his shoulders expressively. "In England you have the B.B.C., is it not so? But here we have Radio Paris—and not so much money!"

I uttered the expected platitudes about the advantages and disadvantages of our monopoly system of broadcasting.

The French Station

"But let us talk of Radio Paris," I said, "for that, among other things, including the Colonial Exhibition, is what has brought me to Paris."

Monsieur Gaube pointed a proud finger at a large-scale map of La France.

"There you see Chatillon," he explained, "and there, although you cannot see it, is the new—how would you say?—'bigger and better' Radio Paris! Its distance from Paris?

A matter of some forty kilometres. Its aerial power? No less than 85 kilowatts. But yes, we want you to hear us in England!"

I also learned that near this giant transmitter, which certainly rivals our Brookman's Park and Moorside Edge stations, and hopelessly out-classes Daventry, has been erected a super receiving station, for the reception and relay of America and other distant sources of broadcasting.

Then we went into the conference room or, in our idiom, the talks studio. Like other European broadcasting stations Radio Paris talks a good deal. Not, of course, exclusively about its advertisers!

Well, there was nothing particularly notable about the Radio Paris talks studio—except the microphone, which is a Reiss, as used at Savoy Hill.

Before passing into the "Salle de Reunion du Conseil d'Administration"

—in other words, the "Board Room"—I learned a good deal from Monsieur Gaube about the early days of Radio Paris.

Did you know it as "Radiola"—way back in 1922? Then in March, 1923, the Compagnie Francaise de Radiophonie took over the transmissions and Radio Paris came into being at Clichy. The power in those early days was only 1,500 watts, which seems puny in these days of 75-kilowatt stations.

At the Old Studios

I well remember, years ago, calling at 79 Boulevard Haussmann, where the studios of Radio Paris used to be situated.

As a result of the early transmissions, listeners grew rapidly in numbers. It became necessary to increase the power of the station, to extend the hours of transmission, and to augment the orchestra.

The history of development at Radio Paris is, indeed, the history that might be written of every successful broadcasting station—with one difference. In France, direct taxation is anathema to the people, who would die sooner than pay a small licence fee for broadcasting!

Consequently, the demand for "bigger and better" transmissions from Radio Paris was but slowly acceded to, owing to the lack of funds—a chronic disability from which the station suffers even now.

Increased Power

Still, the power went up from 1,500 watts, firstly to 4.5 kilowatts and soon after to 13.5 kilowatts. As most readers know, it is now 17 kilowatts—and the 85-kilowatt station waits only for the P.T.T. to lay the cables to connect Paris with Chatillon.

It was in August, 1927, that the Compagnie moved from its cramped quarters at Boulevard Haussmann to the hotel at rue Francois. Here were constructed the "Petit Studio" and the "Grand Studio," both of which I was shown, with some pride, by Monsieur Gaube.

The small studio resembles many I have seen at B.B.C. stations. It is heavily draped, contains a Reiss microphone and is used extensively for chamber music. From here also solo turns are broadcast.

But the "last cry" is the big studio—quite a vast affair, with several points of technical interest. For example, there are two Reiss microphones, mounted one above the other, at right angles. They rest on a large mattress arrangement—totally unlike anything to be seen in other broadcasting studios.

Satisfactory Results

Whatever the technical reason for this arrangement may be—my French failed me on this explanation!—there is no doubt the result satisfies the Radio Paris engineers and its audience.

Monsieur Gaube became animated over the question of echo, presumably because I mentioned the word in commenting upon their acoustics of this big studio.

"Ah, echo! That is what your B.B.C. engineers would call it. But we do not speak of echo in that way. By echo we mean the *repetition* of the original sound. Therefore, I say, this studio has *no* echo. But it has what we call resonance."

The studio certainly struck me as

being acoustically "lively." I would have left its acoustics at that. But Monsieur Gaube evidently prides himself on this aspect of his big studio. For he took pains to explain the variable resonance effect obtained by opening or closing the heavy curtains of the ante-room at the end of the studio. Curtains all round the studio could also be altered at will. So much for the studio, which is decorated as only the French can do these things—brightly, artistically, but never gaudily.

There was not much more to see at rue Francois. They have, of course, the usual amplifier and control panels near the studios, but the main gear is out at Clichy. I did not see this, but I extracted an invitation to see the 85-kilowatt gear when it eventually takes the air!

On, then, to see that English announcer we hear so often during the sponsored programmes from Radio Paris. He is Mr. T. St. A. Ronald, an Englishman—and glad of it! So are we, for without him much of the announcing at Radio Paris, especially on Sundays, would be uninteresting through the lack of our understanding.

English Repetition

No doubt you have all heard this sort of thing: "Vous venez d'entendre disque F1654." Then in English: "That was F1654." Well, after every announcement in French—by a Frenchman—Mr. Ronald repeats in English, no doubt to the great joy of many English listeners.

Mr. Ronald's voice has a "friendly" timbre, hasn't it? He is, in person, also friendly. We chatted about sponsored programmes. He has been announcing those at Radio Paris for the past eighteen months. So far he has not missed a single concert.

Mr. Ronald is the Paris representative of Universal Radio Publicity, Ltd., the London organisation responsible for the broadcasting of sponsored programmes from Radio Paris.

Great things are expected when the new high-power plant is inaugurated. Then the "sales audience" will be immense and English advertisers will be able to "tell the world"—or at least the greater part of Europe—just how perfect are their cigarettes to smoke, suitcases for holidays, dentifrices to keep the teeth clean, and hotels to live in!

Meanwhile, Daventry, with its meagre 35 kilowatts, will continue, on doubt, to issue fat-stock prices to farmers who are tuned to Radio Paris!

THE LEAKY GRID

BY the time you read these words you will be by the seaside. When you have returned to your hotel, wet through for the fourth time, you will probably not feel like turning out again to the concert on the pier. I trust you have taken your portable with you, because the August programmes are full of interest to the holiday-maker.

Sea Sufferings

Every evening Mendelssohn's overture, *Calm Sea and Prosperous Voyage*, will be relayed from the Old Sic, as a comfort to you after what you suffered in that sailing boat you could not manage.

Another item that has been considered likely to put you in the right frame of mind for to-morrow, which will be wetter than to-day has been, is a short revue called *Lie Lohengrin*. It will help you to keep cheerful.

Mozart's famous opera, the *Magic Newt*, is to be relayed from the Brighton Aquarium; also the B.B.C. is risking its reputation by broadcasting Rossini's *Barber of Savoy Hill*. I expect it will be a close shave.

When you go down to the beach, take your portable to entertain you while you watch the bathers, as Puccini's *Girl with the Golden Vest* will be given during the holiday season, as well as Semtana's *Battered Bride*.

Haydn's *Creation* is being relayed as an opera, called *The Garden of Eden*. You will find that Cain will be Abel to persuade Adam to sing Wagner's *O Star of Eve*. Lunch-time music will include an orchestral version of Shakespeare's well-known plays, *The Serchant for Guinnice* and *The Naming of the Brew*.

Wet Evening Lectures

Lectures will be given on all wet evenings. Cookery courses will be regularly broadcast by Burnton Tartlett, Arnold Snacks, and Oskar Fried.

Advice will be given to all young men who fall in love with girls staying at their hotels. Galsworthy only for this. The lecture will be accompanied by very soft music, to be conducted by a famous Frenchman who appeared recently at the symphony concerts.

While it is thought that all true hearts should be bound together as with a Boulton, one never knows what their Ansermet be. W.-W.

We Test Before You Buy

Conducted by the "W.M." Set Selection Bureau

FREE ADVICE TO PROSPECTIVE SET BUYERS

To take advantage of this service it is necessary only to mention (1) the maximum price and whether this is for a complete installation or the bare set; (2) where the set will be used; (3) what particular stations are desired; (4) whether a self-contained set (with or without aerial), or an ordinary set with external accessories is preferred; and (5), in the case of mains-driven sets, whether the mains are A.C. or D.C.

A stamped-addressed envelope for reply is the only expense. Address your inquiry to Set Selection Bureau, WIRELESS MAGAZINE, 58-61 Fetter Lane, E.C.4. There is no need to send any coupon, but it is essential to give the information detailed above on one side of the paper only. Tell your friends about this service.

IT is a long time since we first tried to translate the impossible word "portable" into the more accurate word "transportable." The process of educating the set-buying public to the right idea on self-contained sets has been slow, but is now, happily, completed.

To-day it is a rare thing to find a set-buyer grumbling about the weight of a so-called portable, he knows perfectly well that, however lightly the set chassis and loud-speaker may have been constructed, and however flimsy the suitcase or cabinet container, the weight of the

self-contained batteries makes the total weight of the installation at least 26 pounds and probably as much as 35 pounds.

At this time of the year every radio store dresses its windows with a dazzling array of these self-contained sets—some still called portables, others quite frankly named transportables, especially those worked from the mains.

On this page we picture three fair listeners enjoying the fleeting sunshine of our seaside—or is it meant to be the south of France?—listening languidly to the strains of

a portable or transportable. Such a picture is not impossible, but we hope this bevy of beauty is not attempting to obtain more than the modest output of which a two-volt power valve with a 100-volt anode supply is capable!

The set so happily depicted is of the table-cabinet type.

The set, batteries, loud-speaker and frame aerial are contained within an upright wooden cabinet—as distinct from the suitcase favoured by some other set-makers and buyers.

It is a curious trait in the Englishman's character to hide as much as possible his actions and intentions from his fellows. That, we believe, accounts for the popularity of the suitcase portable, which, in many ways, is not so convenient as the cabinet type.

A suitcase portable set never really looks like a suitcase. Still, this type of set certainly pleases the English traveller, because it prevents his fellow travellers from knowing exactly what it is he is carrying!

The table cabinet set usually has some projecting control knobs to give away the nature of the contraption; or else the

grille of the loud-speaker makes the owner appear to belong to the pigeon-fancying fraternity! But these are small objections—what is to prevent the set-maker providing a suitable waterproof cover for table-cabinet portables?

This year the portable-set buyer can achieve his heart's desire at less expense than last year. Average prices for portables are remarkably low, in view of the fact that such sets are entirely self-contained.

For example, a good suitcase portable, incorporating an up-to-date four-valve circuit, consisting of a screen-grid high-frequency amplifying valve, a detector and two low-frequency amplifying valves, costs about 20 guineas. Such a portable is selective, sensitive enough to bring in a good number of foreign stations and its power valve, although over-running the self-contained high-tension battery, will provide good quality at moderate volume.

TAKE A PORTABLE WITH YOU!

This month we review, besides others, two portables and one transportable receiver. Read these reports carefully—these sets are ideal for your holiday needs



EDISON BELL PICNIC PORTABLE

Maker.—Edison Bell, Ltd.
Price.—£14 10s. This is for the de-luxe model, but the standard model is only £13 10s. A special waterproof cover for either model is available, price 10s. 6d.

Power Supply.—Batteries. This portable contains the usual 99-volt high-tension battery of the standard-capacity type, a 2-volt jelly-acid accumulator and a 9-volt grid battery.

The batteries are contained in the right-hand section of the main part of the suitcase. We noted that the accumulator could very easily be removed for re-charging. The high-tension battery leads, and those for the grid-bias battery, are plainly marked and make good contact with the sockets.

Power Consumption.—We measured the total anode-current consumption of this set by inserting a milliammeter in the high-tension negative lead while the set was in action. We obtained a reading of 10 milliamperes, which is really quite moderate when one remembers that there are five valves—an average of only 2 milliamperes per valve.

The most economical rate of discharge for the standard-capacity battery employed in this set is between 7 and 8 milliamperes, so the over-running is not very excessive.

One of the reasons for the comparatively low anode-current consumption can be traced to the use of a Mullard PM2 output power valve. When this has a maximum anode voltage of only 99 its anode current is little more than 4 milliamperes.

Valve Combination.—This Picnic Portable set utilises a combination of valves that makes for simplicity in construction and operation. Of the five valves, two are untuned high-frequency-amplifying stages, both of the PMiHF type. The only tuning circuit of the whole set is therefore the frame tuning.

Following the two high-frequency stages is a leaky-grid detector, and after this are the two low-frequency

stages.

The point to be watched with such a combination is selectivity. This is dealt with later in the report.

Controls.—No one can deny that the controls of the Edison Bell Picnic Portable are neat and accessible. There are two slow-motion dials mounted on a small panel at the left-hand side of the main compartment. The dial near the lid of the case is for tuning and the other dial is for reaction.

We note that both these dials are engraved in degrees from 0 to 100. The readings are very easy to see and the dial knobs turn smoothly.

The only other control is a large switch lever. This has three positions. The centre switch contact turns off the set. The "up" position is for high wavelengths and the "down" position for medium wavelengths.

This is undoubtedly an easy set to operate. Although there is only one tuning control it is necessary to adjust the reaction control for all stations within range.



Those of your friends who do not already know of these regular commercial set reports will be grateful to have their attention drawn to them.

QUITE LIGHT TO CARRY

The weight of this set is below the average for portables. It weighs only 26lb.

Reaction is meant to be used in this set and is not just an ornament.

The reaction control gives a very good increase in signal strength, especially for distant stations. There is no objectionable "plop" as the set goes into oscillation. In fact, there is no doubt that

the smooth reaction of this portable is largely responsible for its satisfactory performance.

Selectivity.—The type of set with two untuned high-frequency-amplifying stages is often viewed with suspicion in these days of twin regional transmissions.

The selectivity of some portables with such a high-frequency arrangement is so bad that the two programmes from a regional centre cannot be separated. Quite emphatically, these remarks do not apply to the Edison Bell Picnic Portable.

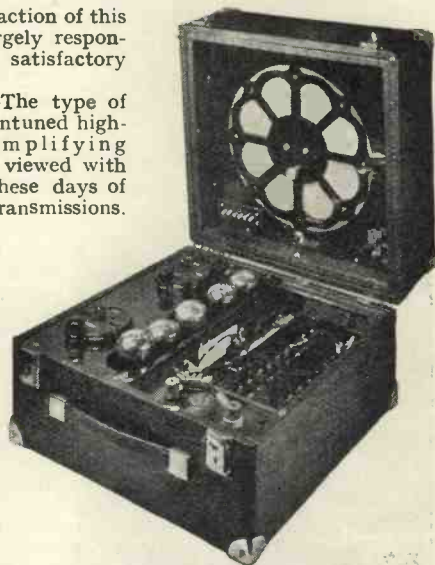
Tested in the heart of London and on the outskirts, some fifteen miles from Brookman's Park, the National and Regional transmissions were separated with the greatest ease.

The readings conclusively prove that the Edison Bell Picnic Portable has a selectivity very far above the average for the type of circuit used. London National, maximum at 34 degrees, was entirely tuned out at 39 degrees and at 30 degrees, a total spread of only 9 degrees.

London Regional was even more easily disposed of. We first tuned this station in at 72 degrees and were frankly amazed that it could be cut out at 68 and 74 degrees, a total spread of only 6 degrees.

Sensitivity.—As already mentioned, we tuned in the two London stations—and tuned them out again with surprising facility. Naturally, both these stations were very strongly received on the self-contained loud-speaker. Midland Regional came in at good strength at 78 degrees and North Regional was quite a pleasant signal at 90 degrees.

During daylight we tuned



SIMPLE TO OPERATE

This photograph shows the Edison Bell portable ready for use. It has only one tuning control

in Brussels No. 1 at 96 degrees, the strength and quality being very satisfactory. Then Rome at 76 degrees and Cologne at 22 degrees were strongly received. Subsequently we brought our log up to twelve stations on the medium waves.

On the long waves Davenport 5XX was very strongly heard at 82 degrees. It interfered slightly with Radio Paris at 89 degrees. Huizen at 95 degrees was clear of interference and well worth hearing.

Quality.—The speech on this portable is clear and the music is pleasing, provided the volume is kept at a moderate level.

Appearance.—Neat without being "natty" best describes the appearance of the Edison Bell Picnic Portable. The convenient placing of the strap handle saves one's kneecap from being banged during the transportation of the set.

Summary.—The weight of the Edison Bell Picnic Portable is only 26 lb. The dimensions are 13½ in. by 13½ in. by 10 in. A special point about the wave range is the provision of a small push-pull switch to alter the medium waves from the normal tuning band to a band from 170 to 350 metres, thus bringing in several very low-wave stations not normally heard.

AMPLION CABINET PORTABLE



HANDSOME FINISH

This set, entirely self-contained, is housed in an attractive walnut cabinet. The size is 20½ in. high, 16¼ in. wide, 11½ in. deep

Maker.—Graham Amplion, Ltd.

Price.—22 guineas. This applies to the cabinet model under review and also to the suit-case model, which employs the same circuit arrangement.

Power Supply.—Batteries. The high-tension battery is a standard-capacity unit of 120 volts. The low-tension accumulator is a 2-volt 25-ampere-hour type. The grid-bias battery is a small 9-volt unit.

Due to the upright shape of the cabinet the battery compartment is neat and accessible. The high- and low-tension batteries fit snugly into their compartment. The battery leads are plainly marked.

Power Consumption.—While the set was working we measured the total anode-current consumption, by inserting a milliammeter between the negative end of the high-tension battery and the high-tension negative lead. We obtained a reading of 12 milliamperes, which, although somewhat excessive for the standard-capacity battery, is quite moderate in

view of the fact that a pentode output valve is employed.

The total filament-current consumption was found to be .7 ampere. The 2-volt accumulator therefore lasts between 30 and 40 hours per charge.

Valve Combination.—This transportable is unusual in its circuit combination, which consists of two stages of high-frequency amplification, a detector and a transformer-coupled pentode; the first high-frequency stage is tuned but the second is aperiodically coupled to the detector by means of a high-frequency choke. For both high-frequency amplifying stages screen-grid valves are used. Reaction is obtained between the detector valve and the second high-frequency amplifying valve. A somewhat unusual capacity reaction arrangement is used,

which tests show to be conducive to smooth and effective regeneration. Although the pentode valve is connected directly to the loud-speaker winding the latter has been specially designed to provide good matching.

Controls.—There is a look of simplicity about the controls of the Amplion Transportable not belied by actual operation. On lifting the lid at the top of the cabinet one is faced with three thumb-operated slow-motion dials, reading from 0 to 100 degrees.

The dial on the left is rather inappropriately marked "volume." Actually, this is the reaction control. The centre dial and the dial on the right are marked "Tune 1" and "Tune 2" respectively. Both have to be adjusted for each station received.

The "Tune 1" dial tunes very sharply, but tuning as a whole is not critical because

the "Tune 2" dial tunes quite broadly.

There is only one other control and that is a switch lever mounted at the extreme left-hand corner. This has three positions; to the left it switches off the set, at the centre it provides long-wave tuning and to the right medium-wave tuning.

One quickly grows accustomed to operating the horizontally-mounted dials. Undoubtedly tuning is made easier by the fact that, save at the lowest wavelengths, the two dial settings are approximately the same for any given station.

Sensitivity.—Very soon after this Amplion transportable was put on test we appreciated the considerable sensitivity. In spite of the fact that signals are picked up on the self-contained frame aerial, the overall amplification before detection, as provided by the two screen-grid valves, must be very great.

We were pleased to find that good sensitivity exhibited on the medium wavelength band was equally evident on the long waves. Admittedly, reaction must be used to bring up the strength of all but the local stations to full loud-speaker

portable was made in south-west London. Reception was carried out in daylight. The first station to be heard was Brussels No. 1, which came in at 82 and 82 on the "Tune 1" and "Tune 2" dials respectively. This was a full-loud-speaker signal.

Then we got North Regional at full loud-speaker strength, the log points being 76 and 76. Langenberg was quite good at 75 and 75. The two tuning dials were still in step by the time Midland Regional was reached, for the log points were 60 and 60.

London Regional was naturally very strongly heard at 50 and 50. The London National at 19 and 26 showed that towards the minimum readings the dials go slightly out of step.

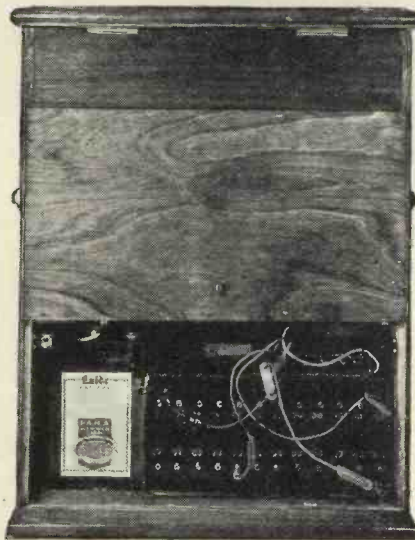
It was on the long waves that our most interesting foreign station reception was obtained during this daylight test. We were able to get Huizen at 82 and 82, followed by Radio Paris at 78 and 77, and then Davenport at 60 and 69. After that came Eiffel Tower at 60 and 60. Lastly, Kalundborg at 30 and 36.

Selectivity.—This transportable has sufficient selectivity to make it suitable for operation fairly close to

regional broadcasting centres. London National, maximum at 19 and 26, was entirely eliminated at 15 and 22 below, and 26 and 33 above, indicating a total spreading effect of only 11 degrees on each dial. London Regional, maximum at 50 and 50, was cut out at 46 and 46 below and at 55 and 55 above, a total spread of only 9 degrees on each dial.

Quality.—We have nothing but praise for this part of the set's performance. Indeed, we might have been listening to a mains-operated set, so pleasing was the general response. It just shows what can be done when a pentode is properly matched to a balanced-armature cone loud-speaker.

Appearance.—Unusually pleasing. The cabinet is well shaped with carrying handles fitted down each side. Controls are hidden when the lid of the cabinet is closed.



EASILY ACCESSIBLE

A back view showing the batteries inserted and ready for use. Removal for replacements is an easy matter even for the family

volume. But the application of reaction is so delightfully smooth that there is no difficulty in locating innumerable stations.

Our test of this trans-

COSSOR COMMANDER FOUR

Maker.—A. C. Cossor, Ltd.

Price.—14 guineas.

Power Supply.—Batteries. The batteries are not supplied with the set, although ample space is provided for them inside the cabinet. A 120-volt double- or treble-capacity battery is advisable for the high-tension supply.

We recommend a 2-volt 30-ampere-hour accumulator for the filament-current supply. With an ordinary small power valve a grid battery of 9 volts will be needed.

As this is a four-valver one would hardly expect to be able to work it from the standard type of high-tension battery. We found the total anode-current consumption was 14 milliamperes, indicating a need for at least double-capacity high-tension battery units. The filament current was found to be .6 ampere.

Valve Combination.—The Cossor Commander is that rare type of battery set—a set with two stages of high-frequency amplification! The two Cossor 215SG screen-grid valves precede a Cossor 210HF detector valve, which is transformer coupled to a Cossor 220P power valve. The insertion of the valves is made clear in the instruction booklet. It is necessary to fix valve screens over the screen-grid and detector valves.

The combination of valves included in the Cossor Commander set makes possible a high degree of sensitivity and a degree of selectivity above the average. The two screen-grid high-frequency amplifying valves provide a considerable amount of amplification before detection, so that only a small external aerial is needed to give full loud-speaker reproduction, even of weak signals.

The presence of the two screen-grid valves makes possible the use of three tuned circuits, which can provide a high degree of selectivity if the coils are properly designed.

Controls.—We were pleased with the excellence of the controls on the Cossor Commander. Of course, the big feature is the single tuning control. To the immediate right of the tuning scale is the knob actuating the scale and the three-gang condenser, which simultaneously varies the wavelength of the three tuned circuits.

The tuning dial is very plainly engraved in degrees, from 0 to 100. Just to the left of this dial is the knob for reaction, working a small variable condenser. We were surprised at the build-up effect of this control. One might imagine that a set with two stages of high-frequency amplification could dispense with reaction, but experience shows that there is a certain "deadness" about sets omitting reaction in some form or another.

We ought to point out that reaction in a set of this sort is quite a different proposition from reaction in a two-valver. We mean that in the Cossor Commander one can get countless stations with reaction set at zero, but a final adjustment to reaction enables one to take liberties with the selectivity control.

As soon as the set is made more selective by decreasing the aerial coupling condenser capacity the required signal loses strength. This loss can be readily made up with a touch of reaction.

On the extreme left of the front of the cabinet is the wave-change switch knob. The coil contacts work with a good "click" action, thanks to the use of small tumbler switches ganged together underneath the chassis.

Another good control is the knob on the extreme right—for volume. This works on the low-frequency side after detection and reduces even the strongest signal to the point of inaudibility. Presumably, the makers intend the selectivity

control, actually a variable condenser in the aerial lead, to act as a pre-detector volume control and so prevent overloading of the detector during the reception of very strong signals.

The selectivity control is mounted on the left-hand side of the cabinet and plays a big part in the performance of the set, especially in the separation of distant stations.

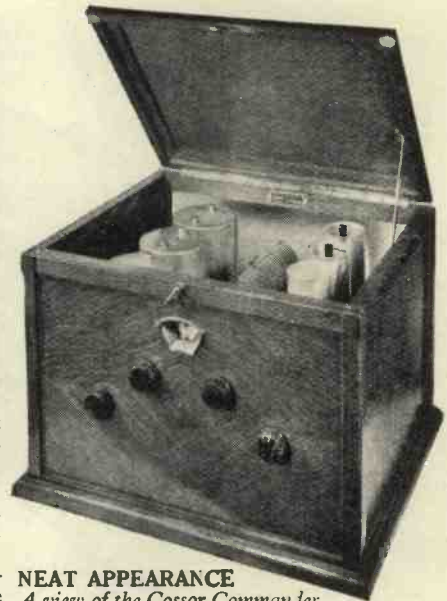
Selectivity.—NEAT APPEARANCE

As would be expected from a set with

three tuned circuits, the Cossor Commander very easily disposes of the local stations. The London National, maximum at 22 degrees, was reduced to inaudibility at 17 degrees below and 27 degrees above, indicating a total spreading effect of only 10 degrees.

Similarly, the London Regional station, maximum at 53 degrees had disappeared at 46 and 56 degrees, a total spread of 10 degrees.

Between the spread limits of the two Brookman's Park stations there were thus 19 degrees, forming a "silent zone" for the reception of foreign stations. During



A view of the Cossor Commander with the lid raised

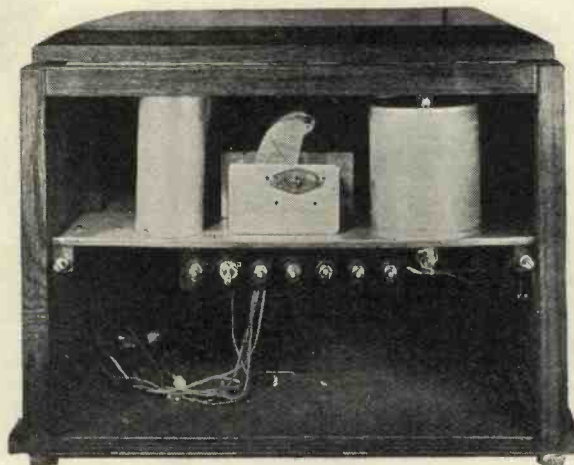
tests we logged no less than nine foreigners between 261 and 356 metres, clear of the local stations' interference.

Long-wave selectivity was not quite so good as on the medium waves, although Eiffel Tower and Radio Paris were both quite clear of Daventry.

Sensitivity.—Tested during daytime the medium waves yielded Brussels No. 1 at 88 degrees, North Regional 82 degrees, Langenberg 80 degrees, Midland Regional 64 degrees and Hilversum 35 degrees. All these came in at full loud-speaker strength. After 10 p.m. we brought the medium wavelength log on the Cossor Commander up to twenty-six stations.

The good sensitivity of this set on the medium waves is repeated on the long waves. Huizen at 93 degrees, Radio Paris at 84 degrees, Daventry at 70 degrees, Eiffel Tower at 61 degrees, and Kalundborg at 40 degrees were all received at full loud-speaker strength.

Quality.—It was quite a treat to hear such good quality of reproduction on a battery-operated set. Quality is not affected by the volume control, even at its lowest setting. We tested the set for quality with the new Marconiphone permanent magnet moving-coil loud-speaker, which certainly brought out the inherently pleasing tone.

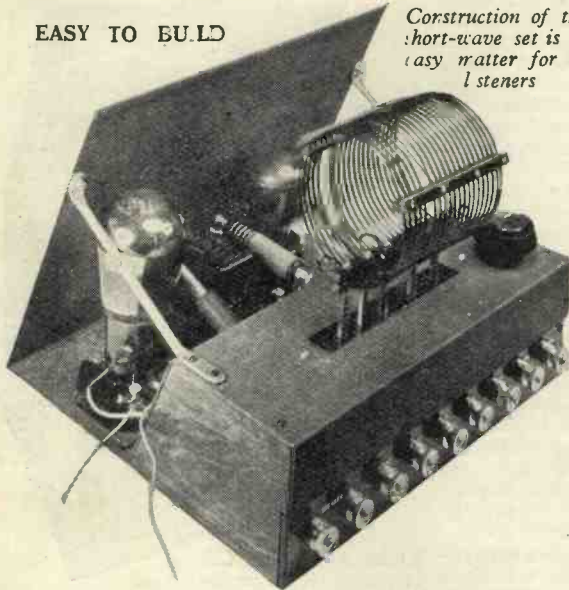


EASILY FIXED BATTERY LEADS

A back view showing the roomy battery compartment. All terminals and battery leads are clearly indicated

EDDYSTONE SHORT-WAVE TWO (KIT SET)

EASY TO BUILD



Construction of this short-wave set is an easy matter for all listeners

Maker.—Stratton & Co., Ltd.

Price.—£3 19s. This is the total cost of the components listed by the makers and includes a special aluminium chassis which can be bought separately for 18s. 6d., drilled complete with coil stand, end pieces, brackets and terminal blocks. Included also are three short-wave coils, No. D1, price 5s.; No. D3A, price 5s. 6d., and No. D4, price 6s. 6d. The constructional details and the blueprint can be obtained, price 6d., from the makers.

Power Supply.—The above price does not include the batteries needed to work this set. If the makers, recommended pentode power valve is used, we suggest that double-capacity high-tension batteries are advisable, although the maximum voltage need be only 100 volts. A 2-volt accumulator and a 9-volt grid-bias battery are also required.

Power Consumption.—With the pentode valve slightly over-biased we found the total anode-current consumption taken from the high-tension battery was 10 milliamperes. With a small power valve in place of the pentode, this was reduced to 7 milliamperes, with, of course, some loss in volume.

Valve Combination.—As might be expected, the valve combination comprises a leaky-grid detector transformer coupled to the pentode output valve. We note from the circuit diagram,

supplied with the set, that the modified Reinartz system of reaction is employed.

The short-wave coil is tuned by a .00015-microfarad variable condenser. Reaction is varied by means of a .00025-microfarad variable condenser, connected in series with the reaction coil across the anode of the detector valve and earth.

A special short-wave high-frequency choke is inserted between the anode of the detector and the primary winding of the low-frequency transformer.

We note that the makers have coupled the aerial to the grid end of the short-wave tuning coil through a small midget variable condenser and not by means of an aperiodic coil, as is normally done. During tests the .00001-microfarad condenser in the aerial lead was found to provide a very efficient coupling. There were no blind spots over the tuning range of each coil and reaction was readily obtained on all the short wavelengths.

The grid condenser has a capacity of .0003 microfarad and the grid leak has a resistance of 3 megohms. The grid leak is taken to the negative side of the filament of the detector valve, and not the positive side. The result is very smooth reaction and apparently there is no loss of sensitivity.

Controls.—We were supplied with a completely assembled Eddystone short-wave chassis. From this we

were able to appreciate the excellent layout of the controls and of the other components. A very short study of the chassis proves that the makers are fully aware of all the design needs for short-wave work.

Thus the coil unit, for tuning and reaction, is mounted on a platform at the back of the chassis, well clear of the metal panel and controls. Near the holder for the short-wave coils is the knob of the midget coupling condenser.

The control panel is arranged "on the slope." The slow-motion dials for the tuning and reaction condensers are fitted with extension spindles and the tuning and reaction condensers are actually underneath the coil unit—well away from hand-capacity effects. The whole layout is notable for the shortness of all the connecting wires.

Apart from the two slow-motion dials for tuning and reaction, and the knob for varying the aerial coupling, the only other control is an on-off switch mounted at the centre of the metal control panel.

The two slow-motion dials are divided into degrees from 0 to 180. Such detailed divisioning is essential for short-wave work, where between every two adjacent degrees one finds probably two or three stations.

In estimating the efficiency of short-wave controls, we have to bear in mind that the greatest need is for a delicate adjustment of tuning and reaction condensers and that the sensitivity depends almost entirely upon the smoothness of reaction.

Handling the controls of the Eddystone chassis soon convinced us that all these points have been carefully watched by the makers. We could detect no appreciable backlash in the movement of the slow-motion dials and consequently very critical adjustments could be made.

By providing a short, low-resistance earth we pre-

vented any sign of hand-capacity effects when operating the dials. On withdrawing the hand from these controls the station remained tuned-in and did not disappear in the annoying way so commonly experienced in short-wave work. In fact, for a two-valver this Eddystone short-wave set is delightfully free from instability.

Sensitivity.—It is true to say that the sensitivity of a short-wave set, providing it is well designed, can be measured most fairly by the operator's skill. In other words there is no limit to the range of reception or to the number of short-wave stations capable of being heard.

During our first evening with the Eddystone short-wave chassis we tuned in the American broadcasting station 2XAD at 77 degrees on the tuning dial, using the smallest of the three coils. This 20-metre relay of WGY, Schenectady, came in at very great phone strength.

As a matter of fact, we were able to work a loud-speaker at moderate volume



NEAT PANEL

This set has a sloping panel and would require a special cabinet

in our subsequent reception of this station. The smallest coil tunes from about 15 to 36 metres, so one could get the 32-metre American broadcasting station 2XAF at the top end of the tuning scale.

During tests we found 2XAF was strongly received with the middle coil in circuit. This coil tunes from 27 to 55 metres and we got 2XAF at 52.5 degrees on the dial. Just above it was OXY, a Danish relay that came in at great strength. At 52 degrees we found Zeesen, received so strongly that it worked a loud-speaker.

COLUMBIA MODEL 306 PORTABLE

Maker.—Columbia Graphophone Co., Ltd.

Price.—17 guineas. This price includes the suitcase portable and all the necessary valves and batteries. There are no extras.

Power Supply.—Batteries. Altogether there are three batteries, a 120-volt standard capacity high-tension battery, a 2-volt 20-ampere hour solid electrolyte accumulator and a 9-volt grid-bias battery.

We were struck with the neat fixing of the batteries in the back of the suitcase. There is a battery packing frame to prevent movement of the batteries when the set is in transport.

There are only two high-tension battery leads, which, like the low-tension and grid-bias leads, are plainly marked.

Power Consumption.—The four valves in this suitcase portable were found to take a total anode current of 13 milliamperes. The output valve accounted for 6 milliamperes and the first low-frequency-amplifying valve for 4 milliamperes.

This total consumption is on the high side for the standard-capacity type of battery, but in a suitcase portable it is difficult to see how good quality can be obtained without over-running the high-tension battery. The filament-current consumption is .5 ampere, so the accumulator should last two or three weeks between each charge.



SIMPLE TO OPERATE

Although the panel layout is rather unusual, tuning is quite easy. Note the battery packing frame at the back

Valve Combination.—Of the four valves in the Columbia 306 model, the first is a screen-grid high-frequency-amplifying valve, the second is the detector, the third is a low-frequency-amplifying valve and the fourth is the power output.

The high-frequency valve, is coupled to the leaky-grid detector by means of a tuned-grid coil. There are thus two tuned circuits, the frame tuning and the grid tuning. These are conveniently ganged so that both circuits are simultaneously tuned.

The actual valves used in the model tested were all of the Cossor make. An SG215 screen-grid valve precedes an HF210 detector, which is followed by an LF210 valve and finally there is the P215 power valve.

Such a valve combination is more useful in these days than the five-valve combination so popular in portable sets a year or so ago.

Controls.—The first impression we gained of the controls was of simplicity. And subsequent tests showed that all the controls were easy to adjust.

The makers have arranged the controls on two small escutcheon plates, in a horizontal position at the front of the set. The left-hand plate carries the tuning device, which consists of a dial calibrated in medium waves on the right, from 250 to 500 metres, in steps of 50 metres, and long waves on the left, from 1,000 to 2,000 metres, in steps of 200 metres.

As these wavelength divisions are rather widely separated it would be helpful to have degree divisions to fill in the blank spaces. As it is, the wavelength calibrations are quite accurate, and certainly aid the search

for distant stations by enabling one to set the tuning dials within a few metres of any required wavelength.

To the left of the dial is a thumb-controlled disc, marked "Tuner." This actuates the calibrated scale and also the two moving sets of conden-

ser plates. To the right of the scale is a similar shaped disc marked "Balance." This operates the fixed plates of the aerial tuning condenser and thus corrects any discrepancy in the tuning adjustments of the two circuits.

Apart from the tuning plate on the left there is a similar plate on the right, carrying two small knobs and a three-position switch lever for "Off," "Medium," and "Long Wave" reception. The small knob to the left is marked "Volume" and controls the sensitivity of the screen-grid high-frequency-amplifying valve. Very strong signals are prevented by this control from overloading the detector valve.

The small control knob to the right is called "Intensifier." This is quite a good name for the reaction, which in this set is applied to the detector valve and greatly increases the strength of distant stations.

We think it is quite a good idea to divide the total number of controls into two separate panels, as the makers have done in this Columbia portable. Somehow, control seems much simpler when the knobs are thus separated. We hardly know whether to credit the makers with a knowledge of psychology or a passion for neatness. In any case the controls are admirably placed.

Sensitivity.—We tested this portable during a recent evening, while still quite light. The first station tuned in was London National, which came in very near the 261-metre mark. Turning to the 350-metre mark we got London Regional.

These two stations were received with very great strength in south-west London. The volume control had to be turned half-way towards its minimum position.

Midland Regional on 398 metres was very strongly received. Full loud-speaker signals were readily obtained from North Regional on 479 metres. For this station we had to use a fair amount of

reaction for good volume.

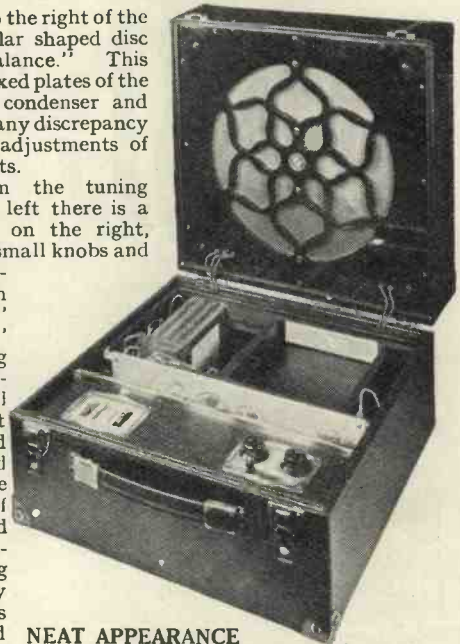
Brussels No. 1 on 509 metres came in at great strength. Rome on 441 metres and Hilversum on 298 were also very well received. Radio Normandi on 222 metres was exceptionally strong.

On the long wavelengths the set behaved as well as any four-valve portable yet tried. We were very pleased indeed with the strength of Radio Paris, Huizen and Kalundborg.

Selectivity.—We should say that this is up to the needs of listeners living fairly close to regional broadcasting centres. We had no difficulty in entirely separating the two Brookman's Park stations. Indeed, we were able to log several foreign stations in between 261 and 356 metres during a subsequent test after dark. Midland Regional was received quite clear of London Regional, a feat impossible on the average five-valve portable.

The long-wave selectivity is satisfactory. Radio Paris can be heard quite clear of Daventry, which only slightly interferes with Eiffel Tower.

Quality.—It is always difficult to criticise portable-set quality, especially when one realises the limitations imposed by the compact nature of the installation. Still, the Columbia suit-case portable has a pleasing tone, especially for music.



NEAT APPEARANCE

Here you see the Columbia portable ready for use. This model is finished in dark rexine

A Marconiphone portable in use.



Enjoy Those Operas!

WHITAKER-WILSON,
the "W. M." Music
Critic, gives some ad-
vice to listeners and
explains the develop-
ment of operatic form

THE story of the development of opera has always been considered one of the most important in the history of music and art. The reason is, of course, that it is a combination of song and action.

If you come to think of it, opera is the natural outcome of all artistic thoughts. You go to a theatre and enjoy a play by Shakespeare, or Bernard Shaw, and you realise how important it is that everything shall be done exactly as it really might have been done in actual life; that, in point of fact, is the acme of good acting.

The Spoken Word

In Shakespeare's day anything had to do for scenery; he never dreamed, even in his most ecstatic moments, that his plays would see such productions as we can now accord them. I imagine that everything was summed up in the actual words, and the way in which they were spoken.

Whether Shakespeare ever thought of attaching great importance to the actions has been a matter of doubt in my mind; I have always noted a lack of stage directions. It is the custom, in these days, for an author to state exactly what he wants, and often to insist that he obtains it.

Those of you who have acted in any of the Gilbert and Sullivan amateur productions will know that you have to conform to the generally-accepted method of rendering every detail; very little latitude is allowed you.

Now let us look at the other side—the musical side. Music was very slow in developing until J. S. Bach came on the scenes. He and Handel helped to move things on a good deal. Handel wrote operas by the dozen; he generally reckoned to write most of a scene between lunch and supper.

Bach never tried his hand at opera, which is a wonder, as he became friendly with Keiser in Hamburg; Keiser was making a good thing out of opera. Handel and Bach never met although they made two attempts to do so. Bach helped on music enormously; we should have been further behind had he not lived; there is no denying that.

To make my point clear regarding opera as an art is to point out that music, having progressed so much that great songs and arias had been written by equally great musicians, such as these two, naturally sought expression in some other direction.

It was a brilliant idea to combine songs with action; everybody must have thought that. And so it came about that the resources of the stage were combined with the resources of music pure and simple.

The ordinary comic opera, or even musical comedy, seems to be quite reasonable in its outlook. Here we have songs and choruses interspersed with spoken matter.

Grand Opera, which is what I am suggesting you study now that many of the best are being relayed for your enjoyment, is surely the furthest limit of this combination of which I have spoken.

It is only natural that at some time in the career of both arts the combination should take the form of *everything being sung*. "Say it in song" must be a very old sentiment.

It was not long before opera writers began to make fools of themselves. They were very dependent on the singers, and they soon found out that the singers were going to have it all their own way. It was quite an ordinary event for one of them to break off in the middle of a sentence—in the middle of a word, sometimes—in order to execute a succession of shakes and trills just to show off his (or, more often, *her*) voice.

Gluck's Reform

It was such absurdities that annoyed Gluck so much and brought about his reforms. He considered that it was ridiculous for this sort of thing to be accepted as true art, which is only true when it is true to life. He objected to dancers being dragged in at any stage in the plot just to suit the dancers.

He ventilated his views in Vienna to some extent, but the Viennese, ever idle and pleasure-loving, did not see any reason to alter the accepted Italian style of writing which included all these incongruities. Gluck therefore went to Paris and began by writing in the French press.

Marie Antoinette had once been a pupil of his and was ready to help him in his scheme. The heat of the opposition must have surprised both of them. Insults flew about in the most disturbing fashion. Gluck

pegged away and held to his point.

The opposition party sent for Piccini, a well-known Italian composer, to come over to Paris and help hawl down the intruder. The result was more like a hot parliamentary election than a fight over a principle in art.

The street in which Piccini resided became known as *Bad-language Street* (*Rue des Mauvaises Paroles*); Gluck's was known as *Shriekers' Avenue* or something very like it.

Working Together

The climax came when Berton, the new opera director, asked Gluck and Piccini to dinner one evening. They eyed each other a bit at first, but ended by liking each other immensely. Berton asked them to write an opera together. That was a bit tactless and did not appeal to either of them.

Then he made an improved suggestion. He asked them to set the same subject—Racine's *Iphigenia in Tauris*. This they agreed to do. Gluck's appeared first and was a great success—so great that Piccini threw his into a drawer and refused even to look at it for two whole years. When he was eventually persuaded to produce it the result was a total failure. Hence the Gluckists won.

From that time Opera began to be a real thing. When Wagner came to grips with it he found it a reasonable form of art. He infused his own personality into it, and the Wagnerian operas certainly stand alone.

Verdi was another who fought his way against great odds. The police on more than one occasion interfered because it was thought that his operas had too political a significance. Verdi succeeded in the end and his operas will never die now.

That Opera has certain faults I can never deny. It is principally because it is so necessary that the cast shall be composed of people who are singers. It is impossible to risk casting a person who is an excellent actor and happens to know something about singing. That will not do.

Casting a Play

When casting an ordinary play one thinks for a while and then says: "We must have so-and-so for that part; he is the type, the right height, and will carry off the characteristics which the author requires." That is how plays are cast and is the reason why so many are successful, even when the plays are not really good in themselves.

You know as well as I do that you have often come away from a theatre and said that you enjoyed the acting, but you thought the play was poor.

In opera it is usually different. The plots are never very powerful and great importance is attached to the music itself.

You have often smiled to yourself as you have watched the antics of a huge soprano who is supposed to represent an anaemic, lovesick maiden.

One of Verdi's operas came to a temporary standstill through a soprano, who was enormously fat and healthy-looking, being told on the stage that she was dying of consumption. Profanities emanated from the gallery that sent the house into roars.

Opera by wireless prevents us from seeing these incongruities. I do not know that I can use that as an excuse for urging you to listen to opera. It is obviously weak. When television comes the argument, if it is an argument, will fall to the ground.

If I am to be successful in persuading you to listen to opera it must be only when I am honest and point to the fact that in nearly all of them the broadest and most intelligible tunes are to be found.

Who has not thrilled at the *Soldiers' Chorus* from Gounod's *Faust*? Who has not delighted in *la Donna è mobile* in Verdi's *Rigoletto*? Who has not learnt to love the *Pilgrims' Chorus* in Wagner's *Tannhäuser*?

These immortal tunes are played, apart from their operatic surroundings, everywhere one goes. Records exist of them in hundreds.

The great point of listening to opera by wireless is knowing something about the story of the opera itself. I have been asked by the Editor to begin a series of the stories from the operas. There are very few I have not seen, as a matter of fact, and I think I can spin their plots for you in an intelligible form.

Each issue, for some time to come, will have a column devoted to the story of some opera. It will be an outside column on a right-hand or left-hand page and thus can be cut out and kept for reference.

I shall take those which I think are likely to be relayed some time in the near future. I may not be successful in this, but at least I shall be able to give you something that will come in useful some time. More than that I can hardly hope to do.

Stories of the Operas

MADAM BUTTERFLY

(Puccini)

Chief Characters.

Madam Butterfly	Soprano
Suzuki (her servant)	Mezzo-Soprano
Kate Pinkerton	Mezzo-Soprano
B. F. Pinkerton,	
Lieutenant, U.S.N.	Tenor
Sharpless (U.S. Consul	
at Nagasaki)	Baritone
Goro (a marriage broker)	Tenor
Prince Yamadori	Baritone
The Bonze (Butterfly's Uncle)	Bass

Time: Present Day. Place: Nagasaki.

ACT I

PINKERTON is about to contract a "Japanese marriage" with the pretty Japanese "Butterfly," and is discovered looking over a little house facing the harbour at Nagasaki. He has leased this house. Suzuki (Butterfly's faithful maid) is also present.

Sharpless, the Consul, tells Pinkerton he is not playing the game. He is amusing himself; Butterfly is serious. Pinkerton laughs at his friend's fears. The bride arrives with her relatives. The Consul now realises that he was right; Butterfly is taking this seriously and is obviously in love with Pinkerton. She will even renounce her faith and embrace his. This means being cut off from her relatives.

Other officials arrive to see all is in order. The Bonze (priest) curses her for her action and Pinkerton turns everybody out of the house. Left alone with Butterfly, there is a love scene.

ACT II

Three years have elapsed. Pinkerton has gone and has not returned. Suzuki, though confident that he has played her mistress false, prays for his return. Butterfly is confident. (Here comes the famous song, "One Fine Day.")

Pinkerton is returning, but has already written to Sharpless sending a message to Butterfly telling her of his American marriage. Sharpless tries to deliver it, but Butterfly's distress is so great on hearing of Pinkerton at all that he cannot give her the true message. She thinks all is well.

Yamadori, a wealthy Jap, proposes to her. Goro urges her to accept. She is poor, Pinkerton's allowance having ceased. Sharpless tells her the truth. She fetches her baby boy, born since Pinkerton's departure. A cannon sounds; it is Pinkerton's ship. Now Butterfly is quite certain he is true. Night falls.

(Part 2)

It is dawn. Pinkerton and Sharpless arrive. Suzuki, distressed on learning the truth, tries to prevent Butterfly from entering. Butterfly interviews Mrs. Pinkerton and offers the baby boy if Pinkerton will fetch him in half an hour.

She then mortally wounds herself and is found dying by the little boy's side; Pinkerton, on entering, discovers the child playing with his toys and waving an American flag.

W.-W.

Flashes from Our Aerial

THE parish school had been presented with a wireless receiver and most of the children heard a broadcast for the first time.

"Now," said the teacher, "I want you boys to write an essay of about two hundred and fifty words and to take wireless as your subject."

One boy wrote: "Radio is a grate thing you can here music and torks and komik chaps and orl kinds of ammusements. My daddy made a big one and it took him a weke and my ma went for him like billyo for staying upp late evry nite and he swetted pints over it."

As a postscript he added: "I've ritten 50 wurdz down and daddy sed the uther 2 hunderd wen the set woodnt wurk but i cant spell them orl."

A wireless dealer in a little village sent a postcard to his wholesaler. It read:

Dear Sir,—Please send me by return one doz. valve holders and one gross of 2BA round-headed brass screws.

P.S.—My wife tells me that we have three dozen valve holders in stock, so don't send them.

P.S.S.—My assistant says that he has found some brass screws, so please cancel this part of order.

From Our Post-bag

Sir,—I was listening in on Saturday nite at 10.45 to 11 o'clock and I herd something like a farmyard come through the birds wisling dogs barking pigs gruntin also a lot more diferent animiles it was a station below Budapest as I thort and what sort of programme would you call it.

He had spent five days on the road; it was his first trip as the travelling representative of a wireless firm. Much to his delight he had sold a number of radio receivers and had booked orders for large quantities of components. In a moment of elation he decided to send a telegram to his wife to impart the glad news. He walked into the nearest post-office and handed the following over the counter:

Dear Maggie I sold thirty wireless sets and other things. Am returning to-night by the 8.57. You may buy

Here is a page of wireless stories for holiday reading. Readers who know any really good radio jokes are invited to send them to the WIRELESS MAGAZINE; half a crown will be paid for each one published. Letters should be addressed to "Jokes," WIRELESS MAGAZINE, 58/61 Fetter Lane, London, E.C.4.

that hat. Kiss baby. Love, Harry.

"With the address," said the postal clerk, "that will be two shillings and fourpence."

"How much? Two shillings and fourpence for that message."

"Well, you can shorten it if you like," and the form was handed back to him.

"Righto, that's what I'll do." He took it to a quiet corner and read the telegram through for the third time.

"Dear Maggie. Well, she knows her name." (His pen struck through the two words.) "Sold thirty wireless sets. She wouldn't think I was selling Dutch cheese. Returning to-night by the 8.57. She'll find that out when I get home. You may buy that hat. I might not do so well next week and if she gets a new hat she'll want to go out more. That means another pair of shoes." (His pen again struck out the lines.) "Kiss baby. Just as if I'd ask her to kiss the cook for me. Love, Harry. That looks sloppy and she knows my name."

He walked back to the counter, crumpled up the form, and said to the clerk: "It's all right, there's no telegram to send. I shall be back home to-night."

The local broadcasting station was relaying the luncheon hour concert from a popular restaurant. One of the diners, somewhat deaf, finishing his meal as the orchestra struck up a selection, picked up a hat from the clothes rack.

"Take that hat off!" shouted an angry voice in his ear.

"I'm very sorry," said the man. "Are they playing 'God Save the King'?"

"No," replied the voice, "it's my hat."

Modern Bedtime Story

Once upon a time a rich man bought a wireless set and paid cash for it . . .

Professor Dryrot was broadcasting a talk on exotic fevers from KBXD, Hot Gulch (Minn.) by the courtesy of the Rum Alley Bootleggers' Association, Inc.

"My dear listeners, against malaria there are only two certain remedies known; one is whisky . . ."

Silas B. Schoenermaker, of Ritztown (Mass.), hurriedly took off his headphones and put a long-distance call through to the studio. He was connected just as the learned man had concluded his lecture.

"Say, excuse me butting in, Professor, but in a talk you just radiated you said that there was only one sure remedy against malaria."

"That is so," came a faint reply over the line, "what do you wish to know?"

"Where can I get it? I say, where can I get it?"

"Get what? Whisky?"

"No, malaria. I've got whisky, but my wife won't let me drink it."

Eight years ago Angus McTavish had invested in a pair of headphones and a coil with which he had built himself a wireless receiver. It still worked well but for the past three months he had been seriously thinking of buying another crystal. Screwing up his courage, he walked into the dealer's shop at Aberdeen.

"Good morning to you, Mr. McDonald," he cried as he walked up to the counter. "Here we are again."

SMITH: "I picked up a bargain yesterday. Got a wireless set."

ROBINSON: "Oh! How cheap?"

SMITH: "Only costs me five shillings a week."

ROBINSON: "Easy payments, eh? How many weeks?"

SMITH: "Weeks? Dash it all, I forgot to ask the chap."



GIVES HIGH TENSION AND CHARGES YOUR ACCUMULATOR

DURING the summer months, when no radio set is subject to such prolonged use as it is during the winter, dry batteries do give a satisfactory service as regards the high-tension supply. The Super 60 receiver, designed specially by W. James for WIRELESS MAGAZINE, is a good example.

With the valves specified the high-tension current consumption is of the order of 12 milliamperes and can be obtained quite conveniently and economically from a double-capacity battery when reception is required only for a comparatively short period each day.

But in the autumn, when the days begin to draw in and the radio set is in use for many hours at a stretch, batteries will not last so long and many listeners will feel the need for a more constant source of high-tension supply.

Preparing for the Autumn

Although they may not feel the need for one at present, many owners of Super 60 sets will turn their attention to mains units when the autumn comes. So that they can be prepared well in advance we present here full details of a high-grade unit for use with A.C. (alternating-current) mains which not only gives high tension, but also enables the accumulator to be charged at home without any trouble.

One very great advantage of a mains unit is that it costs practically nothing to run; in fact, the first cost is almost

the last. Even the extensive use of such a unit as illustrated in these pages will make no appreciable difference to one's electric-light bill.

Using a Larger Power Valve

A further advantage gained by using this unit with the Super 60 receiver is that a larger power valve can be used with perfect economy. The power valve originally recommended by W. James for the set was of a low-power type that imposes very little drain on the source of high tension and was chosen particularly to give economical battery working.

With the greater power available from a mains unit, however, a larger power valve can be satisfactorily employed. It will cost practically no more to run and will considerably improve the quality of reproduction obtained from the receiver.

Quite apart from the question of high-tension supply, there is a great advantage also in being able to charge one's accumulator on the spot and so obviate the necessity for carrying it to and from a charging station.

It will be evident that this A.C. unit can be divided quite naturally into two parts—one part giving a high-

voltage output for application to the valve anodes and the other part giving an output of a comparatively low voltage for charging the accumulator.

Both high- and low-tension rectifiers are of the metallic type and can therefore be relied upon to give long and useful

COMPONENTS NEEDED FOR THE SUPER 60 A.C. UNIT

CHOKE, LOW-FREQUENCY

- 1—Bulgin 20-henry, 12s. 6d. (or R.I., Varley).

CONDENSERS, FIXED

- 3—Ferranti 2-microfarad, type C2, 11s. 3d. (or Hydra, Franklin).
2—Ferranti 4-microfarad, type C6, 15s. (or Hydra, Franklin).

EBONITE

- 1—Terminal strip, 9 in. by 2 in.

LOW-TENSION BATTERY CHARGER

- 1—Heayberd, type AO2, with Westinghouse R421 unit, £1 12s. 6d.

METAL RECTIFIER

- 1—Westinghouse type HT5, 15s.

RESISTANCES, FIXED

- 1—Bulgin 5,000-ohm, flexible type, 1s. (or Lissen, Readi-Rad).

- 2—Bulgin 10,000-ohm, flexible type, 2s. (or Lissen, Readi-Rad).

RESISTANCE, VARIABLE

- 1—Sovereign 50,000-ohm potentiometer, 4s. 6d. (or Regentstat, Sovereign).

SUNDRIES

- Tinned copper wire for connecting.
Length of Sistoflex sleeving.
Length of rubber-covered flex.
1—Ferranti safety box, £1 10s.

SWITCH

- 1—Bulgin two-way toggle switch, marked: H.T., L.T., type S81, 2s.

TERMINALS

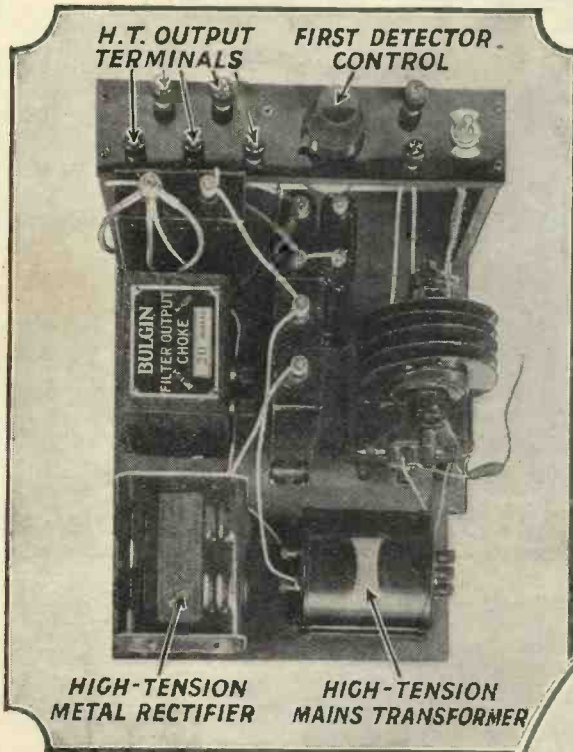
- 7—Belling-Lee, small ebonite type, marked: L.T.—, L.T.+ , H.T.+4, H.T.+3, H.T.+2, H.T.+1, H.T.—, 1s. 9d. (or Clix, Ealex).

TRANSFORMER, MAINS

- 1—Heayberd, type W21, 14s. (or R.I.)

The prices mentioned are those for the parts used in the original set; the prices of alternatives as indicated in the brackets may be either higher or lower

THE SUPER 60 A.C. UNIT—Continued



COMPACT BUT ACCESSIBLE

Although the unit is compact, the parts are in no sense overcrowded and all the terminals are easily accessible

service without any adjustments or complications. For almost four years these metal rectifiers have been on the market and although many have been in constant use ever since they were first introduced to listeners we have never yet heard of one becoming exhausted or worn out through old age.

From the diagram on page 55 it will be seen that the circuit employed in conjunction with the high-tension rectifier is quite straightforward although it incorporates every essential refinement to ensure complete stability of operation.

Mains Transformer

The mains transformer has a tapped primary suitable for 200-, 230-, or 250-volt A.C. mains and the secondary gives an output of 135 volts for the metal rectifier.

Current taken direct from the rectifier is in a very rough state and if applied direct to the set would result in all kinds of humming noises. For this reason a method of smoothing the current has to be introduced; in this unit a 20-henry low-frequency

choke is used in conjunction with two 4-microfarad condensers. It will be seen that the choke is in the positive lead and that the condensers are placed one on each side of it, across the positive and negative leads.

Four output terminals are provided; these are marked H.T. + 1, H.T. + 2, H.T. + 3 and H.T. + 4. The voltage-regulating resistances are so arranged that the set

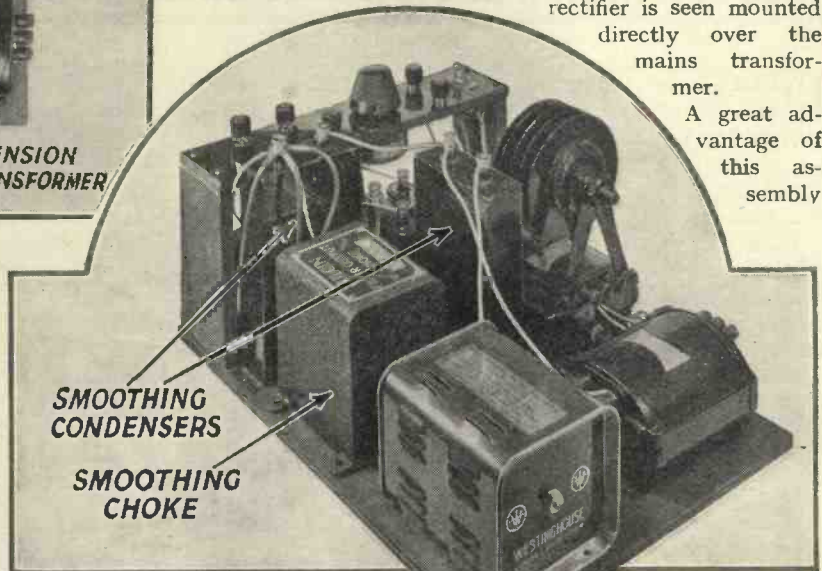
taken direct to two low-tension terminals, the accumulator being connected to these whenever a charge is required.

The rectifier is designed to charge at .5 ampere when a 6-volt battery is connected. When a 2- or 4-volt accumulator is connected the charging rate is, of course, slightly higher, which is an advantage because a full charge is obtained quicker.

Although the low-tension rectifier for charging the accumulator is made by Westinghouse it is bought as a complete unit with the mains transformer from the firm that make the latter.

The combined assembly is seen quite clearly in the photograph on page 55, where the low-tension rectifier is seen mounted directly over the mains transformer.

A great advantage of this assembly



A UNIT THAT WILL IMPROVE

Those who have A.C. mains will find that they require. It is a source of constant high the low-tension accumulator when req ired

YOUR SUPER 60

this unit is just what tension and also charges

will work at its best when the terminals marked as indicated above are connected to the corresponding leads on the receiver itself. In other words H.T. + 1 on the unit is connected to H.T. + 1 on the Super 60, and so on.

The circuit arrangement of the low-tension rectifier, or trickle charger as it is more correctly called, is, of course, very much simpler because no smoothing is required. A second mains transformer is used to supply 9 volts A.C. to the low-tension rectifier; the primary of this transformer is also tapped for 200-, 230-, and 250-volt supplies.

The output from the rectifier is

is that it can be easily omitted if the listener does not desire to make provision for charging his accumulator. If the low-tension side is left out the high-tension side is not affected in any way.

Although there are no very high voltages at any part of the circuit we have thought it advisable to build the unit into a Ferranti safety box as seen in the heading photograph on page 53. This box is so arranged that the main supply is cut off as soon as the lid is raised.

Special Safety Box

This is accomplished by means of

GIVES HIGH TENSION FROM THE MAINS

a special switch built into the box, one part being fixed in a corner of the box itself and the other part being fixed in the lid. The switch incorporates a fuse in each mains lead.

Incorporated as it is in one of the safety boxes, the unit is absolutely shockproof and can be safely used even when there are children about the house.

Accessible Assembly

From the photographs and diagrams that appear in these pages it will be seen that the construction is not at all complicated. Although the assembly is compact none of the parts is unduly crowded and everything is easily accessible.

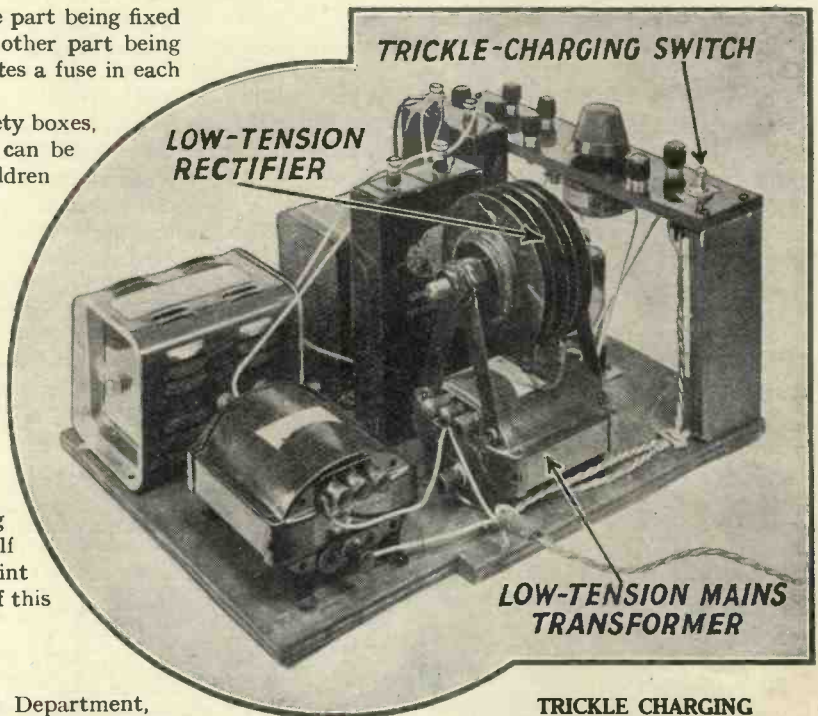
If desired a full-size blueprint, which shows the position of every part and clearly indicates all the connecting wires required, can be obtained for half price, that is 6d. post free, if the blueprint coupon to be found on the last page of this issue is used by August 31.

Where to send your Order

Address your inquiry to Blueprint Department, WIRELESS MAGAZINE, 58-61 Fetter Lane, London, E.C.4, and ask for No. WM248.

A quarter-scale reproduction of the blueprint appears on page 56. This will enable the reader to follow the main lines of the layout. One point to be noted is that the connections to the two mains transformers are shown as if the terminals were on top; this is done for clearness, because actually the terminals are on the ends of the transformers.

Three of the connections in the unit are actually made



TRICKLE CHARGING

If for any reason the constructor does not desire to charge his own accumulator, the trickle charger can be omitted without affecting the rest of the unit

with flexible or spaghetti resistances. These are the leads numbered 15, 16, and 18.

The terminal strip is shown from the underside, so that the connections to the various parts are quite clear. When all the connections to the strip have been completed it can be screwed firmly to two wooden supports, as seen in the photograph on page 54.

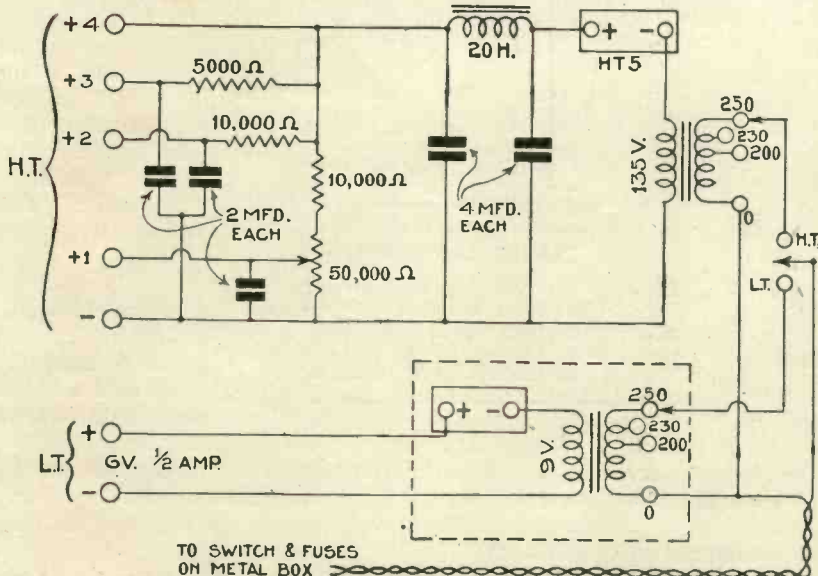
All Connections Numbered

Wiring up will not present any difficulty if the diagram is carefully followed, for each lead is numbered in the best and most convenient order of assembly. Start with connection No. 1 and work through in the proper numerical sequence.

Change-over Switch

It will be seen that on the terminal strip is mounted a small switch. This is so arranged that either the high-tension or low-tension side of the unit is put into operation; both parts cannot be used at the same time. In one position the mains are connected to the transformer associated with the high-tension rectifier, and in the other position the mains are connected to the transformer associated with the low-tension rectifier.

No on-off switch is provided on



SIMPLE CIRCUIT WITH ALL NECESSARY REFINEMENTS

The top part of this diagram shows the arrangement of the high-tension circuit, while the lower part shows the arrangement of the trickle charger

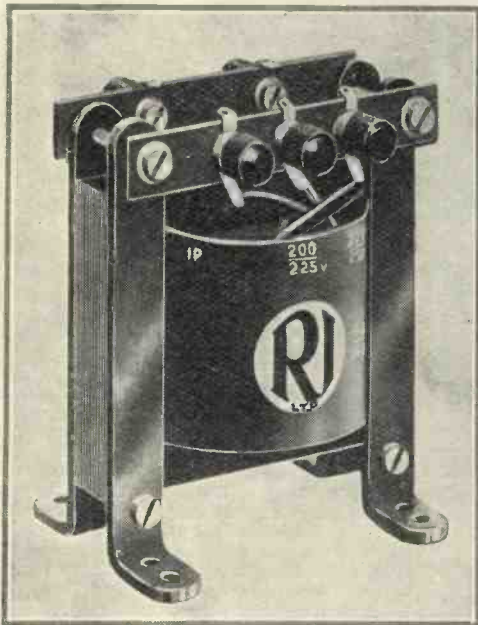
THE SUPER 60 A.C. UNIT—Continued

the unit itself, but the supply can always be cut off by raising the lid, as already mentioned, or a wall switch can be used, of course, if there is one in a convenient position.

Connecting the Unit to the Set

The method of connecting the unit to the Super 60 has already been explained and no further reference to this will be necessary.

When the unit is placed in the metal safety box, as



TYPICAL MAINS TRANSFORMER

This photograph shows a type of R.I. mains transformer suitable for use in the Super 60 A.C. Unit

shown in the heading photograph, that is with the terminal strip at the right-hand end, the small switch already referred to is pushed to the left when a supply of high tension is needed and to the right when the trickle charger is to be used.

When the unit is first put into use for high tension the potentiometer mounted on the terminal strip, and varying the voltage available from H.T. +1, must be set carefully until the best results are obtained from the set.

Obtaining the Loudest Signals

Start with the knob in its mid-way position and move it round step by step until the loudest signals are obtained from the receiver. Each time the knob is adjusted, of course, it will be necessary to raise the lid of the safety box and the whole unit will automatically be switched off.

To charge the accumulator disconnect it from the set entirely and connect it to the two low-tension terminals in the unit. Take very great care to connect the positive side of the accumulator to the positive low-tension terminal in the unit, otherwise the battery will be discharged

instead of being charged and considerable damage may be done to the plates.

Do not forget that it is necessary to move the switch in the unit to the right or the accumulator will not receive any current.

Under normal conditions the unit will charge the accumulator at about the same rate that it is discharged when the set is in operation. It can be kept in a fully charged state by putting it on charge for about the same number of hours that it is actually in use for reception. In other words, if the set has been used for three hours one evening the accumulator should be put on charge for three hours.

Keep the Accumulator Well Charged

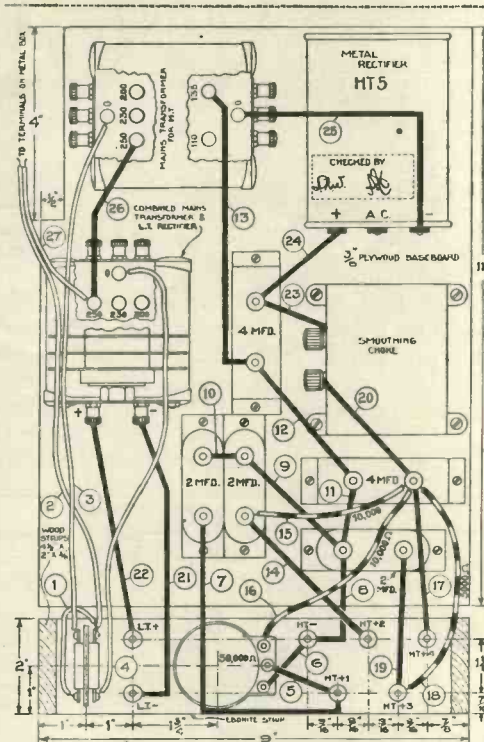
This does not mean that the accumulator can never be used for long periods at a stretch without charging. It can, of course, be used until totally discharged if required, but if it is allowed to get into this low state it may

take forty hours or more of charging to refill it. Much the best plan is to keep the battery as nearly as possible in a fully charged condition all the time.

It must not be overlooked that the electrolyte in an accumulator is subject to evaporation and it is essential to keep the level of the liquid up to the mark that is to be found on every battery.

"Topping Up"

When it is noticed that the level of the liquid has fallen (and in hot weather evaporation takes place quite rapidly) the battery should be "topped up" with distilled water obtained from a chemist. Sulphuric acid should not be added, and on no account should ordinary tap water or rain water be used because of



LAYOUT AND WIRING

This diagram is reproduced at quarter scale, but if desired, a full-size blueprint can be obtained at half price (that is, 6d., post free) if the coupon on the last page of this issue is used by August 31. Ask for No. WM248

the chemical impurities with which they abound.

Constructors of this unit should take particular care when ordering the mains transformer to state very clearly the exact voltage and periodicity (or frequency) of their mains.

Beginners are particularly warned to make certain that their mains are of the A.C. type and not D.C. (direct-current) supplies. This unit will work only on A.C. mains.

A COMPLETE
HOLIDAY STORY

Illustrated by
LESLIE H.
SHEPHERD

"In the lounge, at some little distance from our settee, a loud-speaker on a tall pedestal was broadcasting the Berlin Teemusik. As the studio orchestra struck up a peculiarly Russian type of melody, my vis-à-vis gasped. 'My God,' I heard him say under his breath, 'that melody!'"

Unter Den Linden

THE STORY OF AN UNUSUAL ADVENTURE

By J. GODCHAUX ABRAHAMS

"SORRY," I muttered as, pushing through the revolving doors of the Majestic Palace Hotel, Berlin, I collided accidentally with an elderly woman who was making her way out to the café terrace. I raised my hat and she accepted my apology with a slight smile.

At that moment, as I passed into the hotel lounge, I saw at my feet a small brown leather wallet which I gathered she had dropped at the time I jostled her so rudely. Well, I picked it up with a view to handing it back but on looking round found that she had already disappeared in the ever-growing throng of passers-by on Kurfürstendamm.

There was nothing else to do but to give it into the office, and I was making my way to the reception desk when I felt a slight touch on my arm. In front of me stood a tallish man of rather distinguished appearance. "Sorry," I muttered again. He put his finger to his lips and whispered rather than spoke:

"Be warned. I see you are a

stranger to Berlin. Let the leather wallet fall to the ground—and forget it."

"My intention," I replied smiling, "was quite an honest one; I intended to place this in the hands of the hotel manager."

My mysterious stranger solemnly shook his head, then, taking my arm drew me towards a quieter corner of the lounge.

"You must excuse my apparent familiarity," he said with a polite bow, "but, if the experience of an elderly man may prove of use to you in such circumstances, pray give me your attention for a few minutes."

Not unwillingly, I consented; for the next half-hour I was at a loose end, having arrived at the hotel somewhat early for an appointment. I tendered my cigar case. "You were saying?" I inquired. He took three or four very deliberate puffs to make sure that the weed was alight, then told me this tale:—

"Three nights ago, I was sitting outside the Café Magnolia, near the

Friedrichstrasse, that well-known haunt of *schiebers* and members of the Berlin underworld. It was a coolish evening, and I watched from the Terrace the passers-by hurrying home in the dwindling daylight to the congested suburbs of the capital.

"A woman at a neighbouring table attracted my attention. She was neatly dressed in widow's weeds, and notwithstanding her thick veil I could see a pale and thoughtful face which bore traces of tears. She appeared to be suffering from suppressed emotion and now and again gave quick glances to the right and left as if expecting somebody.

"As twilight fell and the weather was becoming chilly, I called the *oberkellner*, paid for my coffee and picking up my hat and stick slowly sauntered across to Unter den Linden, now a blaze of light. On reaching the pavement, packed with pedestrians, quite by accident I pushed against somebody going in the direction of the Brandenburger Tor.

UNTER DEN LINDEN—Continued

"I had no difficulty in recognising my widow of the Magnolia and, as in your case, at my feet I saw a small brown leather wallet, which I took it she had dropped at the same moment. To my surprise on looking up I found that she had disappeared in the crowd, so I slipped the case into my coat pocket and continued my walk.

"I am on a few days holiday in Germany; I have never visited this capital before. My knowledge, I may tell you, of any language except English is of the scantiest, but experience has always proved that my native tongue, added to a certain amount of self-assurance, is all that is needed for continental travel.

"It was almost dinner time when I arrived at the hotel, and I had but a few minutes in which to change, but on reaching my bedroom I examined the case in the hope of finding a clue to its owner. Its contents revealed little.

"In one compartment was a pocket map of the city, in the other a note for five marks and a small folded sheet in which appeared in red block letters the word *Volowski*, followed by some half-dozen bars of music and a short sentence in a language I did not understand.

"The red ink was blurred; there was no trace of any name and address. It was hopeless wasting more time over the matter, so I decided to visit the café on the following day at about the same time on the off-chance of seeing again the lady in black.

"I had made no definite plans for spending my time whilst in Berlin and the pocket-wallet incident seemed to add just that spice of adventure which would pull these days out of the hum-drum monotony of rubber-necking around the metropolis.

"In the hotel lounge, after dinner, sauntering across to the raised platform on which the orchestra had been playing, I nodded to the conductor. Here was a chance of getting a translation of the sentence in red ink and of finding out whether the bars of music had any significance.

"I drew out the brown leather wallet. 'Could you tell me,' I inquired, 'what this might be?' I tendered the scrap of paper. He glanced at it hurriedly, hummed a bar or so under his breath, apparently realised its meaning, shuddered and pushed it back into my hand. 'Quick,' he whispered in broken

English, 'you take this away; show nobody it; there is great danger—for you.'

"'But,' I expostulated, 'let me explain.'

"'Es ist nutzlos—it is useless,' he rejoined, in the same undertone. Then leaning further towards me: 'I may not with you speak; the manager may see us. You will leave Berlin to-night, *nicht wahr?*'"

In the lounge at some little distance from our settee, a loud-speaker on a tall pedestal was broadcasting the Berlin *Teemusik*. As the studio orchestra struck up a peculiarly Russian type of melody, my *vis-à-vis* gasped. "My God," I heard him say under his breath, "that melody again."

I raised my eyes to his face. It appeared to be drawn. His mouth was twitching and I noticed that his brow was beaded with perspiration. He passed his hand once across his forehead then, with an apparent effort, resumed his narrative:

"A glance at the clock showed me that it was only a few minutes past nine. It was a fine night, so lighting a cigar I left the hotel for a short stroll along Kurfürstendamm, that wonderful Charlottenburg boulevard where every other building is a café, restaurant, cabaret, cinema or night bar; you probably know it.

"The pavement was packed with an endless stream of Berliners, respectable and otherwise, making for their favourite beer haunts or *Weinstuben*. Passing Freddy's, where I had lunched earlier in the day, I seated myself at a table in front of the restaurant with a good view down both sides of the avenue.

"I had discovered that the waiter spoke perfect English having acted in a similar capacity in London before the War. When he brought me a Scotch and soda, I pulled out my wad of notes to pay him; with them I grasped the little brown wallet.

"'You know both English and German,' I said, 'just take a look at this.' I showed him my 'find.' No ignorance of German was to prevent me from securing a translation. He took the scrap of paper in his hand. It seemed to tremble. He furtively looked around, then bending over my shoulder gasped into my ear: 'For Heavens' sake, sir. Hide this away quickly. Do not lose time. We may even be watched now.'

"At that moment, through the

open door of the restaurant, I heard the orchestra. It was playing the same melody—the one you have just heard, the melody the band-master had hummed. 'Look here,' I said to the waiter, 'just tell me. . . .'

"'Ober,' a voice cried from the other side of the terrace. He turned sharply as a guest beckoned to him. 'No time, now. Go at once, sir,' he whispered as he passed my table. 'Go back to your hotel, or better still, leave Berlin to-night. And for God's sake do not hum this tune.'

"'But,' I ejaculated. He was gone. I was dumbfounded. What could it mean? The man did not appear to be joking; his hand had trembled, his face had blanched. I left a silver mark by the side of my glass, walked off hurriedly and found myself a few minutes later striding down Kurfürstendamm, away from Freddy's.

"I caught myself talking half aloud, to the evident enjoyment of some passers-by. Was I awake or asleep? Was this real? Now, I'm not of a nervous disposition—far from it—but the whole business was most extraordinary. Had the scrap of paper any value? Was it incriminating? All who had seen it had hinted as much.

"Would it be better to hand it over to the police or should I throw the wallet away and let somebody else find it? The latter was an easy course to adopt as I had reached a corner of the street far from an electric-light standard.

"With this intention I had already grasped the leather case in my hand, but my innate obstinacy prevented my acting impulsively. Instead, I extracted the contents and pushed them down the side of my right boot between leather and sock, and dropped the wallet into the gutter. I knew this was a ridiculous step to take; I knew that if I told the story later few would believe me and that those who did would express doubts regarding the state of my mind, but the warnings had been spontaneous in every instance and sounded genuine, and sincere.

"Who was the lady in black? What did the sentence in red ink mean? Why was the melody a dangerous one to play? Was it German—or Russian—or . . . No, dash it, I would keep the papers until the next day."

My interest in the stranger's story was aroused. My eyes must

A COMPLETE HOLIDAY SHORT STORY

have shown this, as my companion touching my arm said, in an appealing tone: "You do believe me, do you not?"

I nodded affirmatively. I refrained from speaking, anxious not to interrupt his narrative.

"By this time, lost in thought and walking quickly, I had strayed beyond the busy portion of the thoroughfare and found myself in a network of small side streets. I must have turned off the boulevard and had not the slightest notion in what direction my hotel lay.

"The luminous hands on my watch pointed to 11.20 p.m. A faint hum of traffic was audible in the distance, but in the street itself there was nobody of whom I could ask my way. Some seconds later I heard footsteps and in the dim light I saw a man running towards me. In the hope that my frail knowledge of the language could help me out of the difficulty I turned to meet him.

"A slight sound as of a footfall behind me attracted my attention and I swung round on my heels, but at the same moment something struck the back of my head. My knees gave under me, the street spun round and I remembered no more."

He glanced somewhat uneasily around him, then lowering his voice: "How long I remained unconscious, sir, I do not know, but I was disturbed by somebody who attempted to lift me and, opening my eyes, saw in a hazy mist an elderly gentleman with a beard. I also noticed that a large limousine car was drawing up against the kerb. With the help of the stranger I managed to scramble to my feet; my head ached violently and I clutched at his arm.

"I beg your pardon, it's very kind of you," I blurted out. My recollection of what had actually happened was still very vague. "You appear to have met with an accident," he said.

"I really do not know what happened." I felt more steady on my feet now and the facts were coming back to me.

"Have you been attacked?" Yes, that was it. The man running towards me and the footsteps behind me. My hands patted my clothes. It must have been robbery, yet my wad of

notes had not disappeared and my passport was still in my pocket. So far as I knew, nothing had been stolen from me. The wisest course was to return to the hotel. But where was it?

"Very many thanks, *mein Herr*," I said. "I am now feeling quite recovered. Am I far from the Majestic Palace Hotel?"

"Quite a good distance, but if you wish it I will drive you there; that is my auto. I saw you lying on the ground and got out to assist you." The man spoke English fluently but with the trace of a foreign accent. That word 'auto'! I had an idea, also, that he was not German. He helped me into the limousine and said a few words to the chauffeur as he stepped in.

"You still feel the shock, no doubt. It was probably an attack; since the revolution our streets are not so safe as they were. As it happens, my house is close by, in the next street. We can go there for a few minutes as you will wish to tidy your clothes. And perhaps a drink after your little adventure, eh?"

"I agreed, with a laugh. The car pulled up outside a large building a few moments later and my guide, leading the way, took me to the first floor letting himself in with his key.

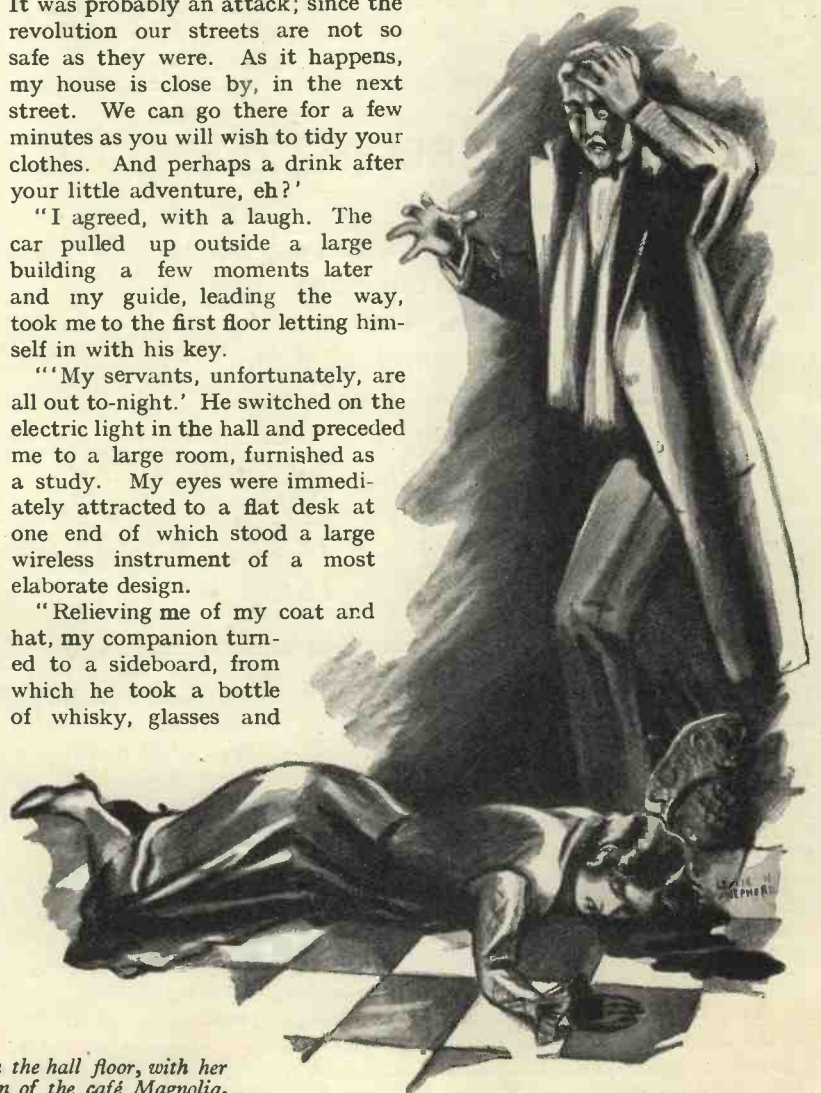
"My servants, unfortunately, are all out to-night." He switched on the electric light in the hall and preceded me to a large room, furnished as a study. My eyes were immediately attracted to a flat desk at one end of which stood a large wireless instrument of a most elaborate design.

"Relieving me of my coat and hat, my companion turned to a sideboard, from which he took a bottle of whisky, glasses and

some mineral water. 'A rest for a few minutes and what you English call a "pick-me-up" will do you good,' he said smiling. 'I have lived in London and am acquainted with your pet idioms.'

"Should I tell him all that happened? I was on the point of doing so when, for some unaccountable reason, I refrained and, accepting the proffered glass, drank to his health.

"Faintly, in the distance, I heard the front door of the house open and close again. My host rose from his chair. 'If you are ready,' he said, 'we. . . .' But he was interrupted. On the threshold of our room stood a thick-set man clad in evening clothes, possibly one of his servants. A few short sentences, which I



"There at my feet, in front of me on the hall floor, with her head in a pool of blood, lay the woman of the café Magnolia, the woman who had dropped the brown leather wallet."

UNTER DEN LINDEN—Continued

judged were not German, and the stranger again turned to me.

"If you will kindly excuse me for a few minutes, I am called to the telephone. I must leave you to your own devices, but if you care to listen. . . ." He walked to the radio receiver, switched it on, then going out, softly closed the door.

"Wireless telephony has interested me since broadcasting was introduced into Europe and such an invitation in a foreign country could not be ignored. I stepped to the table and picked up the headphones. Yes, Berlin was on. The tune played by the orchestra seemed familiar although . . . Why, of course, it recalled the melody the bandmaster had hummed and the piece Freddy's orchestra was playing. It was so difficult to remember, yet . . ."

His hesitation caused me to look up at him. His face had taken on a

was unable to gather what all the speech was about.

"Suddenly I heard the words repeated: *Polizei . . . Volowski . . . ermordert*. Surely, that last word meant murder. It sounded like one of our Scotland Yard S.O.S. calls or, perhaps, a news bulletin. Confound the noise and atmospherics. It was becoming interesting. If only I . . ."

"I took off the headphones. I had heard a door slam and the noise had resounded throughout the house. I listened, expecting my host to return as it seemed quite a long time since he had been called to the telephone."

He leant across the table, and his voice almost sank to a whisper. His mouth twitched nervously; the memory of his adventure appeared to cause him anguish.

"I could hear no other sound in the house. How my head ached! It

the position I was in. By Gad, it was clear. For some reason I had been brought purposely to the flat, in connection with the murder, and it was not mere chance which had made the stranger stumble across me.

"I need make no search; there was, of course, nobody in the house; the murderers had left when I heard the door slam. What a mess! There was only one way out; to get back to the hotel quickly before any alarm was raised. I could explain neither my presence in the house nor that of the murdered woman.

"Scrambling down the stairs I was out in the street in the space of a few seconds, but it was just as quiet as when I had left it. Not a passer-by. In the distance I espied a crawling taxi and ran to it. 'Majestic Palace Hotel,' I stammered, and added, 'drive like Hell.'

"My nerves are still badly jangled. Life in Berlin is somewhat beyond me. I, who thought that the brown leather wallet would give me a spice of adventure. My God."

His face positively frightened me; during the time he had related this story his features appeared to have undergone considerable change; the man had aged ten years or more. At the last word, he buried his head in his arms and his body shook with suppressed sobs. I leant towards him.

"If you would show me. . . ." I began.

"Yes, yes," he replied excitedly. "Perhaps you can help me. The melody and the red words on the paper will explain."

I got up from my seat and at that moment saw coming towards me, from the other side of the lounge, a middle-aged woman in nurse's uniform. She made for our corner. My companion nervously looked up, then, rapidly bending down, tore off one of his boots and shook it violently. With a yell he sprang up from his seat.

"The music, nurse. Save me, I've lost the papers."

The woman gently placed her hand on his shoulder as if to pacify him, then turning to me and touching her forehead with her forefinger, said in an undertone:

"I hope, sir, my patient has not been annoying you; he is quite harmless."

He followed her like a lamb!

THE WIRELESS ZOO

*Of all the insects men abhor
None can outdo the Broadcast Bore,
He is a ponderous bumble-bee
And hums and haws unceasingly:
He simply loves the Microphone;
He cannot leave the thing alone,
He likes to stand and drone away
Till "Turn it off!" his listeners say,
But, though he's always drivelling,
He never has been known to sting!*

LESLIE M. OYLER.

puzzled look. Obviously the events had affected his memory.

"Cannot you recall. . . ." I began.

"No, you see my head still ached; it does now. It was impossible to put these matters out of my mind. When the band ceased a few seconds later, a man started to speak. I could not catch all the words, but one, at least was quite clear; it was the name *Volowski*. Where had I seen it? Yes, it was on the scrap of paper in the leather wallet. The transmission was poor, even if I could have understood all the sentences, and I

was time to get back to the hotel; the stiff whiskey had not improved the pain. I picked up my hat and coat, hesitated a moment or so, then, with a framed excuse on my lips, I opened the door of the room.

"There, at my feet, in front of me on the hall floor, with her head in a pool of blood, lay the woman in black, the woman of the café *Magnolia*, the woman who had dropped the brown leather wallet.

"I gasped in horror as I leant over her; I had no doubt she was stone dead. A shout brought no one to my help. In one brief moment I realised

WHEN I put this question to one of the WIRELESS MAGAZINE staff he said: "Oh, I hope not. I hate pentodes." I believe many people feel rather the same about this class of valve; but, on the other hand, there is a fair sprinkling of enthusiasts who believe that it is only a matter of time before the pentode ousts the triode power valve completely.

Advantage of the Pentode

What are the advantages of the pentode? First and foremost, of course, there is the question of sensitivity. The fact that a pentode will provide a given power output with a smaller grid swing is well known, but it is interesting to make a simple calculation to find how much the difference is in a practical case.

We will take two valves made by the same firm, the Mazda P220/A, which is one of the latest 2-volt power valves, and the Mazda 230/Pen. These are reasonably comparable, despite the difference in filament

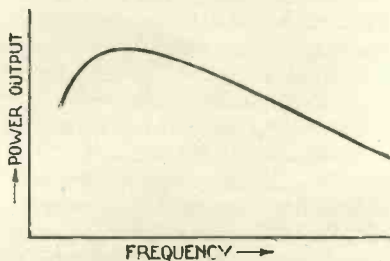


Fig. 1.—Falling-off in triode power output at high frequency

current, for the results of the analysis are very little altered if we take the Mazda P240, which takes even more filament current than the pentode.

The P220/A will deliver an output of 330 milliwatts with 150 volts on the anode, at 15 volts peak grid swing. The power output is proportional to the square of the grid swing, so that we may estimate the sensitivity as the milliwatts output divided by the square of the volts

input, which gives us $\frac{330}{225} = 1.46$.

The pentode valve, on the other hand, will deliver 350 milliwatts with 150 volts on the anode and 125 volts on the auxiliary grid with a grid swing of only $7\frac{1}{2}$ volts. Consequently, our sensitivity here is rather more than four times as much, being

$$\frac{56.5}{350} = 6.2$$

Is A Pentode Craze Coming?

By J. H. REYNER, B.Sc., A.M.I.E.E.

The pentode also makes a better use of the power supplied to it by the high-tension battery. Reverting to the examples just considered, the triode valve draws a current of 12 milliamperes from the battery when correctly biased with 15 volts at 150 volts on the anode. The anode power supplied by the battery is, therefore, 1.8 watts, while the available power output, as we have seen, is 330 milliwatts or .33 watt, giving an efficiency of 18.3 per cent. This is not at all a bad figure as valves go to-day, and with the 2-volt class it is good, the ratio of power used to power supplied often being as low as 10 per cent.

Such a state of affairs must obviously trouble any thinking man, and it is one of the strongest urges to the valve designer. The pentode gives him an opportunity of improving matters, for in the case just considered we have an output of 350 milliwatts, whereas the valve working under the conditions already stated would only take 9.5 milliamperes anode current.

Pentode Efficiency

This is an input of 1.42 watts as against an output of .35 watts, giving an efficiency of 24.6 per cent. This is low enough, in all conscience,

but it is distinctly better than in the case of the triode.

We have limited our discussion to 2-volt valves. The advantages of a pentode are even more striking in 6-volt or mains valves. It is not necessary to carry out further detailed comparison, but we may remark in passing that the Mullard 24B, which gives an output of 3 watts with 400 volts on the anode, operates at an efficiency of 37.5 per cent.

Anode Efficiency

In the higher powers such as this, however, the triode is able to put up quite a good comparative performance as far as anode efficiency is concerned, although, of course, it still requires more grid swing in order to load it fully.

"Yes," I hear you say, "but what about the quality?" Admittedly, if a pentode is used under the same conditions as are employed with a triode it will show up to a very poor advantage. This, however, is not a fair method of using the valve, because its internal mechanism and method of operation is entirely different.

Let us consider the two valves side by side. In the first place we will assume that a moving-iron loud-speaker is being used. The impedance of such a loud-speaker rises with the frequency. When we apply voltage to the grid of an output valve we cause it to generate power, some of which is wasted on the internal resistance of the valve, the remainder being usefully applied in operating the loud-speaker.

The maximum power in the output circuit is obtained when the loud-speaker impedance and the valve resistance are equal (we cannot use the valve in this condition because

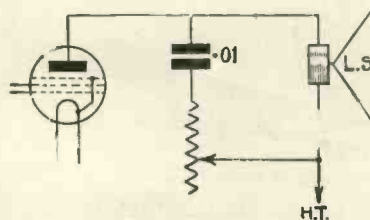


Fig. 2.—Circuit for limiting upper frequency response from pentode

IS A PENTODE CRAZE COMING?—Continued

it distorts, but we need not trouble with this point for the moment).

Suppose we match the valve to the loud-speaker at some frequency so that we obtain the maximum power output. As we raise the frequency the impedance of the loud-speaker increases. Consequently the power falls off, and it does so, in fact, almost proportionally as the loud-speaker impedance rises.

Falling-off of Output

Fig. 1 indicates the way in which the power output falls off, and it will be clear that at the upper frequencies the power supplied to the loud-speaker is much less than at the

lower ones, although we are still applying the same voltage to the grid.

As it happens, this condition is just what is wanted for the average loud-speaker, which requires more power in the bass in order to maintain a correct balance of tone. With a pentode, on the other hand, the power supplied varies very little with the load. This is because the peculiar characteristics of the pentode tend to maintain the anode current constant, whereas with triodes if we increase the external resistance the anode current naturally falls off.

The pentode therefore supplies too much power in the upper frequencies,

and this gives us a harsh and tinny effect often associated with these valves. It has been shown by Sowerby and others that this defect can be overcome by placing a correcting circuit consisting of a condenser and resistance across the loud-speaker or primary of the transformer, shown in Fig. 2. With this arrangement good balance of quality can be obtained with a pentode even when using a moving-iron loud-speaker.

Constant Current

With a moving-coil loud-speaker, on the other hand, we require a constant current through the coil at all frequencies. The impedance of the average moving coil is fairly constant over the lower and middle registers so that a triode will give this condition.

In the upper frequencies, however, the impedance rises very rapidly, and this produces nothing less than a complete cut-off of the upper frequencies when using a triode. With a pentode the current through the coil continues much the same as before, so that the high frequencies are properly in evidence.

Moreover, they are pure high frequencies and are not due to resonances. Many loud-speakers are deliberately arranged to have paper resonances in the upper frequencies to counteract the cut-off which is inevitable if the diaphragm is made really limp. Such a loud-speaker used with a pentode will again sound shrill, but if a proper soft cone is used a really sweet upper register will be obtained, full of attack and free from resonances.

Defects Overcome

The pentode has been with us two years or more now, and the earlier defects in construction and design have been overcome. The performance factor of the modern pentode is such as to command the attention of any designer.

Indeed, so much research has taken place on this subject that the pentode, hitherto considered a low-frequency valve pure and simple, is challenging the position of the screen-grid valve. Crossors have recently introduced a valve known as MS-Pen-A, which is a pentode on the lines of a screen-grid valve with the construction suitably arranged to minimise the internal capacity.

A RUNNING COMMENTARY!



WIFE: "Miss the train? Of course we shall miss the train! As usual, John, you leave everything till the last minute. You MUST tie up those dahlias; you MUST switch on for the weather forecast; you MUST just run round to say good-bye to your mother; and, of course, you MUST lose your collar stud. John, you're impossible."



New-style Auditions at Savoy Hill

CHECKING A RADIO PLAY AS IT IS BROADCAST

Members of the B.B.C. dramatic department at the dramatic control panel at Savoy Hill listening to a radio play as it is being broadcast. Various studios can be faded in and out as required

IN spite of twice-weekly visits for the past five years, I am afraid I still don't know my way about Savoy Hill!

Owing to the difficulty of finding space for all the new gear, the engineers are constantly changing their abodes and I have an ever-present dread that one day, when they have changed over the canteen and the echo room, I shall commit a ghastly *faux pas* before I discover the mistake! The other day, for instance, I hurriedly dashed into one of the rooms which I was sure belonged to a friend of mine on the engineering staff. He had moved.

In place of the office equipment was a weird contraption of buzzing wire and rotating drums, while on a big rack in the corner was a large power amplifier.

A Reminder

There was not time, then, to investigate and in the haste to find the right room I forgot this rather amazing discovery. A reminder was soon to come.

Later, I was chatting with an official of the talks department, and he asked me if I had noticed how much better the broadcast debates had been recently, in style if not in material. Honestly enough, I said that I never listened to these debates,

The B.B.C. engineers have now installed a talking-tape machine in one of the Savoy Hill offices and here Our Special Correspondent describes this apparatus, which is used for auditions and radio play rehearsals.

but that friends had remarked recently on a greater "naturalness"—not that the impromptu features of the debate were missing, but rather that the people taking part spoke as though they knew the limitations of their voices over the microphone.

"That's it," said "Talks," enthusiastically, "and soon you'll notice the same difference in the plays. We're using the Blattnerphone now, you know."

"The Blattnerphone?"

"The talking-tape machine—that German invention which our engineers at Clapham have been testing since the beginning of the year. It's the machine on which we recorded the *Empress of Britain* ship-to-shore talk, and which was used to 'bottle' the Derby running commentary."

Then I remembered. A friend at

the Clapham testing department had told me that one of Curt Stille's curious steel-tape recording machines had been sent along so that the B.B.C. could give it a try out. During the interim it had been kept very "hush-hush," and even the people who knew the rough principles of its operation were not quite sure of the details. And it was the tape machine which had been running in that little room on the second floor when I accidentally intruded.

The engineering sanctum was approached and permission obtained to see the talking-tape machine at work.

A special room is given to this new recording apparatus at Savoy Hill because of the immense amount of work which it has to do.

Practically every audition, they tell me, is now conducted with the recording machine. It can be connected up to any studio by 'phone line.

Permanent Recorder

When the Clapham engineers were carrying out their tests, the outside broadcast department, the audition officials and the talks and dramatic departments each realised how handy it would be to have a permanent recorder "on tap," as it were, and as it is not at present possible to have more than one machine it was decided to install it in a central place and let

NEW-STYLE AUDITIONS—Continued



CABARET BEHIND THE "MIKE"

This is what a cabaret performance from Hamburg studio looks like behind the "mike"

any department which wanted it connect up by means of special 'phone lines.

In case there are any readers who do not remember, from the description which was given some time back, what the talking-tape machine can do, I will explain.

Magnetic Impression

On a steel tape (wire was used in the earlier machines) which runs through the apparatus, a magnetic impression is made of speech or music which it is desired to record. When the tape is run back again through the machine the speech impression can be taken off it and the reproduction is every bit as good as that of a high-class gramophone recorder.

The recording is entirely magnetic—the steel tape running between magnet bobbins—and there is no appreciable change in the tape. The tape drums hold the speech impression almost indefinitely, and knocking and heating do not affect the magnetic record.

The B. B. C. engineers had an experimental Blattner machine down at Clapham and when they had carried out tests with this in order to get the purity satisfactory, and up to the usual B. B. C. standard, then a new machine was supplied to their order and was fitted in this little

course, at a constant speed—the tape passes through three separate sets of magnet bobbins.

It is here that the Blattnerphone secret exists. Many explanations have been given as to the way in which the magnetic recording is done, but here is the first accurate description.

The magnet bobbins in each set bear close down on the tape as it speeds past. A steady direct current is passed through the first set of bobbins, which saturates the tape in a magnetic field. A much smaller current is passed through the second set of bobbins in the reverse direction, and super-imposed on this is the speech current. The third set of bobbins is used for playing back. A standard B. B. C. type "B" amoli-

fier is used for putting the speech on the tape. The playback set of bobbins is connected to a separate amplifier when the bottled broadcast is to be given.

"We find this recording machine invaluable for auditions," said one of the men whose unfortunate job it is to try out new artistes. "Previously, we had a scheme whereby people who passed the audition tests were informed almost immediately that they would be put on the waiting list for an engagement or a contract, while the unlucky ones were not definitely told of their failure.

"This was diplomatic because we had no way of proving to unsuccessful audition people that they had a mode of delivery unsuited for broadcasting.

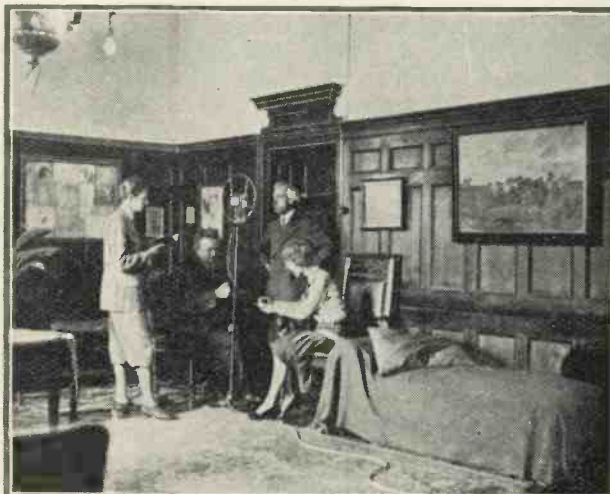
"Now, if there is any difficulty at all, we 'phone up the talking-tape room and have a record made. This can be played back immediately and heard on a loud-speaker in the studio so that the person up for the audition can see that our judgment is correct."

Immediate Playback

The advantage of the tape machine for this purpose is that an immediate playback can be obtained, which you can't do with a gramophone recorder, and also the same length of tape can be used over and over again, for once it runs past the saturating bobbins the previous speech impression is wiped off.

The talking-tape machine was first used, after its installation in Savoy Hill, by Bernard Shaw, and "G. B. S." played tricks with it!

The drums of the tape machine run for twenty minutes without a stop. "G. B. S." was timed to talk for twenty minutes, but he went on speaking for half an hour! Anyway, this tape record of part of "G. B. S.'s" impromptu speech will be cut, excerpts made from it, and used later in a "surprise" broadcast.



GERMAN BROADCASTING SCHOOL

At Munich there is a special school for radio artistes. Here is a group rehearsing before the microphone

Secrets of the B. B. C.'s post-bag are revealed in another special article on page 17

LET those who wish to follow me along this new experimental line (one that must lead to deductions of very considerable importance in the science of record reproduction) be first warned of two things:—

It can only relate to the use of pick-ups and not at all to the use of soundboxes on gramophones; also, the machine used for rotating the records must have its level so set that the centripetal force acting on the needle (the tendency for the needle to run towards the middle of the record) must be counteracted.

Position of the Needle

The level of the machine must be such that if the needle in the pick-up is placed on the middle of the plain rim of the record, it shall stay in that same position, although the record be rotating, not running off the edge on to the grooved portion.

In theory, all gramophones ought to be set in this way, but as a matter of fact the point in practice is not of much importance under ordinary reproducing conditions. However, for these experiments it is essential.



A dealer learning all about an H.M.V. radio gramophone at the Service School in the H.M.V. Dagenham factory

Wireless Magazine GRAMO-RADIO SECTION

FEATHERWEIGHT ON THE NEEDLE

By H. T. BARNETT, M.I.E.E.

Such a setting is quite easy to encompass; it is only necessary for the turntable to slope downward very slightly to the point where the needle is first put on the record.

I just have the latest Edison-Bell pick-up with attached arm; it is styled the Cinema model. The pick-up is a fairly heavy one, so I was surprised to find that by screwing up the counterweight spring I could take off the whole weight of both tonearm and pick-up, so that the whole combination would rise entirely clear of the record.

Lightest Possible Contact

This new quality suggested to me that it might be worth while trying to see whether the two or three ounces to which I ordinarily weight the needle (so great an improvement on heavier weighting) might not be reduced with advantage to such a small amount as should just bring the needle into the lightest possible contact with the record.

Of course, with the mechanical resistance of a soundbox diaphragm to be actuated by the needle, one could not expect featherweight contact to suffice, but in view of the tiny magnetic resistance to the movements of a pick-up reed, it seemed to me quite possible that the needle of a pick-up should remain truly in the groove, even with the heaviest recordings, once it had been put there.

I fitted the pick-up and arm to my motor board, easily finding a position for very perfect track alignment. Then I put on the turntable the most vigorous record in my stock.

Now I released the counterweight tension spring until the pick-up would just fall, the apparent weight of the pick-up with a Columbia soft tone needle in it being then so slight that it was impossible to estimate it by touch.

On starting the motor, I was delighted to find that, although sur-

face noise was entirely negligible, nevertheless the reproduction was as full and as smooth—in some places smoother—than I used to get from the record under my ordinary needle weighting.

The record ran through its points of least perfect track alignment and its climax of terrific tone, giving the smoothest and best reproduction I had ever heard.

By three increments I then increased the needle weighting to three ounces; each addition to weight increased surface noise and decreased the smoothness of the reproduction.

Revolutionary Results

Now obviously I had arrived at a new condition of things that demanded on the score of quality alone an overhauling of established ideas. With the almost entire abolition of friction between the needle and the record, it occurred to me that the needle question might become greatly modified and possibly also simplified.

I took a quite new record from my stock and, again setting the counterspring to featherweight, I put a Columbia soft-tone needle in the pick-up and I played the first

FEATHERWEIGHT ON THE NEEDLE—Continued

inch of the recording width for a quarter of an hour continuously with the same needle.

At the end of this time, examining the needle under a powerful magnifier, it was seen to be substantially new. Then I took two more of the same needles and used

surface noise and smoother reproduction than the new part; there was a vocal part in the music and it was in this that the slight difference caused by burnishing out microscopic manufacturing roughnesses could best be heard.

This new Edison-Bell pick-up

and arm and Columbia soft-tone needles, undoubtedly they should adopt featherweighting the needle, as standard practice, but there is a lot of work yet to be done on the subject; there are many questions to be answered.

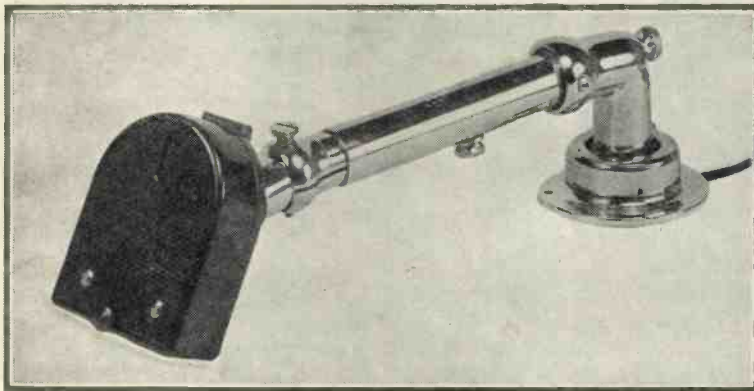
Important Questions

I think the most important question is whether the same practice is equally advantageous with the Limit, the B.T.H., and other pick-ups; should the ordinary loud-tone needle be treated in the same way; is the life of the fibre needle (or other needle of the kind) increased, its tendency to break down lessened, and its reproduction rendered less smudgy; will the Tungstyle needle still tear up a record; can needles of new substances be used advantageously; should 50 degrees still remain the favoured needle angle?

Further Experiments

I am greatly interested in the outcome of the experiments that must be made (I hope I shall not be the only one working and that I may hear from others who are), and I shall plug along steadily until the whole subject is thrashed out; therefore, I say this article is

(To be continued)



This is the new Edison Bell pick-up; it is known as the Cinema model and costs £1 10s.

each of them for half an hour on the same inch width of recording.

At the end of the test, examination of the needles showed the merest fraction of the actual point worn away from each, with no suspicion of shouldering. Examination of the record showed not the faintest sign of wear.

On playing the record right through the used portion gave less

happens to be the best for vocal reproduction I ever heard, the *s*, the *ch*, and the *sh* being notably clean and definite, also in proportion to tone volume and with all needle weightings the surface noise is very small.

The conclusion already to be drawn from this work so far as it has gone is that for those who use

OF all the kinds of classical music best suited for reproduction electrically, and particularly for playing to mixed audiences, I have no doubt whatever that the pianoforte concerto stands first favourite.

I say "for reproduction electrically," thinking particularly of those units comprising moving-coil loud-speakers, because there is such an enormous difference in piano tone as given out by such a loud-speaker and by the best mechanical gramophone in the world.

Priceless Work

On the May Parlophone list there is a priceless work of this kind, a star performance at strictly ordinary price: *Pianoforte Concerto No. 1 (Chopin)*. The first movement is on three 10-in. discs at 3s. each and the remaining two movements are each on a 12-in. disc at 4s. 6d., thus making the price of the

PIANO CONCERTOS

complete piano concerto only 18s.

The soloist is Moriz Rosenthal, playing with the Berlin Opera House Orchestra, under Dr. Weissmann.

Rosenthal's work is both brilliant and temperamental, and he obtains in places some effects of *touch* that never came through to me from a record before.

I suppose one ought to expect that from a pupil of Liszt, but I am quite sure I should not have been able to visualise exactly *what the pianist's fingers were doing* had not the recording been by Parlophone, who in their work, in my opinion, again reassert the lead they have taken during the past year and a half in putting on to a record the

absolute tone of a magnificent and not "underfelt" piano, as well as those unexplainable delicacies of tone, quality of attack, of tone volume, and of those lots of other things comprised in the word "touch."

In the June Broadcast bulletin, on two discs at 2s. each, we have the first movement of Schumann's *Pianoforte Concerto in A Minor* (Op. 54).

When we had their *Saint-Saëns' Concerto* not so long ago (I hope everybody bought it), I thought the limit of perfection in recording percussion tone volume had been reached with the fine Broadcast ten-twelve groove.

Better Tone and Volume

I was wrong; the new concerto is just a little better, both in tone volume, and also in the roundness of the piano tone. H.T.B.

Choosing Your Records

Sacred Music

(a) He Shall Feed His Flock, (b) I Know that My Redeemer Liveth, Frank Nichols, boy soprano, with organ in St. Mary-le-Bow Church, 2s. BRDCST 5236

Boys are not really ideal singers of oratorio, but this one has points. The singing is slow and stodgy. I cannot honestly recommend it as a rendition of Handel.

Classical Orchestral Music

★(a) Symphony No. 2 in D Major, op. 36 (Beethoven), Vienna Philharmonic Orch. (d.s.), 4s. 6d. (four records). H.M.V. C2030-3

A detailed review of the Symphony is manifestly impossible here. Kraus is the conductor. The rendering is clear and reasonable. It is certainly an album to acquire if you have not heard the second Symphony and if you know the Symphony you will enjoy this particular rendering.

Organ Music

Fantasia and Fugue in C Minor (Bach), organ, W. G. Alcock, M.V.O. (d.s.), 4s. 6d. H.M.V. C2005

I have listened to this with pleasure, but I feel Dr. Alcock's registration is not good enough. He does not bring out the sub-



DR. ALCOCK

ject of the fugue clearly enough for my liking. But we all play it differently. His pace is a bit stodgy, but that, again, is a matter of opinion, I suppose.

Piano Solos

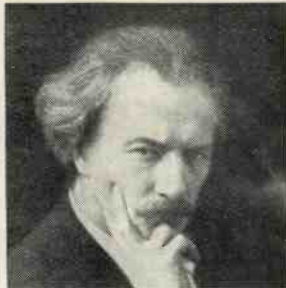
(a) Mazurka in C Sharp Minor, Op. 63; Mazurka in F, Op. 68 (Chopin); Mazurka in G, Op. 50, Mazurka in C, Op. 67, (Chopin), Niedzielski, with piano, 3s. H.M.V. B3550

For my personal taste his tone is far too hard and virile for

Here are reviews of the latest releases by WHITAKER-WILSON, the "W.M." Music Critic. Read them carefully before buying your next batch of records. Outstanding records are indicated by an asterisk (★) against the title.

Chopin; on the other hand, he has a following and is entitled to respect. The recording is excellent, but the piano leaves much to be desired. That, of course, may be his fault; I cannot say for certain.

(a) Minstrels, (b) Wind in the Plain (Debussy), piano, Ignace Jan Paderewski, 6s. H.M.V. DA1173



PADEREWSKI

Two of the most delightful works of Debussy. Paderewski is far too heavy in his louder passages; at least I think Debussy would have said so. However, Paderewski's opinion is entitled to some respect.

(a) Walkin' My Baby Back Home, (b) Stand Up and Sing, Claude Ivy, 1s. 6d. DEC F2327

Both are played on a piano. I do not see much object in the record, but the playing is quite good.

Light Orchestral Music

(a) Berenice, (b) Eugen Onegin, Hastings Municipal Orch. 2s. 6d. DEC K578

Two very pleasant works; they make good light orchestral music. Both are, of course, well known.

★From Offenbach's Sample Box, Marek Weber and His



MAREK WEBER

Orch. (d.s.), 4s. 6d. H.M.V. C2208

A bit of mixture, but quite pleasant as light orchestral music. It does not greatly appeal to me in the musical sense, but it will, I feel sure, be quite a good seller.

(a) Good Friends, (b) When the Guards Are on Parade, Lew Sylva's Band, 1s. BRDCST 719

(b) has some drilling patter preceding it. Both are martial in character, (a) being a six-eight one-step and (b) a novelty quick-step.

(a) Irish Melodies, (b) Welsh Fantasia, both played by Carlos Ames, harp solo, 1s. 6d. PIC 761

Commendable on account of their not being too hackneyed. Still it is another medley!

(a) It Would Be Wonderful (b) Good-bye, Rolando and his blue Salon Orch., 1s. 6d. WIN 5273

This record has a good surface and tone. (b), by the way, is not "to Summer!" Both sides are excerpts from *White Horse Inn*.

★Morning, Noon and Night, overture, Athenaeum Symphony Orch., (d.s.), 1s. 6d. PIC 760

By Suppé. Makes an excellent light orchestral record.

★(a) Selection of Waltzes, (b) Intermezzo Selection, Charles Ancliffe and his Orch., 2s. BRDCST 5239

This makes very acceptable light orchestral music, the recording of which is beyond reproach. (b) is especially good.

★Welsh Rhapsody, London Symphony Orch., (d.s.), 6s. 6d. H.M.V. D1939-40

This beautiful work, of quite a light type, is very well treated here. It should be very popular.

(a) White Horse Inn, (b) Wonder Bar, Peggy Cochran, piano, with Dance Band, 1s. 6d. BRDCST 3054

Both are selections and very good ones. I am not very keen on them in this particular form, but they are not amiss by any means.

Light Opera & Songs

(a) And Then, We Won't Go Home, (b) Tripper's Lullaby, Florrie Forde, with orch., 1s. 3d. IMP 2491

Quite good, but not thrilling. I am of opinion, more and more, that these songs are not good enough. Our light music is

getting worse. Nothing humorous in the funny records; nothing arresting in the sentimental records. Yet the production is improving each month. Something is wrong somewhere!

Around the Coast with Lawrence Wright, Million Airs, (d.s.), 1s. 6d. DEC F2335

I don't know what to make of this. You must hear it for yourself. It contains some of the worst orchestral playing I have ever heard. The singers are moderately good.

★Belle of New York, soloists, chorus and orch. (d.s.), 1s. 6d. BRDCST 3053

Quite worth hearing. It is very well done and a change from the modern type of production.

(a) Beneath the Window of My Love, Richard Terelli, ten., with London Concert Orch., (b) Love, What Has Given You This Magic Power? Stiles Allen and Richard Terelli, with London Concert Orch., 1s. 6d. WIN 5278

This is the third disc I have just listened to from *Land of Smiles*. This time, however, the vocalists are not the same and the effect is better. Stiles Allen, though not perfect when recorded, is always worth listening to.

(a) By a Lazy Country Lane, (b) There's Only One Love, Billy Scott-Coomber, with orch., 1s. 3d. IMP 2488

Not bad songs, but nothing very wonderful about either of



BILLY SCOTT-COOMBER

them. I wish someone would act as song censor! We sadly need a *Musicalotini*!

(a) Carry Me Back to the Mountains, (b) Oklahoma Charlie, Bud Billings and Carson Robison, with orch., 2s. 6d. ZONO 5900

Very effective. Both songs are well sung in duet, the voices blending. The "darky" atmosphere is as strong as it is pleasant.

★(a) Court Serenade, (b) Marie, Marie (Roland) Comedy Harmonists, with piano, 3s. H.M.V. B3862

Very entertaining. The singing on both sides is smart and expressive at the same time. A very enjoyable record.

★(a) Crocodile, (b) Richard of Taunton Dene, Norman

CHOOSING YOUR RECORDS—Continued

Allin and chorus, with piano, 3s. COL DB492

These songs are well known and of excellent type. Allin's voice is admirable and the baritones who help him are equally good. Well worth having.

Drury Lane Memories, Regal Cinema Orch. (d.s.), 4s. 6d. COL DX247

Of the *Ol' Man River* type. Very well done and for what it is, makes a good disc.

(a) **Fourteen Rollicking Sailors, (b) Tell England**, both sung by Fred Walmesley, with orch., 1s. 3d. IMP 2477
The patter preceding (a) is



FRED WALMESLEY

rather poor stuff and the song is not up to much; (b) is preferable in my view. There is a martial strain that may find response in many listeners. It is worth hearing, at all events.

(a) **Goodnight, Sweetheart, (b) You are My Heart's Delight**, Jack Gordon with orch., 1s. 3d. IMP 2487

The usual sentimental stuff, but not amiss in many respects. I thought the day for this exact model of song had passed. Apparently not.

★(a) **I Miss a Little Miss (f.), (b) Oklahoma, (f.)**, G. H. Elliott, with orch., 1s. RAD 1498

Always good, he is here at his best. Ask to hear this record; I think it will please you; (b) is very attractive.

★**Irving Berlin's Famous Waltz Songs, Gwen Henry and Sam Browne**, with Harry Hudson's Melody Men (d.s.), 2s. WIN L5288
The singing is none too good, but much better than much of what I have recently heard. The band is excellent.

(a) **Kathleen Mavourneen, (b) Killarney, Terence O'Brien**, ten., with orch., 2s. BRDCST 5237

Very good—if you want them!

(a) **Let's Get Friendly, Betty Warren and Roy Barbour, (b) Bubbling Over with Love, Betty Warren and Alec Kellaway**, 1s. 3d. IMP 2478

(a) begins with a certain amount of patter; both songs have a certain attraction about them, but they are the type that tends to pall rather quickly.

★**Merry Widow, Savoy Light Opera Singers and Players (d.s.)**, 2s. WIN L5289

Very good indeed and worth having.

(a) **My Brother Makes the Noises for the Talkies, (b) I'm Happy when I'm Hiking**, Albert Whelan, 1s. 3d. IMP 2490

Fairly good. Neither song has anything clever about it. I feel I cannot recommend anything that has not good words. The tunes are quite respectable, but what is the use of that? Fifty per cent., perhaps more, depend on clever lyrics. This is an age of mediocrity in this respect.

(a) **My Canary Has Circles Under His Eyes, (b) Alone and Afraid**, Elsie Carlisle, with orch., 1s. 3d. IMP 2489

A typical Carlisle record. Her



ELSIE CARLISLE

voice is as atrocious as ever it was, but I suppose she has an appeal. Personally I suffer tortures when I hear her! I mean no offence, but I loathe this style of singing so much that I cannot be honest and polite at the same time. Nothing vulgar, though. I congratulate Miss Carlisle on that.

★(a) **O Lord Send Us the Sunshine (f.), (b) River Stay 'Way From My Door (f.)**, Marcus Browning and His Black Diamonds, 1s. 6d. WIN 5270

Admirable recording makes this an outstanding disc; also very pleasant singing. The songs are, of course, well known. The chorus work is very effective.

★(a) **O Lord, Send Us the Sunshine, (b) River, Stay 'Way From My Door**, Norman Blair, bar., with orch., 2s. 6d. ZONO 5896

A nice voice, with a soft, appealing tone. He sings these admirably, (b) is very attractive and this is about the best version I have heard of it.

On with the Show, 1931, Marius Winter's Carlton Orch. (d.s.), 1s. 3d. IMP 2474

This contains many pieces that were recently novelties. It is fairly well produced, but I am not impressed with much of it. There is a lack of freshness, or is it that I am tired of its contents?

(a) **Patiently Smiling, Peter Baust, ten., with orch., (b) Love, What Has Given You This Magic Power**, Peter Baust, ten., Leonie Burgerstein, sop., 1s. 6d. WIN 5276

Both from *Land of Smiles*, the former for tenor alone, the latter a duet with soprano. Her notes seem overblown to me and the whole rendition is a trifle

smudgy. I think it is worth doing again.

Phillp Ridgeway Takes "His Parade" to the Seaside (d.s.), 1s. 3d. IMP 2493

I hope next summer he will leave it at home and lock it up. It is boring to the last degree. Come on, Imperial! Let us have something with a trace of refinement in it. Your chorus is good; your patter is appalling. You can do better than this. Try!

★(a) **Reaching for the Moon (w.), (b) Lady of Spain**, Rhythmic Eight, dance orch., 2s. 6d. ZONO 5906

An outstanding dance disc. The rhythmic qualities of the orchestra are most noticeable. I have enjoyed both sides immensely.

(a) **River, Stay 'Way From My Door, (b) Songs I Heard on Mother's Knee**, Billy Elliott, with orch., 1s. 3d. IMP 2498

His singing is too detached for my personal pleasure, but he is expressive. I do not dislike the music; (b) is well known and fairly well rendered. Not an outstanding record by any means.

(a) **Run Away From Me, Arthur Margetson, (b) For All or Nothing**, Olga Lindo and Arthur Margetson, 1s. 6d. DEC F2326

(a) Margetson alone. (b) a duet. He makes some attempt at singing; she sings about one note in ten; (a) contains some rather good imitations of George Graves and Robey. Quite good.

★(a) **Seaside Jollities (1931)**, Million-Airs (d.s.), 1s. 6d. DEC F2321

The singing here is very good. I like the record very much. It contains well-known songs, but they are well sung and that is a great deal in records of this kind.

(a) **Shake and Let Us Be Friends, (b) Smile Song**, Florrie Forde, with orch., 1s. 3d. IMP 2500

These are the type of songs I feel irritable enough to try to discourage. The words are absolute tosh and the music cannot be expected to be anything else. Where are our lyric writers?

★(a) **Share My Umbrella (f.), You'll be Mine in Apple Blossom Time (f.)**, Eddie Gross-Bart and His Cafe Anglais Band, 1s. 6d. WIN 5272

(a) A very good tune; that is why I have starred the disc, but I have no hesitation in saying that the singer is atrocious. I



DENNIS NOBLE

have no use for men (or women either) who half sing, half speak. Eddie Gross-Bart wants lessons badly!

(a) **Slu-Foot Lou, (b) Wild and Woolly West**, Frankie Marvin, with violin and guitars, 2s. 6d. ZONO 5898

This is moderately good. The singing is not very attractive to me, having just listened to Norman Blair and Foster Richardson. Marvin makes poor comparison.

(a) **So We'll Go No More A-Roving, (b) Devout Lover**, both by Dennis Noble, bar., with piano, 4s. 6d. COL DX248

His is a very good recording voice. The voice is better than the songs in both cases, but the record is worth hearing; so one may think it worth buying.

Songs of Old Erin, Maestros, quintette, with orch. (d.s.), 4s. 6d. COL DX232

A medley of the *Minstrel Boy* type. The harmonised effects are good and the voices excellent. I loathe the medleys, but recommend this one to anybody who can stand them because its production is so excellent.

(a) **Soul of the Violets, Sylvia Cecil, with orch. (b) Pretty Kitty Kelly**, Alec Kellaway, with orch., 1s. 3d. IMP 2476

His voice, on the deeper side, records very well in (b), which I happen to have put on first. Miss Cecil, in (a), is not perfect in the matter of clarity of diction. It is not easy to catch her words. The songs are of the usual light type, with nothing very special about them.

(a) **Tread on the Tail of My Coat, (b) Biddy Mulligan**, Tony Reddin, 1s. 3d. IMP 2471

Tony, what have you done to your voice? Take some lessons and then do these attractive songs all over again!

★(a) **Trepak, (b) Merry Butter-week**, Theodore Chaliapine,



CHALIAPINE

bass, with chorus and orch., 8s. 6d. H.M.V. DB1511

A fine record. Chaliapine's admirers will do well to acquire this. His superb phrasing and expression are worth studying closely. His power of sustaining long phrases is really thrilling. A magnificent piece of singing.

Vagabond King, London Light Opera Company (d.s.), 1s. RAD 1494

Not too impressed by this. I do not like the solo voices; the man is better than his companion.

SPECIAL REVIEWS BY WHITAKER-WILSON

- ★(a) Vagabond of the Sea, (b) Drink, Brothers, Drink, Foster Richardson, with orch., 2s. 6d. ZONO 5895

His voice is admirably suited for microphone work. Both songs are well known. If I have any criticism to pass on his singing it is to suggest that, in his laudable effort to make his diction perfect, he is inclined to sing in a *stacca'o* manner. A little more smooth tone would improve him. The record, however, is good.

- ★(a) Walkin' My Baby Back Home, (b) Reaching for the Moon, Bob and Alf Pearson, with piano, 1s. 6d.

BRDSCST 3052

Quite one of their best. They are usually worth hearing; here they are excellent.

- (a) Walking My Baby Back Home, Maurice Chevalier, bar., with orch., (b) Hello, Beautiful, Maurice Chevalier, 3s. H.M.V. B3845



MAURICE CHEVALIER

His popularity amazes me. It must be his smile; it is certainly not his voice, which is atrocious.

- ★White Horse Inn, Gandino and his orch. (d.s.), 1s. 3d. IMP 2485

This is well done and the music is quite attractive. It is a selection, of course. Some of the numbers are well worth hearing.

- ★(a) White Horse Inn, Greta Hoffman, Richard Terelli, Kate Muller, Henry Upston, with London Concert Orch. (d.s.), 1s. 6d. WIN 5281

This is really excellently produced in every way. The music is quite attractive, though not inspired by any manner of means. Still, the record is one that I believe will appeal to many people.

- ★(a) White Horse Inn, (b) In Salzkammergut, Greta Hoffman, sop., with London Concert Orch., 1s. 6d. WIN 5279

These discs are all worth hearing. I suggest you make a note of the numbers of these Edison Bell records in this section and choose what appeals to you most. They are certainly good.

- (a) You Are My Heart's Delight, Peter Baust, ten., with orch., (b) Cup of Tea with You, Peter Baust and Leonie Burgerstein, ten. and sop., with orch., 1s. 6d. WIN 5277

From *Land of Smiles*. The same remark applies here as to the other disc from the same production. The music seems attractive, but the rendition not crystal-clear. I am a little disappointed.

- ★(a) You Are My Heart's Delight, (b) Patiently Smiling, Richard Terelli, ten., London Concert Orch., 1s. 6d. WIN 5280

Quite worth hearing. Looking at the batch of Edison Bell as a whole, I think congratulations are due to the firm for a very acceptable issue. They are all worth getting.

Military Bands

- ★Faust, Band of H.M. Welsh Guards (d.s.), 2s. BRDSCST 5238

Excellent. Those who want a good military band record should ask for this.

- (a) Medley of British Songs, (b) Le Reve Passe, Band of H.M. Welsh Guards, 1s. 6d. BRDSCST 3056

Quite good in production, but a trifle boring to listen to all the same.

- ★Tales of Hoffman, selection, Band of H.M. Coldstream Guards (d.s.), 4s. 6d. H.M.V. C2092

An admirable military band arrangement for which I have every respect. The Coldstreams are always worth hearing; here they are at their best.

- ★(a) Turkish Patrol, (b) Marche Militaire, Band of the Honourable Artillery Company, 1s. 6d. PIC 759

An excellent military band record. (a) is especially well done. I sincerely recommend it.

- ★(a) When the Guards are on Parade, (b) Shake and Let Us be Friends (f.), both played by H.M. Royal Horse Guards, 1s. 3d. IMP 2479

A very military military band record with a certain amount of sung matter. Lovers of this type of light music would do well to acquire this excellent disc.

Spoken Records

- ★(a) Dawn on the Irish Coast, (b) St. Patrick's Day in Exile, Tony Reddin and the Provincial Players, 1s. 3d. IMP 2472

Quite atmospheric. A pleasant Irish recitation to incidental music. I have heard worse, I must admit. Irish readers, please note.

- Khaki Memories (d.s.), 1s. 6d. WIN 5282

The title is enough.

- (a) Stone Outside Dan Murphy's Door, (b) St. Patrick's Day in Exile, Tony Reddin and the Provincial Players, 1s. 3d. IMP 2473

Pleasantly Irish. There is nothing in the patter that is really funny, but the Irish brogue has an attraction about it.

Humorous Records

- (a) Butcher's Boy, Billy Lan-
cet, boy com., with Butcher

and Betty (d.s.), 1s.

BRDSCST 712

Quite good, but not a "scream" by any means. The patter has decided points—in some places it is quite clever. Ask to hear it.

- Cleely Courtneidge Plonks Her Guitar (d.s.), 1s. 6d. WIN 5275

You must hear this and judge it for yourself. It is supposed to be humorous; it merely bored me. The song is no better than the patter, which is, in my opinion, pure rubbish.

- (a) Girls of the Old Brigade, (b) Sh! There's a Ghost in the House, Charlie Higgins, com., with orch., 1s. BRDSCST 713

Moderate only. Nothing really funny on either side. The whole thing seems to me to be a trifle strained and forced.

- (a) In My Bell Bottom Trousers, (b) Oh! Sailor Behave, Albert Whelan, with orch., 1s. 3d. IMP 2499

Of these two (b) is the better, but neither is worth hearing. The words are nonsense, though the music is passable. My poor humorous column!



CHARLES PENROSE

- Laughing Policeman's Sweep-stake, Charles Penrose, Kaye Connor, and Company with piano (d.s.), 3s. COL DB493

There are two sides of it and most of it in the laughing. When the first laughing record came out we all laughed. This sort of thing can be overdone. If you have never heard a laughing record (I congratulate you if it is so), buy this one. Then give it away to someone you do not like but have to be nice to!



KAYE CONNOR

- ★(a) Louisa from Plsa, (b) I'm Millie, a Messy Old Mermaid, Douglas Byng, with orch., 1s. 6d. BRDSCST 3051

(b) is very original. The reminiscences of Millie are quite entertaining. I like *Louisa from*

Pisa quite as well. A very entertaining record.

- (a) Old-time Song Medley, (b) River, Stay 'Way From My Door, Sandy Powell's Mouth Organ Band, 1s. BRDSCST 716

This is a classic, and no mistake. Ask to hear it and if you



SANDY POWELL

can endure it, buy two copies, one for yourself and one for your bitterest enemy!

- (a) 'Ops, (b) Barrers in the Walworth Road, Will Deller, com., with piano, 1s. 6d. PIC 763

The most unutterable rubbish I have listened to for long enough. Piccadilly, recall it and melt it down; it is boring in the extreme. Sorry, but I must be honest!

- ★(a) Referee, (b) Bonnie Leezie Lindsay, Sir Harry Lauder, com., with orch., 3s. 6d. ZONO G0102

Very characteristic and delightfully humorous. The patter is well up to standard and the tunes the sort we have learned to expect from him.

- ★(a) We Won't Go Home Till Morning, (b) Tell England, Bobbie Comber, com., with orch., 1s. BRDSCST 714

Tell England is very good. If you have not heard it, I suggest you buy this at once.

Dance Music

- ★(a) Bells of Normandy (w.), (b) Parade of the Minutes (f.), Harry Hudson's Melody Men, 1s. RAD 1493

(a) is very attractive. So is (b), but I have heard too many versions recently to be attracted by it.

- ★(a) Blue Lagoon (w.), (b) Under the Spell of Your Kiss (f.), Phantom Players, 1s. 6d. DEC F2306

They are excellent. I do not remember having heard them before. They are very pleasing.

- ★(a) By the River Sainte Marie (f.), (b) When I Take My Sugar to Tea (f.), Jack Hylton and his Orch., 3s. H.M.V. B6016

Admirably produced. I recommend this as one of the best dance discs to which I have listened for a long time.

- (a) Darling, I'm Longing to Greet You (f.), Good Friends, Percy Chandler and his Band, 1s. 6d. PIC 769

A useful dance record. Both sides are well done and the tone of the band is good.

CHOOSING YOUR RECORDS—Continued

(a) Good Friends (f.), Jay Wilbur and his Band, (b) Blue Again, (f.), Buddy Blue and his Texans, rs. 3d. **IMP 2459**

These two make an interesting comparison in tone. Wilbur is likely to reach farther in a dance room; Buddy Blue is more reserved. Both works are too well known to need description.

★(a) Good Friends, (f), Million-airs, (b) Let's Get Friendly (f.) Blue Lyres, rs. 6d. **DEC F2313**

Very good for dancing. Both are fox-trots and excellently sung. An outstanding dance disc.

★(a) Hawaiian Stars Are Gleaming, (b) O Cara Mia, Sevilla Serenaders, rs. 3d. **IMP 2480**

Yes, very nice! Quite an appealing atmosphere about it. Ask to hear it.

★(a) Hawaiian Stars Are Gleaming, (b) Pasadena Rose Val Rosing and Jack Burnaby, with Hawaiian acc., rs. **BRDCST 715**

Both are rather sentimental, but quite attractive. The production is excellent and the Hawaiian accompaniment singularly effective. A very good little disc.

(a) If You Can't Sing, Whistle (f.), (b) Were You Sincere? (f.) Vic Filmer and his Murray's Club Band, rs. 6d. **PIC 771**

This is a good band and the rendering acceptable for dance purposes. In (b) the singers are not very good; the harmonies sound out of tune to me.

★(a) It Must Be True (f.), (b) I Surrender, Dear (f.), Lou Gold and his Orch., rs. 3d. **IMP 2483**

A good orchestra. The record is worth having on that account.

★(a) Just Two Hearts and a Waltz Refrain (w.), (b) Would You Like to Take a Walk? (f.), Lou Gold and his Orch., rs. 3d. **IMP 2482**

Lou Gold is worth hearing. The tone of his orchestra is good. Recommended on that account!

★(a) Koppa-Ka-Banna, (b) When It's Sunset on the Nile (w.), Lew Sylva and his Band, rs. **BRDCST 718**

Very effective, (b) especially. The recording is really excellent. This record is worth more than a shilling.

★(a) Lady, Play Your Mandoline (f.), Under the Roofs of Paris (w.), Radio Melody Boys, rs. **RAD 1495**

Another outstanding disc. The Radio Boys are better than ever, which is saying a great deal.

★(a) Laughing at the Rain (f.), (b) Indiana Sweetheart (w.) Sam Browne, with Radio Melody Boys, rs. **RAD 1496**

Well worth getting; the recording is admirable. Both works are too familiar to need any description.

★(a) Laughing at the Rain (f.), (b) Oklahoma (f.), Blue Jays, rs. 6d. **WIN 5284**

Both have vocal refrains and

ABBREVIATIONS USED IN THESE PAGES

bar.	baritone	IMP	IMPERIAL
BRDCST	BROADCAST	orch.	orchestra
BRUNS	BRUNSWICK	PHONY	PHONOCORD
COL	COLUMBIA	PIC	PICCADILLY
com.	comedian	RAD	RADIO
con.	contralto	sop.	soprano
DEC	DECCA	ten.	tenor
d.s.	double-sided	w.	waltz
f.	fox-trot	WIN	WINNER
H.M.V.	HIS MASTER'S VOICE	ZONO	ZONOPHONE

both are well done. The Jays play admirably.

★(a) Lights of Paris, (b) Parade of the Minutes (f.), Jay Wilbur and his Orch., rs. 3d. **IMP 2481**

Both played excellently. A good dancing record.

(a) Love Song of Old Valencia, (b) Lady of Spain, Fred Knight, bar., with acc., rs. 6d. **PIC 762**



FRED KNIGHT

Quite well done, but I am tired of both songs. If you are not, you cannot do better than acquire this.

(a) Makin' Wicky Wacky Down in Waikiki, (b) Laughing at the Rain (f.), Jerry Hoey and his Orch., rs. 6d. **PIC 765**

Not very useful for dancing purposes, but pleasant enough



JERRY HOEY

to listen to. I refer to (a). The other side is rather overdone now.

★(a) Miss Elizabeth Brown (f.), (b) River, Stay 'Way From My Door (f.), Sam Nichol's Top-notchers, rs. 6d. **BRDCST 3059**

I need say nothing about these songs. The recording and the singing are good enough to make this an outstanding disc.

★(a) O Lord Send Us the Sunshine (f.), (b) River, Stay 'Way from My Door (f.), Radio Melody Boys, rs. **RAD 1487**

Quite an outstanding fox-trot record. Both sides are very

well done from the rhythmic point of view. The voice is also excellent.

★(a) Pretty Kitty Kelly (w.) (b) Bubbling over with Love, both played by Jack Payne and his B.B.C. Dance Orch., 3s. **COL CB277**

The waltz is quite effective; the one-step (b) is very good. The playing is well up to Jack's high standard. Quite a safe record.

(a) Pretty Kitty Kelly, (b) Ninety-nine Out of a Hundred, Eddie Gross-Bart and his Cafe Anglais Band, rs. 6d. **WIN 5286**

The playing is good; the singing not worth hearing. It seems a great pity that some good singers are not employed. These tunes are quite good enough to be sung decently and in a good vocal style.

★(a) Tango Lady, Blue Jays, (b) Ninety-nine Out of a Hundred, Blue Jays, rs. **RAD 1492**

(a) is very much overdone, but well done here. (b) is new to me; it is a very good tune. Excellent recording characterises this inexpensive disc. A shilling is very cheap for such workmanship.

★(a) Tango Lady, (b) Really Mine (w.) Percy Chandler and his Band, rs. 6d. **PIC 764**

A very good tango—one of the best I have heard, with pleasant counter-melodies to the voice. The waltz is by no means amiss.

(a) Tap Your Feet (f.), (b) High Life (f.), Spike Hughes and his Orch., rs. 6d. **DEC F2333**

Rather a "jazzy" band—too much so for me, I fear. Too many unpleasant noises for my taste. Still, if you want a jazz record, you cannot do better than buy this.

★(a) Ten Cents a Dance (f.) Jay Wilbur and his Band, (b) I'm Yours (f.), Clevelanders, rs. 3d. **IMP 2484**

Quite good. (b) is effective, especially. This is one of our best "record" bands.

(a) Wabash Moon (w.), (b) Good-night, Sweetheart (f.), Ferrachini's Hawaiian Band, rs. 6d. **BRDCST 3058**

(a) is a good tune. I am not deeply impressed with the band; the singing (in duet) is very fair.

(a) Walking My Baby Back Home (f.), Lou Gold and his Orch., (b) I Miss a Little Miss (f.) Jack Albin and his Hotel Pennsylvania Dance Orch., rs. 3d. **IMP 2460**

These two bands make a pleasant contrast in the matter of tone-production; Lou Gold is much more vibrant than Jack Albin, but both exhibit admir-

able rhythmic qualities. The music in either case is good. A very well balanced record.

★(a) Walking My Baby Back Home (f.), Ted Weems and his Orch., (b) By My Side (f.) Bert Lown and his Hotel Biltmore Orch., 3s. **H.M.V. B6005**

(a) The tone of this band is very appealing. (b) The tone here is also excellent. Both sides are quiet in effect. I recommend the disc as being outstanding from the tonal point of view.

★(a) Waltz You Saved For Me (w.), (b) I'm Happy When You're Happy (f.), both played by Jack Payne and his B.B.C. Dance Orch., 3s. **COL CB276**

Excellent. I prefer the fox-trot of the two. The words of the waltz are rot. Now Jack, read your lyrics more carefully. We look to you to keep up your high standard and no amount of your excellent playing will compensate for weak lyrics. Mind it does not happen again!

★(a) Wedding of the Garden Insects, (b) Tap Your Feet (f.), both played by Marius Winter's Carlton Orch., rs. 3d. **IMP 2475**

The words of (a) are rather amusing and the tune is a good one. Tap Your Feet is faster in movement and rather "jazzy," but quite entertaining.

★(a) When I take My Sugar to Tea (f.), (b) My Temptation, Waldorfians, rs. 6d. **PIC 766**

(a) Quite amusing. Again I recommend the disc for the tone of the band which, for dancing purposes, is admirable.

(a) With the Help of the Moon (f.), (b) It Looks Like Love (f.), Waldorfians, rs. 6d. **PIC 768**

(a) A pleasant fox-trot, though I prefer (b) in the matter of melody. Piccadilly's recording is improving. In these days of a high standard in this respect even from *mush*, see that the recording, like Caesar's wife, is above suspicion.

★(a) Would You Like to Take a Walk? (f.), (b) Bubbling Over with Love (f.), Sam Nichols' Top-notchers, rs. 6d. **BRDCST 3060**

Very good. Ideal for dancing and thoroughly vigorous in effect. I wish all dance records had as much spirit in them.

★(a) You Didn't Have to Tell Me (f.), (b) I Miss a Little Miss (f.), Jack Harris and his Grosvenor House Band, rs. 6d. **BRDCST 3057**

A very good dance record. This band is, of course, well known. Its highest standard is maintained here.

(a) Your Eyes (f.), (b) It Would Be Wonderful (f.), Jay Wilbur and his Band, rs. 3d. **IMP 2457**

I prefer (b) to (a), but both are good and very well rendered. (b) has an excellent melodic outline and rhythmic playing characterises both sides.

★(a) Your Eyes (f.), (b) You Too, (f.), Waldorfians, rs. 6d. **PIC 767**

Recommended for the tone of the players, which is extraordinarily good.

Your Mains Transformer

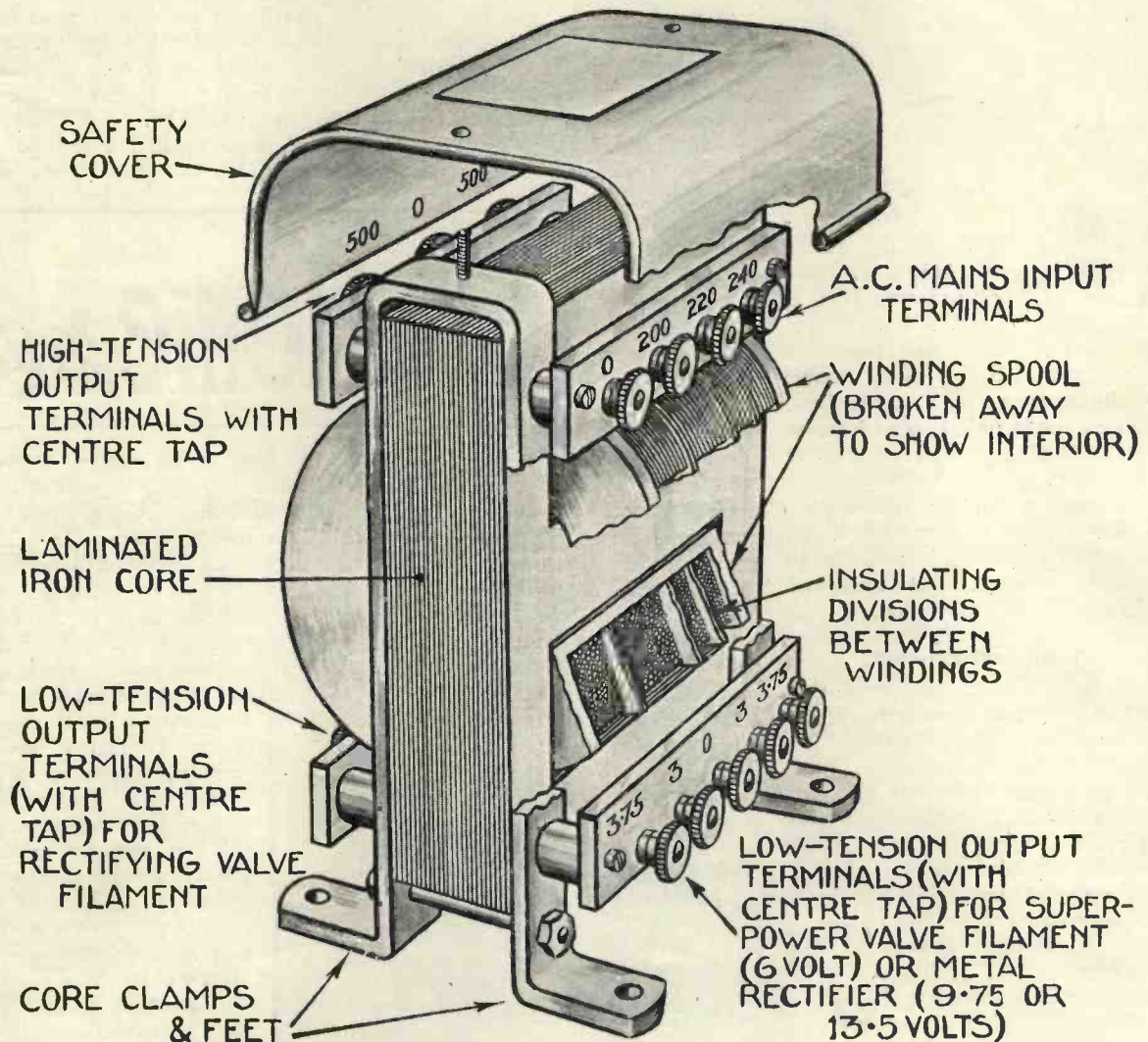
HOW IT IS CONSTRUCTED

HOW many listeners with all-electric sets realise what a vast amount of detail there is in the construction of a mains transformer with two or three windings? That the assembly is intricate is evident from the drawing reproduced on this page.

The transformer illustrated is a standard commercial model with three secondary windings—and a primary, of course. The primary is tapped so as to be suitable for use on 200-, 220-, or 240-volt A.C. mains. One

output (with a centre tap) for heating the filaments of a standard rectifying valve. The other winding gives 6 volts for running the filament of a super-power valve or 9.75 or 13.5 volts for supplying a metal rectifier. All these voltages are obtained from a single winding which is provided with a centre tap.

It will be realised that very great care has to be taken in the insulation of all these different windings in order to prevent short-circuits.



of the secondaries gives a high-voltage output and the other two windings give outputs at comparatively low voltages.

It will be seen that there are three terminals for the high-tension output, 500 volts each side of the centre tap. It will thus be evident that there is a potential difference of 1,000 volts between the two terminals marked "500."

Of the two low-tension windings one gives a 4-volt

This drawing will make it clear, moreover, that the assembly of a large mains transformer is quite a difficult job and this, combined with the cost of the large amount of wire and iron required for the core, accounts for what may be regarded as the high cost of such instruments.

As a matter of interest, it may be mentioned that the transformer illustrated is actually a type made by Varley, but of course similar instruments are produced by other firms.



At this time of the year, providing the eccentricities of our English summer permit, radio out of doors is one of the chief delights of the season. No garden, tennis club or even a punt on the river, seems complete unless some form of portable or transportable receiver is close handy.

Most readers will have their indoor set a fixture, probably in the form of a radio-gramophone or in a large cabinet, which makes its transport an impracticable proposition.

Cheap and Efficient

For those who are contemplating the building of a cheap portable set for use out of doors, the WIRELESS MAGAZINE Technical Staff have specially designed the Home and Garden Three, a cheap and efficient battery-operated portable, capable of giving good service with adequate strength for any of the outdoor purposes mentioned.

Furthermore, the merest novice can build it in the course of a few hours without any difficulty. The selectivity obtainable on this set is adequate enough for all general purposes, and is, in fact, above the average for a portable utilising this type of circuit.

Before going into any details concerning the main constructional points, let

us impress upon prospective builders that this set is designed for use within an area of thirty miles of a Regional station, although it is quite probable that satisfactory results may be obtained up to a distance of fifty miles or so.

Although the set incorporates, as will be seen from the photographs on these pages, a self-contained loud-speaker, it can easily be adapted for use with headphones, with the result that the reception range would be considerably increased.

We shall be pleased to publish reports of this set, but readers are asked to mention the locality of reception for the guidance of others. May we also point out that half a guinea is paid for every reader's photograph of a home-constructed set published in this journal.

Several unique points have been incorporated in the design. The complete set has been built on a detachable wooden chassis which fits inside the portable cabinet. This is an important point as it greatly facilitates the simplicity of building.

Quite a straightforward circuit is utilised, consisting of a leaky-grid detector followed by two stages of low-frequency amplification. The high-efficiency of the detector circuit is mainly due to the design of the frame aerial in which a somewhat unusual design has been adopted.

Frame Aerial Windings

Two sections of the frame used for tuning purposes are wound with stranded copper wire, whilst the reaction winding is wound with ordinary 28-gauge cotton-covered wire.

The frame aerial wire is identical to that used for winding the frame aerial of the Super 60. Full details for winding will be seen from the diagram of page 74.

We believe that the method used for switching from the medium-wave

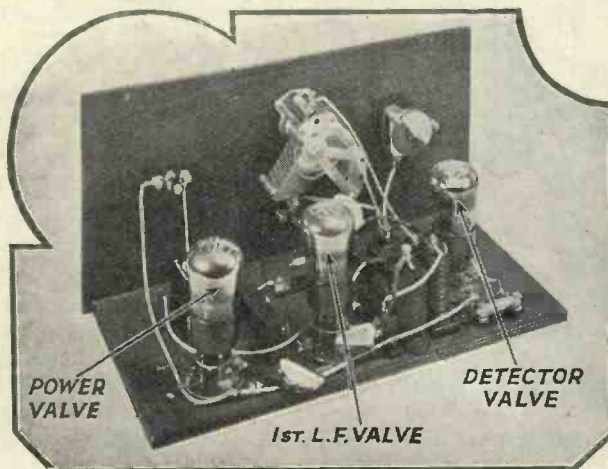
The Home and

to the long-wave tuning is somewhat unique, a simple three-point shorting switch providing a change-over from medium to long waves. It will be noted that the reaction winding for the medium-wave frame is well spaced from the latter by an additional section of the reaction winding utilised for long-wave tuning. To make up for the loose coupling thus provided between the medium-wave frame and its associated reaction winding, the latter is provided with a greater number of turns than usual.

It is this arrangement that is responsible for the very smooth reaction control on the medium waves—an advantage seldom found in this type of set.

The frame is tuned by a .0005-microfarad variable condenser and the reaction is controlled by a .0002-microfarad reaction condenser.

Standard values of coupling condenser and resistance are used for the leaky-grid detector. The condenser is a .0003-microfarad, and the grid-leak has a resistance of



EASY TO BUILD

This photograph gives a clear idea of the simplicity of building the Home and Garden Three

2 megohms. In order to facilitate easy reaction control, and to keep the high frequency oscillations out of the low-frequency circuits, a high-frequency choke is included in the anode circuit of the detector valve.

Detector Efficiency

To further increase the efficiency of the detector, a .0002-microfarad fixed condenser is fitted between the anode and negative filament of the valve. Low-frequency oscillation, or motor-boating, as it is commonly called, is prevented by the insertion of a 10,000-ohm resistance and a 2-microfarad by-pass condenser.

A large number of portable sets suffer from poor quality of reproduction. In many cases this is due to the frequent use of two transformers or a badly arranged output-stage. The battery space being small it is

of better quality and freedom from motor-boating. The parallel-feed method of connecting the transformer enables the use of a transformer of small dimensions, thus saving a good deal of valuable space. Also, the anode current being diverted from the primary winding of the transformer, the life of the transformer is considerably lengthened.

Furthermore, the bass response is increased without the loss of the high-frequencies. Little more need be said of the general circuit arrangement, the loud-speaker being connected in the usual way.

In these pages a quarter-scale layout and wiring diagram is

components, your blueprint and tools ready at hand. This remark not only applies here, but to any set you may contemplate building, it will save you a deal of time and bother.

The first part of the construction to be undertaken should be the winding of the frame aerial round the special wooden chassis, taking particular care to see that the windings are accurately spaced as shown in the accompanying diagram.

Mounting the Loud-speaker

The loud-speaker should then be mounted in the cabinet behind the fret. There will be no snags attached to this procedure if the specified unit and chassis is used, this being already fitted to a ply-wood fixing board.

The rest of the set is built on a baseboard and panel which fits in the top section of the wooden chassis. There is no need for us to give details of the actual construction. The position of the components on the baseboard will be clear from the layout.

When all the parts have been screwed down in position, the wiring can be started. It is best to use tinned copper wire covered with insulated sleeving.

On the blueprint and the layout, every wire is numbered in the best order of assembly. Start from No. 1



Garden Three

impossible to accommodate anything much larger than the smallest size in high-tension batteries, with the result that a small power valve, capable of giving only a small undistorted power output, can be used.

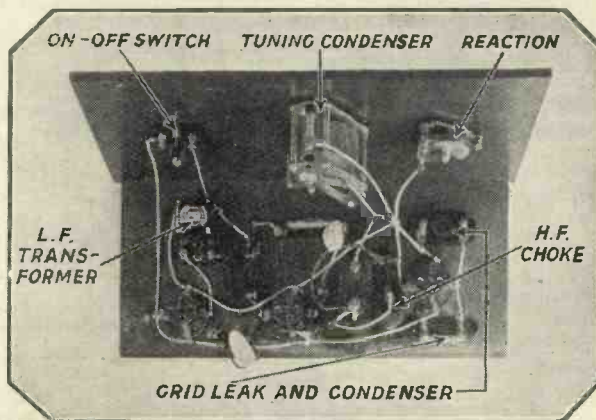
If a larger valve is used, the battery is hopelessly over-run. In this set a Mullard PM2A is used in the output stage with the result that the current consumption is quite low, being only of the order of 8 or 9 milliamperes.

Another method of overcoming the quality problem is by the use of resistance-capacity coupling followed by a stage of parallel-fed transformer coupling for the low-frequency stages. This method has been adopted in the design of this receiver.

It may be argued that the overall amplification is not so great with this arrangement as if two transformers had been used. However, the high efficiency of the detector stage makes good the losses incurred by the first low-frequency valve, and at the same time we have the additional advantages

reproduced. If desired, a full-size blueprint, consisting of a combined template, layout and wiring diagram, can be obtained for half-price (that is, 6d., post free), if the coupon on page 104 is used by August 31. Ask for No. WM246, and address your application to Blueprint Department, WIRELESS MAGAZINE, 58-61 Fetter Lane, E.C.4.

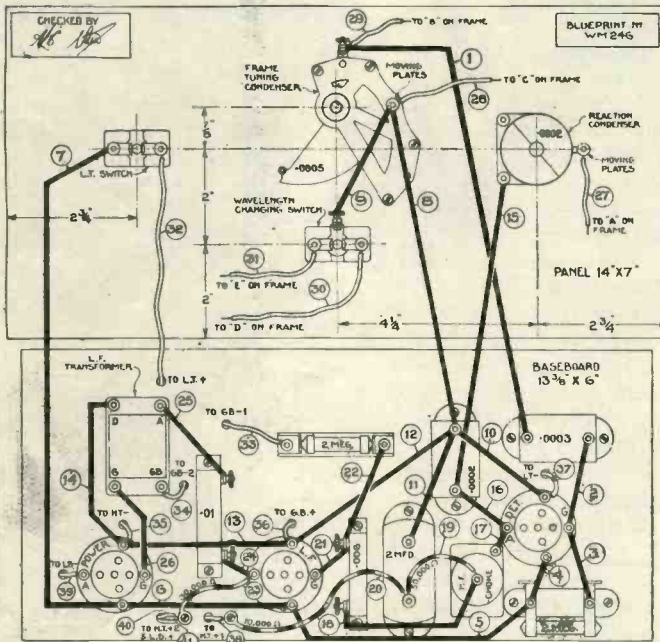
When a start is to be made with the set, see that you have all the



SIMPLE LAYOUT

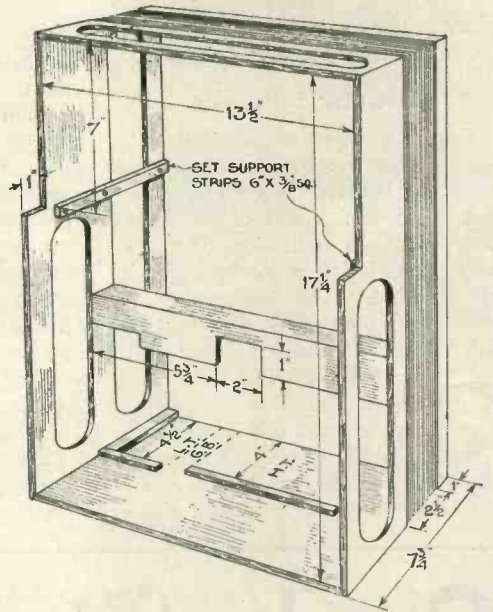
A general plan view showing the position of components on the baseboard. Nothing could be simpler

THE HOME AND GARDEN THREE—Cont.



LAYOUT AND WIRING DIAGRAM

This is reproduced at quarter-scale. A full-size blueprint can be obtained for 6d., post free, if the coupon on page 104 is used before August 31. Ask for No. WM246



THE WOODEN CHASSIS

Here you see a drawing of the special chassis on which the set is built. Note the supports for holding the set in position

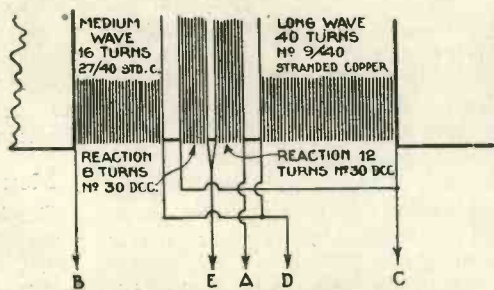
and fix each wire in the numerical order shown. This will avoid missing or making any wrong connections.

After construction, the next job is to choose a suitable type of valve for the set. If any deviation from those shown in the list of components is made, care should be taken to use valves with similar characteristics. The detector valve should be of medium impedance, that is to say, between 20,000 and 30,000 ohms. The first low-frequency valve should have an impedance of approximately 10,000 ohms, and the power valve about 4,000 ohms.

Choosing a Power Valve

If a larger power valve is used, that is of lower impedance, the current consumption will rise and will result in over-running the battery unless a standard capacity type is utilised.

Connecting up the batteries will be the next step. H.T.+1 should be taken to a tapping between 90 and 110 volts and H.T.+2 to the highest



FRAME AERIAL DIMENSIONS

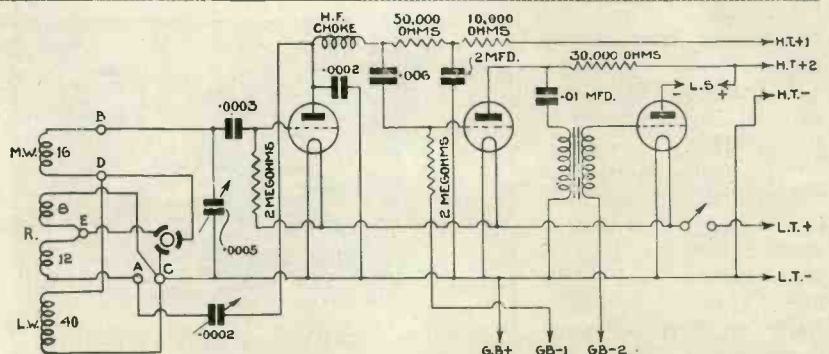
Full details are given in the above diagram for winding the frame aerial. When building take special care in accurately spacing the windings

positive tapping on the battery. It will be seen from the circuit diagram that the loud-speaker is connected between the anode of the power valve and H.T.+2.

Loud-speaker Connections

This means it will be necessary to fix the positive lead from the loud-speaker, usually denoted by a red thread running through the covering, to the H.T.+2 wander plug. The method of connecting is clearly shown in the layout.

Switch on the set by pulling out (Continued on page 76)



CIRCUIT OF THE HOME AND GARDEN THREE

The circuit comprises a leaky-grid detector followed by resistance-coupled and transformer-coupled low-frequency stages

NOW

THE NEW H.F. INTERVALVE COIL



Now comes the new Varley H.F. Intervalve Coil, specially designed for use with the Constant Square Peak Coil.

It is completely screened, and its inductance as screened is exactly matched to that of the Constant Square Peak Coil. With a good ganged condenser the tuning will keep in step over the whole long- and medium-wave range.

Extension rods are supplied for mechanically coupling the switch to that of the Constant Square Peak Coil.

LIST No. BP6 **8/6**

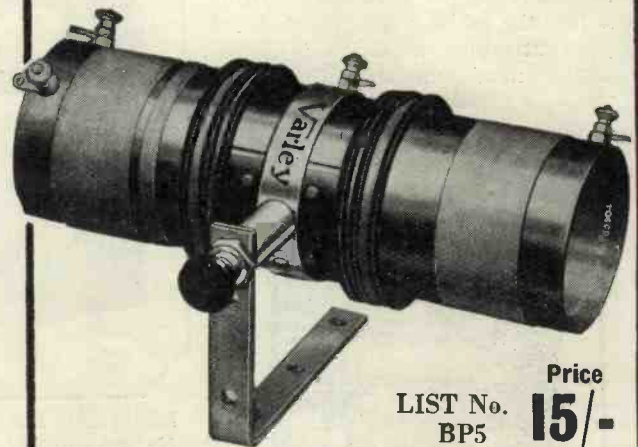
FOR USE WITH THE CONSTANT SQUARE PEAK COIL

The Varley Constant Square Peak Band-Pass Coil—the ideal pre-selective device for any set; S.G., Reacting Detector or Super-het.

Confines local station to a few degrees. Enables programmes—now swamped by powerful transmissions—to be heard and enjoyed. Actually improves quality of reproduction. Abolishes all interference by medium waves on long waves. Supersedes wave-traps. Easily replaces existing aerial coils. Needs no screening.

This new Coil combines a *negative* inductance and capacity coupling, so giving a constant square-topped peak and separation of substantially 9 kilocycles over the whole of both wavebands.

Supplied complete with extension rod for switch and universal mounting bracket. Ask your dealer for the Free Colour Folder, or write direct.



(REGD. DESIGN No. 763904. PATENT PENDING)

LIST No. BP5 **15/-**

INDUCTANCE MATCHED TO ENSURE ACCURATE GANGING

Varley

Advertisement of Oliver Pell Control, Ltd., Kingsway House, 103 Kingsway, London, W.C.2.

Telephone: Holborn 5303

Speedy replies result from mentioning "Wireless Magazine"

THE HOME AND GARDEN THREE—Cont.

COMPONENTS NEEDED FOR THE HOME AND GARDEN THREE

CHOKE, HIGH-FREQUENCY

- 1—Readi-Rad, Hilo type, 4s. 6d. (or Bulgin, R.I.).

CONDENSERS, FIXED

- 1—Lissen .0002-microfarad, 1s. (or Trix, Ready Radio).
- 1—Lissen .0003-microfarad, 1s. (or Trix, Ready Radio).
- 1—Lissen .006-microfarad, 1s. 6d. (or Trix, Dubilier).
- 1—Lissen .01-microfarad, 2s. (or Dubilier).
- 1—Lissen 2-microfarad, Mansbridge type, 2s. 6d. (or Dubilier, Formo).

CONDENSERS, VARIABLE

- 1—Lotus .0005-microfarad, type LC/5, 5s. 9d. (or J.B., Ready Radio).
- 1—Lotus .0002-microfarad reaction, type RC/2, 5s. 3d. (or J.B., Ready Radio).

DIAL, SLOW-MOTION

- 1—Astra Popular, 3s. (or Ormond, Lissen).

EBONITE

- 1—Red Triangle, 14 in. by 7 in. panel, 8s. 2d. (or Becol).

HOLDERS, GRID-LEAK

- 2—Lissen, type LN180, 1s. (or Dubilier, Watmel).

HOLDERS, VALVE

- 3—Clix, with terminals, 2s. 6d. (or Lotus, Formo, W.B.).

PLUGS AND TERMINALS

- 6—Clix wander plugs, marked H.T.—2, H.T.—1, H.T.—, G.B.—, G.B.—1, G.B.—2, 1s. (or Belling-Lee, Eelex).
- 2—Clix spade terminals, marked L.T.—, L.T.—, 4d. (or Belling-Lee, Eelex).

RESISTANCES, FIXED

- 1—Lissen 10,000-ohm, flexible type, 9d. (or Magnum, Bulgin).

The prices mentioned are those for the parts used in the original set; the prices of alternatives as indicated in the brackets may be either higher or lower

- 1—Lissen 30,000-ohm, flexible type, 1s. 2d. (or Magnum, Bulgin).

- 1—Lissen 50,000-ohm, flexible type, 1s. 2d. (or Magnum, Bulgin).

- 2—Lissen 2-megohm grid leaks, 2s. (or Dubilier, Telsen).

SUNDRIES

- Tinned copper wire for connecting.
- Lengths of Sistofox sleeving.
- 1—Carton of Lewcos 27/40 frame aerial wire, 5s. 6d.
- 1—Carton of Lewcos 9/40 frame aerial wire, 4s. Length of rubber-covered wire.

SWITCHES

- 1—Readi-Rad on-off switch, 10d. (or Bulgin, W.B.).
- 1—Readi-Rad 3-point, 1s. 6d. (or Bulgin, W.B.).

TRANSFORMER, LOW-FREQUENCY

- 1—R.I. Parafeed, 8s. 6d.

ACCESSORIES

BATTERIES

- 1—Drydex 120-volt, type H1012, 18s. 6d. (or Ever Ready, Siemens).
- 1—Drydex 9-volt grid-bias, type H1001, 1s. 4d. (or Ever Ready, Siemens).
- 1—Exide 2-volt accumulator, type JZ3, 10s. (or C.A.V., Lissen).

CABINET

- 1—Peto-Scott, £1 5s.

LOUD-SPEAKER UNIT AND CHASSIS

- 1—Ormond, portable type, £1 5s.

VALVES

- 1—Mullard PM1HF, 8s. 6d. (or Mazda HL210, Cossor 210 HF).
- 1—Mullard PM2DX, 8s. 6d. (or Mazda L210, Cossor 210LF).
- 1—Mullard PM2A, 10s. 6d. (or Mazda P220, Cossor 215P).

bottom of the cabinet. For the maximum signal strength the front of the cabinet should be in a straight line with the direction of the transmitting station. This can easily be found by trial.

Low Running Costs

Maintenance costs of the Home and Garden Three will be very cheap. The accumulator should last approximately fifty hours per charge, and the high-tension battery will need renewing every four or five months, this depending, of course, on the amount the set is used.



NEAT APPEARANCE

The finished job—a simple and neat-looking portable which will give you good service in Regional areas

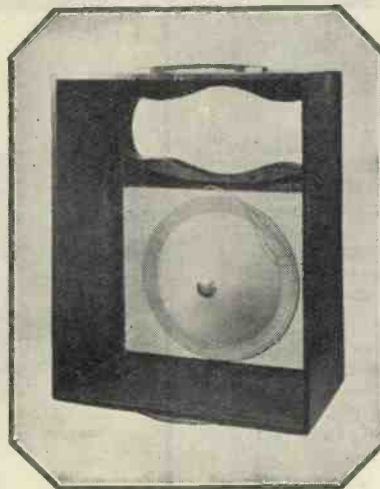
the knob of the switch on the right-hand side of the panel.

Tuning Hints

Next, the reaction condenser should be turned until a slight hissing noise denotes that the set is on the verge of oscillation. Then adjust the main tuning control in the centre until a station is heard at its maximum strength, afterwards a final adjustment of the

reaction condenser will clarify the signal for listening purposes.

Stations will be tuned in on the



MOUNTING THE LOUD-SPEAKER

No difficulty will be experienced in mounting the loud-speaker. It is screwed direct to the front of the cabinet

main dial without any difficulty, providing care is taken with the adjustment of the reaction condenser for each station.

A deal of difference to signal strength can be made by rotating the set on the turntable fitted to the

Care should be taken to see that the grid bias applied to the last valve is not below that given in the valve manufacturers' recommendation, otherwise the anode current will be excessive, and the battery will not give the service it should.

Using the battery and valve specified in the list of components, the wander plug marked G.B.—2 should be plugged into the 3-volt tapping on the grid-bias battery.

The Home and Garden Three gave satisfactory results during a daylight test in South London. Both the transmissions from Brookmans Park were picked up at good strength and quality, and free from mutual interference. Midland Regional was also heard at fair strength. Selectivity was adequate enough for all normal purposes.



ALL PARTS ACCESSIBLE

Here you see the portable with the back removed. Both the set and batteries are easily accessible



The whole range of Ferranti prices is lower than those of any corresponding type—and in many cases the test voltages are higher.

Think of the SAFETY FACTOR

Ferranti Condensers are of the rolled foil pure linen tissue paper insulated type, and are not of the Mansbridge pattern. The paper is continually tested for moisture content. Their test voltages are three times their A.C. working voltages, and twice their D.C. working voltages. The insulation resistance is not less than 1,000 megohms at 20 degrees Centigrade.

They are built by engineers with unrivalled experience in the electrical industry, in the manufacture of High Tension apparatus, including condensers for pressures up to 1,000,000 volts.

They comply with the British Standard Specification for Condensers, and with the latest recommendations of the Institution of Electrical Engineers.

PRICES:

2 mfd.	C.1. 1,050-v. D.C. test, 5/8
	C.2. 750-v. D.C. test, 3/9
	C.4. 2,250-v. D.C. test, 9/6
	C.5. 1,500-v. D.C. test, 7/-
4 mfd.	C.6. 1,050-v. D.C. test, 7/6
20 mfd. Packs.	1,050-v. D.C. test, 28/-

3 NEW TYPES OF CONDENSER
750-v D.C. Test. Standard Quality, fitted with Soldering tags: Rectangular case.

C.7	— 1 mfd. 2/6
C.8	— 2 mfd. 3/3
C.9	— 4 mfd. 5/6

Use the components specified by expert designers. Suitable for all first-class sets.

FERRANTI FIXED CONDENSERS

FERRANTI LTD., Head Office and Works: HOLLINWOOD, LANCASHIRE. London: Bush House, Aldwych, W.C.2

The AMAZING NEW TWO-VALVE Short-wave Assembly

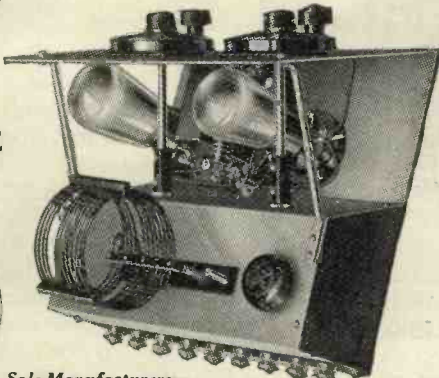
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GIVES EXCELLENT RECEPTION
FROM PRINCIPAL SHORT-WAVE
STATIONS THROUGHOUT THE WORLD

GET the THRILL
of RECEIVING
WORLD-WIDE
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SHORT-WAVE
APPARATUS



**SIMPLE and
INEXPENSIVE.**
Can be **EASILY
ASSEMBLED**
with a **SCREW-
DRIVER** and
pair of **PLIERS.**
NO SOLDERING

PRICE OF PARTS for COMPLETE SET £4 5 0
(Individual parts can be purchased separately)
**SEND FOR FULL CONSTRUCTIONAL DETAILS,
LIST and BLUEPRINTS, PRICE 6d.**

**LONDON SERVICE DEPOT: C. Webb, Ltd.,
164 Charing Cross Road. W.C 2**
(adjoining Tottenham Court Road Tube Station)
Telephone: Temple Bar 2944



Sole Manufacturers—
STRATTON & Co., Ltd., Balmoral Works, Birmingham

Super 60 Operating Hints

These notes by W. James will interest all builders of the Super 60, the Super 60 Portable and the A.C. Super 60's. The designer explains points that affect the results obtained for all these sets and gives many valuable operating hints.

WHEN tuning a super-heterodyne receiver you will have noticed that the oscillator tuning is much sharper than that of the frame aerial.

This is natural enough, but the mistake ought not to be made of being careless with the tuning of the frame.

Interference

Experience shows that interference can be produced when the frame is not exactly in tune, although there may well be no difference in the strength of the signal when the frame-aerial tuning condenser is moved through a degree or two from the point of exact tune.

There are times when a high-pitched whistle is to be heard as the result of poor tuning, and this disappears when the controls are accurately adjusted.

It is for this reason, too, that a sharp tuning frame aerial is needed. With a broad tuning frame a station may easily be received with that to which the frame aerial is adjusted.

Suppose, for example, that the frame is tuned to 1,000 kilocycles and the oscillator is set at 1,126 kilocycles to produce the best frequency of 126 kilocycles. Then if there is a signal of 1,126 + 126, or 1,252 kilocycles in the frame aerial, this will interfere, because the oscillator will beat with it and produce the beat frequency of 126 kilocycles.

Sharp-tuning Frame

Our frame aerial should, therefore, be sharp tuning enough to cut out this interference, so that if we are tuned to a weak station of 1,000 kilocycles and the local station happens to be of 1,252 kilocycles, interference will not be heard.

A frame aerial should be able to tune as sharply as this quite easily. The need for accurately tuning the frame, particularly when dealing with a strong signal, is apparent when it is

considered that another station may be let in.

A fault of some users is to tune too quickly. The condenser turning the oscillator must be moved very slowly and the frame ought to be tuned more or less in step with the oscillator.

There is no doubt that the tendency is to tune too quickly, with the result that stations are missed. A good plan is to tune first to the local station and to get it properly. It may be necessary to turn the frame aerial in order to reduce the input and also to set the volume control well down.

There is actually a point on the volume control below which you should not go in order to avoid distortion, and turning the frame will weaken the signal if the local station has too great a strength. The right tuning point of the frame-aerial circuit will not be discovered unless the signal is made weak, and having found it and made a note of the two settings, it is easy enough to go forward with both controls.

In this way the tuning will be found very easy, but if you do not

proceed systematically, lots of stations will not be heard.

The super-heterodyne receiver is probably the best type for dealing with numbers of stations working fairly close together. Any amount of magnification is available, the selectivity is exceptionally good, and quality can be made as satisfactory as desired.

Band-pass Filters

In the Super 60, both battery and A.C. models, there are three band-pass filter units. Each unit has two tuned circuits coupled to provide desirable tuning characteristics. Each unit is shielded and, being accurately tuned by the makers, the combined effect of the three units coupled to the valves is to provide band-pass tuning, the width of the band of frequencies passed being good enough for first-class reception.

At the detector we can so arrange matters that the top notes are of the desired strength. There are several transformers having a rising characteristic which may compensate for any losses elsewhere. The higher notes are, as a matter of fact, best reduced in strength a little. With too much top the reception is not as clear as when the higher notes are weakened.

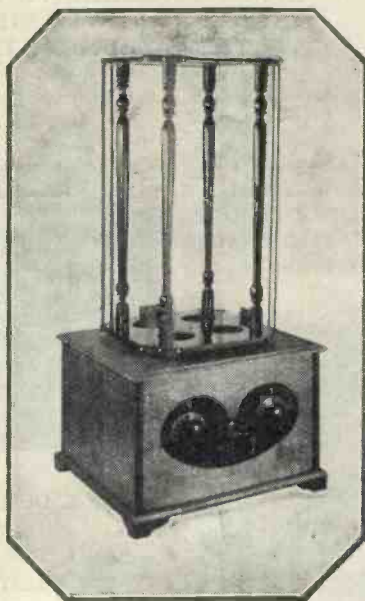
Hiss and noise are to be avoided when possible and one of the features of the Super 60 is the absence, as a rule, of such noises.

Using a Pentode

Some users have fitted a pentode and have obtained greater volume by so doing. A correcting circuit is needed, however, or the general tone will be too high pitched. A resistance and condenser connected across the output will weaken the higher notes and bring them down in strength to more nearly their correct relative value. Magnification depends upon various factors, such as the setting of the first detector, the strength of the oscillations, and the general design of the long-wavelength amplifier. Too strong oscillations are not needed and are of no value, besides which the anode current is excessive.

With too weak oscillations, how-

(Continued on page 80)



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P.204

Speedy replies result from mentioning "Wireless Magazine"

SUPER 60 OPERATING HINTS—Continued

ever, the strength will suffer. The strength of the oscillations can be varied by altering the value of the anode-feed resistance and if you cared to experiment along these lines you would discover that the oscillator is not critical, but must be properly adjusted. As the resistance is reduced, so the current increases, and it is not wise to reduce the resistance unless you are sure the extra current can be supplied by the battery.

Mains Drive

In a mains set a few more milliamperes will not matter. There will probably be nothing gained by altering the resistance from the values given, as they were carefully chosen for average valves. But the experiment is an interesting one.

As the first detector is an anode rectifier, the voltages must be suitable or the signals will not be as strong as they should be. The adjustments are not at all critical, but if they are a long way out nothing much will be heard. Grid bias and high tension can be altered in the battery model.

In the A.C. sets the anode voltage is fixed and the grid-bias and screen voltages can be varied. With a screen-grid valve as the first detector, it is better first to choose a bias which will suit the oscillator and then to adjust the voltage of the screen in order to obtain a suitable rectifying characteristic.

These valves are sensitive to grid bias, owing to their steep slopes, but there is no difficulty at all in setting the stage.

There is not much to be done to the long-wavelength amplifier in order to increase the magnification. The design of the band-filter coils has been carefully worked out by the makers to provide good amplification with the valves available.

If the valves and all connections are carefully shielded and complete de-coupling is used, the magnification is a little greater than in the straightforward battery model, but it is hardly needed. With a careful layout the various wires in the high-frequency circuits are short and high magnification with stability is obtained.

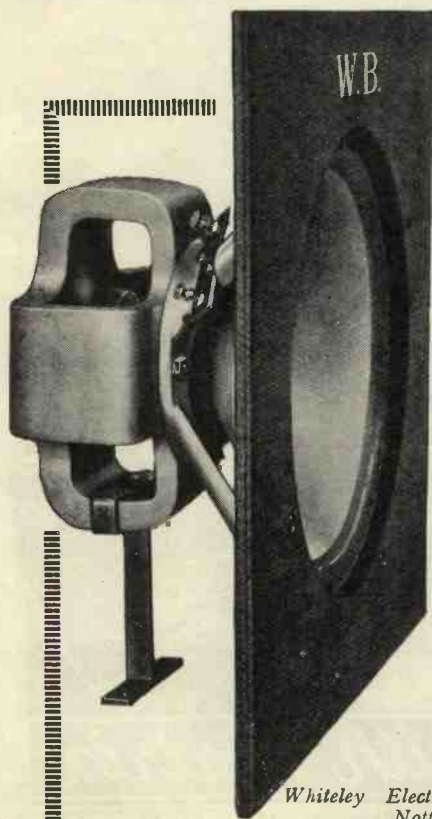
The total cost of a set is fairly low, because although several valves are used the couplings are not very expensive. There is an advantage in using fixed tuning circuits adjusted by the makers to the correct frequency, as trimmers are not needed and anybody can use the coils.

In sets having a number of tuned stages of high-frequency magnification the ganged condensers are costly, screening is difficult, and it is rather hard for the amateur to adjust each circuit in order to obtain accurate tuning.

Special Coils

From all points of view, therefore, the super-heterodyne type of set has advantages, provided that suitable parts are available. If the long-wavelength coils are out of tune, the results will be poor, both selectivity and magnification being less than normal. Only the recommended coils should, therefore, be used.

Coils which have not been approved by the WIRELESS MAGAZINE ought not to be fitted in sets of the Super 60 type.



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AMATEUR WIRELESS



Ronald Frankau, brother of Gilbert Frankau, the author, has been heard recently

BRAVO, B.B.C.! Your recent attempt at providing suitable summer programmes has, to say the least of it, been fairly successful. But why so much drab quintet music and vocal items?

Irritating Music

There is nothing so irritating as a preponderance of this uninteresting sort of music. Surely the imagination and enthusiasm of the music department of Savoy Hill has



A well-known comedy actress heard in "Tilly of Bloomsbury", Laura Smithson

THE MONTH'S RADIO MUSIC

not run dry so soon? North Regional programmes appear to have an enthusiastic personality behind them. The few programmes that have been arranged up North have certainly put some of

whole was a thoroughly enjoyable performance.

Is it necessary that we should return to the Bach cantatas at 3 o'clock?

And so again, on August 8, another season of Promenade Concerts at the Queen's Hall will begin. This will be the thirty-seventh season, all of which have been under the admirable

direction of that master musician, Sir Henry Wood. The orchestra will consist of ninety-three players and a bevy of the best singers and solo instrumentalists of the day will be heard.

It is true that a large number of listeners condemn these concerts as being of a boring nature and a waste of energy on the part of the compilers. Our advice

(Continued on page 84)



Muriel George and Ernest Butcher are two fine interpreters of old English folk songs

the London programmes to shame. Come, Savoy Hill, keep up your reputation!

Bach or Baynes?

June 28 was the first Sunday in the interval of the unending series of Bach cantatas and in place of the usual broadcast we had one of the finest of light orchestras, namely Sydney Baynes and his band. The change was welcome; the band played well-chosen music and the



A notable composer and singer, Gwen Knight has featured in late programmes

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1 Read-Rad .0005-mfd. variable condenser	4 6
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2 T.C.C. 1-mfd. fixed condensers	14 2
2 J.B. .0005-mfd. fix. log slow-motion condensers (40-1)	1 1 0
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1 Read-Rad combined coil and valve holder	7 0
1 Telsen 4-pin valve holder	1 4
8 Belling-Lee wander plugs (5, H.T., and 3, G.B.)	1 4
2 Spade terminals, red and black	2 6
1 Read-Rad link resistances, 15,000 and 20,000 ohms	2 6
1 Read-Rad 1-megohm grid leak	10
1 Sovereign 50,000-ohm potentiometer	4 6
1 Telsen "Ace" L.F. transformer	5 6
1 Read-Rad 3-point wave-change switch	1 6
1 Packet Read-Rad "Jiffilink" for wiring	2 6
1 Read-Rad 3-point strip for frame connections	6
6 Valves as specified: 2, S.G.; 2, H.F.; 1, L.F.; and 1 power	3 16 0
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2 T.C.C. 2-mfd. fixed condensers	7 8
1 J.B. .0005-mfd. triple-gang condenser, type 1072	1 3 6
1 J.B. illuminated vernier dial	5 0
1 Read-Rad .0005-mfd. "Brookmans" reaction condenser	3 6
1 J.B. .00004-mfd. midjet condenser	4 0
1 Varley constant square peak coil	15 0
1 Varley H.F. intervalve coil	8 6
1 R.I. dual astatic H.F. choke	4 6
1 Read-Rad "Hilo" H.F. choke	4 6
1 Atlas L.F. choke CFS/182	1 0
3 Telsen 4-pin valve holders	1 6
6 Belling-Lee wander plugs, 3 H.T. and 3 G.B.	10
1 Read-Rad 10,000-ohm flexible resistance	1 0
2 Read-Rad 20,000-ohm flexible resistances	8 6
1 Read-Rad 30,000-ohm flexible resistance	1 8
1 Lewcos 40,000-ohm flexible resistance	1 6
1 Read-Rad 2-megohm grid leak	10
2 Junit terminal blocks with terminals	2 4
1 Siemens S.G. coil	1 0
1 Read-Rad L.T. switch	10
1 Telsen "Radiogrand" L.F. transformer	6 6
1 Packet Read-Rad "Jiffilink" for wiring	9 6
3 Mullard or Cosor valves to specification: 2, G.G. detector and power	1 19 0
Flex, screws, etc.	10
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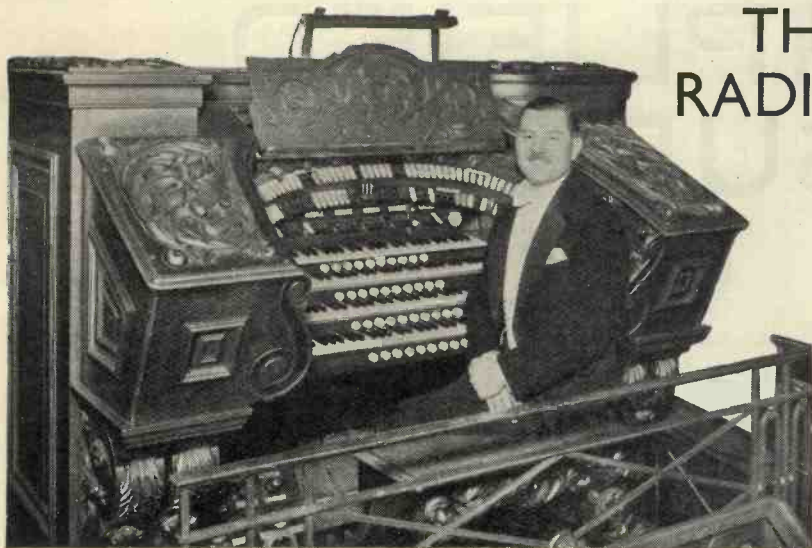
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THE MONTH'S RADIO MUSIC—Cont.



One of the earliest of cinema organ broadcasters, Reginald Foort now plays from the Regal, Marble Arch

that it is performed properly.

The programmes of the "Proms" are in essence the same as in previous years. Monday will be Wagner night; Tuesday's programmes will be miscellaneous, different concerts being devoted to the works of Mozart, Haydn, Tchaikowsky and Russian composers; Bach and Brahms works will, as usual, be heard on Wednesday nights. On these evenings, a new note will be struck by the use of the organ as a solo instrument.

British Works

Thursday is again British composers' night, individual concerts being devoted to the works of Elgar, Delius, Vaughan Williams and others; Beethoven on Fridays; and Saturdays will be the popular night.

Ravel's now famous *Bolero*, will be heard on the opening night, and this novel work is worth making a point of hearing. It will amuse you if you have not heard it before.

Amongst the famous artists taking part are Pouishnoff, Moisevitch, Myra Hess, all pianists; Albert Sammons and Isolde Menges, violinists; and amongst the vocalists are Slobodskaya, Walter Widop, Muriel Brunskill and Keith Falkner, all well-known broadcasters.

Pouishnoff was the first of the world-famous pianists to be heard in this country. In the early days
(Continued on page 86)



Richard Watson, a principal bass at Covent Garden Opera

to listeners is not to view these remarkable concerts from that standpoint. Actually, they present a great opportunity to the average listener to get to understand the better of the classical works in music.

Almost every type is covered, from the works of modern composers to those of the favourites, namely Wagner, Liszt, Brahms, Haydn, Schubert, etc.

Classical Music

It is essential and desirable that a large part of the time allocated to broadcast music should consist of music of the classical type, and an understanding of these works will make listening-in a pleasant hobby during the coming winter months. The B.B.C. will ensure



Sir Henry Wood again conducts the "Proms" at the Queen's Hall



A contralto heard from Midland Regional, Dorothy Lebish



A brilliant singer known for his concert performances, Edward Dykes



A popular tenor heard in Midland programmes, Geoffrey Dams



Miranda Sugden, soprano, heard recently has a wide choice of songs



An excellent baritone, Leslie Holmes has sung in recitals from London



A popular Welsh tenor heard from Cardiff, Trefor Jones

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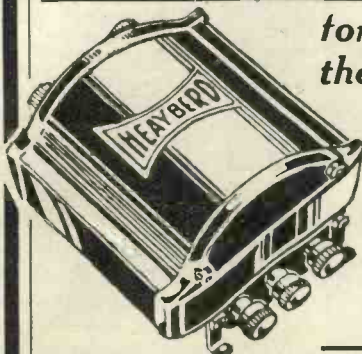
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Advertisers like to know you "saw it in the 'Wireless Magazine'"

THE MONTH'S RADIO MUSIC—Continued



Le Trio Morgan, consisting of three French sisters, broadcasts all types of music from pre-Bach to De Falla and Ravel

he would not broadcast under his own name, but instead, gave several anonymous recitals, without fee, as an experiment. The "unknown pianist" received thousands of letters to convince him that broadcasting would in no way harm his reputation.

Composers who will conduct

Several British composers will personally conduct their own works and amongst them are Sir Edward Elgar, Dr. Vaughan Williams, Dame Ethel Smythe, and Gustave Holst. The latter will conduct his famous suite, "The Planets" and this will be the first time in "Prom" history that the complete work will have been given at any one concert.

Probably the most interesting innovation at these concerts is the dress-reform movement that has been started by members of the orchestra. On really hot nights (referring to the weather) members of the orchestra will discard their usual "boiled" shirts and "tails" and will be seen wearing soft silk shirts and flimsy black alpaca jackets. We do not know if Sir Henry Wood will



Mary Hamblin, soprano, is a member of the Wireless Singers

join in this revolutionary dress-reform movement.

Another addition has just been announced to the list of broadcast cinema orchestras. Pleasant light music is always a great asset in popularising programmes and there is still room in our general programmes for additional entertainment in this direction. This time, the orchestra of the Trocadero Theatre at the Elephant and Castle, London, consisting of twenty players, is to be heard on Tuesday afternoons between 4 and 5.15 p.m.

Relaying a Cinema Orchestra

It is interesting to note that the orchestra will not be relayed from the auditorium of the cinema itself but instead from one of the theatre cafés. The reason for this step is that the management cannot always guarantee that the orchestra will be playing in the theatre during the period allocated for broadcasting.

Listeners will be familiar with the fine recitals that are given by the Trocadero cinema organist, Quentin MacLean, in the mid-day programmes on



A pupil of the Royal Academy, Herbert de Leon, baritone, has broadcast



Mason and Armes, "Entertainers with a Piano," are well known to Midland listeners

Wednesdays. It will be remembered that this organist played at a performance of Hindemuth's *Concerto for Organ and Orchestra* at the "Proms" last year.

No outstanding items have occurred during the month's broadcasting under review. Probably one of the most interesting events was the splendid piano playing given by the fourteen-year-old Wilfred Worden. He was, as is usual with young microphone artistes, rather nervous, but nevertheless he has the making of a first-class pianist.

Last month we mentioned that the B.B.C. had decided to continue its grant towards the maintenance of the National Orchestra of Wales and so save it from disbandment.

Now we learn that an appeal fund has been instituted to ensure the continuance of this orchestra.

T. F. HENN

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200 v. at 28 m.a. :
L.T. 4 v. at 6 amps.
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Tappings: one fixed.
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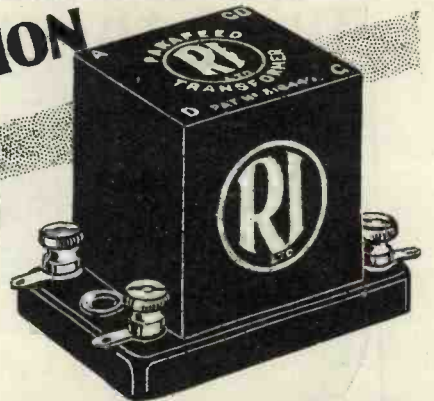
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Behind the Scenes at Savoy Hill

By Our Special Commissioner

AN unconscionably large number of inquiries reached Savoy Hill following upon the Government's announcement of a financial concession in licence fees, as to the effect which was likely to be apparent in the programmes.

The listener's attitude of mind in this respect is easily understandable; he interprets his ten-shilling contribution in terms of broadcast material, and if results are not in accord with his own views, immediately wants to know for what purpose the B.B.C. thinks he is paying his ten shillings.

Effect of the Concession

What actually is the effect of the concession? The Post Office has agreed to take 10 per cent., instead of 12 1/2 per cent., as the first charge on each licence fee. Thus nine shillings, or threepence more than was formerly

available, is left for division between the Treasury and the B.B.C. in the per centage proportions set out in the original agreement between the Post Office and the B.B.C.

The Corporation gets a diminishing proportion of the threepence until its share drops to 1 3/4d. per licence on the fourth million. The total B.B.C. share on the present licence figures is approximately £35,000, while the amount which the B.B.C. could very well do with is £250,000, in view of its heavy commitments for the regional scheme and Broadcasting House.

One suggestion which has been made in certain influential quarters is that the £35,000 might be used to inaugurate the scheme for Empire broadcasting; but the present financial stringency is not to be relieved by increasing broadcasting's burdens.

The cost of the Empire station should be met in some other way.

Very little dislocation appears to have been caused in the north by the introduction of the Moorside Edge transmitters and by the closing down of the relay stations. But at the time of writing extensive tests are being carried out at Hull, Sheffield, Stoke and Liverpool to ascertain whether the North Regional transmissions cater adequately for listeners in those towns or not.

Crystal Reception

Although crystal reception has so far been found satisfactory when a really good aerial is installed, a one-valve set with a thoroughly inefficient indoor aerial has been found to provide adequate volume on

(Continued on page 90)

Build the "SIMPLIFIED SUPER 60"

MAGNUM WIRE-WOUND SPAGHETTI RESISTANCES



As specified for "Super 60"

15,000 ohms. 1/6

20,000 ohms. 1/6

Made in all values from 300 ohms to 100,000 ohms

	£	s.	d.
1 Mahogany cabinet	17	6	0
1 Set of 4 Lewcos coils	2	10	0
1 Fixed condenser, .0002 mfd.	3	6	0
2 Fixed condensers, .001 mfd.	3	8	0
5 Fixed condensers, 1 mfd.	11	3	0
2 Ormond .0005 S/M condensers, type B.A.C.	12	0	0
1 Ebonite panel, 12 in. by 8 in.	5	0	0
1 Wearite combined holder	7	0	0
1 Telon 4-pln valveholder	2	6	0
8 Belling-Lee wander plugs as specified	7	0	0
2 Belling-Lee spade terminals as specified	9	0	0
1 Magnum 15,000-ohm spaghetti resistance	1	6	0
1 Magnum 20,000-ohm spaghetti resistance	1	6	0
1 Lissen 1-meg. grid leak	1	0	0
1 Potentiometer, 50,000 ohms	4	8	0
1 W.B. 3-point switch	1	3	0
1 Ferranti A.F.8 L.F. transformer	11	6	0
Connecting wire, sleeving, cortabs, ebonite strip, 3 terminals and G.B. clips	3	7	0

£6 15 0

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1 Lewcos dual-range frame aerial	1	12	6
1 Set of 6 valves as specified	3	16	0
Set of H.T., L.T. and G.B. batteries	2	0	0
Simplified Super 60, ready wired and tested, including cabinet, royalties paid	9	15	0
As above, but including valves and frame aerial, royalties paid	15	0	0

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We specialise also in the "Super 60" Radio Gram, "Super 60" Portable, "Super 60" A.C. Model, Home and Garden Portable and Ranger receivers.

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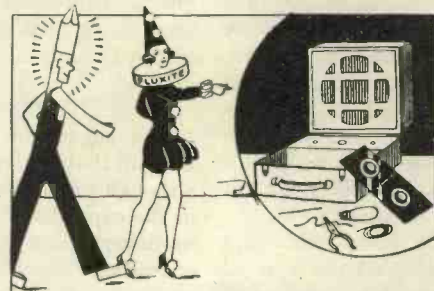
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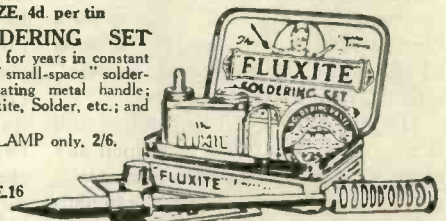
We're Fluxite and Solder, The reliable pair, Famous for soldering—Known everywhere! If your Set is in trouble, There's no need, to moan, Let US come and help you restore it to 'tone'!

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Simple to use and lasts for years in constant use. Contains special "small-space" soldering iron with non-heating metal handle; pocket blow-lamp, Fluxite, Solder, etc.; and full instructions.
COMPLETE, 7/6, or LAMP only, 2/6.
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IT SIMPLIFIES ALL SOLDERING



ASTRA "POPULAR"

The Dial specified for the "HOME AND GARDEN THREE"

Chosen again because the Astra Geared action provides such perfect control. Smooth, firm, no slip. Slow motion or Direct Drive. Price **3/-**

Obtainable from all dealers



NEW SIX-SIXTY VALVE SCREEN 1/3

SAY SIX-SIXTY

THE SIMPLEST WAY TO SCREEN YOUR VALVES
The most effective form of screen for high-efficiency Screen-Grid and Detector Valves. Simplifies and cheapens the construction of new receivers—as easy to fit as a valve! Fitted in a moment to existing receivers with marked gain in stability. The valve lies close to the screen, and its earthed filament or heater pin passes through a lug in the screen base, earthing the screen.

Six-Sixty Radio Co., Ltd., Six-Sixty House, 17/18, Rathbone Place, Oxford St., W.1. Tel.: Museum 6116/7

Speedy replies result from mentioning "Wireless Magazine"

BEHIND THE SCENES AT SAVOY HILL—Cont.

headphones. Nevertheless, this country has not emerged from the stage when crystal reception can be regarded as a thing of the past.

The listener to broadcasting is as conservative as the best, or worst, of us and in many cases he is not prepared to modernise his ideas in keeping with the efforts which are being made to modernise transmission methods.

There is to be no attempt, therefore, on the part of the B.B.C. to force him into accepting the technician's point of view.

Delicate Question

The delicate question of spending more money, which is involved, may conceivably cause some annoyance. It has indeed prompted some listeners already to ask the B.B.C. who is expected to pay for alterations to sets which were designed to fulfil a specific purpose but which are inadequate to new conditions.

The time will come when all listeners will realise that the regional scheme was planned for their benefit quite as much as for the purpose of representing Great Britain's contribution towards the solution of the wavelength problem, and more and more sets will be designed for the reception of regional programmes. Until that time arrives, the process of educating the backward, or recalcitrant, listener will continue.

His difficulties will be studied and if a decision is reached to reopen any relay stations in the late summer it will be almost entirely for the benefit of crystal set users who perhaps cannot afford to adapt their receiving apparatus in the meantime.

Northerners' Sets

With the exception of the towns in which the relay transmitters are situated, the average receiving equipment used by listeners in the north is appreciably more sensitive than that used by listeners in London, as it was installed mainly for the reception of Daventry 5XX.

Hence such alteration to sets as was necessitated by the introduction of the medium wavelengths at Moorside Edge was in the nature of modification rather than extension.

As wireless sets find their way into more and more homes, institutions and organisations of one kind or

another, listening groups become more and more of a possibility, but there is often the serious drawback that no suitable leader can be found.

The lack of leaders is a big obstacle to the realisation of the ambition to make the educative influence of broadcast talks a real force in the development of public knowledge.

There seems to be something rather frightening in the prospect of becoming a group leader: it smacks of responsibilities which the serious-minded are not willing lightly to undertake; but while the B.B.C. and the Central Council for Broadcast Adult Education admit that to be a group leader is not easy, it is not such an exacting task as that of lecturer or tutor of the usual adult type.

A Suggestion

The suggestion is therefore put forward that students and others who, although they are not prepared to act in the capacity of group leader, may be nevertheless willing and capable of leading discussion groups.

A lot of misunderstanding over the B.B.C.'s methods of conducting its business is due to genuine ignorance of the circumstances. Government departments make no attempt to keep "on the right side" of the public — considering themselves amenable only to the House of Commons—but the B.B.C. goes out of its way to probe into charges relating to sins of omission and commission, to clear up misunderstandings, to remove grievances and to put itself right with the world.

Savoy Hill's policy is to go out after the scandal-mongering critic as soon as he shows his hand. If there is venom in his attack, the B.B.C. will often leave him alone, depending upon the common-sense of the public to read between the lines of his criticism. (In this connection the amount of injury that the unbalanced critic can do himself is surprising. Savoy Hill has proof of this.)

If the critic is motivated by fair-mindedness, then the facts are put before him and the fault, if any, is acknowledged.

The really difficult critic, from Savoy Hill's point of view, is he who has no particular feeling about broadcasting, one way or the other, but who at every turn makes capital out of the B.B.C.'s supposed delin-

quencies. He will not suffer himself to be contradicted, his motto being: "What I have said, I have said."

Unconsciously, he plays into the hands of any person who nurses a grievance against the B.B.C. Aggrieved persons who keep a record of critics and their particular line of attack, have sometimes found this irresponsible type of critic a god-send; for he can generally be relied upon to take up even the weakest case.

Recent Example

An example which occurred recently concerned an artiste who broadcast eighteen months ago and who wrote to the B.B.C. for another engagement. He was very much surprised, so his critic-champion wrote in a Sunday newspaper, to receive a letter from an agent, who said that the B.B.C. wanted him to give another audition, as he had not appeared for them for some time.

A point made by the critic was that the B.B.C. handed over the entertainer's letter to an agent.

So unusual was the charge and so contrary to the B.B.C.'s practice, that immediate inquiry was instituted and the facts were revealed as follows: When the artiste applied for an engagement, a letter was written to him to the effect that as a considerable time had elapsed since he was last heard, another test was desirable, so that Savoy Hill might be up-to-date in its information about his work.

Scenting Business

That letter unfortunately found its way to an agent's office, instead of being posted direct to the artiste, and the agent, scenting possible business, instead of returning the letter or re-directing it, wrote to the artiste quoting the B.B.C.'s communication. An audition has since been given to the artiste, who will shortly receive an engagement.

So far, therefore, as he is concerned, all's well that ends well. But how about the critic, whose imputation was completely disproved?

It would be a serious matter if artistes became afraid of offering their services to the B.B.C. lest their applications were forwarded to agents; and so it should be stated definitely that this is not the B.B.C.'s way of carrying on business.

'YOU CAN HAVE MUSIC WHEREVER YOU GO!..'

THE LOTUS REMOTE CONTROL EXTENDS YOUR RECEPTION TO ANY OR EVERY ROOM IN THE HOUSE, AND EVEN TO THE GARDEN

Don't confine your Radio reception to the one room in which your Set is situated. There is nothing more annoying than to find you cannot listen in owing to this room being in use. The LOTUS Remote Control Outfit enables you to extend your reception to any or all rooms in the house and even to your garden in the most simple, economic and efficient manner.

No skill is required to install the outfit, and two rooms can be wired in half an hour. The Control consists of a Relay which is connected to the Set, and in each room or point, where reception is required a LOTUS Single Filament Control Wall Jack is fitted. The LOTUS Jack Plug fitted to the Loud-Speaker Terminals when inserted in any Wall Jack at once switches on the Set, and when withdrawn automatically cuts it off. Ask your dealer for full particulars and in case of difficulty write direct to the makers.



Type AR/40
All-mains Relay

LOTUS Remote Controls are obtainable suitable for every type of receiving Set whether working from Batteries, Mains Units, or All-Mains.

Cost for Receiver using L.T. and H.T. Batteries. Complete outfit for two Rooms.

1 Lotus Relay ...	12/6
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21 yards 4- Strand Wire...	3/6
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Extra for each additional room:

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Complete 2 Room Outfit for Receiver using L.T. Battery and H.T. Eliminator, 45/-.
7/6 extra each additional room.

Complete 2 Room Outfit for All-Mains Receivers, 47/6.
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LOTUS

Remote Control OUTFIT

LOTUS RADIO LIMITED, MILL LANE, LIVERPOOL

Little Radio Problems

Solved by JAY COOTE.

NO matter how much time you devote to the study of radio, you are bound to come up against one or two problems daily which have got you "beat."

I am quite aware that the technical publications, generally, put themselves at the entire disposal of their readers and are always willing to give assistance; in fact, to-day, some "dailies" and "weeklies" have gone out of their way to answer *any* query sent to them.

But have you noticed how highly technical are the replies? Have you observed how cold and formal are the terms in which the answers are couched? They lack the human touch.

Very well, then. By the kindness of the Editor, I have been allowed to dip into his voluminous mailbag and,

at random, have picked out a few knotty questions sent in by puzzled readers. I append my answers.

Please note that subtle difference in the tone of the replies, that *je ne sais quoi* which must gladden the heart of the bamboozled tyro and which instantly makes him realise how I am with him in his troubles and how sympathetically I share his worries.

It's that tactful human touch which makes all the difference, a stirring factor which proves, beyond doubt, that I am not a mere mechanical "query-man," but a true friend in need—and deed.

Here goes:

1.—*In the absence of my wife, children and ma-in-law (whose house I am now minding), I have inadvertently upset the entire contents of a 2-volt*

accumulator on the drawing-room carpet. Could you tell me how I could restore the colours of the design or, alternatively, how the damaged area could be camouflaged?—John N. Peck, Cane Road, Wapping, E.

ANSWER.—This is very unfortunate, John, and I very much fear that if you have not secured full honours in tatting, weaving, invisible mending and the cross-stitch, you will find it difficult to match the pattern in the carpet. However, do not be discouraged for you might try painting on the floor-boards a colourable imitation of the design to dissimulate the bare spots; with luck, it may deceive even the female section of the household, but do not be too optimistic.

Of course, if the boards have been eaten away by the acid, the damage
(Continued on page 94)

"Amateur Wireless" Handbooks

EACH 2/6 NET

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Wireless-controlled Mechanism For Amateurs. By Raymond Phillips

This book is an illustrated practical guide to the making and using of short-range wireless control apparatus, and it has been written so simply that it can be understood by any enthusiast possessing an elementary knowledge of wireless.

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The intelligent novice, and particularly the home constructor and the keen wireless amateur who is always rigging up different circuits and experimenting for progress, will find this Data Book extremely helpful.

The Book of the Neutrodyne.

By J. H. Reyner, B.Sc. (Hons.), A.M.I.E.E.

CONTENTS: Why Neutralising is Necessary; Systems of Neutralising; Difficulties Encountered in Neutralised Circuits; How to Obtain Good Selectivity Without Loss of Quality; Design of High-frequency Transformers; Lay-out in Neutralised Receivers; Some Suitable Circuits.

Price 1/6 net, or post free for 1/9

ALL EUROPE AT YOUR FINGER TIPS with this ULTRA MODERN RECEIVER

The Halcyon "Europa" 5-valve transportable is the result of months of scientific investigation and now satisfies the most exacting demands of the wireless enthusiast, whilst ease and simplicity of control is appreciated by the merest novice. The circuit is based upon the famous super-het coils, which proved such a success in the W. James' Super 60 receiver, recently described in this publication. There is but a single tuning control, no reaction, and neither outdoor nor indoor aerials nor earth are necessary.

SELECTIVITY

The selectivity of the Halcyon "Europa" is knife-edged. The National and Regional stations can easily be tuned out in one degree.

SPECIFICATION

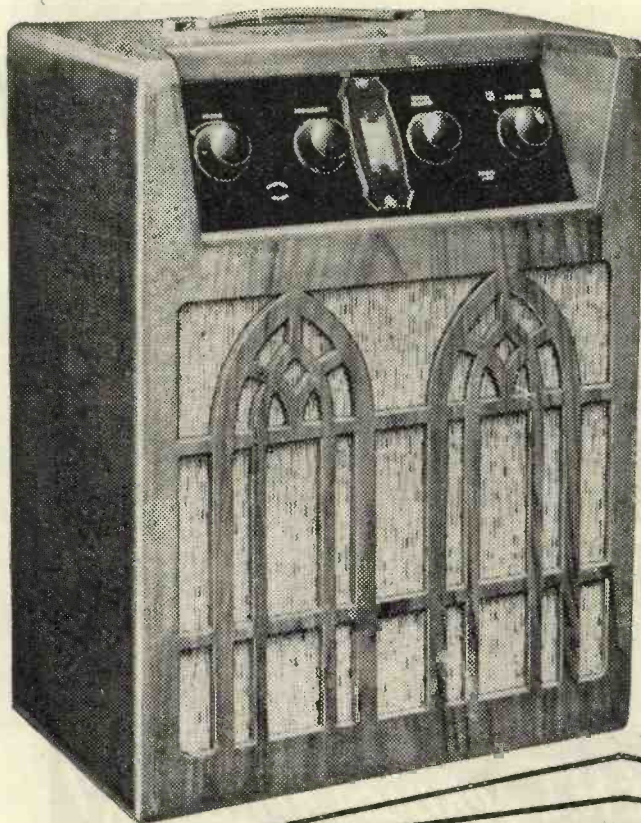
Five-valve band-pass supersonic Heterodyne receiver, embodying detector and oscillator valve, two screened-grid intermediate frequency amplifying valves, detector and pentode output valves. Single dial ganged condensers. Celestion speaker. Scale in metres. Plugs provided for gramophone pick-up.

PRICE

Complete with B.R.V.M.A. valves, H.T. and L.T. batteries, and all accessories, and including royalties—22 guineas. All mains model, complete with valves and all accessories, including royalties—28 guineas. Deferred terms can be arranged.

DEFERRED TERMS

If preferred, the "Europa" can be supplied on the following deferred terms: £4 down and 11 monthly instalments of £1 19s. 6d.



*Your Dealer stocks this ultra-modern Receiver
Ask him to give you a demonstration of its capabilities or write
for full details to the sole manufacturers :*

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MIDLAND SHOWROOMS & SERVICE DEPOT: 65a Broad Street, Birmingham. *Phone—Midland 4290.*
NORTHERN SALES DEPOT: 3 Upper Fountains Street, Leeds. *Phone—Leeds 25100*

Advertisers like to know whence the business comes—please mention "W.M."

LITTLE RADIO PROBLEMS—Continued

must be handled in a different manner. I suggest cutting out a 3-foot square hole with a view to installing a kitchen-lift, or how about a coal-shoot? This can be easily constructed with a large Danish egg box—make sure that it is Danish—and threepennyworth of tenpenny nails.

However, on second thoughts, as the mishap occurred in your mother-in-law's house, why worry?

2.—I possess a full 100-ft. aerial affixed at one end to the gable of the roof, at the other to a tall poplar at the end of an 18 ft. 9 in. garden. In a high wind the aerial sways, thus causing, I am told, the National and Regional programmes to get mixed up. Moreover, when Jack Payne's dance band plays, the house rocks. How should I alter my wireless set?—I. R. Purchase, Chez Nous, Jerrybuilt Park Estate, N.W.58.

ANSWER.—Many readers from your district have written me in the same strain and I have carefully considered the matter. We can tackle this

intricate problem by three different methods, namely: (a) suppress Jack Payne; (b) ditto the poplar; (c) remove the house, but perhaps before going to this extreme it may be found possible to strike a happy medium.

If the house sways simultaneously with the aerial and poplar, that is at the same frequency, stay the house at each corner. If, in a high wind, the roof should blow away, wherever it happens to fall, dig the house in underneath it. You will find this method easier than to erect a new aerial or to displace the poplar.

An ordinary coal-shovel borrowed from your neighbour should do what you require, but for 9d. you can buy a dinky entrenching tool (see advertisement columns) which will suit your purpose better. I do not recollect its exact name, but any ex-service man will willingly tell you what he called it.

Under no circumstances allow yourself to be induced to strain your aerial taut; it would cause the house to lean towards the poplar. You would lose

height and thus experience difficulty in receiving transmissions on the higher wavelengths.

3.—Last night, when father, uncle and I lifted the portable set off the what-not in the best parlour, we dropped it and the knobs fell off. The music went very faint. As we want to hear the Boisterous Grigs dance band to-morrow night for Aunt Maria's birthday, what are we to do? Please oblige. P.S.—How can we stick it and where?—William Blinks, 572 Peep Street, Peckham.

ANSWER.—As you have omitted to enclose a diagram in your letter it is not quite clear to me whether the knobs were on the set, what-not or parlour, but in no circumstance would I stick it.

On similar occasions in our laboratory we have tried this method as a last resource but unsuccessfully. Your best plan would be to rip out the inside of the portable, leaving the metal screening box intact. Some of the smaller components can be prised

(Continued on page 96)

Your set teeming with energy! it's such a simple step to Better Radio Service



With
SIEMENS
FULL O'POWER
RADIO BATTERY

*the only battery with one piece
(seamless) pure zinc cells*

Get one and see what H.T. service really is!

Sole of SIEMENS ELECTRIC LAMPS AND SUPPLIES LIMITED. 38/9, Upper Thames Street, London, E.C.4.

★ for the Ether Marshal



The designer has advisedly chosen the British General H.F. Choke, which, by reason of its high Inductance and low resistance, guarantees a perfect performance curve and supreme efficiency without resonant peaks. Totally enclosed in Bakelite, sealed against atmospheric effects.

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USE THE NEW Preh

PREH STANDARD POTENTIOMETER

A nicely-finished component of best quality bakelite; one-hole mounting, SMOOTH, ACCURATE, and ABSOLUTELY RELIABLE. Complete with arrowed knob, price 5/-.



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A very fine component indeed. Extreme smoothness and silence obtained by ingenious spring contact track. Price complete with knob 5/6



PRECISION COMPONENTS

in the very next circuit you build

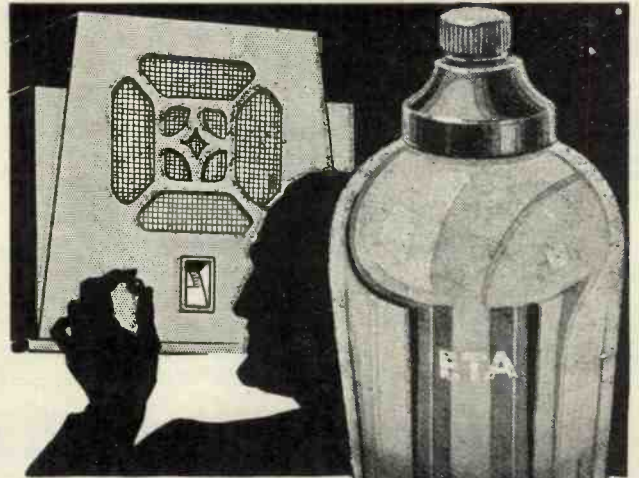
You cannot buy a volume control or wire-wound resistance—a rheostat or a potentiometer—at once so smooth in its action, so accurate in its specified resistance, and so reliable as PREH. There is a complete new range of Precision Components now available under this trade-mark, and before you buy any new component you should enquire—“IS IT MADE IN THE NEW PREH RANGE?”

Send for complete list and name of nearest dealer.

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GIVE YOUR SET A TONIC FIT ETA VALVES



Perhaps there's nothing really wrong with your set. It just wants 'bucking up' a bit. Now is the time to put ETA Valves to the test. Everyone says they're good. Prove it yourself. Though ETA Valves are so highly efficient their prices are lower than those of other first-quality valves.

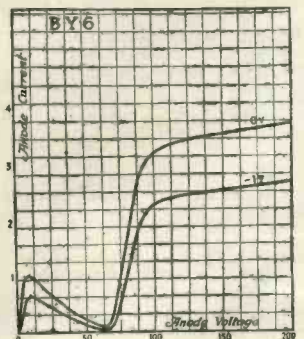


B.Y.6 Screen Grid 17/6

ETA VALVES

THE ELECTRICAL TRADING ASSOCIATION LIMITED.
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Advertisers take more interest when you mention "Wireless Magazine"

LITTLE RADIO PROBLEMS—Continued

A RADIOACROSTIC

Wander plugs detest, we see
 Insulators' company.
 Rheostat's a fickle lass,
 Ever-changing, somewhat crass.
 Laminated Cores can aid
 Each Transformer in his trade,
 Step-up ones and step-down, too—
 See what Wireless parts can do!

LESLIE M. OYLER

out by the aid of a lobster pick and nut-crackers will also be found of considerable assistance.

When you have disembowelled the instrument, barring the above-mentioned box, cover the outside of the handsome fumed oak case with a jazz pattern wallpaper and use it in country rambles as a picnic hamper.

The metal screening box keeps ham sandwiches or shrimps delightfully fresh.

(b) No, I am afraid that notwithstanding the conversion you must keep up your weekly payments.

4.—I have recently made a three-valve set, but I don't want to hear talks.

The overture to William Tell and such-like is good enough for me. Please give me a circus for an eliminator to cut them out. P.S.—I don't want to listen to the Children's Hour as our schoolmaster says my little boy is perfectly normal.—Mary N. Bright, Sunshine Cottage, Little Doodrop-on-Slush.

ANSWER.—So pleased to hear from you again, Mary. Well, for 1/11 3/4—you need not pay more—from the local dealer's you can buy a practical little switch which, when gently pushed over, ensures complete silence. All you need do is to watch the programme and throw the lever into reverse when you are sure the studio officials have recovered their sanity.

An eliminator would not help you; it can only cope with alternating- or direct-, but not with hot-air currents. If you now think of buying a gramophone, write me again.

EARNEST INQUIRER wishes to know what "alternative programme" means. The words imply the same programme on "alternate" days

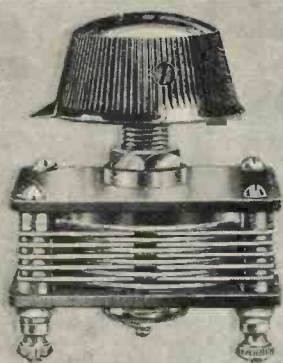
ACCURATE CONTROL MADE EASY



J.B. NEUTRALISING CONDENSER

J.B. NEUTRALISING CONDENSER—extremely simple design, cannot go wrong. Minute capacity changes made with ease. The slotted knob can be adjusted with a screw-driver and hand-capacity effects eliminated. Maximum capacity, 20 m.mfd. Minimum capacity, 1.5 m.mfd. ... 3/6

J.B. DIFFERENTIAL REACTION CONDENSER, for smooth reaction control. Carefully shaped vanes ensure equal capacity changes for both halves. Insulated centre spindle. Bakelite dielectric between vanes makes short-circuits impossible. Pigtail to rotor. .0001, 4/-; .00015, 4/-; .0002, 4/3; .00025, 4/3; .0003, 4/6



J.B. DIFFERENTIAL REACTION CONDENSER

PRECISION INSTRUMENTS



Advertisement of Jackson Bros., 72 St. Thomas' Street, London, S.E.1

Telephone: Hop 1837



Now build your Portable in the 'RIVERSIDE' Cabinet.



Chosen by Mr. James for the "Super 60" You want your portable this Summer to be attractive in appearance, yet strong and sturdy for constant handling. You cannot do better than build it in the Camco "Riverside" Cabinet. It is covered in handsome blue leatherette of good quality, and supplied with inner frame, useboard, and polished wood panel, 14 in. x 6 7/8 in. Only 45/- complete.

Name
 Address
 W.M.3

Send Coupon for free Catalogue to CARRINGTON Mfg. Co. Ltd., 24, Hatton Garden, LONDON, E.C.1 (Phone: Holb. 8302) (Works: S. Oraydon)



For the
SIMPLIFIED SUPER 60
and the
HOME & GARDEN 3
use these
Exide & Drydex
BATTERIES

as specified by the designer (or designers).

SIMPLIFIED SUPER 60

For low tension, Exide Type CZ3, 2 volts, 30 ampere hours
 For high tension, Drydex Type H.1015, Orange Triangle, 120 volts 24/-
 For grid bias, Drydex Type H.1007, Green Triangle, 9 volts - 1/6

HOME & GARDEN 3

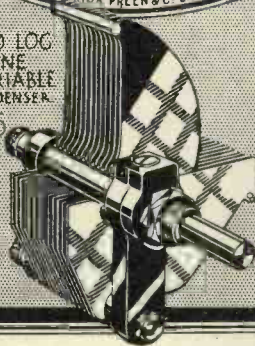
For low tension, Exide Unspillable, Type J.Z3, 2 volts, 30 ampere hours - - - - - 14/-
 For high tension, Drydex Dry Battery, Type H.1012, Green Triangle, 120 volts - - - - - 16/9
 For grid bias, Drydex Dry Battery, Type H.1001, Red Triangle, 9 volts - - - - - 1/-

Exide Batteries, Clifton Junction, near Manchester. Branches: London, Manchester, Birmingham, Bristol, Glasgow, Dublin, Belfast.

N12

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ARTHUR PREEN & CO LTD

MID LOG
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 VARIABLE
 CONDENSER
 4/6

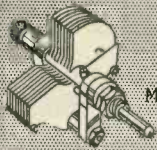
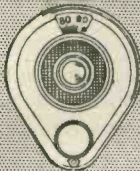


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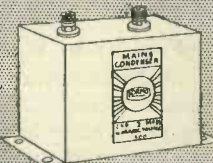


MIDGET CONDENSER

2/9

MAINS
 CONDENSER
 CAP. 2

3/3



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Your Loud-speaker in the Garden

AFTER the recent articles about "Listening on the Lawn" and "Summer Radio," I suppose that there has been a wholesale trek to the garden with loud-speakers. One or two of my neighbours have expressed disappointment at the results of wireless in the garden. I am wondering whether the mistakes they made are common.

Portable Quality

The first complaint came from a portable-set owner. He was quite satisfied with the quality and volume of this set when used in his study, but he was horribly discontented with the thin, reedy tones that emanated from the set in the garden.

Well, that set owner really ought to have known better. In this magazine the limited undistorted output for portable sets has been frequently pointed out.

Nothing much can be done to increase the output of such sets.

with provision for the increased anode current, a really satisfactory increase in undistorted volume can be obtained.

To connect the loud-speaker in the garden to the set in the house, one can use almost any sort of wire, provided that it is well insulated. Bell wire could be used, but for general convenience the twin-flex used for electric lighting is usually specified. This kind of connecting wire is not entirely "all-weather," although underneath the cotton or silk braiding is a rubber covering, which is probably capable of combating the rigours of any English summer.

All sets connected to loud-speaker

There is really no need to get up at all, if one provides a suitable relay device. In a battery-operated set, the switching off is simply a matter of disconnecting one of the filament leads. This is done by means of a panel switch, fitted in one of the accumulator leads to the filament.

Filament Switching

A simple relay will do this filament-switching from a distance. As the remote switch is closed, the relay battery actuates the relay, which in turn closes the filament switch contact, while it is quite practicable to carry the minute relay current along the extension wires, it would be quite impracticable to extend the filament leads.

I have recently tried out the Lotus remote control house-wiring system. I must say I found the outfit very convenient for garden wireless. A complete remote control outfit for two rooms costs only £2 5s. and comprises one Lotus relay, two Lotus filament control wall-jacks, two Lotus jack-plugs, and twenty-one yards of four-strand wire.

Fool-proof Working

Two of the four strands are for the loud-speaker current, and the remaining two are for the relay current. When the remote loud-speaker plug is inserted in its jack, the loud-speaker is put into the output circuit of the set, and the relay switch is automatically closed. From my tests I can say the Lotus relay is absolutely fool-proof in action, and once the great convenience of switching off from a distance is actually experienced, one wonders why it was not installed before!

Should you intend to take advantage of this handy apparatus, let me remind you that if you have an all-mains set a different type is necessary.

A remote control outfit for use with an all-mains set costs £2 7s. 6d. for a two-room installation. Additional apparatus, consisting of a filament control wall-jack and fifteen yards of four-strand wire, costs 7s. 6d. for each additional room. A. S. H.



REMOTE CONTROL OUTFIT
Here you see the Lotus Remote Control outfit for use with all-mains receivers. The cost is £2 7s. 6d. for a two-room installation

If a larger power valve is put in place of the existing small power valve the poor overworked high-tension battery, which will almost certainly be of only standard capacity, will quickly exhaust itself through excessive over-running.

Extra Volume Required

Ordinary sets with separate batteries and loud-speaker can often be quite easily fitted to cope with garden radio conditions. The main condition is extra volume—extra undistorted volume! The trouble is that volume is usually increased by over-loading the power valve. The result is distortion.

By fitting a size larger power valve,

extensions in the garden should be provided with loud-speaker filter circuits. That is to say, the loud-speaker should not be directly connected in the anode circuit of the power valve.

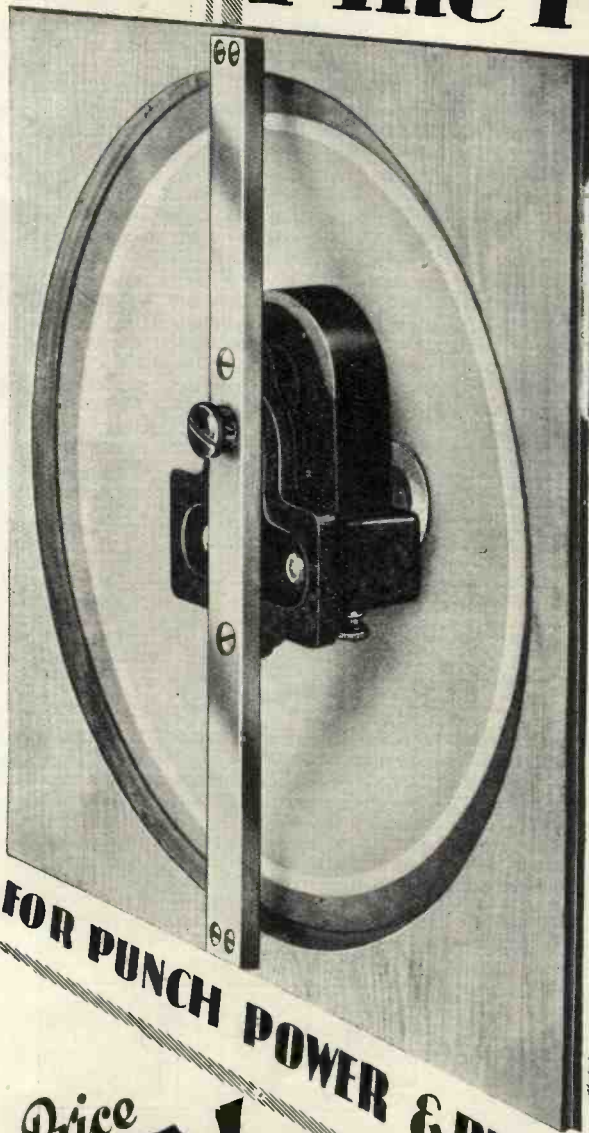
Either a choke-capacity filter output or transformer will serve to divert the high-tension current from the loud-speaker windings, allowing only the low-frequency current to be carried along the extension wires.

Another complaint I had to listen to from a neighbour trying garden wireless referred to the inconvenience of getting up from a comfortable deck-chair and going inside to switch off at such times as talks are being broadcast.

Less Space... Complete Reliability. Fine Performance..

outstanding features of

The ORMOND BOARD-CHASSIS ASSEMBLY



This loud-speaker assembly has been specially constructed for use in the "Home and Garden Three Receiver."

The combination comprises the famous Ormond Four Pole Adjustable Unit with a cone of specially selected material, the whole being secured to a five-ply baffle board.

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DESIGN DATA SHEETS *By J. H. Reyner, B.Sc., A.M.I.E.E.*

"W.M." Design Data

No. 13

DECOUPLING RESISTANCE, CALCULATION OF

THE choice of a resistance for a decoupling circuit depends upon two considerations. First of all the decoupling resistance must have a high impedance in comparison with that of the by-pass condenser used. Since the by-pass condenser is usually limited to 1- or 2-microfarad, this depends upon the frequency which the circuit will amplify. If the circuit cannot give good amplification at frequencies below, say, 150 cycles, it is unnecessary to arrange the decoupling to be good enough for 50 cycles.

The table herewith shows the impedance of by-pass condensers at various frequencies. The decoupling resistance should be ten times this value for satisfactory operation.

The second point is that the voltage drop on the resistance must be such that the voltage on the anode of the

valve itself is what is required. To evaluate this, the anode current of the valve is determined from the valve characteristics under the particular condition of anode voltage and grid-bias required.

The voltage drop on the decoupling resistance is then worked out on the assumption that every 1,000 ohms drops 1 volt per milliampere. Thus a 30,000-ohm decoupling resistance carrying 3 milliamperes would drop 90 volts.

The voltage drop on the decoupling resistance is added to the voltage assumed on the anode of the valve, and the total voltage must not be greater than the voltage available. If it is less the value of the resistance may be increased, since this will not affect the decoupling action and will serve to give the additional voltage drop required.

If the voltage on the decoupling resistance is too great, however, the only alternative is to reduce the anode voltage on the valve, or reduce the decoupling resistance and circumstances must dictate which is to be adopted.

Condenser	Impedance (ohms)			
	f = 50	100	150	200
1-mfd.	3,200	1,600	1,070	800
2-mfd.	1,600	800	530	400

"W.M." Design Data

No. 14

BAND-PASS FILTER, REACTION OF

THE most general use for the band-pass filter is in the aerial-tuning circuit of a high-frequency receiver. Here it limits the voltage applied to the first valve and largely overcomes the difficulties of cross-modulation.

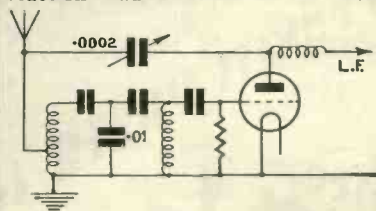
There are, however, occasions where one uses a simple band-pass filter on a plain detector circuit followed by one or more stages of low-frequency amplification. In such circumstances it is necessary to apply reaction to the circuit, and the manner in which this is done has some effect on its operation.

It is preferable to apply reaction to both circuits of the filter which may conveniently be done by feeding the energy back into the aerial circuit. The reaction effect is then transmitted through the filter, improving the tuning of both the circuits as required. If the reaction is only applied around the second circuit, the tuning of one circuit becomes much sharper than that of the other, giving a lop-sided resonance curve, in which one of the peaks is much larger than the other. This at once destroys the band-pass action, although the selectivity may appear to be improved.

It is not necessary to use a separate coil for the reaction if this is applied to the first circuit as just discussed. The

reaction lead may be taken to the aerial coupling tap, as shown in the diagram. This is quite a convenient way of obtaining reaction, since no additional facilities are required, and its use is quite satisfactory where a simple circuit is required.

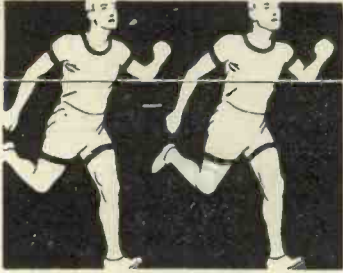
The circuit operates because there is a phase-change in the filter itself. If a reaction lead is taken to an aerial



Simple reaction circuit for a band-pass filter

tapping on an ordinary single circuit, the reaction effect will be reversed, the signal strength being decreased instead of increased.

In the case of the band-pass filter, however, the voltage developed in the first circuit is transferred to the second circuit by means of common coupling which may be either an inductance or a capacity or both, a capacity being shown in the diagram for convenience.

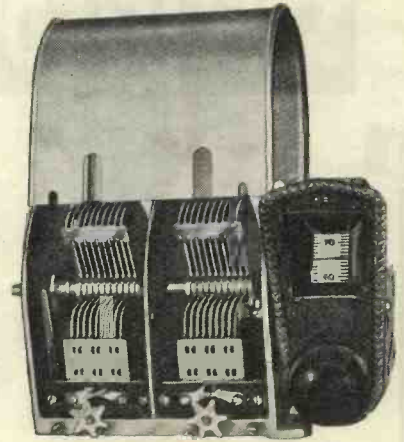


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DESIGN DATA SHEETS—Cont.

"W.M." Design Data

No. 15

SHORT-WAVE ADAPTORS

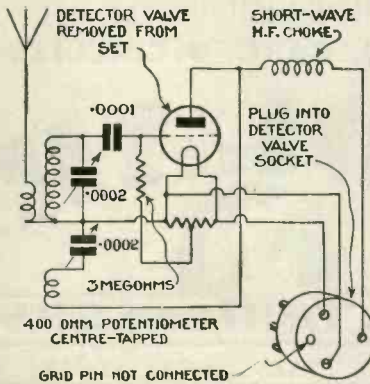
THOSE who do not wish to use an entirely separate set for short-wave reception may very conveniently use an adaptor for the purpose. Such a device consists of a short-wave tuning circuit, comprising coils, condensers, and valve holder, on which the short-wave signals are picked up and detected.

The currents from the anode of the valve are then led into the normal set

which is used for their further amplification, so that the signals may be applied to a loud-speaker.

The simplest method is that shown in the figure, which consists of a straight reaction circuit. The inductances may either be short-wave plug-in coils or a specially designed short-wave tuner, and the leads between the coils and condensers must be kept short. The leads between the tuned circuit and the valve holder can be several inches in length without causing any detrimental effects.

The signal is picked up and rectified on this arrangement, the aerial being transferred from the normal set to the aerial terminal shown. Low-frequency currents are then passed from the anode of the valve into the anode socket of the detector circuit in one's normal set, from which they pass through the low-frequency stages and are suitably amplified. The detector valve in the ordinary set is removed for this purpose and inserted in the holder in the adaptor, while the plug shown in the circuit is inserted in the detector socket in the normal receiver which supplies the necessary high and low tension to the adaptor without any other connections.

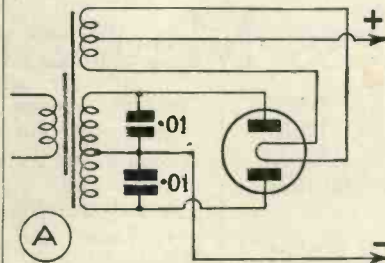


Circuit for adding a short-wave adaptor

"W.M." Design Data

No. 16

CARRIER HUM



Simple method for obviating carrier hum

A DIFFICULTY often experienced with mains sets is that the hum is brought up in the carrier of a strong station. In severe cases it is brought up on weak stations also, and the reception of distant programmes is rendered more difficult.

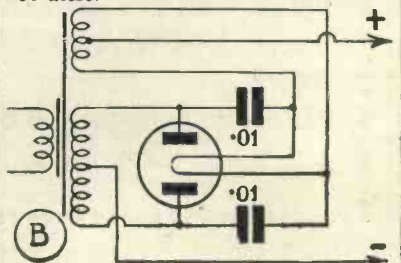
This effect is due to high-frequency currents on the mains, which may be got rid of by any device tending to provide a shunt circuit for them. The simplest method is shown in Fig. (a), which applies to a double-wave rectifying valve. This method has the disadvantage that each condenser has to be made to withstand the full voltage on each half of the transformer.

Fig. (b) shows a method adopted by Philips Radio whereby not only can

smaller condensers be used, but they need only have quite a low test voltage.

In the case of a metal rectifier where the transformer is not centre-tapped, a shunt condenser of 1-microfarad across the secondary of the transformer is all that is required to shunt the high-frequency currents in most cases.

Carrier hum is also introduced occasionally by incomplete earthing. Earthing the core of the mains transformer or the low-frequency transformer or both will often dispose of the last trace of this carrier hum. This, however, is largely a question of the layout of the set, and if the mains transformer is kept well away from the other low-frequency, iron-cored apparatus, difficulties of this type should not arise.



Circuit used by Philips Radio

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Five-Point Two (D, Trans)	WM220
Brookman's A.C. Two (D, Trans)	WM225
Aladdin Two (D, Trans)	WM231
Ever-tuned Regional Two (D, Trans)	WM241
Talisman Two (D, Trans)	AW194
Hyper-Selective Two (D Pentode)	AW198
British Broadcast Two (D, Trans)	AW215
Easy-tune Two (D, Trans)	AW226
Wavelets Two (D, Trans)	AW229
No Battery Mains (A.C.) Two (D, Trans)	AW230
No Battery Gramo-radio 2 (D, Trans)	AW238
1930 Talisman 2 (D, Trans)	AW239
Easy Tune Short-wave 2 (D, Trans)	AW242
Searcher Two (D, Trans)	AW245
Arrow Two (D, Trans)	AW249
Forty-Five Shilling Two (D, Trans)	AW250
Searcher Short-wave 2 (D, Trans)	AW259
Challenge Two (D, Trans)	AW261
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Inceptordyne (SG, D, Pen.)	WM179
Music Marshal (D, 2 Trans)	WM100
Gramo-Radio D.C. Three (SG, D, Trans)	WM106
Concert Three (D, 2 Trans)	WM109
De-Luxe Three (D, RC, Trans)	WM209
Five-Point Three (SG, D, Trans)	WM212
Falcon Three (AC Set)	WM217
New Brookman's Three (SG, D, Trans)	WM218

A blueprint of any one set described in the current issue of the "Wireless Magazine" can be obtained for half-price up to the date indicated on the coupon (which is to be found on page 104) if this is sent when application is made. These blueprints are marked with an asterisk (*) in the above list and are printed in bold type. An extension of time will be made in the case of overseas readers.

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Regional Band-pass Four (SG, D, RC, Trans)	WM211
Five-Point Four (SG, D, RC, Trans)	WM216
Regional A.C. Four (SG, D, RC, Trans)	WM222
Supertone Four (SG, D, Push-pull)	WM227
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"A.W." Selectivity Unit	AW290	-/6
B.B.C. Official Selectivity Unit	AW294	-/6

Each blueprint shows the position of each component and every wire and makes construction a simple matter. Copies of "Wireless Magazine" and of "Amateur Wireless" containing descriptions of all these sets can be obtained at 1s. 3d. and 4d. respectively, post free. Index letters "A.W." refer to "Amateur Wireless" sets and "W.M." to "Wireless Magazine" sets.

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Under no circumstances can questions be answered personally or by telephone. All inquiries must be made by letter so that every reader gets exactly the same treatment.

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If you want advice on buying a set a stamped-addressed envelope only (without coupon or fee) should be sent to Set Selection Bureau, WIRELESS MAGAZINE, 58-61 Fetter Lane, London, E.C.4.

AROUND AND ABOUT

WE learn that models of the 521 radio gramophone manufactured by the Gramophone Co., Ltd., are now available for use with 100-110 volts and 200-250 volts, 25 to 40 cycles, and 75 to 100 cycles. The price of these special models is 57 guineas.

In addition, the Gramophone Company, in view of the fact that a number of electricity companies are changing over from D.C. to A.C., are prepared to convert an existing D.C. radio gramophone to A.C. at a cost of £15.

Ferranti, Ltd., have recently marketed a mains transformer, type SM2, giving an output of 135 volts, which, in conjunction with the Westinghouse rectifier, type HT7, in a voltage-doubler circuit, will give a D.C. output up to 200 volts 28 milliamps and an L.T. winding providing 4 volts 6 amperes. This transformer is suitable for use in the A.C. "Super 60" and is priced at 35s.

Birmingham is the first city in this country to make use of the wireless amateurs' Q.S.L. card for civic publicity. The City of Birmingham Information Bureau is supplying all the local amateur transmitters with these cards free of charge.

Each card bears Birmingham's trade mark, a cog wheel with a map of England in the centre. On an average over two hundred Q.S.L. cards are sent each week from Birmingham to all countries of the world, so the publicity value of the innovation is considerable.

When the new Langenberg transmitter increases its power to 75 kilowatts, the present transmitter at Cologne will be closed down and transferred to Treys.

It is hoped that the new Langenberg station, construction of which is now being pushed forward, will be ready for operation by the 15th of December next, the fifth anniversary of the inauguration of Radio Langenberg.

Substantial reductions in the prices of Grosvenor dry batteries have been announced by Grosvenor Electric Batteries, Ltd. In addition, two new lines have been introduced, namely, a 50-volt red line at 5s. 6d. and a similar 108-v. type at 10s.

The Danish broadcasting station in response to numerous requests from listeners has adopted an interval signal consisting of a motif from one of the Danish folk songs. This interval signal, is something the B.B.C. might well adopt in preference to the death-watch tick.

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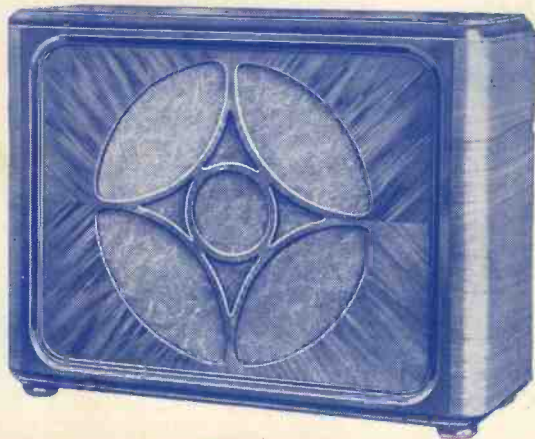
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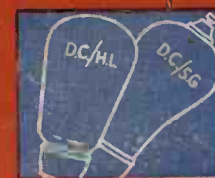
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