

WAYFARER GRAND PORTABLE

CIRCUIT.—A tuned frame aerial precedes V1, a screen grid valve, one section forming the long-wave coil and being shorted out by a switch for medium wave reception.

A local-distance switch operates on this valve; in the local position an extra resistance is placed in series with the screen decoupling resistance.

Coupling to V2, a triode, is by a single tuned circuit with reaction fed back from the anode in the orthodox manner. Attention is drawn to the grid leak potentiometer used with this valve.

The output of V2 passes through a resistance and capacity stage to V3, a triode, which is coupled by a parallel-fed transformer to the output pentode V4.

A permanent magnet moving coil speaker is used, and it is fed from the anode of V4 through a matching transformer.

Attention is drawn to the battery economising circuit employed in this receiver. This cuts down the total current drawn from the H.T. battery to between 8 and 9 m.a.

H.T. and G.B. are obtained from a combined Drydex, type H1026. This has 99 volts H.T. and 9 volts G.B. L.T. is obtained from an Exide LBJ3 jelly acid accumulator, rated at 2 volts 15 amp. hour.

Special Notes.—A pair of sockets will be found in the bottom right-hand corner of the control panel for connecting a pick-up.

This is connected to the grid of V3 and will not be affected by the volume control, so the pick-up used should possess its own volume control.

No switching position is provided, and although the connection of a pick-up is usually sufficient to cut out broadcast

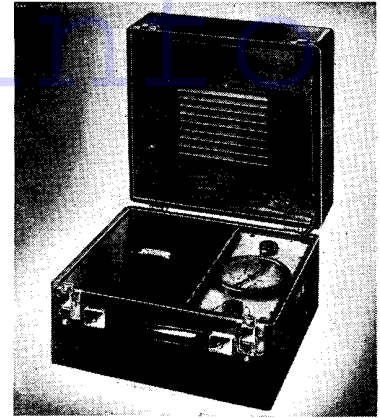
reception, it is advisable to either tune the receiver to a point where there is no transmission or short out the aerial and earth terminals.

A jack on a terminal strip on the speaker baffle provides connections for a pair of headphones. Insertion of the plug automatically breaks the internal speaker circuit.

A fuse is fitted in the negative H.T. lead. A 3.5 volt .15 amp. flash-lamp bulb may be used as a replacement.

Removing Chassis.—Remove the four wood screws which will be found in the control panel, then slide the whole chassis sideways just far enough to free the tuning knob from its slot. Then lift the chassis vertically, and it may be removed to the extent of the speaker and frame aerial leads, which may be considered sufficient for testing the receiver.

Removing frame aerial and speaker.—Take out four screws, one in each corner of the speaker fret, which should then be removed; four more black-headed screws will then be found in the speaker baffle; after these have been removed the speaker and frame aerial should be gently slid for-



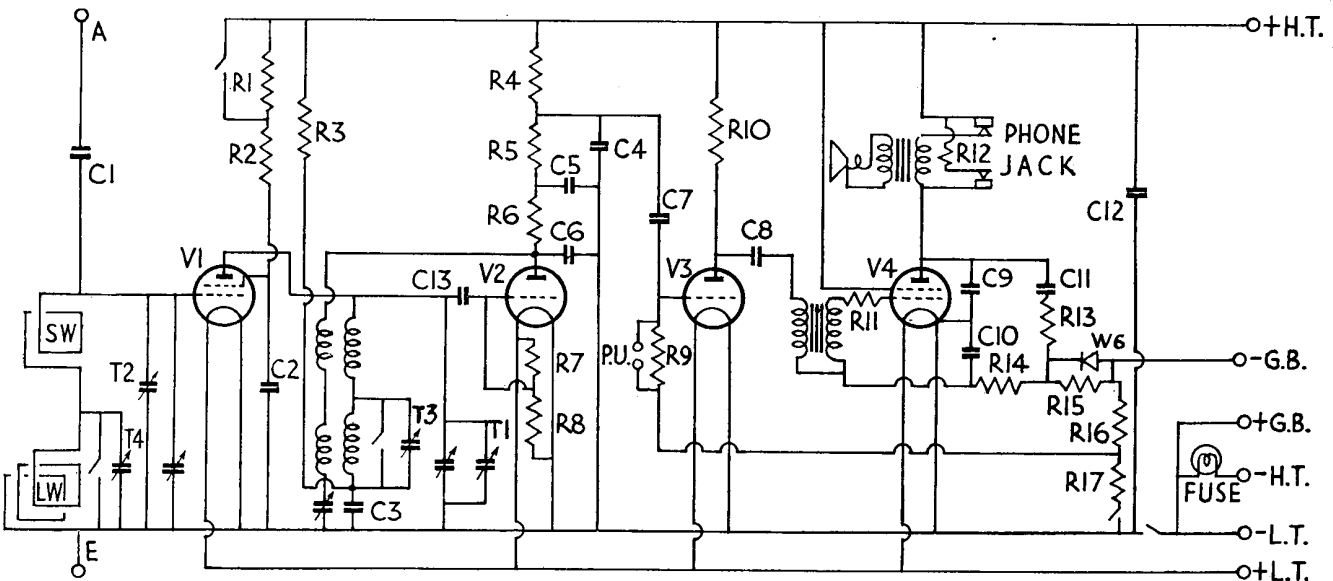
The Wayfarer Grand suitcase portable is made by London Electric Appliances, Ltd. A straight four circuit is employed with a battery economiser circuit that saves H.T. Pick-up terminals and a headphone jack are fitted.

CONDENSERS

C.	Purpose.	Mfds.
1	Series aerial .. .. .	.001
2	V1 screen decoupling .. .	.1
3	V1 anode decoupling .. .	.5
4	H.F. filter .. .. .	.003
5	H.F. filter .. .. .	.003
6	H.F. filter .. .. .	.0003
7	L.F. coupling .. .. .	.01
8	L.F. coupling .. .. .	.05
9	Pentode compensating ..	.003
10	V4 bias decoupling .. .	.1
11	Economiser feed .. .. .	.1
12	H.T. shunt	8
13	V2 grid .. .. .	.0001

RESISTANCES

R	Purpose.	Ohms
1	Local—distance	3 meg.
2	V1 screen decoupling .. .	75,000
3	V1 anode decoupling .. .	5,000
4	V2 anode load	75,000
5	H.F. filter	5,000
6	H.F. filter	5,000
7	V2 grid leak pot.	2 meg.
8	V2 grid leak pot.	2 meg.
9	V3 grid leak	500,000
10	V3 anode load	50,000
11	V4 grid stopper	500,000
12	Headphone shunt	1,000
13	Economiser feed	100,000
14	V4 grid bias decoupling ..	250,000
15	Westector load	50,000
16	Grid bias pot.	1,000
17	Grid bias pot.	250



Midget valves and a Harries power output tetrole are used in the Wayfarer Grand. The arrangement is screen-grid H.F., triode detector, triode L.F. and output. A grid-leak potentiometer is used on the detector and the L.F. valve is parallel coupled to the output stage. There is a local-distance switch cutting R1 (3 meg.) in or out.

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ward out of the lid, and laid on top of the chassis and battery compartment.

The connecting leads from the receiver chassis may now be unsoldered, reconnection being as follows:—

With the aerial laid flat, a small terminal strip will be seen in the far right hand corner; this carried three leads: top tag, blue lead; centre tag, yellow lead; bottom tag, green lead.

Make sure when reconnecting that the green lead is passed through the hole in the baffle. Two further tags will be found by the side of the aerial trimmers; that nearer the top of the frame aerial takes a red lead and the other a black lead.

As a check, see that the leads are connected as follows: green, start of medium-wave aerial; yellow, junction of medium and long-wave winds; blue, end of long-wave wind; red, speaker transformer; and black, telephone jack.

Circuit Alignment Notes

To carry out the alignment of this receiver, the chassis must be removed as above and placed so that the valves are upright. The speaker fret must be removed.

Medium Waves.—Connect a modulated oscillator to the external aerial and earth terminals and tune it and the receiver to

200 metres (1,500 kc.). Adjust T1 and the right hand trimmer (T2) on the speaker baffle for maximum sound output.

Critical reaction should be used during the adjustment of all trimmers, which means that the reaction control must be continually adjusted to keep it just below the oscillation point.

Check the adjustment of these trimmers at 220 metres (1,365 kc.) and 500 metres (600 kc.).

Long Waves.—Tune the oscillator and the receiver to 1,000 metres (300 kc.) and adjust T3 and the left-hand trimmer (T4) on the speaker baffle for maximum output.

Check at 1,800 metres (166.5 kc.).

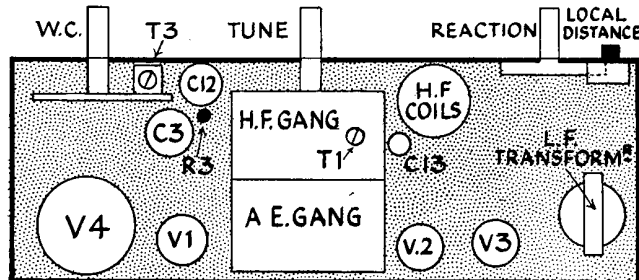
A. H. Hunt, Ltd., of Wandsworth, London, S.W.18, make an exact replacement for C12. The condenser is list number 3477, price 1s. 9d.

VALVE READINGS

No signal. No reaction. New batteries.

V	Type.	Electrode.	Volts.	Ma.
1	(All Hivac) XSG met. (Midget 4)	Anode .. Screen ..	82 32	* —
2	XD met. (Midget 4)	Anode ..	24	* —
3	XL (Midget 4)	Anode ..	38	* —
4	Z230 (5)	Anode .. Screen ..	98 99	2.95 .5

* Inaccessible.



Layout of the top of the chassis. It should be noted that a trimmer is fitted on the speaker baffle and is not shown in this or the diagram below.

Wayfarer Grand on Test

SUITABLE portable for battery operation from Drydex H1026 combined H.T. and G.B. battery and Exide LBJ3 2-volt accumulator. Price 10 gns.

DESCRIPTION.—Two-waveband, four-valve battery portable set with self-contained frame aerial.

FEATURES.—Permanent magnet speaker, aeroplane type dial, local distance switch. Battery economiser circuit. Midget valves and Harries power output tetrode.

Sensitivity and Selectivity

MEDIUM WAVES (200-555 metres).—Sensitivity sufficient to give good room strength from powerful stations during daylight. Selectivity can be enhanced by directional properties of the aerial. Useful number of stations after dark.

LONG WAVES (875-2,100 metres).—Main stations give sufficient volume. Deutschlandsender audible, but aerial not sufficiently selective to give complete separation by directional properties.

Acoustic Output

The tone is good for a battery portable set with very reasonable consumption. This is enhanced by the battery economiser circuit which enables more current to be dealt with on full volume.

Book Review

VALVE THEORY AND PRACTICE

GREAT changes have taken place in valve design and practice during the last few years. New applications of existing types have been found and new valves have been designed for new functions, such as Q.P.P. and A.V.C., to say nothing of the popular triode-hexode frequency changer.

As a consequence there is a demand among service engineers and students for such a work as that published by Pitman's, *Thermionic Valves in Modern Radio Receivers*, by Alfred T. Witts, A.M.I.E.E. (8s. 6d.).

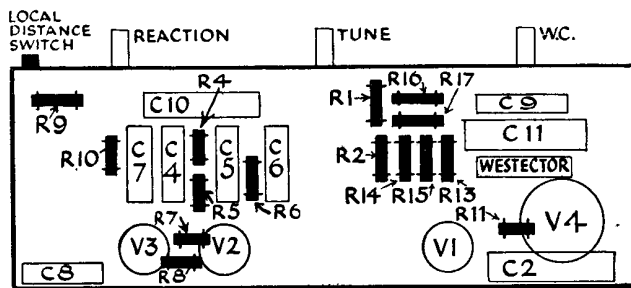
First dealing with fundamentals such as electron emission and valve characteristics, the book goes on to describe the various types of valve in use to-day. Out-of-date phenomena and circuits are avoided, as are theoretical arrangements not actually employed to-day.

Chapter headings are according to function and run in stage-by-stage order, finishing with arrangements in special functions, such as A.V.C.

Although described as an "outline," the book runs to nearly 200 pages, and includes considerable detail. For instance, in dealing with electron emission, the author describes briefly processes employed in obtaining the necessary high vacuum by means of gettering.

There are over a hundred circuits and diagrams illustrating each point.

It is impossible to avoid equations in such a work, but the mathematics are not really formidable.



Underside view of the Wayfarer Grand chassis. When aligning the set the chassis and the speaker fret must be removed. The speaker itself should not be removed during ganging.

Sleuthing an Intermittent Fault

SHERLOCK HOLMES methods were necessary to find a fault in a five-band superhet.

There were no signals on four of the bands, though the fifth—an ultra-short—functioned. Tests revealed a voltage of 240 on the top cap of the second valve, the frequency changer. Since this is the grid connection there was a leak somewhere. Isolating the grid from the H.T. by a condenser cured the trouble. Then I set to in search of the cause.

Valves 1 and 2 were coupled by H.F.T.s on the four faulty bands. I found, and

I suspected, a primary-to-secondary short.

Four secondaries made testing complicated, but I put a voltmeter in the grid of the mixer and moved the cans till I found that this treatment to the long-wave can cleared the fault.

Removing the can, it was found that the end of the L.W. secondary was brought out to a soldering tag only an eighth of an inch from the primary trimmer screw. A loose loop of bare wire on this secondary end intermittently touched the screw. Clearing this cured the trouble permanently.—W. G. G.

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