

# SERVICE ENGINEER

## LISSEN MODEL 8168 SUITCASE PORTABLE

**CIRCUIT.**—A four-valve portable battery receiver for operation on medium and long wave bands.

The input to V1, an H.F. pentode, is via a tuned frame aerial. Signals then pass to V2, a triode, through an inductively-coupled H.F. coil, reaction being employed in the orthodox manner. The reaction condenser is ganged with the volume control, which operates by varying the bias on the grid of V1.

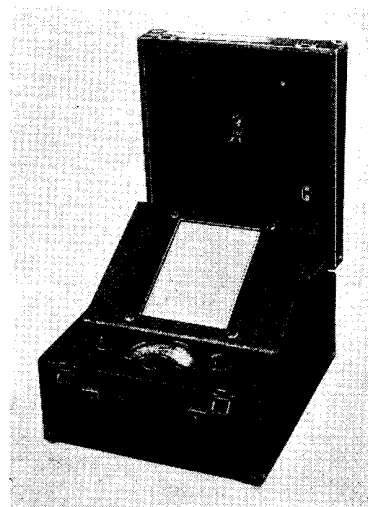
The output of V2 is fed to V3, a triode,

via a resistance and capacity stage and through a further R.C. stage to the output pentode V4.

High tension and grid bias are derived from a single combined battery, and low tension from a jelly-acid accumulator.

**Removing Chassis.**—Remove the batteries and valves and the four leads from the frame aerial which are secured by bolts to a terminal board on the right hand side of the chassis. The leads to

(Continued on next page.)



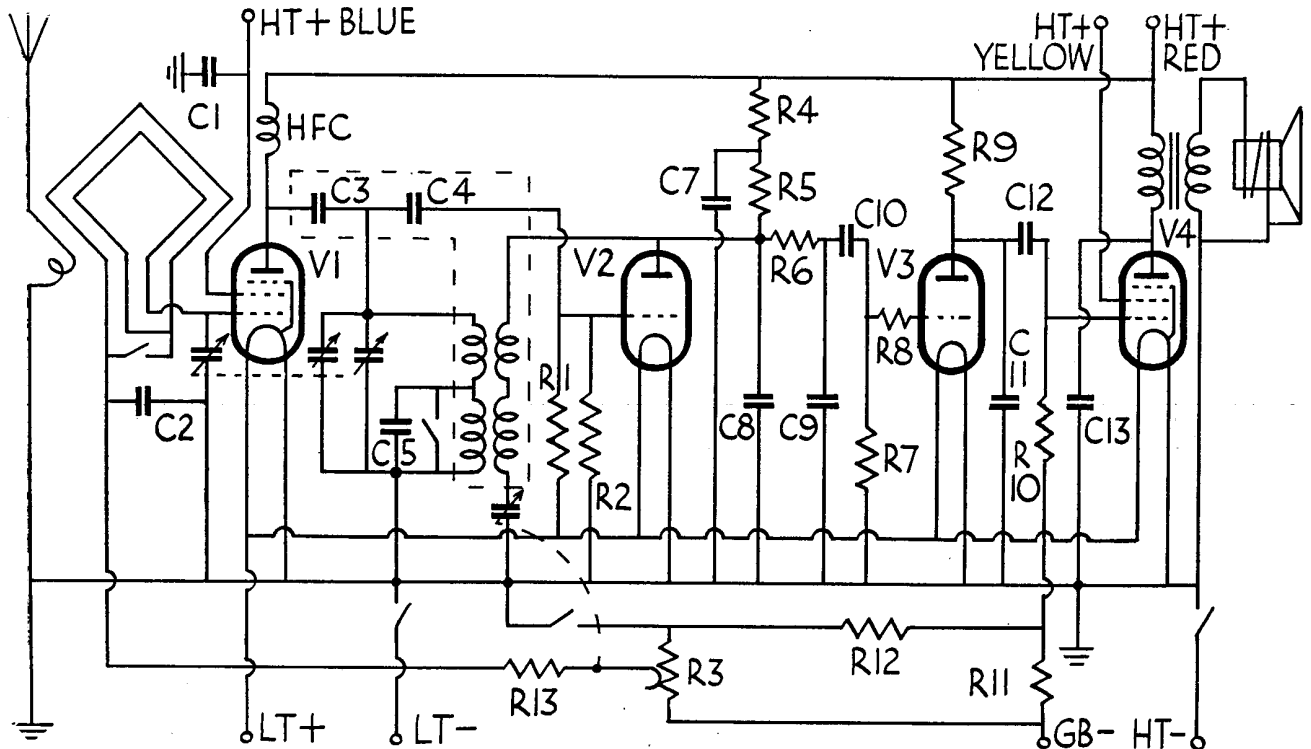
The model 8168 four-valve battery portable introduced by Lissen, Ltd.

### CONDENSERS

C.	Purpose.	Mfd.
1	V1 screen decoupling...	.1
2	V1 bias decoupling ...	.1
3	V1 anode coupling ...	.00005
4	V2 grid... ..	.00005
5	Medium wave trimmer ...	—
6	Reaction ... ..	—
7	V2 anode decoupling...	2
8	H.F. filter ... ..	.0002
9	H.F. filter ... ..	.001
10	L.F. coupling ... ..	.025
11	Anode shunt ... ..	.001
12	L.F. coupling ... ..	.025
13	Pentode compensating ...	.001

### RESISTANCES

R.	Purpose.	Ohms.
1	V2 grid leak ... ..	2.1 meg.
2	V2 grid leak ... ..	2.1 meg.
3	Volume control ... ..	—
4	V2 anode decoupling...	30,000
5	V2 anode load ... ..	30,000
6	H.F. filter ... ..	50,000
7	V3 grid leak ... ..	51,000
8	V3 grid stopper ... ..	50,000
9	V3 anode load ... ..	50,000
10	V4 grid leak ... ..	260,000
11	Bias potentiometer ...	1,400
12	Bias potentiometer ...	3,000
13	V1 bias decoupling ...	110,000



This theoretic circuit diagram of the Lissen portable reveals an orthodox H.F., detector and 2 L.F. arrangement. A winding coupled to the frame aerial provides connections for an external aerial and earth. L.F. coupling is by resistance and capacity.

# LISSEN MODEL 8168 PORTABLE (Continued)

which they are attached are of the same colour, and further, coloured dots are marked by the appropriate terminals so that reconnection is an easy matter.

Then remove four wood screws from the panel. The chassis and speaker will completely remove from the case.

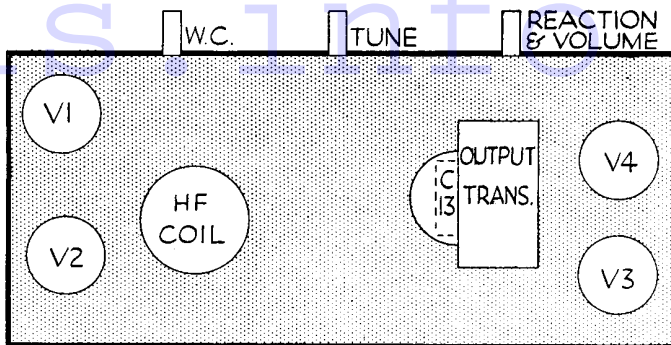
## ALIGNMENT NOTES

Connect a modulated oscillator tuned to 250 metres to the aerial and earth terminals and an output meter across the speaker terminals.

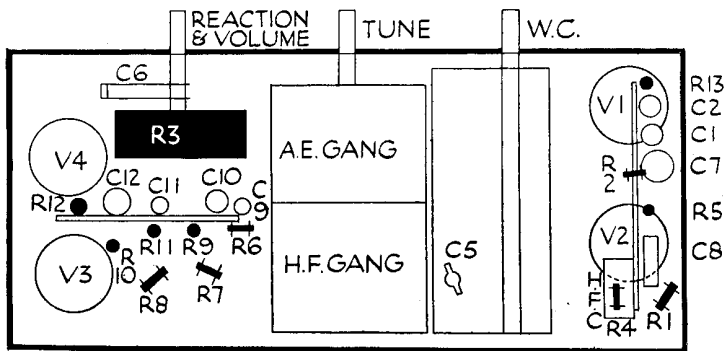
Tune in the signal, and check that the pointer is reading correctly. If not, correct by slackening the two grub screws on the condenser shaft. Then adjust T1 for maximum reading on output meter.

Repeat at 500 metres and again at 250 for check.

The diagram on the right indicates how components are situated on the valve-side of the compact 8168 chassis.



This drawing aids identification of the "below chassis" components of the Lissen portable.



## VALVE READINGS

No signal. No reaction. New batteries.				
V.	Type.	Electrode.	Volts.	Ma.
1	K50 Met. (7) ...	anode ...	125	.45
		screen ...	72	.1
2	K30 C.Met. (4) ...	anode ...	52	.8
		screen ...	63	.8
3	K30 C.Met. (4) ...	anode ...	125	4.2
		screen ...	124	.8
(All Ever Ready)				

## Two Comprehensive Books for Service Men

TWO informative American books for service engineers and radio men generally have been made available here by Holiday and Hemmerdinger, of Holmer Works, Dolefield, Bridge Street, Manchester, 3.

Both volumes are by John F. Rider, who is well known in the U.S.A. for his radio service publications.

The first is "Servicing Superheterodynes," which was published in January this year, and is a completely revised edition of a work that has been popular since 1931.

Mr. Rider assumes the reader has a general knowledge of service work, and deals solely with the special features of superhets.

First he describes the principle of operation and the function and characteristics of individual parts of a superhet. Special circuits and tube applications are reviewed

and then follow large chapters on troubles and their symptoms and on the use of test oscillators.

The book is not too "American" in style or technicalities. British practice is now fairly close behind the American, and so most of the practical references can be followed and will prove of value.

While not over theoretical, the first part of the volume will assist in the appreciation of the "works" of a superhet and the reasons for its advantages compared with the "straight" set. The sections on breakdowns, trouble "shooting" and the use of test oscillators—which comprise the bulk of the book—will undoubtedly prove of considerable assistance to the service man.

In the fault-finding chapter over 40 troubles are listed, and all the possible causes for each given.

The concluding chapter describes the

vibrator H.T. units which are used with car radio sets, and are becoming increasingly popular over here. An appendix lists the I.F.s of hundreds of American commercial receivers.

The second book is "The Cathode Ray Tube at Work." The author says: "The book is intended primarily for the radio servicing industry as a reference text covering the operating principles and practical applications. It is not intended as an engineering text, but as a practical book."

"The subject of television has been omitted entirely. . . . However, the theory given should be of some value in the effort to comprehend the operation of the cathode-ray tube in television systems."

"Servicing Superheterodynes" is available at 4s. 10d. post free, and "The Cathode-Ray Tube at Work" at 11s. post free.

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