

TRADER SERVICE SHEETS

RECEIVER SERIES (NUMBER FIFTEEN)

THE chassis embodied in the Telsen model 1240 A.C. radio-gramophone is also fitted in the model 474 table console receiver, so that the following information applies in most respects to both instruments. A 3-valve (plus rectifier) straight circuit is employed, notable features being the band-pass input filter, iron-cored coils, an H.F. pentode detector, and the high-efficiency output pentode.

TELSEN MODEL 1240 A.C. RADIOGRAM

(and MODEL 474 RECEIVER)

CIRCUIT DESCRIPTION

Aerial input by way of series condenser C1 and coupling coils L1, L2 to capacity coupled band-pass filter preceding pentode H.F. amplifier (V1, Mullard metallised SP4). Primary L3, L4 tuned by C17; secondary L5, L6 tuned by C19; coupling condenser C2. Tuned-secondary transformer coupling between V1 and pentode grid leak detector (V2, Mullard metallised SP4). Primary L7; secondary L8, L9, tuned by C21. Reaction applied by means of coil L10 and controlled by differential condenser C23. Gramophone pick-up connected in grid circuit of V2 by switch S5. R.C. coupling between V2 and I.H.C. output pentode (V3, Mazda AC2/Pen). Usual tone compensating condenser C13 in anode circuit. Grid resistance R12 functions as volume control on radio and gramophone.

H.T. current supplied by I.H.C. full-wave rectifier (V4, Mullard IW3). Smoothing by speaker field and condensers C14, C15.

DISMANTLING THE MACHINE

Removing Chassis.—This is mounted on the horizontal shelf, with the speaker beneath, and to the right, looking into the back of the cabinet. First of all, remove the three control knobs (single grub screws). Note that there is a loose black disc behind the tuning knob.

Now remove the tuning scale, so as to free the pointer. The scale is held by two nuts, with washers each side. Remove wood screws holding chassis to front and side of cabinet. There are

two screws in the bracket in front, and three in that at the side.

Remove the four bolts, with steel and rubber washers, holding chassis to shelf. Unless the speaker is removed first, the bolt above the speaker will have to be turned with pliers, or a bent screw-driver. When replacing, do not omit thick rubber washers above and below the shelf.

Unscrew wave-change switch lever at side of cabinet. Remove nut and escutcheon of pick-up switch. Unsolder lead from the pick-up and the earth wires to the screening and body of switch, and pull switch through the hole in the cabinet towards chassis.

Loosen clips holding gramophone motor mains lead, and free the lead. The chassis can then be turned sufficiently to give access to most of its components.

To free it entirely, remove mains lead from the two motor terminals, and unsolder speaker wires. Pull them through the hole in the shelf, when chassis may be removed.

When replacing speaker leads, note that the single black lead goes to the speaker earth tag, and the single yellow lead goes to the lower of the two tags on the speaker transformer. The twisted red and grey leads go to the tags at the right of the speaker, the grey one at the top, and the red at the bottom.

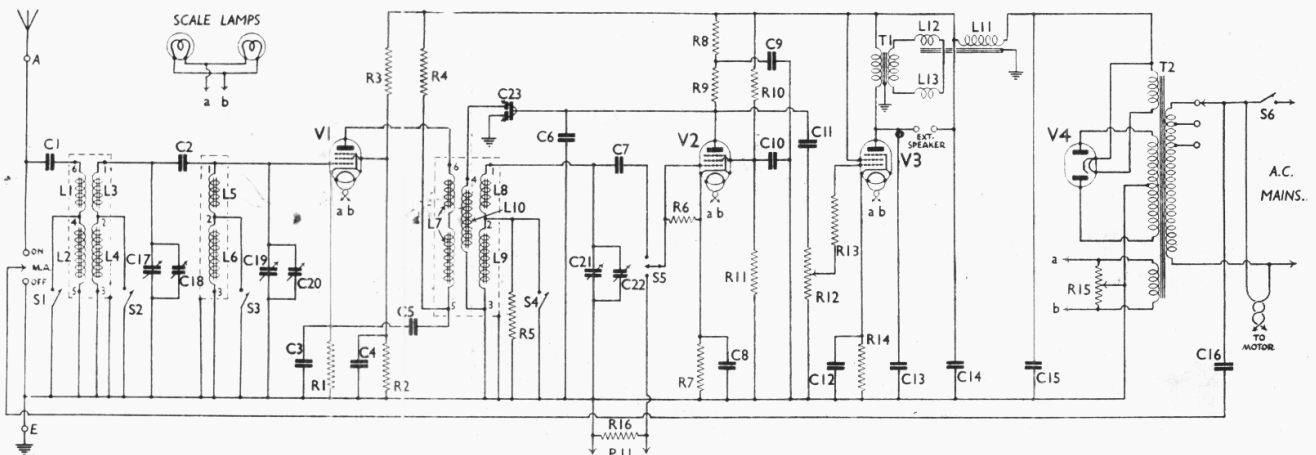
Removing Speaker.—It is best to remove this on its sub-baffle, which is held to the cabinet by eight wood-screws. When replacing, note that the speaker transformer is to the left of this chassis, looking at the back.

COMPONENTS AND VALUES

Resistances		Values (ohms)
R1	V1 G.B. resistance ..	300
R2	V1 S.G. pot. divider ..	50,000
R3		50,000
R4		15,000
R5	V1 anode decoupling ..	50,000
R6	V2 grid resistance ..	500,000
R7	V2 G.B. resistance ..	500
R8	V2 anode decoupling ..	50,000
R9	V2 anode resistance ..	250,000
R10	V2 S.G. pot. divider ..	50,000
R11		100,000
R12	Manual volume control ..	250,000
R13	V3 grid H.F. stopper ..	100,000
R14	V3 G.B. resistance ..	150
R15	Hum control pot. ..	30
R16	Shunt across pick-up ..	1,000

Condensers		Values (μF)
C1	Aerial series condenser ..	0.0003
C2	Band-pass top coupling ..	Very low
C3	V1 cathode by-pass ..	0.1
C4	V1 S.G. by-pass ..	1.0
C5	V1 anode decoupling ..	0.1
C6	V2 anode H.F. by-pass ..	0.0002
C7	V2 grid condenser ..	0.0001
C8	V2 cathode by-pass ..	1.0
C9	V2 anode decoupling ..	2.0
C10	V2 S.G. by-pass ..	1.0
C11	L.F. coupling to V3 ..	0.01
C12	V3 cathode by-pass ..	2.0
C13	V3 anode tone comp. ..	0.02
C14	H.T. smoothing ..	4.0
C15		3.0
C16	Mains aerial condenser ..	0.005
C17	Band-pass pri. tuning ..	—
C18	Band-pass pri. trimmer, pre-set ..	—
C19	Band-pass sec. tuning ..	—
C20	Band-pass sec. trimmer, pre-set ..	—
C21	H.F. trans. sec. tuning ..	—
C22	H.F. trans. sec. trimmer, pre-set ..	—
C23	Differential reaction cond. ..	0.0003

(Continued overleaf)



The circuit diagram of the Telsen Model 1240 radiogram. The Model 474 table receiver has a similar chassis. The dotted lines show the coils indicate the screens, which are earthed. The coil terminals are numbered on the diagram to correspond with the numbers on the coils themselves. C23 is a differential condenser. L13 is the speaker speech coil, and L12 is the hum-bucking coil.

TELSEN MODEL 1240 (and 474)
(cont'd)

Other Components		Values (ohms)
L1	Aerial coupling coils ..	3·8
L2		12·9
L3		8·2
L4		32·5
L5	Band-pass pri. coils ..	7·8
L6		32·5
L7	Band-pass sec. coils ..	7·2
L8		7·8
L9	H.F. trans. pri. coil ..	32·5
L10	H.F. trans. sec. coils ..	4·5
L11	Reaction coil ..	2500·0
L12	Speaker field ..	0·1
L13	Hum neutralising coil ..	1·7
T1	Speaker input trans. ..	Pri. 700·0
		Sec. 0·4
T2	Mains trans. ..	Pri. total 26·0
		Heater sec. 0·05
		Rect. fil. sec. 0·05
		H.T. sec. 750·0
S1-S4	Waveband switches ..	—
S5	Radio-gramophone switch ..	—
S6	Mains switch (ganged R12) ..	—

VALVE ANALYSIS

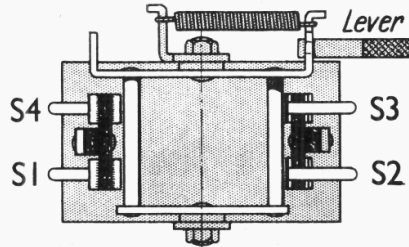
The voltages and currents are given in the table below. Voltages were measured from the points indicated to chassis, with the 1,200 V scale of an Avometer. Current measurements in the early valves were taken with the meter inserted in the low H.F. potential ends of the circuits.

Valve	Anode Volts	Anode Current (mA)	Screen Volts	Screen Current (mA)
V1 SP4	190	3·7	85	1·5
V2 SP4	40	0·55	25	0·3
V3 AC2/Pen	235	30·5	255	8·0
V4 IW3†	350*	—	—	—

* Each anode, A.C. †Or MU12.

GENERAL NOTES

Switches.—S1 to S4 are the ganged wave-band switches, which form a unit mounted at the left of the chassis, looking at the back. They are operated by a lever, projecting through the side of the cabinet. The switches are all closed



Plan of the wave-band switch unit.

on the M.W. band and open on the L.W. band.

A plan view of the switch unit is shown in diagrammatic form on this page.

S5 is the Q.M.B. S.P. D.T. radio-gramophone switch, also mounted at the side of the cabinet, and clearly shown in the rear chassis view. In the radio position the grid of V2 is connected to one side of C7, and in the gramophone position the grid of V2 is connected to one side of the pick-up (and R16).

S6 is the mains switch for the chassis, ganged with the volume control, R12.

Coils.—The coils comprise three iron-cored units, with small push-on cylindrical screens. The plan view of the chassis indicates the coils to be found in each unit. The individual coils may easily be identified by the numbers 1-6 moulded

on top of each coil former. These numbers refer to the pin terminals which will be found projecting round the bases of the coil formers. The corresponding numbers are shown on the circuit diagram at the ends of each coil.

Condenser C2.—This is the band-pass coupling condenser between the tops of L3 and L5. It is formed by a spiral of wire wound over another wire, and insulated from it by sleeving. The condenser has a very low capacity, and is indicated in the plan and front views of the chassis.

Resistance R16.—This is a small fixed resistance which is connected directly across the pick-up beneath the motor plate.

Potentiometer R15.—This is the usual "hum-dinger," mounted on the top deck of the chassis.

Condenser C16.—The mains aerial condenser is located behind the rear terminal plate of the chassis, as indicated in the rear chassis view.

Condenser Block.—All the large condensers are of the paper type, and form parts of the condenser block located at the base of the chassis.

C14 and C15 are each made up of two of the units in the block, which are connected in parallel.

Scale Lamps.—There are two of these, connected in parallel. Each lamp is an Osram M.E.S. type, rated at 6·2 V, 0·3 A.

Condenser C23.—This is a differential reaction condenser, totally enclosed in a moulded case. It cannot be opened up without removing two hollow rivets.

Extra Loudspeaker.—The sockets for this are connected across the primary of the speaker transformer T1. The speaker employed must therefore be of the high resistance type.

Alternative Valves.—Suitable alternatives to the valves in the chassis described are: V1 and V2, **Cossor MS/Pen** or **Mazda ACS2/Pen** or **Micromesh 8A1**; V4, **Marconi-Osram MU12** or **Micromesh R2**.

Pick-up.—This is of the low impedance type, having a resistance of 700 Ω. Before checking this, R16 must be disconnected.

MOTOR ADJUSTMENTS

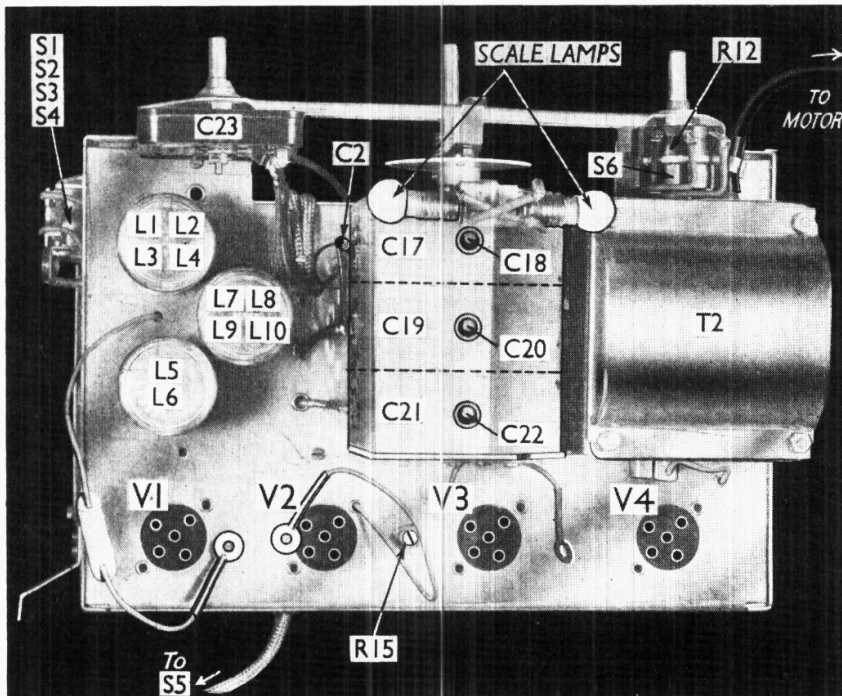
The motor fitted is a **Garrard AC4**, and it is mounted on a metal motor plate with all accessories, including the Garrard pick-up and the fully automatic stop and switch.

If any serious fault occurs in the motor, this can be removed without disturbing the automatic switch mechanism by first taking off the speed adjustment arm (one set screw), and then removing the three bolts holding the motor to the metal plate. These have countersunk heads, and are provided with steel and rubber washers.

Two screw-down grease cups are fitted for lubrication of the motor. Their heads project through holes in the motor plate.

Automatic Switch.—Moving the pick-up head to the right releases the turntable brake and closes the motor switch. At the end of a record, having run-off or eccentric grooves, the motor is automatically braked, and the motor switch opened.

To understand the principle of the automatic mechanism, reference should



Plan view of the chassis. S1-S4 are the wave-band switches mounted in a single unit. The trimmers C18, C20, C22 are sealed at the works. Note the small band-pass coupling condenser C2, at the left-hand side of C17. R15 is the "hum-dinger," operated by a slotted screw head.

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be made to the diagram on this page.

As the needle travels across the record, the pick-up arm moves lever A, which, through the friction washer and spring, moves lever B, carrying with it the main lever and trip lever. This trip lever moves in towards the turntable spindle on which is mounted the striker, which gently wipes against the rubber bush on the end of the trip lever at every revolution. It thus taps back the main lever, and trips the stop mechanism.

This continues until the needle reaches the run-in or eccentric groove in the centre of the record, when the trip lever is moved forward into the path of the striker, which then strikes the side of the lever, and trips the stop mechanism.

If the stop fails to operate, the cause is probably either *insufficient* friction between levers A and B, or the main lever or link may be bent, or rubbing on motor plate. To increase the friction, *unscrew* friction screw in lever B (anti-clockwise).

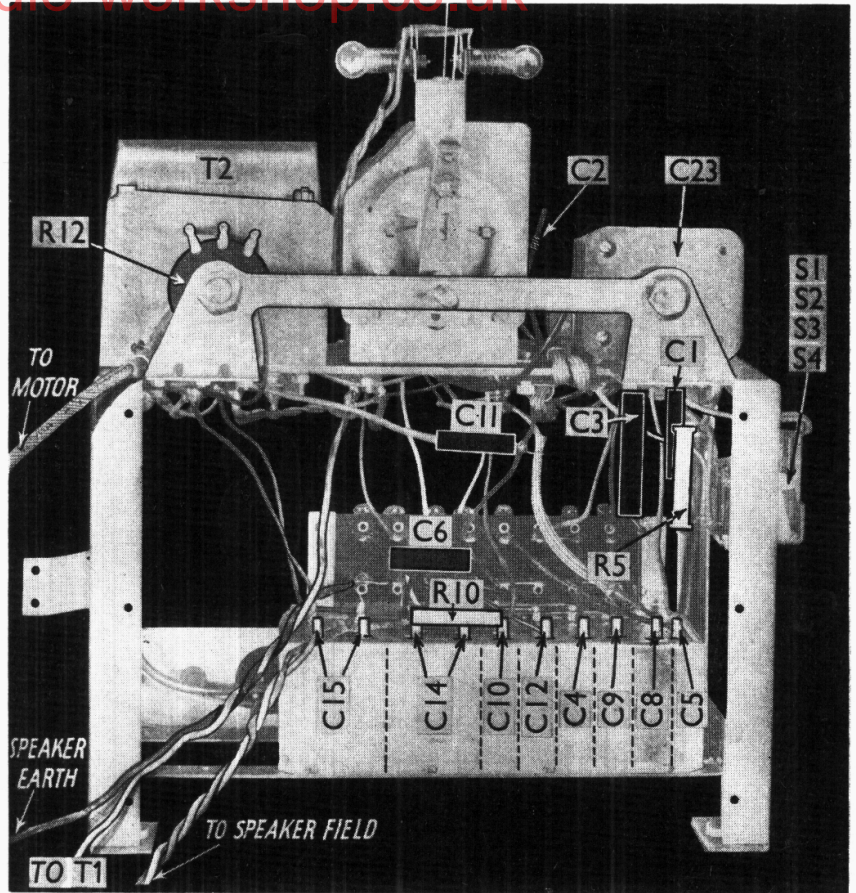
If stop operates early, this is due to excessive friction or to the rubber bush on trip lever being worn. Friction can be reduced by screwing the friction screw *downwards* (clockwise).

NOTE.—As the friction adjustment is very sensitive, the screw should not be turned more than one-quarter of a turn at a time.

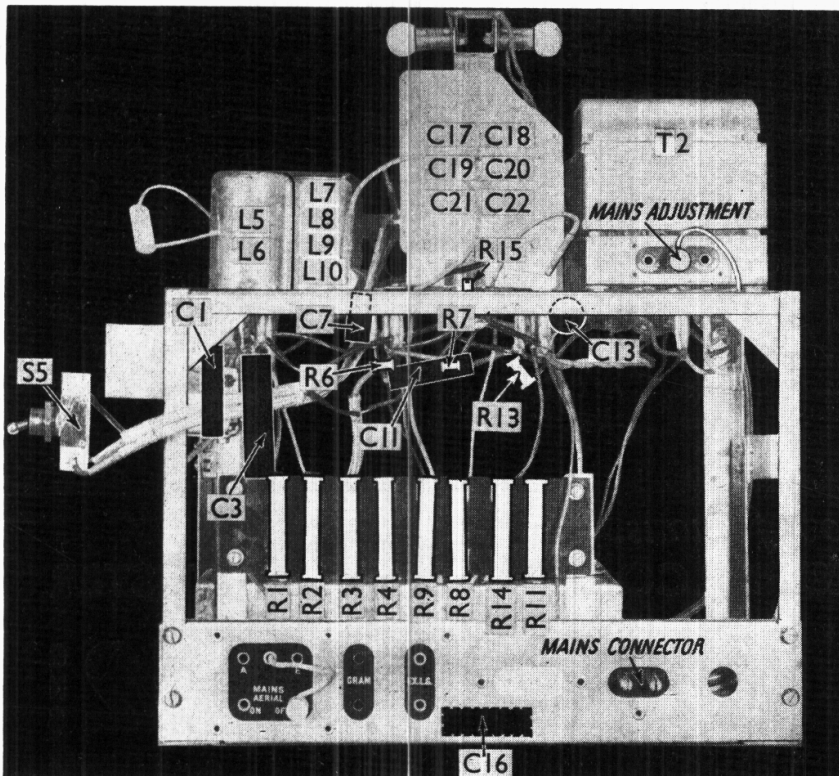
Excessive friction may cause a knocking noise, and record wear.

If the rubber bush on end of trip lever is worn, this may be turned round on its pin to expose a new face to the striker.

Should the leather brake pad require adjustment, it is important to see that the switch opens and cuts off the current before the turntable is braked.



Above: Front view of the chassis. The cross-bracing strips have been removed. Note that C14 and C15 each consist of two units of the condenser block, in parallel.



Left: Rear chassis view. C16 is behind the terminal plate.

Below: Diagram of the Garrard automatic switch and brake.

