

ULTRA 150 THREE-BAND RADIOGRAM

CIRCUIT.—Aerial coupling to the grid of V1, a triode hexode frequency changer, is via a set of band-pass coils on the medium and long wave bands. On short waves the coupling is effected by a transformer coil.

An iron-cored I.F. transformer, tuned to 456 kc., couples V1 to V2, the I.F. amplifier. It will be noticed that on gramophone the pick-up potentials are fed to the control grid of V2, the screen grid being used as an anode. R22 acts as the anode load and the L.F. coupling condenser, C23, leads to a switch arrangement and thence via a further coupling condenser, C23, and H.F. stopper resistance to the volume control. On radio this arrangement is rendered inoperative, and V2 operates as a conventional I.F. amplifier.

Another iron-core transformer couples V2 to the demodulating diode of V3, a double diode pentode valve. The other diode, fed by a coupling condenser, C20, provides a D.C. potential that is fed back to the grids of V1 and V2 for automatic volume control.

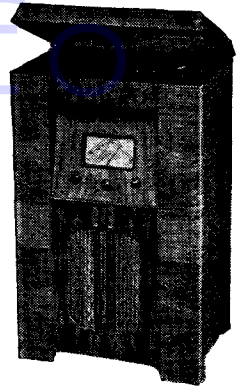
A manual volume control is included in the coupling arrangements to the control grid of the pentode section of V3. A pentode compensator condenser, C24, effects a fixed modification of the tone.

Mains equipment consists of a mains transformer, a full-wave rectifying valve, V4, electrolytic smoothing condensers and a smoothing choke (the speaker field).

Chassis Removal.—Remove the two grub-screw fixed control knobs and the wave-change knob (spring fixing). Remove the back of the cabinet, detach the flex leads to the motor and the two leads to the pick-up, the green lead to the aerial socket and the black to the soldering tag on the chassis.

(Continued on opposite page.)

A Garrard motor and pick-up unit are added to a three-valve plus rectifier chassis in the 150.



CONDENSERS

C.	Purpose.	Mfds.
1	MW aerial coupling .. ..	.000005
2	LW aerial coupling .. ..	.00001
3	Top band pass coupling ..	—
4	Bottom band pass coupling ..	.025
5	V1 A.V.C. decoupling .. ..	.05
6	V1 screen decoupling .. ..	.1
7	V1 cathode bias shunt .. ..	.5
8	SW osc. fixed padder .. ..	.004
9	SW osc. grid coupling .. ..	.0001
10	MW and LW osc. grid .. ..	.001
11	IFT1 primary fixed trimmer ..	.00015
12	IFT1 sec. fixed trimmer .. ..	.00015
13	Osc. anode coupling .. ..	.0001
14	V2 screen decoupling	2
15	T2 A.V.C. decoupling .. ..	.05
16	V2 cathode bias shunt .. ..	.1
17	LW osc. fixed trimmer .. ..	.00006
18	IFT2 prim. fixed trimmer .. ..	.00015
19	IFT2 sec. fixed trimmer .. ..	.00015
20	A.V.C. diode coupling .. ..	.0002
21	HF bypass .. ..	.0002
22	V3 cathode bias shunt	50
23	Lf coupling .. ..	.01
24	Pentode compensator .. ..	.004
25	HT smoothing	16
26	HT smoothing	8
27	Pick up shunt .. ..	.0002
28	V2 screen Lf coupling .. ..	.1
29	V2 screen shunt .. ..	.001

RESISTANCES

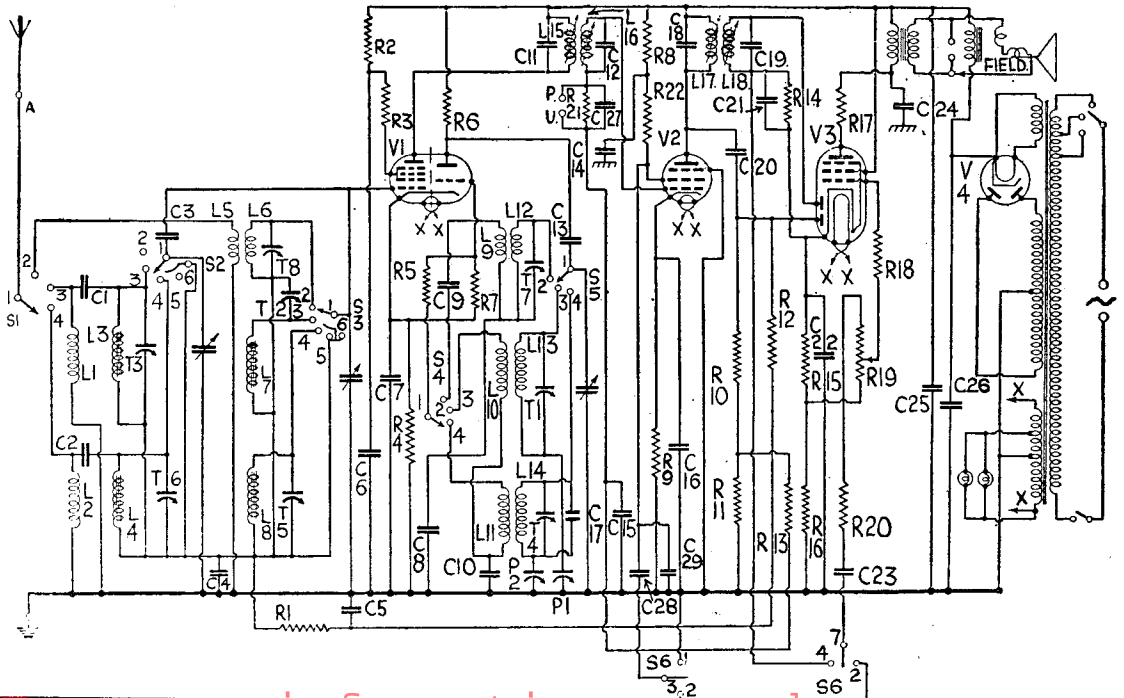
R.	Purpose.	Ohms.
1	V1 A.V.C. decoupling (part) ..	25,000
2	V1 screen decoupling	20,000
3	V1 screen stabiliser	60
4	V1 cathode bias	165
5	Regeneration modifier	60
6	Osc. anode load	40,000
7	Osc. grid leak	25,000
8	V2 screen decoupling	15,000
9	V2 cathode bias	60
10	A.V.C. diode load (part)	250,000
11	A.V.C. diode load (part)	750,000
12	V1 A.V.C. decoupling (part) ..	1 meg.
13	V2 A.V.C. decoupling	1 meg.
14	Demodulating diode load	500,000
15	V3 cathode bias (part)	138
16	V3 cathode bias (part)	276
17	V3 anode stabiliser	60
18	V3 grid stopper	1,000
19	Volume control	1 meg.
20	HF stopper	10,000
21	Pick up shunt	10,000
22	V2 screen load	7,000

VALVE READINGS

No signal. Volume maximum. MW min. cap. 230 volt A.C. mains.

V.	Type.	Electrode.	Volts	Ma.
1	All Mazda. ACTH1 (7)	anode ..	260	4.5
		screen ..	105	8.2
		osc. anode ..	70	4.6
2	ACVP2 (7)	anode ..	260	12
		screen ..	185	3.2
3	AC2/PenDD(7)	anode ..	245	33
		screen ..	260	8.4
4	UU4 (4)	heater ..	380	—

A conventional form of the efficient "short" superhet circuit is found in the Ultra 150. A high-slope output pentode is fed direct from a diode in the same "bottle."



Unsolder the three leads to the speaker and remove the four chassis securing bolts and washers from the underside of the shelf.

The speaker may be removed by unscrewing the three nuts securing three clamps and unsoldering the remaining three leads.

When replacing, the pick-up leads (coming from a hole in the chassis deck) are connected with the green lead going to the bolt on the left of the cabinet, to which a red lead is already secured, and the black lead goes to an adjacent earthing bolt, to which a black lead is already connected. The green wire from the rear of the chassis deck is connected to the aerial socket.

With the speaker transformer at the bottom, and counting from left to right, the speaker connections are: First tag blank with regard to external leads; second tag, connect the black lead; third the blue lead from the extension L.S. sockets; fourth, the black with white spot; fifth, the green with black spot that is connected to the two upper sockets of the extension L.S. panel; sixth, the red lead; and, to the seventh, connect the yellow, to which is connected the speaker control wander plug.

It should particularly be noted that if the chassis and speaker are operated out of the cabinet, the fifth tag should be connected to the seventh tag on the speaker transformer, otherwise the speaker will remain inoperative.

Special Notes.—A pair of sockets on an insulating panel on the side of the cabinet enable a low impedance permanent magnet extension speaker to be operated.

Two pilot lamps are fitted in screw-in holders clipped to brackets at the side of the scale. These are Osram bulbs rated at

4.5 volt 0.3 amp. and fitted with M.E.S. bases.

The mains input is adjusted by inserting the metal link between the socket C and the appropriate socket.

It will be found that some of the coils are inaccessable for purposes of resistance

(Continued on page 52.)

WINDINGS (D.C. Resistances)			
Inductance.	Ohms.	Range	Measured between
L1	15	MW	S1 contact 3 to chassis.
L2	70	LW	S1 contact 4 to chassis.
L3	1.5	MW	Across T3.
L4	19	LW	Across T6.
L5	.5	SW	S1 contact 2 to chassis.
L6	.25	SW	Across T8.
L7	1.6	MW	Across T2.
L8	18	LW	Across T5.
L9	7	Any	Coil side C9 to black lead T7.
L10	1	MW	S4 contact 3 and C10.
L11	1.2	LW	S4 contact 4 and C10.
L12	below 1	W	Across T7.
L13	5.5	MW	Across T1.
L14	9.5	LW	Across T4.
L15	4	—	Anode V1 and HT line.
L16	4	—	Control grid V2 to C15.
L17	4	—	Anode V2 and HT line.
L18	4	—	S6 contact 4 (blue lead) to signal diode V3.
Output trans. prim.	462	—	Black and black and white spot lead spkr panel.
Mains trans. prim.	21	—	"C" socket to pink of mains lead.
Total HT sec.	565	—	Anode pins V4.

Ultra 150 on Test

MODEL 150.—For A.C. operation, 200-250 volts, 40-60 cycles. Price, £21.

DESCRIPTION.—Three-valve, plus rectifier superhet radiogram, covering three waveranges.

FEATURES.—Full-vision scale calibrated in metres and station names. Scale coloured as to wave-band. Controls for wavechanging, tuning and combined volume control and master switch. Garrard motor with speed control and automatic stop switch. Sockets for extension L.S. with control plug.

LOADINGS.—88 watts with motor; 74 watts without motor.

Sensitivity and Selectivity

SHORT WAVES (16.8-50 metres).—Very good gain and selectivity. Easy handling, no drift and good all-round performance.

MEDIUM WAVES (200-550 metres).—Well maintained gain with good selectivity and sufficient sensitivity for normal requirements. Local stations spread on adjacent channels, quiet background, free from whistles.

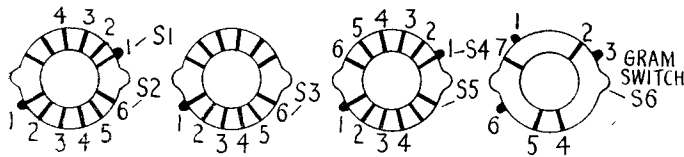
LONG WAVES (900-2,000 metres).—Representative gain and selectivity. All main stations easily received.

Gramophone Section

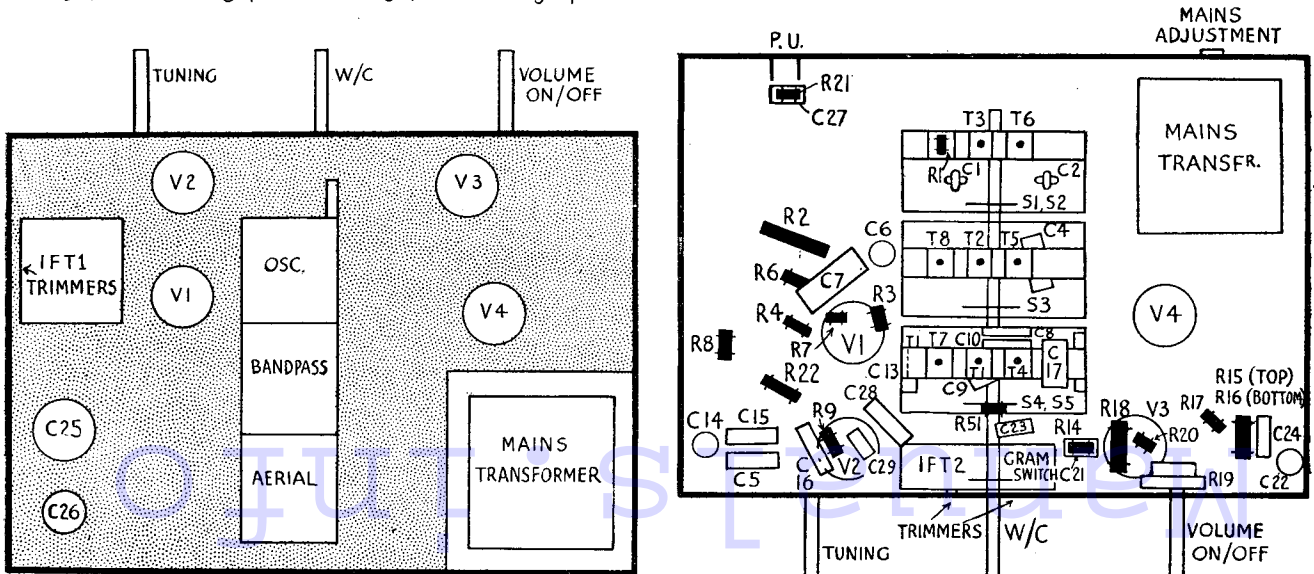
Motor speed substantially correct, little trace of speed variation. Sensitivity of pick-up ample for any ordinary record, with good reserve power. Characteristic good with no over-emphasised top, slight low-note compensation and good freedom from needle scratch.

Acoustic Output

Ample volume for an ordinary room, with a rather deep tone, but appreciable crispness.



The switch banks numbered corresponding to the circuit and under-chassis diagrams.



All components on and under the Ultra chassis can be identified by means of these two diagrams. To facilitate reference, all resistors are in solid black and condensers in outline.

