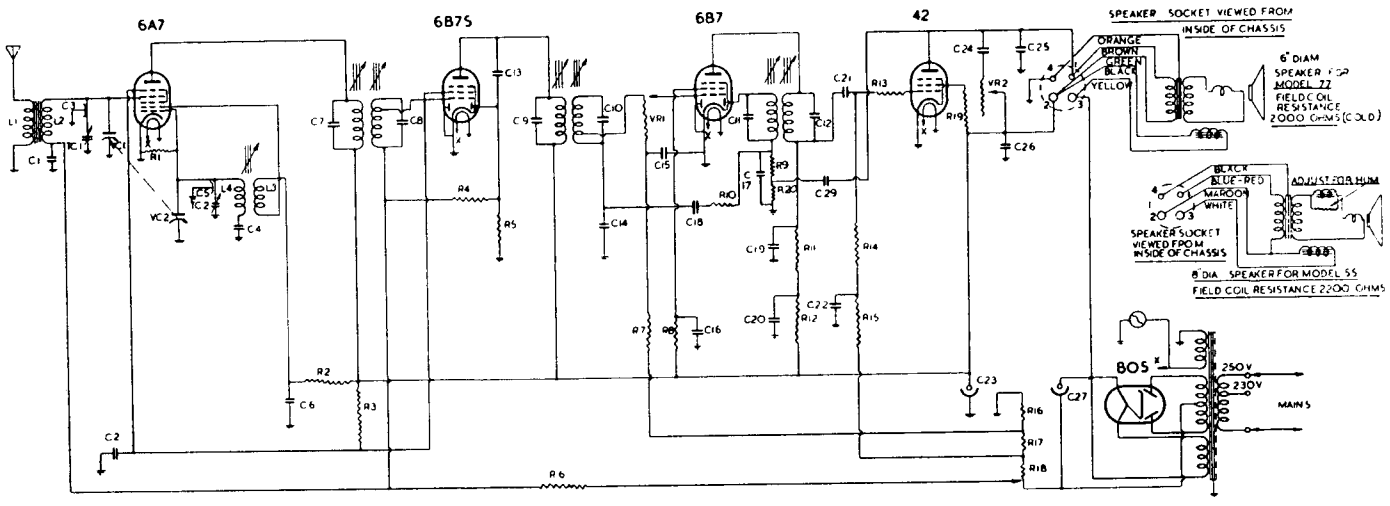
"H.M.V." A.C. Broadcast Console 55 and Mantel 77

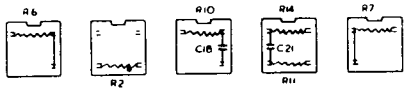


REF	PART NO.	DESCRIPTION
R1	H1X	50000 OHMS 1/3 WATT
R2	AC3X	25000 OHMS 1 WATT
R3	S3X	40000 OHMS 1 WATT
R4	AAIXX	.2 MEGOHMS 1/3 WATT
R5	ACIXX	750000 OHMS 1/3 WATT
R6	A83X	10 MEGOHMS 1 WATT
R7	P1XX	1 MEGOHM 1/3 WATT
R8	P2X	1 MEGOHM 1/2 WATT
R9	O1XX	500000 OHMS 1/3 WATT
R10	J1XX	100000 OHMS 1/3 WATT
R11	J1X	100000 OHMS 1/3 WATT
R12	ADIXX	15000 OHMS 1/3 WATT
R13	J1XX	100000 OHMS 1/3 WATT
R14	O1XX	500000 OHMS 1/3 WATT
R15	N1XX	250000 OHMS 1/3 WATT
R16	APD 086	50 OHMS } BIAS VOLTAGE
R17		240 OHMS } DIVIDER
R18		200 OHMS }
R19	AF2X	3000 OHMS 1/2 WATT
R20	AH1X	200 OHMS 1/3 WATT

REF	PART NO.	DESCRIPTION
C1	0013/M	.05 MFD 200V CONDENSER
C2	0013/E	.1 MFD 400V
C3	0914	FIXED TRIMMER SHUNT .1 OMMF
C4	0243/AM	400 MMFD
C5	0944	FIXED TRIMMER SHUNT .1 OMMF
C6	0013/E	.1 MFD 400V
C7	0243/AB	100 MMFD
C8	0243/AB	100 MMFD
C9	0243/AB	100 MMFD
C10	0243/AB	100 MMFD
C11	0243/AB	100 MMFD
C12	0243/AB	100 MMFD
C13	0243/Q	50 MMFD
C14	0243/O	250 MMFD
C15	0013/L	.5 MFD 400V
C16	0013/E	.1 MFD 400V
C17	0243/O	250 MMFD
C18	0013/J	.01 MFD 400V
C19	0243/AL	400 MMFD
C20	0013/A	.5 MFD 400V
C21	0013/I	.02 MFD 400V
C22	0013/M	.05 MFD 200V
C23	0014/J	.16 MFD 500 W.V. 600 P.V. ELECTR
C24	0013/G	.05 MFD 400V
C25	0013/O	.002 MFD 600V
C26	0013/A	.5 MFD 400V
C27	0014/L	.8 MFD 500 WV 600 PV ELECTRO
C28		
C29	0243/AO	1500 MMFD

REF	DESCRIPTION	PART NO.
VC1 & VC2	380 MMFD 2 GANG CONDENSER	APC0057/A
TC1 & TC2	AIR CONDENSER (TRIMMER)	APD0786
VR1	1 MEGOHM POTENTIOMETER	APD0877
VR2	50000 OHM POTENTIOMETER	APD0676/B
	DIAL LAMP 6.3V .3AMP	
	6" DIA SPEAKER FOR MODEL 77	APC0090
	8" DIA SPEAKER FOR MODEL 55	APC0097

NOTE R20 AND C29 WERE NOT FITTED IN A FEW CHASSIS OF EARLY PRODUCTION



H.M.V. Models 55, 66, 77, 88

OPERATING VOLTAGES.

H.M.V. Console Models 55, 66 and Mantel Models 77, 88 are basically the same, the difference being that models 66 and 88 are the dual-wave versions of models 55 and 77, which operate on the broadcast band only.

All readings are taken with a "1,000 ohms per volt" meter, voltages being those existing between chassis and the points indicated; receiver tuned to point of no signal and operated from the 240 v. mains. A cross-check on the operating condition of the receiver can be made by noting the alteration of the voltages of various valve electrodes when the receiver is tuned in to a strong local station; voltages appearing at certain valve electrodes under these conditions are shown in parenthesis. Under no signal conditions the bias to the 6A7 and 6B7s is applied through resistance R6 (models 55/77) and R7 (models 66/88); during signal reception the A.V.C. takes charge.

OPERATING VOLTAGES.

6A7, Frequency Converter: Plate, 255 v.; screen, 85 v. (90 v.); grid, see introductory notes for details; osc. anode grid, B/C 150 v. (140 v.), S/W 155 v.

6B7S, 1st stage 460 kC. I.F. Amplifier and A.V.C. Rectifier: Plate 255 v.; screen, 85 v. (90 v.); grid, see introductory notes for details.

6B7, 460 kC. I.F. Amplifier, Detector and A.F. Voltage Amplifier: Plate, 130 v.; screen, 40 v.; grid, taken from tapping on back bias resistor.

42, Output Pentode: Plate, 235 v.; screen, 235 v.; grid, taken from tapping on back bias resistor. Cathode current, 38 mA.

80s, Rectifier: Filament to chassis, 390 v.; filtered high tension (from terminal 2 on speaker panel), 255 v.

"His Master's Voice"

SERVICE MANUAL

for

FIVE-VALVE A.C. RECEIVERS

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CONSOLE

Model 55 - - - Broadcast

Model 66 - - - Dual-Wave

BAKELITE CONSOLE

Model 77 - - - Broadcast

Model 88 - - - Dual-Wave

TECHNICAL SPECIFICATION

VOLTAGE RANGE

200 to 250.

40 to 50 cycles.

It is important that the receiver be operated at the correct voltage; the voltage taps on the mains transformer should be utilised as follows:

Voltage of AC supply	Use tap designated
200–230	230
231–250	250

CONSUMPTION

65 watts

WAVE-LENGTH RANGE

16.5 to 50 metres, or 18.2 to 6 megacycles (Models 66 and 88 only).

200 to 550 metres, or 1500 to 545 kilocycles.

MAX. UNDISTORTED POWER OUTPUT

2.5 watts

DIMENSIONS

		Height	Width	Depth
Model 55)	Console	34¾"	28"	12½"
,, 66)				
,, 77)	Mantle	15"	11"	8"
,, 88)				

WEIGHT

	Net.	Gross
Model 55)	54 lbs.	69 lbs.
,, 66)		
,, 77)	21 lbs.	25½ lbs.
,, 88)		

LOUDSPEAKER

Models 55 and 66 use 8" cone speaker with field acting as filter choke.

DC resistance, cold	2,200 ohms
DC resistance voice coil ..	4.5 ,,
400 cycle impedance of voice coil	5.0 ,,

Models 77 and 88 use 6" cone speaker.

DC resistance of field, cold ..	2,000 ohms
DC resistance of voice coil ..	3.4 ,,
400 cycle impedance of voice coil	3.9 ,,

VALVES

6A7, 6B7S, 6B7, 42, 80S.

CIRCUIT DESCRIPTION

These models incorporate the conventional 6A7 frequency changing circuit, with slight modifications, followed by a two-stage intermediate frequency amplifier using as first stage a 6B7S and as second stage a 6B7. The 6B7 is arranged in a reflex circuit, so that it also functions as the first stage audio amplifier, resistance capacity coupled to a 42 output pentode.

AVC is taken from one diode plate of the 6B7S, while one diode plate of the 6B7 is used as signal rectifier.

Coupling to the aerial on the broadcast band is effected through an iron-cored transformer having the normal tuned secondary.

The three intermediate frequency transformers use specially tapped, iron-cored coils adjusted to give the best compromise between gain and selectivity.

All fixed bias voltages are obtained from a resistor in the negative H.T. line, thus enabling all cathodes to be connected direct to the ground.

The speaker field winding is used as filter choke with 8 mf. and 16 mf. electrolytic condensers on input and output respectively.

Padding on the B.C band is effected by adjustment of the oscillator secondary inductance in conjunction with a fixed padding condenser.

A sensitivity control is provided in the form of an adjustable clip on the bias resistor.

WAVEBAND SWITCHING (Models 66 and 88 only)

This is carried out by means of a single deck switch. The oscillator primaries are connected in series and not switched. However, a little feedback is applied across the padding condenser on the short-wave band, and this is switched by contacts on the wave-change switch.

AVC

Referring to the circuit diagram, page 4, the voltage divider network comprising R5, R6, R7, causes a constant DC voltage to appear across R6, which applies a delay voltage to the AVC diode. As the voltage across the bias divider (R17, 18, 19) is approx. 25 to 30 volts, the delay voltage is thus approx. 1 13 of this value.

TONE CONTROL

The tone is controlled by a series resistor-condenser combination across the output transformer primary.

PRELIMINARY TESTS

The following tests should be made:—

(1) Unfiltered HT + (terminal 3 on speaker panel) to chassis 390 volts. If voltage is low, check line voltage to see that transformer is working from correct primary tap, also try replacing 80S. (**Note.**—The 80S will give about 12 to 15 volts higher DC output than the standard 80.) Also test filter condensers for leakages. Do tests 2 and 3.

(2) Filtered HT (terminal 2 on speaker panel) to chassis 255 volts. If voltage is low, check output filter condenser. Do test 3.

(3) Output pentode current. Check voltage drop across output transformer primary (terminal 1 and 2 on speaker strip). This should be 18 volts in the case of the 8″ speaker (Models 55 and 66) or 8.5 volts in the case of the 6″ speaker (Models 77 and 88). If high or low and voltages on tests 1 and 2 are O.K, try replacing the 42.

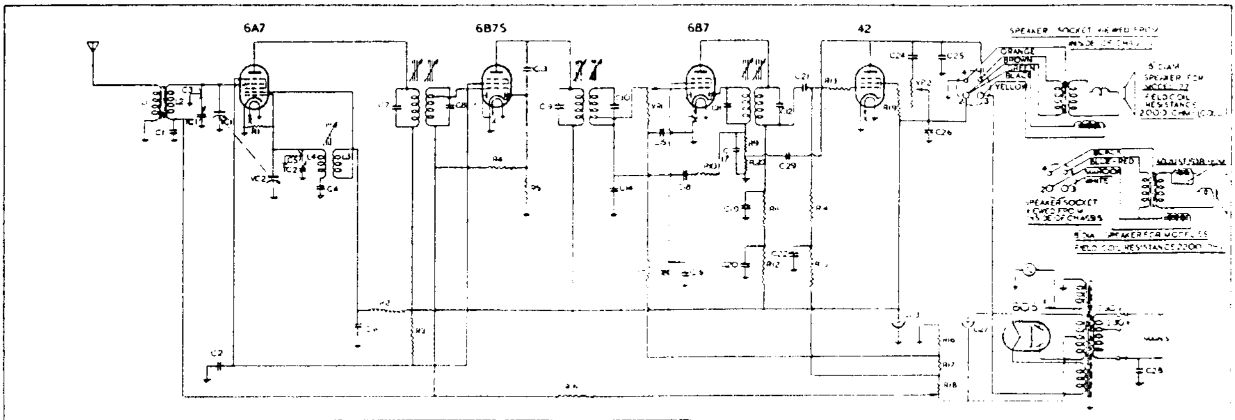
(4) Check all valves for filament continuity and freedom from inter-electrode short circuits.

(5) If fault still persists, compare voltages with table on page 5.

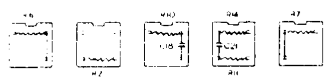
Note.—In the case of Models 77 and 88, where no terminal strip is provided on the speaker, the foregoing tests can only be carried out after removal of chassis from cabinet. The same speaker connection numbering will be found by consulting the diagram on page 4, and noting that the numbers given for the speaker plug are correct only when viewing socket from the BOTTOM.

IMPORTANT.

All the above voltage tests should be made with a voltmeter having not less than 1000 ohms per volt of the full scale reading, and should then be within 10% of the specified values.

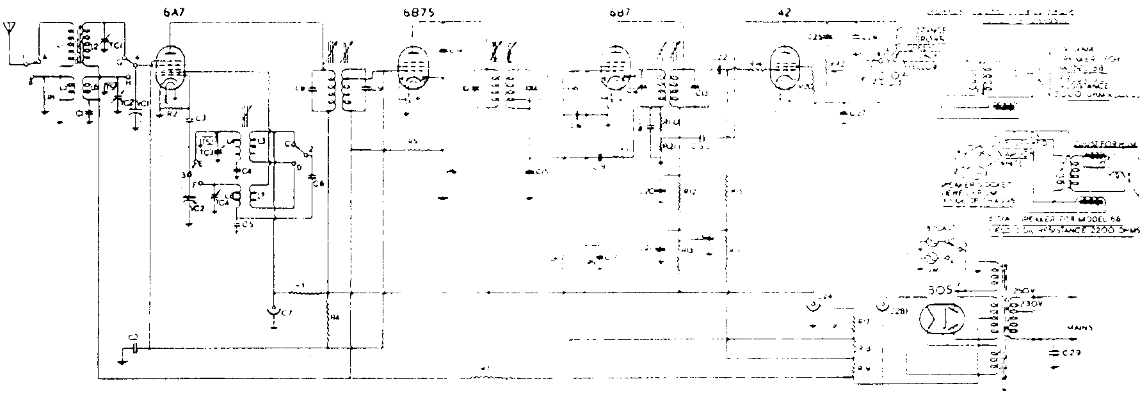


NOTE: R20 AND C29 WERE NOT FITTED IN A FEW CHASSIS OF EARLY PRODUCTION



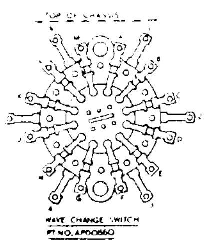
REF	PART NO.	DESCRIPTION	REF	PART NO.	DESCRIPTION	REF	DESCRIPTION	PART NO.
R1	HIX	50000 OHMS 1/3 WATT	C1	0013/M	.05 MFD 200V CONDENSER	VC1 & VC2	380 MMFD. 2 GANG CONDENSER	[illegible]
R2	AE3X	25,000 OHMS 1 WATT	C2	0013/E	.1 MFD 400V	TC1 & TC2	AIR CONDENSER (TRIMMER)	[illegible]
R3	S3X	40000 OHMS 1 WATT	C3	0914	FIXED TRIMMER SHUNT 10 MMF	VR1	1 MEGOHM POTENTIOMETER	[illegible]
R4	AAIXX	2 MEGOHMS 1/3 WATT	C4	0243/AM	400 MMFD	VR2	50,000 OHM POTENTIOMETER	[illegible]
R5	ACIXX	750,000 OHMS 1/3 WATT	C5	0944	FIXED TRIMMER SHUNT 190 MMF		DIAL LAMP 6.3V .3 AMP	
R6	AB3X	10 MEGOHMS 1 WATT	C6	0013/E	.1 MFD 400V		6" DIA SPEAKER FOR MODEL 77	[illegible]
R7	PIXX	1 MEGOHM 1/3 WATT	C7	0243/AB	100 MMFD		8" DIA SPEAKER FOR MODEL 55	[illegible]
R8	P2X	1 MEGOHM 1/2 WATT	C8	0243/AB	100 MMFD			
R9	OIXX	500,000 OHMS 1/3 WATT	C9	0243/AB	100 MMFD			
R10	UIXX	100,000 OHMS 1/3 WATT	C10	0243/AB	100 MMFD			
R11	UIX	100,000 OHMS 1/3 WATT	C11	0243/AB	100 MMFD			
R12	ADIXX	15,000 OHMS 1/3 WATT	C12	0243/AB	100 MMFD			
R13	UIXX	100000 OHMS 1/3 WATT	C13	0243/Q	50 MMFD			
R14	OIXX	500000 OHMS 1/3 WATT	C14	0243/O	250 MMFD			
R15	NIXX	250,000 OHMS 1/3 WATT	C15	0013/L	.5 MFD 400V			
R16	APO	50 OHMS } BIAS VOLTAGE DIVIDER	C16	0013/E	.1 MFD 400V			
R17	10861	240 OHMS }	C17	0243/O	250 MMFD			
R18		200 OHMS }	C18	0013/J	.01 MFD 400V			
R19	AF2X	3000 OHMS 1/2 WATT	C19	0243/AL	400 MMFD			
R20	AHIX	200 OHMS 1/3 WATT	C20	0013/A	.5 MFD 400V			
			C21	0013/I	.02 MFD 400V			
			C22	0013/M	.05 MFD 200V			
			C23	0014/J	16 MFD 500WV 600PV ELECTRO			
			C24	0013/G	.05 MFD 400V			
			C25	0013/O	.002 MFD 600V			
			C26	0013/A	.5 MFD 400V			
			C27	0014/L	8 MFD 500WV 600PV ELECTRO			
			C28	0013/N	.01 MFD 600V			
			C29	0243/AO	1500 MMFD			

Models 55 77



NOTE: A FEW CHASSIS OF EARLY PRODUCTION WERE FITTED WITH C2 AS 1 MFD. ALSO C30 AND R21 WERE NOT FITTED

REF	PART NO.	DESCRIPTION	REF	PART NO.	DESCRIPTION	REF	DESCRIPTION	PART NO.
R1	BIX	500 OHMS 1/2 WATT	C1	0013/M	.05 MFD 200V CONDENSER	VC1 & VC2	380 MMFD. 2 GANG CONDENSER	[illegible]
R2	HIX	.05 MEGOHMS 1/3 WATT	C2	0014/O	4.0 MFD 200V WAGE ELECTRO CON	TC1 TC2 TC3 & TC4	AIR CONDENSER	[illegible]
R3	AE3X	25000 OHMS 1 WATT	C3	0243/AB	100 MMFD	VR1	1 MEGOHM POTENTIOMETER	[illegible]
R4	S3X	40000 OHMS 1 WATT	C4	0243/AM	400 MMFD	VR2	.5 MEGOHM POTENTIOMETER	[illegible]
R5	AAIXX	2 MEGOHMS 1/3 WATT	C5	0243/AN	325 MMFD		DIAL LAMPS 6.3V .3 AMP	
R6	ACIXX	.75 MEGOHMS 1/3 WATT	C6	0013/J	.01 MFD 400V	[illegible]	FIXED TRIMMER SHUNT 70 MMF	[illegible]
R7	AB3X	10 MEGOHMS 1 WATT	C7	0014/H	16 MFD 300V WITH [illegible]	[illegible]	FIXED TRIMMER SHUNT 10 MMF	[illegible]
R8	PIXX	1 MEGOHM 1/3 WATT	C8	0243/AB	100 MMFD		6" DIA SPEAKER FOR MODEL 88	[illegible]
R9	P2X	1 MEGOHM 1/2 WATT	C9	0243/AB	100 MMFD		9" DIA SPEAKER FOR MODEL 66	[illegible]
R10	OIXX	.5 MEGOHM 1/3 WATT	C10	0243/AB	100 MMFD			
R11	UIXX	.1 MEGOHM 1/3 WATT	C11	0243/AB	100 MMFD			
R12	UIX	.1 MEGOHM 1/3 WATT	C12	0243/AB	100 MMFD			
R13	ADIXX	15000 OHMS 1/3 WATT	C13	0243/AB	100 MMFD			
R14	UIXX	.1 MEGOHM 1/3 WATT	C14	0243/Q	50 MMFD			
R15	OIXX	.5 MEGOHM 1/3 WATT	C15	0243/O	250 MMFD			
R16	NIXX	.25 MEGOHM 1/3 WATT	C16	0013/L	.5 MFD 200V			
R17	APO	50 OHMS } BIAS VOLTAGE DIVIDER	C17	0013/E	.1 MFD 400V			
R18	10861	240 OHMS }	C18	0243/O	250 MMFD			
R19		200 OHMS }	C19	0013/J	.01 MFD 400V			
R20	AF2X	3000 OHMS 1/2 WATT	C20	0243/AL	400 MMFD			
R21	AHIX	200 OHMS 1/3 WATT	C21	0013/A	.5 MFD 400V			
			C22	0013/I	.02 MFD 400V			
			C23	0013/M	.05 MFD 200V			
			C24	0014/J	16 MFD 500V ELECTROLYTIC			
			C25	0013/G	.05 MFD 400V			
			C26	0013/O	.002 MFD 600V			
			C27	0013/A	.5 MFD 400V			
			C28	0014/H	8 MFD 500V ELECTRO WITH C7			
			C29	0013/N	.01 MFD 600V			
			C30	0243/AO	1500 MMF			



WAVE CHANGE SWITCH
PT NO. APO0660

Models 66/88

DISMANTLING

REMOVAL OF CHASSIS

(1) Remove knobs (knobs without screws pull straight off shaft).

(2) Disconnect power plug and speaker plug.

(3) Remove four fixing screws from underside of cabinet shelf; the chassis is now free.

REMOVAL OF LOUDSPEAKER

(1) Remove 4-pin plug from back of chassis.

(2) Remove four screws holding speaker chassis and remove speaker.

IMPORTANT

It is extremely important, when servicing, to make sure that the speaker is plugged into the chassis before switching on, otherwise the 8 MF electrolytic condenser may be seriously damaged.

VOLTAGE TABLE

Values given may vary ± 10% and are taken on 240 volt mains (250 volt primary tap). Receiver tuned to no signal point unless otherwise stated.

	V1 (6A7) Amplr. Sect.	V1 (6A7) Osc. Sect.	V2 (6B7S)	V3 (6B7)	V4 (42)	V5 (80S)
Plate to chassis volts	BC 255	140* / 150	255	130	235	—
	SW 255	155				
Screen to chassis volts	90* / 85		90* / 85	40	235	
Heaters	6.3		6.3	6.3	6.3	5.0
Negative end of bias voltage divider to chassis	28 volts					

*Tuned to strong local station.

Total HT current measured at terminal 3 of speaker or speaker socket	53 ma.
6A7 oscillator anode current measured at 25,000 ohms filter resistor	4.2 ma.
V1 and V2 screen current measured at 40,000 ohms dropping resistor	4.3 ma.
V3 screen current measured at 1 meg. dropping resistor	0.2 ma.
V4 total current measured between cathode and ground	38 ma.

RADIO FREQUENCY TESTS AND ADJUSTMENTS

Insensitivity or poor selectivity generally indicate mis-alignment of the tuned circuits.

In any case where a component replacement has been made in either the IF or RF circuits of the receiver, or if the wiring has been disarranged, all circuits must be re-aligned.

To do this, the following equipment is required:

An oscillator or signal generator capable of tuning to 460 kc, 1400 kc, and 600 kc for Models 77 and 88, and also to 17.65 mc (17 metres) for Models 55 and 66. An output meter should be used to indicate when the circuits are tuned to resonance.

IF alignment should always precede RF alignment, and even if only one coil or one range of coils has been serviced, the whole of the realignment should be done in the order given, i.e., broadcast range first followed by short-wave range.

In carrying out the following operations, it is important that the input to the receiver from the oscillator should be kept low and progressively reduced as the circuits are brought into line, so that the reading on the output meter does not exceed about 1.0 volt.

For all alignment operations the output meter should be connected directly across the voice coil terminals on the speaker.

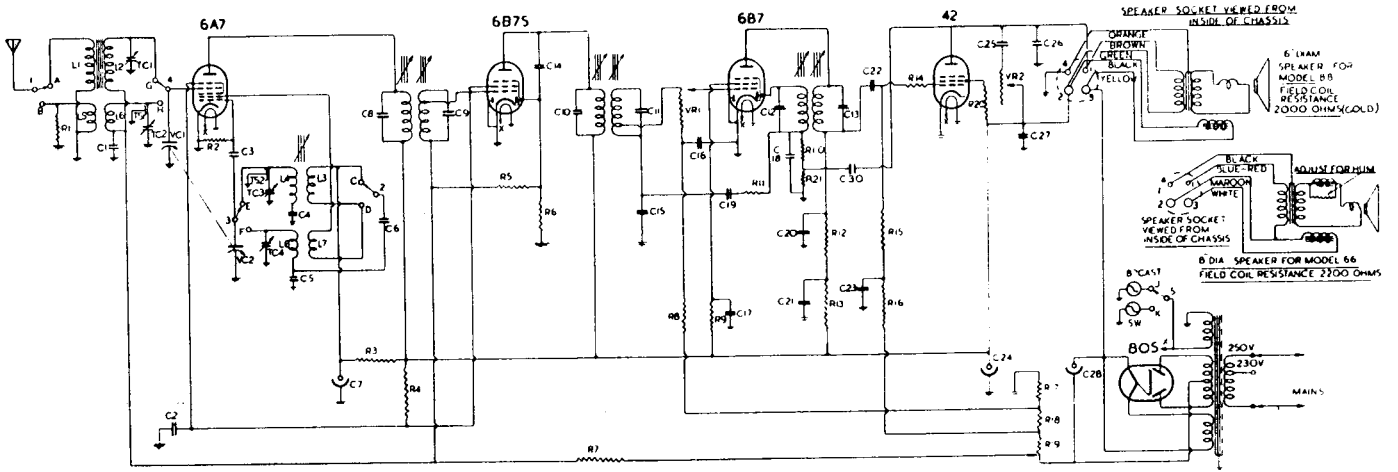
IF ALIGNMENT

Rotate volume control fully clockwise and tone control fully anticlockwise. Set wave-change switch (Models 66 and 88) to broadcast range and fully engage the vanes of the ganged condenser. Connect the output leads of the signal generator to the grid of the 6A7 through a 0.1 mf. condenser and to the chassis. (Note.—Do not disconnect the clip and lead from 6A7 grid.)

(1) Tune signal generator to exactly 460 kc.

(2) Adjust the trimmer screws on the IF transformers (the top screw is the secondary and the bottom the primary in all three

"H.M.V." A.C. Dual-Wave Console 66 and Mantel 88



REF	PART NO	DESCRIPTION
R1	B1X	500 OHMS 1/3 WATT
R2	H1X	.05 MEGOHMS 1/3 WATT
R3	AE3X	25000 OHMS 1 WATT
R4	B3X	40000 OHMS 1 WATT
R5	AA1XX	2 MEGOHMS 1/3 WATT
R6	AC1XX	.75 MEGOHMS 1/3 WATT
R7	AB3X	0.9 MEGOHMS 1 WATT
R8	P1XX	1 MEGOHM 1/3 WATT
R9	P2X	1 MEGOHM 1/2 WATT
R10	O1XX	.5 MEGOHM 1/3 WATT
R11	U1XX	.1 MEGOHM 1/3 WATT
R12	J1X	.1 MEGOHM 1/3 WATT
R13	AD1XX	15000 OHMS 1/3 WATT
R14	U1XX	.1 MEGOHM 1/3 WATT
R15	O1XX	.5 MEGOHM 1/3 WATT
R16	N1XX	.25 MEGOHM 1/3 WATT
R17	APD 0861	50 OHMS, 240 OHMS, 2200 OHMS — BIAS VOLTAGE DIVIDER
R18		
R19		
R20	AF2X	3000 OHMS 1/2 WATT
R21	AM1X	200 OHMS 1/3 WATT

REF	PART NO	DESCRIPTION
C1	0013/M	.05 MFD 200V CONDENSER
C2	0004/O	4 0MFD/200V WKG ELECTRO CON
C3	0243/AB	100 MMFD
C4	0243/AM	420 MMFD
C5	0243/AN	1250 MMFD
C6	0013/J	.01 MFD 400V
C7	0004/H	16 MFD 300V WITH C 2B
C8	0243/AB	100 MMFD
C9	0243/AB	100 MMFD
C10	0243/AB	100 MMFD
C11	0243/AB	100 MMFD
C12	0243/AB	100 MMFD
C13	0243/AB	100 MMFD
C14	0243/O	50 MMFD
C15	0243/O	250 MMFD
C16	0004/L	.5 MFD 200V
C17	0004/E	.1 MFD 400V
C18	0243/O	250 MMFD
C19	0013/J	.01 MFD 400V
C20	0243/AL	400 MMFD
C21	0003/A	.5 MFD 400V
C22	0013/I	.02 MFD 400V
C23	0013/M	.05 MFD 200V
C24	0004/J	16 MFD 500V ELECTROLYTIC
C25	0003/G	.05 MFD 400V
C26	0013/O	.002 MFD 600V
C27	0003/A	.5 MFD 400V
C28	0014/H	8 MFD 500V ELECTRO WITH C7
C29		
C30	0243/AO	1500 MMFD

REF	DESCRIPTION	PART NO
VC1 & VC2	380 MMFD 2 GANG CONDENSER	APC0057/A
TC1 TC2 TC3 & TC4	AIR CONDENSER	APD0786
VR1	1 MEGOHM POTENTIOMETER	APD0877
VR2	.05 MEGOHM POTENTIOMETER	APD0676/8
	DIAL LAMPS 6.3V .3 AMP	
TS1	FIXED TRIMMER SHUNT .730 MMF	APD0910
TS2	FIXED TRIMMER SHUNT .110 MMF	APD0914
	6" DIA SPEAKER FOR MODEL 88	APC0090
	8" DIA SPEAKER FOR MODEL 66	APC0097

NOTE A FEW CHASSIS OF EARLY PRODUCTION WERE FITTED WITH C2 AS 1 MFD AL SO C 30 AND R 21 WERE NOT FITTED