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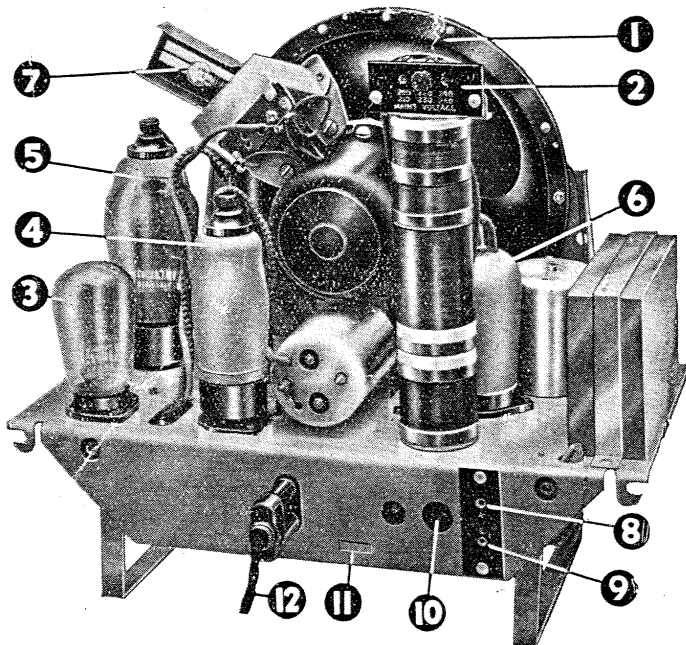
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SERVICE INFORMATION



Model AD65

CONSOLETTA RECEIVER



AD65 Chassis

Universal model for A.C. or D.C. mains, 200-250 volts.

1. Speaker mounted on chassis.
2. Mains voltage adjustment panel.
3. Rectifier valve.
4. I.F. Amplifier valve.
5. Output Pentode valve.
6. Detector-Oscillator valve.
7. Pilot light.
8. Aerial socket.
9. Earth socket,
10. Image rejection adjustment.
11. Serial number. (To be quoted in all correspondence).
12. Mains Lead.

WARNING.

As the chassis is alive, take care in handling when back is off, or when chassis removed from cabinet for test purposes. This particularly applies to sets working on A.C. mains, or in the case of D.C. mains, where the positive main is earthed.

When working on A.C. it is advisable, as an extra precaution, to insert the plug in the mains socket so that chassis is at earth potential. Test by connecting a condenser of about .25 mfd. in series with the earth lead and touch chassis with bare end of wire. If a flash occurs reverse the mains plug.

Do not forget (a) to replace the back, (b) fill grub screw holes on control knobs with wax after refitting.

DESCRIPTION OF CIRCUIT

Mains Consumption : AC 230 volt input (plug in 220-230 volt tap), 290-320 m/a.
DC 230 volt input (plug in 220-230 volt tap), 290 m/a.

VALVES.

1. The frequency changer.

This valve is an octode, the approved type being a Mullard FC13, and combines the functions of 1st. detector and local oscillator.

The valve may be considered as a triode oscillator, the electron stream of which acts as the cathode for the H.F. Pentode.

A universal base is fitted and the control grid is brought out to a terminal on top of valve.

2. The I.F. Amplifier.

This valve is a variable-mu H.F. Pentode, the approved type being a Mazda VP/1321. It is fitted with a seven pin base, the anode being connected to a terminal on top of valve.

3. Demodulator and Output Stage.

This valve is a Duo-diode-Pentode, the approved type being a Mazda Pen/DD/4020. It is fitted with a seven pin base, the control grid being connected to a terminal on top of valve.

One diode acts as a demodulator and the other provides A.V.C.

4. Rectifier.

Half wave rectification is used, and either a Mullard UR2 or UR1 valve is the approved type.

When the UR2 is used, the two anodes are joined together thus using the valve as a half wave rectifier.

SIGNAL FREQUENCY CIRCUIT.

This consists of an inductively coupled band pass filter, the aerial being connected through a .001 mfd. condenser to a tapping point on the M/W or L/W aerial section of the band pass coils.

The band pass filter consists of four coils wound on one former, and looking from the L/W aerial end, the coils are as follows :—

- (1) L/W aerial coil (Leesona wound).
- (2) M/W aerial coil (Single layer).
- (3) L/W grid coil (Leesona wound).
- (4) M/W grid coil (Single layer).

OSCILLATOR CIRCUIT.

This consists of a tuned grid circuit coupled to a coil in the anode circuit of the triode section of the octode valve.

The oscillator coils are wound on one former and are mounted with a .001 condenser (C9) in a screening can, and fixed to the chassis in front of the frequency changer valve.

INTERMEDIATE FREQUENCY STAGES.

Coupling between V1 and V2, and between V2 and V3, is by means of I.F. transformers. These transformers are mounted with their necessary trimmers in screened cans on chassis.

The 1st. I.F. Transformer is fitted in a horizontal position under the pot winding of the loud speaker.

The 2nd. I.F. transformer is fitted at the back of the I.F. amplifying valve.

Both the transformers consist of similar windings, but spacing of coils differs. In the 1st. I.F. the coils are 5/8" apart and in the 2nd. 3/8" apart.

In some models the 2nd. I.F. screening can also contains resistances R5 and R16 and condenser C13.

In other models resistances and condenser are mounted under chassis.

MAINS FILTER.

This consists of two Leesona wound coils, (L13 and L14) and two .1 non inductive condensers (C19 and C20).

POWER SUPPLY.

As previously explained, either a full wave rectifying valve is used with the anodes in parallel to give half wave rectification, or a half wave rectifying valve is used on AC. When used on DC, the rectifying valve is unnecessary, but as it passes current continuously so long as the anode is maintained at a positive potential, it is left in circuit to avoid switching complications. It must not be short circuited on DC as the electrolytic condensers are not reversible.

All valve heaters are connected in series. the mains voltage being dropped by resistances R8, R9 and R10.

DEMODULATOR AND REFLEX L.F. AMPLIFICATION.

One diode of the Duo-diode-Pentode valve is connected directly to the secondary of the 2nd I.F. transformer, the loading for this diode being L9-R16-R5 to cathode. C13 by-passes the H.F. component.

Rectified L.F. is developed across the load resistances R5 and R16, and is tapped off at the junction of these resistances and passed via condenser C23 to the grid of the I.F. amplifying valve.

It will be observed that the H.T. supply to the screening grid of V2 is through the resistances R18 and R19. This electrode is coupled to the control grid of the pentode section of the output valve through condenser C14, the resistance R6 being a grid leak.

Resistance R19 and condenser C12 form an ordinary decoupling circuit.

Resistances R6, R18 and condenser C14 form a resistance coupling system.

The cathode, control grid and screening grid of valve V2 are thus used as a three electrode amplifying circuit, resistance-capacity coupled to the output pentode, the valve V2 performing the dual functions of I.F. amplifier and 1st. L.F. stage.

A.V.C. SYSTEM.

The system provides simple A.V.C. to the grids of V1 and V2.

The A.V.C. diode of V3 receives its L.F. supply from the anode of the I.F. valve, the load circuit being R15-R4 and R20 to chassis and then via bias resistance R7 to cathode,—the voltage drop across R7 being about 6 volts, which provides the delay action.

The grid circuit of V1 is taken from the junction of the resistances R15 and R4, and grid of V2 is taken to the junction of resistances R4 and R20.

Any signal strong enough to overcome the delay bias on the A.V.C. diode will cause that diode to rectify. A negative potential will be developed across the load resistances R15, R4 and R20, the voltage across R20 is applied to the grid of V2, whilst the voltage across R4 and R20 is applied to the grid of V1. Under these circumstances the grid of V1 receives a greater bias than the grid of V2.

The stronger the signal the greater the bias applied to the grids of V1 and V2, and signal strength is thus automatically controlled.

VOLUME CONTROL.

A 2000 ohm variable resistance is connected in the cathode circuits of V1 and V2, and it operates by varying the grid bias to these valves.

TO REMOVE CHASSIS FROM CABINET

(In this model the chassis and loud speaker are in one unit, the tuning scale being attached to the cabinet).

1. Detach back by undoing seven special screws, and lift slightly before removing to avoid fouling mains resistance.
2. Remove control knobs by slackening grub screws.
3. Remove nut holding mains switch and push switch through hole.
4. Remove two screws in back of chassis, holding chassis to internal ribs of cabinet.
5. Remove two nuts on speaker mounting when chassis can be withdrawn.

RE-ALIGNMENT

To re-align Model AD65, connect output meter from anode of output valve to chassis. If the meter used does not contain a condenser, it should be isolated from the D.C. H.T. supply by means of a condenser of about 2 mfd. Then proceed as follows :—

1. Set wave change switch to long wave position.
2. Set tuning condenser to maximum position.
3. Apply 110 K.C. output of oscillator to A and E sockets.
4. Adjust I.F. trimmers in the following order :—
 - (a) 1st. I.F. Primary
 - (b) 2nd. I.F. Primary
 - (c) 1st. I.F. Secondary
 - (d) 2nd. I.F. Secondary

Adjustments (a), (c) and (d) should be for maximum reading on the meter, and (b) for minimum reading.

If signals from oscillator are not strong enough when it is connected to the A and E sockets, connect instead from grid of octode valve to chassis.

POSSIBLE FAULTS

- | | |
|--|---|
| 1. Hum above normal. | Cause. Suspect C12, C17, C18, C19 or C20. |
| 2. Bad instability. | Suspect C8. |
| 3. Apparent Noisy Volume Control. | Suspect C24. |
| 4. Crackle. | |
| (a) Loose Pilot Light. | (d) Internal intermittent short in fixed condenser. |
| (b) Noisy valve. | (e) Bad joint. |
| (c) Loose connection or valve loose in socket. | (f) Dirty wave change switch. |
| (g) Outside interference. | |

VOLTAGES AND RESISTANCE READINGS

Filament current 200 m/a on D.C. (Test by reversing polarity of input).

Volume control total resistance	...	...	...	2000 ohms.
Loud speaker field resistance	...	...	...	400-420 ohms.
Output transformer primary	...	...	...	625 ohms.
" " secondary	...	...	Less than .5	ohms.
Mains resistance section R8	...	...	...	100 ohms.
" " " R9	...	...	...	100 ohms.
" " " R10	...	...	...	560 ohms.
" " " R12	...	...	...	5000 ohms.

COILS.

Long wave aerial coil L3	...	...	...	14 ohms.
Medium wave aerial coil L2	...	...	...	3.75 ohms.
Long wave grid coil L5	...	...	...	14 ohms.
Medium wave grid coil L4	...	...	...	3.75 ohms.

Oscillator Coil.

Medium wave section	...	...	...	5 ohms.
Long wave section	...	...	...	10 ohms.
Anode section	...	...	...	5.5 ohms.

1st. & 2nd. I.F. Transformers

Primary	...	...	...	100 ohms.
Secondary	...	...	...	100 ohms.

VALVES

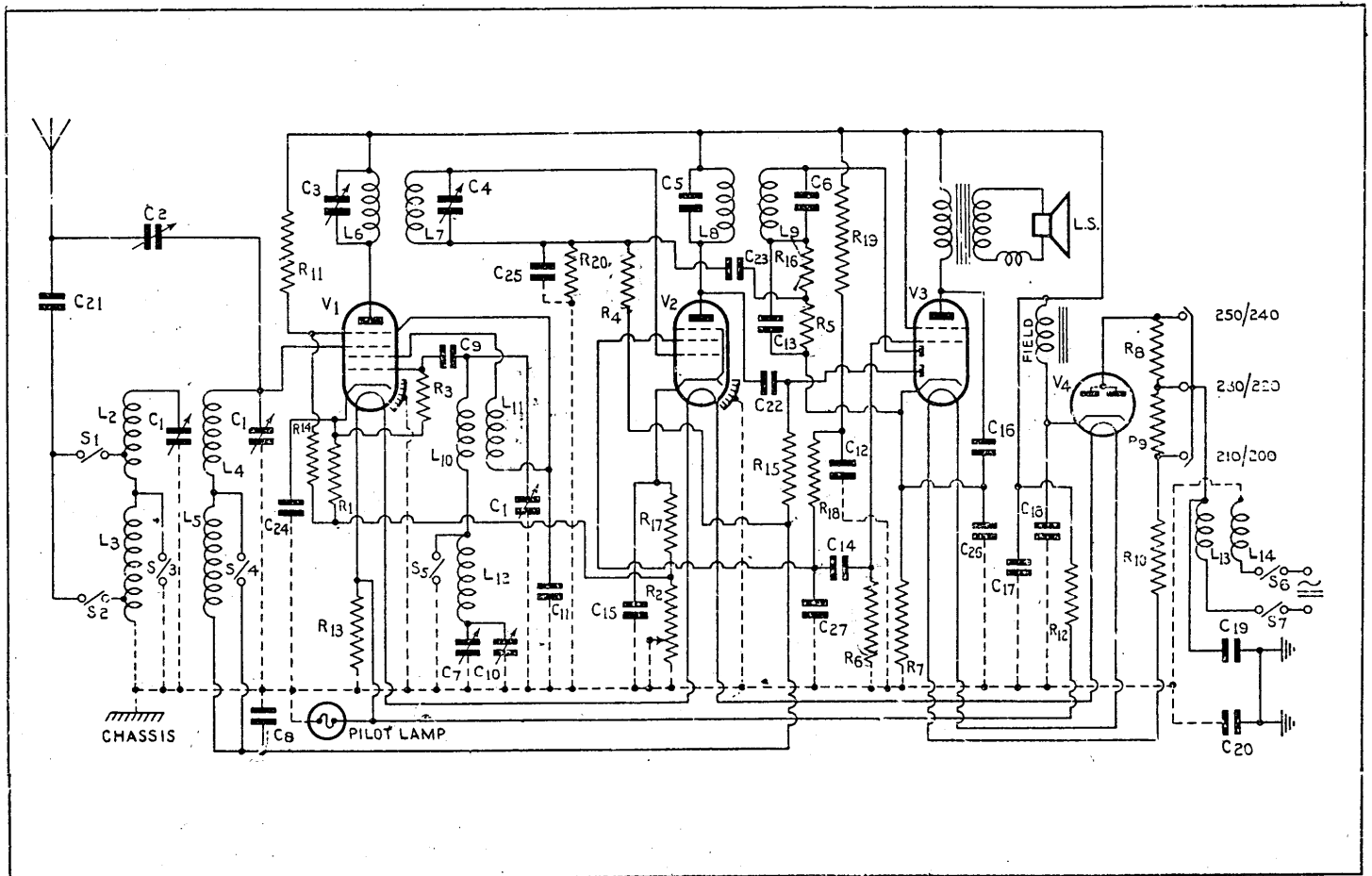
Two voltage readings are given, one taken with a Standard Avometer on the scale indicated and the other with a voltmeter having a resistance of 1000 ohms. per volt.

All readings taken with 230 volt input and set adjusted to 220/230 volt tap.

	On AC				On DC			
	Avo Scale	Avo Reading	1000 ohm. per volt Reading	Current	Avo Scale	Avo Reading	1000 ohm per volt Reading	Current
OCTODE								
Anode to Chassis	1200	195-200	195-200	1.6 m/a	1200	185-190	185-190	1.57 m/a
Anode Current	120	1.5-15	2-17		120	1.5-14	2-16	
Cathode to Chassis	1200	80-90	80-90	2.1 m/a	1200	80-85	80-85	1.9 m/a
Oscillator Anode to Chassis	1200	80-90	80-90		1200	80-85	80-85	
Oscillator Anode Current	1200	80-90	80-90	6 m/a	1200	80-85	80-85	5.2 m/a
Screen Grid to Chassis	1200	80-90	80-90		1200	80-85	80-85	
Screen Grid Current	1200	80-90	80-90		1200	80-85	80-85	
I.F. VALVE								
Anode to Chassis	1200	195-200	195-200	4.5 m/a	1200	185-190	185-190	4.3 m/a
Anode Current	1200	115-145	115-155		1200	110-140	110-145	
Screen to Chassis	1200	115-145	115-155	.8 m/a	1200	110-140	110-145	.8 m/a
Screen Current	1200	115-145	115-155		1200	110-140	110-145	
Cathode to Chassis	120	1.5-14	2-16		120	1.5-13	2-15	
DEMODULATOR								
Anode to Chassis	1200	180	180	29 m/a	1200	170	170	28 m/a
Anode Current	1200	180	180		1200	170	170	
Screen to Chassis	1200	200	200	10 m/a	1200	190	190	9 m/a
Screen Current	1200	200	200		1200	190	190	
Grid Bias	120	6	6		120	6	6	
RECTIFIER								
Cathode to Chassis	1200	235-245	235-245		1200	220		

MODEL AD65

CIRCUIT DIAGRAM and VALUES



Circuit Diagram AD65.

Ref.	Description	Part No.	Ref.	Description	Part No.
C1	Gang Condenser	D.4319	R7	Fixed Resis. 165 ohms	D.P.478
C2	2nd Channel Pre-set	D.P.313	R8	Resistance 100 ohms	D.P.416
C3	I.F. Pre-set Condr	S.A.42	R9	Resistance 100 ohms	D.P.416
C4	I.F. Pre-set Condr	S.A.42	R10	Resistance 560 ohms	D.P.416
C5	I.F. Pre-set Condr	S.A.43	R11	Fixed Resis. 15,000 ohms	A.3263
C6	I.F. Pre-set Condr	S.A.43	R12	Resistance 5,000 ohms	D.P.416
C7	L.W. Padding Pre-set	D.P.313	R13	Fixed Resis. 100 ohms	D.P.437
C8	Fixed Condr. .1 mfd.	A.3845	R14	Fixed Resis. 60,000 ohms.	A.3263
C9	Fixed Condr. .001 mfd.	A.3841	R15	Fixed Resis. 1 Megohm	P.2071
C10	Fixed Condr. .0008 mfd.	A3839	R16	Fixed Resis. 30,000 ohms	A.3263
C11	Fixed Condr. .1 mfd.	A.3845	L2	B.P. Coil M.W. No. 1	D.P.471
C12	Electrolytic Condr. 2 mfd.	B.4123	L3	B.P. Coil L.W. No. 1	
C13	Fixed Condr. .0003 mfd	A.3842	L4	B.P. Coil M.W. No. 2	
C14	Fixed Condr. .005 mfd	A.4232	L5	B.P. Coil L.W. No. 2	
C15	Electrolytic Condr. 25 mfd	A.3265	L6	1st. I.F. Coil	S.A.42
C16	Fixed Condr. .005 mfd	A.4232	L7	1st. I.F. Coil	S.A.42
C17	Electrolytic Condr. 24 mfd.	B.4123	L8	2nd. I.F. Coil	S.A.43
C18	Electrolytic Condr. 8 mfd.	B.4123	L9	2nd. I.F. Coil	S.A.43
C19	Fixed Condr. .1 mfd	A.3844	L10	Osc. Coil	S.A.44
C20	Fixed Condr. .1 mfd	A.3844	L11	Osc. Coil	S.A.44
C21	Fixed Condr. .001 mfd	A.3842	L12	Osc. Coil	S.A.44
C22	Fixed Condr. .0001 mfd	P.2074	L13	Filter Coil	S.A.14
C23	Fixed Condr. .0005 mfd.	A.3842	L14	Filter Coil	S.A.14
R1	Fixed Resis. 200 ohms	D.P.495	S1-5	Wave Change Switch	B.4176
R2	Volume Control	B.4367	S6-7	On-Off Switch	B.4167
R3	Fixed Resis. 60,000 ohms	A.3263	V1	Octode Valve	B.4227
R4	Fixed Resis. 250,000 ohms	A.3263	V2	H.F. Pentode Valve	B.4365
R5	Fixed Resis. 250,000 ohms	A.3263	V3	Output D.D. Pentode	B.4364
R6	Fixed Resis. 500,000 ohms	A.3263	V4	Rectifier Valve	B.4230

PRICE LIST OF SPARE PARTS FOR AD65

Ref. No.	Part No.	Description	List Price	Ref. No.	Part No.	Description	List P
CABINETS				CONDENSERS			
	DP430	Cabinet (Black)	1.12.6	C.1.	D4319	Variable condenser	...
	DP431	Cabinet (Walnut)	1. 5.0	C2	DP313	Image Rejection Pre-set Condenser	...
KNOBS				C8-11	A3845	Fixed condenser .1 mfd.	...
	DP142	Knob (Black) Volume Control	1/-	C9	A3841	" "	.001
	C3838	" (Walnut) Volume Control	9d.	C10	A3839	" "	.0006
	DP425	" (Black) Tuning	2/-	C12-17-18	B4123	" "	24+8+2 mfd. (in 1 block)
	C4212	" (Walnut) Tuning	1/6	C13	A3842	" "	.0003
	B4211	" (Black) Wavechange	1/-	C14-16	A4232	" "	.005
	B4211	" (Walnut) Wavechange	9d.	C15-26	A3265	" "	25 mfd.
SCALES ETC.				C19-20-24	A3844	" "	.1
	C4191/1	Scale	3/-	C21	A3842	" "	.001
	A4127	Scale Clamp	1d.	C22	P2074	" "	.0001
	C4237	Scale centre Bar	3/-	C23	A3846	" "	.01
LOUD SPEAKER				C25	A4272	" "	.004
	C4165	Loud speaker mounting	1/6	C27	A3842	" "	.0005
	DP422	Loud speaker, without transformer	1.10.0	RESISTANCES			
	DP61	Output transformer	10/6	R1	DP495	Fixed resistance 200 ohms.	9
	DP426	Loud speaker lead	6d.	R3-14	A3263	" "	60,000 ohms.
	DP537	Baffle and felt assembly	1/9	R4-6	A3263	" "	500,000 ohms.
	DP419	Silk and ring assembly	6d.	R5-20	A3263	" "	250,000 ohms.
COILS				R7	DP478	" "	165 ohms.
L6 & 7	SA42	1st. I.F. Coil Assembly	5/6	R11-18	A3263	" "	15,000 ohms.
L8 & 9	SA43	2nd I.F. Coil Assembly	5/6	R13	DP437	" "	100 ohms.
L10-11-12	SA44	Oscillator Coil Assembly	6/6	R14	A3263	" "	60,000 ohms.
L2-3-4-5	DP471	Band pass coil	5/6	R15	P2071	" "	2 Megohms.
L13-14	SA14	Filter Unit	3/-	R16	A3263	" "	30,000 ohms.
MISCELLANEOUS				R17	DP441	" "	300 ohms.
S6-7	A4167	On-off switch	2/-	R8-9-10	DP416	Mains Resistance	...
S1-2-3-4-5	B4176	Wave change switch	2/6	R2	B4367	Volume Control	...
	DP196	Mains lead complete	2/6	VALVES			
	P2108	2 Pin Socket	1/-	V1		Octode Valve.	Mullard FC13
	DP533	Back cover and cowl assembly	4/-	V2		H.F. Pentode Valve.	Mazda AC/VP1321
	P2445	Pilot Lamp	9d.	V3		Output D.D. Pentode.	Mazda Pen/DD/4020
	DP418	Mains panel assembly	6d.	V4		Rectifier Valve.	Mullard UR2
	P2422	Insulated screw for mains tap	3d.				
	D4182	Centre drive wheel and pilot lamp mounting	3/-				
	A3303	Mains plug	6d.				
		Condenser drive cord	3d.				
		Condenser drive spring	1d.				

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