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PHILCO VALVES

AVERAGE CHARACTERISTICS

BASE AND SCHEMATIC LAYOUTS

BULB SIZES

August, 1938

6.3 VOLTS SERIES

Type	Description	Use	Base	Bulb	Type of Cathode	Fil. Amps.	Plate Volts	Negative Control Grid Volts	Plate Current Cut-off Grid-volts*	Screen Volts	Plate Current (Ma.)	Screen Current (Ma.)	Mutual Conduct. Micromhos	Plate Resistance Ohms	Amp. Factor	Load for Output Ohms	Power Output Milli-watts
36E	Tetrode	R.F.	5B	ST12C	Heater	.3	135	1.5	—12	67.5	2.8	Not over	1,000	475,000	475	—	—
							180	3.0	—18	90	3.1	½ Ip	1,050	500,000	525	—	—
							250	3.0	—25	90	3.4	—	1,100	600,000	660	—	—
		Det.					250†	Appx. 8.0	—	90	Plate Current to be adjusted to 0.1 Ma. with no signal.						
37	Triode	Det.	5A	ST12	Heater	.3	90	6.0	—11	—	2.5	—	800	11,500	9.2	—	—
		Amp.					135	9.0	—16	—	4.1	—	925	10,000	9.2	—	—
							180	13.5	—22	—	4.3	—	900	10,200	9.2	—	—
							250	18.0	—30	—	7.5	—	1,100	8,400	9.2	—	—
38	Pentode	Power	5C	ST12C	Heater	.3	100	9.0	—	100	7.0	1.2	875	140,000	120	15,000	270
		Amp.					180	18.0	—	180	14.0	2.4	1,050	110,000	120	11,600	1,000
							250	25.0	—	250	22.0	3.8	1,200	100,000	120	10,000	2,500
39/44E	Vario-Mu Pentode	R.F.	5G	ST12C	Heater	.3	90	3.0	—	90	5.6	Not over	960	375,000	360	—	—
							135	3.0	—	90	5.6	½ Ip	980	375,000	530	—	—
							180	3.0	—	90	5.8	—	1,000	750,000	750	—	—
							250	3.0	—*42.5*	90	5.8	—	1,050	1,000,000	1,050	—	—
41E	Pentode	Power	6I	ST12	Heater	.4	135	10.0	—	135	12.5	2.0	1,600	94,000	150	10,400	750
		Amp.					180	13.5	—	180	18.5	3.0	1,850	81,000	150	9,000	1,500
							250	18.0	—	250	32.0	5.5	2,200	68,000	150	7,600	2,400
42E	Pentode	Power Amp.	6I	ST14	Heater	.65	250	16.5	—	250	34.0	6.5	2,200	95,000	165	7,300	3,000
44E	—	R.F.	5I	See 39/44E Characteristics													
75	Double Diode Triode	Det. Amp.	6D	ST12C	Heater	.3	250	2.0	—3.5	—	1.0	—	1,100	91,000	100	Triode Section.	
76	Triode	Osc. Amp.	5A	ST12	Heater	.3	250	13.5	—	—	4.2	—	1,250	11,750	13.8	—	—
77E	Pentode	R.F.	6A	ST12C	Heater	.3	250	3.0	—6	100	2.3	.6	1,250	1,500,000	1,500	—	—
		Det.					250	4.3	—	100	Plate current to be adjusted to 0.1 Ma. with no signal						
78E	Vario-Mu Pentode	R.F.	6A	ST12C	Heater	.3	180	3.0	—*32.5*	75	4.0	1.0	1,110	1,000,000	1,100	—	—
							250	3.0	—*42.5*	100	7.0	2.0	1,450	800,000	1,160	—	—
							250	3.0	—*52.5*	125	10.5	3.0	1,650	600,000	900	—	—
79	Double Triode	Power Amp.	6F	ST12C	Heater	.6	180	0.0	—	—	7.5	Class B Operation		—	—	7,000*	5,000¶
							250	0.0	—	—	10.5			—	—	14,000*	8,000¶
85	Double Diode Triode	Det. Amp.	6D	ST12C	Heater	.3	250	20.0	—37	—	8.0	—	1,100	7,500	8.3	20,000	350
89	Double Triode	Power Amp.	6A	ST12C	Heater	.4	250	31.0	—	250T	32.0	—	1,800	2,600	4.7	5,500	900
							250	25.0	—	250P	32.0	3.0	1,550	80,000	12.5	8,000	1,500
							250	0.0	—	—	6.0	Class B Operation, two valves			—	9,000**	3,500‡
6A4/LA	Pentode	Power Amp.	5D	ST14	Filament	.3	135	9.0	—	135	14.0	2.5	1,900	52,600	100	9,500	700
							180	12.0	—	180	22.0	3.9	2,200	45,500	100	8,000	1,500
6A7	Vario-Mu Heptode	Converter	7B	ST12C	Heater	.3	250	3.0	—45	100	3.5	2.2	520C	360,000	283	No. 2 Grid 200 Volts Max. 4.0 Ma. No. 1 Grid Resistor 50,000 Ohms.	
6A8EG	Vario-Mu Heptode	Converter	8A	ST12C	See 6A7 Characteristics.												
6B4G	Triode	Power Amp.	8B	ST16	Filament	1.0	250	45.0	—	—	60.0	—	5,250	800	4.2	2,500	3,200
							300	62.0	—	—	80.0	per valve, push-pull.		Fixed Bias.	—	3,000**	15,000
6B7	Double Diode Pentode	R.F. or I.F.	7C	ST12C	Heater	.3	180	3.0	—13	75	3.4	0.9	840	1,000,000	840	I.F. Amplifier	
							250	3.0	—17	100	6.0	1.5	1,000	800,000	800	A.F. Amplifier	
		A.F.					250††	4.5°	—	50	0.65	—					
6B8EG	Double Diode Pentode	R.F. or I.F.	8C	ST12C	See *6B7* Characteristics.												
6C6	Pentode	R.F.	6A	ST12C	Heater	.3	250	3.0	—	100	2.0	0.5	1,225	1,500,000	1,500	—	—
		Det.					250	Appx. 6.0	—	100	Plate Current to be adjusted to 0.1 Ma. with no input signal.						
6D6	Pentode	R.F. Amp.	6A	ST12C	Heater	.3	250	3.0	—	100	8.2	2.0	1,600	800,000	1,280	—	—
6F6EG	Pentode	Power Amp.	7G	ST14	Heater	.65	250	16.5	—	250	34.0	6.5	2,500	75,000	185	7,000	3,400
							315	22.0	—	315	42.0	8.5	2,600	100,000	185	7,000	5,000
							250	20.0	—	Connect to Plate	31.0	—	2,700	2,600	6.2	4,000	850
							350	38.0	—	Connect to Plate	56.0	per valve, push-pull.			—	8,000**	15,000

6F7	Pentode Triode	Det. Osc.	7E	ST12C	Heater	.3	250 100	3.0 3.0	— —	100	6.5 3.5	1.5 —	1,100 450	850,000 17,800	900 8.0	Pentode Section. Triode Section.	
6F7B	Pentode Triode	Det. Osc.	7E	ST12C	Heater	.3	250 100	3.0 3.0	— —	100	6.5 3.5	1.5 —	1,100 525	850,000 16,200	900 8.5	Pentode Section. Triode Section.	
6F7E	Pentode Triode	Det. Osc.	7F	See 6F7E Characteristics.													
6H6G	Double Diode	Rectifier	8D	ST12	Heater	.3	100	(R.M.S. per plate)		—	4.0 max.	—	—	—	—	—	—
6J5G	Triode	A.F. Amp.	8E	ST12	Heater	.3	250	8.0	—	—	9.0	—	2,600	7,700	20	—	—
6K5G	Triode	A.F. Amp.	8F	ST12C	Heater	.3	100 250	1.5 3.0	— —	— —	0.35 1.1	— —	900 1,400	78,000 50,000	70 70	— —	— —
6K7EG	Pentode	R.F.	8G	ST12C	Heater	.3	90 250	3.0 3.0	— —	90 100	5.4 7.0	1.3 1.7	1,275 1,450	315,000 800,000	400 1,160	Remote Cutoff —	— —
6N7G	Double Triode	Power Amp. Driver Driver	8H	ST14	Heater	.8	250 300 250 294	0 0 5.0 6.0	— — — —	— — — —	28.0 35.0 6.0 7.0	Class " B " Operation. Class " B " Operation. — —	 3,100 3,200	 11,300 11,000	— — 35 35	8,000 10,000 40,000 40,000	8,000 10,000 350‡‡ 400‡‡
6R7G	Double Diode Triode	Det. Amp.	8I	ST12C	Heater	.3	250	9.0	—	—	9.5	—	1,900	8,500	16	—	—
Pen. DD61	Double Diode Pentode	Det. Power Amp.	7I	ST32C	Heater	.3	250	5.3	—	250	32.0	6.0	8,000	—	—	6,700	3,500

¶380 Mw. applied between grids; 2nd condition type 37 driver with PRI/½ SEC. trans. ratio—2.6.
†Applied through 250,000 ohms.
‡Power output for two valves with 40 volts R.M.S. applied.
P—Pentode Connection.
T—Triode Connection.
‡‡Both sections in parallel.
*Figures in italics are grid volts giving Mu of 2 mmhos.
††Applied through 200,000 ohms.
°Unsuited for self bias circuit arrangement.
C—Conversion Conductance.
**Plate to Plate load.

2.0 VOLTS SERIES

Type	Description	Use	Base	Bulb	Type of Cathode	Fil. Amps.	Plate Volts	Negative Control Grid Volts	Plate Current Cut-off Grid-volts*	Screen Volts	Plate Current (Ma.)	Screen Current (Ma.)	Mutual Conduct. Micromhos	Plate Resistance Ohms	Amp. Factor	Load for Output Ohms	Power Output Milli-watts
1A4E	Vario-Mu Pentode	R.F.	4K	ST12C	Filament	0.06	180	3.0	—	67.5	2.3	0.7	700	750,000	525	Remote Cutoff.	
1A6	Heptode	Converter	6H	ST12C	Filament	0.06	180	3.0	*—30*	67.5	1.3	—	300	500,000		Anode Grid 135 Volts Max. Anode Grid Current 2.3 Ma.	
1C6	Heptode	Converter	6H	ST12C	Filament	0.13	180	3.0	*—14*	67.5	—	—	—	—		Anode Grid 135 Volts Max. Anode Grid Current 3.3 Ma.	
15E	Pentode	Det. Osc.	5B	ST12C	Heater	0.24	135	1.5	—	67.5	1.85	0.6	625	800,000	500	—	—
19	Double Triode	Power Amp.	6E	ST12	Filament	0.26	135	0.0	—	—	2.7	—	Class B Operation		—	10,000**	2,100¶
30	Triode	Det. Amp.	4A	S12	Filament	0.06	90 135 180	4.5 9.0 13.5	— 9 —13 —17	— — —	2.5 3.0 3.1	— — —	850 900 900	11,000 10,300 10,300	9.3 9.3 9.3	— — —	— — —
31	Triode	Power Amp.	4A	ST14C	Filament	0.13	135 180	22.5 30.0	—37 —50	— —	8.0 12.3	— —	925 1,050	4,100 3,600	3.8 3.8	7,000 5,700	185 375
32	Tetrode	R.F.	4B	S14	Filament	0.06	135 180	3.0 3.0	— 7.25 — 7.5	67.5 67.5	1.7 1.7	Not over ¼ Ip	640 650	950,000 1,250,000	610 780	— —	— —
33	Pentode	Power Amp.	5D	ST14	Filament	0.26	135	13.5	—27	135.0	14.5	3.0	1,450	50,000	70	7,000	700
34E	Vario-Mu Pentode	R.F.	4K	ST14C	Filament	0.06	135 180	3.0 3.0	—23 —23	67.5 67.5	2.0 2.8	— —	600 620	600,000 1,000,000	360 620	— —	— —
2101	Pentode	Power Amp.	5H	ST14	Filament	0.12	135	4.5	—	135	8.0	2.6	1,700	200,000	340	16,000	450
2102	Double Diode Triode	Det. Amp.	6J	ST12	Filament	0.12	135	1.5	—	—	2.1	—	1,300	23,000	30	Triode Section.	
2103	Double Pentode	Power Amp.	7H	ST12	Filament	2.6	135 135	4.5 7.5	— —	135 135	7.5 4.0	2.1 1.2	1,600 —	220,000 —	350 —	16,000 24,000**	230 per Section 600 Push-pull
T2	Triode	Det. Amp.	4J	ST30	Filament	0.1	150	1.5	—	—	2.7	—	1,500	21,000	32.0	—	—
SP21	Pentode	R.F. Det.	7J	ST30C	Filament	0.1	150 150	— —	— —	60 60	0.55 Plate current to be adjusted to 0.1 Ma. with no signal.	0.16	900	6,400,000	—	—	—
VP21	Vario-Mu Pentode	R.F.	7J	ST30C	Filament	0.1	150	1.5	—	60 70	1.1 1.8	Not over ¼ Ip	820	1,450,000	—	—	—
OP22	Pentode	Power Amp.	5J	S14	Filament	0.2	150 120	4.5 4.5	— —	150 120	9.0 5.0	1.85 1.0	2,300 1,890	105,000 130,000	— —	17,000 23,000	600 250
Pen. 23	Pentode	Power Amp.	5J	ST31	Filament	0.3	120	2.5	—	120	5.0	1.0	5,300	—	—	19,000	370

**Plate to plate load. *Figures in italics are grid volts giving Mu of 2 mmhos.
¶170 Mw. power input between grids; type 31 driver with PRI/½ SEC ratio 1.53; type 30 as driver with trans. PRI/½ SEC ratio 2.66 gives 1,200 Mw. output.

2.5 VOLTS SERIES

Type	Description	Use	Base	Bulb	Type of Cathode	Fil. Amps.	Plate Volts	Negative Control Grid Volts	Plate Current Cut-off Grid-volts*	Screen Volts	Plate Current (Ma.)	Screen Current (Ma.)	Mutual Conduct. Micromhos	Plate Resistance Ohms	Amp. Factor	Load for Output Ohms	Power Output Milli-watts
24E	Tetrode	R.F.	5B	ST14C	Heater	1.75	250	3.0	— 9	90	4.0	Not over ¼ Ip	1,050	600,000	630	—	—
		Det.					250†	Approx. 5.0		20 to 45 Plate Current to be adjusted to 0.1 Ma. with no input signal.							
		A.F.					250§§	7.0	—	90	0.55	—	600	2,300,000	1,300	—	—
27	Triode	Amp.	5A	ST14	Heater	1.75	90	6.0	—12	—	2.7	—	820	11,000	9.0	—	—
							180	13.5	—22.5	—	5.0	—	1,000	9,000	9.0	—	—
							250	21.0	—32	—	5.2	—	975	9,250	9.0	—	—
35/51	Vario-Mu Tetrode	R.F.	5B	ST14C	Heater	1.75	180	3.0	*—25*	90	6.3	Not over	1,020	300,000	305	—	—
							250	3.0	*—28*	90	6.3	¼ Ip	1,050	400,000	420	—	—
		A.F.					250	1.0	—	45-67.5	0.5	—	—	2,000,000	—	—	—
45	Triode	Power Amp.	4A	ST14	Filament	1.5	180	31.5	—50.5	—	31.0	—	2,125	1,650	3.5	2,700	825
							250	50.0	—80	—	34.0	—	2,175	1,610	3.5	3,900	1,600
							275	56.0	—85	—	36.0	—	2,050	1,700	3.5	4,600	2,000
46	Tetrode	Power Amp.	5F	ST14	Filament	1.5	250	33.0	—	Connect to Plate	22.0	—	2,350	2,380	5.6	6,400	1,250
							300	0.0	—	Connect to Grid	4.0	Class B Operation	—	—	—	5,200**	16,000§
							400	0.0	—	Connect to Grid	6.0	Class B Operation	—	—	—	5,800**	20,000‖
47E	Pentode	Power Amp.	5H	ST14	Filament	—	250	16.5	—	250	31.0	6.0	2,500	60,000	150	7,000	2,700
51	Vario-Mu Tetrode	R.F., A.F.	See Type 35/51 Characteristics.														
53	Double Triode	Power Amp.	7D	—	—	—	250	0.0	—	—	28.0	Class B Operation	—	—	—	8,000**	8,000¶
							300	0.0	—	—	35.0	Class B Operation	—	—	—	10,000**	10,000
							294	6.0	—	—	7.0	Class A Driver Operation	3,200	11,000	35	20-40,000	400 plus°
55	Double Diode Triode	Det.	6D	ST12C	Heater	1.0	250	20.0	—	—	8.0	—	1,100	7,500	8.3	20,000	350
56	Triode	Amp.	5A	ST12C	Heater	1.0	250	13.5	—	—	5.0	—	1,450	9,500	13.8	—	—
		Det.					250	Approx. 20.0	—	—	Plate Current to be adjusted to 0.2 Ma. with no input signal.						
57	Pentode	R.F.	6A	ST12C	Heater	1.0	250	3.0	— 7	100	2.0	1,225	—	1,500,000+	1,500+	—	—
		Det.					250	6.0	—	100	Plate Current to be adjusted to 0.1 Ma. with no input signal.						
		A.F.					250	1.0	—	50	0.5	—	600	3,000,000	1,800	—	—
58	Pentode	R.F.	6A	ST12C	Heater	1.0	250	3.0	*—45.5*	100	8.2	2.0	1,600	800,000	1,280	—	—
		A.F.					250	3.0	—	75	0.5	—	600	1,500,000	900	—	—
59	Pentode	Power Amp.	7A	ST16	Heater	2.0	250	28.0T	—	Connect to Plate	26.0	—	2,600	2,400	6.0	5,000	1,250
							250	18.0P	—	250	35.0	9.0	2,500	40,000	100.0	6,000	3,000
							400	0.0	—	—	26.0	Class B Operation	—	—	—	6,000**	20,000‡
2A3	Triode	Power Amp.	4A	ST16	Filament	2.5	250	45.0	—	—	60.0	—	5,250	800	4.2	2,500	3,500
							300	62.0	—	—	40.0	per valve push pull Fixed Bias.			—	3,000**	15,000
2A5	Pentode	Power Amp.	6C	ST14	Heater	1.75	250	16.5	—	250	34.0	6.5	2,200	75,000	165	7,000	3,000
2A6	Double Diode Triode	Det.	6D	ST12C	Heater	0.8	250	2.0	—	—	1.0	—	1,100	91,000	100	—	—
2A7	Heptode	Converter	7B	ST12C	Heater	0.8	100	1.5	—	50	1.3	—	350C	600,000	Anode grid 200 V. Max.		
							250	3.0	—	100	3.5	2.2	520C	360,000	Anode grid current 4.0 Ma.		
2B7	Double Diode Pentode	R.F. or I.F.	7C	ST12C	Heater	0.8	100	3.0	—13	100	5.8	1.7	950	300,000	285	Pentode Section.	
							250	3.0	—17	100	6.0	1.7	1,000	800,000	800		
		A.F.					250††	4.5	—	50	0.65	—					

P—Pentode Connection.
C—Conversion Conductance.
†Applied through 250,000 Ohms.
§§Applied through 800,000 Ohms.
¶350 Mw. power input between grids.

††Applied through 200,000 Ohms.
**Plate to Plate load.
°Grids connected together and plates connected together.
‖950 Mw. power input between grids.
*Figures in italics are grid volts giving Mu of 2 mmhos.

‡Power Output for two valves with 40 volts RMS applied.
T—Triode Connection.
§650 Mw. power input between grids.

MISCELLANEOUS SERIES

Type	Description	Use	Base	Bulb	Type of Cathode	Filament Rating		Plate Volts	Negative Control Grid Volts	Plate Current Cut-off Grid-volts	Screen Volts	Plate Current (Ma.)	Screen Current (Ma.)	Mutual Conductance Micromhos	Plate Resistance Ohms	Amp. Factor	Load for Output Ohms	Power Output Milliwatts
						Volts	Amps.											
00A	Triode	Gas type Det.	4A	S14	Filament	5.0	0.25	45	Grid Return to Fil. Neg.	—°	—	1.5	—	666	30,000	20.0	—	—
01A	Triode	Det. Amp.	4A	ST14	Filament	5.0	0.25	90	4.5	—7.5	—	2.5	—	725	11,000	8.0	—	—
								135	9.0	—13.5	—	3.0	—	800	10,000	8.0	—	—
10	Triode	Power Amp.	4A	S17	Filament	7.5	1.25	250	22.0	—32	—	10.0	—	1,330	6,000	8.0	13,000	400
								350	31.0	—45	—	16.0	—	1,550	5,150	8.0	11,000	900
								425	39.0	—56	—	18.0	—	1,600	5,000	8.0	10,200	1,600
12A	Triode	Power Amp.	4A	S14	Filament	5.0	0.25	90	4.5	—9.5	—	5.0	—	1,575	5,400	8.5	5,000	35
								135	9.0	—15.5	—	6.2	—	1,650	5,100	8.5	9,000	130
								180	13.5	—20.5	—	7.7	—	1,800	4,700	8.5	10,650	285
14	Tetrode	Det. Amp.	5B	ST14C	Heater	14.0	0.3	See Characteristics of Type 24.										
17	Triode	Det. Amp.	5A	ST14	Heater	14.0	0.3	See Characteristics of Type 27.										
18E	Pentode	Power Amp.	6I	ST14	Heater	14.0	0.3	250	16.5	—42	250.0	34.0	7.0	2,200	75,000	165.0	7,000	3,000
20	Triode	Power Amp.	4A	T8	Filament	3.3	0.132	90	16.5	—26	—	3.0	—	415	8,000	3.3	9,000	45
								135	22.5	—37	—	6.5	—	525	6,300	3.3	6,500	110
22	Tetrode	R.F.	4B	S14	Filament	3.3	0.132	135	1.5	—7.5	45.0	1.7	Not over	375	725,000	270.0	—	—
								135	1.5	—13	67.5	3.5	$\frac{1}{8}$ Ip	500	325,000	160.0	—	—
26	Triode	Amp.	4A	ST14	Filament	1.5	1.05	90	7.0	—12	—	2.9	—	935	8,900	8.3	—	—
								135	10.0	—17.5	—	5.5	—	1,100	7,600	8.3	—	—
								180	14.5	—25	—	6.2	—	1,150	7,300	8.3	—	—
43E	Pentode	Power Amp.	6I	ST14	Heater	25.0	0.3	95	15.0	—35	95.0	20.0	4.0	2,000	45,000	90.0	4,500	900§
								135	20.0	—35	135.0	38.0	7.0	2,300	35,000	80.0	4,000	2,000‡‡
48	PowerTet.	Power Amp.	6B	ST16	Heater	30.0	0.40	125	20.0	—45	100.0	58.0	9.5	3,900	4,000§§	17.0§§	1,500	2,500
50	Triode	Power Amp.	4A	S21	Filament	7.5	1.25	300	54.0N	—83	—	35.0	—	1,900	2,000	3.8	4,600	1,600
								350	63.0N	—100	—	45.0	—	2,000	1,900	3.8	4,100	2,400
								400	70.0N	—114	—	55.0	—	2,100	1,800	3.8	3,670	3,400
								450	84.0N	—127	—	55.0	—	2,100	1,800	3.8	4,350	4,600
71A	Triode	Power Amp.	4A	ST14	Filament	5.0	0.25	90	16.5	—30	—	10.0	—	1,400	2,170	3.0	3,000	125
								135	27.0	—41.5	—	17.3	—	1,650	1,820	3.0	3,000	400
								180	40.5	—59	—	20.0	—	1,700	1,750	3.0	4,800	790
X99	Triode	Det. Amp.	4A	T8	Filament	3.3	0.063	90	4.5	—12	—	2.5	—	425	15,500	6.6	15,500	70
V99	Triode	Det. Amp.	4G	T8	See X99 Characteristics.													
485	Triode	Det. Amp.	5A	S14	Heater	3.0	1.25	90	3.0	—	—	5.0	—	1,150	10,800	12.5	—	—
								120	4.0	—	—	6.0	—	1,350	9,300	—	—	—
182B	Triode	Power Amp.	4A	S17	Filament	5.0	1.25	250	35.0	—	—	18.0	—	1,500	3,300	5.0	4,500	1,750
183	Triode	Power Amp.	4A	S17	Filament	5.0	1.25	250	58.0	—	—	20.0	—	2,000	2,000	3.0	4,500	2,000
								250	65.0	—	—	26.0	—	2,000	1,500	—	—	—
2151	Pentode	Power Amp.	6I	ST14	Heater	14.0	0.3	250	31.0	—	250	47.0	11.6	2,400	50,000	—	—	6,000
Pen. DD	Double Diode	Det.	7I	ST32C	Heater	25.0	0.3	250	7.75	—	250	43.0	8.6	7,000	—	—	5,000	4,100
2530	Pentode	Power Amp.																

Italicised Type numbers indicate valves which are not at present carried in London stock owing to insufficient demand.

°Grid leak .25 to 5 megohms, grid condenser 250 mmfd.

§11 per cent. total harmonic distortion.

§§Subject to considerable variation.

‡‡9 per cent. total harmonic distortion.

N—Self bias is advisable in all cases; grid coupling resistor 10,000 ohms max.

MISCELLANEOUS PILOT LAMPS

Voltage	Current Amps.	Colour of Filament Support Bead	Dimensions		Base	Philco Part Number
			Overall Height	Overall Diameter		
2.0	.06	Pink	1 1/8"	13/32"	Min. Bayonet	34-2065
2.0	.06	Pink	1 1/8"	13/32"	Min. Screw	5316
2.1	.12	White	1 1/8"	13/32"	Min. Bayonet	34-2150
2.5	.5	White	1 1/8"	13/32"	Min. Screw	3463
6-8	.15 at 6.3 volts	Brown	1 1/8"	13/32"	Min. Screw	4567
6-8	.25 at 6.3 volts	Blue	1 1/8"	13/32"	Min. Screw	6608
6-8	.2 at 7.5 volts	White	15/16"	7/16"	Min. Screw	34-2031
6-8	.4 at 6.3 volts	White	1 1/16"	7/16"	Min. Bayonet	34-2039
6-8	.2 at 7.5 volts	White	15/16"	7/16"	Min. Bayonet	34-2040
6-8	.25 at 6.3 volts	Blue	1 1/8"	13/32"	Min. Bayonet	34-2064
6-8	.15 at 6.3 volts	Brown	1 1/8"	13/32"	Min. Bayonet	34-2068
6-8	.35 at 6.3 volts	Pink	1 1/8"	13/32"	Min. Bayonet	34-2141

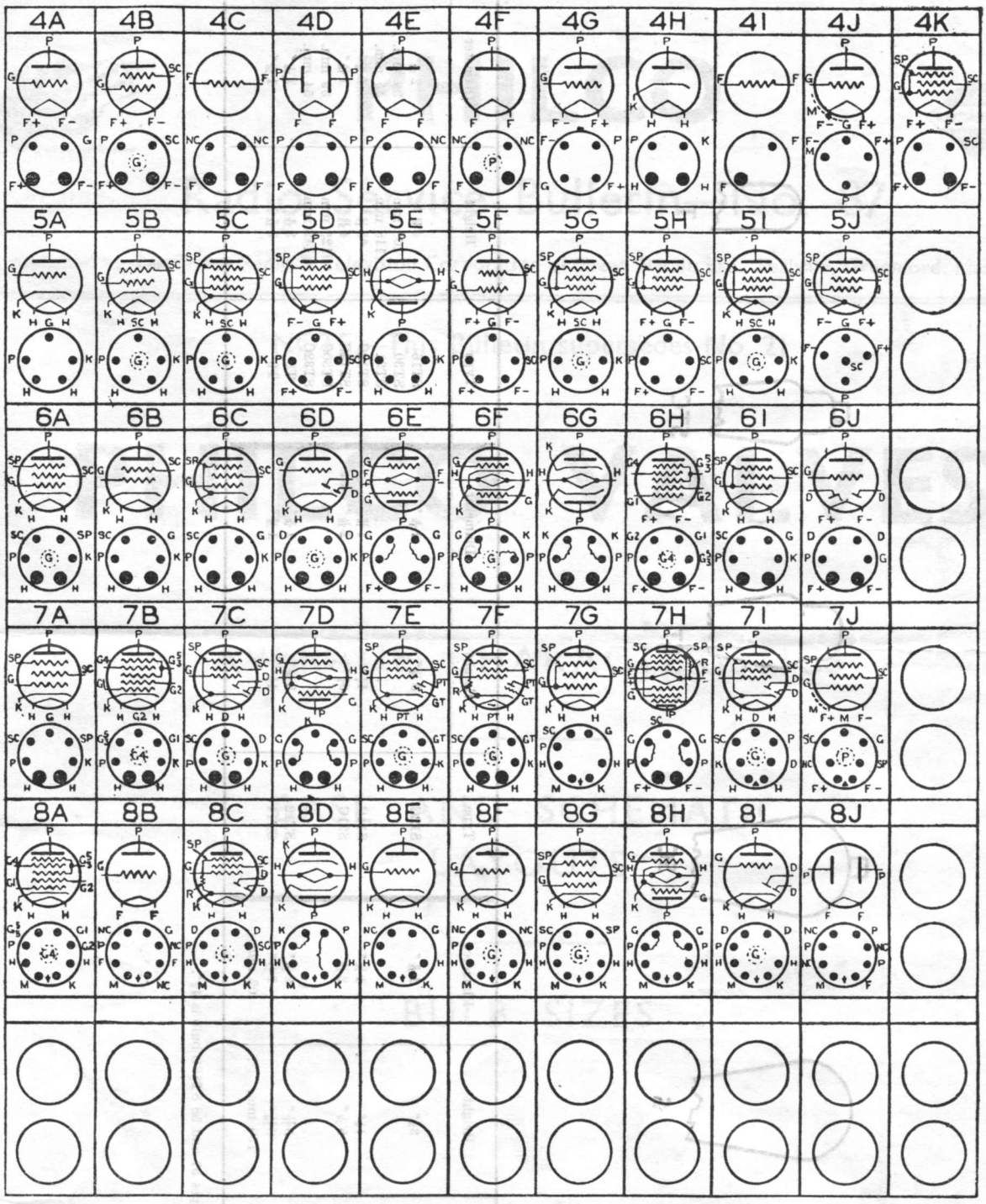
RECTIFIER SERIES

Type	Description	Base	Bulb	Type Cathode	Filament Rating			Maximum Plate Volts Per Plate	Plate Current Milliamps.	Approx. Effective Volt drop§§	Remarks
					Volts	Amps.	Supply				
5Z3	Full Wave	4D	ST16	Filament	5.0	3.0	AC	500	250	—43	
12Z3	Half Wave	4H	ST12	Heater	12.6	0.3	AC or DC	250‡	60	11	
25Z5	Full Wave and Voltage Doubler	6G	ST12	Heater	25.0	0.3	AC or DC	125	100	14°	
25RE	Full Wave and Voltage Doubler	6G	ST12	Heater	25.0	0.3	AC or DC	275‡	100		
35RE	Full Wave and Voltage Doubler	6G	ST14	Heater	35.0	0.3	AC or DC	250‡	125		
80	Full Wave	4D	ST14	Filament	5.0	2.0	AC	350	125	24	
								400	110	0	
								550	135	125	With 20H. (min.) choke input only
81	Half Wave	4E	S19	Filament	7.5	1.25	AC	700	85	17	
82	Full Wave	4D	ST14	Filament	2.5	3.0	AC	500	(400x)125	15	
83	Full Wave	4D	ST16	Filament	5.0	3.0	AC	500	(800x)250	15	
84 or 6Z4	Full Wave	5E	ST12	Heater	6.3	0.5	AC or DC	350*	(75†) 50	—80	
866	Half Wave	4F	S19C	Filament	2.5	5.0	AC	7,500	600	15	
5X4G	Full Wave	8J	ST16	Filament	5.0	3.0	AC	500	250		
5Y4G	Full Wave	8J	ST14	Filament	5.0	2.0	AC	350	125		

*Cathode-heater insulation 500 v. D.C. max. Inverse peak plate volts 1,000 max. †Plates paralleled for half wave rectification. ‡Cathode-heater insulation 350 v. D.C. max.
° As half wave rectifier with 16 mfd. filter capacity. Equivalent resistance of 25Z5 to D.C.=100 ohms. §§At indicated anode Volts and current.
xIntermittent peak current.

MISCELLANEOUS BALLAST TUBES

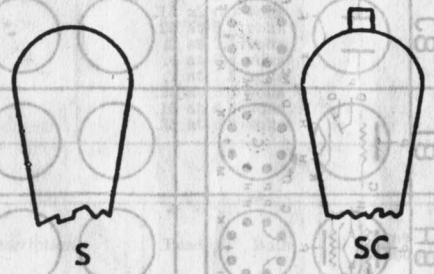
Type	Base	Bulb	For use in Philco Models	Voltage Drop Across Lamp	Filament Current (Amperes)
2	4C	S17	46	9.0	0.3
3	4C	S17	46E	128.0	0.3
4	4C	S17	47E single speaker	117.0	0.4
5	4C	S17	47E double speaker	117.0	0.46
6	4C	S12	36, 37 and 38	0.6/1.4	0.7
7	4C	S17	248E,	176.0	0.3
8	4C	S17	247E	132.0	0.3
9	4C	S17	48	50.0	0.3
1A1	4C	S12	238A	0.6/1.4	0.5
1C1	4C	S17	34A	0.6/1.4	0.8
36-3134	4I	Wire, Metal Case	263E, 1263	176.0	0.3
301	Edison Screw Cap	S33	280, 1280, 290, U407, 580, 583, 1583, X-521	Range 138-221 volts	0.3
302	Edison Screw Cap	S33	U427, U527, U53, U537, V537, W537	Range 112-195 volts	0.3
304	Edison Screw Cap	S33	U647, U1647, U638	Range 95-165 volts	0.3



BOTTOM VIEWS OF BASES AND SCHEMATICS OF VALVES.

Symbols——F = Filament. H = Heater. P = Plate. K = Cathode. G = Grid. GI = Inner Grid. G2 = Second Grid. $G\frac{3}{5}$ = Third and Fifth Grids. G4 = Fourth Grid. SC = Screen Grid. D = Diode Plate. NC = No Connection. SP = Suppressor Grid. M = Metallising (when used). R = 25,000 ohms. GT = Triode Grid. PT = Triode Plate.

} = Adjoining Electrodes.



Type	Height	Diameter	Type	Height	Diameter	Type	Height	Diameter
S12	3⅜″	1 $\frac{5}{16}$″	S12C	3 $\frac{15}{16}$″	1 $\frac{5}{16}$″	ST16	4 $\frac{13}{16}$″	2 $\frac{1}{16}$″
						ST30	108 mm.	39 mm.
						ST31	118 mm.	45 mm.
S14	4½″	1 $\frac{13}{16}$″	S14C	4½″	1 $\frac{13}{16}$″	ST12C	*3 $\frac{15}{16}$″	1 $\frac{5}{16}$″
S17	5 $\frac{1}{16}$″	2 $\frac{13}{16}$″	S21C	6⅛″	2 $\frac{11}{16}$″	ST14C	4 $\frac{13}{16}$″	1 $\frac{13}{16}$″
						ST30C	125 mm.	39 mm.
						ST32C	142 mm.	54 mm.
S19	5 $\frac{11}{16}$″	2 $\frac{7}{16}$″	ST12	3 $\frac{11}{16}$″	1 $\frac{5}{16}$″	T8	3 $\frac{1}{16}$″	1 $\frac{1}{16}$″
S21	5 $\frac{11}{16}$″	2 $\frac{11}{16}$″	ST14	4⅛″	1 $\frac{13}{16}$″	T9	3 $\frac{7}{16}$″	1 $\frac{1}{16}$″
S33	130 mm.	62 mm.						

*Height of types 57 and 58 ST12C bulb is 4⅜″.