

RESISTANCE COUPLED AMPLIFIER DATA

Self Bias Operation

	Ebb = 100 VOLTS							Ebb = 250 VOLTS						
	0.1		0.27			0.47		0.1		0.27			0.47	
Rb														
Rc ₁	0.39		1.0			1.8		0.39		1.0			1.8	
Rc ₂														
Rk	1200	1200	2700	2700	2700	4700	4700	470	470	1000	1000	1200	1800	1800
I _b	0.61	0.61	0.271	0.271	0.271	0.163	0.163	1.75	1.75	0.75	0.75	0.74	0.44	0.44
I _{c₁}	0.173	0.173	0.076	0.076	0.076	0.044	0.044	0.49	0.49	0.212	0.212	0.207	0.121	0.121
E _{c₁}	-0.94	-0.94	-0.938	-0.938	-0.938	-0.974	-0.974	-1.05	-1.05	-0.962	-0.962	-1.14	-1.01	-1.01
E _{c₂}	32.5	32.5	23.5	23.5	23.5	20.5	20.5	59	59	38	38	43	32.1	32.1
E _b	39	39	26.9	26.9	26.9	23.4	23.4	75	75	47.5	47.5	50	43	43
E _{sig}	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
E _{out}	7.8	8.9	8.0	10.2	12.2	9.6	12.5	13.6	15.5	15.4	19.8	22.0	19.5	25.5
Gain	78	89	80	102	122	96	125	136	155	154	198	220	195	255
% Distortion	4.6	4.3	5.0	3.8	3.0	5.2	3.9	2.2	2.1	2.8	2.1	2.0	3.0	3.1
E _{sig} (1)	0.11	0.11	0.1	0.1	0.1	0.1	0.1	0.22	0.22	0.15	0.15	0.2	0.14	0.14
E _{out}	8.55	9.8	8.0	10.2	12.2	9.6	12.5	29	33	22.5	28.0	41.5	26.4	34.5
Gain	77.8	89	80	102	122	96	129	132	150	150	187	207.5	189	246.5
% Distortion	5.1	4.6	5.0	3.8	3.0	5.2	3.9	4.8	4.3	4.5	3.8	5.0	4.7	4.4

Note (1). For self bias operation this is taken at the grid current point with less than 1/4 microampere grid current.

FOR CIRCUIT SEE FIGURE 1

(For 7N7 Data See Type 7A4)

**Sylvania Type 7R7
1AR7**

OBSOLETE AND SELDOM ENCOUNTERED TYPES

Type	Construction		Class	Use	Emitter			Plate Volts	Screen Volts	Neg. Grid Volts	Plate Current Ma.	Screen Current Ma.	Plate $\text{\textcircled{1}}$ Resistance Ohms	Amp. $\text{\textcircled{2}}$ Factor	Power Output Mw.	Suggested Replacement Type	
	Style	Base Diag.			Type	Volts	Amp.										
01A	ST-14	4D	Triode	Det. Amp.	Fil.	5.0	0.25	90 135	.....	4.5 9.0	2.5 3.0	.....	11,000 10,000	8.0 8.0	.....	
0A2	Min.	5B0	Diode	Voltage Reg.	Cold K	Starting Voltage=155, Operating Voltage=150, Operating Current=5 to 30 Ma.									
0B2	Min.	5B0	Diode	Voltage Reg.	Cold K	Starting Voltage=115, Operating Voltage=105, Operating Current=5 to 30 Ma.									
0Y4	Metal	4BU	Gas Diode	H-W Rect.	Cold K	117 A.C. Volts Per Plate, RMS, 75 Ma. Max., 40 Ma. Min. Output Current									
0Z3	5N	Gas Rect.	F.W. Rect.	Cold K	350 V. RMS Per Plate, 75 Ma. Max. DC Output.									0Z4
0Z4A	T-7	4R	Gas Duodiode	F.W. Rect.	Ionie	300 A.C. Volts Per Plate, RMS, 110 Ma. Max., 30 Ma. Min. Output Current									
1, KR1	ST-12	4G	Diode	H.W. Rect.	Cath.	6.3	0.30	350 V. RMS Plate, 50 Ma. DC Output.									1V
1A3	Min.	5AP	Diode	Det.	Cath.	1.4	0.15	Single Diode, Cathode Type for H.F. Use.									
1A4	ST-12	4K	Tetrode	R.F. Amp.	Fil.	2.0	0.06	90 180	67.5 67.5	3.0 3.0	2.2 2.3	0.9 0.8	600,000 1.0 Meg.	720 750	.....	1A4P, 1A4T
1A4P	ST-12	4M	Pentode	R.F. Amp.	Fil.	2.0	0.06	135 180	67.5 67.5	3.0 3.0	2.2 2.3	0.9 0.8	1 Meg. 1 Meg.	625 725	.....	
1A4T	ST-12	4K	Tetrode	R.F. Amp.	Fil.	2.0	0.06	135 180	67.5 67.5	3.0 3.0	2.2 2.2	0.7 0.7	350,000 600,000	625 650	.....	
1A6	ST-12	6L	Heptode	Converter	Fil.	2.0	0.06	135 180	67.5 67.5	3.0 3.0	1.8 1.5	2.1 2.0	400,000 500,000	275 \heartsuit 300 \heartsuit	$G_2=135$ V. at 2.0 Ma. \blacksquare $G_2=180$ V. at 2.5 Ma. \blacksquare		
1AB5	Lock-In	5BF	Pentode	R.F. Amp.	Fil.	1.2	0.13	90 150	90 150	0 1.5	3.5 6.8	0.8 2.0	275,000 120,000	1,100 1,350	.....	
1B4	ST-12	4K	Tetrode	R.F. Amp.	Fil.	2.0	0.06	90 180	67.5 67.5	3.0 3.0	1.6 1.7	0.7 0.6	1.0 Meg. \heartsuit 1.5 Meg. \heartsuit	600 650	.....	1B4P 1B4T
1B4/951	ST-12	4K	Tetrode	R.F. Amp.	Fil.	2.0	0.06	Same as Type 1B4.									1B4 P or T
1B4P	ST-12	4M	Pentode	R.F. Amp.	Fil.	2.0	0.06	135 180	67.5 67.5	3.0 3.0	1.6 1.7	0.7 0.6	1.5 Meg. 1.5 Meg.	560 650	.....	

$\text{\textcircled{1}}$ Load Resistance for Power Output Tubes.

$\text{\textcircled{2}}$ Mutual Conductance for Tetrodes, Pentodes, Etc.

\heartsuit Conversion Conductance.

\heartsuit Approximate.

\blacksquare Plate to Plate.

\blacksquare Through 20,000 Ohms.

\heartsuit Per Tube or Section—No Signal.

\blacksquare Plate and Target Supply.

OBSOLETE AND SELDOM ENCOUNTERED TYPES—Cont.

Type	Construction		Class	Use	Emitter			Plate Volts	Screen Volts	Neg. Grid Volts	Plate Current Ma.	Screen Current Ma.	Plate $\text{\textcircled{1}}$ Resistance Ohms	Amp. $\text{\textcircled{2}}$ Factor	Power Output Mw.	Suggested Replacement Type	
	Style	Base Diag.			Type	Volts	Amp.										
1B5/25S	ST-12	6M	Duodi Tri.	Det. Amp.	Fil.	2.0	0.06	135	....	3.0	0.8	....	35,000	20	....	
1B7GT	GT	7Z	Heptode	Conv.	Fil.	1.4	0.10	90	45	0	1.5	1.3	350,000	350 ∇	$G_2=90$ V. at 1.6 Ma.	1A7GT	
1C6	ST-12	6L	Heptode	Converter	Fil.	2.0	0.12	135	67.5	3.0	1.3	2.5	600,000	300 ∇	$G_2=135$ V. at 3.1 Ma. \blacksquare $G_2=180$ V. at 4.0 Ma. \blacksquare		
						2.0	0.12	180	67.5	3.0	1.5	2.0	700,000	325 ∇			
1C7G	ST-12	7Z	Heptode	Converter	Fil.	2.0	0.12	Same as 1C6.									
1D5G	ST-12	5R	Tetrode	R.F. Amp.	Fil.	2.0	0.06	180	67.5	3.0	2.3	0.7	600,000	750	....	1D5GP, 1D5GT
1D5GP	ST-12	5Y	Pentode	R.F. Amp.	Fil.	2.0	0.06	135	67.5	3.0	2.2	0.9	1 Meg.	625	....	
						2.0	0.06	180	67.5	3.0	2.3	0.8	1 Meg.	725			
1D5GT	ST-12	5R	Tetrode	R.F. Amp.	Fil.	2.0	0.06	135	67.5	3.0	2.2	0.7	350,000	625	....	
1D7G	ST-12	7Z	Heptode	Converter	Fil.	2.0	0.06	135	67.5	3.0	1.8	2.1	400,000	275 ∇	$G_2=135$ V. at 2.0 Ma. \blacksquare $G_2=180$ V. at 2.5 Ma. \blacksquare		
						2.0	0.06	180	67.5	3.0	1.5	2.0	500,000	300 ∇			
1D8	T-9	8AJ	Diode Triode	Det. Amp.	Fil.	1.4	0.1	45	....	0	....	....	77,000	25	....	
						90	....	0	....	....	43,500	25				
			Pentode	Pwr. Amp.	45	45	4.5	1.6	0.3	20,000	650	35	
					90	90	9.0	5.0	1.0	12,000	925	200					
1E4	T-9	5S	Triode	Det. Amp.	Fil.	1.4	0.05	Same Characteristics as Type 1LE3.									
1E5G	ST-12	5R	Tetrode	R.F. Amp.	Fil.	2.0	0.06	180	67.5	3.0	1.7	0.6	....	650	....	1E5GP, 1E5GT
1E5GP	ST-12	5Y	Pentode	R.F. Amp.	Fil.	2.0	0.06	135	67.5	3.0	1.6	0.7	1.5 Meg.	560	....	
						2.0	0.06	180	67.5	3.0	1.7	0.6	1.5 Meg.	650			
1E5GT	ST-12	5R	Tetrode	R.F. Amp.	Fil.	2.0	0.06	Same as Type 1E5G.									1E5GP
1E7GT	ST-12	8C	Pentode	Pwr. Amp.	Fil.	2.0	0.24	90	90	3.0	3.8	1.1	340,000	1,150	....	
						2.0	0.24	135	135	4.5	7.5	2.2	280,000	1,425			
						2.0	0.24	135	135	7.5	10.5 \blacklozenge	3.5 \blacklozenge	24,000\blacklozenge	....		

$\text{\textcircled{1}}$ Load Resistance for Power Output Tubes.

$\text{\textcircled{2}}$ Mutual Conductance for Tetrodes, Pentodes, Etc.

∇ Conversion Conductance.

\blacklozenge Approximate.

\blacklozenge Plate to Plate.

\blacksquare Through 20,000 Ohms.

\blacklozenge Per Tube or Section—No Signal.

\blacklozenge Plate and Target Supply.

OBSOLETE AND SELDOM ENCOUNTERED TYPES—Cont.

Type	Construction		Class	Use	Emitter			Plate Volts	Screen Volts	Neg. Grid Volts	Plate Current Ma.	Screen Current Ma.	Plate \odot Resistance Ohms	Amp. \odot Factor	Power Output Mw.	Suggested Replacement Type	
	Style	Base Diag.			Type	Volts	Amp.										
1F4	ST-14	5K	Pentode	Pwr. Amp.	Fil.	2.0 2.0	0.12 0.12	90 135	90 135	3.0 4.5	4.0 8.0	1.1 2.4	20,000 16,000	1,400 1,700	110 310		
1F5G	ST-14	6X	Pentode	Pwr. Amp.	Fil.	2.0	0.12	Same as 1F4.									
1F6	ST-12	6W	Duodi Pent.	R.F. Amp.	Fil.	2.0	0.06	180	67.5	1.5	2.2	0.7	1 Meg.*	650	....	
1F7G	ST-12	7AD	Duodi Pent.	R.F. Amp.	Fil.	2.0	0.06	Same as 1F6.									
1F7GV	ST-12	7AF	Duodi Pent.	R.F. Amp.	Fil.	2.0	0.06	Same as 1F7G except diodes placed one above the other.									
1G5G	ST-14	6X	Pentode	Pwr. Amp.	Fil.	2.0 2.0 2.0	0.12 0.12 0.12	90 124 135	90 124 135	6.0 11.0 13.5	8.7 10.7 9.7	3.0 4.3 3.6	8,500 8,000 9,000	1,500 1,500 1,550	250 600 550		
1H4G	ST-12	5S	Triode	Amp.	Fil.	2.0 2.0 2.0	0.06 0.06 0.06	90 135 180	.... .... ....	4.5 9.0 13.5	2.5 3.0 3.1	.... .... ....	11,000 10,300 10,300	9.3 9.3 9.3	.... .... ....	
1H6G	ST-12	7AA	Duodi Tri.	Amp.	Fil.	2.0	0.06	135	....	3.0	0.8	....	35,000	20	....	
1J5G	ST-14	6X	Pentode	Pwr. Amp.	Fil.	2.0	0.12	135	135	16.5	7.0	1.8	13,500	1,000	450		
1J6G	ST-12	7AB	Duo Tri.	Pwr. Amp.	Fil.	2.0 2.0 2.0	0.24 0.24 0.24	135 135 135	.... .... ....	0 3.0 6.0	24 26 30	.... .... ....	10,000 10,000 10,000	.... .... ....	2,200* 2,000* 1,600*	
1N6G	T-9	7AM	Diode Pent.	Pwr. Amp.	Fil.	1.4	0.05	90	90	4.5	3.1	0.6	25,000	800	100		
1Q6	T-3	8CO	Diode Pent.	Det. Amp.	Fil.	1.25 1.25	0.04 0.04	30 67.5	30 67.5	0 0	0.33 1.60	0.09 0.40	500,000 400,000	330 600	.... ....	
1R4	Lock-In	4AH	H.F. Diode	Detector	Cath.	1.4	0.15	117 V. RMS			1.0	Resonant Frequency 1,500 Mc.					
1SA6GT	GT	6BD	Pentode	R.F. Amp.	Fil.	1.4	0.05	45 67.5 90	45 67.5 67.5	0 0 0	1.1 2.4 2.45	0.3 0.7 0.68	700,000 600,000 800,000	750 950 970	.... .... ....	1N5GT
1SB6GT	GT	6BE	Di. Pent.	Det. Amp.	Fil.	1.4	0.05	45 90	45 67.5	0 0	0.6 1.45	0.16 0.38	900,000 700,000	500 665	.... ....	1LD5
1V	ST-12	4G	Diode	H.W. Rect.	Cath.	6.3	0.30	350 V. RMS Plate, 45 Ma. DC Output.									76

\odot Load Resistance for Power Output Tubes.

\ominus Mutual Conductance for Tetrodes, Pentodes, Etc.

∇ Conversion Conductance.

\blacklozenge Approximate.

\blacktriangle Plate to Plate.

\blacksquare Through 20,000 Ohms.

$\#$ Per Tube or Section—No Signal.

\S Plate and Target Supply.

OBSOLETE AND SELDOM ENCOUNTERED TYPES—Cont.

Type	Construction		Class	Use	Emitter			Plate Volts	Screen Volts	Neg. Grid Volts	Plate Current Ma.	Screen Current Ma.	Plate \odot Resistance Ohms	Amp. \odot Factor	Power Output Mw.	Suggested Replacement Type
	Style	Base Diag.			Type	Volts	Amp.									
2A3	ST-16	4D	Triode	Pwr. Amp.	Fil.	2.5	2.5	250 300	....	45.0 62.0	60 40 per tube	....	2,500 3,000 $\frac{1}{2}$	4.2	3,500 15,000	2A3H
2A3H	ST-16	4D	Triode	Pwr. Amp.	Cath.	2.5	2.5	Same as Type 2A3.								2A3
2A4G	ST-12	5S	Gas Triode	Relay Tube	Fil.	2.5	2.5	Instantaneous Forward or Inverse Anode Volts=200, Peak Anode Amps.=1.25, Average Anode Current=0.1 Amp. Max., Avg. Time=45 sec. Cold Starting Time=2 sec.								
2A5	ST-14	6B	Pentode	Pwr. Amp.	Cath.	2.5	1.75	250 285	250 285	16.5 20.0	34 38	6.5 7.0	7,000 7,000	.... ....	3,200 4,800	
2A6	ST-12	6G	Duodi Tri.	Det. Amp.	Cath.	2.5	0.80	250	....	2.0	0.9	....	91,000	100	....
2A7, 2A7S	ST-12	7C	Heptode	Converter	Cath.	2.5	0.80	Same Characteristics as Types 6A7 or 6A8G.								
2B7, 2B7S	ST-12	7D	Diode Pent.	Det. Amp.	Cath.	2.5	0.80	100 250	100 100	3.0 3.0	5.8 6.0	1.7 1.5	300,000 800,000	950 1,000	.... ....
2C4	T-5 $\frac{1}{2}$	5AS	Gas Triode	Control Tube	Fil.	2.5	0.65	350	....	50	5	Voltage Drop = 16 Volts				
2D21	T-5 $\frac{1}{2}$	7BN	Gas Tetrode	Relay Tube	Cath.	6.3	0.6	400	....	5	Average Cathode Current = 100 Ma. Max., Averaged over any 30 sec. interval					
2E5	T-9	6R	Elect. Ray	Indicator	Cath.	2.5	0.80	Same Characteristics as Type 6E5.								
2S/4S	ST-12	5D	Duo Diode	Det.	Cath.	2.5	1.35	Approximate 40 Ma. Per Plate, 50 Ma. DC Output.								
2V3G	ST-12	4Y	Diode	H.W. Rect.	Fil.	2.5	5.0	6000 V. RMS Plate, 2 Ma. DC Output.								2X2A
2W3GT	GT	4X	Diode	H.W. Rect.	Fil.	2.5	1.50	350 V. RMS Plate, 55 Ma. DC Output, Cond. Filter Input.								
2Z2/G84	ST-12	4B	Diode	H.W. Rect.	Fil.	2.5	1.50	350 V. RMS Plate, 50 Ma. DC Output.								
G2/2S	.....	5D	Duo Diode	Det.	Cath.	2.5	1.75	....	....	....	....	....	....	....	....	2S/4S
3A5	Min.	7BC	Duo. Tri.	Amp.	Fil.	1.4 2.8	0.22 0.11	90 135	....	2.5 20.0	3.7 30.0	....	8,300 Push-Pull Class C R.F. Amp.	15 2,000	....
3B5GT	GT	7AQ	Beam Amp.	Amp.	Fil.	1.4 2.8	0.10 0.05	45 67.5	45 67.5	4.5 7.0	4.4 6.7	0.3 0.5	8,000 5,000	1,400 1,500	70 180	
3B7	Look-In	7BE	Duotriode	Osc. Amp.	Fil.	2.8	0.11	135	Class AB ₂ Class C	0	22.0	....	16,000 $\frac{1}{2}$	20	1,500	
4A6G	ST-12	8L	Duo Tri.	Pwr. Amp.	Fil.	2.0 4.0	0.12 0.06	.... 90	....	....	....	....	Class P to P Load B Amp. 8,000	20	1,000	

\odot Load Resistance for Power Output Tubes.

\circledast Mutual Conductance for Tetrodes, Pentodes, Etc.

∇ Conversion Conductance.

\blacklozenge Approximate.

\blacktriangle Plate to Plate

\blacksquare Through 20,000 Ohms.

\ast Per Tube or Section—No Signal.

\S Plate and Target Supply.

OBSOLETE AND SELDOM ENCOUNTERED TYPES—Cont.

Type	Construction		Class	Use	Emitter			Plate Volts	Screen Volts	Neg. Grid Volts	Plate Current Ma.	Screen Current Ma.	Plate ① Resistance Ohms	Amp. ② Factor	Power Output Mw.	Suggested Replacement Type
	Style	Base Diag.			Type	Volts	Amp.									
G4/4S	.....	5D	Duo. Di.	Det.	Cath.	2.5	1.0	.....	.....	.....	.....	.....	.....	.....	.....	2S/4S
5T4	Metal	5T	Duo Di.	F.W. Rect.	Fil.	5.0	2.0	450 V. RMS Per Plate, 225 Ma. DC Output, Cond. Input Filter. 550 V. RMS Per Plate, 225 Ma. DC Output, Choke Input Filter.								5U4G
5X3	ST-14	4C	Duodiode	Rect.	Fil.	5.0	2.0	400 AC V. Per Plate, RMS, 110 Ma. Output Current. Choke or Cond. Input to Filter. 1275 AC V. Per Plate, RMS, 30 Ma. Output Current. Choke or Cond. Input to Filter.								6A4/LA
KR5	ST-16	5B	Pentode	Pwr. Amp.	Fil.	6.3	0.30	135	135	9.0	14	2.5	9,500	1,900	700	6A4/LA
6A3	ST-16	4D	Triode	Pwr. Amp.	Fil.	6.3	1.00	250	.....	45.0	60.0	.....	2,500	4.2	3,200	
						6.3	1.00	325	.....	68.0	40.0*	Fixed Bias 850 Ohms	3,000	.....	15,000	
6A4/LA	ST-14	5B	Pentode	Pwr. Amp.	Fil.	6.3	0.30	100	100	6.5	9.0	1.6	11,000	1,200	310	
6A6	ST-14	7B	Duo. Tri.	Pwr. Amp.	Cath.	6.3	0.8	300	.....	0	35.0	Per Plate	8,000	Max. Signal	10,000	6N7G
				Driver Driver	.....	6.3	0.8	250	.....	5.0	6.0	.....	11,300	35	.....
6A7S	ST-12	7C	Heptode	Converter	Cath.	6.3	0.30	Same as Type 6A7.								6A7
6AB5/6N5	T-9	6R	Electron Ray	Indicator	Cath.	6.3	0.15	135\$ Series Plate Resistor 0.25 Meg., Target Current 2.0 Ma., Grid Bias=10 for 0° Shadow.								
6AB6G	ST-12	7AU	Duo Tri.	Pwr. Amp.	Cath.	6.3	0.50	250	Inp. Tri.	0	5.0	.....	.....	.....	.....	6N6G
								250	Outp. Tri.	.....	34.0	.....	8,000	.....	3,500	
6AB7/1853	Metal	8N	Pentode	Amp.	Cath.	6.3	0.45	300	200	3.0	12.5	3.2	700,000	5,000	.....

① Load Resistance for Power Output Tubes.

② Mutual Conductance for Tetrodes, Pentodes, Etc.

▼ Conversion Conductance.

◆ Approximate.

‡ Plate to Plate.

■ Through 20,000 Ohms.

* Per Tube or Section—No Signal.

\$ Plate and Target Supply.

OBSOLETE AND SELDOM ENCOUNTERED TYPES—Cont.

Type	Construction		Class	Use	Emitter			Plate Volts	Screen Volts	Neg. Grid Volts	Plate Cur- rent Ma.	Screen Cur- rent Ma.	Plate $\text{\textcircled{1}}$ Resistance Ohms	Amp. $\text{\textcircled{2}}$ Factor	Power Output Mw.	Suggested Replacement Type	
	Style	Base Diag.			Type	Volts	Amp.										
6AD5GT	GT	6Q	Triode	Amp.	Cath.	6.3	0.30	250	....	2.0	0.9	....	66,000	100	....	
6AD6G	T-9	7AG	Electron Ray	Indicator	Cath.	6.3	0.15	100	Ray Control	....	....	....	....	....	....	....
6AD7G	ST-14	8AY	Tri. Pent.	Tri. Amp. Pent. Amp.	Cath.	6.3	0.85	250	....	25	3.7	....	19,000*	6	....	....
6AE5GT	GT	6Q	Triode	Amp.	....	6.3	0.85	250	250	16.5	34.0	6.5	7,000	2,500	3,200	....
6AE6G	ST-12	7AH	Duo Plate Tri.	Remote Cut-Off Sharp Cut-Off	Cath.	6.3	0.15	250	....	15.0	7.0	....	3,500	4.2	....	....
6AE7GT	GT	7AX	Duo. Tri.	Amp.	Cath.	6.3	0.50	250	....	13.5	5.0	....	9,300	14	....	Per Section
6AF5G	ST-12	6Q	Triode	Amp.	Cath.	6.3	0.30	180	....	18.0	7.0	....	4,900	7.4	....	....
6AF6G	T-9	7AG	Twin Elec. Ray	Indicator	Cath.	6.3	0.15	100	Ray Control	....	....	....	....	....	....	....
6AH5G	ST-16	6AP	Beam Amp.	Amp.	Cath.	6.3	0.90	350	250	18.0	54.0	2.5	4,200	5,200	10,800	6L6G	
6AH7GT	GT	8BE	Duotriode	Amp. (per unit)	Cath.	6.3	0.30	100	....	3.6	3.7	....	10,300	16	....	....
6AL6G	ST-16	6AM	Beam Amp.	Pwr. Amp.	Cath.	6.3	0.90	180	....	6.5	7.6	....	8,400	16	....	....
6AN6	Min.	7BJ	Quadruple Di.	Rectifier	Cath.	6.3	0.20	75 Volts RMS Per Plate, 8 Ma. D-C Output Per Plate.							
6AQ7GT	GT	8CK	Duodiode Tri.	Det. Amp.	Cath.	6.3	0.30	250	....	2.0	2.3	....	44,000	70	....	....
6B5	ST-14	6AS	Duo Tri.	Pwr. Amp.	Cath.	6.3	0.80	300	Inp. Tri. Outp. Tri.	0	8.0	....	....	....	....	....
								300		45.0	....	....	7,000	....	4,000	....

$\text{\textcircled{1}}$ Load Resistance for Power Output Tubes.
 $\text{\textcircled{2}}$ Mutual Conductance for Tetrodes, Pentodes, Etc.
 ∇ Conversion Conductance.

\blacklozenge Approximate.
 \blacktriangle Plate to Plate.
 \blacksquare Through 20,000 Ohms.

* Per Tube or Section—No Signal.
 $\text{\textcircled{3}}$ Plate and Target Supply.

OBSOLETE AND SELDOM ENCOUNTERED TYPES—Cont.

Type	Construction		Class	Use	Emitter			Plate Volts	Screen Volts	Neg. Grid Volts	Plate Cur- rent Ma.	Screen Cur- rent Ma.	Plate ① Resistance Ohms	Amp. ② Factor	Power Output Mw.	Suggested Replacement Type
	Style	Base Diag.			Type	Volts	Amp.									
6B6G	ST-12	7V	Duodi Tri.	Det. Amp.	Cath.	6.3	0.30	250	....	20	0.9	....	91,000	100	....	6Q7GT
6B7, 6B7S	ST-12	7D	Duodi Pent.	R.F. or I.F. Amp.	Cath.	6.3	0.30	100	100	3.0	5.8	1.7	300,000	950	....
						6.3	0.30	250	125	3.0	9.0	2.3	600,000	1,125	....
6B8GT	GT	8E	Duodi Pent.	Det. Amp.	Cath.	6.3	0.30	Characteristics Same as Type 6B7.								
6C6	ST-12	6F	Pentode	Amp.	Cath.	6.3	0.30	100	100	3.0	2.0	0.50	1 Meg.	1,185	....	77
						6.3	0.30	250	100	3.0	2.0	0.50	> 1 Meg.	1,225	....
						6.3	0.30	180	....	5.3	5.3	....	11,000	20	....
						6.3	0.30	250	....	8.0	6.5	....	10,000	20	....
6C7	ST-12	7G	Duodi Tri.	Det. Amp.	Cath.	6.3	0.30	250	....	9.0	4.5	....	16,000	20	....	6SR7GT
6C8G	ST-12	8G	Duo Tri.	Amp. Inv.	Cath.	6.3	0.30	250	....	4.5	3.2	....	22,500	36	....
6D5G	....	6Q	Triode	Pwr. Amp.	Cath.	6.3	0.70	275	....	40	31	....	7,200	4.7	1,400	
6D6	ST-12	6F	Pentode	Amp.	Cath.	6.3	0.30	100	100	3.0	8.0	2.2	250,000*	1,500	....	78
						6.3	0.30	250	100	3.0	8.2	2.0	800,000*	1,600	....
6D7	ST-12	7H	Pentode	Amp.	Cath.	6.3	0.30	Same as 6C6.								6C6
6D8G	ST-12	8A	Heptode	Converter	Cath.	6.3	0.15	135	67.5	3.0	1.5	1.7	600,000	325*	G ₂ =135 V. at 1.8 Ma. G ₃ =250 V. at 4.5 Ma.†	7A8
						6.3	0.15	250	100	3.0	3.5	2.6	400,000	550*		
6E6	ST-14	7B	Duotriode	Pwr. Amp.	Cath.	6.3	0.60	180	....	20.0	11.5	....	15,000‡	6.0	750	
								250	....	27.5	18.0	....	14,000‡	6.0	1,600	
6E7	ST-12	7H	Pentode	Amp.	Cath.	6.3	0.30	Same as 6D6.								6D6
6F7, 6F7S	ST-12	7E	Tri. Pent.	Amp.	Cath.	6.3	0.30	100	(Tri.)	3.0	3.5	....	16,200	8.5	(Pent.)	
						250	100	3.0	6.5	1.5	850,000	1,100				
6F8G	ST-12	8G	Duo Tri.	Amp. Inv.	Cath.	6.3	0.60	250	....	8.0	9.0	....	7,700	20	....	6SN7GT
6G5/6H5	T-9	6R	Elect. Ray	Indicator	Cath.	6.3	0.30	....	....	0-22	....	....	....	....	....	6U5/6G5
6H4GT	GT	5AF	Diode	Rect.	Cath.	6.3	0.15	100	....	....	4.0	....	....	....	....	7A6
6H5	T-9	6R	Elect. Ray	Indicator	Cath.	6.3	0.30	Same as 6G5/6H5.								6U5/6G5

① Load Resistance for Power Output Tubes.

② Mutual Conductance for Tetrodes, Pentodes, Etc.

* Conversion Conductance.

♦ Approximate.

‡ Plate to Plate.

§ Through 20,000 Ohms.

* Per Tube or Section—No Signal.

‡ Plate and Target Supply.

OBSOLETE AND SELDOM ENCOUNTERED TYPES—Cont.

Type	Construction		Class	Use	Emitter			Plate Volts	Screen Volts	Neg. Grid Volts	Plate Cur- rent Ma.	Screen Cur- rent Ma.	Plate \odot Resistance Ohms	Amp. \odot Factor	Power Output Mw.	Suggested Replacement Type
	Style	Base Diag.			Type	Volts	Amp.									
6J4	Min.	7BQ	Triode	Amp.	Cath.	6.3	0.4	150	....	Self	15.0	....	4,500	55	200 Ohm Cath. Bias Resistor	
6P7G	ST-12	7U	Pent. Tri.	Amp.	Cath.	6.3	0.30	Same as 6F7.								6F7
6Q6, 6Q6G	.....	6Y	Diode Tri.	Det. Amp.	Cath.	6.3	0.15	250	....	3.0	1.2	....	....	65	....	6T7G
6Q6G/6T7G	.....	7V	Duodi Tri.	Det. Amp.	Cath.	6.3	0.15	250	....	3.0	1.2	....	....	65	....	6T7G
6R6G	ST-12	6AW	Pentode	R.F. Amp.	Cath.	6.3	0.30	250	100	3.0	7.0	1.7	800,000*	1,450	....
6SV7	Metal	7AZ	Diode Pent.	.....	Cath.	6.3	0.30	100	100	1.0	3.7	1.4	700,000	2,600	....
						6.3	0.30	250	150	1.0	7.5	2.8	1.5 Meg.	3,600	....
6T5	ST-12	6R	Elect. Ray	Indicator	Cath.	6.3	0.30	250§	....	0-22	3.0	....	....	....	....	6U5/6G5
6T7G	ST-12	7V	Duodiode Tri.	Det. Amp.	Cath.	6.3	0.15	100	....	1.5	0.3	....	95,000	65	....
						6.3	0.15	250	....	3.0	1.2	....	62,000	65	....
6T7G/6Q6G	ST-12	7V	Duodi Tri.	Det. Amp.	Cath.	6.3	0.15	250	....	3.0	1.2	....	62,000	65	....	6T7G
6V7G	ST-12	7V	Duodi-Triode	Det. Amp.	Cath.	6.3	0.3	Same Characteristics as Type 85.								
6W5G	ST-12	6S	Duo Diode	F.W. Rect.	Cath.	6.3	0.90	325 V. RMS Per Plate, 90 Ma. DC Output, Cond. Input Filter. 450 V. RMS Per Plate, 90 Ma. DC Output, Choke Input Filter.								6X5G
6Y3G	ST-12	4AC	Diode	H.W. Rect.	Cath.	6.3	0.70	5000 A.C. Volts Per Plate RMS 7.5 Ma. Output Current.								2X2A
6Y5	ST-12	6J	Duo Diode	F.W. Rect.	Cath.	6.3	0.80	350 V. RMS Per Plate, 50 Ma. DC Output.								6X5G
6Y5V	ST-12	6J	Duo Diode	F.W. Rect.	Cath.	6.3	0.80	350 V. RMS Per Plate, 60 Ma. DC Output.								6X5G
6Y7G	ST-12	8B	Duo Triode	Class B Amp.	Cath.	6.3	0.6	Same Characteristics as Type 79.								
6Z3	.....	4G	Diode	H.W. Rect.	Cath.	6.3	0.30	350 V. RMS Plate, 50 Ma. DC Output.								1V
6Z4, 6Z4/84	ST-12	5D	Duo Diode	F.W. Rect.	Cath.	6.3	0.50	350 V. RMS Per Plate, 60 Ma. DC Output, Cond. Input Filter.								6X5G
6Z5, 6Z5/12Z5	ST-12	6K	Duo Diode	F.W. Rect.	Cath.	6.3	0.80	230 V. RMS Per Plate, 60 Ma. DC Output.								6X5G
						12.6	0.40									
6Z7G	ST-12	8B	Duo Triode	Class B Amp.	Cath.	6.3	0.3	135	....	0	60	....	....	9,000	2,500	
						6.3	0.3	180	....	0	60	....	....	12,000	4,200	
6ZY5G	ST-12	6S	Duo Diode.	F.W. Rect.	Cath.	6.3	0.30	325 V. RMS Per Plate, 40 Ma. DC Output, Cond. Input Filter.								6X5G or 14Y4
7A7LM	Metal	8V	Pentode	Amp.	Cath.	6.3	0.30	250	100	3.0	8.6	2.0	800,000*	2,000	....	7A7

\odot Load Resistance for Power Output Tubes.
 \odot Mutual Conductance for Tetrodes, Pentodes, Etc.
 ∇ Conversion Conductance.

\diamond Approximate.
 \ddagger Plate to Plate.
 \blacksquare Through 20,000 Ohms.

$\#$ Per Tube or Section—No Signal.
 \S Plate and Target Supply.

OBSOLETE AND SELDOM ENCOUNTERED TYPES—Cont.

Type	Construction		Class	Use	Emitter			Plate Volts	Screen Volts	Neg. Grid Volts	Plate Cur- rent Ma.	Screen Cur- rent Ma.	Plate $\text{\textcircled{1}}$ Resistance Ohms	Amp. $\text{\textcircled{2}}$ Factor	Power Output Mw.	Suggested Replacement Type
	Style	Base Diag.			Type	Volts	Amp.									
7AB7	Lock In	8B0	Pentode	Amp.	Cath.	6.3	0.15	250	100	2.0	4.0	1.3	500,000	1,800	.....
7B5LT	T-9	6AE	Pentode	Pwr. Amp.	Cath.	6.3	0.40	250 315	250 250	18.0 21.0	32.0 25.5	5.5 4.0	7,600 9,000	2,300 2,100	3,400 4,500	7B5
7B6LM	Metal	8W	Duodi Tri.	Det. Amp.	Cath.	6.3	0.30	100 250	..... .....	1.0 2.0	0.4 0.9	..... .....	110,000 91,000	100 100	.....	7B6
7B8LM	Metal	8X	Heptode	Converter	Cath.	6.3	0.30	100 250	50 100	1.5 3.0	1.1 3.5	1.3 2.7	600,000 360,000	360 ∇ 550 ∇	$G_2=100$ V. at 2.0 Ma. \blacksquare $G_2=250$ V. at 4.0 Ma. \blacksquare	7B8
7C4	Lock-In	4AH	H.F. Diode	Detector	Cath.	6.3	0.15	117 V. RMS			5.0	Resonant Frequency 900 Mc.				
7C5LT	T-9	6AA	Beam Amp.	Pwr. Amp.	Cath.	6.3	0.45	250 315	250 225	12.5 13.0	45.0 34.0	4.5 2.2	5,000 8,500	4,100 3,750	4,500 5,500	7C5
7T7	Lock-In	8V	Pentode	Amp.	Cath.	6.3	0.30	100 250	100 150	1.0 1.0	5.3 10.8	2.1 4.1	350,000 900,000	4,000 4,900	.....
10	ST-16	4D	Triode	Pwr. Amp.	Fil.	7.5	1.25	250 350 425	..... ..... .....	23.5 32.0 40.0	10.0 16.0 18.0	..... ..... .....	13,000 11,000 10,200	8.0 8.0 8.0	400 900 1,600	
WD11	T-8	4F	Triode	Det. Amp.	Fil.	1.1	0.25	45 Det. + Fil. 0.25 to 5.0 90 Amp. 4.5 2.5			5.0	Meg. Grid Leak. 15,500 6.6				
WX12	T-10	4D	Triode	Det. Amp.	Fil.	1.1	0.25	Same as WD11.								
12A, 112A	ST-14	4D	Triode	Det. Amp.	Fil.	5.0	0.25	90 135	..... .....	4.5 9.0	5.0 6.2	..... .....	5,400 5,100	8.5 8.5	35 130	
12A5	ST-12	7F	Pentode	Pwr. Amp.	Cath.	12.6 6.3	0.30 0.60	100 180	100 180	15.0 25.0	19.0 48.0	6.0 14.0	4,500 3,300	1,700 2,400	800 3,400	
12A6	Metal	7AC	Beam Amp.	Pwr. Amp.	Cath.	12.6	0.15	250	250	12.5	30	3.5	7,500	3,000	3,400	
12A6GT	T-9	7AC	Beam Amp.	Pwr. Amp.	Cath.	12.6	0.15	Same as 12A6.								

$\text{\textcircled{1}}$ Load Resistance for Power Output Tubes.

$\text{\textcircled{2}}$ Mutual Conductance for Tetrodes, Pentodes, Etc.

∇ Conversion Conductance.

\blacklozenge Approximate.

\blacksquare Plate to Plate.

\blacksquare Through 20,000 Ohms.

∇ Per Tube or Section—No Signal.

$\text{\textcircled{2}}$ Plate and Target Supply.

OBSOLETE AND SELDOM ENCOUNTERED TYPES—Cont.

Type	Construction		Class	Use	Emitter			Plate Volts	Screen Volts	Neg. Grid Volts	Plate Cur- rent Ma.	Screen Cur- rent Ma.	Plate $\text{\textcircled{1}}$ Resistance Ohms	Amp. $\text{\textcircled{2}}$ Factor	Power Output Mw.	Suggested Replacement Type	
	Style	Base Diag.			Type	Volts	Amp.										
12A7	ST-12	7K	Diode Pent.	Rect. Amp.	Cath.	12.6	0.30	125 V. RMS	135	135	13.5	9.0	2.5	13,500	975	550	
12AH7GT	GT	8BE	Duotriode	Amp.	Cath.	12.6	0.15	100 180	....	....	3.6 6.5	3.7 7.6	....	10,300 8,400	16 16	....
12B7	Lock In	8V	Pentode	Amp.	Cath.	12.6	0.15	Same as Lock In Type 14A7.									14A7
12B8GT	GT	8T	Triode Pentode	Tri. Amp. Pent. Amp.	Cath.	12.6	0.30	90 90	....	....	0.0 3.0	2.8 7.0	....	37,000 200,000	90 1,800	....	6AT6 6BA6
12C8	Metal	8E	Duodi Pent.	Det. Amp.	Cath.	12.6	0.15	See Type 6B8.									
12L8GT	GT	8BU	Duo Pentode	Pwr. Amp.	Cath.	12.6	0.15	110 180	110 180	5.5 9.0	6.1% 13.0%	1.3% 2.8%	14,000* 10,000*	1,680* 2,150*	300* 1,000*		
12Z3	ST-12	4G	Diode	H.W. Rect.	Cath.	12.6	0.30	235 V. RMS Per Plate, 55 Ma. DC Output, Condenser Input Filter.									
12Z5	....	7L	Duo Diode	Rect. Doub.	Cath.	12.6	0.30	225 V. RMS Per Plate, 60 Ma. DC Output, Condenser Input Filter.									
13	....	4C	Duo Diode	F.W. Rect.	Fil.	5.0	....	....									80
14Z3	....	4G	Diode	H.W. Rect.	Cath.	14.0	0.30	250 V. RMS Plate, 60 Ma. DC Output.									12Z3
15	ST-12	5F	Pentode	Amp.	Cath.	2.0	0.22	135	67.5	1.5	1.85	0.3	800,000	750	....	
16, 16B	....	4B	Diode	H.W. Rect.	Fil.	7.5	....	....									81
18	ST-14	6B	Pentode	Pwr. Amp.	Cath.	14.0	0.30	See Type 6F6G.									
19	ST-12 GT	6C	Duo Tri.	Pwr. Amp.	Fil.	2.0 2.0 2.0	0.26	135 135 135	.... .... ....	0 3.0 6.0	10.0 3.4 0.2	.... .... ....	10,000* 10,000* 10,000*	.... .... ....	2,100 1,900 1,600		
20	T-8	4D	Triode	Pwr. Amp.	Fil.	3.3	0.132	90 135	.... ....	16.5 22.5	2.8 6.0	.... ....	9,600 6,500	3.5 3.5	50 130		
22	ST-14	4K	Tetrode	Amp.	Fil.	3.3	0.132	135	67.5	1.5	3.7	1.3	250,000	500	....	
22AC	....	5E	Tetrode	Amp.	Cath.	2.5	1.75	250	90	3.0	4.0	1.7	....	1,050	....	24A	

$\text{\textcircled{1}}$ Load Resistance for Power Output Tubes.

$\text{\textcircled{2}}$ Mutual Conductance for Tetrodes, Pentodes, Etc.

▼ Conversion Conductance.

◆ Approximate.

♣ Plate to Plate.

■ Through 20,000 Ohms.

* Per Tube or Section—No Signal.

‡ Plate and Target Supply.

OBSOLETE AND SELDOM ENCOUNTERED TYPES—Cont.

Type	Construction		Class	Use	Emitter			Plate Volts	Screen Volts	Neg. Grid Volts	Plate Current Ma.	Screen Current Ma.	Plate ① Resistance Ohms	Amp. ② Factor	Power Output Mw.	Suggested Replacement Type	
	Style	Base Diag.			Type	Volts	Amp.										
24A, 24S	ST-14	5E	Tetrode	R.F. Amp.	Cath.	2.5 2.5	1.75 1.75	180 250	90 90	3.0 3.0	4.0 4.0	1.7 1.7	400,000 600,000	1,000 1,050	..... .....	
25, 25S	.....	6M	Duodi Tri.	Det. Amp.	Fil.	2.0	0.06	135	.....	3.0	1.0	.....	.....	20	.....	1B5/25S
25A7GT	GT	8F	Di. Pent.	H.W. Rect. Pwr. Amp.	Cath.	25.0 25.0	0.30 0.30	117 100	A-C Volts Per Plate, RMS, 75 Ma. Output Current.			.....	.....	.....	.....
25AC5GT	GT	6Q	Triode	Pwr. Amp. Dyn. Coup. Amp.	Cath.	25.0 25.0	0.30 0.30	110 165	.....	+15 46.0	45.0 .....	.....	15,200 2,000	58 .....	..... 2,000	
25B5	ST-12	6D	Duo Tri.	Pwr. Amp.	Cath.	25.0	0.30	See Type 25N6G.									
25B6G	ST-14	7S	Pentode	Pwr. Amp.	Cath.	25.0	0.30	105 200	105 135	16.0 23.0	48.0 62.0	2.0 1.8	1,700 2,500	4,800 5,000	2,400 7,100	25A6GT	
25B8	T-9	8T	Triode Pentode	Tri. Amp. Pent. Amp.	Cath. Cath.	25	0.15	100 100	..... 100	1.0 3.0	0.6 7.6	..... 2.0	75,000 185,000	112 370	.....	
25D8GT	.....	8AF	Di. Tri. Pent.	Det. Amp.	Cath.	25.0	0.15	100 100	..... 100	1.0 3.0	.5 8.5	..... 2.7	.....	100 1,900	(Tri.) (Pent.)	12AV6 and 12BD6
25N6G	ST-12	7W	Duo Tri.	Pwr. Amp.	Cath.	25.0	0.30	110 180	110* 100*	0 0	45 46	7.0* 5.8*	2,000 4,000	.....	2,000 3,800	
25Y5	ST-12	6E	Duo Diode	Rect. Doub.	Cath.	25.0	0.30	117 V. RMS Per Plate, 75 Ma. DC Output, Per Plate. 235 V. RMS Plate, 75 Ma. DC Output Per Plate.								25Z5	
KR25	.....	6B	Pentode	Pwr. Amp.	Cath.	2.5	1.75	250	250	16.5	3.4	6.5	7,000	2,200	3,000	2A5
26	ST-14	4D	Triode	Amp.	Fil.	1.5	1.05	90 180	..... .....	7.0 14.5	2.9 6.2	.....	8,900 7,300	8.3 8.3	.....	
26A6	T-5½	7BK	Pentode	R.F. Amp.	Cath.	26.5	0.07	26.5 250	26.5 250	..... .....	1.7 10.5	0.7 4.0	250,000 1,000,000	.....	.....
26A7	T-9	8BU	Duo Pent.	Pwr. Amp.	Cath.	26.5	0.6	26.5	26.5	4.5	20	2.0	1,500	5,500*	200		
26C6	T-5½	7BT	Duodi, Tri.	Det. Amp.	Cath.	26.5	0.07	Same Characteristics as Type 7E6.									

① Load Resistance for Power Output Tubes.

② Mutual Conductance for Tetrodes, Pentodes, Etc.

▼ Conversion Conductance.

◆ Approximate.

▲ Plate to Plate.

■ Through 10,000 Ohms.

*Screen Listings refer to Input Triode.

* Per Tube or Section—No Signal.

§ Plate and Target Supply.

OBSOLETE AND SELDOM ENCOUNTERED TYPES—Cont.

Type	Construction		Class	Use	Emitter			Plate Volts	Screen Volts	Neg. Grid Volts	Plate Cur- rent Ma.	Screen Cur- rent Ma.	Plate ① Resistance Ohms	Amp. ② Factor	Power Output Mw.	Suggested Replacement Type	
	Style	Base Diag.			Type	Volts	Amp.										
26D6	T-5½	7CH	Heptode	Converter	Cath.	26.5	0.07	26.5 100 250	26.5 100 100	0.5 1.5 1.5	0.45 1.6 2.8 3.0	1.6 8.0 7.8	500,000 1,000,000	270 455 475	.....	
27, 27S	ST-12	5A	Triode	Amp.	Cath.	2.5	1.75	90	.....	6.0	3.0	.....	10,000	9.0	.....	
						2.5	1.75	135	.....	9.0	4.7	.....	9,000	9.0	.....	
						2.5	1.75	180	.....	13.5	5.0	.....	9,000	9.0	.....	
						2.5	1.75	250	.....	21.0	5.2	.....	9,250	9.0	.....	
						2.5	1.75	250	30.0*	Adjust Bias for 0.2 Ma. Plate Current Without Signal.						
27HM	.....	5A	Triode	Amp.	Cath.	2.5	1.75	180	.....	13.5	5.0	.....	9,600	13	.....	56
28Z5	Lock-In	6BJ	Double Diode	F.W. Rect.	Cath.	28.0 28.0	0.24 0.24	325 450	A-C Volts Per Plate, RMS, 100 Ma. Output Current, Condenser Input to Filter. A-C Volts Per Plate, RMS, 100 Ma. Output Current, 6h Choke Input to Filter.								
KR2S	.....	5D	Duo Diode	F.W. Rect.	Cath.	6.3	0.50	350 V. RMS, 50 Ma. DC Output.							84, 6Z4	
30	ST-12	4D	Triode	Amp.	Fil.	2.0	0.06	90	.....	4.5	2.5	.....	11,000	9.3	.....	
						2.0	0.06	135	.....	9.0	3.0	.....	10,300	9.3	.....	
						2.0	0.06	180	.....	13.5	3.1	.....	10,300	9.3	.....	
31	ST-12	4D	Triode	Pwr. Amp.	Fil.	2.0	0.13	135	.....	22.5	8.0	.....	7,000	3.8	185	
						2.0	0.13	180	.....	30.0	12.3	.....	5,700	3.8	375	
32	ST-14	4K	Tetrode	R.F. Amp.	Fil.	2.0	0.06	135	67.5	3.0	1.7	0.4	950,000	640	.....	
						2.0	0.06	180	67.5	3.0	1.7	0.4	1.2 Meg.	650	.....	
						2.0	0.06	180	67.5	6.0*	Adjust Bias for 0.2 Ma. Plate Current Without Signal.						
32L7GT	GT	8Z	Diode Beam Amplifier	Rectifier	Cath.	32.5	0.30	125	RMS Volts Per Plate, 60 Ma. Output Current, Condenser Input to Filter.								
33	ST-14	5K	Pentode	Pwr. Amp.	Fil.	2.0	0.26	135	135	13.5	14.5	3.0	7,000	1,450	700		
						2.0	0.26	180	180	18.0	22.0	5.0	6,000	1,700	1,400		
34	ST-14	4M	Pentode	R.F. Amp.	Fil.	2.0	0.06	67.5	67.5	3.0	2.7	1.1	400,000	560	.....	
						2.0	0.06	135	67.5	3.0	2.8	1.0	600,000	600	.....	
						2.0	0.06	180	67.5	3.0	2.8	1.0	1 Meg.	620	.....	
35/51, 35S/51S	ST-14	5E	Tetrode	R.F. Amp.	Cath.	2.5	1.75	180	90	3.0	6.3	2.5	300,000	1,020	.....	
						2.5	1.75	250	90	3.0	6.5	2.5	400,000	1,050	.....	

① Load Resistance for Power Output Tubes.
 ② Mutual Conductance for Tetrodes, Pentodes, Etc.
 ▼ Conversion Conductance.

◆ Approximate.
 ▲ Plate to Plate.
 ■ Through 20,000 Ohms.

* Per Tube or Section—No Signal.
 † Plate and Target Supply.

OBSOLETE AND SELDOM ENCOUNTERED TYPES—Cont.

Type	Construction		Class	Use	Emitter			Plate Volts	Screen Volts	Neg. Grid Volts	Plate Cur- rent Ma.	Screen Cur- rent Ma.	Plate $\text{\textcircled{1}}$ Resistance Ohms	Amp. $\text{\textcircled{2}}$ Factor	Power Output Mw.	Suggested Replacement Type
	Style	Base Diag.			Type	Volts	Amp.									
35A5LT	T-9	5AA	Beam Pwr.	Amp.	Cath.	35.0	0.15	110	110	7.5	40	3.0	2,500	5,800	1,500	35A5
35Z3LT	T-9	4Z	Diode	H.W. Rect.	Cath.	35.0	0.15	235 V. RMS Plate, 100 Ma. DC Output.								35Z3
35Z6G	ST-14	7Q	Duo Diode	Doub. Rect.	Cath.	35.0	0.30	117 V. RMS Plate, 110 Ma. DC Output.								
36, 36A	ST-12	5E	Tetrode	R.F. Amp.	Cath.	6.3	0.30	100	55	1.5	1.8	Not	550,000	850	Adjust Bias for .1 Ma. Plate Current Without Signal.
						6.3	0.30	135	67.5	1.5	2.8	over $\frac{1}{2}$	475,000	1,000	.....
						6.3	0.30	180	90	3.0	3.1	Plate	500,000	1,050	.....
						6.3	0.30	250	90	3.0	3.2	Cur.	550,000	1,080	.....
						6.3	0.30	250	20 to 25	6.0*	.....	.....	.....	.....	.....
37, 37A	ST-12	5A	Triode	Amp.	Cath.	6.3	0.30	90	.....	6.0	2.5	.....	11,500	9.2	.....
						6.3	0.30	135	.....	9.0	4.1	.....	10,000	9.2	.....
						6.3	0.30	180	.....	13.5	4.3	.....	10,200	9.2	.....
						6.3	0.30	250	.....	18.0	7.5	.....	8,400	9.2	.....
38, 38A	ST-12	5F	Pentode	Pwr. Amp.	Cath.	6.3	0.30	100	100	9.0	7.0	1.2	15,000	875	270	
						6.3	0.30	135	135	13.5	9.0	1.5	13,500	925	550	
						6.3	0.30	180	180	18.0	14.0	2.4	11,600	1,050	1,000	
						6.3	0.30	250	250	25.0	22.0	3.8	10,000	1,200	2,500	
39, 39/44, 39A	ST-12	5F	Pentode	R.F. Amp.	Cath.	6.3	0.30	90	90	3.0	5.6	1.6	375,000	960	.....
						6.3	0.30	180	90	3.0	5.8	1.4	750,000	1,000	.....
						6.3	0.30	250	90	3.0	5.8	1.4	1 Meg.	1,050	.....
40	ST-14	4D	Triode	Amp.	Fil.	5.0	0.25	135	1.5	0.2	150,000	30	
40Z5/45Z5GT	GT	6AD	Diode	H.W. Rect.	Cath.	45	0.15	Characteristics same as Type 35Y4.								
41	ST-12	6B	Pentode	Pwr. Amp.	Cath.	6.3	0.40	Characteristics same as Type 6K6GT and 7B5.								
42	ST-14	6B	Pentode	Pwr. Amp.	Cath.	6.3	0.65	Characteristics same as Type 6F6G.								
43	ST-14	6B	Pentode	Pwr. Amp.	Cath.	25.0	0.30	Characteristics same as Type 25A6GT.								
44	5F	Pentode	Amp.	Cath.	6.3	0.30	See Type 39 or 39/44.								39/44
45	ST-14	4D	Triode	Pwr. Amp.	Fil.	2.5	1.5	180	.....	31.5	31.0	.....	2,700	3.5	830
						2.5	1.5	250	.....	50.0	34.0	.....	3,900	3.5	1,600
						2.5	1.5	275	.....	56.0	36.0	.....	4,600	3.5	2,000
45A	4D	Triode	Pwr. Amp.	Fil.	2.5	1.50	325	68	43	3,200	3.5	3,000	45

$\text{\textcircled{1}}$ Load Resistance for Power Output Tubes.

$\text{\textcircled{2}}$ Mutual Conductance for Tetrodes, Pentodes, Etc.

▼ Conversion Conductance.

◆ Approximate.

▲ Plate to Plate.

■ Through 20,000 Ohms.

* Per Tube or Section—No Signal.

§ Plate and Target Supply.

OBSOLETE AND SELDOM ENCOUNTERED TYPES—Cont.

Type	Construction		Class	Use	Emitter			Plate Volts	Screen Volts	Neg. Grid Volts	Plate Current Ma.	Screen Current Ma.	Plate Resistance Ohms	Amp. Factor	Power Output Mw.	Suggested Replacement Type
	Style	Base Diag.			Type	Volts	Amp.									
46	ST-16	5C	Dual Grid Triode	Pwr. Amp.	Fil.	2.5	1.75	250	Tie Gs to P	33.0	22.0	.....	6,400	5.6	1,250	
				(Class B)	.....	2.5	1.75	300	Tie Gs to G	0	150 Peak per tube	5,200	2 Tubes	16,000		
				(Class B)	.....	2.5	1.75	400	Tie Gs to G	0	200 Peak per tube	5,800	2 Tubes	20,000		
47	ST-16	5B	Pentode	Pwr. Amp.	Fil.	2.5	1.75	250	250	16.5	31.0	6.0	7,000	2,500	2,700	2A5
48	ST-16	6A	Tetrode	Pwr. Amp.	Cath.	30.	0.40	95	95	20.0	52	12.0	1,500	3,900	2,000	
								125	100	22.5	52	12.0	1,500	3,900	3,000	
49	ST-14	5C	Dual Grid Tri.	Class A Amp.	Fil.	2.0	0.12	135	Gs to P	20	6.0	.....	11,000	4.7	170	
				Class B Amp.	.....	.....	.....	180	Gs to G	0	4.0	2 tubes	12,000	.....	3,500	
50	ST-16	4D	Triode	Pwr. Amp.	Fil.	7.5	1.25	300	.....	54.0	35.0	.....	4,600	3.8	1,600	
						7.5	1.25	350	.....	63.0	45.0	.....	4,100	3.8	2,400	
						7.5	1.25	400	.....	70.0	55.0	.....	3,670	3.8	3,400	
						7.5	1.25	450	.....	84.0	55.0	.....	4,350	3.8	4,600	
50Z7G	ST-12	8AN	Duo Diode	F.W. Rect.	Cath.	50	0.15	117 V. RMS Per Plate, 65 Ma. DC Output.								
EF50	Lock-In	9C	Pentode	R.F. Amp.	Cath.	6.3	0.3	250	250	.....	10	3.1	600,000	.....	.....
HZ50	.....	4G	Diode	H.W. Rect.	Cath.	12.6	0.30	250 V. RMS Plate, 60 Ma. DC Output.								12Z3
51, 51S	ST-14	5E	Tetrode	Amp.	Cath.	2.5	1.75	See Type 35, 35/51.								35
52	ST-14	5C	Dual Grid Tri.	Class A Amp.	Fil.	6.3	0.30	110	.....	0	43	.....	2,000	5.2	1,500	6A4/LA
				Class B Amp.	.....	.....	.....	180	2 Tube	0	3.0	.....	10,000	.....	5,000	
53	ST-14	7B	Duo. Tri.	Pwr. Amp.	Cath.	2.5	2.0	Characteristics same as Type 6N7GT.								
55	ST-12	6G	Duodi Tri.	Det. Amp.	Cath.	2.5	1.0	Characteristics same as Type 6V7G.								
55S	ST-12	6G	Duodi Tri.	Det. Amp.	Cath.	2.5	1.00	250	.....	20	8.0	.....	7,500	8.3	350	55
56, 56S	ST-12	5A	Triode	Amp.	Cath.	2.5	1.0	250	.....	13.5	5.0	.....	9,500	13.8	.....
				Det.	.....	2.5	1.0	250	.....	20.0	Adjust Bias for 0.2 Ma. Plate Current Without Signal.	.....	.....	.....
56AS	ST-12	5A	Triode	Amp.	Cath.	6.3	0.40	250	.....	13.5	5.0	.....	9,500	13.8	.....	76

① Load Resistance for Power Output Tubes.

② Mutual Conductance for Tetrodes, Pentodes, Etc.

▼ Conversion Conductance.

◆ Approximate.

♠ Plate to Plate.

■ Through 20,000 Ohms.

* Per Tube or Section—No Signal.

§ Plate and Target Supply.

OBSOLETE AND SELDOM ENCOUNTERED TYPES—Cont.

Type	Construction		Class	Use	Emitter			Plate Volts	Screen Volts	Neg. Grid Volts	Plate Current Ma.	Screen Current Ma.	Plate $\text{\textcircled{1}}$ Resistance Ohms	Amp. $\text{\textcircled{2}}$ Factor	Power Output Mw.	Suggested Replacement Type	
	Style	Base Diag.			Type	Volts	Amp.										
57, 57S	ST-12	6F	Pentode	Amp.	Cath.	2.5	1.0	100	100	3.0	2.0	0.5	1 Meg.	1,185	....	
					.....	2.5	1.0	250	100	3.0	2.0	0.5	1 Meg.	1,225	....	
57AS	ST-12	6F	Pentode	Amp.	Cath.	6.3	0.40	250	100	3.0	2.0	0.5	1 Meg.	1,225	....	6C6
58, 58S	ST-12	6F	Pentode	Amp.	Cath.	2.5	1.0	100	100	3.0	8.0	2.2	250,000	1,500	....	
					.....	2.5	1.0	250	100	3.0	8.2	2.0	800,000	1,600	....	
58AS	ST-12	6F	Pentode	Amp.	Cath.	6.3	0.40	250	100	3.0	8.2	2.0	800,000	1,600	....	6D6-78
59	ST-16	7A	Pentode	Pwr. Amp.	Cath.	2.5	2.0	250	250	18.0	35.0	9.0	6,000	2,500	3,000		
				Triode	.....	2.5	2.0	250	Tie Gs to P	28.0	26.0	....	5,000	2,600	1,250	
				Triode—Class B	.....	2.5	2.0	300	Tie Gs to G	0	10.0#	....	4,600	....	15,000 (2 tubes)	
				Triode—Class B	.....	2.5	2.0	400	Tie Gs and Su to P	0	13.0#	....	6,000	....	20,000 (2 tubes)	
59B	.....	7M	Pentode	Pwr. Amp.	Fil.	2.5	2.0	250	250	18.0	35.0	9.0	6,000	....	3,000	(See Type 59)
64, 64A	.....	5E	Tetrode	Amp.	Cath.	6.3	0.40	180	90	3.0	3.1	1.5	500,000	1,050	....	36
65, 65A	.....	5E	Tetrode	Amp.	Cath.	6.3	0.40	180	90	3.0	4.5	1.3	750,000	1,000	....	39/44
67, 67A	.....	5A	Triode	Det. Amp.	Cath.	6.3	0.40	180	.....	13.5	4.3	....	10,200	9.2	....	37
68, 68A	.....	5E	Pentode	Pwr. Amp.	Cath.	6.3	0.40	135	90	13.5	14	3.0	7,500	1,400	650	38
70A7GT	T-9	8AB	Di. Beam Amp.	H.W. Rect. Pwr. Amp.	Cath.	70.0	0.15	125 V. RMS	110	110	7.5	40	3.0	2,500	5,800	1,500	70L7GT
71	ST-14	4D	Triode	Pwr. Amp.	Fil.	5.0	0.50	180	.....	40.5	20	....	4,800	3	790	71A
					.....	5.0	0.25	90	.....	16.5	10.0	....	3,000	3	125	
71A	ST-14	4D	Triode	Pwr. Amp.	.....	5.0	0.25	135	.....	27.0	17.3	....	3,000	3	400	
					.....	5.0	0.25	180	.....	40.5	20.0	....	4,800	3	790	
					.....	5.0	0.125	180	.....	40.5	20	....	4,800	3	790	
71B	ST-14	4D	Triode	Pwr. Amp.	Cath.	5.0	0.125	180	.....	40.5	20	....	4,800	3	790	71A

$\text{\textcircled{1}}$ Load Resistance for Power Output Tubes.
 $\text{\textcircled{2}}$ Mutual Conductance for Tetrodes, Pentodes, Etc.
 \blacktriangledown Conversion Conductance.

◆ Approximate.
 \blacktriangle Plate to Plate.
 \blacksquare Through 50,000 Ohms.

† Applied through 250,000 Ohms.
 \ast Per Tube or Section—No Signal.
 \S Plate and Target Supply.

OBSOLETE AND SELDOM ENCOUNTERED TYPES—Cont.

Type	Construction		Class	Use	Emitter			Plate Volts	Screen Volts	Neg. Grid Volts	Plate Cur- rent Ma.	Screen Cur- rent Ma.	Plate ① Resistance Ohms	Amp. ② Factor	Power Output Mw.	Suggested Replacement Type
	Style	Base Diag.			Type	Volts	Amp.									
75, 75S	ST-12	6G	Duodi Tri.	Det. Amp.	Cath.	6.3	0.30	250	....	2.0	0.9	....	91,000	100	....
76	ST-12	5A	Triode	Amp.	Cath.	6.3	0.30	100	....	5.0	2.5	....	12,000	13.8	....
						6.3	0.30	250	....	13.5	5.0	....	9,500	13.8	....
						6.3	0.30	250	....	20.0*	Adjust Bias for 0.2 Ma	Plate Current Without Signal.	....	....	....
77	ST-12	6F	Pentode	Amp.	Cath.	6.3	0.30	100	60	1.5	1.7	0.4	600,000*	1,100	....
						6.3	0.30	250	100	3.0	2.3	0.5	>1.0 Meg.	1,250	....
78	ST-12	6F	Pentode	Amp.	Cath.	6.3	0.30	90	90	3.0	5.4	1.3	300,000	1,275	....
						6.3	0.30	180	75	3.0	4.0	1.0	1 Meg.	1,100	....
						6.3	0.30	250	100	3.0	7.0	1.7	800,000	1,450	....
						6.3	0.30	250	125	3.0	10.5	2.6	600,000	1,650	....
79	ST-12	6H	Duo Tri.	Pwr. Amp.	Cath.	6.3	0.60	250	Class B	0	21.0	Both Triodes	14,000*	....	8,000	6N7
80M	....	4C	Duo Di. M.V.	F.W. Rect.	Fil.	5.0	2.00	450	V. RMS Per Plate, 125 Ma. DC Output.							80
81, 81M	ST-16	4B	Diode	H.W. Rect.	Fil.	7.5	1.25	700	A-C Volts Per Plate, RMS, 85 Ma. Output Current. Condenser Input to Filter.							82
82V	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	82
84/6Z4	ST-12	5D	Duodiode	F.W. Rect.	Cath.	6.3	0.50	325	A-C Volts Per Plate, RMS, 60 Ma. Output Current. Condenser Input to Filter.							85
G84	....	4B	Diode	H.W. Rect.	Fil.	2.5	1.50	450	A-C Volts Per Plate, RMS, 60 Ma. Output Current. 10h Choke Input to Filter.							2Z2/G84
						2.5	1.50	350	V. RMS Plate, 50 Ma. DC Output.							2A6
G84/2Z2	....	4B	Diode	H.W. Rect.	Fil.	2.5	1.50	350	V. RMS Plate, 50 Ma. DC Output.							2A6
85	ST-12	6G	Duodi Tri.	Det. Amp.	Cath.	6.3	0.30	Characteristics same as Type 6V7G.								6V7G
85AS	ST-12	6G	Duodi Tri.	Det. Amp.	Cath.	6.3	0.30	250	....	9.0	4.5	....	16,000	20	....	85
88	....	4C	Duo Diode	F.W. Rect.	Fil.	5.0	2.00	450	V. RMS Per Plate, 125 Ma. DC Output.							83V
89	ST-12	6F	Pentode	Pwr. Amp.	Cath.	6.3	0.40	180	180	18.0	20.0	3.0	8,000	1,550	1,500	
						6.3	0.40	160	160	20.0	17.0	....	7,000	4.7	300	
						6.3	0.40	180	180	0	3.0	....	9,400*	Tie Gs to G	3,500 (2 tubes)	
89Y	....	....	....	....	....	....	....	Same as Type 89. Has low-loss base.								

① Load Resistance for Power Output Tubes.

② Mutual Conductance for Tetrodes, Pentodes, Etc.

▼ Conversion Conductance.

◆ Approximate.

‡ Plate to Plate.

‡ Through 20,000 Ohms.

* Per Tube or Section—No Signal.

‡ Plate and Target Supply.

OBSOLETE AND SELDOM ENCOUNTERED TYPES—Cont.

Type	Construction		Class	Use	Emitter			Plate Volts	Screen Volts	Neg. Grid Volts	Plate Cur- rent Ma.	Screen Cur- rent Ma.	Plate ① Resistance Ohms	Amp. ② Factor	Power Output Mw.	Suggested Replacement Type	
	Style	Base Diag.			Type	Volts	Amp.										
VR90/30	ST-12	4AJ	Diode	Voltage Reg.	Cold K	.....	.....	See Type 0B3.			.....	.....	.....	.....	.....	0B3
95	.....	6B	Pentode	Pwr. Amp.	Cath.	2.5	1.75	315	315	22.0	42	8.0	7,000	2,300	5,000	2A5
96	.....	4G	Diode	H.W. Rect.	Cath.	10.0	0.50	350 V. RMS Plate, 100 Ma. DC Output.			.....	.....	.....	.....	1V	
98	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	84
V99	T-8	4E	Triode	Det. Amp.	Fil.	3.3	.063	90	.....	4.5	2.5	.....	15,500	6.6	.....	.....
X99	T-9	4D	Triode	Det. Amp.	Fil.	3.3	.063	Same as V99.			.....	.....	.....	.....	.....	.....
VR105/30	ST-12	4AJ	Diode	Voltage Reg.	Cold K	.....	.....	See Type OC3.			.....	.....	.....	.....	.....	OC3
117P7GT	GT	8AV	Diode Beam Amp.	H.W. Rect. Pwr. Amp.	Cath.	117.0	0.09	117 V. RMS Plate,	105	105	5.2	43	4.0	4,000	5,300	850
117Z4GT	GT	5AA	Diode	H.W. Rect.	Cath.	117	0.04	117 V. RMS Plate,
143D	Diode	H.W. Rect.	2X2
VR150/30	ST-12	4AJ	Diode	Voltage Reg.	Cold K	See Type OD3.			OD3
182B/482B	ST-14	4D	Triode	Pwr. Amp.	Fil.	5.0	1.25	250	.....	35.0	20	.....	4,500	5.0	1,350	71A or 45
183/483	ST-14	4D	Triode	Pwr. Amp.	Fil.	5.0	1.25	250	.....	65.0	20	.....	4,500	3.0	1,800	71A or 45
210T	ST-16	4D	Triode	Pwr. Amp.	Fil.	7.5	1.25	Standard Type 10 with Ceramic Base, See Type 10 Characteristics.			.....	.....	.....	.....	.....	.....
288	83V
401	.....	4D	Triode	Det. Amp.	Cath.	3.0	1.35	90	.....	3.0	5.0	.....	9,500	9.5	.....	27
482A	.....	4D	Triode	Pwr. Amp.	Fil.	5.0	0.80	200	.....	45.0	18	.....	4,500	2.0	1,500	71A
482B	.....	4D	Triode	Pwr. Amp.	Fil.	5.0	1.25	250	.....	35.0	18	.....	4,500	5.0	1,500	182B/482B
483	.....	4D	Triode	Pwr. Amp.	Fil.	5.0	1.25	250	.....	65.0	20	.....	4,500	3.0	2,000	183/483
484	.....	5A	Triode	Det. Amp.	Cath.	2.8	1.60	180	.....	9.0	6.0	.....	9,300	12.5	.....	485
485	ST-12	5A	Triode	Det. Amp.	Cath.	3.0	1.25	180	.....	9.0	5.8	.....	8,900	12.5	.....	27
585	.....	4D	Triode	Pwr. Amp.	Fil.	7.5	1.25	450	.....	84.0	55	.....	4,350	3.8	4,600	50

① Load Resistance for Power Output Tubes.

② Mutual Conductance for Tetrodes, Pentodes, Etc.

▼ Conversion Conductance.

◆ Approximate.

‡ Plate to Plate.

■ Through 20,000 Ohms.

* Per Tube or Section—No Signal.

§ Plate and Target Supply.

OBSOLETE AND SELDOM ENCOUNTERED TYPES—Cont.

Type	Construction		Class	Use	Emitter			Plate Volts	Screen Volts	Neg. Grid Volts	Plate Current Ma.	Screen Current Ma.	Plate [Ⓛ] Resistance Ohms	Amp. [Ⓢ] Factor	Power Output Mw.	Suggested Replacement Type	
	Style	Base Diag.			Type	Volts	Amp										
586	.....	4D	Triode	Pwr. Amp.	Fil.	7.5	1.25	450	.....	84.0	55	.....	4.350	3.8	4,600	50	
P861	.....	5D	Duo Diode	F.W. Rect.	Cath.	6.3	0.50	225 V. RMS Per Plate, 50 Ma. DC Output.									84
864	T-9	4D	Triode	Amp.	Fil.	1.1	0.25	90	.....	4.5	2.9	.....	13,500	8.2	.....	
								135	.....	9.0	3.5	.....	12,700	8.2	.....	
879	ST-12	4AB	Diode	H.W. Rect.	Cath.	2.5	1.75	Now known as 2X2A.									2X2A
950	.....	5K	Pentode	Pwr. Amp.	Fil.	2.0	0.125	135	135	16.5	5.5	2.0	13,500	950	575	33	
951	.....	4K	Tetrode	Amp.	Fil.	2.0	0.60	180	67.5	3.0	1.7	0.4	1.2 Meg.	650	.....	1B4P	
1201	Lock In	8BN	Triode	Osc. Amp.	Cath.	6.3	0.15	See Type 7E5.									
1203A	Lock In	4AH	H.F. Diode	Det.	Cath.	6.3	0.15	See Type 7C4.									
1204	Lock In	8B0	Pentode	Amp.	Cath.	6.3	0.15	See Type 7AB7.									
1206	Lock In	8BV	Duo Tetrode	R.F. Amp.	Cath.	6.3	0.30	See Type 7G8.									
1221	ST-12	6F	Pentode	Amp.	Cath.	6.3	0.30	Non Microphonic, See 6C6.									
1223	ST-12	7R	Pentode	Amp.	Cath.	6.3	0.30	Non Microphonic, See 6C6.									
1229	ST-12	4K	Tetrode	.....	Fil.	2.0	0.06	Special Type 32. Made for Low Grid Current Applications.									
1231	Lock In	8V	Pentode	Amp.	Cath.	6.3	0.45	300	150	200	10.0	2.5	700,000	5,500	(Cath. Resistor)		
1232	Lock In	8V	Pentode	Amp.	Cath.	6.3	0.45	See Type 7G7.									
1265	ST-12	4AJ	Diode	Voltage Reg.	Cold K	.....	.....	Starting Voltage=135, Operating Voltage=90, Operating Current=5 to 30 Ma.									
1266	T-9	4AJ	Diode	Voltage Reg.	Cold K	.....	.....	Similar to Type OB3/VR-90-30, Except Regulating at 70 Volts.									
1267	T-9	4V	Gas Triode	Relay Tube	Cold K	.....	.....	Similar to Type OA4G.									OA4G
1275	ST-16	4C	Duodiode	Rect.	Fil.	5.0	1.75	Similar to Type 5Z3.									
1276	ST-16	4D	Triode	Amp.	Fil.	4.5	1.14	Similar to Type 6B4G.									
1291	Lock In	7BE	Duo Triode	Osc. Amp.	Fil.	1.4	.220	See Type 3B7.									
						2.8	.110										

Ⓛ Load Resistance for Power Output Tubes.
 Ⓢ Mutual Conductance for Tetrodes, Pentodes, Etc.
 ▼ Conversion Conductance.

◆ Approximate.
 ▲ Plate to Plate
 ■ Through 20,000 Ohms.

* Per Tube or Section—No Signal.
 § Plate and Target Supply.

OBSOLETE AND SELDOM ENCOUNTERED TYPES—Cont.

Type	Construction		Class	Use	Emitter			Plate Volts	Screen Volts	Neg. Grid Volts	Plate Cur- rent Ma.	Screen Cur- rent Ma.	Plate ① Resistance Ohms	Amp. ② Factor	Power Output Mw.	Suggested Replacement Type	
	Style	Base Diag.			Type	Volts	Amp.										
1293	T-9	4AA	Triode	Oscillator	Fil.	1.4 1.4	0.11 0.11	90 90	.....	0	5.2 13.25	.....	.....	15	.....	
1294	Lock In	4AH	H.F. Diode	Det.	Cath.	1.4	.150	See Type 1R4.									
1299	Lock In	6BA	Beam Amp.	Pwr. Amp.	Fil.	1.4 2.8	.220 .110	See Type 3D6.									
1612	Metal	7T	Heptode	Mixer Amp.	Cath.	6.3	0.30	Non Microphonic, See 6L7.									
1626	ST-12	6Q	Triode	Osc. Amp.	Cath.	12.6	0.25	250	.....	.....	25 max.....	.....	5	4,000			
1629	T-9	7AL	Electron Ray	Indicator	Cath.	12.6	0.15	Same as Type 6E5.									
9001	T-5½	7BD	Pentode	Det. Amp.	Cath.	6.3	0.15	90 250	90 100	3 3	1.2 2.0	0.5 0.7	1,000,000 1 Meg. Min	1,400	.....	
9002	Min.	7BS	Triode	Amp.	Cath.	6.3	0.15	250	.....	7.0	6.3	.....	11,400	25	.....	
9003	Min.	7BD	Pentode	R.F. Amp.	Cath.	6.3	0.15	250	100	3.0	6.7	2.7	700,000	1,800	.....	
9006	T-5½	6BH	UHF Diode	Rect.	Cath.	6.3	0.15	270 V. RMS Plate, 5 Ma. DC Output.									
AD	.....	4G	Diode	H.W. Rect.	Cath.	6.3	0.30	350 V. RMS Plate, 50 Ma. DC Output.									1V
AF	.....	4C	Duo Diode	F.W. Rect.	Fil.	2.5	3.00	500 V. RMS Per Plate, 125 Ma. DC Output.									82
AG	.....	4C	Duo Diode	F.W. Rect.	Fil.	5.0	3.00	500 V. RMS Per Plate, 250 Ma. DC Output.									83
AX	.....	4D	Triode	Det. Amp.	Fil.	5.0	0.25	135	.....	9.0	.....	.....	20,000	8	55	01A	
B	.....	4E	Triode	Det. Amp.	Fil.	3.3	0.063	90	.....	4.5	2.5	.....	15,500	6.6	.....	V99	
BA	.....	4J	Duo Diode	F.W. Rect.	Cold K	.....	.....	350 V. RMS Per Plate, 350 Ma. DC Output.									
BH	.....	4J	Duo Diode	F.W. Rect.	Cold K	.....	.....	350 V. RMS Per Plate, 125 Ma. DC Output.									0Z4
BR	.....	4H	Diode	H.W. Rect.	Cold K	.....	.....	300 V. RMS Plate, 50 Ma. DC Output.									0Z4
D½	.....	4B	Diode	H.W. Rect.	Fil.	7.5	1.25	700 V. RMS Plate, 85 Ma. DC Output.									81
D1	.....	4C	Duo Diode	F.W. Rect.	Fil.	5.0	2.00	350 V. RMS Per Plate, 125 Ma. DC Output.									80
DE1	.....	5A	Triode	Det. Amp.	Cath.	2.5	1.75	250	.....	21.0	5.2	.....	34,000	9	300	27	
E	.....	4D	Triode	Pwr. Amp.	Fil.	3.3	0.132	135	.....	22.5	6.5	.....	6,500	3.3	110	20	
G	.....	4D	Triode	Amp.	Fil.	5.0	0.25	180	.....	3.0	0.2	.....	150,000	30	.....	40	

① Load Resistance for Power Output Tubes.

② Mutual Conductance for Tetrodes, Pentodes, Etc.

▼ Conversion Conductance.

◆ Approximate.

▲ Plate to Plate.

■ Through 20,000 Ohms.

* Per Tube or Section—No Signal.

‡ Plate and Target Supply.

OBSOLETE AND SELDOM ENCOUNTERED TYPES—Cont.

Type	Construction		Class	Use	Emitter			Plate Volts	Screen Volts	Neg. Grid Volts	Plate Cur- rent Ma.	Screen Cur- rent Ma.	Plate ① Resistance Ohms	Amp. ② Factor	Power Output Mw.	Suggested Replacement Type	
	Style	Base Diag.			Type	Volts	Amp.										
H	.....	4D	Triode	Det. Amp.	Fil.	5.0	0.25	45	.....	0	1.5	.....	31,500	20	.....	01A
H2-10	.....	4AB	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2X2/879
LA	.....	5B	Pentode	Pwr. Amp.	Fil.	6.3	0.30	180	180	12.0	22	3.9	8,000	2,200	1,400	6A4
PZ	.....	5B	Pentode	Pwr. Amp.	Fil.	2.5	1.75	250	250	16.5	31	6.0	7,000	2,500	2,700	47
PZH	.....	6B	Pentode	Pwr. Amp.	Cath.	2.5	1.75	250	250	16.5	34	6.5	7,000	2,200	3,000	2A5
RE1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	80
RE2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	81
S02	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50
Wunderlich A Auto	.....	6N	Dual Grid	Det.	Cath.	6.3	0.40	250	.....	16.5	7.0	.....	10,200	9.2	.....	
Wunderlich A	.....	5H 6N	Dual Grid	Det.	Cath.	2.5	1.00	250	.....	16.5	7.0	.....	10,200	9.2	.....	
Wunderlich B	.....	6P	Special	Det.	Cath.	2.5	1.00	250	.....	.....	17.0	.....	.....	.....	.....
X6030	Lock In	X6030	Diode	Noise Diode	Fil.	3.0m	0.6	90 250 1400	..... ..... .....	..... ..... .....	4.0 3.0 0.535	..... ..... .....	..... ..... .....	..... ..... .....	..... ..... .....
XXB	Lock In	7BW	Duo Triode	Amp.	Fil.	1.4	0.10	90	.....	0	4.5	.....	11,200	14.5	.....	
XXD	Lock In	8AC	Duo Triode	Amp.	Cath.	12.6	0.15	See Type 14AF7/XXD.									
XXFM	Lock In	8BZ	Duodi Tri.	Det. Amp.	Cath.	6.3	0.30	See Type 7X7.									
XXL	Lock In	5AC	Triode	Amp.	Cath.	6.3	0.30	100 250	..... .....	0 8.0	10.0 8.0	..... .....	7,000 8,700	25 20	..... .....	7A4

① Load Resistance for Power Output Tubes.

② Mutual Conductance for Tetrodes, Pentodes, Etc.

▼ Conversion Conductance.

◆ Approximate.

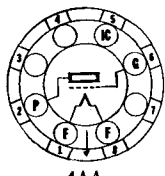
♣ Plate to Plate.

■ Through 20,000 Ohms

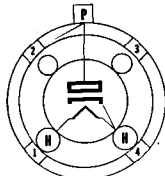
* Per Tube or Section—No Signal.

§ Plate and Target Supply.

BASE DIAGRAMS FOR SELDOM ENCOUNTERED TYPES



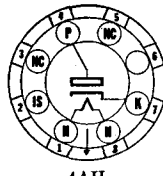
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4AB



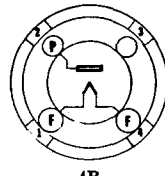
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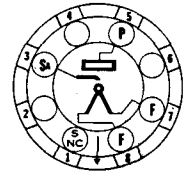
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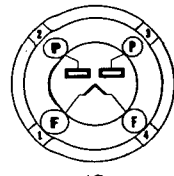
4AJ



4B



4BU



4C



4D



4E

4F

- 1 F
- 2 P
- 3 F
- 4 G



4G

4H

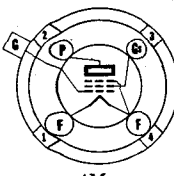
- 1 K
- 2 J
- 3 J
- 4 A

4J

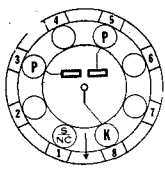
- 1 A1
- 2 K
- 3 NC
- 4 A2



4K



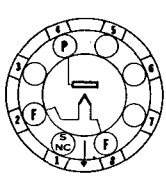
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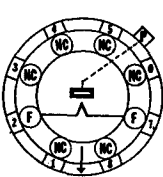
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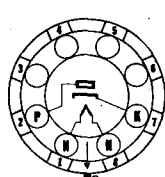
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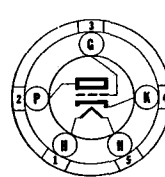
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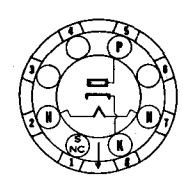
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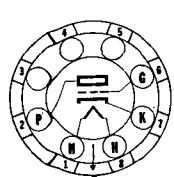
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5A



5AA

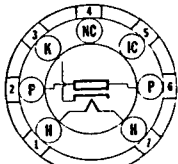


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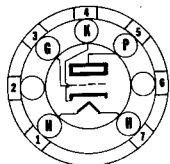
BASE DIAGRAMS FOR SELDOM ENCOUNTERED TYPES—Cont.



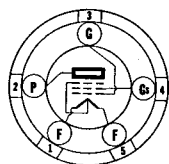
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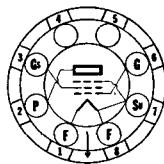
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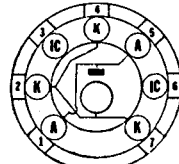
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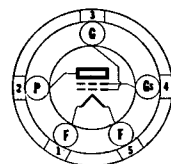
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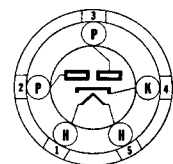
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5BO



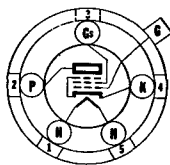
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5D



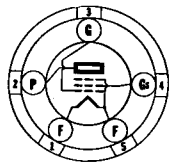
5E



5F

5H

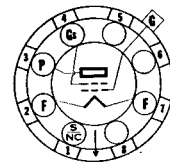
- 1 H
- 2 G P
- 3 P
- 4 G
- 5 H
- Cap K



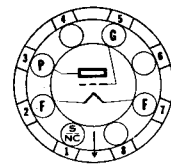
5K

5N

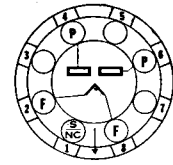
- 1 J
- 2 A
- 3 A
- 4 K
- 5 J



5R



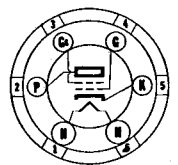
5S



5T



5Y



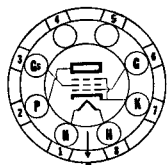
6A



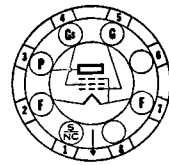
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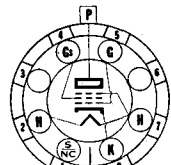
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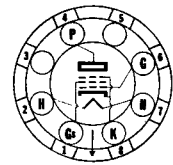
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6AF

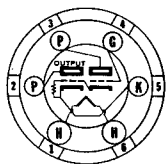


6AM



6AP

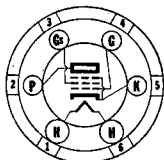
BASE DIAGRAMS FOR SELDOM ENCOUNTERED TYPES—Cont.



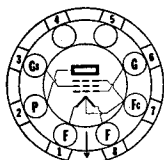
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6AW



6B



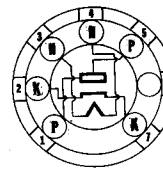
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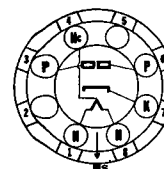
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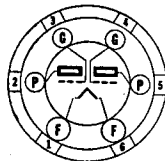
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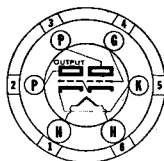
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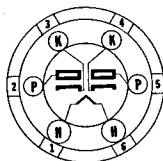
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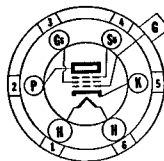
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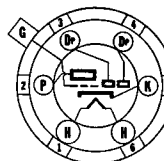
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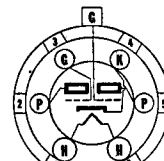
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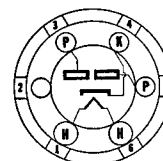
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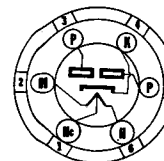
6G



6H



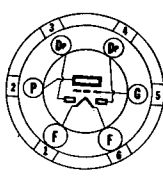
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6K



6L



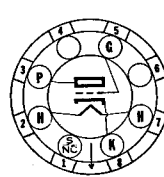
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6N

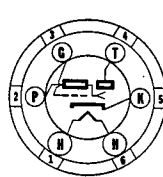
- 1 H
- 2 P
- 3 G
- 4 G
- 5 K
- 6 H

6P

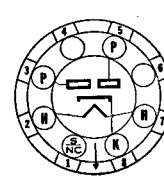
- 1 H
- 2 P
- 3 G
- 4 G
- 5 K
- 6 H
- Cap Gs



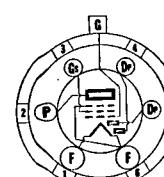
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6R



6S



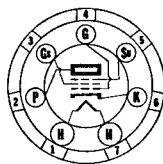
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BASE DIAGRAMS FOR SELDOM ENCOUNTERED TYPES—Cont.



6X

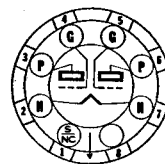
6Y
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 2 H
 3 P
 4 NC
 5 D
 6 NC
 7 H
 8 K
 9 G
 Cap



7A



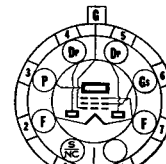
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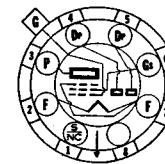
7AB



7AC



7AD



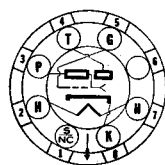
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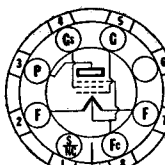
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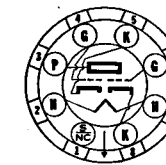
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7AQ



7AU



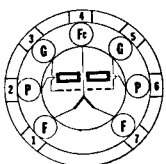
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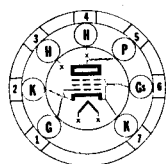
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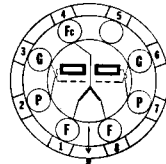
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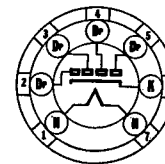
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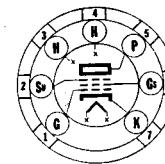
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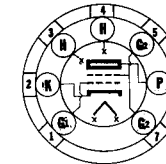
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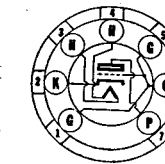
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7BK

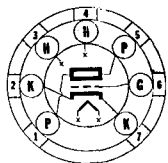


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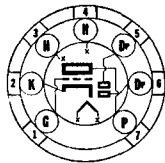


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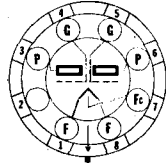
BASE DIAGRAMS FOR SELDOM ENCOUNTERED TYPES—Cont.



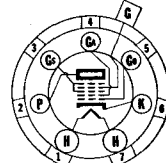
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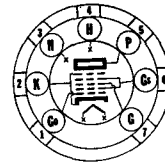
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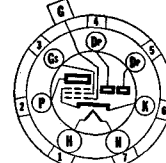
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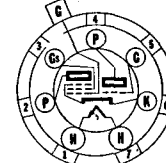
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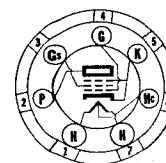
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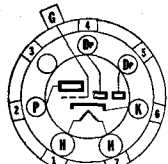
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7E



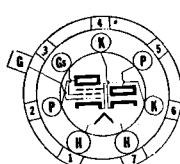
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7G



7H



7K

7L

- | | |
|---|----|
| 1 | H |
| 2 | P2 |
| 3 | K2 |
| 4 | Hc |
| 5 | K1 |
| 6 | P1 |
| 7 | H |

7M

- | | |
|---|----|
| 1 | F |
| 2 | P |
| 3 | Gs |
| 4 | G |
| 5 | SU |
| 6 | NC |
| 7 | F |



7Q



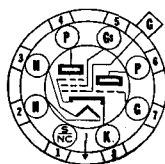
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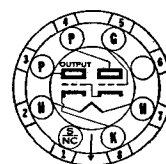
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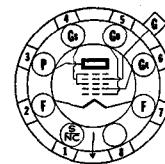
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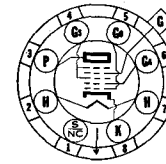
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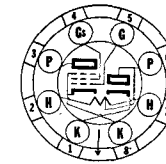
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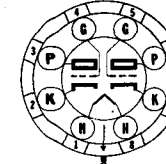
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8A



8AB



8AC

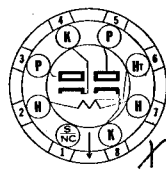
BASE DIAGRAMS FOR SELDOM ENCOUNTERED TYPES—Cont.



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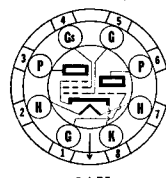
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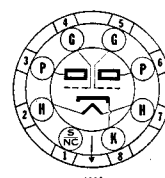
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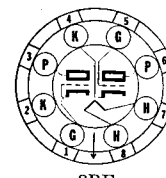
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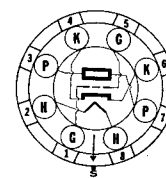
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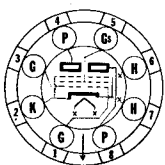
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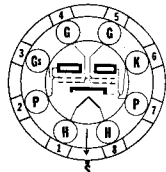
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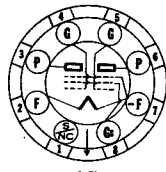
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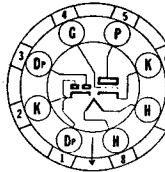
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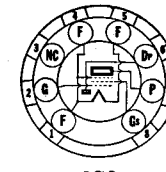
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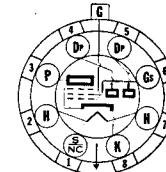
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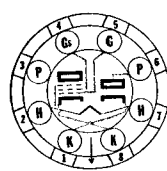
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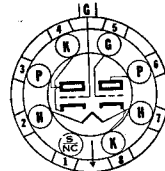
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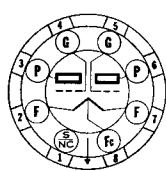
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8F



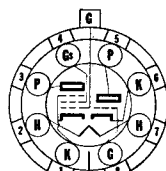
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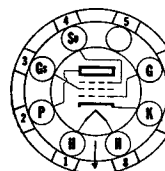
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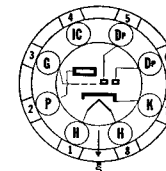
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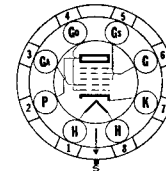
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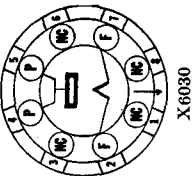
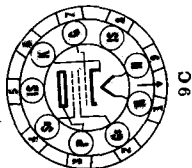
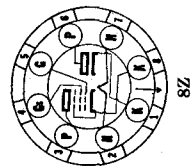


8W



8X

BASE DIAGRAMS FOR SELDOM ENCOUNTERED TYPES



SYLVANIA PANEL LAMPS

A complete line of Sylvania Panel Lamps, especially designed for radio dials, tuning meters, flash-tuning arrangements, and the like, is now available. A market for some types of these lamps will also be found in flashlights, parking lights, auto panel boards, record players, pin-ball machines, and wherever a miniature lamp of this style is required.

The early types of panel lamps were used primarily as on-off indicators in radio receivers. Present-day panel lamps must be constructed to withstand speaker vibrations, have noise-free operation, current drain within the required limit (particularly when used in ac-dc receivers and battery receivers), and to provide shadowless illumination. Sylvania radio panel lamps have been constructed for all these requirements.

The replacement of panel lamps should be made with lamps having the same type number. This is particularly true in tuning meters, battery, and ac-dc receiver replacements. Sylvania Type S47 is the same as other lamps marked 40A. Lamps marked 49A may be replaced with Sylvania Type S49. Type S292 is mainly for use in 2.5 volt receivers where the line voltage is high and when regular 2.5 volt lamps will not give satisfactory life.

The filament wires of all standard panel lamps are mounted through a small colored glass bead located above the bulb press. If the markings on the lamp to be replaced are not legible, the bead color may be used as identification, since the color identifies the lamp type. The bead color of each lamp is shown in the tabulated data below, and it will be noted that in some cases the bead colors identify more than one particular type of lamp. In these cases other means of identification will be required, such as comparison of bulb, base, and circuit voltage.

CHARACTERISTICS

Type No.	Circuit Volts	Design		Bead Color	Bulb Style	Miniature Base	Usual Service	Type No.
		Volts	Amp.					
S40	6-8	6.3	0.15	Brown	T-3¼	Screw	Radio Dials	S40
S41	2.5	2.5	0.50	White	T-3¼	Screw	Radio Dials	S41
S42	3.2	3.2	0.35	Green	T-3¼	Screw	Radio Dials	S42
S43	2.5	2.5	0.50	White	T-3¼	Bayonet	Radio Dials and Tuning Meters	S43
S44	6-8	6.3	0.25	Blue	T-3¼	Bayonet	Radio Dials and Tuning Meters	S44
S45	3.2	3.2	0.35	White	T-3¼	Bayonet	Radio Dials	S45
S46	6-8	6.3	0.25	Blue	T-3¼	Screw	Radio Dials and Tuning Meters	S46
*S47	6-8	6.3	0.15	Brown	T-3¼	Bayonet	Radio Dials	*S47
S48	2.0	2.0	0.06	Pink	T-3¼	Screw	Battery Set Dials	S48
*S49	2.0	2.0	0.06	Pink	T-3¼	Bayonet	Battery Set Dials	*S49
S50	6-8	7.5	0.20	White	G-3½	Screw	Auto Sets Flash Lights	S50
S51	6-8	7.5	0.20	White	G-3½	Bayonet	Auto Sets, Auto Panels	S51
S55	6-8	6.5	0.40	White	G-4½	Bayonet	Auto Sets, Parking Lights	S55
S292	2.9	2.9	0.17	White	T-3¼	Screw	Radio Dials	S292
S292A	2.9	2.9	0.17	White	T-3¼	Bayonet	Radio Dials Coin Machines	S292A
S1455	18.0	18.0	0.25	Brown	G-5	Screw	Coin Machines	S1455
S1455A	18.0	18.0	0.25	Brown	G-5	Bayonet	Coin Machines	S1455A

*Sylvania Types S47 and S49 are interchangeable with Types 40A and 49A, respectively, in other brands.

SYLVANIA BALLAST TUBES AND PLUG-IN RESISTORS

Ballast Tubes and Plug-in Resistors form two divisions based upon differences in construction and regulating characteristics. The first group is employed mainly in battery operated receivers to maintain substantially constant current over a considerable range of battery voltage variation. The second group is used in ac-dc receivers and 32-volt sets where the voltage drop required may cover a wide range. Such a resistor tube affords some amount of regulation, but the characteristic is not as flat as for regulators intended for use in battery receivers. These should be operated as closely as possible to the standard current ratings in order to realize the most efficient performance.

The tubes for use in battery sets are designed to permit the operation of 2-volt types from a 3-volt battery source which may consist of two banks of dry cells in parallel, the banks being connected in series. The supply voltage varies from about 3.4 volts to 2.2 volts during the life of the batteries. For this range of supply voltage the types listed below will maintain the socket terminal voltage between 1.8 and 2.2 volts. During the major part of battery life the socket voltage remains very close to the rated value of 2.0 volts.

Due to the confusion in ballast and resistor tube type numbers there has been considerable misunderstanding as to the correct type of tube to be used for replacement purposes in receivers. All the Sylvania ballast tubes listed will replace any ballast tubes having the same type numbers. Furthermore, Sylvania ballast tubes will also replace any ballast tubes for similar service, regardless of designating type numbers, providing the filament current load is identical and the basing arrangement is the same. The same is true for the Sylvania resistor types employed in ac-dc service provided that, in addition, the average voltage drop is also the same.

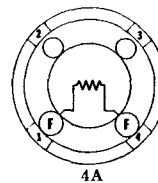
To determine the filament current load in series with the ballast tube it is necessary to include the total filament current drain of the receiver tubes plus the current drain of the dial light if the latter is employed. For example, a set using a Type 19, a Type 30, and 3 Type 34 tubes has a normal filament current drain of 500 milliamperes. The correct ballast tube would be a Type 1A1.

CHARACTERISTICS

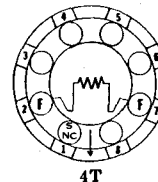
Type	Use	Ma. Average Load Current	Average Voltage Drop*	Bulb	Base
1A1/5E1	Battery	500	1.0	ST-12	4-A
1B1	Battery	360	1.0	ST-12	4-A
1C1	Battery	745	1.0	ST-12	4-A
1D1	Battery	240	1.0	ST-12	4-A
1E1	Battery	480	1.0	ST-12	4-A
1F1	Battery	720	1.0	ST-12	4-A
1G1	Battery	420	1.0	ST-12	4-A
1J1	Battery	620	1.0	ST-12	4-A
1K1	Battery	550	1.0	ST-12	4-A
1R1G	Battery	540	1.0	ST-12	4-T
1T1G	Battery	560	1.0	ST-12	4-T
1X1	Battery	780	1.0	ST-12	4-A
1Y1	Battery	540	1.0	ST-12	4-A
1Z1	Battery	900	1.0	ST-12	4-A
2	DC or AC-DC	300	9.0	S-14	4-A
3	DC or AC-DC	300	128.0	ST-16	4-A
4	DC or AC-DC	400	115.0	ST-16	4-A
4A1	Battery	300	4.0	ST-12	4-A
5	DC or AC-DC	460	115.0	ST-16	4-A
6	Battery	685	1.0	ST-12	4-A
7	DC or AC-DC	300	176.0	ST-16	4-A
8	DC or AC-DC	300	132.0	ST-16	4-A
9	DC or AC-DC	300	50.0	ST-16	4-A
46A1	DC or AC-DC	400	46.1	ST-12	2-S
46B1	DC or AC-DC	300	46.1	ST-12	2-S

*The voltage drop shown is for average operation and may vary according to the supply voltage.

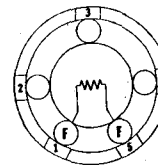
BASE VIEWS



4A



4T



2S

SYLVANIA ELECTRIC PRODUCTS INC.

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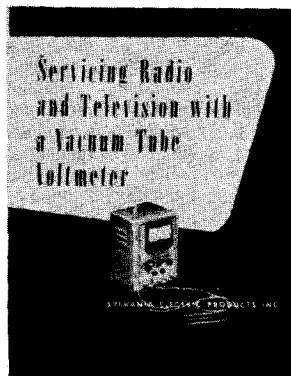


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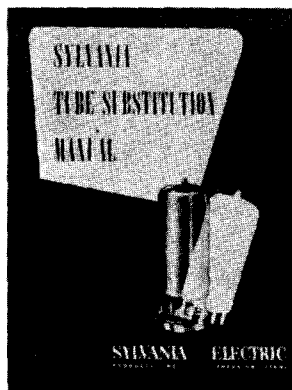
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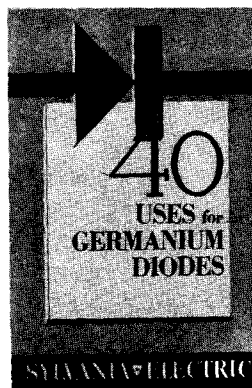
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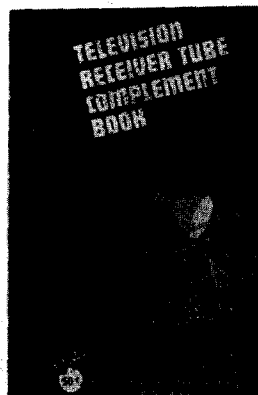
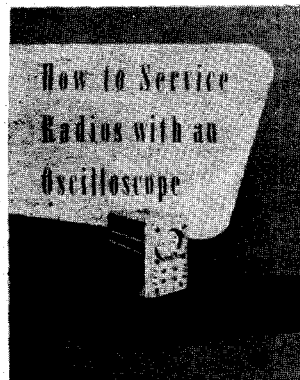
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