Vol. 12

CISIN'S
NEW
CONDENSED EDITION
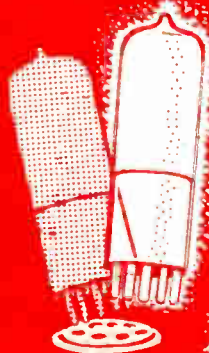
TV
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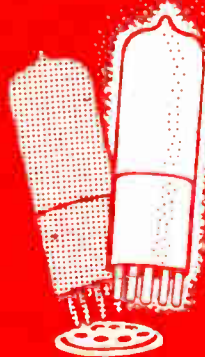
INCLUDING
FOREIGN
SUBSTITUTIONS

SUBSTITUTION
GUIDE

NEW
TV & RADIO
TUBE SUBSTITUTION GUIDE

CONDENSED EDITION ▪ VOLUME 12

By **H. G. CISIN**, *E. E.*
Consulting Engineer

This new edition is an up-to-date, condensed substitution guide for the more widely used tubes. It is a compact, handy reference source in a form which permits it to be carried in coat pocket or tube caddy.

Section 1 includes tubes domestic and foreign, which can be substituted directly for U.S.A. tubes, without the necessity of any circuit or socket changes.

Section 2 lists foreign tubes and their U.S.A. equivalents.

Section 3 contains a list of tubes, many of them new, for which there are no DIRECT substitutes. However, by means of a unique consultation service described in this section, it is possible to obtain "indirect" equivalents -- tubes which will function well in place of the original ones.

HARRY G. CISIN, Publisher
Amagansett, N.Y.

SUBSTITUTES FOR U.S.A. TUBES

Tube -- Substitute	Tube -- Substitute	Tube -- Substitute
00A - 01A, 200A, 300A, 40	1AD4 - DF62(f)	1D7 - 1C7*
01A - 00A, 00AA, 01B 40, UX201A, 501A	1AE4 - 1L4*(t), 1T4*(t), 1V4*(t)	1D7G - <u>1C7G*</u>
0A2 - 0B2, 6073, 150C2(f), 6626, STV150/30(f)	1AF - 951	1D8 - <u>1B8</u>
	1AF4 - 1L4*, 1U4*, 1T4*(t), 1AJ4(t), DF96(f), W25(f)	1D8GT - <u>1B8GT</u>
		1DN5 - <u>1U5</u>
01B - 01A	1AF5 - 1S5*(t)	1D21 - SN4
0A2WA - 6073, 6626, 0A2	1AG5 - 1AJ5, 1AK5	1E3 - DC89(f)
0A3 - VR75, 0B3, 5651	1AH5 - DAF96(f), 1AF5	1E4 - 1G4, 1H4(t)
0A4 - <u>1267</u>, <u>Z300T(f)</u>	1AJ4 - 1AF4, DF96(f)	1E4G - 1G4GT, 1H4G(t) 1H4GT, 1E4GT
0B2 - <u>6074</u>, STV108/30(f), <u>0B2WA</u>, 6627	1AJ5 - 1AG5, 1AK5	
	1AK4 - 1AH4(t)	
0B2WA - <u>0B2</u>, 6074, 6627	1AK5 - 1AG5, 1AJ5	1E5 - KF35(f)
0B3 - VR90, <u>1266</u>	1AN5 - DF97	1E8 - 1C8
0C3 - <u>VR105</u>, 0C3W	1AM4 - 1AF4	1F5 - 1J5, KL35(f)
0D3 - <u>VR150</u>, <u>150C3</u>(f)	1AX2 - 1AX2A, 1AX2B, 1X2(t)	1G3 - 1K3, 1B3, <u>1J3</u>, 8016
0E3 - <u>85A1(f)</u>		
0G3 - <u>STV85/10(f)</u>	1AX2A - 1X2A, 1X2B	1G4 - 1E4, 1H4(t)
0Y4 - 0Y4G, 0Z4A, <u>1005/CK1005</u>	1B3GT - 1G3, 1J3, 1K3, <u>8016</u>, <u>2B3(t)</u>, DY30(f), 1N2, 1N2A, 1G3GT	1G5 - 1J5, 1F5
		1G6 - 1J6*(t)
0Y4G - <u>0Y4</u>, <u>1005/CK1005</u>, 0Z4A		1H2 - 1X2, 1X2A, 1X2B
		1H4 - 1E4(t)
0Z4 - <u>0Y4</u>, 0Z4A, 1003, 0Z4G	1B4 - <u>1A4</u>, <u>1E5</u>, 32, 34	1H5 - DAC32(f) HD14(f)
	1B4P - <u>951</u>	
0Z4A - <u>1003</u>, 0Y4, 0Z4, <u>0Z4G</u>, 1005/CK1005	1B5 - 25S	1HT4 - 6345
		1J3 - 1B3, 1G3, 1K3, <u>8016</u>
	1B7 - 1A7*, <u>1LC6</u>	
0Z4G - 0Z4, 0Z4A, 0Y4, 1003	1B8 - <u>1D8</u>	1J5 - <u>1G5</u>
	1C5 - 1A5*, 1Q5(t), DL35(f), N14(f)	1J6 - 1G6*
1A3 - DA90(f), 1D13(f)		1K3 - 1G3
1A4 - 1B4, 1A4P, 1A4T, 32, 34	1C6 - 1A6	1L4 - 1AF4*, 1T4, 1U4, DF92(f)
	1C7 - 1D7*, KK32(f)	
1A4P - 34, 1C4(f)		1L6 - 1U6*
1A4T - 1A4P	1C8 - 1AE5*, 1E8	1LA4 - 1LB4
1A5 - 1C5*, 1G4(t), 1Q5*	1D5 - 1E5	1LA6 - 1LC6
	1D5G - 1D5GP, 1D5GT, 1E5G, 1E5GP, 1E5GT	1LB4 - 1LA4
1A6 - 1C6*		1LC5 - 1LG5, 1LN5
1A7 - <u>1B7*</u>, 1C7*, <u>DK32(f)</u>, <u>X14(f)</u>		1LC6 - 1LA6
	1D5GP - 1D5G, 1D5GT, 1E5G, 1E5GT	1LE3 - <u>1293*</u>, 1LF3
1AB6 - 1AC6*, DK96(f)	1D5GT - 1D5, 1D5G, 1D5GP, 1E5G, 1E5GP, 1E5GT	
1AC5 - <u>1V5</u>		1LF3 - <u>1LE3</u>
1AC6 - <u>1AB6</u>, DK92(f), <u>X18(f)</u>		

*Parallel heater circuits only.   <u>Underline</u>: Good or better substitute. (f) Foreign. (t) Temporary (emergency) suhstitute.

Tube -- Substitute	Tube -- Substitute	Tube -- Substitute
1LG5 - 1LC5, 1LN5	2B4 - 885	3B24 - 3B24WA, 3B24A
1LN5 - 1LC5, 1LG5	2B7 - 2B7S	3BA6 - 3AU6
1M3 - DL70(f), 1N3	2B7S - 2B7	3BE6 - 3BY6(t)
1N3 - 1M3	2B25 - 1091	3BN4 - 3BN4A
1N5 - 1P5, 1D5(t), DF33(f), Z14(f)	2C21 - 1642, 33	3BT6 - 3AV6
1P5 - 1N5	2C23 - 10Y	3BY6 - 3CS6
1Q5 - 1T5*, 1A5*, 1C5(t), DL36(f)	2C40 - 446, 446A, 446B	3BZ6 - 3BC5, 3BC6
1R4 - 1294	2C43 - 464A	3C2 - 3A3, 3B2
1R5 - DK91(f), X17(f)	2C44 - GL464, 2C43	3C4 - 3V4, DL96(f), 1P1(f)
1S2 - 1H2, DY86(f), 1S2A	2C50 - 2C52, 12SL7	3C5 - 3B5, 3Q5
1S2A - 1H2	2C51 - 5670*, 6185, 6385, 6386	3C6 - XXB(f)
1S4 - DL91(f)	2C52 - 12SL7*, 12SN7(t), 12SX7(t), 2C50	3C45 - 6130, 5137, 45Z3
1S5 - 1AF5*, DAF91(f), 1FD9(f)	2D21 - 2D21W, 5727, 2D21WA	3CE5 - 3CB6, 3CF6
1S6 - 1T6	2D21W - 2D21*, 5727, 2D21WA	3CF6 - 3BZ6, 3CE5
1T4 - 1L4, 1AF4*, 1U4, DF91(f), 1F3(f)	2E5 - 2G5	3CS6 - 3BY6
1T5 - 1A5, 1C5*, 1G4(t), 1Q5	2E25 - 2E25A	3D6 - 3LF4*, 1299*, DL29(f)
1T6 - 1S6	2E26 - 6893	3E5 - 3V4, 3C4, DL96(f), N25(f)
1U4 - 5910, 1AF4*, 1L4, 1T4, DF904(f)	2E30 - 5812	3LE4 - 3LF4
1U5 - 1DN5, DAF92(f)	2E31 - 2E32	3LF4 - 3LE4, 3D6*, 1299*
1U6 - 1L6	2E32 - 2E31	3Q4 - 3S4, DL95(f), N18(f)
1V - 6Z3	2E35 - 2E36	3S4 - 3W4(f), N17(f), 3Q4
1V5 - 1AC5	2E36 - 2E35	3Q5 - 3B5, 3C5, DL33(f)
1V6 - DCF60(f)	2E41 - 2E42	3S4 - 3Q4, DL92(f), N17(f), 1P10(f)
1W4 - A11B(f)	2E42 - 2E41	3V4 - 3C4*, 3E5*, DL94(f), N19(f)
1W5 - 1V5(t)	2EA5 - 2CY5(f), 2EV5(f)	4BC8 - 4BK7, 4BQ7, 4BQ7A, 4BS8, 4BZ7, 4BZ8
1X2 - 1AX2(t), 1AX2A, 1X2A, 1X2B	2G5 - 2E5	4BK7 - 4BC8, 4BQ7, 4BS8, 4BZ8
1X2A - 1AX2, DY80(f), 1X2B	2G21 - 2G22	4BQ7 - 4BC8, 4BK7, 4BS8, 4BZ7, 4BZ8, 4BQ7A
1X2B - 1AX2, 1X2A, 1H2	2G22 - 2G21	4BS8 - 4BC8, 4BK7, 4BQ7, 4BQ7A, 4BZ8
2A3 - 45, 5390, 2A3A, 2A3W	2T4 - 2AF4, 2AF4A, 2AF4B	4BX8 - 4BC8, 4BK7, 4BQ7, 4BS8, 4BZ8
2A3A - 5930	2X2 - 879, 2B21(f), 143D(f), 2X2A, 2X2W	4BZ7 - 4BC8, 4BK7, 4BQ7, 4BS8, 4BZ8, 4BQ7A
2A3W - 5930	2X2A - 879, 2B21(f), 143D(f), 2X2	4BZ8 - 4BC8, 4BK7, 4BQ7, 4BS8
2A6 - 55*	2X2W - 2X2	4CB6 - 4DT6(t), 4DE6
2A7 - 2A7S	3A3 - 3B2, 3C2	5AR4 - GZ34(f)
2AF4 - 2T4, 2AF4A, 2AF4B	3A4 - DL93(f)	5AS4 - 5AS4A, 5AW4, 5U4GA, 5U4GB, 5V3, 5931, 5AU4, 5AX4GT, 5U4G
2AF4A - 2AF4, 2AF4B, 2T4	3A5 - DCC90(f)	
2AF4B - 2AF4A, 2AF4, 2T4	3AL5 - XAA91(f)	
2B3 - 1B3(t)	3AU6 - 3BA6, XF91(f)	
	3A V6 - 3BT6	
	3B2 - 3A3, 3C2	
	3B4 - HD30(f)	
	3B5 - 3C5, 3Q5	
	3B7 - 1291	

*Parallel heater circuits only. Underline: Good or better substitute. (f) Foreign. (t) Temporary (emergency) substitute.

Tube	Substitute	Tube	Substitute	Tube	Substitute
5AU4	5AW4, 5U4GA, 5U4GB, 5V3, 5931, 6AS4, 5R4GY, 5T4, 5U4G, 5AS4A	5U8	5EA8	6AD5	6AE5, 6AF5, 6C5, 6J5, 6J5GT, 6J5WGT, 6P5
5AW4	5U4, 5AU4, 5U4GA, 5U4GB, 5V3, 5391, 5AS4, 5R4GY, 5T4, 5U4G, 5AS4A, 5W4	5V3	5AS4, 5AU4, 5AW4, 5U4GB	6AD6	6AF6
5AX4	5AS4, 5U4GA, 5U4GB, 5931, 5T4, 5U4G, 5W4, 5Y3, 5Y3GT, 5Y3G/GA, 5Z4	5V4	5V4GA, GZ32(f)	6AE5	6AD5, 6C5, 6J5, 6J5GT, 6J5WGT, 6P5
5BK7	5BQ7, 5B27	5W4	5W4GT, 5W4G	6AE8	X79
5CG4	5Y4GA	5X3	5Z3, 80, 83, 83V, 1275	6AF4	6T4, 6AN4, 6AF4A
5CL8	5CL8A, 5CL8AGA	5X4	5X4GA, 5Y4G, 5Y4GA, 5Y4GT	6AF5	6AD5, 6AE5, 6C6, 6J5, 6P5
5R4G	5R4WGA, 5R4WGB, 5R4WGY, 5AW4, 5T4, 5AX4, 5U4G, 5AS4, 5Z4, 5931	5Y3	5Y3GT, 5Y3WGT, 5Y3WGTA, 5Y3WGTB, 5Y3GA, 5AW4, 5AX4, 5T4, 5AX4GT, 5V4, 5W4, 5Z4, 5931, 5U4G, 5U4GA, 5U4GB, U50(f), 6087, 6106	6AF6	6AD6
5R4GY	5R4GYA, 5AW4, 5R4G	5U4G	5X4, 5Y4GA, 5Y4GT	6AG5	6AK5*, 6AJ5*(t), 6186, 6BA6, 6CE5, 6BC5, 6CF6, 6BD6, 6CB6, 6AH6, 6AS6(t), 6AS6W(t), 6BH6(t), 6BJ6(t), 5590*, 5591*, 9001*, 9003*, EF96(f)
5R4WGA	5R4WGB, 5R4WGY	5Z3	5X3, 80, 83, 83V, 1275	6AG7	6AK7, 6AG7Y
5R4WGB	5R4WGA, 5R4WGY	5Z4	5V4GA, 5V4G, GZ30(f)	6AH6	6BC5*, 6AJ5*(t), 6485, 6AK5*(t), 6AU6*(t), 6BD6*(t), 6AH6WA
5R4WGY	5R4WGA, 5R4WGB	6A4/LA	52, LA	6AJ4	6AM4
5T4	5AS4, 5AW4, 5AX4, 5R4G, 5U4G, 5U4GA, 5U4GB, 5W4, 5Y3, 5Z4, 5931	6A5	6B4	6AJ5	6CF6*(t)
		6A6	6E6*, B63(f)	6AJ7	6AC7, 6AB7, 1852, 1853, 6SD7*, 6SE7*, 6SJ7*, 6SS7*, 5693*
		6A7	6A7S		
5U4G	5AS4, 5AW4, 5AX4GT, 5U4WG, 5T4, 5U4GA, 5U4GB, 5V3, 5W4, 5Y3, 5931, U52(f), GZ34(f), H52(f)	6A8	6D8*, 6J8, 6K8, X63(f), 6A8G, 6A8GT	6AJ8	ECH81(f), DP61(f)
		6AB4	EC92(f)	6AK5	6AG5*, 6AJ5(t), 6CF6, 6AK5WA, 6AK5W, 6BC5*(t), 5590*, 5591*, 9003, 5654, 6096, 408A, EF95(f)
		6AB5	6E5*(t), 6N5		
5U4GA	5AS4, 5AW4, 5AU4, 5AX4, 5T4, 5U4G, 5U4GB, 5V3, 5W4, 5Y3, 5Z4, 5931, H52(f), U52(f), GZ34(f)	6AB6	6AC6*	6AK7	6AG7
		6AB7/1853	6AC7/1852, 6AJ7, 6SD7*, 6SE7*, 6SJ7*, 6SK7*, 6SS7*, 5693*	6AK8	6T8, 6T8A, DH719(f), 6R8
5U4GB	5AS4, 5AU4, 5AW4, 5AX4, 5T4, 5U4G, 5U4GA, 5V3, 5Y3, 5Z4, 5931, U52(f)	6AB8	ECL80(f), SN152(t)	6AL5	6AL5W, 5726, 6058, 6097, 6663, D77(f), DD6(f), EB91(f), EA91(f), 6D2(f), D152(f), DD7(f)
		6AC5G	6AC5GT		
		6AC5GT	6AC5G	6AM4	6AJ4
		6AC6	6AB6*	6AM6	6064, EF91(f), SP6(f), 6F12(f), 8D3(f), Z77(f)
		6AC7	6AB7, 6AC7W, 6AJ7, 6SD7*, 6SJ7*, 6SK7*, 6SS7*, 1852, 1853, 6006*, (f) 6134, 5693*, 6F10	6AM8	6AM8A

*Parallel heater circuits only.   Underline: Good or better substitute.
(f) Foreign.   (t) Temporary (emergency) substitute.

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Tube -- Substitute	Tube -- Substitute	Tube -- Substitute
6AN4 - 6AF4, 6T4, 6AF4A	**6BA6** - 6AU6, 6BD6,	**6BL4** - 6AU4GTA,
6AN5A - 6AN5WA	6AG5, 6BC5,	6AX4(t)
6AN8 - 6AN8A	6CG6, 6BA6W,	**6BL6GT** - 6BX7, 6SN7*,
6AQ4 - EC91(f), 6L34(f)	5749, 6136,	6SU7*(t), 5592,
6AQ5 - 6BM5, 6AQ5A,	EF93(f), HM04(f),	5591*(t), 6SL7(t),
6AQ5W, 6BF5*(t),	6660	6BL7GTA
6005, 6669, EL90(f)	**6BA8** - 6BA8A, 6AU8,	**6BK7A** — 6BK7B, 6BQ7,
6AQ6 - 6AT6*, 6AV6*,	6AW8, 6BH8	6BQ7A, 6BS8,
6BF6*, 6BK6*,	**6BC5** - 6CE5, 6CF6,	6BZ7, 6BZ8,
6BT6*, 6BU6*,	6AG5(t), 6AJ5*(t),	X155, 6BC8
6066*, A4375A,	6AK5*(t), 9001*(t),	**6BM5** - 6AQ5
D28	9003*(t), 5591*,	**6BM8** - ECL82(f)
6AQ8 - ECC85(f), B719(f)	5654*, 6AS6*(t)	**6BN5** - EL85(f)
6AR6 - 6AR6WA, 6098,	**6BC8** - 6BQ7A, 6BS8,	**6BN8** - 6BJ8
6098W, 6384	6BQ7GB, 6BK7,	**6BQ5** - EL84(f), N709(f)
6AS6 - 6AS6W, 5725,	6BK7A, 6BK7B,	**6BQ6G** - 6BQ6GT, 6BQ6GTA,
7752	6BZ7, X155	6BQ6GTB, 6CU6,
6AS7G - 6080, 6080WA, WB	**6BD4** - 6BD4A, 6BK4,	6DQ6, 6DQ6A
6AT6 - 6AV6, 6066,	**6BD4A** - 6BK4	**6BQ7** - 6BC8, 6BK7, 6BS8,
DH77(f), EBC90(f),	**6BD5** - 6AU5*(t), 6AV5*(t)	6BK7A, 6BQ7A,
6BF6, 6BK6,	**6BD6** - 6AH6*(t), 5749	6BZ7, 6BZ8, X155
6BT6, 6BU6	**6BE6** - 5915, EK90(f),	**6BQ7A** - 6BS8, 6BZ7, 6BC8,
6AT8 - 6AT8A	6BY6, 5750	6BK7, 6BK7A,
6AU4 - 6AX4, 6BL4,	**6BE7** - EQ80(f)	6BZ8, X155
6W4, 6AU4GTA	**6BE8** - 6BE8A	**6BR5** - EM80(f)
6AU5 - 6AV5*, 6BD5*	**6BF5** - 6AQ5*(t),	**6BR8** - 6CL8A, 6BR8A
6AU6 - 6BA6, 6BD6,	6AQ5A*(t)	**6BS7** - 8D7(f)
6AU6WGT,	**6BF6** - 6BU6, A-4442	**6BS8** - 6BC8, 6BK7,
6AU6A, 6AU6WB,	**6BF7** - 6BG7	6BK7A, 6BQ7.
6136, 5749, 6163,	**6BG6G** - 6CD6*(t), 6DN6,	6BQ7A, 6BZ8,
5590*, 7543(f),	6BG6GA	X155
5591*, 9001*,	**6BG7** - 6BF7	**6BT6** - 6066, 6BK6, 6AQ6*
6AG5(t), 9003*	**6BH6** - 6BJ6, 6AS6*,	6BD7*, 6AV7
6AU7 - 6AU7A, 7AU7	6BC5*(t), 6CB6*,	**6BU6** - 6BF6
6AU8 -6AW8, 6BA8, 6BH8	6265*, 6661,	**6BW4** - EZ81*(f), 6CA4
6AV4 - 6BX4, 6X4	E90F(f)	**6BW7** - 6BX6
6AV5 - 6AU5*, 6BD5*,	**6BH8** - 6AU8, 6AW8, 6BA8	**6BX4** - 6X4, 6AV4*, 6Z31
6AV5GA	**6BJ5** - N78(f)	**6BX6** - 6BN7, 6BY7,
6AV6 - 6AT6, 6AQ6*, 6066,	**6BJ6** - 6BH6, 6BA6*,	EF80(f), Z152(f),
6BT6, EBC91(f)	6AS6*, 6BC5*(t),	Z179(f)
6AW8 - 6AU8, 6AW8A	6CB6*, 6BA6W,	**6BX7** - 6BL7
6AX4 - 6AU4, 6BL4, 6U4,	5749, 6136, 6662	**6BX8** - 6BC8, 6BE6,
6DA4	**6BJ8** - 6BN8	6BK7, 6BQ7, 6BS8,
6AX5 - 6W5*, 6X5*,	**6BK4** - 6BD4A	6BZ7, 6BZ8, X155
6ZY5*, 1274	**6BK6** - 6066, 6AT6, 6AV6,	**6BY6** - 6CS6, 5915
6AX8 - 6AU8, 6U8*, 6U8A*	6BF6, 6BT6, 6BU6	**6BY7** - 6BX6, EF85(f),
6B4 - 6A5	**6BK7** - 6BK7B, 6BQ7,	W179(f)
6B6 - 6Q7, 6Q7G, 6Q7GT,	6BQ7A, 6BS8,	**6BZ6** - 6CB6, 6DE6
DH63(f)	6BZ7, 6BZ8, X155,	6CF6,
6B8 - 6B8G, EBF32(f)	6BC8	EF190(f)

*Parallel heater circuits only.   Underline: Good or better substitute. (f) Foreign.
(t) Temporary (emergency) substitute.

Tube	--	Substitute
6BZ7	-	6BQ7A, 6BQ7, 6BK7A, 6BK7, 6BC8, 6BZ8, 6BQ8, 6BS8, X155
6BZ8	-	6BC8, 6BK7A, 6BK7, 6BS8, 6BZ7, 6BQ7A, 6BQ7, 6BQ8, X155
6C4	-	5610, 6135, 9002(t), EC90(f), 6C4W, L77(f), 6100, 6C4WA
6C5	-	6AD5, 6AE5, 6AF5, 6L5*
6C6	-	6D6, 77, 78, 1221, 1603, 7700
6C8	-	6F8*,
6CA4	-	EZ81*(f), 6BW4*
6CA7	-	6L6*, EL34(f), 6L6GB*, 6L6GC* KT66*(f), 5881*, 7027*, 6L6G, 6L6GA, 7D11(f), 12E13(f)
6CB5	-	6CB5A
6CB6	-	6DE6, 6CB6A, 6BZ6, 6DC6, 6AS6*(t), 6BH6*(t) 6BJ6*(t), 6CF6, 6AG5, 6BC5, 6AJ5(t)*, 6AK5*, 5590*, 5591*, 5654*
6CD6G	-	6DN6, 6BG6*, 6CD6-GA
6CD7	-	EM34(f)
6CF6	-	6CB6, 6AG5, 6AK5, 6BC5, 5590, 5591, 5654, 9001(t), 9003(t), 6AJ5*(t), 6186
6CG6	-	6AG5, 6AU6, 6BA6, 6BC5, 6BD6, 6AH6*, 6AK5*, 5591*, 5654*, 5590*(t), 9001*(t), 9003*(t), 6AJ5*(t)

Tube	--	Substitute
6CG8	-	6CG8A
6CH6	-	6132, EL821(f), EF82(f), M8135(f) EL822(f)
6CJ6	-	EL81(f)
6CK6	-	EL83(f)
6CL6	-	6677
6CL8	-	6CL8A
6CN6	-	EL38(f)
6CQ6	-	EL38(f), 9D6(f)
6CR4	-	A2521
6CS6	-	6BY6, 6BE6, EH90(f)
6CT7	-	EAF42(f)
6CU6	-	6DQ6G, 6BQ6GT, 6DQ6A, 6BQ6GTA 6BQ6GTB, 6DQ6, 6DQ6A
6CU7	-	ECH42(f)
6CV7	-	EBC41(f)
6CW5	-	EL86(f)
6CW7	-	ECC84(f)
6D6	-	6C6, 77, 78
6D7	-	6E7
6D8	-	6A8*, 6J8*, 6K8*, X73M(f)
6DA6	-	EF89(f)
6DC6	-	6BZ6, 6CB6, 6DE6
6DC8	-	EBF89(f)
6DE6	-	6BZ6, 6CB6, 6DC6
6DG6	-	6W6, 6K6*, 6V6*
6DJ8	-	ECC88(f)
6DN6	-	6CD6,6BG6, 6BG6GA
6DQ6	-	6BQ6GT, 6BQ6GTA, 6CU6 6DQ6A
6DR8	-	EPF83(f)
6DS8	-	ECH83(f)
6E5	-	6T5, 6U5, 6G5, OSW3110(f)
6E6	-	6A6, B63(f)
6ES6	-	EF97(f)
6E7	-	6D7
6E8	-	ECH35(f)
6E8A	-	6GH8 (except R. F. osc. and mixer)
6F4	-	6L4(t)

Tube	--	Substitute
6F5	-	6F5GT, H63(f)
6F6	-	6K6*, 6L6*, 6U6*, 6V6*(t), 1611, 5881*, 1621, 1622*, KT63(f), 6F6G, 6F6GT
6F7	-	6F7S
6F7S	-	6F7
6F8	-	6C8*
6G5	-	6E5, 6T5, 6U5, 6AB5*
6G6	-	6F6, 6K6, 6V6
6G7	-	89RS(f)
6GH8	-	6EA8
6H5	-	6U5, 6G5, EM35(f), Y61(f)
6H6GT	-	EB34(f), D63(f), 6H6WGT 6H6GT
6J4	-	6J4WA
6J5GT	-	6AD5, 6AE5, 6AF5, 6C5, 6L5*, 6P5, 6J5WGT, L63(f)
6J6	-	5964, 6101, 6J6A, 6J6W
6J7	-	6J7GT, 6K7, 6S7*, 6U7, 6W7*, 6J7G, 7000, 1223, 1620
6J8	-	6A8, 6D8*, 6K8
6K4	-	6AD4
6K6	-	6F6*, 6L6*(t), 6U6*, 6V6*, 6G6*(t) 1621*, 5871
6K7	-	6J7, 6S7*, 6U7, 6W7*, 5732, 6K7G, 6K7GT, 1NR81(f)
6K8	-	6A8, 6J8
6L4	-	6F4(t)
6L5	-	6AD5*, 6AE5*, 6C5*
6L6	-	6F6*, 6K6*, 6U6*, 6V6*, 1614, 6L6W, KT66*(f), 5881, 1622, 1621*, 5932, 6550, 7027*, 6L6G, 6L6GB, 6L6GC, 6L6W
6L6GA	-	6L6GAY, 6L6GB, 6L6WGA

*Parallel heater circuits only. Underline: Good or better substitute. (f) Foreign.
(t) Temporary (emergency) substitute.

Tube -- Substitute	Tube -- Substitute	Tube -- Substitute
6L6GB - 6L6WGB	6SN7GT- 6BL7*, 6BX7*,	6W2 - 6X2
6L6GT - 6L6WGT	6SL7*, 6SL7GT*,	6W4 - 6AX4, 6U4, 6AD4
6L7 - 1612, 6L7G	6SN7GT,	6W5 - 6AX5*, 6X5*,
6N6 - 6AB6*	6SN7WGT,	6ZY5*
6N7 - 6Y7, 6Z7, 1635*,	6SN7GTA, 5692,	6W6 - 6G6*, 6L6(t)*,
6N7GT	6SN7GTB, 5691(t),	5881*, 6F6*(t),
6N8 - EBF80(f)	6180, B65(f),	6K6*, 6U6*, 6V6*,
6P5 - 6AD5, 6AE5,	ECC33*(f)	6Y6G, 6Y6GA,
6AF5, 6C5, 6J5,	6SN7GTA - 6SN7WGTA	6Y6GT
6L5*	6SQ7 - 6SR7, 6ST7*,	6W7 - 6J7*, 6K7*, 6U7*,
6P8G - ECH35(f)	6SZ7*, 6SQ7G	6S7
6Q4 - EC80(f)	6SR7 - 6SQ7, 6SZ7*,	6X2 - 6W2, EY51(f),
6Q5G - 884	6ST7*, 6SR7GT	R12(f), U43(f)
6Q7 - 6B6, 6R7, 6T7*,	6SS7 - 6SJ7*, 6SK7*,	6X4 - 6X4W, 6BX4,
6V7, DH63(f)	6SS7GT	6AV4*, 6063,
6R4 - EC81(f)	6ST7 - 6SQ7*, 6SR7*	6202, EZ90(f)
6R7 - 6Q7, 6T7*6V7	6SU7 - 6SL7, 6 SN7(t),	U78(f)
6R8 - 6T8, 6AK8, 6T8A	6113	6X5 - 6X5GT, 6AX5*,
6S4 - 6S4A	6SV7 - 6SF7	6W5*, 6ZY5*,
6S7 - 5732*, 6W7, 6J7*,	6SZ7 - 6SQ7*, 6SR7*,	1274*, 6X5WGT,
6K7*, 6U7*,	6ST7	EZ35(f), U147(f),
KTW61(f)	6T4 - 6AN4, 6AF4	U70(f)
6SA7GT- 5961, 6SB7Y,	6T5 - 6AB5*, 6E5, 6U5,	6X8 - 6X8A
6SA7WGT	6G5, 6N5	6Y5 - 6Z5 (6-volt use
6SB7Y - 6SA7, 5961	6T7 - 6B6*6Q7*, 6R7*,	only)
6SD7 - 6AB7*, 6AC7,*	6V7*	6Y6 - 6K6*, 6L6*, 6U6*,
6SS7*, 6SE7,	6T8 - 6R8, 6AK8,	6V6*, 6G6*(t),
6SJ7, 6SK7, 5693,	EABC80(f), 6T8A	6Y6G, 6Y6GA,
1852*, 1853*	6U3 - EY80(f)	6Y6GT
6SF7 - 6SV7	6U4GT - 6AX4GT, 6DA4,	6Y7 - 6N7*, 6Z7*, 1635
6SG7 - 6AB7*, 6AC7*,	6W4	6Z3 - 1V
6006 , 6SG7GT,	6U5 - 6G5, 6AB5*, 6E5*,	6Z4 - 84, 98
6SH7*	6N5*, Y61(f)	6Z5 - 6Y5(6-v use only)
6SH7 - 6AB7*, 6AC7*,	6U6 - 6F6*, 6G6*(t),	6Z7 - 6N7*, 6Y7*
6SG7, 6006,	6K6*, 6L6*(t),	6ZY5 - 6AX5*, 6W5*, 6X5*
6SG7GT, 6SJ7,	6V6*, 6W6*(t),	1274
6SK7, 6SH7GT	5881*	7A4 - 7B4, XXL
6SJ7 - 5693, 6SK7,	6U7G - 6K7GT/G, 6U7GT,	7A5 - 7B5*, 7C5*
6SS7*, 6006,	6J7G, 6J7GT,	7A7 - 7H7, 7L7, 7B7*,
6SJ7GT, 6SJ7Y	5732	7C7*
6SJ7GT- 6SJ7WGT	6U8 - 6AX8, 6U8A ,	7A8 - 7B8*, 7J8*, 7S7*
6SK7 - 6AB7*, 6AC7*,	ECF82(f),	7AB7 - 1204
6SG7, 6SH7, 6SJ7,	6V3 - 6V3A	7AD7 - 7AG7*(t), 7AH7*(t),
6SS7*, 6137, 6006,	6V4 - EZ80(f)	7AJ7*(t), 7AK7*(t),
6SK7GT, 6SK7W	6V6 - 6F6*, 6G6*(t),	7B7*(t), 7C7*(t),
6SL7GT- 6SL7WGT, 6113,	6K6, 6L6*, 6U6*,	7G7*(t), 7H7*(t),
6SN7*, 6SU7,	6W6*, 6Y6*, 1621*,	7L7*(t), 7T7*(t),
5691*, 6592(t)	1622*, 5871, 5992,	7V7*(t)
6SL7W,	6V6GTA, 6V6GT	7AF7 - 7F7
6SU7GTY	6V7 - 6R7, 6T7*	7N7*

*Parallel heater circuits only.   Underline: Good or better substitute.   (f) Foreign.
(t) Temporary (emergency) substitute.

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Tube -- Substitute	Tube -- Substitute	Tube -- Substitute
7AG7 - 7AH7, 7B7(t), 7C7(t), 7AJ7*(t), 7AK7*(t), 7G7*, 7H7*, 7L7*, 7T7*, 7V7*	7T7 - 7A7, 7B7*, 7G7*, 7H7, 7L7, 7V7, 1232*, 1273	12AU6 - 12BA6, 12BD6, B329(f), ECC82(f), HF94(f)
7AH7 - 7AG7, 7B7(t), 7C7(t), 7AJ7*, 7AK7*(t), 7G7*(t), 7H7*(t), 7L7*(t), 7T7*(t), 7V7*(t)	7V7 - 7B7*, 7C7*, 7G7, 1231	12AU7 - 12AU7WA, 5814, 5814A*, 6067, 6189, 6680, 5963, 12AZ7*(t), 12AU7A, 12AT7, 12AX7, 12AY7, 12AV7*
	7X7 - XXFM(f)	
	7Y4 - 7Z4*	
	7Z4 - 7Y4	
	8A8 - LZ319(f), PCF80(f), 30C1(f)	
7AJ7 - 7AH7*, 7AK7*(t), 7B7*(t), 7C7(t), 7G7*(t), 7V7*(t). 7H7, 7L7, 7T7	8AU8 - 8AW8, 8BA8, 8BH8, 8AU8A	12AV6 - 12AT6, 12BK6, 12BT6, 12BU6, 12BF6(t), HBC91(f)
	8AW8 - 8AU8, 8BH8	
	8BA8 - 8AU8, 8AW8	12AV7 - 5965, 12AZ7, 12AT7*, 6829, 6414, 12AU7*, 12AX7*, 12AY7*, 12BH7*, B339*(f), 12AX4GTA
7AK7 - 7AH7(t)*, 7AJ7*(t), 7B78(t), 7C7*(t), 7G7*(t), 7H7*(t), 7L7*(t), 7T7 *(t), 7V7*(t)	8BH8 - 8AU8, 8AW8	
	9A8 - PCF80(f)	
	9AK8 - PABC80(f)	
	9AQ8 - PCC85(f)	
	9U8 - PCF82(f), 9U8A	
7AU7 - XCC82(f)	10 - 10Y, RK10, 50, 210, 310	12AX7 - 12AT7, 12AU7, 12AY7, 12AV7*, 12BH7*, 12AZ7*, 12AD7, 5751*, 6057, 6681, ECC83(f)
7B4 - 7A4, XXL		
7B5 - 7A5*, 7C5*	10Y - 10, RK10, 50, 210, 310, 410, 2566A, 2C23	
7B6 - 7E6		
7B7 - 7AH7, 7C7, 7H7*, WG149(f)	12A - 71A	
7B8 - 7A8*, 7J7, 7S7	12A4 - 12B4	12AY7 - 12AT7, 12AU7, 12AV7*, 12AX7, 12BH7*, 6072*
7C4 - 1203A	12A8 - 12K8	
7C5 - 7A5*, 7B5*	12AC5 - UF41(f)	12AX4GT - 12AX4GTA
7C6 - 7B6*, DH149(f)	12AC6 - 12AF6	
7C7 - 7B7, 7H7	12AD6 - 12AG6	12AZ7 - 12AT7*, 12BH7*, 12AU7*(t), 12AX7*(t), 12AY7*(t), 12AV7
7E5 - 1201	12AD7 - 12AX7*	
7E6 - 7B6, 7C6*	12AE6 - 12AT6, 12AV6	
7E7 - 7R7	12AF6 - 12AC6	
7F7 - 7AF7, 7N7*	12AF7 - 6679	12B4 - 12A4, 12B4A
7F8 - 7F8W	12AG6 - 12AD6	12B6 - 12B6W
7G7 - 7A7*, 7B7*, 7C7*, 7H7*, 7L7*, 7V7, 1232*, EF22(f)	12AK7 - 12AZ7*, 12AX7, 12AY7, 12AD7	12B7 - 14A7
		12BA6 - 12AU6, 12BD6, HF93(f)
	12AT6 - 12AV6, 12BK6, 12BF6(t), 12BT6(t), 12BU6(t), HBC90(f)	
7G8 - 1206		12BD6 - 12AU6, 12BA6
7H7 - 7A7, 7B7*, 7C7*, 7L7, 7T7, 7V7*, 1273		12BE6 - HK90(f)
		12BF6 - 12BU6, 12AT6(t), 12AV6(t), 12BK6, 12BT6
7J7 - 7B8, 7S7	12AT7 - 12AT7WA, 6060, 6201, 6679, 12AU7, 12AV7, 12AX7, 12AY7, 12AZ7*, ECC81(f) B309(f), B152(f), 12BH7*	
7L7 - 7A7, 7G7*, 7H7, 7T7, 7V7*		12BH7 - 12AT7*, 12AU7*, 12BH7A, 12AV7*, 12AX7*, 12AY7*, 12AZ7*
7N7 - 7AF7*, 7F7*		
7R7 - 7E7		
7S7 - 7B8, 7J7, X148(f), X81M(f)		12BK6 - 12BU6, 12BT6, 12AT6, 12AV6, 12BF6(t)

*Parallel heater circuits only. Underline: Good of better substitute. (f) Foreign. (t) Temporary (emergency) substitute.

Tube -- Substitute	Tube -- Substitute	Tube -- Substitute
12BQ6 - 12BQ6GA, 12BQ6GTA, 12BQ6GTB, 12CU6, 12DQ6, 12CH6	12SN7 - 12SX7, 12SL7*(t), 12SN7GT, 12SN7GTA, B36(f)	25A6 - 25B6, 25C6, 25L6, 5824
12BT6 - 12AT6, 12AV6, 12BK6, 12BU6, 12BF6(t)	12SQ7 - 12SR7, 12SW7(t)	25A7 - 32L7
	12SR7 - 12SQ7, 12SW7, 12SR7GT	25AV5GT - 25AV5GA
12BU6 - 12BF6, 12AT6(t), 12AV6(t), 12BK6(t), 12BT6(t)	12SW7 - 12SQ7(t), 12SR7	25AX4 - 25U4, 25W4
	12SX7 - 12SN7, 12SL7*(t)	25B5 - 43
12BV7 - 12BY7, 12BY7A	12SY7 - 12SA7	25B6 - 25A6, 25G6, 25L6, 25N6, 5824
12BY7 - 12BY7A, 12BV7	12W6 - 12L6, 1632	25BQ6 - 25BQ6GT, 25BQ6GA, 25BQ6GTB, 25CU6, 25DQ6
12BZ7 - 12AX7*	14A7/12B7 - 1280, 1284, 12B7, 14C7, 14H7	
12DQ6 - 12BQ6, 12CQ6	14AF7/XXD - 14F7, 14N7*	25BQ6GA - 25BQ6GTB, 25CU6, 25DQ6
12C5 - 12CA5, 12CU5, 12R5	14B6 - 14E6	
	14B8 - 14J7, 14S7	25BQ6GT - 25BQ6GA, 25BQ6GTB, 25CU6
12CA5 - 12C5	14C5 - 14A5*	25DQ6
12CU5 - 12C5	14C7 - 14B7, 1284, 14A7, 14A7, 14H7, 1280	25C5 - 25CA5
12CU6 - 12BQ6, 12DQ6		25C6 - 25A6, 25B6, 25L6, 5824
12D4 - 12AX4, 12AX4GTA	14E6 - 14B6	
12DQ6 - 12BQ6, 12BQ6GA, 12BQ6GTA, 12BQ6GTB, 12CU6, 12CH6	14E7 - 14R7	25CA5 - 25C5
	14F7 - 14R7, 14AF7/XXD	25CD6 - 25DN6
	14H7 - 1280, 1284, 14A7	25CU6 - 25BQ6, 25DQ6, 25BQ6G, 25BQ6GA, 25BQ6GT, 25BQ6GTB
	14J7 - 14B8, 14S7	
	14K7 - UCH42(f)	
12DT7 - 7025	14L7 - UBC41(f)	
12E5 - 1626*, 12J5, 12J5GT,	14N7 - 14AF7/XX2*	25DN6 - 25CD6
12G4 - 12H4	14R7 - 14E7	25DQ6 - 25BQ6, 25BQ6G,
12H4 - 12G4	14S7 - 14B8, 1J7	25BQ6GA,
12J5 - 1626*, 12E5, 12J5GT, 12J5WGT	14W7 - 12B7, 14A7, 14C7, 14H7, 1280, 1284	25BQ6GT, 25BQ6GTB, 25CU6
	15A6 - PL83(f)	
12J7 - 12K7	16A5 - PL82(f), N329(f)	25L6 - 6046, 25A6, 25B6, 1632, 25W6, 5824, KT32(f), 13D1(f)
12K7 - 12J7, W76(f)	7DQ6 - 17DQ6GA, 17DQ6A	
12K8 - 12A8, X71M(f), X76M(f)	17Z3 - PY81(f)	25S - 1B5
	19AQ5 - HL90(f)	
12L6 - 12W6, 1632	19AU4 - 19AU4GTA	25U4 - 25AX4, 25W4
12L8 - 1644	19BG6 - 19BG6G, 19BG6GA	25W4 - 25U4, 25AX4
12SA7 - 12SY7	19C8 - 19T8	25W6 - 25L6, 6046, 25A6, 25B6, 25C6
12SC7 - 1634	19T8 - 18C8	
12SG7 - 12SH7, 12SJ7, 12SK7	19X3 - 19Y3, 19U3(f), PY80(f), U152(f)	25Y5 - 25Z5
		25Z5 - 25Y5
12SH7 - 12SG7, 12SJ7, 12SK7	19Y3 - 19X3, U154(f), PY82(f), U319(f)	25Z6 - 25Z6GT, 25Z6WGT, 35Z6(t)
12SJ7GT - 12SJ7	20 - X99*	26 - 126, 326, UX26, 226
12SK7 - 12SG7, 12SH7, 12SJ7, 12SK7GT	21A6 - PL81(f), N152(f), N359(f)	26A6 - 26CG6
		26BK6 - 26C6(t)
12SL7 - 2C52*, 12SL7GT, VT289	24A - 35/51(t), 3924	26C6 - 26BK6(t)
		26CG6 - 26A6

*Parallel heater circuits only. Underline: Good or better substitute. (f) Foreign.
(t) Temporary (emergency) substitute.

Tube -- Substitute	Tube -- Substitute	Tube -- Substitute
27 - 56, 3373	71A - 482, 483	1206 - 7G8
28J. - 28D7W, 1283	75 - 6C6(t), 85(t)	1221 - 6C6, 77
28D7W - 28D7, 1238	76 - 37	1223 - 6J7
30 - 31*	77 - 6C6, 1221	1229 - 1A4, 1B4, 32, 951
31 - 30*, 3872	78 - 6D6	1230 - 30
32 - 1A4, 1B4, 951, 3873	80 - 83V, 83, 5Z3, 3841	1231 - 7G7, 7V7
32L7 - 25A7	81 - 10(t), 50(t)	1232 - 7G7*
33 - 1F4*, 950*	82 - 2A3(t), 45(t), 1006	1238 - 28D7
34 - 1A4, 1B4, 32, 951	83 - 5Z3	1266 - 0B3
35/51 - 24A	83V - 5Z3, 80, 83	1267 - 0A4
35A5 - 50A5(series fil.)	84 - 6Z4	1273 - 7A7, 7AJ7, 7H7, 7L7, 7T7
35B5 - 50B5(series fil.)	85 - 75	1274 - 6AX5*, 6W5*, 6ZY5*, 6X5
35Z5 - 50Z6(series fil.)	85AS - 85	1275 - 5Z3, 5X3, 80, 83, 83V
35L6 - 50C6, 50L6	89 - 89Y	
35Z5 - 45Z5(series fil.)	98 - 84	1280 - 12B7, 1284
36 - 39/44, U76(f)	117L7GT - 117L7/M7GT	1284 - 12B7, 1280
37 - 76	117L7/M7GT - 117L7GT	1291 - 3B7
38 - 38A, 4612	117N7GT - 117P7GT	1293 - 1LE3*
39/44 - 36, 39A, U76(f)	117P7GT - 117N7GT	1294 - 1R4
40 - 00A, 01A, 12A	182B/482B - 71A, 183/483	1299 - 3D6
40A1 - 40B2	183/483 - 182B/482B, 71A	1612 - X64(f), 6L7(t)
40B2 - 40A1	408-A - 6AK5(t)	1614 - 6L6, 5881, EL35(f)
41 - 42	410 - 10Y	1620 - 6J7, ECH42(f)
42 - 6B5, 41	446 - 446A, 446B, 2C40	1621 - 6F6, 5581*, 6K6*, 6L6*, 6V6*.
44 - 49/44	446A - 446B, 446, 2C40	
45 - 2A3, 3921	446B - 446A, 446, 2C40	1622 - 6L6, 6F6*, 6V6*, ' 5881
45Z3 - 6130	464 - 2C44	
45Z5 - 35Z5(series fil.)	464A - 2C43	1626 - 12E5*, 12J5*
50 - 10, 3871	807 - 5933, QV05-25(f), 807W	1632 - 12L6, 12W6
50AX6 - 50Z6		1634 - 12SC7(t)
50B5 - A4388	807W - 5933, 807, QV05-25(f)	1635 - 6Y7, 6N7*
50C5 - HL92(1)		1639 - EBC33(f), DL63(f), VR55(f)
50C6 - 50L6	807WA - 5933WA	
50L6 - 50C6	884 - 6Q5	
50Y7 - 50Z7	885 - 2B4	1642 - 2C21
50Z6 - 50AX6	950 - 1F4, 33*	1644 - 12L8
50Z7 - 50Y7	951 - 1B4P/951	2050 - 2051, 2050W
53 - 5608-A	954 - 956, VR-95(f)	2566A - 10Y
55 - 2A6	955 - 5731(t)	3373 - 27
55S - 2A6, 55	955A - 5731	3841 - 80
56 - 27, 485	956 - 954, VR-95(f)	3871 - 50
56AS - 37*, 76*	957 - 958A*	3872 - 30
56S - 27, 56	958A - 957*	3873 - 32
57 - 58	1005/CK1005 - OY4, OZ4A	3921 - 45
57AS - 6C6*, 77*	1091 - 2B25	3924 - 24A
57S - 57, 58	1201 - 7E5, 1201A	4612 - 38
48 - 57(t)	1203 - 7C4, 1203A	5137 - 6130
58AS - 6D6*, 78*	1204 - 7AB7	5551 - 5551A, 5551/652
58S - 57, 58		

*Parallel heater circuits only.   Underline: Good or better substitute. (f) Foreign.
(t) Temporary (emergency) substitute.

Tube	-- Substitute	Tube	-- Substitute	Tube	-- Substitute
5590	- 6BC5*, 5591, 9001, 9003, 6AG5*(t), 401A, 6CF6*	5824	- 25B6. 25L6,	6006	- 6SG7
		5829	- 5829WA	6028	- 408A, 6028/408A
		5838	- 5839*	6046	- 25L6, 5824
		5839	- 5838*	6057	- 12AX7, 5751
5591	- 5590, 9001, 9003, 6AG5*, 6BC5*(t), 6AK5, 5654, 6CF6*	5840	- 5899, 5900, 5901, 5840A, EF72(f)	6058	- 6AL5, 5726
				6060	- 12AT7, 6201
				6061	- 6V6
5608A	- 53	5842	- 5842/417A	6063	- 6X4
5610	- 6C4, 6C4WA	5847	- 5847/404A, 404A	6064	- 6AM6·
5633	- SN-944(f), 5634			6066	- 6AT6
5634	- SD128E(f), 6533	5861	- 1DO3-10(f), EC55(f)	6067	- 5814*, 12AU7
5636	- 5636A			6072	- 12AY7
5641	- 5641A, EY70(f)	5871	- 6V6, 5992	6073	- 0A2
5647	- 6489, EA71(f), SN946(f)	5881	- 1622, 5932, 1621*, 6K6(t), 6F6(t), 6U6(t), 6V6(t), 6L6WGB	6074	- 0B2
				6080	- 6AS7G, 6080WA. 6080WB
5651	- 5651WA, 0A3				
5654	- 6AJ5, 6AK5. 6096, 5591, 6AK5W, EF95(f)	5670	- 5670WA, 2C51, 6CC42(f)	6087	- 5Y3GT
				6095	- 6AQ5W, 6AQ5, 6005, EL90(f), M8245(f), N727(f)
5685	- C6J/A	5670WA	- 5670, 2C51, 6CC42(f)		
5692	- 6SN7, 6180			6096	- 6AK5, 5654, DP61(f), E95F(f)
5693	- 6SJ7	5672	- 5678		
5702	- 5784	5676	- 5677*	6097	- 6AL5, 5726, 6663, D2M9(f), 6038, DD6(f), EAA91(f), QD77(f)
5703	- 5703WA, 5703WB, 6149	5677	- 5676*		
		5678	- 5672		
5718	- EC70(f), 6778	5687WA	- 5687		
5725	- 6AS6W, 6AS6, 6187	5691	- 6SL7*, 6SN7(t)	6098	- 6AR6WA. 6098W, 6AR6
		5899	- 5899A, 5840, 5900, 5901, EF71(f)		
5726	- 6AL5W, 6AL5, 6058, 6097	5900	- 5840, 5899, 5901	6100	- 6C4, 6C4WA, EC90(f), QL77(f)
5727	- 2D21W, 2D21	5901	- 5840, 5899, 5900	6101	- 6J6, 6J6WA, ECC91(f), M8081(f)
5731	- 955A(t)	5910	- 1U4		
5732	- 6K7, KTW63(f), W61(f), W63(f)	5915	- 6BY6, 6BE6		
		5920	- E90CCF(f), ECC960(f)	6105	- 5AZ4, 5W4, 5Y3, U50(f)
5749	- 6BA6W, 6BA6, EF93(f), W727(f), PMO4(f)	5930	- 2A3, 2A3W	6106	- 5Y3GT
		5931	- 5U4GB	6107	- BS212(f)
5750	- 6BE6, 6BE6W	5932	- 6L6, 5881	6108	- BS213(f)
5751	- 5751WA, 12AX7, 6057, 5751A	5933	- 807, 5933WA, 807WA	6109	- BS404(f)
				6113	- 6SL7, 6SU7, ECC35(f)
5751A	- 12AX7, 5751, 6057	5933WA	- 807WA		
5651WA	- 12AX7, 6057, 5751	5961	- 6SA7	6130	- 3C45, 5137, 45Z3, TG30(f)
5784	- 5784WA, 6150	5963	- 12AU7		
5812	- 2E30	5964	- 6J6	6132	- 6CH6
5814	- 12AU7, 5814WA, 12AU7A, 6067, ECC82(f)	5965	- 12AV7, 6829, 6414	6134	- 6AC7
				6135	- 6C5
		5992	- 6V6*, 5871*	6136	- 6AU6, 6AU6WA, 6AU6WB
5814A	- 12AU7, 5814 5814WA, 12AU7A	5998	- 6AS7*, 421A,		
		6000	- 6000W	6137	- 6SK7
		6005	- 6AQ5W, 6AQ5, 6095	6146	- 6293

*Parallel heater circuits only. Underline: Good or better substitute. (f) Foreign. (t) Temporary (emergency) substitute.

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Tube -- Substitute	Tube -- Substitute	Tube -- Substitute
6150 - 5784WA	6414 - 5965, 6829	6778 - EC70F(f), 5718
6180 - 5692 , 6SN7	6485 - 6AH6	6779 - Z803U(f)
6186 - 6AG5	6487 - EF70(f)	6829 - 5965, 6414
6187 - 6AS6W, 6AS6, 5725	6488 - EF73(f)	6893 - 2E26
	6489 - EA76(f), EA71(f), 5647	6906 - BL643(f), E91H(f)
6189 - 12AU7WA, 12AU7		6922 - E88CC(f)
6201 - 12AT7, 6060	6550 - 6L6	7000 - 6J7
6202 - 6X4	6661 - 6BH6	7199 - DB230A(f)
6221 - 5718	6662 - 6BJ6, E99F(f)	7036 - 5915A
6222 - 5719	6663 - 6AL5	7543 - 6AU6
6223 - 5840	6669 - 6AQ5	7700 - 6C6, 1603
6252 - QQVO3-28(f)	6677 - 6CL6	8016 - 1B3, 1G3, 1J3, 1K3
6265 - 6BH6	6678 - 6U8	
6267 - EF86(f)	6679 - 12AT7	9003 - 5590, 9001
6277 - 3B28A(f)	6680 - 12AU7	A2521 - 6CR4
6345 - 1HT4	6681 - 12AX7	CK1013- 5517
6360 - QQVO3-10(f)	6686 - E81L(f), EL861(f)	X99 - 20 *
6373 - EL79(f)		X155 - 6BZ8, 6BC8, 6BQ7, 6BK7, 6BS8, 6BZ7
6374 - EY84(f)	6687 - E91H(f), 7036	
6375 - DC70(f)	6688 - E180F(f)	XXFM - 7X7
6388 - 6388/443A	6689 - E83F(f)	XXL - 7A4

*Parallel heater circuits only.   Underline: Good or better substitute.   (f) Foreign.
(t) Temporary (emergency) substitute.

Every effort has been made to make this replacement guide complete and accurate. Nevertheless, there is always the possibility of a few errors of omission or commission. For this reason the publisher assumes no responsibility in connection with substitutions made in accordance with this guide.

If the tube for which a substitute is desired is not listed, this is probably because a change in socket or wiring would be necessary in order to use a different type tube or because no suitable substitute can be obtained.

Where a tube is to be substituted in a modern series string circuit, it is important to use only that type which has controlled warm-up time. Use of a tube lacking this feature may result in premature failure. For example a 6SN7GTA tube must not be substituted in a series string circuit for a 6SN7GTB, since the former lacks the controlled warm-up feature.

Certain tubes in the preceding lists may be substituted only in parallel connected circuits. These are indicated by an asterisk (*) after the tube designation. If no asterisk is shown, tube may be substituted either in series or parallel connected heater systems. In cases where the asterisk appears after a suggested substitute, it is necessary to know whether the heaters or filaments are connected in series or parallel. This information may be obtained readily without consulting a diagram or tracing the circuit. If a burnt out or defective tube is to be replaced, remove it from its socket. If all other tubes remain lit when the switch is turned on, the heaters are in parallel. If, upon removal of the defective tube, any other tubes show loss of heater glow, the removed tube is part of a series system hookup.

SECTION 2

SUBSTITUTES FOR FOREIGN TUBES

Tube		Substitute	Tube	Substitute	Tube	Substitute
1C1	-	1R5(t), DK91,	1R5SF	- 1AQ5	5B/250A	- 807, 5933,
		X17	2B21	- 2X2A, 2X2W,		807W, QV05-25
1C2	-	1AC6, 1AB6,		879, 143D	5F22A	- 4-250A
		DK92, X18, X20	2B94	- 5894,	5F23A	- 4-400A
1C3	-	1AB6, 1AC6*		AX9903/5894	5G24	- 5544
1C4	-	1A4P, 34	2H2B	- 3B28	5H69A	- 869B
1C5	-	DL35, N14, 1A5*	2CY5	- 2EA5, 2EV5	5J180E	- 7876
1D13	-	1A3	2H66	- 866A (See DCG4)	5M-HH3	- 5J6
1E3	-	DC80	2K25	- 723A/B, K340	5P29	- 6CN6
1F1	-	1AJ4, 1AF4	2K26	- KS7-85	5S1	- 807
1F2	-	1L4(t), DF92,	2EV5	- 2EA5	5T20	- 250TL
		1U4, 1AF4*	2T24	- 3C24, HK24G,	5T21	- 250TH
1F3	-	1T4, DF91, W17		25TG,	5T30	- 450TL
1FD1	-	1AH5, 1AJ5,		3-25D3/25TG	5T31	- 450TH
		DAF96	2T25	- 8012A	5T33	- 833A
1FD9	-	1S5, DAF91,	2T26	- 826, GL826	5V5545	- 5545
		ZD17, 1AF5*	3F65	- 4-65A	6/30L2	- 6GA8
1G45P	-	3C45, H45,	3G10	- 7E5, 1201,	6AM5	- EL91, N77,
		ZG547, 5137		RGN1503		N144, 7D9
1G50	-	2050, VT-245,	3G15	- C1A	6AM6	- 6064, EF91,8D3,
		GL2050, B2A,	3G94	- 394A, WF394A		6F12, SP6, Z77
		1665	4B13	- 813	6AT7N	- 6DT8
1H16	-	816, HY886JR	4F15R	- 4X150A	6B32	- 6AL5, 5726,
		NU866JR/816,	4G23	- 3C23		6058, 6097, 6663
		GL816, VT-216	4G63	- 5563	6C9	- 6CU7*
1H35	-	1AB6	4H32	- 4B32	6C10	- 6CU7*
1P1	-	3C4, 3E5,	4H72	- 872A	6CC42	- 5670, 5670WA
		DL96, N25	4H73	- 673	6D2	- 6AL5(t), 5726,
1P10	-	3S4, N17,	4H88	- 8008		6097, 6058, 6663
		3Q4, DL92	4R-HH2	4BS8	6DG7	- EF89
1P11	-	3V4(t), N19,	4T16	- 100TL	6DL5	- EL95
		3C4*, 3E5*,	4T17	- 100TH	6E8	- 6A8(t)
		DL94	4Y25	- 807	6ECH80	- 6AN8

*Parallel heater circuits only   (t) Temporary substitute

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Tube	Substitute	Tube	Substitute	Tube	Substitute
6ECL84	- 6DX8	7F57	- 8578	40PPA	- 7D3
6F10	- 6AC7, 6AB7,	7T40	- 1000T	62CH	- 6CU7*
	6AC7W, 6AJ7,	7T45	- 1500T	62DDT	- 6CV7, EBC41,
	6SD7*, 6SJ7*,	8D3	- 6AM6, 6064,		DH150, DH718,
	1852, 1853, 6006*		EF91, SP6,		6LD3
	6134, 5693		Z77, 6F12	62VP	- 6CJ5
6F12	- 6AM6(t), 6064(t),	8D5	- 6BR7, 6059	63ME	- 6U5G
	EF91, SP6, 8D3,	8D7	- 6BS7	63T1	- 6AB8
	Z77	8F66R	- 6166	63TP	- 6AB8
6F16	- 6CJ5	8T21	- 9C21	64ME	- 6CD7(t)
6F18	- 6EC7	8T21R	- 9C22	64SPT	- 6BX6
6F19	- 6BY7	8T71R	- 5671	65ME	- 6BR5
6F21	- 6CQ6, 6065	9D6	- 6CQ6, 6065,	66KU	- 6BT4
6F22	- 6CF8, 6267		EF92, VP6,	67PT	- 6CK5, BF61,
6F50R	- 4X500A		W77		EL41, N150
6FD12	- 6DC8, 7125	9P9	- 9BM5	108C1	- 0B2(t), 0B2WA(t),
6G5G	- 6U5G	9T21	- 5770		6074, 6627, S860
6G45	- 5545+, 5685	10C14	- 19D8	85A1	- 0E3(t)
6C12	- 6AJ8	10LD3	- 14L7	85A2	- 0G3
6C16	- 6BL8	10P18	- 45B5	121VP	- 12AC5, 10F9,
6L12	- 6AQ8, ECC85,	10PL12	- 50BM8		HF121, UF41,
	B719	12E13	- 6CA7, 6L6*,		W118, W145
6L13	- 12AX7		7027, 6L6GA*,	141TH	- 14K7, UCH42,
6L16	- 6CW7		6L6GB*, 6L6G*,		X142
6L34	- 6AQ4, EC91,		7D11	150B2	- 6354, M8163,
	M8099	13D1	- 25L6, 25A6,		QS 1200
6LD3	- EBC41, DH718,		6046, 25B6,	150B3	- QS150/15
	6CV7, DH150,		25C6, 25W6,	150C2	- 0A2(t),
	62DDT		5824, KT32		0A2WA(t),
6LD12	- 6T8, 6AK8	13D2	- 6SN7GTB		S856, 6626, 6073
6M1	- 6U5G(t)	13E1	- 7972	150C3	- 0D3, KD25,
6M2	- 6CD7	14D12	- 8078		VR150
6P9	- 6BM5	16P12	- 7974	177DDP	- 17C8, 17N8,
6P15	- 6BQ5	17N8	- 17C8		UBF80
6P17	- 6AM5, 6516,	19D8	- 19AJ8	311SU	- 31A3
	EL91, M8082,	19U3	- 19X3	403A/B	- 6AK5*, 5591,
	N77, N144,	20D3	- 12AH8, PY80,		5608, 5654*,
	QA2402, QM77		U152, U309		6096*, DP61
6Z31	- 6BX4, 6X4	30C1	- 8A8(t), 9A8(t),	451PT	- 45A5, N142,
7AN7	- 30L1, B319,		LZ319		UL41, UL46,
	PCC84	30C15	- 9EN7		10P14
7D9	- 6AM5, 6516,	30F5	- 7ED7	7247	- 17DW8
	6P17, EL91,	30FL1	- 9GB8	8719	- 6AQ8
	M8082, QN77,	30L1	- 7AN7(t)	18042	- 6086, TS53(t)
	N77, N144,	30P4	- 25GF6		
	QA2042, QN77	30P12	- 12FB5	A11B	- 1W4
7D10	- 6CH6	30P16	- 16A5	A239	- 3B24W
7D11	- 6CA7, 6L7*,	30P18	- 15CW5	A2521	- 6CR4
	EL34, 6L6GB*,	30PL1	- 13GC8	A2674	- 436A+
	6L6GA*,	30PL12	- 16A8(t)	ACS4	- 6076,
	6L6GC*, KT66*,	30PL13	- 16GK8		AX9907R
	5881* 7027*	31A3	- 311SU, V311,	AGR9950-	5869
7F25	- 4-1000A		U118	AGR9951-	5870

* Parallel heater circuits only   (t) Temporary substitute

Tube	Substitute	Tube	Substitute	Tube	Substitute
AH205	- 8578	BPM04	- 6AQ5, 6AQ5A,	DCF60	- 1V6
AFX212	- 6D4		6BM5, 6005,	DCG4/1000G	- 866A,
AH213	- 869B, 6508+,		6BF5*, 6669,		C866A, C866,
	3071		EL90		RCA866A, UE966,
AH217	- 872A, 872	BR129	- 889R		UE966A, 966,
AX224	- 3828	BR191B	- 5762		966A, WL866A/
AX230	- 4B32	BK66	- 5550		866, 3069
AX4-250A	- 4-250A.	BW129	- 889A		GL866A/866,
	5D22, 4-250,	BW137C	- 9C21		NU866A/866,
	X117,	C143	- 813		UX866, RK866.
	4-250/5D22	C144	- 829B		T866A/866,
	5D23/RK65	C178A	-- 5894		CE866A/866,
AA91E	- 6AL5, 5726,	C180	- 832A, VT286		3572, CV32,
	6058, 6097, 6663	C1108	- 6155		EE866A/866,
B36	- 12SN7, 12SX7	C1123	- 4D32		Z225, GU12
B65	- 6SN7, 6BL7*,	C1134	- 6252	DCG5	- 872A
	6SL7*, 5692,	C1135	- 5867	DCG6/18	- 6693
B63	- 6A6, 6E6	CC82E	- 12AU7,	DCG6/6000	- 5869
B152	- 12AT7, 12AT7WA		12AU7WA,	DCG9/20	- 6508
	12AU7, 12AV7*,		5814, 5814A,	DCG12/30	- 5870
	12AX7, 12AY7,		6067, 6189,	DCX4/1000	- 3B28
	12AZ7*, 6060,		6680, 5963,	DD6	- 6AL5, 5726, 6058,
	6201, 6679		12AU7A,		- 6097, 6663
B262	- 5B1, 215SG, S2,		12AT7, 12AX7,	DD7	- 6AM5(t),
	S21, K40B, PM12,		12AV7*		6516(t)
	S215, SG215A,	CR139	- 827R	DDR7	- 6AM5(t), 6516(t)
	S23, S24, SS210,	CR192	- 6166	DET22	- 5861
	220SG	CR1100	- 6075	DF33	- 1N5GT, 1P5, Z14
B309	- 12AT7, 6201	CR1101	- 6181	DF60	- 5678, XFR2
	12AT7WA,	CV16	- REL46	DF62	- 1AD4
	12AU7, 6060,	CX1119	- 7384	DF66	- 5676
	12AV7*, 6679,	D2M9	- 6AL5, 5726,	DF67	- 6008
	12AX7, 12AZ7		6058, 6097,	DF91	- 1T4(t), 1L4(t),
B319	- 7AN7		6663, E91AA		1AF4*(t),
B329	- 12AU7(t),	D21	- 3D21		1U4(t)
	12AU7WA(t),	D27	- 6AL5, 6AK5	DF92	- 1L4(t), 1U4(t),
	5814, 5814A,	D63	- 6H6G, 1638,		1AF4*(t)
	6067, 6189, 6680,		OM3	DF96	- 1AF4, 1AJ4
	5963, 12AZ7*(t),	D77	- 6AL5, 5726,	DF97	- 1AN5
	12BH7*(t)		6058, 6097,	DF652	- 1AD4
B339	- 12AX7, 12AT7,		6663	DF703	- CK5886
	12AU7, 12AY7,	D152	- 6AL5, 5726,	DF904	- 1U4, 1T4, 5910
	12AZ7*, 12AD7,		6058, 6097,	DH63(M)	- 6Q7/GT(t)
	5751*, 6057,		6663	DH77	- 6AT6(t), 6066(t),
	6681, ECC83	DA90	- 1A3, 1D13		6AV6(t), 6BF6(t),
B1109	- 3C24	DAC32	- 1H5(t), HD14		6BK6(t), 6BT6(t)
B1135	- 5867	DAF91	- 1S5(t), 1AF5*	DH81	- 7B6
B142	- 833A	DAF92	- 1U5, 1DN5	DH149	- 7C6
BF61	- 6CK5	DAF96	- 1AH5, 1AJ5,	DH150	- 6CV7, 6LD3,
BK24	- 5552A		1FD1		62DDT, EBC41,
BK24A	- 6347+	DC70	- 6375		DH718
BK34	- 5553	DC80	- 1E3	DH718	- 6CV7, 6LD3, DH150,
BK42	- 5551A	DCC90	- 3A5		62DDT, EBC41,

*Parallel heater circuits only   (t) Temporary substitute

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Tube	Substitute	Tube	Substitute	Tube	Substitute
DH719	- 6T8A, 6AK8	E90F	- 6265, 6661,	EC81	- 6R4
DK32	- 1A7GT(t),		6BH6	EC84	- 6AJ7
	1B7(t)*, 1C7*(t)	E91AA	- 6AL5, 5726,	EC86	- 6CM4
DK91	- 1R5(t), X17, 1C1		6058, 6097,	EC90	- 6C4
DK92	- 1AC6, 1AB6,		6663	EC91	- 6AQ4, 6L34,
	X18, X20	E91H	- 6687, 7036		M8099
DK96	- 1AB6, 1AC6*,	E91N	- 5727, 5757,	EC92	- 6AB4
	1AF4, X25		20A3	EC93	- 6BS4
DL29	- 3D6, 3LF4*,	E95F	- 5654	EC94	- 6AF4, 6AF4A
	1299	E99F	- 6662, 6BJ6,	EC95	- 6ER5
DL33	- 3Q5, 3B5, 3C5,		7694	EC97	- 6FY5
	N17	E130L	- 7534	ECC33	- 6SN7*(t)
DL35	- 1C5(t), 1A5*(t),	E180CC	- 7062	ECC35	- 6SL7*(t)
	N14	E180F	- 6688	ECC40	.- 6N7*(t)
DL36	- 1Q5, 1T5*, 1A5*	E182CC	- 7119	ECC55	- 5861
DL63	- 1639	E188CC	- 7308	ECC81	- 12AT7
DL67	- 6007, 5913	E280F	- 7722	ECC82	- 12AU7(t)
DL70	- 1M3, 1N3	E283CC	- 5751(t)	ECC83	- 12AX7
DL82	- 7B6	E810F	- 7788	ECC84	- 6CW7(t)
DL91	- 1S4(t)	E2754	- 417A	ECC85	- 6AQ8
DL92	- 3S4(t)	EA52	- 6923	ECC86	- 6GM8
DL93	- 3A4(t)	EA76	- 6489, 5647	ECC88	- 6DJ8
DL94	- 3V4, 3C4*, 3E5*	EAA91	- 6AL5(t),	ECC89	- 6FC7
DL95	- 3Q4, 3S4, N18		5726, 6058,	ECC91	- 6J6(t)
DL96	- 3C4, 3V4, 3E5		6097, 6663	ECC180	- 6BQ7A
DL98	- 3B4(t)	EAA901	- 6AL5(t), 5726,	ECC186	- 5814, 6067,
DL620	- 5672		6058, 6097, 6663		7316
DL651	- CK546	EAA901S-	6AL5	ECC189	- 6ES8
DL652	- 5672	EAA9015-	5726	ECC803S-	12AX7, 6681
DM70	- 1M3	EABC80	- 6AK8, 6T8, 6R8	ECC801S-	6201
DM71	- 1N3	EAF42	- 6CT7	ECC802S-	12AU7
DM160	- 6977	EB34	- 6H6*(t), 1638*(t)	ECC960	- 5920
DP61	- 6AK5	EB91	- 6AL5(t), 5726(t),	ECF80	- 6BL8, 6C16
DQ4	- 8698		6058(t), 6097(t),	ECF82	- 6U8
DQ6	- 6508		6663(t)	ECF86	- 6HG8
DY30	- 1B3, 1G3,	EBC33	- 1639(t)	ECH35	- 6E8
	1J3, 1K3	EBC42	- 6CU7	ECH42	- 6J7, 6C9, 6CU7*
DY80	- 1X2A, 1X2B,	EBC41	- 6LD34, 6CV7,	ECH81	- 6AJ8
	1AX2		DH150, DH718,	ECH83	- 6DS8
DY86	- 1S2, 1S2A, 1H2		62DDT	ECH113	- 6CU7*
DY87	- 1H2	EBC80	- 6BD7	ECL80	- 6AB8
E1C	- 955	EBC81	- 6BD7A	ECL82	- 6BM8
E1F	- 954	EBC90	- 6AT6(t)	ED2	- 6AL5, 5726,
E80F	- 6084(t)	EBC91	- 6AV6(t)		6058, 6097, 6663
E81L	- 6686	EBF80	- 6N8		
E80CC	- 6085	EBF81	- 6AD8	EF22	- 7G7
E80CF	- 7643	EBF83	- 6DR8	EF70	- 6487(t)
E80L	- 6227	EBF86	- 6267	EF71	- 5899
E80T	- 6218	EBF89	- 6DC8, 7125	EF72	- 5840
E83F	- 6689	EC55	- 5861	EF73	- 6488
E88CC	- 6922	EC70	- 5718, 6778	EF76	- 6489
E90CC	- 5920	EC80	- 6Q4	EF80	- 6BX6
				EF81	- 6BH5

*Parallel heater circuits only   (t) Temporary substitute

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Tube	Substitute	Tube	Substitute	Tube	Substitute
EF82	- 6CH6	EY51	- 6X2	HL92	- 50C5
EF85	- 6BY7	EY70	- 5641	HL94	- 30A5
EF86	- 6CF8, 6267, Z729	EY80	- 6U3	HM04	- 6BE6
EF89	- 6DA6	EY81	- 6R3	HY61	- 807
EF89F	- 6DG7	EY82	- 6N3	HY90	- 35W4
EF91	- 6AM6	EY84	- 6374, 6443, R18	KD21	- 0A3
EF92	- 6CQ6, 6065	EY86	- 6S2	KD24	- 0C3
EF93	- 6BA6(t), 5749	EY87	- 6S2A	KD25	- 0D3
EF94	- 6AU6(t)	EY88	- 6AL3	KF35	- 1E5
EF95	- 6AK5(t)	EZ35	- 6X5/GT(t)	KK32	- 1C7, 1D7*
EF96	- 6AG5	EZ40	- 6BT4	KL35	- 1F5, 1J5
EF97	- 6ES6	EZ80	- 6V4	KT32	- 25L6GT
EF98	- 6ET6	EZ81	- 6BW4*(t),	KT63	- 6J7
EF183	- 6EH7		6CA4*(t)	KTW63 -	6K7
EF184	- 6EJ7	EZ90	- 6X4, 6BX4,	KT66	- 6L6*(t)
EF730	- 5636		6AV4*	KT81	- 7C5
EH90	- 6CS6	EZ91	- 6AV4, 6BX4,	KT88	- 6CA7
EH900	- 5915		6X4	L63	- 6J5(t), 6C5(t)
EK90	- 6BE6	GZ31	- 5T4	L77	- 6C4
EL33	- 6M6G	GZ34	- 5AR4	LN152 -	6AB8(t)
EL34	- 6CA7	F7001	- 7001	LZ319 -	8A8(t), 9A8(t)
EL35	- 6L6*	F7004	- 5842	LZ329 -	9A8
EL36	- 6CM5	FX219	- 5C22, HT415	M8079 -	6AL5, 5726,
EL37	- 6L6, 5881	FX227	- 6130, 3C45+		6058, 6097, 6663
EL38	- 6CN6	FX231	- KU25	M8081 -	6J6, 6J6WA,
EL41	- 6CK5	G5B	- 872A		6099, 6030,
EL70	- 7001	G40	- 869B		5101, 6106
EL80	- 6M5	G100A	- 857B	M8082 -	6AM5, 7D9,
EL81	- 6CJ6	GU-20/21 - 4B32+			6P17, EL91,
EL83	- 6CK6(t)	GZ30	- 5Z4		N77, N144,
EL84	- 6BQ5	GZ32	- 5V4		QA2402, QN77
EL85	- 6BN5	GZ34	- 5U4G(t),	M8099 -	6AQ4, 6L34,
EL86	- 6CW5		5U4GA(t),		EC91
EL90	- 6AQ5		5U4GB(t),	M8100 -	6AK5
EL91	- 6AM5, 6516,		5Z4(t)	M8135 -	6CH6
	7D9, 6P17,	H52	- 5U4GA, 5AU4,	M8136 -	12AU7
	M8082, N77,		5AX4, 5U4GB,	M8163 -	6354
	N144, QA2402,		5Z4, 5Y4	M8190 -	5783
	QN77	H63	- 6F5	M8204 -	5727
EL95	- 6DL5	H5015	- 3D21	M8206 -	0B3
EL803	- 6CK6	HAA91	- 12AL5	M8212 -	6AL5, 5726
EL821	- 6CH6(t)	HABC80 - 19T8(t)			6058, 6097, 6663
EL822	- 6CH6	HBC90	- 12AT6(t)	ME1401 - 5802	
EL861	- 6686	HBC91	- 12AV6(t)	MT17	- 5557+
ELL80	- 6HU8	HCC85	- 17EW8	MT5545 - 5545	
EM34	- 6CD7	HCH42	- 14K7	MW36-24 - 14EP4*	
EM35	- 6U5G	HCH81	- 12AJ7	MW43-61 - 17QP4*	
EM80	- 6BR5	HD14	- 1H5(t), DAC32	N14	- 1C5(t), 1A5(t),
EM84	- 6FG6	HD30	- 3B4		DL35
EN70	- 5641	HF93	- 12BA6(t)	N15	- 3Q5, N16
EPF83	- 6DR8	HF94	- 12AU6(t)	N16	- 3Q5, N15
EQ80	- 6BE7	HK90	- 12BE6	N17	- 3S4(t)
ESW892	- 892	HL90	- 19AQ5	N18	- 3Q4, 3S4, DL95

*Parallel heater circuits only   (t) Temporary substitute

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Tube	Substitute	Tube	Substitute	Tube	Substitute
N19	- 3V4(t), 1P11	PL345	- 3C45	QE05/40H	- 6159
N25	- 3E5	PL435	- 4C35	QE08/200	- 7378
N63	- 6AG6	PL5551A- 5551A		QEQ6/50	- 807
N77	- 6AM5, 7D9, 6P17,	PL5552A- 5552A		QQC04/15	- 5895
	EL91, M8082,	PL5553A- 5553A		QQE03/12	- 6360
	N144, QA2402,	PL522	- 5C22	QQE03/20	- 6252,
	QN77	PL5544	- 5544		AX9910
N144	- 6AM5(t)	PL5545	- 5545	QQE04/5	- 7377
N379	- 15CW5(t)	PL2D21	- 2D21	QQE04/20	- 832 A
N709	- 6BQ5(t)	PL4 -400A	- 4-400A		VT-286
N727	- 6AQ5	PL4C35	- 4C35	QQE06/40	-829B, 5894
NR68	- 6Q7G	PL4D21	- 4D21	QQ V03-10	- 6360
N78	- 6BJ5	PL5C22	- 5C22	QQV03/12	- 5763,
N142	- 45A5	PL17	- 5557		A4541H
N147	- 6AG6	PL57	- 5559	QQV03-20A	- 6252
N148	- 7C5(t)	PL1267	- 0A4G, 1267	QQV03-28	- 6252(t)
N150	- 6CK5	PL5555	- 5555	QQV04/15	- 832A,
N152	- 21A6(t)	PL5557	- 5557		VT286
N153	- 15A6	PL5559	- 5559	QQV06-40A	- 5894,
N309	- 15A6	PL5684	- 5684		AX9903
N359	- 21A6	PL5822	- 5822	QQV07-40	- 829B,
NR81	- 6K7G	PL6011	- 6011		NU829B,
N329	- 16A5(t)	PL6574	- 6574		GL829,
0M3	- 6H6, 1638	PL6755	- 6755+		RK829,
0SW3109 - 6H6, 1638,		PM04	- 6BA6(t)		RK829B,
	0M3	PM05	- 6AK5(t)		RCA828
P2-40B	- 829B, NU829,	PM07	- 6AM6(t)	QS150/30	- 0A2, 6626
	RK829, RK829B,	PY80	- 19X3(t)	QS1205	- 0A3
	RCA828, GL829	PY81	- 17Z3	QS1206	- 0C3
P807	- 807	PY82	- 19X3(t), 19Y3(t)	QS1207	- 0A2. 6073,
PABC80 - 9AK8		QA2404	- 6AL5, 5726,		6626
PCC84	- 7AN7		6058, 6097,	QS1208	- 0B2, 6074,
PCC85	- 9AQ8		6663		6627
PCC86	- 4CM4	QB2/250 - 813, WL813,		Q S1209	- 5651
PCC189	- 7ES8(t)		GL813, NU813,	QT1251	- 5823(t)
PCC88	- 7DJ8		T813, VT144	QV1-150A	- 4X150A,
PCC89	- 7FC7	QB3/200 - 4-65A			X424D
PCF80	- 8A8(t), 9A8(t)	QB3/300 - 6155		QV20- P18	- 4PR60A
PCF82	- 9U8, 9U8A	QB3. 5/750 - 5D22		QV05-25	- 807
PCL82	- 16A8		4-250, X117,	Q Y2-100	- 813, GL813,
PCF86	- 7HG8		4-250/5D22		WL813,
PCL84	- 15DQ8	QB4/110C-7527			NU813, T813,
PE1/100 - 6083,		QB5/1750-6079			VT144
	AX9909	QBL4/800 - 4X500A		Q Y-3-125	- 4D21, 4-125A
PE04/10E - 837, RK837,		QBL5/3500 - 6076			6155, X103,
	WL837, GL837,	QBW5/3500 - 6075			4D21/4-125A
	A4002B, VT101	QD77	- 6AL5, 5726,	QY4/65	- 4-65A
PL21	- 5727		6058, 6097,	QY4/250	- 4-250A,
PL36	- 25E5(t)		6663		5D22, 6156
PL81	- 21A6	QEL1/150 - 4X150A,		QY4/500A	- 4X500A
PL82	- 16A5		X424D	QY5-500	- 6079
PL83	- 15A6, N153	QE05/40 - 6146		Q Y5-3000A - 6076	
PL84	- 15CW5	QE05/40F - 6883		Q Y5-3000W - 6075	

*Parallel heater circuits only   (t) Temporary substitute

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Tube	Substitute	Tube	Substitute	Tube	Substitute
R16	- 1T2	TB4/800	- 250TH	U52	- 5U4G, 5AS4,
R52	- 5Z4, 5V4G,	TB5/2500	- 7092		5Z4, 5AW4,
	5V4GA	TBL2/300	- 7004		5U4GA, 5U4GC,
REL46	- CV16	TBL6/14	-7804		5931, 5AX4
RG3-250A	-866A	TBL6/4000	- 7753	U70	- 6X5GT(t)
RG4-3000	- 6693	TBL6/6000	- 5923	U76	- 39/44
RGN1503	- 7E5	TBL7/8000	- 6961	U78	- 6X4(t)
RR3-250	- 3B28	TBL12/38	- 7806	U145	- 31A3
RR3/1250	- 4B32	TBL12/100	- 6078	U147	- 6X5GT(t)
RS613	- 5866	TBW6/14	- 7805	U149	- 7Y4(t)
RS630	- 5867, 6569+	TBW6/6000	- 5923	U150	- 6BT4
RS631	- 5868	TBW7/8000	- 6960	U151	- 6X2
RS635	- 7092+	TBW12/38	- 6077	U153	- 17Z3
RS685	- 4D21, 4-125A,	TC552-B	- 834	U154	- 19Y3(t)
	6155+	TD1-100A	- 2C39A,	U191	- 19CS4
RS686	- 5D22, 4-250A,		2C39WA,	U192	- 19Y3
	6156+		X474	U319	- 19Y3(t)
RS687	- 6079	TD03-10	- 5861(t)	U381	- 38A3
RS1002	- 4-250A+, 6156+	TH3B24W	- 3B24W	U718	- 6BT4
RS1006	- 5866	TH5C22	- 5C22	UABC80	- 28AK6
RS1007	- 6155	TH100TH	- 100TH	UAF42	- 12S7
RS1016	- 5868	TH250TH	- 250TH	UBC41	- 14L7
RY12-100	- 8020	TH833A	- 833A	UBF80	- 17N8, 17C8
S2P20	- 7973	TH1257	- 1257	UC92	- 9AB4
SllE12	- 7971	TH5949	- 5949	UCC85	- 26AQ8
SD128E	- 5634	TH6885	- 6885	UCH42	- 14K7
SD719	- 1AB5	TH6886	- 6886	UCH81	- 19D8, 19AJ8
SN152	- 6AB8	TH6587	- 6587	UCL82	- 50BM8
SN944	- 5633	TH6942	- 6942	UF41	- 12AC5
SN946	- 5647	TH5949	- 5949	UF89	- 12DA6
SN979	- 5718	THF6017	- 6017	UL41	- 45A5
SP6	- 6AM6(t)	THF6018	- 6018	UL84	- 45B5
STV/10	- 0G3	THF6019	- 6019	UQ80	- 12BE7
STV108/30	- 0B2,	TS54	- 6689	UU12	- 6CA4
	0B2WA, 6627	TY2-125	- 5866	UY41	- 31A3
STV150/30	- 0A2,	TY3-250	- 5867	UY85	- 38A3
	0B2, 6073	TY4-350	- 833A	UY87	- 807
SV2C39A	- 2C39A,	TY4-500	- 5868	V2M70	- 6X4
	2C39WA, X474,	TY6-800	- 7092+	V40	- 8020
	3X100A11/2C39	TY6-5000A	- 5924	V61	- 6BT4
SV4-150A	- 4-150A	TY6-5000W	- 5923	VP6	- 6CQ6
SV4X150A	- 4X150A	TY7-6000A	- 6961	VR54	- 6H6, 1638
SV813	- 813	TY7-6000W	- 6960	VR105/30	- 0C3
SV828	- 828	TY12-25A	- 6618	VR150/30	- 0D3
SV5545	- 5545	TY12-25W	- 6617	W17	- 1T4(t)
T2MO5	- 6J6, 6J6WA,	TY12-50A	- 6077	W25	- 1AF4, 1L4*,
	6101	TY12-50W	- 6078		1U4*, DF96
T66G-GT	- 884	TY16G	- 885+	W61	- 6K7
T450S	- 7915	U25	- 2L2	W63	- 6K7G(t)
TB2.5/300	- 5866	U37	- 1T2	W76	- 12K7
TB3/350	100TH, VT218,	U41	- 1B3	W77	- 6065(t)
	EE100TH,	U43	- 6X2	WD142	- 12S7
	3-100A4/100TH	U50	- 5Y3G, 5U4G,	W149	- 7B7
TB3/750	- 5867		5U4GA, 5U4GB,	W179	- 6BY7(t)
TB4/1250	- 5868		6087, 6106	W719	- 6BY7

*Paraliel heater circuits only   (t) Temporary substitute

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Tube	Substitute	Tube	Substitute	Tube	Substitute
W727	- 6BA7	XAA91	- 3AL5	XXB	- 3C6
WD709 -	6N8	XC95	- 2ER5	Y61	- 6U5
X14	- 1A7(t), 1B7(t),	XCC82	- 7AU7	Y63	- 6U5
	1C7(t)	XCC189	- 4ES8	Z14	- 1N5GT, 1P5,
X17	- 1R5(t), DK91	XF94	- 3AU6, 3BA6		DF33
X18	- 1AC6, 1AB6,	XF183	- 3EH7	Z63	- 6J7G(t)
	X20	XF184	- 3EJ7	Z77	- 6AM6(t)
X20	- 1AC6, 1AB6,	XFR1	- 1AD4	Z152	- 6BX6(t)
X25	- 1AB6	XG5-10	- 6786	Z300T -	0A4(t), 1267(t)
X63	- 6A8(t)	XG5-500 - 5557		Z719	- 6BX6
X64	- 1612	XH3-045 - 3C45, H45,		Z729	- 6267
X71M	- 12K8		CG547, 5137	Z803U -	6779
X76M	- 12K8	XH16-200	- 5C22	Z900T -	5823
X79	- 6AE8	XH25-500	- 5949	ZD17 -	1S5
X81M	- 7S7(t)	XHB-100	- 4C35	ZD152 -	6N8
X148	- 7S7(t)	XL84	8BQ5		
X150	- 6CU7*	XR1-1600A - 5796, 8063			
X719	- 6BX6	XR1-3200 - 5544, 7981			
X727	- 6BE6	XR1-6400A - 6807, GL6807			

*Parallel heater circuits only   (t) Temporary substitute

Note: Some manufacturers of foreign tubes have suggested U. S. A. substitutes, without supplying adequate specifications. Hence, there is a possibility in a few instances, that substitutes may not equal the performance of tubes being replaced.

"NO SUBSTITUTE" TUBES

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The following list contains tubes both old and new, which, at the time this book went to press, had no DIRECT substitutes able to give satisfactory performance.

We are pleased to announce a unique Consultation Service which will supply the designation of a satisfactory substitute together with the information needed to make minor electrical and/or other changes in order to enable the replacement to function in the place of the original tube.

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1AD5	4BN6	5J6	6BK5	6EQ7	6GY8	8B8	11
1AG4	4CX6	5T8	6BN6	6ET7	6H4GT	8B10	11AR7
1F6	4CX7	5V6GT	6BT8	6EU7	6HB5	8CM7	11C5
1LD5	4CY5	5X8	6BU5	6EU8	6HB6	8CN7	11CY7
1LH4	4GK5	6A3	6BV8	6EV7	6HW8	8CS7	11JE8
1V2	4GW5	6AG11	6BW8	6EW7	6J8G	8CW5	12AB5
1Z2	5AM8	6AH4GT	6BY8	6EZ7	6J11	8CY7	12AF3
2AH2	5AN8	6AH5G	6C9	6FG7	6JC8	8EM5	12AL8
2CW4	5AQ5	6AL11	6C10	6FJ7	6JH9	8ET7	12AL11
2E24	5AS8	6AN6	6CH8	6FM7	6JK8	8JK8	12AQ5
2EN5	5AT4	6AQ7GT	6CK4	6FM8	6JK11	8SN7GTB	12AX3
2FV6	5AT8	6AR5	6CL5	6FQ7	6M3	9AU7	12AY3
2FY5	5AZ3	6AR7GT	6CM6	6FV6	6M11	9BR7	12B3
2GW5	5AZ4	6AR8	6CM7	.6FW5	6N4	9CL8	12B8GT
2H21	5BC3	6AR11	6CN7	6G11	6P7G	9DZ8	12BA7
2J2	5BT8	6AS8	6CQ8	6GB5	6Q11	9EF6	12BK5
2V3G	5BW8	6AV6	6CR5	6GC5	6R6G	9X8	12BW4
3A2	5CH8	6AV11	6CR6	6GE5	6S6GT	9BR7	12BZ6
3BC5	5CU4	6AW7GT	6CR8	6GE8	6S8GT	9BW6	12CR5
3BN6	5DJ4	6AX3	6CS5	6GF5	6T6	9DZ8	12CR6
3DG4	5DH8	6AZ8	6CU8	6GJ5	6V8	9EF6	12CS5
3ES5	5EH8	6B10	6D10	6GK6	6X6G	9GB8	12CT8
3GW5	5ES8	6BA4	6DN6	6GM5	6Y3G	9X8	12DB5
3SF5	5EU8	6BA7	6DR4	6GT5	7K7	10C8	12DE8
4AV6	5FG7	6BC4	6DZ8	6GW5	7Q7	10DA7	12DF5
4BN4	5GX6	6BF8	6EH8	6GW8	7W7	10EW7	12DJ8

12DK5	17GK5	50FA5	6350	7137	7604	8077
12DK6	17GT5	50FY8	6352	7156	7619	8078
12DK7	17H3	50X6	6398	7167	7630	8079
12DL8	17HC8	55N3	6417	7190	7631	8081
12DM4	17JK8	60DV3	6419	7191	7687	8082
12DT5	17R5	60E3	6463	7192	7695	8083
12DU7	18	60EH5	6483	7205	7698	8094
12DV7	18A5	60FX5	6519	7208B	7700	8136
12DV8	18DZ8	65C7, Z7	6520	7212	7718	8143
12DW8	18HB8	70A7GT	6525	7229	7720	C2044
12DY8	19	70L7GT	6526	7230	7757	CH1046
12DZ8	19DE7	83V	6550	7231	7763	CK510AX
12EC8	19HV8	90	6611	7232	7768	CK526AX
12EL6	19J6	117Z3	6612	7236	7788	CK527AX
12EM6	19V8	117Z4GT	6763	7246	7789	CK533AX
12ET8	19X8	407A	6792	7258	7792	CK534AX
12F8	20EQ7	1237	6830	7266	7794	CK542DX
12FA6	20EZ7	5594	6831	7296	7795	CK546DX
12FQ8	20J8	5618	6832	7316	7796	CK547DX
12FR8	21EX6	5690	6840	7318	7800	CK549DX
12FV7	22BH3	5696	6872	7327	7804	CK1024
12FX8	22DE4	5838	6873	7358	7815	CK1054
12FY8	25B8GT	5839	6877	7370	7837	GB-6814
12G8	25BK5	5841	6887	7400	7838	GB-6922
12CG6	25CN6	5845	6900	7401	7839	GB-7327
12GE5	25CR5	5857	6901	7408	7841	
12GJ5	25D8GT	5879	6913	7439	7843	
12GT5	25DK4	5947	6919	7440	7851	
12H4	25DT5	5950	6943	7441	7855	
12J8	25E5	5993	6944	7444	7861	
12K5	25F3	6004	6945	7452	7868	
12S8GT	25X4	6012	6946	7462	7869	
12U7	25X6GT	6092	6947	7489	7892	
12X4	25Z3	6094	6948	7490	7899	
13EM7	26D6	6101	6955	7492	7900	
14A4	27GB5	6119	6973	7494	7950	
14B8	28GB5	6135	6977	7495	7962	
14F8	28Z5	6140	6983	7496	7963	
14G6	32ET5	6142	7027	7498	7976	
14Q7	32L7GT	6143	7044	7499	7979	
15	35B5	6145	7054	7500	7983	
15A8	35C3	6184	7055	7502	7995	
15AF11	35CD6GA	6203	7056	7521	8034	
15EW6	35D5	6213	7057	7527	8042	
15G	35DZ8	6215	7058	7541	8043	
16GK6	35HB8	6216	7059	7547	8044	
16GK8	35Y4	6224	7060	7548	8056	
17AV5GA	50A1	6245	7061	7578	8058	
17C9	50A5	6264	7077	7586	8063	
17DE4	50BK5	6281	7079	7587	8064	
17DM4	50CD4	6308	7083	7589	8068	
17GJ5	50CD6G	6332	7105	7591	8070	

When ordering Consultation Service, be sure to give as much information as possible regarding the set for which replacement tube is desired. For example, if set is an AC-DC radio, give type designations of the other tubes in the set. If tube in question is part of a series string heater circuit give all type designations. Wherever possible give model and chassis numbers.

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