

Koren Tube model Library

This library was developed by Norman Koren.

For details, refer to the article, "Improved Vacuum-Tube Models for SPICE simulations," Glass Audio, Vol. 8, No. 5, 1996, available from Audio Amateur Corporation, 305 Union St., PO Box 176, Peterborough, NH 03458 USA. Phone 603-924-9464.

All the usual legal disclaimers apply. The author has made every effort to provide correct information, but assumes no liabilities for errors, misuse of the models, or inevitable changes made by users.

The author welcomes your comments, stories, and questions (if they don't require too much effort to answer). For really BIG stuff, he will consider consulting for a fee.

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1. modified pentode model to work with native LTspice Tetrode symbols.
2. added the two new pentode models
3. updated the triode model to include the VCT variable (contact potential)
4. modified to use sub circuits to save space.
5. Added loads more valves.
6. JJ valves have their own section
7. Svetlana valves have their own section
8. US and European valves are now in sections of similar types
9. Original Koren models retained with _OLD appended
10. All new data samples from the data sheets where available.
11. WW2 Luftwaffe valves in their own section

All the newer models are generated via a modified version of Norman Koren's matlab solver, using at least 10 data point samples, and sometimes as many as 30.

Suusi Malcolm-Brown May 2008 - Apr2012

NOTE Just because it may say 'Equivalents' does not mean that they are exact replacements. In this case 'Equivalents' is referring to electrically the same as. As in the Valve characteristic is the same. It is up to you to check that 'Equivalents' really are Equivalents.

US Triode Output Pentodes and Beam Tetrodes

Triode Output Pentodes and Beam Tetrodes are modelled in two parts, the triode section model which has a 'T' appended to the tube type. The Pentode or Beam tetrode section model which has a 'P' appended to the tube type

Model Name	Part modelled	Tube Equivalents
6AB8T	6AB8 Triode Section	ECL80
6AB8P	6AB8 Pentode Section	
6BM8T	6BM8 Triode Section	ECL82
6BM8P	6BM8 Pentode Section	
6DX8T	6DX8 Triode Section	ECL84
6DX8P	6DX8 Pentode Section	
6GV8T	6GV8 Triode Section	ECL84
6GV8P	6GV8 Pentode Section	
6GW8T	6GW8 Triode Section	ECL86
6GW8P	6GW8 Pentode Section	

US Triode small signal Pentodes

Triode small signal Pentodes and small signal Beam Tetrodes are modelled in two parts, the triode section model which has a 'T' appended to the tube type. The Pentode or Beam tetrode section model which has a 'P' appended to the tube type

Model Name	Part modelled	Tube Equivalents
7199T	7199 Triode Section	
7199P	7199 Pentode Section	
7199P_	7199 Pentode Section Alt	
6AN8T_OLD	6AN8 Triode Section Old	
6AN8P_OLD	6AN8 Pentode Section Old	
6AN8T	6AN8 Triode Section	
6AN8P	6AN8 Pentode Section	
6AX8T	6AX8 Triode Section	ECF 80
6AX8P	6AX8 Pentode Section	
6BL8T	6BL8 Triode Section	ECF 80
6BL8P	6BL8 Pentode Section	
6U8T	6BL8 Triode Section	ECF 82
6U8P	6AX8 Pentode Section	
6HG8T	6HG8 Triode Section	ECF 86
6HG8P	6HG8 Pentode Section	

US Small Signal Triodes

Model Name	Part modelled	Tube Equivalents
6R4	6R4 Triode	EC81
76	76 Triode	
5670	5670 Triode	
5751	5751 Triode	
5965	5965 Triode	12AV7
6072	6072 Triode	12AY7
6922	6922 Triode	E88CC
7025	7025 Triode	ECC83
6CG7	6CG7 Triode	
6DJ8_OLD	6DJ8 Triode Old	
6DJ8	6DJ8 Triode	
6SL7GT	6SL7GT Triode	
6SN7	6SN7 Triode	
6SN7GTA	6SN7GTA Triode	
6SN7GTB	6SN7GTB Triode	
12AT7_OLD	12AT7 Triode OLD	ECC81
12AT7	12AT7 Triode	ECC81
12AT7WA	12AT7WA Triode	ECC81
12AU7_OLD	12AU7 Triode OLD	ECC82 ECC802 5814 6067 6189
12AU7	12AU7 Triode	ECC82 ECC802 5814 6067 6189
12AU7A	12AU7A Triode	ECC82 ECC802 5814 6067 6189
12AV7	12AV7 Triode	5965
12AX7_OLD	12AX7 Triode OLD	ECC83
12AX7	12AX7 Triode	ECC83
12AX7ASYL	12AX7ASYL Triode	ECC83 12AX7A 7025
12AX7A	12AX7A Triode	ECC83 7025
12AY7	12AY7 Triode	
12AZ7	12AZ7 Triode	12AT7 ECC81 ECC801 6060 6201 6679
12BH7A	12BH7A Triode	

US Small Signal and Vary Mu Pentodes

Model Name	Part modelled	Tube Equivalents
5654	5654 Pentode	6AK5, EF95
5879	5879 Pentode	
6267	6267 Pentode	EF86, Z729, 6CF8, 6BK8
6AK5	6AK5 Pentode	5654, EF95
6AU6	6AU6 Pentode	EF94, 6AU6A
6AU6A	6AU6A Pentode	EF94
6CF8	6CF8 Pentode	EF86
6BK8	6BK8 Pentode	EF86, 6BK8
6BY7	6BY7 Pentode	EF85
6DA6	6DA6 Pentode	EF89

US Power Triodes

Model Name	Part modelled	Tube Equivalents
300B	300B Triode OLD	
300B	300B Triode	
2A3_OLD	2A3 Triode OLD	
2A3	2A3 Triode	

US Power Pentodes and Beam Tetrodes

Model Name	Part modelled	Tube Equivalents
5881	5881 Beam Tetrode	6L6GC
6550_OLD	6550 Beam Tetrode OLD	
6550	6550 Beam Tetrode	
6550A	6550A Beam Tetrode	
6686	6686	E81L, EL861
6973	6973	
7027	7027 Beam Tetrode	6L6GC
7027A	7027A Beam Tetrode	6L6GC
7189	7189 Pentode	6BQ5, EL84, N709
7581	7581 Beam Tetrode	6L6GC
7581A	7581A Beam Tetrode	6L6GC
7591A	7591A Beam Tetrode	7898
7868	7868 Beam Tetrode	7591A
6BQ5	6BQ5 Pentode	7189, EL84, N709
6CA7_OLD	6CA7 Pentode OLD	EL34, KT77
6CA7	6CA7 Pentode	EL34, KT77
6CK5	6CK5 Pentode	EL41, EL80, BF61, N150
6CL6	6CL6 PENTODE	
6EH5	6EH5 Pentode	
6L6GB	6L6GB Beam Tetrode	6L6
6L6GC_OLD	6L6GC Beam Tetrode OLD	6L6
6L6GC	6L6GC Beam Tetrode	6L6, 6L6GB, 6L6WGC, 5881, 7027, 7027A
6L6WGT	6L6WGT Beam Tetrode	6L6, 6L6GB, 6L6GC, 5881, 7027, 7027A
6V6	6V6 Beam Tetrode	6V6-GT, 6V6GTA, EL90
6V6-GT	6V6-GT Beam Tetrode	6V6, 6V6GTA, EL90
6V6-GTA	6V6-GTA Beam Tetrode	6V6, 6V6-GT, EL90

European Output Triode

Model Name	Part modelled	Tube Equivalents
6C33C_OLD	6C33C Triode	
6C33C	6C33C Triode	

European Triode Output Pentodes and Beam Tetrodes

Triode Output Pentodes and Beam Tetrodes are modelled in two parts, the triode section model which has a 'T' appended to the tube type. The Pentode or Beam tetrode section model which has a 'P' appended to the tube type

Model Name	Part modelled	Tube Equivalents
ECL80T	ECL80T Triode	6AB8
ECL80P	ECL80P Pentode	
ECL81T	ECL81T Triode	
ECL81P	ECL81P Pentode	
ECL82T	ECL82T Triode	6BM8
ECL82P	ECL82P Pentode	
ECL83T	ECL83T Triode	
ECL83P	ECL83P Pentode	
ECL84T	ECL84T Triode	6DX8
ECL84P	ECL84P Pentode	
ECL85T	ECL85T Triode	6GV8
ECL85P	ECL85P Pentode	
ECL86T	ECL86T Triode	6GW8
ECL86P	ECL86P Pentode	
ECL802T	ECL802T Triode	ECL85
ECL802P	ECL802P Pentode	
ECL805T	ECL805T Triode	ECL85
ECL805P	ECL805P Pentode	

European Triode small signal Pentodes

Model Name	Part modelled	Tube Equivalents
ECF80T	ECF80T Triode	6AX8, 6BL8
ECF80P	ECF80P Pentode	
ECF82T	ECF82T Triode	6U8
ECF82P	ECF82P Pentode	
ECF83T	ECF83T Triode	
ECF83P	ECF83P Pentode	
ECF86T	ECF86T Triode	6HG8
ECF86P	ECF86P Pentode	

European Small Signal Triodes

Model Name	Part modelled	Tube Equivalents
E80CC	E80CC Triode	
EC81	EC81 Triode	
ECC81	ECC81 Triode	
ECC82	ECC82 Triode	12AU7A, 12AU7
ECC83	ECC83 Triode	12AX7A, 7025
ECC84	ECC84 Triode	
ECC85	ECC85 Triode	
ECC86	ECC86 Triode	
ECC87	ECC87 Triode	E80CC
ECC88	ECC88 Triode	E88CC, 6DJ8, 6922
E88CC	E88CC Triode	6DJ8, ECC88, 6922
ECC801S	ECC801S Triode	6201
ECC802S	ECC802S Triode	
ECC803S	ECC803S Triode	6057

European Small Signal and Vary Mu Pentodes

Model Name	Part modelled	Tube Equivalents
EF80	EF80 Pentode	Z719
EF83	EF83 Pentode	
EF85	EF85 Pentode	
EF86	EF86 Pentode	EF806, 6CF8, 6267, Z729
EF89	EF89 Pentode	
EF806	EF806 Pentode	EF86, EF806, CF8, 6267, Z729
Z719	Z719 Pentode	EF80
Z729	Z729 Pentode	EF86,EF806, 6CF8, 6267
EF91	EF91 Pentode	
EF92	EF92 Pentode	6CQ6, W77
EF94	EF94 Pentode	6AU6
EF95	EF95 Pentode	5654, 6AK5

European Power Pentodes and Beam Tetrodes

Model Name	Part modelled	Tube Equivalents
E81L	E81L Pentode	6686, EL861
EL34_OLD	EL34 Pentode OLD	6CA7, KT77
EL34	EL34 Pentode	6CA7, KT77
EL41	EL41 Pentode	EL80, BF61, N150, 6CK5
EL42	EL42 Pentode	EL85, BF62 N151
EL80	EL80 Pentode	
EL81	EL81 Pentode	6CJ6, 6DR6
EL84	EL84 Pentode	7189, 6BQ5, N709
EL85	EL85 Pentode	6BN5
EL90	EL90 Beam Tetrode	6V6-GTA
EL861	EL861 Pentode	6686
GU39	GU39 PENTODE	
N150	N150 Pentode	BF61, EL41, EL80, 6CK5
N51	N151 Pentode	BF62, EL42, EL85
N709	N709 Pentode	6BQ5, EL84, 7189
KT66	KT66 Beam Tetrode	
KT77	KT77 Beam Tetrode	EL34, 6CA7
KT88_OLD	KT88 Beam Tetrode OLD	
KT88	KT88 Beam Tetrode	

JJ Tubes

Model Name	Part modelled	Tube Equivalents
JJECC81	JJECC81 Triode	12AT7
JJECC82	JJECC82 Triode	12AU7
JJECC83S	JJECC83S Triode	12AX7A 7025, 6057
JJECC802S	JJECC802S Triode	ECC82, 12AU7
JJECC803S	JJECC803S Triode	ECC83, 12AX7, 7025, 6057
JJE88CC	JJE88CC Triode	6DJ8, ECC88, 6922
JJECC99	JJECC99 Triode	
JJEF806S	JJEF806S Pentode	EF86, EF806
JJ7591S	JJ7591S Beam Tetrode	7591A
JJEL84	JJEL84 Pentode	EL84, 6BQ5
JJEL509	JJEL509 Beam Tetrode	
JJ2A3	JJ2A3 Triode	2A3
JJ300B	JJ300B Triode	300B
JJ7027	JJ7027 Beam Tetrode	7027A
JJ6L6GC	JJ6L6GC Beam Tetrode	6L6GC
JJEL34	JJEL34 PENTODE	EL34
JJKT66	JJKT66 Beam Tetrode	KT66
JJKT77	JJKT77 Beam Tetrode	KT77
JJKT88	JJKT88 Beam Tetrode	KT88

Svetlana Tubes

Model Name	Part modelled	Tube Equivalents
SV300B	SV300B Triode	300B
SV6N1P	SV6N1P Triode	6N1P
SVEL509	SVEL509 Beam Tetrode	6KG6
SV6L6GC	SV6L6GC Beam Tetrode	6L6GC
SV6550C	SV6550C Beam Tetrode	6550A
SVEL34	SVEL34 Pentode	EL34
SVKT88	SVKT88 Beam Tetrode	KT88

Luftwafe MODELS

Model Name	Part modelled	Tube Equivalents
RL12P10	RL12P10 Pentode	
RL12P35	RL12P35 Pentode	
RL12P50	RL12P50 Pentode	
RV2P700	RV2P700 Pentode	
RV2P800	RV2P800 Pentode	
RV2_4P700	RV2.4P700 Pentode	
RV2_4P701	RV2.4P701 Pentode	
RV2_4P1400	RV2.4P1400 Pentode	
RV12P2000	RV12P2000 Pentode	6AK5, EF94
RV12P2001	RV12P2001 Pentode	
RV12P3000	RV12P3000 Pentode	
RV12P4000	RV12P4000 Pentode	