Frank's Electron tube Pages

Tube Number Systems

- European system after 1934
- Philips system before 1934
- Mazda numbering system
- Brimar type designation code
- Tesla numbering system

European system after 1934 (pro-electron)

1st letter	heater indication
0	tubes without filament
A	4 V AC parallel connection
B	180 mA DC
C	200 mA AC/DC series or parallel connection
D	<= 1.4 V DC dry-battery, parallel connection
E	6.3 V AC or carbattery, parallel connection
F	13 V carbattery
G	5V AC parallel connection
H	early: 4V DC battery. later: 150mA AC/DC series connection
I	20V AC/DC parallel connection
K	2 V battery
O	150 mA AC/DC series connection
P	300 mA AC/DC series connection
U	100 mA AC/DC series connection
V	50mA AC/DC series connection
X	600 mA AC/DC series connection
Y	450 mA AC/DC series connection
2nd+next letters	**tube systems**
A	single detection diode
B	double detection diode

C	small-signal triode
D	power triode
E	small-signal tetrode (or 2nd emmission tube EE1)
F	small-signal pentode
H	hexode or heptode
K	octode
L	power pentode or power tetrode
M	indicator tube
N	thyratron
Q	enneode
W	single gasfilled rectifier diode
X	double gasfilled rectifier diode
Y	single vacuum rectifier diode
Z	double vacuum rectifier diode
digits	**socket & order**
x	P (some are V) (except U-series (e.g.UBL1), those are octal)
1x	Y8A
2x	W8A, Loctal (except D-series (e.g. DL21), those are octal)
3x	K8A, A08, octal
4x	A8A, B8A, Rimlock
5x	T9A, B9G, Enne-al and C2R and some special bases
6x	Subminiature
7x	Subminor8p
8x, 18x, 8xx	B9A, noval
9x, 19x, 9xx	B7G, miniature-7p (Exception: The ECC99 is a poorly chosen tube type number, as it comes with a noval base.)
2xx, 2xxx	decal
5xx	B9D, magnoval
Examples	**Description**
CBL1	output pentode with dual detection diode, heater 200mA, P

	base
EABC80	tripple signal diode with triode, heater 6.3V, noval base
ECC83	dual triode, heater 6.3V, noval base
GZ34	dual vacuum rectifier, heater 5V, octal base
PFL200	pentode and power pentode, heater 300mA, decal base
UCH21	triode and heptode, heater 100mA, base loctal

Philips system before 1934

1st letter	**heater current**
A	0.06 to 0.10 A
B	0.10 to 0.20 A
C	0.20 to 0.40 A
D	0.40 to 0.70 A
E	0.70 to 1.25 A
F	> 1.25 A
2nd digit or 2nd+3rd digits	**heater voltage**
x	heater voltage < 10 V
xx	heater voltage >= 10V
last 2 digits	**description**
xx	amplification factor for triodes
41, 51 etc	tetrode with spacecharge grid (2nd grid is control grid)
42, 52 etc	tetrode with screen grid (1st grid is control grid)
43, 53 etc	power pentode
44, 54 etc	triode with diode or tetrode with diode
45, 55 etc	hf tetrode with variable gain
46, 56 etc	hf pentode
47, 57 etc	hf pentode with variable gain
48, 58 etc	hexode frequency changer
49, 59 etc	hexode with variable gain

Suffix letter	Description
H	?
N	? New, later version
S	? Series connection allowed
T	?

Examples	Bases usually: A or O
E499	triode, If=1A , Vf=4V, gain=99
F443N	power pentode, If=2A, Vf=4V
B2046	hf pentode, If=0.18A, Vf=20V

MAZDA NUMBERING SYSTEM Signal valves

First number indicates heater or filament rating	
1	1.4V (parallel or series)
6	6.3V (parallel or series)
10	0.1A (series)
20	0.2A (series)
30	0.3A (series)
Following letter or letter sequence indicates class of valve	
C	Frequency changer with special oscillator section
D	Signal diode(s)
F	Voltage amplifier tetrode or pentode
FD	Voltage amplifier tetrode or pentode with diode(s)
FL	Voltage amplifier tetrode or pentode with voltage amplifier triode
K	Small gas triode or tetrode
L	Voltage amplifier triode or double triode including oscillator triode
LD	Voltage amplifier triode with diode(s)
M	Tuning indicator
P	Power amplifier valve, tetrode or pentode
PL	Power amplifier valve, tetrode or pentode with voltage amplifier triode
Final number distinguishes between different valves in the same class	

MAZDA NUMBERING SYSTEM Power rectifier valves	
Letters indicates heater or filament rating	
U	High vacuum half-wave
UU	High vacuum full-wave
Final number distinguishes between different valves in the same class	

Brimar type designation code for Receiving Valves

First Number	Indicates the Construction
1	Half Wave Rectifiers
2	Diodes. Single
3	Triodes, Output
4	Triodes, High-mu
5	Tetrodes, Straight
6	Tetrodes, Vari-mu
7	Pentodes, Power and Video
8	Pentodes, R.F. Straight
9	Pentodes, R.F. Vari-mu
10	Diodes, Double
11	Triodes with Double Diode
12	Pentodes, A.F. with Double Diode
13	Triodes Double, High-mu
14	Triodes Double, Class B Output
15	Heptodes
16	Triodes Output, D.C. Coupled
17	Pentodes R.F. with Double Diode
18	Pentodes with Triode
19	
20	Hexode/Heptode with Triode
Letter	**Indicates the heater rating**

A	3.6 to 4.4V Indirectly Heated
B	2V Directly Heated
C	Directly Heated other then 2 or 4V
D	All other heater ratings Indirectly Heated other then 4V

Number	Serial number
Serial Numbers are allocated in chronological order as new valve types are introduced	

TESLA NUMBERING SYSTEM

leading digits	**heater indication**
	Approximate (usually full volts) heater voltage
middle letters	**tube systems** (a subset of European system)
A	single detection diode
B	double detection diode
C	small-signal triode
F	small-signal pentode
H	hexode or heptode
L	power pentode or power tetrode
M	indicator tube
Y	single vacuum rectifier diode
Z	double vacuum rectifier diode
trailing digits	**socket and order**
1x	octal K8A, A08
2x	loctal W8A
3x	heptal B7G
4x	noval B9A
5x	special; mostly, 9 out of 10 pins 1.25mm on a circle diameter 25mm
6x	submagnal B11A (no actual tube in this system known)
7x	duodecal B12A (no actual tube in this system known)

8x	diheptal B14A (no actual tube in this system known)
9x	free wires
Examples	**Description**
35Y31	Single rectifier, heptal (7pin miniature) socket; 35V/150mA series heater; otherwise, European UY1N in heptal format
4L20	HF power pentode; filament 2x2.4V / 325mA, Soviet 4П1Л; German RL4,2P6 in loctal format
6CC42	VHF double triode; 6.3V/350mA heater, noval; equivalent to 2C51
6F24	Telecom pentode, 6.3V/450mA heater, loctal; *not* similar to later Mazda's 6F24
1M90	Subminiature indicator tube, 1.4V/25 mA filament, European DM70
leading 2 digits	**screen specification**
	Approximate screen diameter or diagonal, in centimeters
3rd digit	**type order**
middle letters	**focusing and deflection**
QP	magnetic focusing, magnetic deflection (early TV tubes)
QQ	electrostatic focusig, magnetic deflection (later TV tubes)
QR	electrostatic focusing and deflection (oscilloscope tubes)
trailing digits	**screen color and persistence**
Examples	**Description**
7QR20	Oscilloscope tube, 7cm diameter, green fluorescence, middle persistence
430QP44	TV tube, 43cm diagonal, magnetic focusing and deflection, white fluorescence, pentode system, 90 degrees deflection angle
430QQ44	TV tube, 43cm diagonal, electrostatic focusing, magnetic deflection, white fluorescence, tetrode system, 110 degrees deflection angle
431QQ44	Identical to 430QQ44, except with metal-backed screen
1st letter	**tube category**

R	HF tube
Z	modulator tube
U	gas-filled power rectifier
2nd letter	**tube systems**
	see receiving tubes
digits	**power level**
	Anode dissipation in watts or kilowatts
trailing letters	**cooling system (optional 1st letter), tube order**
X	air cooling
Y	water cooling
Examples	**Description**
RA0007B	Ballast diode controlled by filament current; max anode current 0.7mA
RD1,5XA	Air-cooled power triode up to 30MHz, 1.5kW anode dissipation
RE40AK	KT88 by Tesla Vršovive (in production)