

Decoding European Valve numbers

European system, also known in Britain as the Mullard Code
Two codes are used, one for transmitting and industrial valves, the other for receiving valves. Both consist of a string of two or three letters followed by a series of digits, for example ECC83, EL34.

TRANSMITTING VALVES

First letter (general class of valve)

M	LF power amplifier or modulator triode
P	RF power pentode
Q	RF power tetrode
R	Rectifier
T	RF power triode

Second letter (type of cathode)

G	Oxide-coated filament in mercury-vapour rectifier
V	Indirectly heated oxide-coated cathode
X	Directly heated pure tungsten filament
Y	Directly heated thoriated tungsten filament
Z	Directly heated oxide-coated filament (except in mercury-vapour rectifiers)

Third letter

S	Silica envelope
---	-----------------

First number (anode voltage in kV) followed by hyphen

05	0.5kV
5	5kV
12	12kV and so on

Second number (output)

For valves up to 5kW anode dissipation, the figures indicate maximum anode dissipation in watts.

For water-cooled valves above 5kW dissipation, the figures indicate the maximum output in kW.

For rectifiers, the figures indicate the maximum permissible rectified current per valve in milliamps.

RECEIVING AND GENERAL PURPOSE VALVES

First letter (heater rating)

A	4V
B	180mA DC series connection
C	200mA AC/DC series connection
D	1.4V DC (normally directly heated, can also be 0.625, 1.2 or 1.25V)
E	6.3V (by far the most common prefix)
F	12.6 or 13V
G	5V, later defined as Miscellaneous voltages ¹

H	150mA series connection
K	2V DC
L	450mA series connection (?)
O	cold device, not heated, e.g. cold cathode tube, voltage stabiliser or semiconductor device
P	300mA AC/DC series connection
U	100mA series connection
V	50mA series connection
X	600mA series connection
Y	450mA series connection

The second and where applicable, third and fourth letters in multi-electrode valves indicate the types of device in the valve. They are normally listed in alphabetical order.

A	Signal diode
B	(=AA) double diode
C	Signal triode
D	Output or power triode (e.g. TV shunt stabiliser)
E	Signal tetrode
F	Signal or RF pentode
H	Hexode or heptode (Hexode structure)
K	Heptode or octode (octode structure)
L	Output tetrode, beam tetrode, or pentode (including TV line output valves)
M	Magic eye tuning indicator
N	Gas-filled triode or thyatron
Q	Nonode
X	Full-wave rectifier or double diode (gas-filled)
Y	Half wave rectifier or single diode (vacuum)
Z	Full-wave rectifier or double diode (vacuum)

Digits indicate the base (first digit) and a code to distinguish valves that would otherwise have identical numbers (e.g. EL84 and EL85 are both output pentodes with a 6.3V heater on a B9A base. They are otherwise different).

1 - 10	side contact
11 - 20	footless
21 - 30	Loctal
31 - 39 and 300 series	International Octal
40 - 49, 140 - 149	B8A
60, 70	Subminiatures
80 - 89, 180 and 800 series	B9A
90 - 99	B7G
200 series	B10B
500 series	B9D

GEC Code (Marconi/Osram Brands also)
Consist of Letter (or Letters) followed by digits (e.g. L63, KT88). The digits are simply to distinguish similar valves (like all triodes), and cannot be decoded. The letters have the following meaning.

A	Industrial valve (Maybe almost anything - power triode, etc.)
B	Double triode
D	Diode
GU	Gas-filled rectifier
GT	Gas Triode (Thyratron)
H	Signal triode (high impedance)
KT	Kinkless tetrode (beam tetrode)
L	Signal triode (low impedance)
MU	Indirectly heated rectifier
N	Output pentode
P	Output triode
QP	Quiescent push-pull double pentode
S	Tetrode (Screen Grid Valve)
U	Rectifier
VS	Variable mu tetrode
W	Variable mu pentode
X	Triode hexode, heptode, octode, frequency changer
Y	Tuning indicator
Z	HF pentode

USA (Radio Manufacturers Association)

This code consists of digits, letters, digits plus an optional suffix. A variant is used by the Russians.

The first digits give the heater voltage rating, with the exception that the codes 7 and 14 are used to indicate 6.3V and 12.6V valves with a loctal base. Not all tubes follow the rules; for instance 1F4 has 2V heaters and 2C22 has 6.3V heaters.

Letters specify the type of valve, but there appears to be no consistency of coding. S often indicates a single-ended (no top cap) version of an earlier valve with such a cap

Second digits give either the number of active electrodes, or the number of external connections.

The suffix letters specify the type of envelope or base. The code is

G	large Glass envelope.
GC	Glass Compact, a tubular glass envelope
GT	Glass Tubular, the smallest glass envelope
LT	Locking base
M	Metal envelope
WA	High quality version

Mazda Code (Great Britain)

Consists of digits, Letters, digits. Do not confuse with a US code.

First digits give heater voltage, except that 10, 20, 30 indicate 100mA, 200mA,

300mA for series connection

Letters give type of valve

C Frequency changer
D Signal diode
F Signal tetrode/pentode
K Thyatron
L Signal triode
M Tuning indicator
P Output tetrode/pentode
U Half wave rectifier
UU Full wave rectifier.

Mazda codes tend not to double up letters - L is used for multiple triodes also.

Final digits distinguish between otherwise identical codes.

British Royal Air Force

Code consists of letters followed by digits. The letters have the following

meanings :

VCR - valve cathode ray (CRT)
VGT - valve gas triode (thyatron)
VI - valve indicator (tuning eye)
VR - valve receiving (general receiving valve)
VS - valve stabilising (gas stabiliser)
VT - valve transmitting (general transmitting valve)
VU - rectifier

British Army

Again, letters followed by digits. The letter part gives the valve type as follows :

ACR - Army CRT
AR - Army receiving valve (generally triode)
ARD - Army receiving diode
ARDD - Army receiving double diode
ARH - Army receiving hexode
ARP - Army receiving pentode
ARS - Army receiving screen grid (tetrode)
ARTH - Army receiving triode hexode
ARTP - Army receiving triode pentode
AT - Army transmitting valve (generally power triode)
ATP - Army transmitting Pentode
ATS - Army transmitting Screen Grid (Tetrode)
AU - Army Rectifier
AW - Army Stabiliser

British Royal Navy

Another letters followed by digits code. The letters give the type of the valve, as follows :

NC Navy CRT
NGT Navy gas triode (thyatron)
NR Navy receiving valve
NS Navy stabiliser
NT Navy transmitting (or power) valve
NU Navy rectifier

Other British series

CV (common valve) numbers replaced the above 3 codes during WW2. There is no way to decode these by simple inspection of their number. ZA and 10E are also used as prefixes to catalogue numbers. For example UHF (horned¹ triode 10E/392 is also equivalent to ZA 3055, VR 135, NR 80, CV 1135 and E 1148.

French Army

Originally numbered in the TM (Télégraphie Militaire) series with the letters TM followed by the type number. There was also an 6L1¹ series of all-metal construction with octal base and equivalent to comparable American types but using 11-volt heaters. Thus 11L6 was similar to 6L6 but using 11-volt heaters. Valves marked ECMR indicate French army origin (Etablissement Centrale du Matériel Radio-télégraphique militaire.

German Defence (Reichswehr)

Most German army valves use a special base and bear codes in the format:
two letters, two digits, one letter and two digits.

First letter

R Reichswehr (Defence), includes both Wehrmacht (Army) and Kriegsmarine (Navy)

Second letter

D Dekametric wavebands
G Rectifier (Gleichrichter) or diode
K Cathode ray tube
L Transmitting or Power
V Amplifier (Verstärker)

First number

Heater voltage

Third letter

A Cathode ray indicator
D Dual anode
G Rectifier or diode
H Hexode
L Speed modulation
M Magnetron
P Pentode
T Triode

Final number

This indicates the maximum power output in watts if the valve is a power tube, the coefficient of amplification if an amplifier or maximum rectified current if a rectifier.

A different scheme was used by the Air Force, employing two letters and a number.

The number is a simple type number, issued progressively as each new valve was registered.

First letter

L Luftwaffe (German Air Force)

Second letter

B Cathode ray tube
D Dekametric waves
F Special type
G Rectifier or diode
K Stabiliser
M Magnetron
S Transmitting, wavelengths above 1 metre
V Amplifier, wavelengths above 1 metre

Exceptions to this scheme include SA (rectifier), SD (triode) and SF (pentode), all using 1.9V heaters.

Mazda (France)

Television tubes use the code letter C (for cathode ray tube), a number (indicating screen size in mm), then two letters followed by a number. The first indicates the method of deflection (M = magnetic, S = electrostatic) and the second the screen colour (B = blue, G = green, R = radar long-persistence, W = white). The numbers were allocated sequentially.

Miniwatt (France)

This is a subset of the European system. Either two or three letters are used, followed by a sequential number.

First letter (heater)

A 4V AC
B 180mA DC
C 200mA AC/DC
D 1.4V battery
E AC and 6.3V car battery
F 13V car battery
H 4V battery
K 2V battery
U 100mA AC/DC

Second and optional third letter (type of valve)

A Diode
B Double diode
C Triode (oscillator, detector, amplifier)
D Audio power triode
E Pentode
F RF pentode
H Hexode or heptode
K Octode
L Audio power pentode

M Visual tuning indicator
X Dual-anode rectifier (gas-filled)
Y Single anode rectifier (vacuum)
Z Dual-anode rectifier (vacuum)

Television tubes use two letters followed by a number. The first indicates the method of deflection (D = electrostatic, M = magnetic) and the second the screen colour (B = blue, G = green, R = radar long-persistence, W = white). The numbers were allocated sequentially.

Telefunken (Germany)

This simple code had just two series, RE and RS, standing for Röhren-Empfangen (receiving valves) and Röhren-Senden (transmitting valves). The three-digit number following indicates first the heater current (first two digits, in hundredths of an amp) then the heater voltage (4, 3, 2 or 1 for 4V, 3V, 2V or 1.5V). The final letter indicates the valve base pattern, t for Telefunken, d for Europa-base with side contact for space grid, and no letter at all for Europa-base.

American Army (US Army - Signal Corps)

VT numbers are USA military valves, with no way of decoding their pattern without look-up tables, although many valves were dual-marked with VT and civilian part numbers.

BVA numbers (British Valve Association) were assigned to valves used for civilian replacements in WW2.