

MAZDA

Valves & Picture Tubes

DATA

BOOKLET

1966

YOUR MAZDA WHOLESALER

1966

DATA BOOKLET



**VALVES AND
PICTURE TUBES**

Maintenance Sales Dept.
Thorn-AEI Radio
Valves & Tubes, Ltd.
7 Soho Square
London, W.1

Telephone GERrard 5233
Telex 261680

Returns

Please avoid delay by sending all
returned goods to the appropriate
Service Depot (see back page 160)
and

NOT THIS ADDRESS

Publication TAEI/M/2D

PRICES

Please refer to separate Mazda price list (TAEI/M1) obtainable
on request from the address on this page.

RESALE PRICE MAINTENANCE

Mazda valves and tubes are sold to the trade upon the condition
that they are resold to the public only at our current list prices
plus the full amount of purchase tax applicable.

AVAILABILITY

Inclusion in this booklet does not guarantee availability.
Most types are constantly available, but Mazda publish a
Monthly Availability List for the use of Wholesalers. Retailers
may now be added to this mailing list on request.

ADDITIONAL DATA

This data booklet has been compiled for use in maintenance
work by the radio trade.
Full design data sheets are available free of charge on individual
valve or CRT types. A complete design data Handbook may be
purchased. Please see page 3 for details.

SEMICONDUCTORS

A separate Mazda Data Booklet is published for Semicon-
ductors. Obtainable from the address on this page.

KEEP YOUR OLD MAZDA BOOKLETS

They contain more complete data on Obsolescent and Obsolete
types than is included in this edition.

WPG. 50M 3/66

Printed in Great Britain

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NEW TYPES

These types have been added since the last edition

MAZDA VALVES

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MAZDA PICTURE TUBES

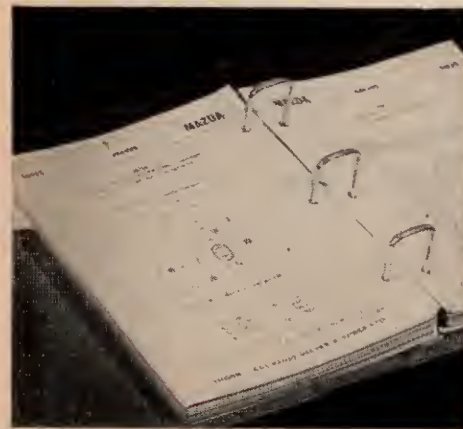
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This Data Booklet is published by Thorn-AEI Radio Valves and Tubes Limited for the convenience of customers and, although every care has been taken in its preparation, no responsibility or liability is assumed or accepted for the accuracy of the information given.

BE FIRST TO KNOW
ABOUT THE NEW TYPES WITH



DESIGN DATA HANDBOOK



It contains in two volumes comprehensive data on all new and maintenance types of Mazda entertainment valves, picture tubes and semi-conductors. The loose-leaf sheets are secured in blue PVC covers by square ring-binders for flat opening and easy insertion.

INITIAL CHARGE including data service for current data year ... £2

ANNUAL SERVICE CHARGE for the following years, covering the periodic supply of Preliminary data sheets on the latest Mazda valve developments as well as the subsequent Final data sheets. This is invoiced on the 1st July each year £1.

Send your order and payment of £2 to:

THORN-AEI PUBLICITY DEPARTMENT
7 Soho Square, London, W.1

KEY TO ABBREVIATIONS

RATING AND OPERATING CONDITIONS

AF	Audio Frequency	P_{out}	Power Output
C_{res}	Reservoir Capacitance	r_a	Valve Anode Resistance
EHT	Extra High Tension	R_a	Anode Circuit Resistance
f	Frequency	R_{eq}	Equivalent Noise Resistance
F.C.	Frequency Changer	R_{g1}	Control Grid Circuit Resistance
F.W.	Full Wave	R_{g2}	Screen Grid Circuit Resistance
g_c	Conversion Conductance	r.m.s.	Root Mean Square Value
g_m	Mutual Conductance	R_{lim}	Surge Limiting Resistance
HF	High Frequency	UHF	Ultra-High Frequency
H.W.	Half Wave	V_a	Anode Voltage
I_a	Direct Anode Current	$V_{a(b)}$	Anode Supply Voltage
$I_{a(av)}$	Mean Anode Current	$V_{a(pk)max}$	Maximum Peak Anode Voltage
$I_{a(o)}$	No Signal Anode Current	V_b	Supply Voltage
$i_{a(pk)max}$	Maximum Peak Anode Current	V_{g1}	Control Grid Voltage
I_{g2}	Screen Grid Current	V_{g2}	Screen Grid Voltage
I_{g2+g4}	Screen Grid Current (frequency changers)	V_{g2+g4}	Screen Grid Voltage (frequency changers)
$I_{g2(o)}$	No Signal Screen Grid Current	V_{g3}	Suppressor Grid Voltage
I_h	Heater Current	V_h	Heater Voltage
$I_k(max)$	Maximum Cathode Current	$v_{het(pk)}$	Peak Heterodyne Voltage
$I_{out(max)}$	Maximum Output Current	VHF	Very-High Frequency
I_t	Target Current	$V_{h-k(pk)max}$	Maximum Peak Heater to Cathode Voltage
L	Length of Column (tuning indicators)	V_{in}	Input Voltage
$P_a(max)$	Maximum Anode Dissipation	V_{out}	Output Voltage
$P_{g2(max)}$	Maximum Screen Dissipation	V_t	Target Voltage
P.I.V. _{max}	Maximum Peak Inverse Voltage	θ	Deflection Angle
pk	Peak	μ	Amplification Factor

KEY TO ABBREVIATIONS

BASE CONNECTIONS

a	anode	IC	internal connection. This indicates that the pin is connected to an electrode for the purpose of improving mechanical rigidity. The connection may not always be made to the same electrode on a given valve type, and it is essential that the corresponding valve holder socket be left unconnected.
a'	anode of first section	k	cathode
a''	anode of second section	k'	cathode of first section
a'''	anode of third section	k''	cathode of second section
a_d	anode of diode section	M	metallising
a_t	anode of triode section	NC	no connection
bp	beam plates	NP	no pin
ct	centre tap	p	pentode
d	diode	q	tetrode
f	filament	s	internal shield
g	grid	SC	side contact
g_1	grid nearest cathode (e.g. control grid)	t	triode or fluorescent target
g_2	second grid from cathode (e.g. screen grid)	TC	top cap
g_3	third grid from cathode (e.g. suppressor grid)		
gt	grid of triode section		
h	heater, heptode or hexode		

MAZDA

NOMENCLATURE FOR VALVES

SIGNAL VALVES

These have a three symbol name comprising a number, a letter or letter sequence and a final number.

First number indicates heater or filament rating,

1	1.4 V (parallel or series)
6	6.3 V (parallel or series)
10	0.1 A (series)
20	0.2 A (series)
30	0.3 A (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 same class.

POWER RECTIFIER VALVES

These have a two symbol name comprising one or two letters and a final number.

Letters indicate class of rectifier,

U	High vacuum half-wave
UU	High vacuum full-wave

Final numbers distinguish between different valves in the same class.

Half-wave rectifiers have the number chosen so that this number, excluding the final digit, corresponds to the approximate heater or filament voltage.

EUROPEAN

NOMENCLATURE FOR VALVES

The type nomenclature consists of two or more letters followed by two or three figures. These symbols give information concerning the heater or filament rating, the principal uses of the valve and the type of base according to the following code:—

The first letter indicates the filament or heater rating,

Letter	Filament or Heater Rating	Operation
D	≤1.4 V	Series or Parallel Supply
E	6.3 V	Series or Parallel Supply
G	Others	Miscellaneous
H	0.15 A	Series Supply
L	0.45 A	Series Supply
P	0.3 A	Series Supply
U	0.1 A	Series Supply
X	0.6 A	Series Supply

The following letters have formerly also been used A(4V), B(0.18A), C(0.2A), F(12.6V), K(2V), and V(50mA).

The second and subsequent letters indicate the construction and/or application of the valve,

A	Diode (excluding rectifier)
B	Double diode
C	Triode (excluding power output triode)
D	Power output triode
E	Tetrode (excluding power & output tetrode)
F	Pentode (excluding power output pentode)
L	Power output tetrode or output pentode
H	Hexode or heptode (of the hexode type)
K	Octode or heptode (of the octode type)
M	Tuning indicator
Y	Half-wave rectifier
Z	Full-wave rectifier

Note: Two or three of the above letters may be combined as required.

The first figure indicates the type of base,

1	Miscellaneous base types
2	Decal (B10B)
3	International octal
5	Magnoval (B9D) and Novar (B9E)—520 and above
8	Noval (B9A)
9	Miniature (B7G)

Note: The remaining first figures and the figure 5 have formerly been used for other base types, e.g., 6 and 7 for subminiature bases.

The remaining two figures are a serial number

Note: The following classification is also used for tetrodes and pentodes (excluding power output types):—

Even number indicates a sharp cut-off characteristic.
Odd number indicates a variable-mu characteristic.

NOMENCLATURES for TELEVISION PICTURE TUBES

Two type nomenclature systems are currently in use for Mazda Picture Tubes. Where applicable, tubes are now dual branded with both Mazda and European type numbers.

e.g. CME 1906/A47-13W

MAZDA SYSTEM

Television type picture tubes are designated by a letter classification followed by a number.
e.g. CME 1906

Letter classification

- CME** Indicates the tube has electrostatic focus and magnetic deflection.
- CRM** Indicates the tube has magnetic deflection and focus.

Number classification

The first part of the type number is used to identify the size of the picture tube measured in inches. For round tubes the number indicates the overall diameter of the face and for rectangular tubes, the overall diagonal of the face of the tube.

The second part of the type number is a serial number to distinguish tubes in the same size group. A suffix letter A or B, etc., may be added in order to indicate a tube with modified features, as for example a tinted front face as compared to clear glass or higher voltage ratings.

EUROPEAN SYSTEM

The type nomenclature consists of one letter and number joined by a hyphen to a number and a final letter. e.g. A47-13W

First Letter classification

The first letter "A" indicates a Television cathode ray tube for entertainment applications.

First Number classification

This first number indicates the screen dimensions in cm. For rectangular screens the screen diagonal and for round screens the diameter.

- | | |
|----|------------------------------------|
| 43 | Represents a 43 cm (17 in.) screen |
| 47 | Represents a 47 cm (19 in.) screen |
| 53 | Represents a 53 cm (21 in.) screen |
| 59 | Represents a 59 cm (23 in.) screen |

Second Number classification

This second number is a serial number indicating a particular design or development.

Final Letter

The final letter indicates the properties of the phosphor screen. For television cathode ray tubes with a white phosphor "W" will be used.

Note: Formerly the letter indicating the screen properties followed the initial letter.



Assembling MAZDA valves at Sunderland "A" factory.

CURRENT AND MAINTENANCE TYPES

MAZDA VALVES

NUMERICAL

ALL BASE DIAGRAMS ARE VIEWED
FROM THE FREE END OF PINS
see page 6 for MAZDA NOMENCLATURE

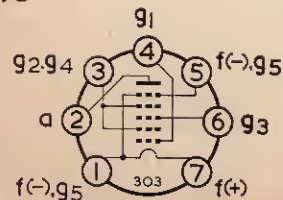
IC1

Pentagrid F.C.
1-4V, 50mA Filament

Typical Operation

V_a	90	V
V_{g2+g4}	67.5	V
V_{g3}	0	V
I_a	1.6	mA
I_{g2+g4}	3.2	mA
R_{g1}	100	k Ω
g_c	300	$\mu A/V$
r_a	600	k Ω

B7G



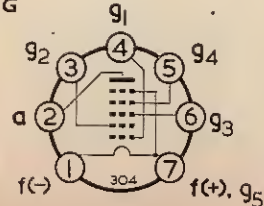
IC2

Pentagrid F.C.
1-4V, 50mA Filament

Typical Operation

V_a	85	V
V_{g4}	60	V
V_{g3}	0	V
$V_{g2(osc)}$	30	V
I_a	0.7	mA
$I_{g2(osc)}$	1.6	mA
I_{g4}	150	μA
R_{g4}	180	k Ω
$R_{g2(osc)}$	33	k Ω
$R_{g1(osc)}$	27	k Ω
g_c	325	$\mu A/V$
r_a	650	k Ω

B7G



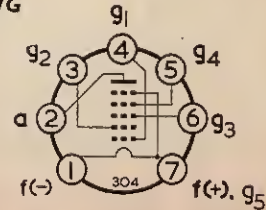
IC3

Pentagrid F.C.
1-4V, 25mA Filament

Typical Operation

V_a	85	V
V_{g4}	68	V
V_{g3}	0	V
$V_{g2(osc)}$	35	V
I_a	0.6	mA
$I_{g2(osc)}$	1.5	mA
I_{g4}	140	μA
R_{g4}	120	k Ω
$R_{g2(osc)}$	33	k Ω
$R_{g1(osc)}$	27	k Ω
g_c	300	$\mu A/V$
r_a	800	k Ω

B7G



IF1

HF Pentode
Vari-mu Amplifier
1-4V, 25mA Filament

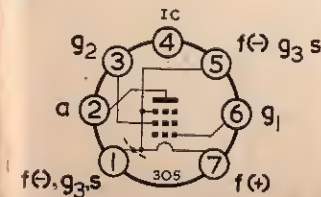
Rating

$P_{a(max)}$	250	mW
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Typical Operation

V_a	85	V
V_{g2}	64	V
V_{g1}	0	V
I_a	1.65	mA
I_{g2}	0.55	mA
R_{g2}	39	k Ω
g_m	0.85	mA/V
r_a	1	M Ω

B7G



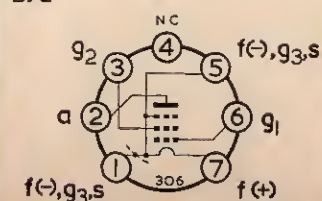
IF3

HF Pentode
Vari-mu Amplifier
1-4V, 50mA Filament

Typical Operation

V_a	90	V
V_{g2}	67.5	V
V_{g1}	0	V
I_a	3.5	mA
I_{g2}	1.4	mA
g_m	0.9	mA/V
r_a	500	k Ω

B7G



IFD1

Diode Pentode
Audio Amplifier
1-4V, 25mA Filament

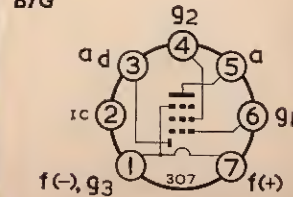
Rating (Pentode)

$P_{a(max)}$	30	mW
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Characteristics (Pentode)

V_a	67.5	V
V_{g2}	67.5	V
V_{g1}	-1.5	V
I_a	170	μA
I_{g2}	55	μA
g_m	170	$\mu A/V$
μ_{g1-g2}	16	

B7G



IFD9

Diode Pentode
Audio Amplifier
1.4V, 50mA Filament

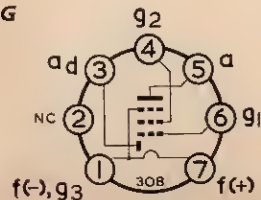
Rating (Pentode)

$P_{a(max)}$ 250 mW

Characteristics (Pentode)

V_a	90	V
V_{g2}	90	V
V_{g1}	0	V
I_a	2.7	mA
I_{g2}	630	μA
g_m	720	$\mu A/V$
r_a	500	$k \Omega$

B7G



IMI

Tuning Indicator
Ball and Line Display
1.4V, 25mA Filament

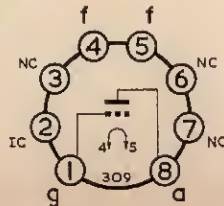
Typical Operation (Battery)

	Pin 5	Pin 4	
	earthed	earthed	
V_a	60	90	V
V_g	0	0	V
I_a	120	250	μA
V_g for cut-off	-8	-13.5	V

Typical Operation (Mains)

	earth	pin 5	
$V_{a(b)}$	110	V	
V_g	0	V	
I_a	90	μA	
R_a	560	$k \Omega$	
V_g for cut-off	-15	V	

B8D



IPI

Audio Output Pentode
1.4V, 50mA or
2.8V, 25mA Filament

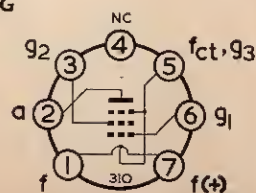
Rating

$P_{a(max)}$ 600 mW

Typical Operation (Parallel Filament)

V_a	85	V
V_{g2}	85	V
V_{g1}	-5.2	V
$I_a(o)$	5	mA
$I_{g2(o)}$	0.9	mA
g_m	1.4	mA/V
r_a	150	$k \Omega$
R_a	13	$k \Omega$
P_{out}	200	mW

B7G



IPI0

Audio Output Pentode
1.4V, 100mA or
2.8V, 50mA Filament

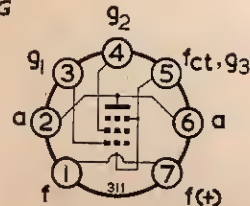
Rating

$P_{a(max)}$ 700 mW

Typical Operation (Parallel Filament)

V_a	90	V
V_{g2}	67.5	V
V_{g1}	-7	V
$I_a(o)$	7.4	mA
$I_{g2(o)}$	1.4	mA
g_m	1.58	mA/V
r_a	100	$k \Omega$
R_a	8	$k \Omega$
P_{out}	270	mW

B7G



IPI1

Audio Output Pentode
1.4V, 100mA or
2.8V, 50mA Filament

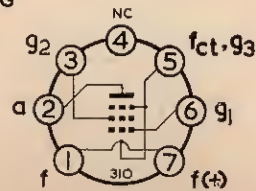
Rating

$P_{a(max)}$ 1 W

Typical Operation (Parallel Filament)

V_a	90	V
V_{g2}	90	V
V_{g1}	-4.5	V
$I_a(o)$	9.5	mA
$I_{g2(o)}$	2.1	mA
g_m	2.15	mA/V
r_a	100	$k \Omega$
R_a	10	$k \Omega$
P_{out}	270	mW

B7G



6/30L2 - ECC804

6C10

6C12

6D2

6F12

6F18

Double Triode
General Purpose
6.3V, 0.3A Heater

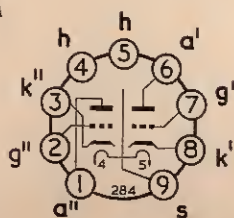
Ratings

$V_{a(max)}$	250	V
$P_{a(max)}$		
(Either Anode)	2.0	W
(Both Anodes)	2.5	W

Characteristics (each)

V_a	200	V
V_g	-7.7	V
I_a	10	mA
g_m	3.4	mA/V
μ	18	

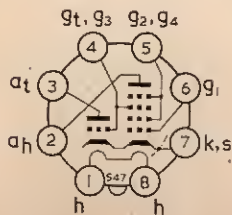
B9A



HF Triode Hexode
Frequency Changer
6.3V, 0.23A Heater

Typical Operation

	Triode	Hexode	
$V_{a(b)}$	250	250	V
V_{g2}	...	85	V
V_{g1}	...	-2	V
I_a	4.8	3	mA
I_{g2}	...	3	mA
R_a	33	...	k Ω
R_{gt+g3}		47	k Ω
R_k		180	Ω
g_c	...	0.75	mA/V

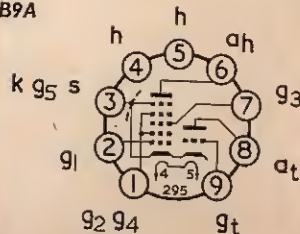


HF Triode Heptode
Frequency Changer
6.3V, 0.3A Heater

Typical Operation

	Triode	Heptode	
$V_{a(b)}$	250	250	V
V_{g2}	...	103	V
V_{g1}	...	-2	V
I_a	4.5	3.25	mA
I_{g2}	...	6.7	mA
R_a	33	...	k Ω
R_{gt+g3}		47	k Ω
R_{g2+g4}	...	22	k Ω
R_k		140	Ω
g_c	...	0.775	mA/V

B9A

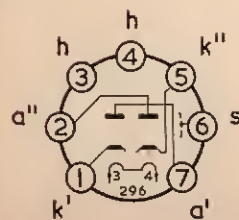


Double Diode
6.3V, 0.3A Heater

Ratings (each)

P.I.V. max	500	V
$I_a(max)$	9	mA
$i_{a(pk)} max$	50	mA

B7G



HF Pentode
6.3V, 0.3A Heater

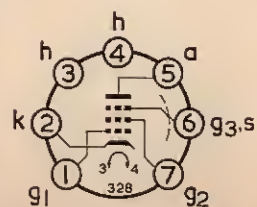
Rating

$P_{a(max)}$	2.5	W
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Typical Operation

V_a	250	V
V_{g3}	0	V
V_{g2}	250	V
V_{g1}	-2	V
I_a	10	mA
I_{g2}	2.5	mA
g_m	7.5	mA/V
r_a	1	M Ω

B7G



HF Pentode
Variable-mu Amplifier
6.3V, 0.2A Heater

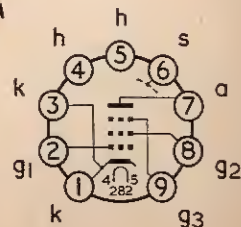
Rating

$P_{a(max)}$	2.25	W
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Typical Operation

V_a	175	V
V_g	0	V
V_{g2}	100	V
V_{g1}	-1.3	V
I_a	12	mA
I_{g2}	3.5	mA
g_m	4.4	mA/V
r_a	400	k Ω

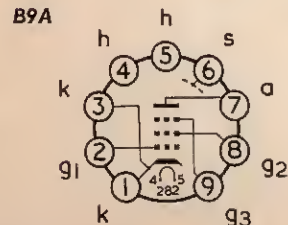
B9A



6F19

HF Pentode
Variable-mu Amplifier
6.3V, 0.3A Heater

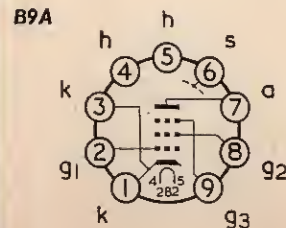
Rating		
$P_a(\max)$	2.5	W
Typical Operation		
V_a	250	V
V_{g3}	0	V
V_{g2}	100	V
V_{g1}	-2	V
I_a	10	mA
I_{g2}	2.5	mA
g_m	6	mA/V
r_a	500	k Ω



6F23

HF Pentode
6.3V, 0.3A Heater

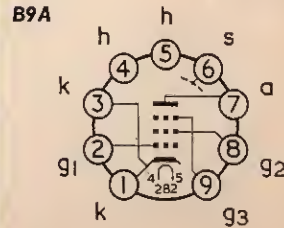
Rating		
$P_a(\max)$	3	W
Typical Operation		
V_a	170	V
V_{g3}	0	V
V_{g2}	170	V
V_{g1}	-1.9	V
I_a	10	mA
I_{g2}	2.6	mA
g_m	9.2	mA/V
R_k	150	Ω



6F24

Frame Grid Pentode
HF Amplifier
6.3V, 0.3A Heater

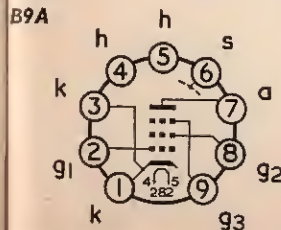
Rating		
$P_a(\max)$	2.5	W
Typical Operation		
V_a	170	V
V_{g3}	0	V
V_{g2}	170	V
V_{g1}	-1.9	V
I_a	10	mA
I_{g2}	2.7	mA
R_k	150	Ω
g_m	15	mA/V



6F25

Frame Grid Pentode
Variable-mu HF Amplifier
6.3V, 0.3A Heater

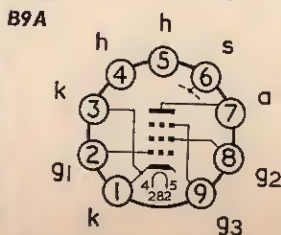
Rating		
$P_a(\max)$	2.5	W
Typical Operation		
$V_{a(b)}$	200	V
V_a	170	V
V_{g3}	90	V
V_{g2}	-1.5	V
I_a	11.5	mA
I_{g2}	2.8	mA
R_{g2}	39	k Ω
R_k	100	Ω
g_m	12.5	mA/V



6F26

HF Pentode
Vari-mu Amplifier
6.3V, 0.3A Heater

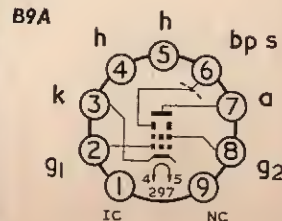
Rating		
$P_a(\max)$	2.5	W
Typical Operation		
V_a	250	V
V_{g3}	0	V
V_{g2}	100	V
V_{g1}	-2	V
I_a	10	mA
I_{g2}	2.5	mA
g_m	6	mA/V
r_a	500	k Ω



6F28

Frame Grid Beam Tetrode
Video Output
6.3V, 0.3A Heater

Rating		
$P_a(\max)$	2.5	W
Characteristics		
V_a	180	V
V_{g2}	180	V
V_{g1}	-2.9	V
I_a	10	mA
g_m	12.5	mA/V

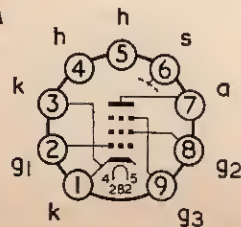


6F29

Frame Grid Pentode
Vari- μ HF Amplifier
6.3V, 0.3A Heater

Rating			
$P_{a(max)}$	2.5	W	
Typical Operation			
$V_{a(b)}$	200	V	
V_a	188	V	
V_{g2}	92	V	
V_{g1}	-2	V	
I_a	12	mA	
I_{g2}	4.5	mA	
R_{g2}	24	k Ω	
R_k	120	Ω	
g_m	12.5	mA/V	

B9A

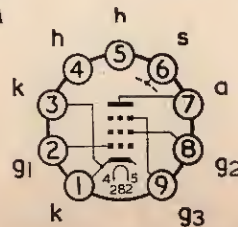


6F30

Frame Grid Pentode
HF Amplifier
6.3V, 0.3A Heater

Rating			
$P_{a(max)}$	2.5	W	
Typical Operation			
V_a	200	V	
V_{g3}	0	V	
V_{g2}	200	V	
V_{g1}	-2.5	V	
I_a	10	mA	
I_{g2}	4.1	mA	
R_k	180	Ω	
g_m	15	mA/V	
r_a	380	k Ω	

B9A

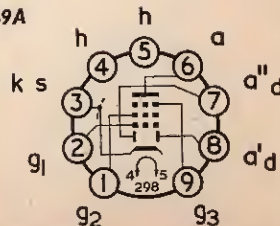


6FD12

Double Diode HF Pentode
Vari- μ Amplifier
6.3V, 0.3A Heater

Rating (Pentode)			
$P_{a(max)}$	2.25	W	
Typical Operation (Pentode)			
$V_a = V_{g2(b)}$	200	V	
V_{g3}	0	V	
V_{g1}	-1.5	V	
I_a	11	mA	
I_{g2}	3.3	mA	
R_{g2}	30	k Ω	
R_k	105	Ω	
g_m	4.5	mA/V	
r_a	600	k Ω	

B9A



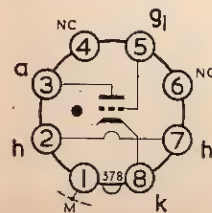
6K25

Thyratron
6.3V, 1A Heater

Rating			
$V_{a(max)}$	400	V	
$i_{a(pk)max}$	500	mA	

Typical Operation			
Control Ratio	20		
R_g	30	k Ω	
$I_{a(av)}$	2.5	mA	

Int. Octal



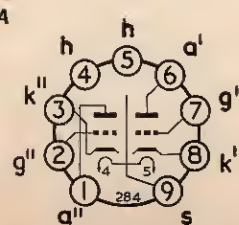
6L12

VHF Double Triode
6.3V, 0.435A Heater

Rating			
$P_{a(max)}$			
(Either Anode)	2.5	W	
(Both Anodes)	4.5	W	

Typical Operation (each)			
	Amplifier	Osc/Mix	
$V_{a(b)}$	250	250	V
V_{g1}	-2	...	V
I_a	10	5.2	mA
R_a	1.8	12	k Ω
R_g	...	1	M Ω
g_m	6.0	...	mA/V
g_c	...	2.3	mA/V
r_a	9.7	22	k Ω

B9A



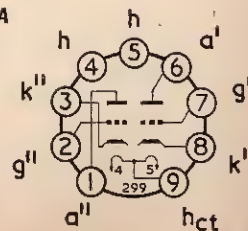
6L13

Double Triode
High- μ Audio Amplifier
6.3V, 0.3A, or
12.6V, 0.15A Heater

Rating			
$P_{a(max)}$			
(Each Section)	1	W	

Characteristics (each section)			
V_a	250	V	
V_g	-2	V	
I_a	1.2	mA	
g_m	1.6	mA/V	
μ	100		
r_a	62.5	k Ω	

B9A



6LD3

Double Diode Triode
Audio Amplifier
6.3V, 0.23A Heater

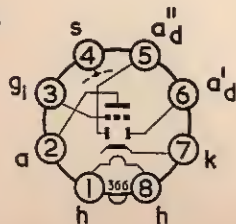
Rating (Triode)

$P_{a(max)}$	1	W
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Typical Operation (Triode)

V_a	100	V
V_g	-0.7	V
I_a	0.8	mA
r_a	54	k Ω
g_m	1.4	mA/V
μ	75	

B8A



6LD12

Triple Diode Triode
Audio Amplifier
6.3V, 0.45A Heater

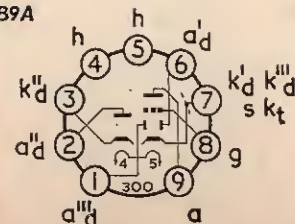
Rating (Triode)

$P_{a(max)}$	1	W
--------------	---	---

Characteristics (Triode)

V_a	100	V
V_g	-1	V
I_a	0.8	mA
r_a	48	k Ω
g_m	1.45	mA/V
μ	70	

B9A



6LD13

Double Diode Triode
Audio Amplifier
6.3V, 0.2A Heater

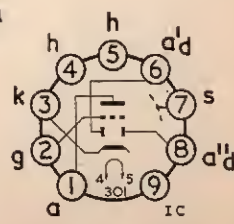
Rating (Triode)

$P_{a(max)}$	1	W
--------------	---	---

Characteristics (Triode)

V_a	100	V
V_g	-0.7	V
I_a	0.8	mA
r_a	54	k Ω
g_m	1.4	mA/V
μ	75	

B9A



6P15

Audio Output Pentode
6.3V, 0.76A Heater

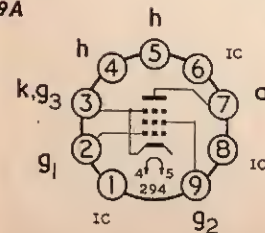
Rating

$P_{a(max)}$	12	W
--------------	----	---

Typical Operation

$V_{a(b)}$	250	V
V_{g2}	250	V
V_{g1}	-7.3	V
I_a	48	mA
I_{g2}	5.5	mA
R_a	4	k Ω
g_m	11.3	mA/V
r_a	38	k Ω
P_{out}	5.4	W

B9A



6P25

Beam Tetrode
Audio Output
6.3V, 1.1A Heater

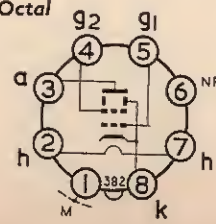
Rating

$P_{a(max)}$	10	W
--------------	----	---

Typical Operation

V_a	258	V
V_{g2}	258	V
I_a	40	mA
I_{g2}	8	mA
R_a	5.1	k Ω
R_k	180	Ω
g_m	8.8	mA/V
P_{out}	4.6	W

Int. Octal



6PL12

Triode Beam Tetrode
Audio or Field Output
6.3V, 0.78A Heater

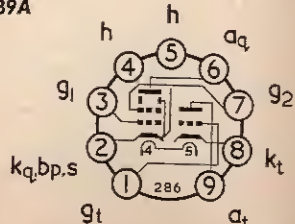
Rating Triode Tetrode

$P_{a(max)}$	1	7	W
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Characteristics

V_a	100	200	V
V_{g2}	...	200	V
V_{g1}	0	-16	V
I_a	3.5	35	mA
I_{g2}	...	7	mA
R_a	...	5.6	k Ω
R_k	...	390	Ω
g_m	2.5	6.4	mA/V
μ	70	...	
P_{out}	...	3.5	W

B9A



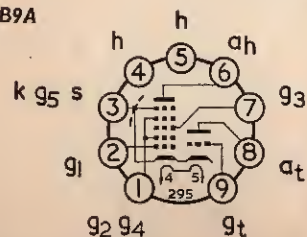
10C14

HF Triode Heptode
Frequency Changer
0·1A, 19V Heater

Typical Operation

	Triode	Heptode	
V_a	103	170	V
V_{g2}	...	102	V
V_{g1}	...	-2·2	V
I_a	4·5	3·2	mA
I_{g2}	...	6·8	mA
R_a	15	...	k Ω
R_{g2+g4}	...	10	k Ω
R_{g3+g5}	47		k Ω
R_k	150		Ω
g_c	...	0·75	mA/V

B9A



10F1

HF Screened Pentode
0·1A, 22V Heater

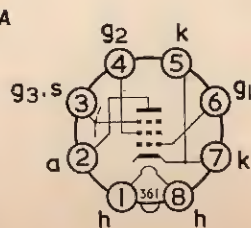
Rating

$P_a(\max)$	3·5	W
-------------	-----	---

Typical Operation

V_a	200	V
V_{g3}	0	V
V_{g2}	200	V
V_{g1}	-1·8	V
I_a	10	mA
I_{g2}	2·6	mA
g_m	9	mA/V

B8A



10F18

HF Pentode
Variable-mu Amplifier
0·1A, 13V Heater

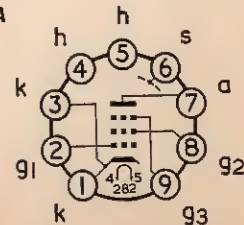
Rating

$P_a(\max)$	2·25	W
-------------	------	---

Typical Operation

V_a	175	V
V_{g3}	0	V
V_{g2}	100	V
V_{g1}	-1·3	V
I_a	12	mA
I_{g2}	3·5	mA
g_m	4·4	mA/V
r_a	400	k Ω

B9A



10FD12

Double Diode HF Pentode
Vari-mu Amplifier
0·1A, 19V Heater

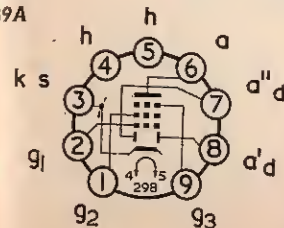
Rating (Pentode)

$P_a(\max)$	2·25	W
-------------	------	---

Typical Operation (Pentode)

$V_a = V_{g2(b)}$	200	V
V_{g2}	100	V
V_{g1}	-1·5	V
I_a	11	mA
I_{g2}	3·3	mA
R_{g2}	30	k Ω
R_k	105	Ω
g_m	4·5	mA/V
r_a	600	k Ω

B9A



10L14

VHF Double Triode
0·1A, 26V Heater

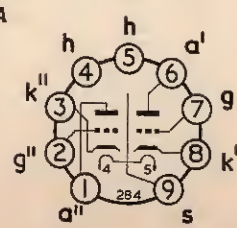
Rating

$P_a(\max)$	(Either)	2·5	W
	(Both)	4·5	W

Typical Operation

	Amp.	Osc/mix	
$V_{a(b)}$	170	170	V
V_{g1}	-1·4	...	V
I_a	8·7	4·8	mA
R_a	1·5	4·7	k Ω
R_g	...	1	M Ω
g_m	6	...	mA/V
g_c	...	2·2	mA/V
r_a	8·4	16	k Ω

B9A



10LD3

Double Diode Triode
Audio Amplifier
0·1A, 14V Heater

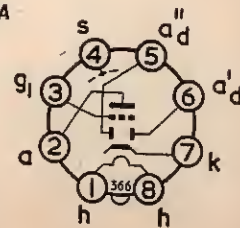
Rating (Triode)

$P_a(\max)$	1	W
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Characteristics (Triode)

V_a	100	V
V_{g1}	-0·7	V
I_a	0·8	mA
r_a	54	k Ω
g_m	1·4	mA/V
μ	75	

B8A



10LD12

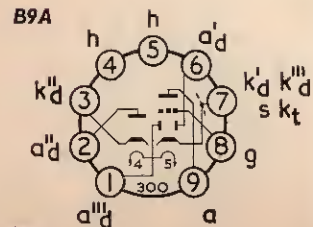
Triple Diode Triode
0-1A, 28V Heater

Rating (Triode)

$P_{a(max)}$	1	W
--------------	---	---

Characteristics (Triode)

V_a	200	V
V_g	-2.3	V
I_a	1	mA
r_a	50	k Ω
g_m	1.4	mA/V
μ	70	



10LD13

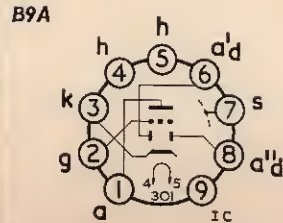
Double Diode Triode
Audio Amplifier
0-1A, 13V Heater

Rating (Triode)

$P_{a(max)}$	1	W
--------------	---	---

Characteristics (Triode)

V_a	100	V
V_g	-0.7	V
I_a	0.8	mA
r_a	54	k Ω
g_m	1.4	mA/V
μ	75	



10P13

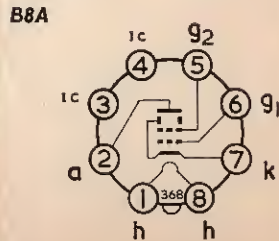
Beam Tetrode
Audio Output
0-1A, 40V Heater

Rating

$P_{a(max)}$	6	W
--------------	---	---

Typical Operation

V_a	180	V
V_{g2}	150	V
V_{g1}	-6.3	V
I_a	29	mA
I_{g2}	5.8	mA
R_s	5.4	k Ω
g_m	7.4	mA/V
P_{out}	2.6	W



10P14

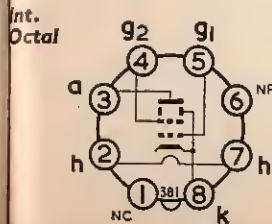
Beam Tetrode
Audio Output
0-1A, 40V Heater

Rating

$P_{a(max)}$	10	W
--------------	----	---

Typical Operation

V_a	165	V
V_{g2}	175	V
V_{g1}	-9.4	V
I_a	42	mA
I_{g2}	10.5	mA
R_s	3.5	k Ω
g_m	7.2	mA/V
P_{out}	3.4	W



10P18

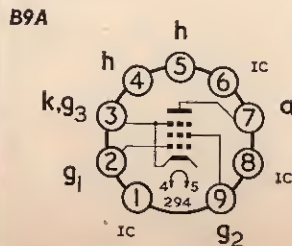
Audio Output Pentode
0-1A, 45V Heater

Rating

$P_{a(max)}$	12	W
--------------	----	---

Typical Operation

V_a	160	V
V_{g2}	170	V
V_{g1}	-12.5	V
$I_{a(o)}$	70	mA
$I_{g2(o)}$	5	mA
R_a	2.2	k Ω
g_m	10	mA/V
r_a	23	k Ω
P_{out}	5.2	W



10PL12

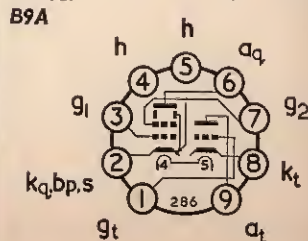
Triode Beam Tetrode
Audio Output
0-1A, 50V Heater

Rating

$P_{a(max)}$	1	7	W
--------------	---	---	---

Characteristics

V_a	100	200	V
V_{g2}	...	200	V
V_{g1}	0	-16	V
I_a	3.5	35	mA
I_{g2}	...	7	mA
R_k	...	390	Ω
R_a	...	5.6	k Ω
g_m	2.5	6.4	mA/V
P_{out}	...	3.5	W



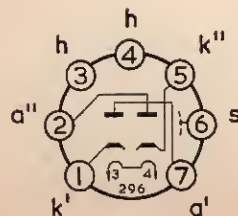
20D1

Double Diode
Separate Cathodes
0-2A, 9-5V Heater

Ratings (each)

P.I.V. _{max}	500	V
$i_a(pk)_{max}$	50	mA

B7G



20L1

AF Double Triode
0-2A, 12-6V Heater

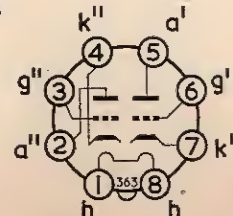
Rating

$P_{a(max)}$ (Either Anode)	3	W
(Both Anodes)	4	W

Characteristics (each)

V_a	200	V
V_g	-8.5	V
I_a	10	mA
g_m	2.8	mA/V
μ	16	
r_a	5.7	k Ω

B8A



20P3

AF Output Beam Tetrode
0-2A, 20V Heater

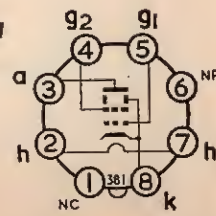
Rating

$P_{a(max)}$	10	W
--------------	----	---

Typical Operation

$V_{a(b)}$	175	V
V_{g2}	185	V
$I_a(o)$	42	mA
$I_{g2(o)}$	10.5	mA
R_a	4	k Ω
R_k	180	Ω
g_m	7.2	mA/V
P_{out}	2.8	W

Int.
Octal



20P4

Line Output Beam Tetrode
0-2A, 38V Heater

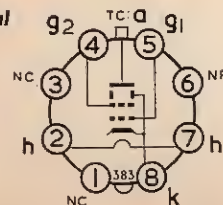
Ratings

$V_{a(max)}$	400	V
$P_{a(max)}$	10	W
$V_{g2(max)}$	250	V
$P_{g2(max)}$	4	W
$V_a(pk+)_{max}$	6	kV

Note

When replacing 20P4 in Murphy TVs, it is necessary to adjust the cathode current in accordance with the instructions in Murphy Service Manuals. The correct value of I_k varies with each model.

Int.
Octal



20P5

Beam Tetrode
Audio Output
0-2A, 20V Heater

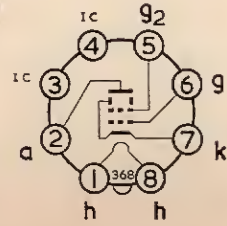
Rating

$P_{a(max)}$	6	W
--------------	---	---

Typical Operation

V_a	180	V
V_{g2}	150	V
V_{g1}	-6.3	V
$I_a(o)$	29	mA
$I_{g2(o)}$	5.8	mA
R_a	5.4	k Ω
g_m	7.4	mA/V
P_{out}	2.6	W

B8A



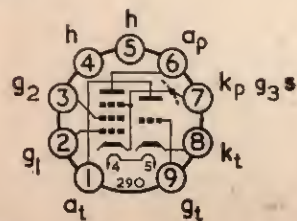
30C1

VHF Triode Pentode F.C.
0-3A, 9V Heater

Typical Operation

	Triode	Pentode	
V_a	120	170	V
V_{g2}	...	145	V
$v_{het(pk)}$	...	5	V
I_a	6	6.8	mA
I_{g2}	...	2	mA
R_g	...	33	k Ω
g_c	...	2	mA/V
μ	20	...	

B9A



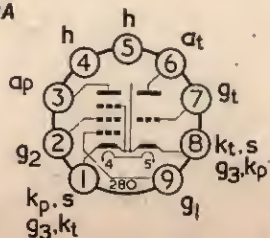
30C15

VHF Triode Pentode F.C.
0-3A, 9V Heater

Typical Operation

	Triode	Pentode	
$V_{a(b)}$	...	200	V
V_a	120	164	V
V_{g2}	...	138	V
$v_{het(pk)}$	...	3.7	V
I_a	6	7.6	mA
I_{g2}	...	2.3	mA
g_c	...	3.3	mA/V
μ	20	...	

B9A



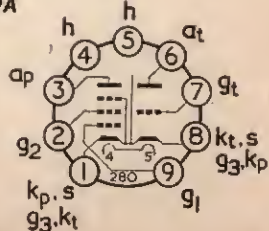
30C17

Frame Grid Triode Pentode
VHF Vari- μ F.C.
0-3A, 7.4V Heater

Typical Operation

	Triode	Pentode	
V_a	60	160	V
V_{g2}	...	150	V
I_a	7	7.3	mA
I_{g2}	...	1.8	mA
R_{g1}	47	2,200	k Ω
R_{g2}	...	27	k Ω
R_a	...	5.6	k Ω
g_c	...	4.8	mA/V
g_m	5.5	...	mA/V
μ	20	...	

B9A



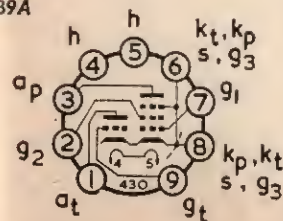
30C18

Triode Frame Grid Pentode
VHF Vari- μ F.C.
0-3A, 7.4V Heater

Typical Operation

	Triode	Pentode	
V_a	77	155	V
V_{g2}	...	135	V
I_a	7.8	7.8	mA
I_{g2}	...	2.4	mA
R_{g1}	47	2,200	k Ω
R_{g2}	...	27	k Ω
R_a	...	5.6	k Ω
g_c	...	4.7	mA/V
g_m	4.5	...	mA/V
μ	17	...	

B9A



30F5

HF Screened Pentode
0-3A, 7.3V Heater

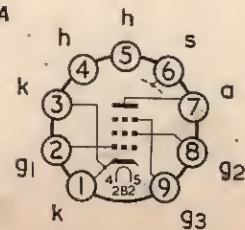
Rating

$P_a(max)$	3	W
------------	---	---

Typical Operation

V_a	170	V
V_{g2}	0	V
V_{g1}	170	V
V_{g1}	-1.9	V
I_a	10	mA
I_{g2}	2.6	mA
R_k	150	Ω
g_m	8.8	mA/V

B9A



30FL1

Triode Beam Tetrode
Video or Synch. Separator
0-3A, 9.4V Heater

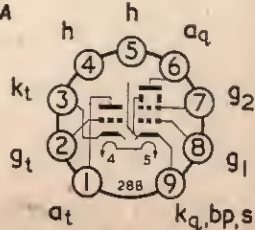
Rating

	Triode	Tetrode	
$P_a(max)$	2	3	W

Characteristics

V_a	200	170	V
V_{g2}	...	170	V
V_{g1}	-7.7	-2.1	V
I_a	10	10	mA
g_m	3.4	8	mA/V
μ	18	...	

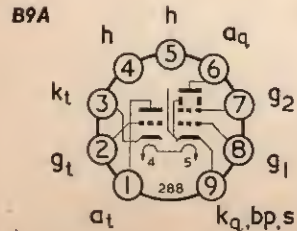
B9A



30FL12

Triode Frame Grid Tetrode
Video Output
0-3A, 10V Heater

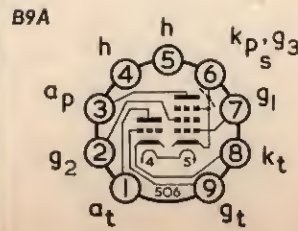
	Triode	Tetrode	
Rating			
$P_{a(max)}$	1.5	2.5	W
Characteristics			
V_a	150	180	V
V_{g2}	...	180	V
V_{g1}	-4.9	-2.9	V
I_a	10	10	mA
g_m	3.7	12.5	mA/V
μ	18	...	



30FL14

Triode Pentode
HF Amp. and Scanning Osc.
0-3A, 7-4V Heater

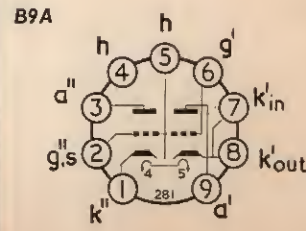
	Triode	Pentode	
Rating			
$P_{a(max)}$	2.0	2.0	W
Characteristics			
V_a	100	160	V
V_{g2}	...	160	V
V_{g1}	-3.0	-1.7	V
I_a	14	12	mA
I_{g2}	...	4.0	mA
g_m	5.5	14.5	mA/V
r_a	3.1	...	k Ω
μ	17	...	



30L1

VHF Double Triode
Cascode RF Amplifier
0-3A, 7V Heater

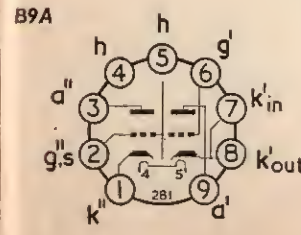
Rating		
$P_{a(max)}$ (Eiher Anode)	2	W
Characteristics (each section)		
V_a	90	V
V_g	-1.5	V
I_a	12	mA
g_m	6	mA/V
μ	24	



30L15

Double Triode
VHF Cascode
Variable-mu Amplifier
0-3A, 7V Heater

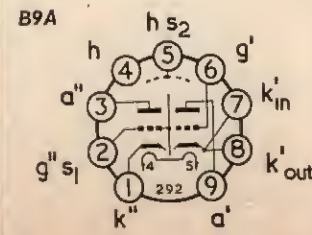
Rating (each section)		
$P_{a(max)}$	2	W
Characteristics (each section)		
V_a	90	V
V_g	-1.2	V
I_a	15	mA
g_m	9	mA/V
μ	27	



30L17

Frame Grid Double Triode
VHF Cascode
Variable-mu Amplifier
0-3A, 7-2V Heater

Rating (each section)		
$P_{a(max)}$	1.6	W
Characteristics (each section)		
V_a	75	V
V_g	0.75	V
I_a	15	mA
g_m	16.5	mA/V
μ	40	

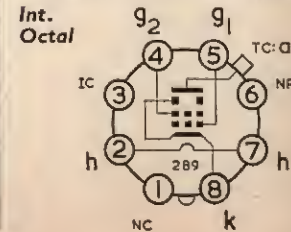


30P4MR

Line Output Beam Tetrode
0-3A, 25V Heater

Ratings		
$V_{a(max)}$	400	V
$P_{a(max)}$	10	W
$V_{g2(max)}$	250	V
$P_{g2(max)}$	4	W
$I_{k(max)}$	160	mA
$V_a(pk+)_{max}$	6.5	kV

Notes
30P4MR is a specially selected valve for use in some Murphy TVs using a single valve line time-base. Other 30P4 valves may be directly replaced by 30P19 without circuit modification.



30P12

Beam Tetrode
Audio or Field Output
0-3A, 12-6V Heater

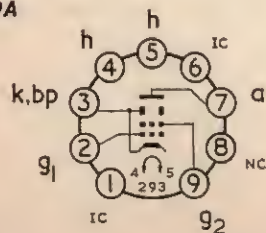
Rating

$P_a(\max)$	6	W
-------------	---	---

Typical Operation

V_a	170	V
V_{g2}	180	V
V_{g1}	-10.3	V
I_a	31	mA
I_{g2}	7.3	mA
R_a	5	k Ω
P_{out}	2.25	W

B9A



30P16

Output Pentode
Audio or Field Output
0-3A, 16-5V Heater

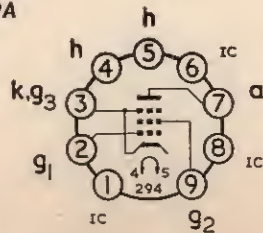
Rating

$P_a(\max)$	9	W
-------------	---	---

Typical Operation

V_a	200	V
V_{g2}	200	V
V_{g1}	-14.4	V
I_a	45	mA
I_{g2}	8.5	mA
R_a	4	k Ω
g_m	7.6	mA/V
r_a	24	k Ω
P_{out}	4.2	W

B9A



30P18

Field Output Pentode
0-3A, 15V Heater

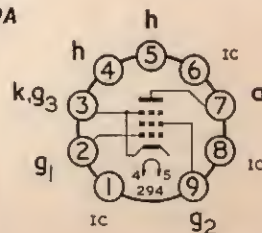
Rating

$P_a(\max)$	12	W
-------------	----	---

Typical Operation

V_a	160	V
V_{g2}	170	V
V_{g1}	-12.5	V
I_a	70	mA
I_{g2}	5	mA
R_a	2.2	k Ω
g_m	10	mA/V
r_a	23	k Ω
P_{out}	5.2	W

B9A



30P19

Beam Tetrode
Line Output
0-3A, 25V Heater

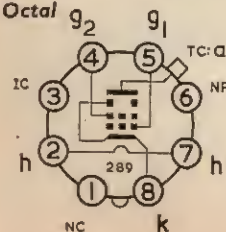
Ratings

$P_a(\max)$ ($P_{g2} \leq 4W$)	11	W
$P_{g2}(\max)$ ($P_a \leq 7W$)	5	W
$V_a(\max)$	250	V
$V_{g2}(\max)$	250	V
V_{h-k} (r.m.s.) \max	200	V
$I_k(\max)$	200	mA
$V_a(pk+)\max$	7	kV

Note

30P19 may be used to replace 30P4, but not 30P4MR.

Int. Octal



30PL1

Triode Beam Tetrode
Audio or Field Output
0-3A, 13V Heater

Rating (Tetrode)

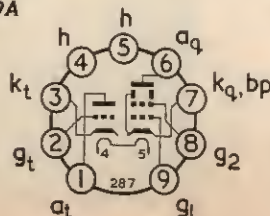
$P_a(\max)$	5.5	W
-------------	-----	---

Typical Operation (Tetrode)

V_a	180	V
V_{g2}	190	V
I_a	28	mA
I_{g2}	6.5	mA
R_a	6.2	k Ω
R_k	270	Ω
P_{out}	2.2	W

For triode characteristics, please see 6/30L2 on page 14.

B9A



30PL13

Triode Beam Tetrode
Field Output
0-3A, 16V Heater

Triode Tetrode

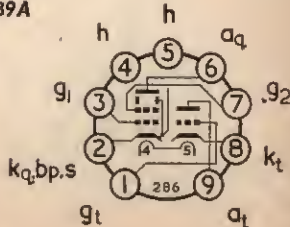
Rating

$P_a(\max)$	1	7	W
-------------	---	---	---

Characteristics

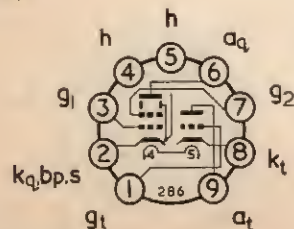
V_a	100	170	V
V_{g2}	...	170	V
V_{g1}	-2.2	-13	V
I_a	10	45	mA
g_m	4.3	7.5	mA/V
μ	18	...	

B9A



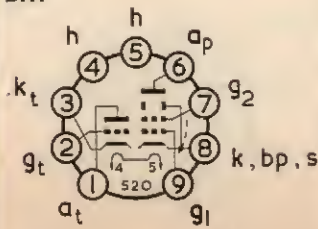
Triode Beam Tetrode
Field Output
0-3A, 16V Heater

	Triode	Tetrode	
Rating			
$P_{a(max)}$	1	8	W
Characteristics			
V_a	100	170	V
V_{g2}	...	170	V
V_{g1}	-2.2	-14.5	V
I_a	10	50	mA
g_m	4.3	7.3	mA/V
μ	18	...	
B9A			



Triode Beam Tetrode
Field Output
0-3A, 16V Heater

	Triode	Tetrode	
Rating			
$P_{a(max)}$	1	8	W
Characteristics			
V_a	100	170	V
V_{g2}	...	170	V
V_{g1}	-2.2	-14.5	V
I_a	10	50	mA
g_m	4.3	7.3	mA/V
μ	18	...	
B9A			



Please do NOT send

Television sets
Radio sets
Tape decks
Lamps
'Frig' motors
Vacuum cleaners
Loudspeakerphones
Kettles
Washing machines
Tuner units
Fenbridge guards
Gas fires
TV relay amplifiers
etc.
to the

MAZDA VALVE
SERVICE DEPT.
BRIMSDOWN



Assembling MAZDA valves at the Rochester factory.

CURRENT AND
MAINTENANCE TYPES

MAZDA
VALVES

ALPHABETICAL

ALL BASE DIAGRAMS ARE VIEWED
FROM THE FREE END OF PINS
see page 7 for EUROPEAN NOMENCLATURE

DAF91

Diode Pentode
Audio Amplifier
1.4V, 50mA Filament

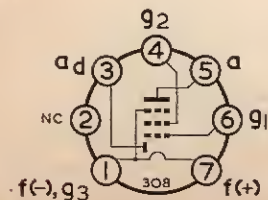
Rating (Pentode)

$P_a(\max)$	250	mW
-------------	-----	----

Characteristics (Pentode)

V_a	90	V
V_{g2}	90	V
V_{g1}	0	V
I_a	2.7	mA
I_{g2}	630	μA
g_m	720	$\mu A/V$
r_a	500	k Ω

B7G



DAF96

Diode Pentode
Audio Amplifier
1.4V, 25mA Filament

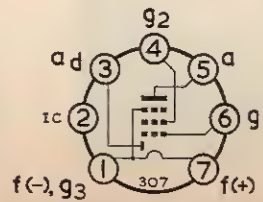
Rating (Pentode)

$P_a(\max)$	30	mW
-------------	----	----

Characteristics (Pentode)

V_a	67.5	V
V_{g2}	67.5	V
V_{g1}	-1.5	V
I_a	170	μA
I_{g2}	55	μA
g_m	170	$\mu A/V$
μ_{g1-g2}	16	

B7G



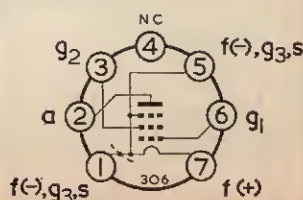
DF91

HF Pentode
Variable- μ Amplifier
1.4V, 50mA Filament

Typical Operation

V_a	90	V
V_{g2}	67.5	V
V_{g1}	0	V
I_a	3.5	mA
I_{g2}	1.4	mA
g_m	0.9	mA/V
r_a	500	k Ω

B7G



DF96

HF Pentode
Variable- μ Amplifier
1.4V, 25mA Filament

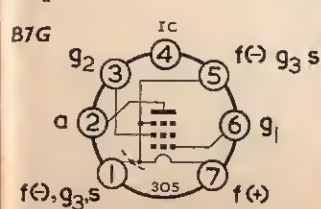
Rating

$P_a(\max)$	250	mW
-------------	-----	----

Typical Operation

V_a	85	V
V_{g2}	64	V
V_{g1}	0	V
I_a	1.65	mA
I_{g2}	0.55	mA
R_{g2}	39	k Ω
g_m	0.85	mA/V
r_a	1	M Ω

B7G



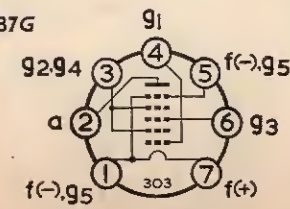
DK91

Pentagrid Frequency Changer
1.4V, 50mA Filament

Typical Operation

V_a	90	V
V_{g2+g4}	67.5	V
V_{g3}	0	V
I_a	1.6	mA
I_{g2+g4}	3.2	mA
R_{g1}	100	k Ω
g_c	300	$\mu A/V$
r_a	600	k Ω

B7G



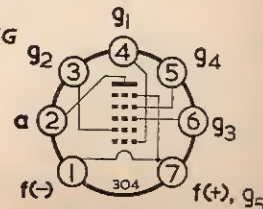
DK92

Pentagrid Frequency Changer
1.4V, 50mA Filament

Typical Operation

V_a	85	V
V_{g4}	60	V
V_{g3}	0	V
$V_{g2(\text{osc})}$	30	V
I_a	0.7	mA
$I_{g2(\text{osc})}$	1.6	mA
I_{g4}	150	μA
R_{g4}	180	k Ω
$R_{g2(\text{osc})}$	33	k Ω
$R_{g1(\text{osc})}$	27	k Ω
g_c	325	$\mu A/V$
r_a	650	k Ω

B7G

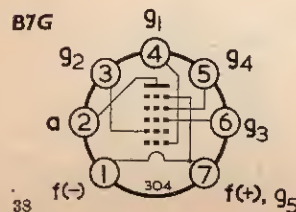


DK96

Pentagrid Frequency Changer
1.4V, 25mA Filament

Typical Operation

V_a	85	V
V_{g4}	68	V
V_{g3}	0	V
$V_{g2(osc)}$	35	V
I_a	0.6	mA
$I_{g2(osc)}$	1.5	mA
I_{g4}	140	μA
R_{g4}	120	$k\Omega$
$R_{g2(osc)}$	33	$k\Omega$
$R_{g1(osc)}$	27	$k\Omega$
g_c	300	$\mu A/V$
r_a	800	$k\Omega$



DL92

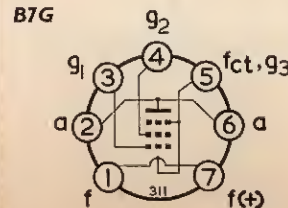
Audio Output Pentode
1.4V, 100mA, or
2.8V, 50mA Filament

Rating

$P_a(max)$	700	mW
------------	-----	----

Typical Operation (Parallel Filament)

V_a	90	V
V_{g2}	67.5	V
V_{g1}	-7	V
I_a	7.4	mA
I_{g2}	1.4	mA
g_m	1.58	mA/V
r_a	100	$k\Omega$
R_a	8	$k\Omega$
P_{out}	270	mW



DL94

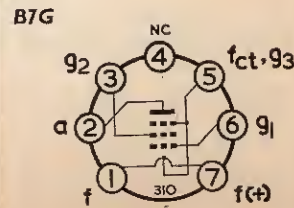
Audio Output Pentode
1.4V, 100mA, or
2.8V, 50mA Filament

Rating

$P_a(max)$	1	W
------------	---	---

Typical Operation (Parallel Filament)

V_a	90	V
V_{g2}	90	V
V_{g1}	-4.5	V
I_a	9.5	mA
I_{g2}	2.1	mA
g_m	2.15	mA/V
r_a	100	$k\Omega$
R_a	10	$k\Omega$
P_{out}	270	mW



DL96

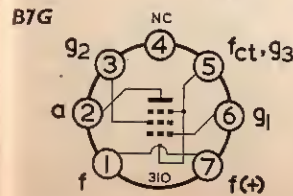
Audio Output Pentode
1.4V, 50mA, or
2.8V, 25mA Filament

Rating

$P_a(max)$	600	mW
------------	-----	----

Typical Operation (Parallel Filament)

V_a	85	V
V_{g2}	85	V
V_{g1}	-5.2	V
$I_a(o)$	5	mA
$I_{g2(o)}$	0.9	mA
g_m	1.4	mA/V
r_a	150	$k\Omega$
R_a	13	$k\Omega$
P_{out}	200	mW



DM71

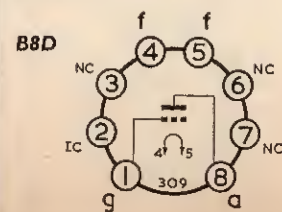
Tuning Indicator
Ball and Line Display
1.4V, 25mA Filament

Typical Operation (Battery)

	Pin 5	Pin 4	
	earthed	earthed	
V_a	60	90	V
V_g	0	0	V
I_a	120	250	μA
V_g for cut-off	-8	-13.5	V

Typical Operation (Mains)

	Earth	Pin 5	
$V_{a(b)}$	110		V
R_a	560		$k\Omega$
I_a	90		μA
V_{g1} for cut-off	-15		V



DY86

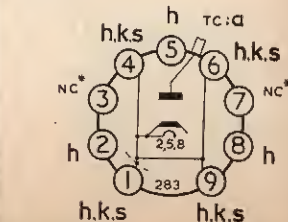
EHT Rectifier
1.4V, 0.55A Heater

Ratings (pulse operation)

P.I.V.-max	22	kV
$I_a(max)$	800	μA
$i_a(pk)max$	40	mA
$C(max)$	2000	pF

B9A

*Should not be earthed. May be connected to adjacent heater pins



DY87

EHT Rectifier
1.4V, 0.55A Heater

Ratings (pulse operation)

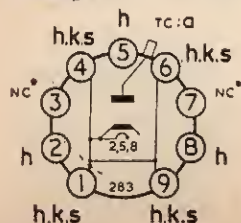
P.I.V. max	22	kV
$I_{out(max)}$	800	μ A
$i_{out(pk)max}$	40	mA
$C_{(max)}$	2 000	pF

Note

This valve differs from DY86 only in so far as the glass envelope is externally treated with silicones to avoid flash-over under conditions of high humidity and low atmospheric pressure.

B9A

* Should not be earthed. May be connected to adjacent heater pins.



EABC80

Triple Diode Triode
Audio Amplifier
6.3V, 0.45A Heater

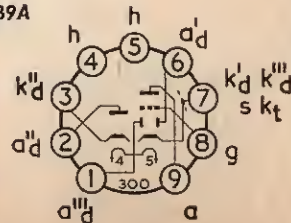
Rating (Triode)

$P_a(max)$	1	W
------------	---	---

Characteristics (Triode)

V_a	100	V
V_g	-1	V
I_a	0.8	mA
r_a	48	k Ω
g_m	1.45	mA/V
μ	70	

B9A



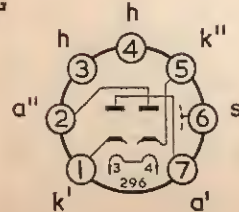
EB91

Double Diode
6.3V, 0.3A Heater

Ratings (each)

P.I.V. max	500	V
$I_a(max)$	.9	mA
$i_a(pk)max$	50	mA

B7G



EBC41

Double Diode Triode
Audio Amplifier
6.3V, 0.23A Heater

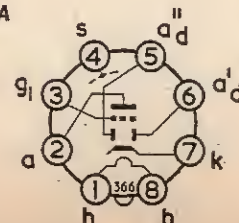
Rating (Triode)

$P_a(max)$	1	W
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Characteristics (Triode)

V_a	100	V
V_g	-0.7	V
I_a	0.8	mA
r_a	54	k Ω
g_m	1.4	mA/V
μ	75	

B8A



EBC81

Double Diode Triode
Audio Amplifier
6.3V, 0.2A Heater

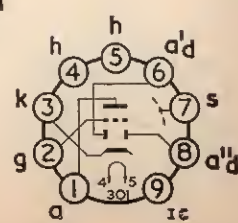
Rating (Triode)

$P_a(max)$	1	W
------------	---	---

Characteristics (Triode)

V_a	100	V
V_g	-0.7	V
I_a	0.8	mA
r_a	54	k Ω
g_m	1.4	mA/V
μ	75	

B9A



EBC90

Double Diode Triode
Audio Amplifier
6.3V, 0.3A Heater

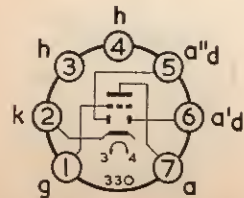
Rating (Triode)

$P_{a(max)}$ 1 W

Characteristics (Triode)

V_a	250	V
V_g	-3	V
I_a	1	mA
g_m	1.2	mA/V
μ	70	
r_a	58	k Ω

B7G



EBF80

Double Diode HF Pentode
Variable-mu Amplifier
6.3V, 0.3A Heater

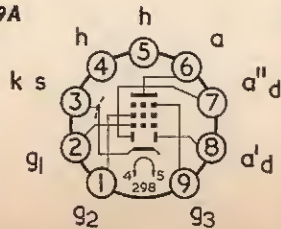
Rating (Pentode)

$P_{a(max)}$ 1.5 W

Typical Operation (Pentode)

V_a	250	V
V_{g3}	0	V
V_{g2}	85	V
V_{g1}	-2	V
I_a	5	mA
I_{g2}	1.75	mA
R_{g2}	95	k Ω
R_k	300	Ω
g_m	2.2	mA/V
μ_{g1-g2}	18	

B9A



EBF89

Double Diode HF Pentode
Variable-mu Amplifier
6.3V, 0.3A Heater

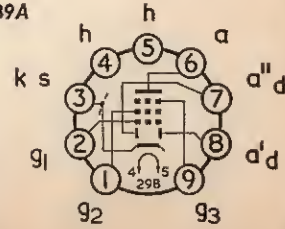
Rating (Pentode)

$P_{a(max)}$ 2.25 W

Typical Operation (Pentode)

$V_a = V_{g2(b)}$	200	V
V_{g3}	0	V
V_{g1}	-1.5	V
I_a	11	mA
I_{g2}	3.3	mA
R_{g2}	30	k Ω
R_k	105	Ω
g_m	4.5	mA/V
r_a	600	k Ω

B9A



ECC81

VHF Double Triode
6.3V, 0.3A or
12.6V, 0.15A Heater

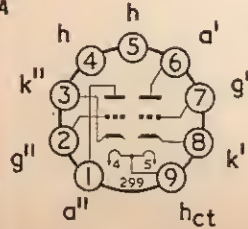
Rating (each section)

$P_{a(max)}$ 2.5 W

Characteristics (each section)

$V_{a(b)}$	250	V
V_g	-2	V
I_a	10	mA
g_m	5.5	mA/V
μ	60	
r_a	11	k Ω

B9A



ECC82

Double Triode
Audio Amplifier
6.3V, 0.3A or
12.6V, 0.15A Heater

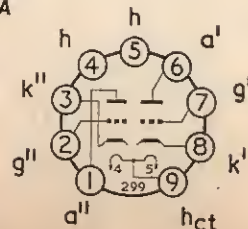
Rating (each section)

$P_{a(max)}$ 2.75 W

Characteristics (each section)

V_a	250	V
V_g	-8.5	V
I_a	10.5	mA
g_m	2.2	mA/V
μ	17	
r_a	7.7	k Ω

B9A



ECC83

Double Triode
High- μ Audio Amplifier
6.3V, 0.3A or
12.6V, 0.15A Heater

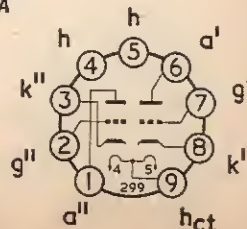
Rating (each section)

$P_{a(max)}$ 1 W

Characteristics (each section)

V_a	250	V
V_g	-2	V
I_a	1.2	mA
g_m	1.6	mA/V
μ	100	
r_a	62.5	k Ω

B9A

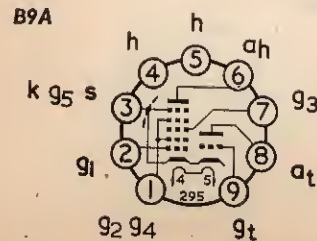


ECH81

HF Triode Heptode
Frequency Changer
6.3V, 0.3A Heater

Typical Operation

	Triode	Heptode	
$V_{a(b)}$	250	250	V
V_{g2}	...	103	V
V_{g1}	...	-2	V
I_a	4.5	3.25	mA
I_{g2}	...	6.7	mA
R_a	33	...	k Ω
R_{g2+g4}	...	22	k Ω
R_{gt+g3}	...	47	k Ω
R_k	...	140	Ω
g_c	...	0.775	mA/V

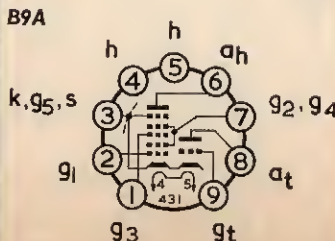


ECH84

Triode Heptode
Synch Separator
6.3V, 0.3A Heater

Triode Heptode

Rating	1.3	1.7	W
$P_{a(max)}$	1.3	1.7	W
Characteristics			
V_a	50	135	V
V_{g3}	...	0	V
V_{g2+g4}	...	14	V
V_{g1}	0	0	V
I_a	3	1.7	mA
I_{g2+g4}	...	0.9	mA
g_m	3.7	2.2	mA/V
μ	50	...	

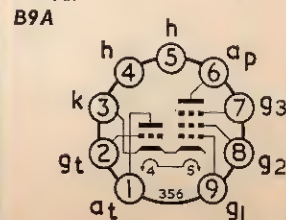


ECL80

Triode Pentode
Audio or Field Output
6.3V, 0.3A Heater

Triode Pentode

Rating	1	3.5	W
$P_{a(max)}$	1	3.5	W
Characteristics			
V_a	100	200	V
V_{g2}	...	200	V
V_{g1}	-2.3	-8	V
I_a	4	17.5	mA
I_{g2}	...	3.3	mA
R_a	...	11	k Ω
r_a	12.5	150	k Ω
g_m	1.4	3.3	mA/V
P_{out}	...	1.4	W

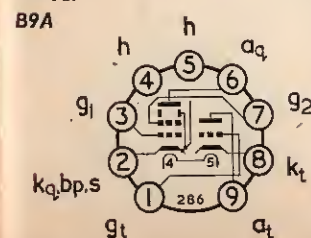


ECL82

Triode Pentode
Audio or Field Output
6.3V, 0.78A Heater

Triode Pentode

Rating	1	7	W
$P_{a(max)}$	1	7	W
Characteristics			
V_a	100	200	V
V_{g2}	...	200	V
V_{g1}	0	-16	V
I_a	3.5	35	mA
I_{g2}	...	7	mA
R_a	...	5.6	k Ω
R_k	...	390	Ω
g_m	2.5	6.4	mA/V
μ	70	...	
P_{out}	...	3.5	W

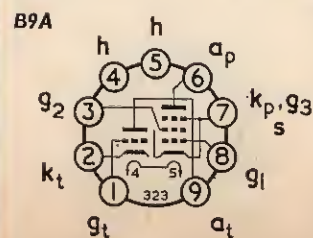


ECL86

Triode Pentode
Audio Amp and Output
6.3V, 0.66A Heater

Triode Pentode

Rating	0.5	9	W
$P_{a(max)}$	0.5	9	W
Typical Operation (Pentode)			
V_a	250	250	V
V_{g2}	...	250	V
I_a	1.2	36	mA
I_{g2}	...	6	mA
R_a	...	7	k Ω
R_k	...	170	Ω
g_m	1.6	10	mA/V
μ	100	...	
P_{out}	...	4	W



EF80

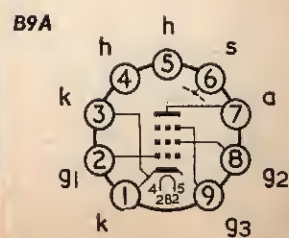
HF Pentode
6.3V, 0.3A Heater

Rating

$P_{a(max)}$	2.5	W
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Characteristics

$V_{a(b)}$	170	V
V_{g3}	0	V
V_{g2}	170	V
V_{g1}	-2	V
I_a	10	mA
I_{g2}	2.5	mA
g_m	7.4	mA/V
r_a	500	k Ω



EF85

EF86

EF89

EF91

EF183

EF184

**HF Pentode
Variable-mu Amplifier
6.3V, 0.3A Heater**

**Audio Pentode
Low Noise Pre-amplifier
6.3V, 0.2A Heater**

**HF Pentode
Variable-mu Amplifier
6.3V, 0.2A Heater**

**HF Pentode
6.3V, 0.3A Heater**

**Frame Grid Pentode
Variable-mu HF Amplifier
6.3V, 0.3A Heater**

**Frame Grid Pentode
HF Amplifier
6.3V, 0.3A Heater**

Rating

$P_a(\max)$	2.5	W
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Typical Operation

V_a	250	V
V_{g3}	0	V
V_{g2}	100	V
V_{g1}	-2	V
I_a	10	mA
I_{g2}	2.5	mA
g_m	6	mA/V
r_a	500	k Ω

Rating

$P_a(\max)$	1	W
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Characteristics

V_a	250	V
V_{g3}	0	V
V_{g2}	140	V
V_{g1}	-2	V
I_a	3	mA
I_{g2}	0.6	mA
g_m	2	mA/V
r_a	2.5	M Ω

Rating

$P_a(\max)$	2.25	W
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Characteristics

$V_{a(b)}$	250	V
V_{g3}	0	V
V_{g2}	100	V
V_{g1}	-2	V
I_a	9	mA
I_{g2}	3	mA
g_m	3.6	mA/V
r_a	1	M Ω
R_k	160	Ω

Rating

$P_a(\max)$	2.5	W
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Characteristics

V_a	250	V
V_{g3}	0	V
V_{g2}	250	V
V_{g1}	-2	V
I_a	10	mA
I_{g2}	2.5	mA
g_m	7.5	mA/V
r_a	1	M Ω

Rating

$P_a(\max)$	2.5	W
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Typical Operation

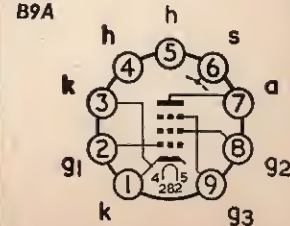
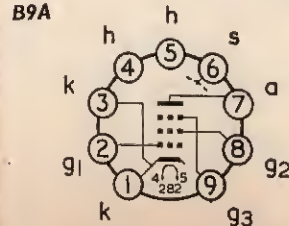
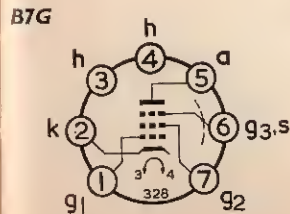
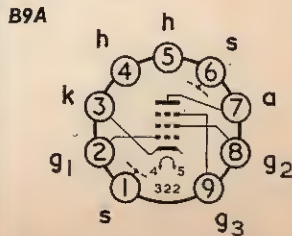
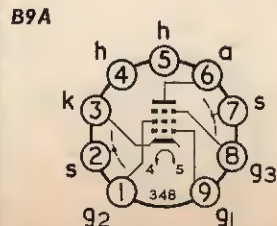
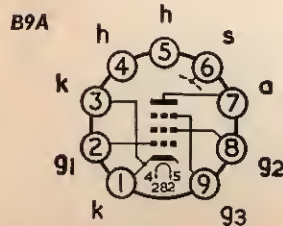
V_b	200	V
V_a	188	V
V_{g2}	92	V
V_{g1}	-2	V
I_a	12	mA
I_{g2}	4.5	mA
R_{g2}	24	k Ω
R_k	120	Ω
g_m	12.5	mA/V

Rating

$P_a(\max)$	2.5	W
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Typical Operation

V_a	200	V
V_{g3}	0	V
V_{g2}	200	V
V_{g1}	-2.5	V
I_a	10	mA
I_{g2}	4.1	mA
R_k	180	Ω
g_m	15	mA/V
r_a	380	k Ω



EH90

HF Dual Control Heptode
6.3V, 0.3A Heater

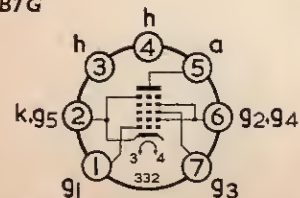
Rating

$P_a(\max)$	1	W
-------------	---	---

Characteristics

V_a	100	100	V
V_{g2+g4}	30	30	V
V_{g3}	-1	0	V
V_{g1}	0	-1	V
I_a	0.8	0.75	mA
I_{g2+g4}	4	1.1	mA
$g_m(g1-a)$...	1.2	mA/V	
$g_m(g3-a)$	1.55	mA/V	

B7G



EL84

Audio Output Pentode
6.3V, 0.76A Heater

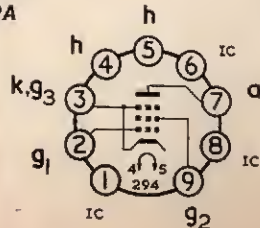
Rating

$P_a(\max)$	12	W
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Typical Operation

$V_{a(b)}$	250	V
V_{g2}	250	V
V_{g1}	-7.3	V
I_a	48	mA
I_{g2}	5.5	mA
R_a	4	kΩ
g_m	11.3	mA/V
r_a	38	kΩ
P_{out}	5.4	W

B9A



ELL80

Double Pentode
Audio Output
6.3V, 0.55A Heater

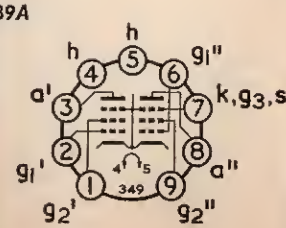
Rating (each section)

$P_a(\max)$	6	W
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Typical Operation (each section)

$V_{a(b)}$	250	V
V_{g2}	250	V
V_{g1}	-9	V
I_a	24	mA
I_{g2}	4.5	mA
R_a	10	kΩ
g_m	6	mA/V
r_a	80	kΩ
P_{out}	3	W

B9A



EM84

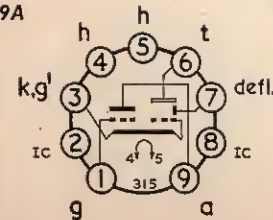
Tuning Indicator
Column Display
6.3V, 0.21A Heater

Typical Operation

$V_{a(b)}$	250	V	
V_t	250	V	
R_a	470	kΩ	
V_g	0	-22	V
I_a	450	60	μA
I_t	1.0	1.8	mA
L^*	21	0	mm

* Length of column

B9A



EM87

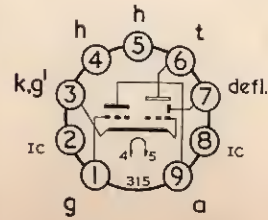
Tuning Indicator
Column Display
6.3V, 0.3A Heater

Typical Operation

V_b	250	V	
V_t	250	V	
R_a	100	kΩ	
$V_{g(b)}$	0	-10	V
I_a	2	0.5	mA
I_t	1.0	1.8	mA
L^*	21	0	mm

* Length of column.

B9A



EY51

EHT Rectifier
6.3V, 0.09A Heater

Ratings (pulse operation)

P.I.V.-max	17	kV
$I_a(\max)$	350	μA
$C_{res}(\max)$	0.005	μF

Wired in



EY86

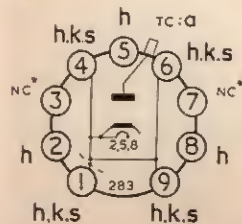
EHT Rectifier
6.3V, 0.09A Heater

Ratings (pulse operation)

P.I.V. _{max}	22	kV
I _{a(max)}	800	μA
i _{a(pk)} max	40	mA

B9A

* Should not be earthed. May be connected to adjacent heater pins.



EY87

EHT Rectifier
6.3V, 0.09A Heater

Ratings (pulse operation)

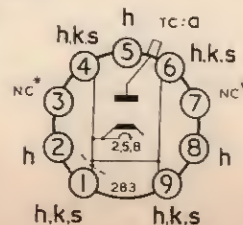
P.I.V. _{max}	22	kV
I _{a(max)}	800	μA
i _{a(pk)} max	40	mA

Note

This valve differs from EY86 only in so far as the glass envelope is externally treated with silicones to avoid flash-over under conditions of high humidity and low atmospheric pressure.

B9A

* Should not be earthed. May be connected to adjacent heater pins.



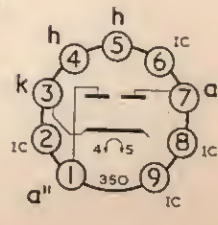
EZ80

Full Wave Rectifier
6.3V, 0.6A Heater

Typical Operation

I _a	90	mA
V _{in(r.m.s.)}	350	V
V _{out}	360	V
C _{res}	50	μF
R _{lim}	300	Ω

B9A



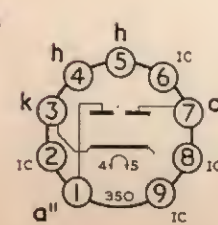
EZ81

Full Wave Rectifier
6.3V, 1A Heater

Typical Operation

I _a	150	mA
V _{in(r.m.s.)}	350	V
V _{out}	352	V
C _{res}	50	μF
R _{lim}	230	Ω

B9A



PC86

Frame Grid Triode
UHF Self-Oscillating Mixer
0.3A, 3.8V Heater

Rating

Pa(max)

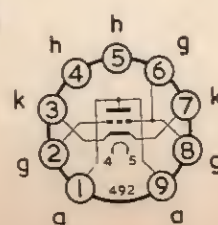
2.2

W

Typical Operation

V _{a(b)}	220	V
I _a	12	mA
I _g	50	μA
R _a	5.6	kΩ
R _g	47	kΩ
V _{osc(r.m.s.)}	2.5	V
g _c	5.5	mA/V

B9A



PC88

Frame Grid Triode
UHF Grounded Grid Amplifier
0.3A, 3.8V Heater

Rating

Pa(max)

2

W

Typical Operation

V _{a(b)}	160	V
I _a	12.5	mA
R _k	100	Ω
g _m	13.5	mA/V
r _a	4.8	kΩ
μ	65	

B9A



PC97

Frame Grid Triode
VHF Variable-mu Amplifier
0.3A, 4.5V Heater

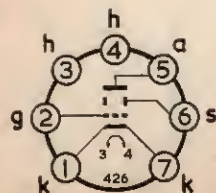
Rating

$P_a(\max)$	2.2	W
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Typical Operation

$V_{a(b)}$	135	V
I_a	10.5	mA
R_a	1	k Ω
$R_{k'}$	82	Ω
g_m	13	mA/V
μ	65	
r_a	5	k Ω

B7G



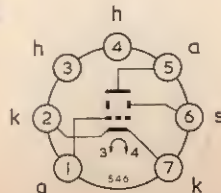
PC900

Frame Grid Triode
VHF Variable-mu Amplifier
0.3A, 4V Heater

Typical Operation

V_b	200	V
R_a	5.6	k Ω
$R_{k'}$	82	Ω
I_a	11.5	mA
I_g	0	μ A
V_g	-1	V
g_m	14.5	mA/V
μ	72	

B7G



PCC84

Double Triode
VHF Cascode Amplifier
0.3A, 7.0V Heater

Rating (each section)

$P_a(\max)$	2	W
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Characteristics (each section)

V_a	90	V
V_g	-1.5	V
I_a	12	mA
g_m	6	mA/V
μ	24	

B9A



PCC89

Frame Grid Double Triode
VHF Cascode
Variable-mu Amplifier
0.3A, 7.5V Heater

Rating (each section)

$P_a(\max)$	1.8	W
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Characteristics (each section)

V_a	90	V
V_g	-1.2	V
I_a	15	mA
g_m	12.3	mA/V

B9A



PCC189

Frame Grid Double Triode
VHF Cascode
Variable-mu Amplifier
0.3A, 7.6V Heater

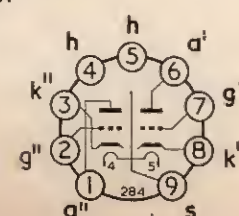
Ratings (each section)

$P_a(\max)$	1.8	W
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Characteristics (each section)

V_a	90	V
V_g	-1.4	V
I_a	15	mA
g_m	12.5	mA/V
r_a	2.5	k Ω
μ	34	
$V_g(g_m/100)$	-9	V

B9A



PCC806

Frame Grid Double Triode
VHF Cascode
Variable-mu Amplifier
0.3A, 7.2V Heater

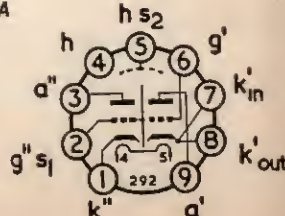
Rating (each section)

$P_a(\max)$	1.6	W
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Characteristics (each section)

V_a	75	V
V_g	0.75	V
I_a	15	mA
g_m	16.5	mA/V
μ	40	

B9A



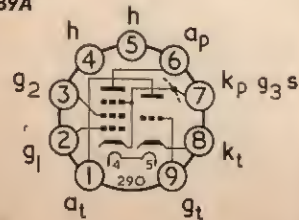
PCF80

VHF Triode Pentode
Frequency Changer
0-3A, 9V Heater

Typical Operation

	Triode	Pentode	
V_a	120	170	V
V_{g2}	...	145	V
$V_{het(pk)}$	...	5	V
I_a	6	6.8	mA
I_{g2}	...	2	mA
R_g	...	33	k Ω
g_c	...	2.0	mA/V
μ	20	...	

B9A



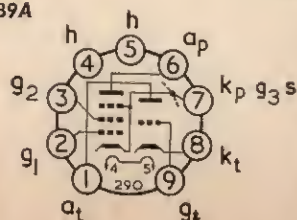
PCF82

VHF Triode Pentode
Frequency Changer
0-3A, 9.5V Heater

Typical Operation

	Triode	Pentode	
V_a	100	170	V
V_{g2}	...	110	V
R_{g1}	27	270	k Ω
I_a	7	5.5	mA
I_{g2}	...	2.0	mA
g_c	...	1.6	mA/V
$V_{het(pk)}$	...	3	V

B9A



PCF86

Triode Frame Grid Pentode
VHF Frequency Changer
0-3A, 8V Heater

Triode Pentode

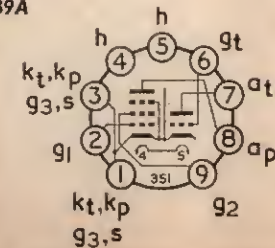
Rating

$P_{a(max)}$	1.5	2	W
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Typical Operation

	Triode	Pentode	
V_a	100	190	V
V_{g2}	...	140	V
V_{g1}	-3	...	V
I_a	14	8.5	mA
I_{g2}	...	2.7	mA
R_{g1}	...	100	k Ω
g_c	...	4.5	mA/V
g_m	5.7	...	mA/V

B9A



PCF87

Frame Grid Triode Pentode
VHF Variable-mu F.C.
0-3A, 7.4V Heater

Typical Operation

	Triode	Pentode	
V_a	60	160	V
V_{g2}	...	150	V
I_a	7	7.3	mA
I_{g2}	...	1.8	mA
R_{g1}	47	2200	k Ω
R_{g2}	...	27	k Ω
R_a	...	5.6	k Ω
g_c	...	4.8	mA/V
g_m	5.5	...	mA/V
μ	20	...	

B9A



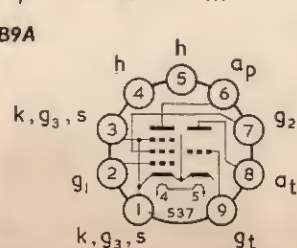
PCF801

Triode Frame Grid Pentode
VHF Variable-mu F.C.
0-3A, 8.5V Heater

Typical Operation

	Triode	Pentode	
V_b	200	200	V
V_{g1}	-3	-1.4	V
I_a	16	10	mA
I_{g2}	...	3	mA
R_a	8.2	2.7	k Ω
R_{g2}	...	27	k Ω
R_{g1}	10	0.1	M Ω
g_c	...	5	mA/V
g_m	3.7	...	mA/V
μ	20	...	

B9A



PCF802

Pentode Line Oscillator
Triode Reactance Valve
0-3A, 9V Heater

Triode Pentode

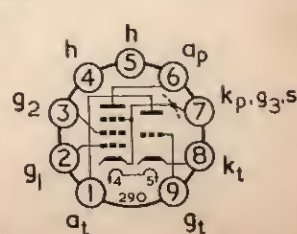
Rating

$P_{a(max)}$	1.5	1.2	W
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Characteristics

	Triode	Pentode	
V_a	200	100	V
V_{g2}	...	100	V
V_{g1}	-2	-1	V
I_a	3.5	6	mA
I_{g2}	...	1.7	mA
g_m	3.5	5.5	mA/V
r_a	20	400	k Ω

B9A

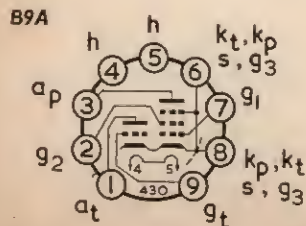


PCF805

Triode Frame Grid Pentode
VHF Variable- μ
Frequency Changer
0-3A, 7.4V Heater

Typical Operation

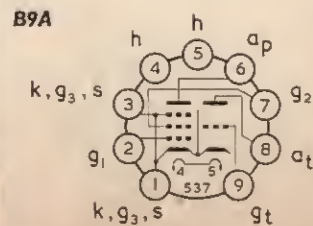
	Triode	Pentode	
V_a	77	155	V
V_{g2}	...	135	V
I_a	7.8	7.8	mA
I_{g2}	...	2.4	mA
R_{g1}	47	2,200	k Ω
R_{g2}	...	27	k Ω
R_a	...	5.6	k Ω
g_c	...	4.7	mA/V
g_m	5.5	...	mA/V
μ	17	...	



PCF806

Triode Frame Grid Pentode
VHF Frequency Changer
0-3A, 8V Heater

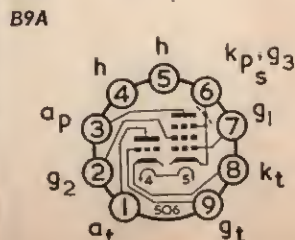
	Triode	Pentode	
Rating			
$P_a(\max)$	1.5	2	W
Characteristics			
V_a	100	170	V
V_{g2}	...	150	V
V_{g1}	-3	-1.2	V
I_a	14	10	mA
I_{g2}	...	3.3	mA
g_m	5.5	12	mA/V
r_a	...	>350	k Ω
μ	17	...	



PCF808

Triode Pentode
HF Amp and Scanning Osc
0-3A, 7.4V Heater

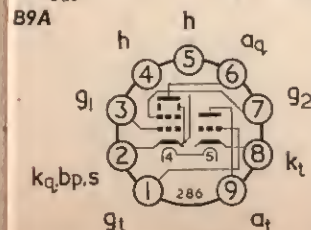
	Triode	Pentode	
Rating			
$P_a(\max)$	2.0	2.0	W
Characteristics			
V_a	100	160	V
V_{g2}	...	160	V
V_{g1}	-3.0	-1.7	V
I_a	14	12	mA
I_{g2}	...	4.0	mA
g_m	5.5	14.5	mA/V
r_a	3.1	...	k Ω
μ	17	...	



PCL82

Triode Output Pentode
Audio or Field Output
0-3A, 16V Heater

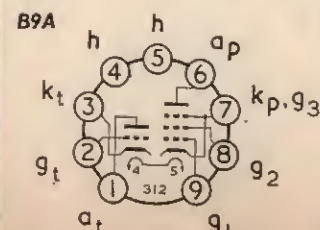
	Triode	Pentode	
Rating			
$P_a(\max)$	1	7	W
Typical Operation (Pentode)			
V_a	100	170	V
V_{g2}	...	170	V
V_{g1}	0	-11.5	V
I_a	3.5	41	mA
I_{g2}	...	8	mA
R_a	...	3.9	k Ω
R_k	...	230	Ω
g_m	2.5	7.5	mA/V
P_{out}	...	3.3	W



PCL83

Triode Output Pentode
Audio or Field Output
0-3A, 12.6V Heater

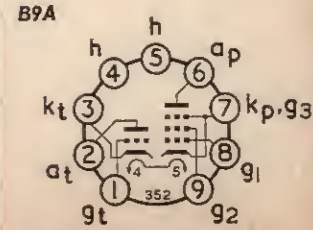
	Triode	Pentode	
Rating			
$P_a(\max)$	3.5	5.4	W
Characteristics			
V_a	250	170	V
V_{g2}	...	170	V
V_{g1}	-8.5	-9.5	V
I_a	10.5	30	mA
I_{g2}	...	5	mA
g_m	2.2	5.5	mA/V
r_a	7.7	53	k Ω
R_a	...	5.6	k Ω
P_{out}	...	2.2	W



PCL84

Triode Pentode
Video Output
0-3A, 15V Heater

	Triode	Pentode	
Rating			
$P_a(\max)$	1	4	W
Characteristics			
V_a	200	200	V
V_{g2}	...	200	V
V_{g1}	-1.7	-2.9	V
I_a	3	18	mA
I_{g2}	...	3	mA
g_m	4.0	10.4	mA/V
r_a	16.2	130	k Ω
μ	65	...	

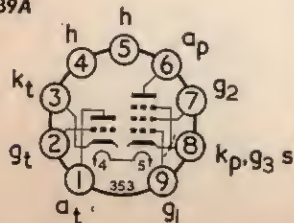


PCL85

Triode Pentode
Field Output
0.3A, 18V Heater

Rating	Triode	Pentode	
$P_{a(max)}$	0.5	7	W
Characteristics			
V_a	100	170	V
V_{g2}	...	170	V
V_{g1}	-0.85	-15	V
I_a	5	41	mA
g_m	5.5	7.5	mA/V
μ	60	...	

B9A



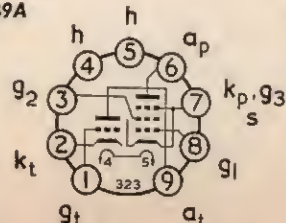
60

PCL86

Triode Pentode
Audio Amplifier and Output
0.3A, 13.6V Heater

Rating	Triode	Pentode	
$P_{a(max)}$	0.5	9	W
Typical Operation			
V_a	200	230	V
V_{g2}	...	230	V
V_{g1}	...	-5.7	V
I_a	0.42	39	mA
I_{g2}	...	6.5	mA
R_a	220	5.6	k Ω
R_{g1}	10	...	M Ω
R_k	...	120	Ω
g_m	...	10.5	mA/V
μ	100	...	
P_{out}	...	3.8	W

B9A

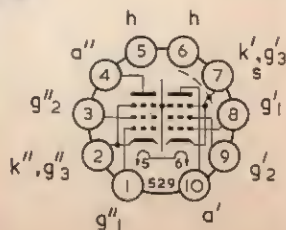


PFL200

Double Pentode
Sync. Sep. and Video Output
0.3A, 16.5V Heater

Ratings	F Section	L Section	
$P_{a(max)}$	1.5	5	W
Characteristics			
V_a	150	170	V
V_{g2}	150	170	V
V_{g1}	-2.3	-2.6	V
I_a	10	30	mA
I_{g2}	3	6.5	mA
g_m	8.5	21	mA/V
μ_{g1-g2}	35	32	
r_a	160	40	k Ω

B10B

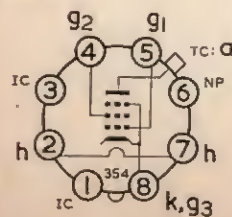


PL36

Line Output Pentode
0.3A, 25V Heater

Rating		
$P_{a(max)}$	12	W
Characteristics		
V_a	100	V
V_{g2}	100	V
V_{g1}	-8.2	V
I_a	100	mA
I_{g2}	7	mA
g_m	14	mA/V
r_a	5	k Ω

Int. Octal

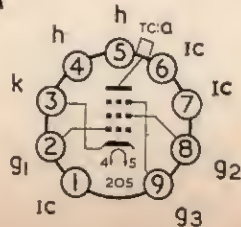


PL81

Line Output Pentode
0.3A, 21.5V Heater

Rating		
$P_{a(max)}$	8	W
$P_a + P_{g2(max)}$	10	W
Characteristics		
V_a	170	V
V_{g2}	0	V
V_{g1}	170	V
V_{g1}	-22	V
I_a	45	mA
I_{g2}	3	mA
g_m	6.2	mA/V

B9A

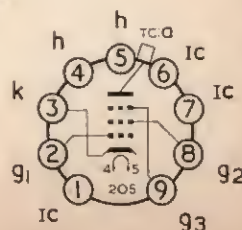


PL81A

Line Output Pentode
Portable Television Receivers
0.3A, 21.5V Heater

Characteristics		
V_a	170	V
V_{g2}	170	V
V_{g1}	-24.3	V
I_a	45	mA
I_{g2}	2.2	mA
g_m	6.2	mA/V
r_a	13	k Ω

B9A



61

PL82

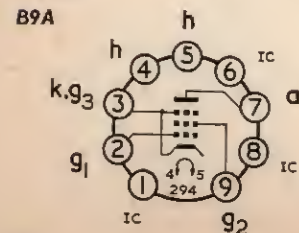
Audio or Field Output Pentode
0.3A, 16.5V Heater

Rating

$P_{a(max)}$	9	W
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Typical Operation

V_a	200	V
V_{g2}	200	V
V_{g1}	-14.4	V
$I_{a(o)}$	45	mA
$I_{g2(o)}$	8.5	mA
R_a	4	k Ω
g_m	7.6	mA/V
r_a	24	k Ω
P_{out}	4.2	W



PL83

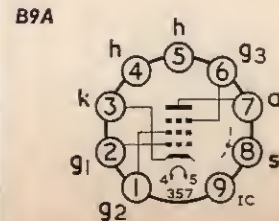
Video Output Pentode
0.3A, 15V Heater

Rating

$P_{a(max)}$	9	W
--------------	---	---

Characteristics

V_a	170	V
V_{g3}	0	V
V_{g2}	170	V
V_{g1}	-2.3	V
I_a	36	mA
I_{g2}	5	mA
g_m	10.5	mA/V
r_a	100	k Ω



PL84

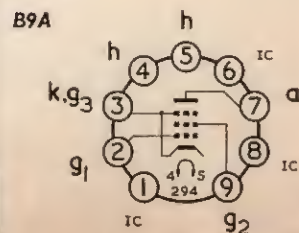
Field Output Pentode
0.3A, 15V Heater

Rating

$P_{a(max)}$	12	W
--------------	----	---

Typical Operation

V_a	170	V
V_{g2}	170	V
I_a	70	mA
I_{g2}	5	mA
V_{g1}	-12.5	V
g_m	10	mA/V
r_a	23	k Ω
R_a	2.2	k Ω
P_{out}	5.2	W



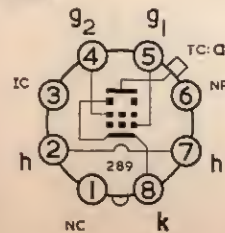
PL302

Beam Tetrode
Line Output
0.3A, 25V Heater

Rating

$P_{a(max)}$ ($P_{g2} \leq 4$ W)	11	W
$P_{g2(max)}$ ($P_a \leq 7$ W)	5	W
$V_a(max)$	250	V
$V_{g2(max)}$	250	V
$V_{h-k(r.m.s.)max}$	200	V
$I_k(max)$	200	mA
$V_a(pk+)$ max	7	kV

Int. Octal



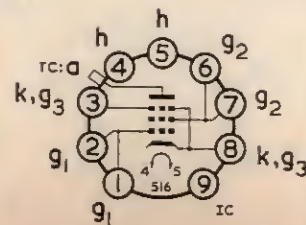
PL500

Line Output Pentode
0.3A, 27V Heater

Rating

$P_{a(max)}$ ($P_{g2} \leq 4$ W)	12	W
$P_{g2(max)}$ ($P_a \leq 8$ W)	5	W
$V_a(max)$	250	V
$V_{g2(max)}$	250	V
$V_a(pk)max$	7	kV
$V_{h-k(r.m.s.)max}$	220	V
$I_k(max)$	250	mA

B9D



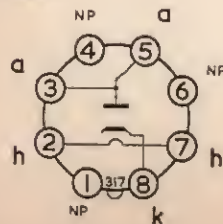
PY32

Half Wave Rectifier
0.3A, 29V Heater

Typical Operation

I_a	300	mA
$V_{in(r.m.s.)}$	250	V
V_{out}	242	V
P.I.V. _{max}	700	V
C_{res}	100	μF
R_{lim}	35	Ω

Int. Octal



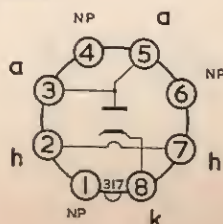
PY33

Half Wave Rectifier
0.3A, 29V Heater

Typical Operation

I_a	325	mA
$V_{in(r.m.s.)}$	250	V
P.I.V. _{max}	700	V
C_{res}	200	μF

Int. Octal



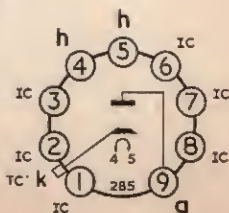
PY81

Efficiency Diode
0.3A, 17V Heater

Ratings

P.I.V. _{max}	4.75	kV
$I_a(av)_{max}$	150	mA
$V_{h-k(pk)_{max}}$	4.75	kV

B9A



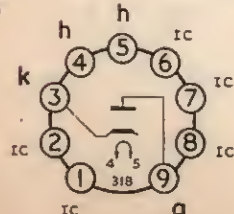
PY82

Half Wave Rectifier
0.3A, 19V Heater

Typical Operation

I_a	180	mA
$V_{in(r.m.s.)}$	250	V
V_{out}	195	V
P.I.V. _{max}	700	V
C_{res}	60	μF
R_{lim}	125	Ω

B9A



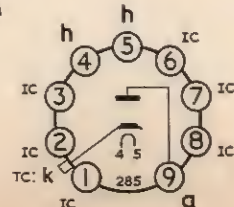
PY83

Efficiency Diode
0.3A, 20V Heater

Ratings

P.I.V. _{max}	5	kV
$I_a(max)$	175	mA
$V_{h-k(pk)_{max}}$	5	kV

B9A



PY88

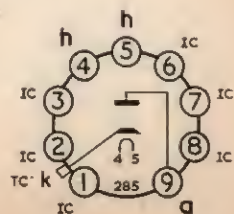
Efficiency Diode
0.3A, 30V Heater

For use with 110° tubes

Ratings

P.I.V. _{max}	6.6	kV
$I_a(av)_{max}$	220	mA
$V_{h-k(pk)_{max}}$	6.6	kV

B9A



PY800

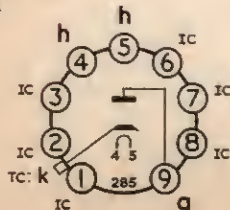
Efficiency Diode 0.3A, 19V Heater

For use with 110° tubes

Ratings

P.I.V.max	5.25	kV
I _{a(max)}	150	mA
i _{a(pk)max}	350	mA
V _{h-k(pk)max}	5.75	kV

B9A



PY801

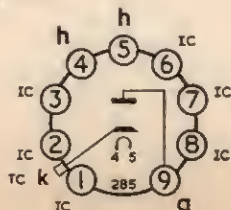
Efficiency Diode 0.3A, 19V Heater

For use with 110° tubes

Ratings

P.I.V.max	5.5	kV
I _{a(max)}	150	mA
i _{a(pk)max}	450	mA
V _{h-k(pk)max}	5.5	kV

B9A



SP41

VHF Pentode 4V, 0.95A Heater

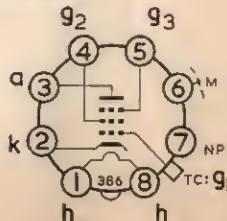
Rating

P _{a(max)}	4.5	W
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Typical Operation

V _{a(b)}	200	V
V _{g3}	0	V
V _{g2}	200	V
V _{g1}	-1.5	V
I _a	10.9	mA
I _{g3}	2.7	mA
g _m	8.5	mA/V
r _a	700	kΩ

Mazda Octal



SP61

VHF Pentode 6.3V, 0.6A Heater

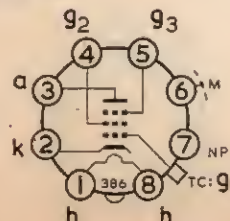
Rating

P _{a(max)}	4.5	W
---------------------	-----	---

Typical Operation

V _{a(b)}	200	V
V _{g3}	0	V
V _{g2}	200	V
V _{g1}	-1.5	V
I _a	10.9	mA
I _{g3}	2.7	mA
g _m	8.5	mA/V
r _a	700	kΩ

Mazda Octal



U25

EHT Rectifier 2V, 0.2A Heater

Ratings (Pulse Operation)

P.I.V.max	19	kV
I _{a(max)}	25	mA
i _{a(pk)max}	0.2	mA
V _{out}	16	kV

Wired in



U26

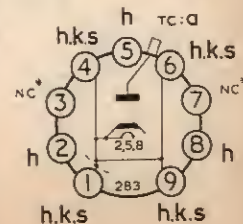
EHT Rectifier 2V, 0.35A Heater

Ratings (Pulse Operation)

P.I.V.max	23.5	kV
I _{a(max)}	0.2	mA
i _{a(pk)max}	60	mA

B9A

*Pins 3 and 7 must not be left unconnected. They should be connected to adjacent heater pins 4 and 6 respectively.



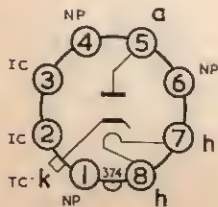
U191

Efficiency Diode
0.3A, 19V Heater

Ratings

P.I.V. _{max}	5	kV
I _{a(max)}	150	mA
i _{a(pk)} max	450	mA
V _{h-k(pk)} max	5	kV

Int. Octal



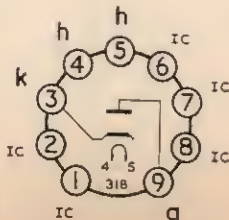
U192

H.W. Rectifier
0.3A, 19V Heater

Typical Operation

I _a	180	mA
V _{in(r.m.s.)}	250	V
V _{out}	195	V
P.I.V. _{max}	700	V
C _{res}	60	μF
R _{lim}	125	Ω

B9A



U193

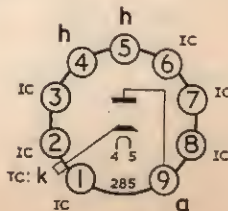
Efficiency Diode
0.3A, 19V Heater

For use with 110° tubes

Ratings

P.I.V. _{max}	5.5	kV
I _{a(max)}	150	mA
i _{a(pk)} max	450	mA
V _{h-k(pk)} max	5.5	kV

B9A



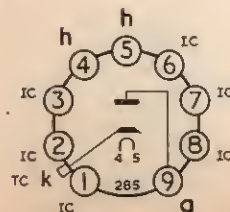
U251

Efficiency Diode
0.3A, 25V Heater

Ratings

P.I.V. _{max}	7	kV
I _{a(max)}	120	mA
V _{h-k(max)}	2	kV
<i>Rating applies only to use as an Efficiency Diode.</i>		

B9A



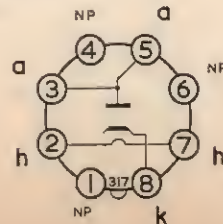
U291

H.W. Rectifier
0.3A, 29V Heater

Typical Operation

I _a	300	mA
V _{in(r.m.s.)}	250	V
V _{out}	242	V
P.I.V. _{max}	700	V
C _{res}	100	μF
R _{lim}	35	Ω

Int. Octal



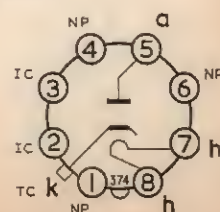
U301

Efficiency Diode
0.2A, 28V Heater

Ratings

P.I.V. _{max}	4.5	kV
I _{a(max)}	150	mA
V _{h-k(max)}	900	V
<i>Rating applies only to use as an Efficiency Diode.</i>		

Int. Octal



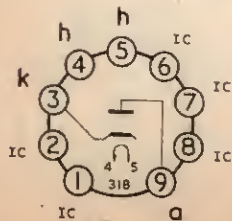
U381

H.W. Rectifier
0-1A, 38V Heater

Typical Operation

I_a	110	mA
$V_{in(r.m.s.)}$	250	V
V_{out}	245	V
P.I.V.max	700	V
C_{res}	100	μF
R_{lim}	100	Ω

B9A



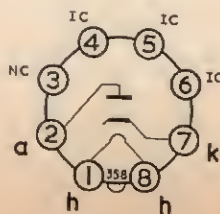
U404

Half Wave Rectifier
0-1A, 40V Heater

Typical Operation

I_a	90	mA
$V_{in(r.m.s.)}$	240	V
V_{out}	200	V
P.I.V.max	750	V
C_{res}	50	μF
R_{lim}	180	Ω

B8A



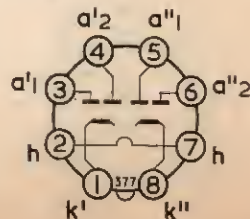
U801

Multiple Rectifier
0-2A, 80V Heater

Typical Operation

I_a (tot)	300	mA
$V_{in(r.m.s.)}$	250	V
V_{out}	280	V
P.I.V.max	1,500	V
C_{res}	80	μF
R_{lim} (per anode)	47	Ω

Int. Octal



UABC80

Triple Diode Triode
0-1A, 28V Heater

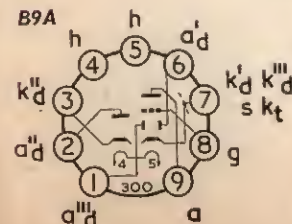
Rating (Triode)

$P_a(max)$	1	W
------------	---	---

Characteristics (Triode)

V_a	200	V
V_g	-2.3	V
I_a	1	mA
r_a	50	k Ω
g_m	1.4	mA/V
μ	70	

B9A



UBC41

Double Diode Triode
Audio Amplifier
0-1A, 14V Heater

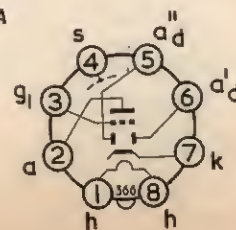
Rating (Triode)

$P_a(max)$	1	W
------------	---	---

Characteristics (Triode)

V_a	100	V
V_g	-0.7	V
I_a	0.8	mA
r_a	54	k Ω
g_m	1.4	mA/V
μ	75	

B8A



UBC81

Double Diode Audio Triode
0-1A, 14V Heater

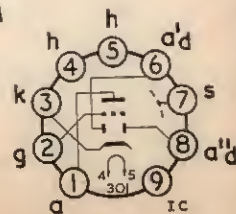
Rating

$P_a(max)$	1	W
------------	---	---

Characteristics (Triode)

V_a	100	V
V_g	-0.7	V
I_a	0.8	mA
r_a	54	k Ω
g_m	1.4	mA/V
μ	75	

B9A



UBF89

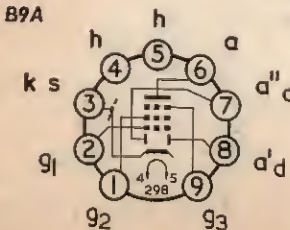
Double Diode HF Pentode
Variable-mu Amplifier
0-1A, 19V Heater

Rating (Pentode)

$P_{a(max)}$	2.25	W
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Typical Operation (Pentode)

V_a	200	V
V_{g2}	100	V
V_{g1}	-1.5	V
I_a	11	mA
I_{g2}	3.3	mA
R_{g2}	30	k Ω
R_k	105	Ω
g_m	4.5	mA/V



UCC85

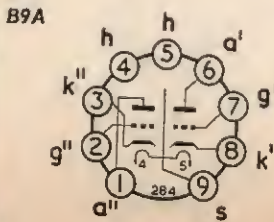
VHF Double Triode
0-1A, 26V Heater

Rating

$P_{a(max)}$ (Either)	2.5	W
(Both)	4.5	W

Typical Operation

Amp.	Osc/mix	
$V_{a(b)}$	170	170
V_{g^1}	-1.4	...
I_a	8.7	4.8
R_a	1.5	4.7
R_g	...	1
g_m	6	...
g_c	...	2.2
μ	50	...

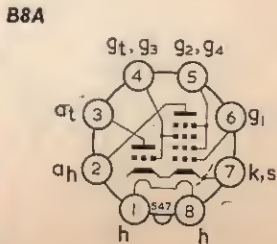


UCH42

HF Triode Hexode
Frequency Changer
0-1A, 14V Heater

Typical Operation

	Triode	Hexode	
$V_{a(b)}$	200	200	V
V_{g2+g4}	...	85	V
V_{g1}	0	-2	mV
I_a	5.2	3	mA
I_{g2+g4}	...	3	mA
R_a	22	...	k Ω
R_g	47	...	k Ω
R_k	...	180	Ω
g_c	...	0.75	mA/V

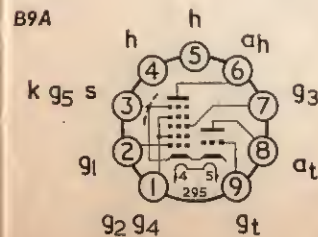


UCH81

HF Triode Heptode
Frequency Changer
0-1A, 19V Heater

Typical Operation

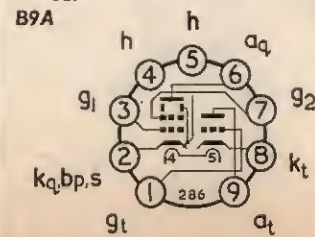
	Triode	Heptode	
V_a	103	170	V
V_{g2}	...	102	V
V_{g1}	0	-2.2	V
I_a	4.5	3.2	mA
I_{g2}	...	6.8	mA
R_a	15	...	k Ω
R_{g2+g4}	...	10	k Ω
R_{g3+g7}	47	...	k Ω
R_k	150	...	Ω
g_c	...	0.75	mA/V



UCL82

Triode Pentode
Audio Output
0-1A, 50V Heater

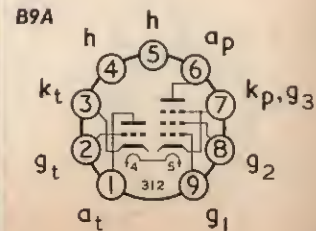
	Triode	Pentode	
Rating			
$P_{a(max)}$	1	7	W
Characteristics			
V_a	100	200	V
V_{g2}	...	200	V
V_{g1}	0	-16	V
I_a	3.5	35	mA
I_{g2}	...	7	mA
R_a	...	5.6	k Ω
R_k	...	390	Ω
g_m	2.5	6.4	mA/V
P_{out}	...	3.5	W



UCL83

Triode Output Pentode
Audio Output
0-1A, 38V Heater

	Triode	Pentode	
Rating			
$P_{a(max)}$	3.5	5.4	W
Characteristics			
V_a	170	170	V
V_{g2}	...	170	V
V_{g1}	-1.5	-9.5	V
I_a	1.6	30	mA
I_{g2}	...	5	mA
g_m	2.1	5.5	mA/V
r_a	40	53	k Ω
μ	82	...	



UF89

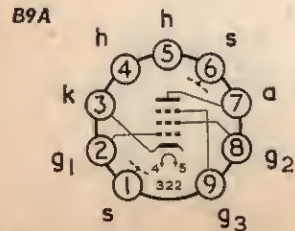
HF Pentode
Variable-mu Amplifier
0.1A, 12.6V Heater

Rating

$P_a(\max)$	2.25	W
-------------	------	---

Typical Operation

$V_{a(b)}$	170	V
V_{g2}	110	V
V_{g1}	-2	V
I_a	11	mA
I_{g2}	3.9	mA
g_m	3.8	mA/V
r_a	450	k Ω



UL41

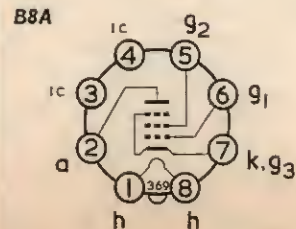
Audio Output Pentode
0.1A, 45V Heater

Rating

$P_a(\max)$	9	W
-------------	---	---

Typical Operation

V_a	170	V
V_{g2}	170	V
V_{g1}	-10.4	V
I_a	53	mA
I_{g2}	10	mA
R_a	3	k Ω
r_a	20	k Ω
g_m	9.5	mA/V
P_{out}	4.2	W



UL84

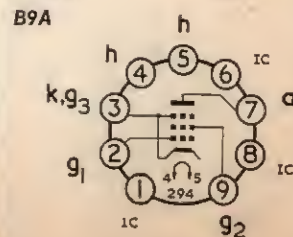
Audio Output Pentode
0.1A, 45V Heater

Rating

$P_a(\max)$	12	W
-------------	----	---

Typical Operation

V_a	160	V
V_{g2}	170	V
V_{g1}	-12.5	V
I_a	70	mA
$I_{a(o)}$	5	mA
$I_{g2(o)}$	5	mA
R_a	2.2	k Ω
r_a	23	k Ω
g_m	10	mA/V
P_{out}	5.2	W



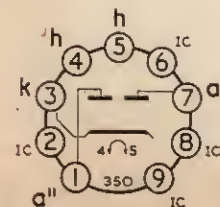
UU12

F.W. Rectifier
6.3V, 1.0A Heater

Typical Operation

I_a	150	mA
$V_{in(r.m.s.)}$	350	V
V_{out}	352	V
C_{res}	50	μF
R_{lim}	230	Ω

B9A



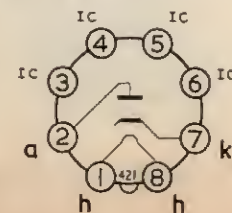
UY41

Half Wave Rectifier
0.1A, 31V Heater

Typical Operation

I_a	100	mA
$V_{in(r.m.s.)}$	250	V
V_{out}	200	V
$V_{h-k(pk)\max}$	550	V
C_{res}	50	μF
R_{lim}	210	Ω

B8A



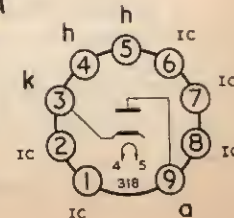
UY85

Half Wave Rectifier
0.1A, 38V Heater

Typical Operation

I_a	110	mA
$V_{in(r.m.s.)}$	250	V
V_{out}	245	V
P.I.V. _{max}	700	V
C_{res}	100	μF
R_{lim}	100	Ω

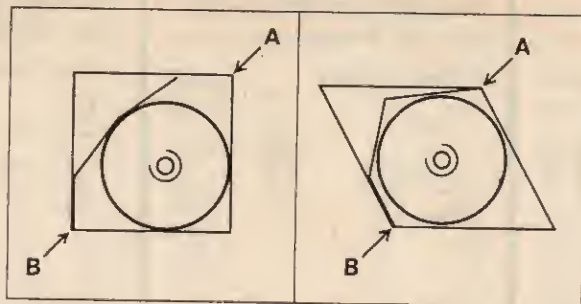
B9A



UNPACKING VALVES

MAZDA Continental Cartons can save you time on both unpacking and re-packing valves. This is especially valuable to the Field Service Engineer.

Used for
Valves with
Bases
B7G
B8A
B8D
B9A
B10B



MAZDA
CONTINENTAL
CARTONS
introduced
March
1965

QUICK PROCEDURE

1. Open the carton at one end.
2. Squeeze the carton diagonally at corners A and B so as to bow the shock absorber partition away from the valve. Do not squeeze too hard.
3. Turn the carton upside down and shake the valve out into your hand. There is no loose internal packing.

MAZDA CONTINENTAL CARTONS SAVE 36% SPACE



MAZDA COLOUR TV TUBE Development No. V3503. 25" Rectangular aluminised screen. Three gun shadow mask type. 90° deflection. Electrostatic focus. Tinted glass—70% light transmission.
MADE IN BRIMSDOWN, ENGLAND

CURRENT AND
MAINTENANCE TYPES

MAZDA

**PICTURE
TUBES**

for Television

ALL BASE DIAGRAMS ARE VIEWED
FROM THE FREE END OF PINS
see page 8 for EUROPEAN NOMENCLATURE

A47-13W

CME1906

19 in. TWIN PANEL
Self-Protected
0-3A, 6-3V Heater

Features

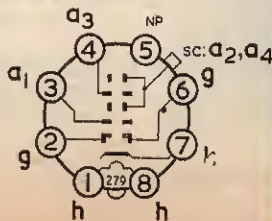
- Short neck
- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Tinted bulb and panel,
light transmission 65%

- Maximum Neck diameter 29.4 mm
- Maximum Overall length, 317 mm

Typical Operation

$V_{a_2 + a_4}$	18 kV
V_{a_1}	400 V
V_{a_3}	(focus) av 200 V
V_g for cut-off	-40 to -77 V

B8H Base,
CT8 side contact



A47-14W

CME1908

19 in. UNPROTECTED*
0-3A, 6-3V Heater

Features

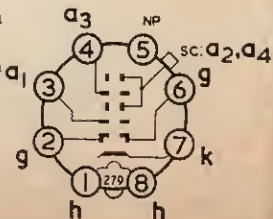
- Dark Screen
- Short neck
- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass,
light transmission 50%

- Maximum Neck diameter 29.4 mm
- Maximum Overall length 309 mm

Typical Operation

$V_{a_2 + a_4}$	18 kV
V_{a_1}	400 V
V_{a_3}	(focus) av 200 V
V_g for cut-off	-40 to -77 V

B8H Base,
CT8 side contact



* Requires implosion protection.

A59-13W

CME2306

23 in. TWIN PANEL
Self-Protected
0-3A, 6-3V Heater

Features

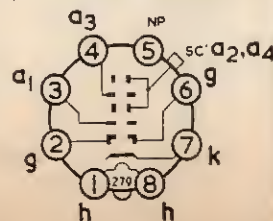
- Short neck
- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Tinted bulb and panel,
light transmission 40%

- Maximum Neck diameter 29.4 mm
- Maximum Overall length 374 mm

Typical Operation

$V_{a_2 + a_4}$	18 kV
V_{a_1}	400 V
V_{a_3}	(focus) av 200 V
V_g for cut-off	-40 to -77 V

B8H Base,
CT8 side contact



A59-15W

CME2308

23 in. UNPROTECTED*
0-3A, 6-3V Heater

Features

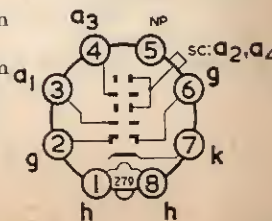
- Dark screen
- Short neck
- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass,
light transmission 45%

- Maximum Neck diameter 29.4 mm
- Maximum Overall length 367 mm

Typical Operation

$V_{a_2 + a_4}$	18 kV
V_{a_1}	400 V
V_{a_3}	(focus) av 200 V
V_g for cut-off	-40 to -77 V

B8H Base,
CT8 side contact



* Requires implosion protection.

A65-11W

CME2501

25 in. RINGUARD
Metal Shell Reinforced
0-3A, 6-3V Heater

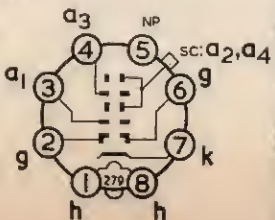
Features

- Integral mounting lugs
- 110° deflection
- Electrostatic focus
- External 'dag
- Aluminised screen
- Grey glass, light transmission approx. 42%
- Maximum Neck diameter 29.4 mm
- Maximum Overall length 389 mm

Typical Operation

V_{a2+a4}	18 kV
V_{a1}	400 V
V_{a3} (focus) av	200 V
V_g for cut-off	-40 to -77 V

B8H Base,
CT8 side contact



AW47-90

CME1902

19 in. UNPROTECTED*
0-3A, 6-3V Heater

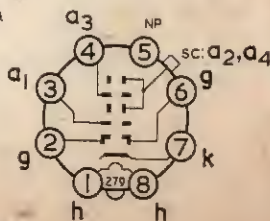
Features

- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass, light transmission 75%
- Maximum Neck diameter 29.4 mm
- Maximum Overall length 330 mm

Typical Operation

V_{a2+a4}	16 kV
V_{a1}	400 V
V_{a3} (focus) av	200 V
V_g for cut-off	-38 to -94 V

B8H Base,
CT8 side contact



* Requires implosion protection.

AW47-91

CME1903

19 in. UNPROTECTED*
0-3A, 6-3V Heater

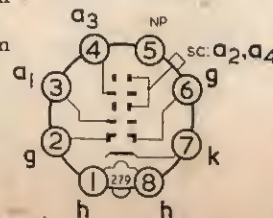
Features

- Short neck
- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass, light transmission 75%
- Maximum Neck diameter 29.4 mm
- Maximum Overall length 309 mm

Typical Operation

V_{a2+a4}	18 kV
V_{a1}	400 V
V_{a3} (focus) av	200 V
V_g for cut-off	-40 to -77 V

B8H Base,
CT8 side contact



* Requires implosion protection.

AW59-90

CME2302

23 in. UNPROTECTED*
0-3A, 6-3V Heater

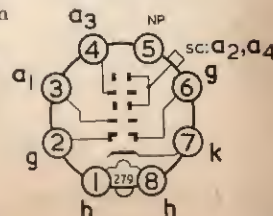
Features

- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass, light transmission 74%
- Maximum Neck diameter 29.4 mm
- Maximum Overall length 386 mm

Typical Operation

V_{a2+a4}	16 kV
V_{a1}	400 V
V_{a3} (focus) av	200 V
V_g for cut-off	-38 to -94 V

B8H Base,
CT8 side contact



* Requires implosion protection.

AW59-91

CME2303

23 in. UNPROTECTED*
0-3A, 6-3V Heater

Features

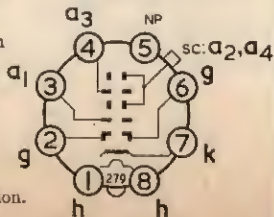
Short neck
110° deflection
Electrostatic focus
Straight gun
External 'dag
Aluminised screen
Grey glass,
light transmission
75%

Maximum Neck
diameter 29.4 mm
Maximum Overall
length 365 mm

Typical Operation

$V_{a2 + a4}$ 18 kV
 V_{a1} 400 V
 V_{a3} (focus) av 200 V
 V_g for cut-off
-40 to -77 V

B8H Base,
CTS side contact



CME141

14 in. UNPROTECTED*
0-3A, 12-6V Heater

Features

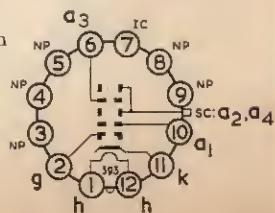
Rectangular face
70° deflection
Electrostatic focus
Ion-trap gun
External 'dag
Aluminised screen
Grey glass,
light transmission
76%

Maximum Neck
diameter 38 mm
Maximum Overall
length 420 mm

Typical Operation

$V_{a2 + a4}$ 12 kV
 V_{a1} 300 V
 V_{a3} (focus) av 100 V
 V_g for cut-off
-30 to -72 V

B12A Base,
CTS side contact



CME1101

11 in. RIMGUARD
Metal Shell Reinforced
0-3A, 6-3V Heater

Features

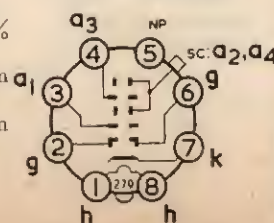
Integral mounting
lugs
Rectangular face
110° deflection
Electrostatic focus
Straight gun
External 'dag
Aluminised screen
Grey glass,
light transmission
50%

Maximum Neck
diameter 29.4 mm
Maximum Overall
length 234 mm

Typical Operation

$V_{a2 + a4}$ 12 kV
 V_{a1} 400 V
 V_{a3} (focus) av 200 V
 V_g for cut-off
-38 to -94 V

B8H Base,
CTS side contact



CME1201

12 in. RIMBAND
Metal Band Reinforced
0-3A, 6-3V Heater

Features

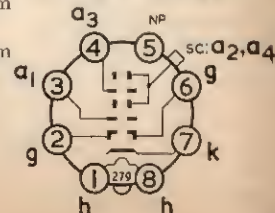
110° deflection
Electrostatic focus
Straight gun
External 'dag
Aluminised screen
Grey glass,
light transmission
50%

Maximum Neck
diameter 29.4 mm
Maximum Overall
length 243 mm

Typical Operation

$V_{a2 + a4}$ 12 kV
 V_{a1} 400 V
 V_{a3} (focus) av 200 V
 V_g for cut-off
-40 to -76 V

B8H Base,
CTS side contact



* Requires implosion protection.

* Requires implosion protection.

CMEI402

14 in. UNPROTECTED*
0.3A, 12.6V Heater

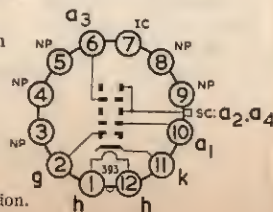
Features

- Rectangular face
- 90° deflection
- Electrostatic focus
- Ion-trap gun
- External 'dag
- Aluminised screen
- Grey glass,
light transmission
78%
- Maximum Neck
diameter 38 mm
- Maximum Overall
length 371 mm

Typical Operation

$V_{a2 + a4}$	12 kV
V_{a1}	300 V
V_{a3} (focus) av	100 V
V_g for cut-off	-30 to -72 V

B12A Base,
CT8 side contact



* Requires implosion protection.

CMEI601

16 in. UNPROTECTED*
0.3A, 6.3V Heater

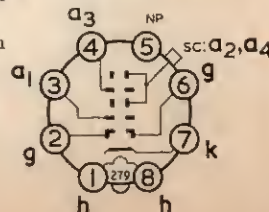
Features

- Short neck
- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass,
light transmission
65%
- Maximum Neck
diameter 29.4 mm
- Maximum Overall
length 278.5 mm

Typical Operation

$V_{a2 + a4}$	16 kV
V_{a1}	400 V
V_{a3} (focus) av	220 V
V_g for cut-off	-40 to -77 V

B8H Base,
CT8 side contact



* Requires implosion protection.

CMEI702

17 in. UNPROTECTED*
0.3A, 12.6V Heater

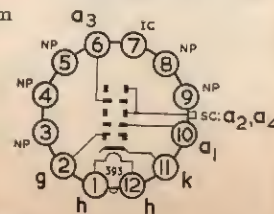
Features

- 90° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass,
light transmission
74%
- Maximum Neck
diameter 38 mm
- Maximum Overall
length 383 mm

Typical Operation

$V_{a2 + a4}$	14 kV
V_{a1}	300 V
V_{a3} (focus) av	100 V
V_g for cut-off	-30 to -72 V

B12A Base,
CT8 side contact



* Requires implosion protection.

CMEI703

17 in. UNPROTECTED*
0.3A, 12.6V Heater

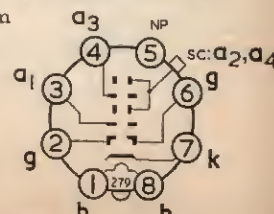
Features

- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass,
light transmission
75%
- Maximum Neck
diameter 29.4 mm
- Maximum Overall
length 324 mm

Typical Operation

$V_{a2 + a4}$	14 kV
V_{a1}	300 V
V_{a3} (focus) av	100 V
V_g for cut-off	-30 to -72 V

B8H Base,
CT8 side contact



* Requires implosion protection.

CME1705

17 in. UNPROTECTED*
0.3A, 12.6V Heater

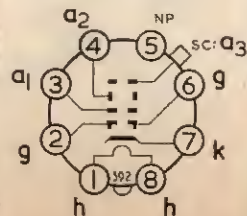
Features

- Short neck
- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass,
light transmission
75%
- Maximum Neck
diameter 29.4 mm
- Maximum Overall
length 290.5 mm

Typical Operation

V_{a3}	15 kV
V_{a1}	450 V
V_{a2} (focus) av	100 V
V_g for cut-off	-30 to -72 V

B8H Base,
CT8 side contact



CME1901

19 in. UNPROTECTED*
0.3A, 12.6V Heater

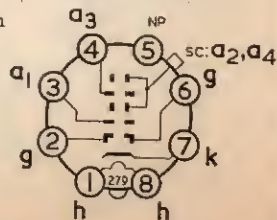
Features

- 114° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass,
light transmission
75%
- Maximum Neck
diameter 29.4 mm
- Maximum Overall
length 322 mm

Typical Operation

$V_{a2 + a1}$	16 kV
V_{a1}	450 V
V_{a3} (focus) av	180 V
V_g for cut-off	-38 to -72 V

B8H Base,
CT8 side contact



* Requires implosion protection.

CME1902

19 in. UNPROTECTED*
0.3A, 6.3V Heater

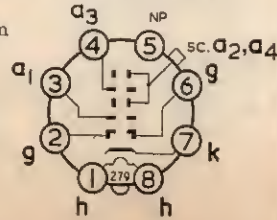
Features

- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass,
light transmission
75%
- Maximum Neck
diameter 29.4 mm
- Maximum Overall
length 330 mm

Typical Operation

$V_{a2 + a1}$	16 kV
V_{a1}	400 V
V_{a3} (focus) av	200 V
V_g for cut-off	-38 to -94 V

B8H Base,
CT8 side contact



* Requires implosion protection.

CME1903

19 in. UNPROTECTED*
0.3A, 6.3V Heater

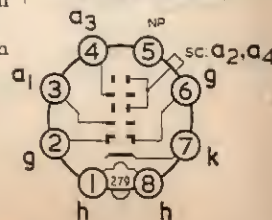
Features

- Short neck
- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass,
light transmission
75%
- Maximum Neck
diameter 29.4 mm
- Maximum Overall
length 309 mm

Typical Operation

$V_{a2 + a3}$	18 kV
V_{a1}	400 V
V_{a3} (focus) av	200 V
V_g for cut-off	-40 to -77 V

B8H Base,
CT8 side contact



* Requires implosion protection.

* Requires implosion protection.

CMEI905

19 in. RIMGUARD
Metal Shell Reinforced
0-3A, 6-3V Heater

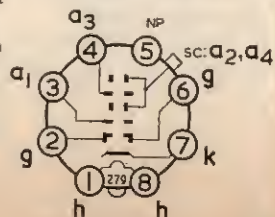
Features

- Integral mounting lugs
- 110° deflection
- Electrostatic focus
- External 'dag
- Aluminised screen
- Grey glass, light transmission 50%
- Maximum Neck diameter 29.4 mm
- Maximum Overall length 309 mm

Typical Operation

$V_{a2 + a4}$	18 kV
V_{a1}	400 V
V_{a3} (focus) av	200 V
V_g for cut-off	-40 to -77 V

B8H Base,
CT8 side contact



CMEI906

19 in. TWIN PANEL
Self-Protected
0-3A, 6-3V Heater

Features

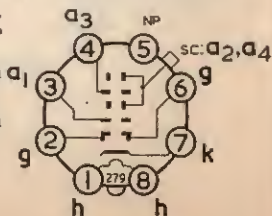
- Glass twin panel
- Short neck
- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass, bulb and panel, light transmission 65%

Typical Operation

$V_{a2 + a4}$	18 kV
V_{a1}	400 V
V_{a3} (focus) av	200 V
V_g for cut-off	-40 to -77 V

B8H Base,
CT8 side contact

- Maximum Neck diameter 29.4 mm
- Maximum Overall length 317 mm



CMEI908

19 in. UNPROTECTED*
0-3A, 6-3V Heater

Features

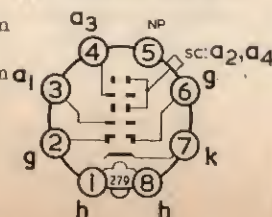
- Dark screen
- Short neck
- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass, light transmission 50%

Typical Operation

$V_{a2 + a4}$	18 kV
V_{a1}	400 V
V_{a3} (focus) av	200 V
V_g for cut-off	-40 to -77 V

B8H Base,
CT8 side contact

- Maximum Neck diameter 29.4 mm
- Maximum Overall length 309 mm



* Requires implosion protection.

CME2101

21 in. UNPROTECTED*
0-3A, 12-6V Heater

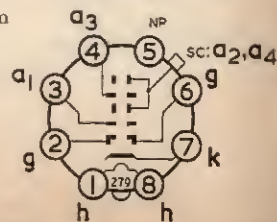
Features

- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass, light transmission 74%
- Maximum Neck diameter 29.4 mm
- Maximum Overall length 378 mm

Typical Operation

$V_{a2 + a4}$	14 kV
V_{a1}	300 V
V_{a3} (focus) av	100 V
V_g for cut-off	-30 to -72 V

B8H Base,
CT8 side contact



* Requires implosion protection.

CME2104

21 in. UNPROTECTED*
0.3A, 12.6V Heater

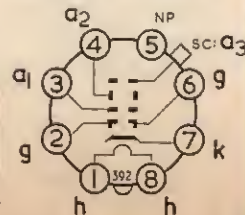
Features

- Short neck
- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass,
light transmission
74%
- Maximum Neck
diameter 29.4 mm
- Maximum Overall
length 344.5 mm

Typical Operation

V_{a3}	16	kV
V_{a1}	450	V
V_{a2} (focus) av	120	V
V_g for cut-off	-30 to -72	V

B8H Base,
CTS side contact



CME2301

23 in. UNPROTECTED*
0.3A, 12.6V Heater

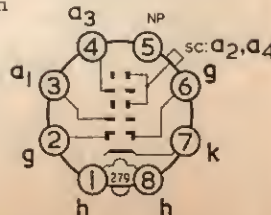
Features

- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass,
light transmission
75%
- Maximum Neck
diameter 29.4 mm
- Maximum Overall
length 386 mm

Typical Operation

$V_{a2 + a1}$	16	kV
V_{a1}	450	V
V_{a3} (focus) av	180	V
V_g for cut-off	-38 to -72	V

B8H Base,
CTS side contact



* Requires Implosion protection.

CME2302

23 in. UNPROTECTED*
0.3A, 6.3V Heater

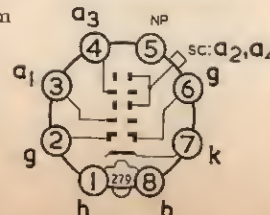
Features

- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass,
light transmission
74%
- Maximum Neck
diameter 29.4 mm
- Maximum Overall
length 386 mm

Typical Operation

$V_{a2 + a1}$	16	kV
V_{a1}	400	V
V_{a3} (focus) av	200	V
V_g for cut-off	-38 to -94	V

B8H Base,
CTS side contact



* Requires Implosion protection.

CME2303

23 in. UNPROTECTED*
0.3A, 6.3V Heater

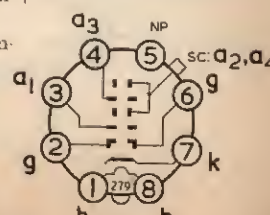
Features

- Short neck
- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass,
light transmission
75%
- Maximum Neck
diameter 29.4 mm
- Maximum Overall
length 365 mm

Typical Operation

$V_{a2 + a1}$	18	kV
V_{a1}	400	V
V_{a3} (focus) av	200	V
V_g for cut-off	-40 to -77	V

B8H Base,
CTS side contact



* Requires Implosion protection.

* Requires Implosion protection.

CME2305

23 in. RIMGUARD
Metal Shell Reinforced
0.3A, 6.3V Heater

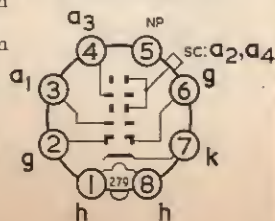
Features

- Integral mounting lugs
- 110° deflection
- Electrostatic focus
- External 'dag
- Aluminised screen
- Grey glass, light transmission approx. 45%
- Maximum Neck diameter 29.4 mm
- Maximum Overall length 367 mm

Typical Operation

$V_{a_2 + a_4}$	18 kV
V_{a_1}	400 V
V_{a_3}	(focus) av 200 V
V_g for cut-off	-40 to -77 V

B8H Base,
CTS side contact



CME2306

23 in. TWIN PANEL
Self-Protected
0.3A, 6.3V Heater

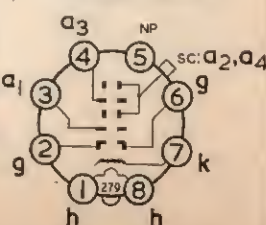
Features

- Glass twin panel
- Short neck
- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass, bulb and panel, light transmission 45%
- Maximum Neck diameter 29.4 mm
- Maximum Overall length 374 mm

Typical Operation

$V_{a_2 + a_4}$	18 kV
V_{a_1}	400 V
V_{a_3}	(focus) av 200 V
V_g for cut-off	-40 to -77 V

B8H Base,
CTS side contact



CME2308

23 in. UNPROTECTED*
0.3A, 6.3V Heater

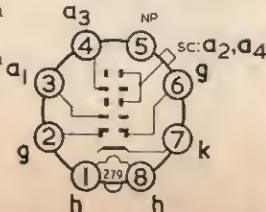
Features

- Dark screen
- Short neck
- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass, light transmission 45%
- Maximum Neck diameter 29.4 mm
- Maximum Overall length 367 mm

Typical Operation

$V_{a_2 + a_4}$	16 kV
V_{a_1}	400 V
V_{a_3}	(focus) av 200 V
V_g for cut-off	-40 to -77 V

B8H Base,
CTS side contact



CME2501

25 in. RIMGUARD
Metal Shell Reinforced
0.3A, 6.3V Heater

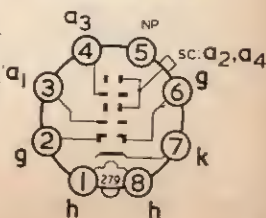
Features

- Integral mounting lugs
- 110° deflection
- Electrostatic focus
- External 'dag
- Aluminised screen
- Grey glass, light transmission approx. 42%
- Maximum Neck diameter 29.4 mm
- Maximum Overall length 389 mm

Typical Operation

$V_{a_2 + a_4}$	16 kV
V_{a_1}	400 V
V_{a_3}	(focus) av 200 V
V_g for cut-off	-40 to -77 V

B8H Base,
CTS side contact



* Requires Implosion protection.

CRM141 & 142

14 in. UNPROTECTED*
Tetrode
0-3A, 12-6V Heater

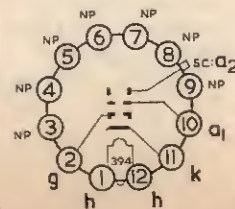
Features

- Round face
- 67° deflection
- Magnetic focus
- Ion-trap gun
- Aluminised screen
- Clear bulb CRM141
- Tinted bulb CRM142
- Maximum Neck diameter 35 mm
- Maximum Overall length 474 mm

Typical Operation

V_{a2}	12 kV
V_{a1}	300 V
V_g for cut-off	-30 to -72 V

B12A Base,
CT2 side contact



* Requires implosion protection.

CRM144

14 in. UNPROTECTED*
Tetrode
0-3A, 12-6V Heater

Features

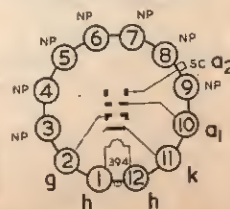
- Rectangular face
- 70° deflection
- Magnetic focus
- Ion-trap gun
- External 'dag
- Aluminised screen
- Grey glass, light transmission 75%

Maximum Neck diameter 38 mm
Maximum Overall length 438 mm

Typical Operation

V_{a2}	12 kV
V_{a1}	300 V
V_g for cut-off	-30 to -72 V

B12A Base,
CT8 side contact



* Requires implosion protection.

CRM171 & 172

17 in. UNPROTECTED*
Tetrode
0-3A, 12-6V Heater

Features

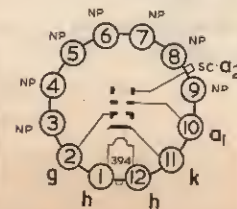
- 70° deflection
- Magnetic focus
- Ion-trap gun
- External 'dag CRM172 only
- Aluminised screen
- Grey glass, light transmission 75%

Maximum Neck diameter 35 mm
Maximum Overall length 501 mm

Typical Operation

V_{a2}	16 kV
V_{a1}	300 V
V_g for cut-off	-30 to -72 V

B12A Base,
CT2 side contact CRM171
CT8 side contact CRM172



* Requires implosion protection.

CRM173

17 in. UNPROTECTED*
Tetrode
0-3A, 12-6V Heater

Features

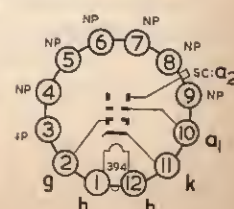
- 90° deflection
- Magnetic focus
- Ion-trap gun
- External 'dag
- Aluminised screen
- Grey glass, light transmission 75%

Maximum Neck diameter 38 mm
Maximum Overall length 427 mm

Typical Operation

V_{a2}	16 kV
V_{a1}	300 V
V_g for cut-off	-30 to -72 V

B12A Base,
CT8 side contact



* Requires implosion protection.

CRM211

21 in. UNPROTECTED*
Tetrode
0.3A, 12.6V Heater

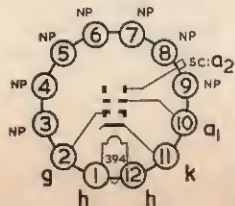
Features

- 70° deflection
- Magnetic focus
- Ion-trap gun
- External 'dag
- Aluminised screen
- Grey glass,
light transmission
75%
- Maximum Neck
diameter 38 mm
- Maximum Overall
length 597 mm

Typical Operation

V_{a2}	18	kV
V_{a1}	300	V
V_g for cut-off	-30 to -72	V

B12A Base,
CT8 side contact



CRM212

21 in. UNPROTECTED*
Tetrode
0.3A, 12.6V Heater

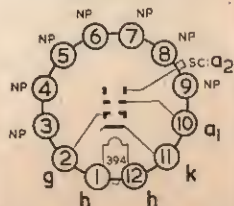
Features

- 90° deflection
- Magnetic focus
- Ion-trap gun
- External 'dag
- Aluminised screen
- Grey glass,
light transmission
75%
- Maximum Neck
diameter 38 mm
- Maximum Overall
length 520 mm

Typical Operation

V_{a2}	18	kV
V_{a1}	300	V
V_g for cut-off	-30 to -72	V

B12A Base,
CT8 side contact



* Requires implosion protection.

* Requires implosion protection.

FENBRIDGE GUARDS ON MAZDA TUBES

Fenbridge Guards are used by many setmakers as a simple means of implosion protection in television receivers, replacing rigid windows. They are made of optical quality flexible PVC with a semi-polished outside surface and a "dew-drop" pattern inside to prevent adhesion or "Newtons Rings". There are two main types:

FENBRIDGE CAPS fitted to the CRT by a metal clamp band around the tube face perimeter.

FENBRIDGE POLYFLEX fitted to the cabinet as a flat membrane which is pushed into screen shape as the CRT is inserted.

Fenbridge Guards are supplied in various colours and values of light transmission according to setmaker requirements. Gold 65%. Blue Smoke 68%. Neutral Grey 78%. Clear 94-98%. Fenbridge Guards are not sold by Thorn-AEI Radio Valves & Tubes Limited.

CARE OF FENBRIDGE GUARDS

Indentations. Warm with hot air blower such as a hair dryer.

Minor Scratches. Polish out with jewellers rouge or non-abrasive polish such as Silvo. Do not use an abrasive metal polish. Polish the whole screen, not just the damaged area.

Major Scratches. Replace with a new Fenbridge Guard obtainable from the service organisation of the setmaker concerned.

Further Advice. Consult the component manufacturer Fenbridge Products Limited, Castle House, Lower King's Road, Berkhamstead, Herts.
Telephone: Berkhamstead 756.

FITTING FENBRIDGE CAPS

Replacing CRT

1. It is preferable not to remove faulty CRT from set until new tube is to hand. This may avoid damage to Fenbridge Cap or loss of fittings. Goggles should be worn when handling unprotected tubes.
2. Remove old CRT from set with Fenbridge Cap attached. Remove Cap from CRT.
3. Clean the screen of the new CRT.
4. Clean inside surface of Fenbridge Cap. Remove dust by blowing—a cycle pump is suitable. Remove foreign bodies by a moistened finger tip. NEVER USE A DUSTER OR RAG.
5. Lay the Cap face downwards on a soft surface on the bench. Lay clamping band on bench around the Cap. Insert CRT screen into Cap and pull fixing band up into position.
6. Tighten band until it just begins to bite. Tension the Cap by pulling hard on the four corner "ears" in turn, then on each of the smaller side ears. A hook through the ear eyelets is best.
7. Fully tighten the fixing band. Clip small ears to fixing band in the same manner as that used by the setmaker concerned.
8. Re-fit tube (with cap attached) into the set and fix corner mounting lugs to cabinet. Some set-makers may also fix small ears to cabinet.

Replacing Fenbridge Cap

9. Remove CRT from set with damaged Cap attached. Remove Cap from tube and clean tube face.
10. Remove new Fenbridge Cap from returnable anti-shrinking polystyrene former and warm if necessary to increase flexibility.
11. Proceed as in 5 and 6.
12. Should any pockets of non-contact remain, they may be shrunk out by a hot air blower.
13. Finish off as in 7 and 8 above by clipping ears and refitting tube in set.



AVAILABLE TO ORDER

Obsolescent types are available from Mazda as long as stocks last, but no further manufacture of these types will take place.

For latest availability, consult your Mazda wholesaler or Mazda representative.

For further data on obsolescent types, please refer to earlier editions of this booklet.

OBSOLESCE

VALVES and PICTURE TUBES

OBSOLESCENT VALVES

VALVE TYPE	DESCRIPTION	HEATER		TYPICAL OPERATION				
		V_h V	I_h A	$V_{a(b)}$ V	V_{g2} V	V_{g1} V	I_a mA	g_m mA/V
6C9	H.F. Triode Heptode	6.3	0.45	(T) 250 (H) 250	100	-2.5	5 3	2.2 (gc) 0.65
6D1	Signal Diode	6.3	0.15	350 P.I.V. max.	—	—	5	—
6F1	H.F. Screened Pentode	6.3	0.35	200	200	-1.8	10	9
6F13	H.F. Screened Pentode	6.3	0.35	200	200	-1.8	10	9
6F14	Video Output Pentode	6.3	0.35	250	135	-1.3	27	10.6
6F15	H.F. Screened Pentode	6.3	0.2	250	100	-2.5	7	2.3
6L18	H.F. Oscillator Triode	6.3	0.3	250	μ 17	-5	4.5	7.6
6L34	V.H.F. Triode	6.3	0.3	250	—	-1.5	10	8.5
6LD20	Double Diode A.F. Triode	6.3	0.25	260	μ 31.5	-3	2	3.4
6M1	Tuning Indicator Sector Display	6.3	0.3	250	V_t 250	-0.5	0.23	—
6P28	Line Output Beam Tetrode	6.3	1.1	350	250	-8.8	72	9.5

VALVE TYPE	BASE	PIN CONNECTIONS									
		1	2	3	4	5	6	7	8	9	TC
6C9	B8A	h	a_h	a_t	g_t, g_3	g_2, g_4	g_1	k, s, g_5	h	—	—
6D1	B8G	h	k	h	—	—	—	—	—	—	a
6F1	B8A	h	a	g_3, s	g_2	k	g_1	k	h	—	—
6F13	B8A	h	a	s	g_3	g_2	g_1	k	h	—	—
6F14	B8A	h	a	s	g_3	g_2	g_1	k	h	—	—
6F15	B8A	h	a	s	g_3	g_2	g_1	k	h	—	—
6L18	B8A	h	a	IC	s	IC	g	k	h	—	—
6L34	B7G	g	k	h	h	k	g	a	—	—	—
6LD20	B8A	h	a_t	g_1	s	$a'' d$	$a' d$	k	h	—	—
6M1	I.Oct.	NP	h	a	t	g	NP	h	k	—	—
6P28	I.Oct.	NC	h	NC	g_2	g_1	NP	h	k	—	a

OBSOLESCENT VALVES

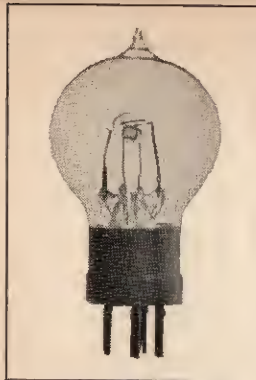
VALVE TYPE	DESCRIPTION	HEATER		TYPICAL OPERATION				
		V _h V	I _h A	V _{a(b)} V	V _{g2} V	V _{g1} V	I _a mA	g _m mA/V
10C1	H.F. Triode Heptode	28	0.1	(T) 80 (H) 175	— 100	— -2.5	5 3	2.2 (gc) 0.65
10C2	V.H.F. Triode Pentode	28	0.1	(T) 80 (P) 135	μ17 135	V _{het(pk)} 3.25	5 5	(gc) 2
10D2	Signal Double Diode	19	0.1	{ P.I.V. 500	—	—	max. 9	—
10F9	H.F. Vari-mu Pentode	13	0.1	175	100	-2.5	7	2.3
10LD11	Double Diode Triode	15	0.1	150	—	-2.25	6	3.4
20F2	H.F. Pentode	11	0.2	250	135	-1.3	27	10.6
20P1	Line Output Beam Tetrode	38	0.2	150	150	—	100	7.3
SP42	A.F. Output Pentode	4	0.95	200	140	-1.25	27	—
T41	Thyratron	4	1.5A	Control Ratio 20		—	—	—
				R _g	30	kΩ	—	—
				I _a (mean)	2.5	mA	—	—
U281	T.V. Efficiency Diode	28	0.2	{ P.I.V. 3,000	—	—	max. 150	—
U282	T.V. Efficiency Diode	28	0.2	{ P.I.V. 4,500	—	—	max. 150	—
UU5	Full-Wave Rectifier	4	2.3	V _{in(r.m.s.)}	500V	—	—	—
				V _{out}	580V	120	—	—
				C _{res}	8μF	—	—	—
UU8	Full-Wave Rectifier	4	2.8	350	{ C _{res} 16μF	R _{lim} 40Ω	—	250

VALVE TYPE	BASE	PIN CONNECTIONS									
		1	2	3	4	5	6	7	8	9	TC
10C1	B8A	h	a _h	a _t	g _t , g ₃	g ₂ , g ₄	g ₁	k, s, g ₅	h	—	—
10C2	B8A	h	a _p	a _t	g _t	g ₂	g ₁	k, s, g ₃	h	—	—
10D2	B7G	k'	a''	h	h	k''	s	a'	—	—	—
10F9	B8A	h	a	s	g ₃	g ₂	g ₁	k	h	—	—
10LD11	B8A	h	a	g ₁	s	a'' d	a' d	k	h	—	—
20F2	B8A	h	a	s	g ₃	g ₂	g ₁	k	h	—	—
20P1	Int. Oct.	NC	h	NC	g ₂	g ₁	NP	h	k, bp	—	a
SP42	M. Oct.	h	k	a	g ₂	g ₃	M	NP	h	—	g ₁
T41	M. Oct.	h	k	a	NC	g	M	NP	h	—	—
U281	I. Oct.	NC	h	NC	NP	a	NP	h	k	—	—
U282	I. Oct.	NC	NC	k	NP	NC	NP	h	h	—	a
UU5	Brit. 4p	a'	a''	h, k	h	—	—	—	—	—	—
UU8	M. Oct.	h, k	NC	a'	NC	a''	NC or M	NC	h	—	—

OBSOLESCE NT PICTURE TUBES

TUBE TYPE	DESCRIPTION	HEATER		TYPICAL OPERATION		
		V _h Volts	I _h Amps	V _{a2} kV	V _{a1} Volts	V _{g1} for cut-off
CRM93	9" Rnd, 57°, alum	12.6	0.3	9	300	-30 to -72
CRM121B	12" Rnd, 57°	2	1.3	9	—	-45 to -98
CRM122	12" Rnd, 57°	7.3	0.3	9	—	-45 to -98
CRM123	12" Rnd, 57°, alum	2	1.3	9	—	-45 to -98
CRM124	12" Rnd, 57°, alum	12.6	0.3	10	300	-30 to -72
CRM143	14" Rect, 70°, alum	12.6	0.3	12	300	-30 to -72
CRM151	15" Rnd, 51°, alum	2	1.3	12	—	-50 to -127
CRM152B	15" Rnd, 67°, alum	2	1.4	12	—	-59 to -127
CRM153	15" Rnd, 67°, alum	12.6	0.3	14	300	-30 to -72
CRM174	17" Rect, 70°, alum	12.6	0.3	16	300	-30 to -72

TUBE TYPE	BASE	PIN CONNECTIONS													
		1	2	3	4	5	6	7	8	9	10	11	12	S.C.	
CRM93	B12A	h	g	NP	NP	NP	NP	NP	NP	NP	NP	a ₁	k	h	a ₂
CRM121B	MO	h	NP	k	NP	g	NP	NP	h	—	—	—	—	—	a
CRM122	MO	h	NP	k	NP	g	NP	NP	h	—	—	—	—	—	a
CRM123	MO	h	NP	k	NP	g	NP	NP	h	—	—	—	—	—	a
CRM124	B12A	h	g	NP	NP	NP	NP	NP	NP	NP	NP	a ₁	k	h	a ₂
CRM143	B12A	h	g	NP	NP	NP	NP	NP	NP	NP	NP	a ₁	k	h	a ₂
CRM151	MO	h	NP	k	NP	g	NP	NP	h	—	—	—	—	—	a
CRM152B	B12A	h	g	NP	NP	NP	NP	NP	NP	NP	NP	NC	k	h	a
CRM153	B12A	h	g	NP	NP	NP	NP	NP	NP	NP	NP	a ₁	k	h	a ₂
CRM174	B12A	h	g	NP	NP	NP	NP	NP	NP	NP	NP	a ₁	k	h	a ₂



Royal Ediswan ES1
bright emitter triode

One of the earliest production valves, made in the Ediswan Ponders End factory where the first prototype diodes in the world were made for Professor Fleming in 1904.

50 YEARS OF VALVE MANUFACTURE EDISWAN MAZDA

1916 to 1966

"Large scale production of valves began during the first world war when the Armed Forces wanted valves in quantity for radio communication. Quantity production was begun by Edison Swan and Cossor."

H.M. Stationery Office. Publication No. Wt1280 - 3395.

Ediswan MAZDA is now the only receiving valve manufacturer with fifty continuous years of valve-making experience.

UNOBTAINABLE

These types are now unobtainable from Mazda, but substitution information on a few selected types is given at the end of the Obsolete list.

Whilst every care is taken in the compilation of substitution information, no responsibility can be accepted for the results obtained.

This Obsolete List includes all known receiving valves formerly sold by Mazda or their predecessors, but which are no longer available. All types are Mazda unless otherwise stated.

Data on individual types is, in most cases, available on request from Mazda Valve Publicity Department.



OBSOLETE

VALVES and PICTURE TUBES

OBSOLETE VALVES

AC/DD	Detector Double Diode
AC/G	Cosmos (Green Spot) Shortpath Voltage Triode
AC/HL	Detector or AF Triode
AC/HL/DD	Double Diode AF Triode
AC/HL/DDD	Triple Diode AF Triode
AC/ME	Tuning Indicator
AC/P*	Detector or AF Triode
AC/P1	AF Triode
AC/P4	E/S Scanning Output Triode
AC/PA1	Cosmos AF Power Triode
AC/PA2	Cosmos AF Power Triode
AC/Pen (5 pin)	Audio Output Pentode
AC/Pen (7 pin)	Audio Output Pentode
AC/R	Cosmos (Red Spot) AF Power Shortpath Triode
AC/S	Cosmos HF Screened Grid
AC/S1/VM	Variable-mu HF Screened Grid
AC/S2	HF Screened Grid
AC/S2 Pen	HF Mixer Pentode
AC/SG	HF Screened Grid
AC/SG/VM	Variable-mu HF Screened Grid
AC/SP1	Noise or AFC Control Pentode
AC/SP3	VHF or Video Pentode
AC/TH1	HF Triode Heptode Mixer
AC/TH1A	HF Triode Heptode Mixer
AC/TP	HF Triode Pentode Mixer
AC/VP1 (5 pin)	Vari-mu HF Pentode
AC/VP1 (7 pin)	Vari-mu HF Pentode
AC/VP2	Vari-mu HF Pentode

AC/X	Cosmos HF Triode
AC2/HL	Detector or AF Triode
AC2/Pen	Audio Output Pentode
AC2/Pen/DD	Double Diode, AF Pentode
AC4/Pen	Audio Output Beam Tetrode
AC5/Pen	Audio Output Beam Tetrode
AC5/Pen/DD	Double Diode Beam Tetrode
AC6/Pen	Line Output Beam Tetrode
B2	B.T.H. AF Power Triode
B4	B.T.H. AF Voltage Triode
BD4	Mazda Mercury Rectifying Valve
BU10 to BU800/6	Ediswan Barretters
D1	TV Signal Diode
DC/HL	Detector or AF Triode
DC/P	AF Output Triode
DC/Pen	AF Output Pentode
DC/SG	HF Screened Grid
DC2/HL/DD	Double Diode AF Triode
DC2/P	AF Output Triode
DC2/Pen	AF Output Pentode
DC2/SG	HF Screened Grid
DC2/SG/VM	Variable-mu HF Screened Grid
DC3/HL	Detector or AF Triode
DD41	HF Signal Double Diode
DD101	HF Signal Double Diode
DD207	HF Signal Double Diode
DD620	HF Signal Double Diode
DE50	Cosmos General Purpose Triode
DF92	HF Battery Pentode

OBSOLETE VALVES

EC91	VHF Triode
EC92	VHF Triode
ECH35	HF Triode Hexode Mixer
EF41	Variable-mu HF Pentode
EL95	Audio Output Pentode
EM34	Tuning Indicator (Double Sector Display)
EM80	Tuning Indicator (Fan Display)
EM81	Tuning Indicator (Fan Display)
EM85	Tuning Indicator (Fan Display) See page 114
EZ40	FW Rectifier
EZ80	FW Rectifier
GP210	B.T.H. and Ediswan Detector Triode
GP407	B.T.H. GP Triode
GP607	B.T.H. GP Triode
FC141	HF Mixer Pentagrid
H2	HF or AF Triode
H141D	Diode AF Triode
H210	HF or AF Triode
H607	Detector and HF Triode
H610	HF or AF Triode
HF210	B.T.H. and Ediswan H.F. Triode
HF407	B.T.H. HF Triode
HF410	Ediswan HF Triode
HF607	B.T.H. HF Triode
HF610	Ediswan HF Triode
HL2	HF or AF Triode
HL21DD	Double Diode AF Triode
HL22	HF or AF Triode

HL22DD	Double Diode AF Triode
HL23	HF or AF Triode
HL23DD	Double Diode AF Triode
HL41	AF Triode
HL41DD	Double Diode AF Triode
HL42DD	Double Diode Vari-mu AF Triode
HL133	AF Triode
HL133DD	Double Diode AF Triode
HL210	HF or AF Triode
HL607	Detector and LF Amplifier
HL610	Detector and LF Amplifier
HL1320	Detector or AF Triode
HL/DD/1320	Double Diode AF Triode
HTB1	Ediswan Barretter for use with U222
L2	HF or AF Triode
L2DD	Double Diode AF Triode
L21DD	Double Diode AF Triode
L22DD	Double Diode AF Triode
L210	Amplifying Detector Triode
LF210	Ediswan GP Triode
LF215	AF Output Pentode
LF407	B.T.H. AF Triode
LF410	Ediswan AF and detector Triode
LF410A	Ediswan AF and detector Triode
M141LF	Ediswan AF Triode
M141RC	Ediswan Voltage amplifying Triode
ME41	Tuning Indicator
ME91	Tuning Indicator
ME920	Tuning Indicator

* This Mazda valve type holds the BBC record for the longest working life of any valve—232,592 hours between 1935 and 1961

OBSOLETE VALVES

MU2	Ediswan EHT Mercury Vapour Rectifier	Pen383	AF Output Beam Tetrode
P41	VHF Oscillator Triode	Pen384	AF Output Beam Tetrode
P61	VHF Oscillator Triode	Pen425	AF Output Pentode
P215	AF Output Triode	Pen453DD	Double Diode Beam Tetrode
P220	AF Output Triode	Pen1340	AF Output Pentode (car radio)
P220A	AF Output Triode	Pen3520	AF Output Pentode
P227	AF Output Pentode	Pen3820	AF Output Beam Tetrode
P240	AF Output Triode	PenDD1360	Double Diode AF Pentode (car)
P245	AF Output Triode	PenDD4020	Double Diode Output Pentode
P415	AF Output Triode	PenDD4021	Double Diode Beam Tetrode
P425	AF Output Triode	PP3/250	AF Output Triode
P615	AF Output Triode	PP3/425	AF Output Triode
P625A	AF Output Triode	PP3/521	AF Output Triode
P625B	AF Output Triode	PP5/400	AF Output Triode
P650	AF Output Triode	PV215	Ediswan Power Triode
PA20	AF Output Triode	PV225	Ediswan Power Triode
PA40	AF Class AB Output Triode	PV410	Ediswan Power Triode
PD220	AF Class B Double Triode	PV425	Ediswan Power Triode
PD220A	AF Class B Double Triode	PV610	Ediswan Power Triode
Pen24	AF Output Pentode	PV625	Ediswan Power Triode
Pen25	AF Output Pentode	PX650	AF Output Pentode
Pen44	AF Output Beam Tetrode	QP25	Audio Output, Class B, Double Pentode
Pen45	AF Output Beam Tetrode	QP230	Audio Output, Class B, Double Pentode
Pen45DD	Double Diode Beam Tetrode	QP240	Audio Output, Class B, Double Pentode
Pen46	Line Output Beam Tetrode	RC2	Ediswan GP Triode
Pen141	AF Output Pentode	RC210	Ediswan AF Triode
Pen220	AF Output Pentode	RC210	B.T.H. Detector Triode
Pen220A	AF Output Pentode	RC410	Ediswan AF Triode
Pen230	AF Output Pentode		
Pen231	AF Output Pentode		

OBSOLETE VALVES

RC610	Ediswan AF Triode	SP215	HF Screened Pentode
RC607	B.T.H. Detector Triode	SP610/G	Cosmos (Green Spot) Shortpath HF Triode
S215A	HF Screened Grid	SP610/B	Cosmos (Blue Spot) Shortpath High Gain HF Triode
S215B	HF Screened Grid	SP610/RR	Cosmos (Double Red Spot) Shortpath AF Power Triode
S215VM	Variable-mu HF Screened Grid	SP610/PA1	Cosmos Shortpath AF Power Triode
SG207	B.T.H. and Ediswan HF Screened Grid	SP1320	HF Screened Pentode
SG215	HF Screened Grid	SP2220	Noise or AFC Control Pentode
SG410	Ediswan HF Screened Grid	T11	Timebase Thyatron
SG610	Ediswan HF Screened Grid	T21	Timebase Thyatron
SP16/R	Cosmos (Red Spot) GP Shortpath Triode	T31	Timebase Thyatron
SP16/G	Cosmos (Green Spot) HF Shortpath Triode	TH41	HF Triode Heptode Mixer
SP16/B	Cosmos (Blue Spot) HF High Gain Shortpath Triode	TH233	HF Triode Heptode Mixer
SP18/RR	Cosmos (Double Red Spot) AF Power Shortpath Triode	TH2320	HF Triode Heptode Mixer
SP20/PA1	Cosmos AF Power Triode	TH2321	HF Triode Heptode Mixer
SP22	HF Screened Pentode	TP22	HF Triode Pentode Mixer
SP41/U	Cosmos Half-wave Shortpath Rectifier	TP23	HF Triode Pentode Mixer
SP42/U	Cosmos Full-wave Shortpath Rectifier	TP25	HF Triode Pentode Mixer
SP43/U	Cosmos Half-wave Shortpath Rectifier	TP26	HF Triode Pentode Mixer (car radio)
SP45/U	Cosmos Half-wave Shortpath Rectifier	TP1340	HF Triode Pentode Mixer (car radio)
SP141	HF Screened Pentode	TP2620	HF Triode Pentode Mixer
SP181	HF Screened Pentode	TS215	B.T.H. AF Triode
SP210	HF Screened Pentode	U21	Slow heating EHT Rectifier
		U22	Slow heating EHT Rectifier
		U24	EHT Rectifier
		U30/250	HW Rectifier
		U65/550	HW Rectifier

OBSOLETE VALVES

U75/300	HW Rectifier	VP210	Vari-mu HF Pentode
U201	HW Rectifier	VP215	Vari-mu HF Pentode
U222	Ediswan Full-wave Rectifier	VP1320	Vari-mu HF Pentode
U235	Ediswan Full-wave Rectifier	VP1321	Vari-mu HF Pentode
U403	HW Rectifier	VP1322	Vari-mu HF Pentode
U4020	HW Rectifier	1D13	Battery HF Diode
UC92	HF Triode	1F2	Battery HF Pentode
UD41	HT Doubling Rectifier	6C31	HF Triode Heptode
UM35	Tuning Indicator (Maltese Cross)	6D1	TV Signal Diode
U150/1100	Mazda Hot-Cathode Mercury Vapour Rectifier	6D3	Slow Heating Diode
UU2	FW Rectifier	6F11	HF Pentode
UU3	FW Rectifier. Use UU5	6F16	Variable-mu HF Pentode
UU4	FW Rectifier. Use UU5	6F20	Variable-mu HF Pentode
UU6	FW Rectifier. See page 115	6F32	Screened HF Pentode (Industrial)
UU7	FW Rectifier. See page 115	6L1	GP Double Triode for TV
UU9	FW Rectifier. See page 116	6K23	Timebase Thyatron
UU10	FW Rectifier	6L19	AF Double Triode. See page 116
UU30/250	FW Rectifier	6M1	Tuning Indicator (Sector Display)
UU60/250	FW Rectifier. Use UU5	6M2	Tuning Indicator (Maltese Cross)
UU120/250	FW Rectifier. Use UU5	6P1	AF Output Beam Tetrode
UU120/350	FW Rectifier. Use UU5	6P26	AF Output Beam Tetrode
UU120/500	FW Rectifier. Use UU5	10F3	Screened HF Pentode
V226	HF Power Pentode	10L1	VHF Grounded Grid Triode
V312	AF Pre-amp Triode	10M1	Tuning Indicator (Sector Display)
V503	Class AB Output Triode	10M2	Tuning Indicator (Maltese Cross)
V914	HF Double Diode	12E1	Ediswan Beam Tetrode Stabiliser
VP22	Vari-mu HF Pentode	30C13	VHF Triode Pentode Mixer
VP23	Vari-mu HF Pentode	30F27	VHF Variable-mu Tetrode
VP41	Vari-mu HF Pentode	30FL13	Triode Beam Tetrode Sync Sep
VP133	Vari-mu HF Pentode		

OBSOLETE PICTURE TUBES

9MH	..	9 in. round, 45°, triode, not aluminised, clear glass, V_h 2.0 V
12MH	..	12 in. round, 45°, triode, not aluminised, clear glass, V_h 2.0 V
CME2307	..	23 in. Twin Panel See page 114
CRM71	..	7 in. round, 54°, triode, not aluminised, clear glass, V_h 2.0 V
CRM91	..	9 in. round, 64°, triode, not aluminised, clear glass, V_h 2.0 V
CRM92	..	9 in. round, 57°, triode, not aluminised, clear glass, V_h 2.0 V
CRM92A	..	9 in. round, 57°, triode, not aluminised, clear glass, V_h 2.0 V
CRM121	..	12 in. round, 57°, triode, not aluminised, clear glass, V_h 2.0 V
CRM121A	..	12 in. round, 57°, triode, not aluminised, clear glass, V_h 2.0 V
CRM152A	..	15 in. round, 67°, triode, aluminised, clear glass, V_h 2.0 V

SUBSTITUTION FOR

CME2307

and 23SP4

CME2307 DATA

**23 in. RECTANGULAR
All Glass Twin Panel
0-3A, 6-3V Heater**

Features

- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag'
- Grey bulb and panel
- Max. Neck diameter 29.4 mm
- Max. overall length 395 mm

Typical Operation and Base Connections

As CME2306.

23SP4

An early American Twin Panel Tube. Approved replacement in Ferguson, HMV and Philco receivers was Mazda CME2307.

FIT CME2306

Plug in replacement

Notes:

1. CME2306 neck is 21 mm shorter, but cone dimensions are same. Max. overall length 374 mm.
2. Panel mounting lugs are identical.
3. Electrical ratings are identical.
4. See page 92 for CME2306 data.
5. CME2306 may also be used as a plug in replacement for 23SP4 in Ferguson, H.M.V. and Philco receivers.

SUBSTITUTION FOR

EM85

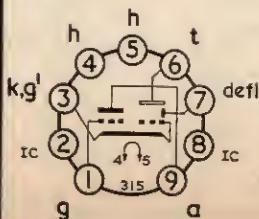
EM85 DATA

**Tuning Indicator
Fan Display
6-3V, 0-3A Heater**

Typical Operation

$V_{a(b)}$	200	V
V_t	200	V
R_a	470	k Ω
V_g	0	-14 V
I_a	0.4	0.1 mA
I_t	1.4	mA
θ	100	°

B9A



FIT EM87

Plug in replacement

Notes:

1. EM87 produces a 'Column' display, whereas EM85 used a 'Fan' display.
2. No circuit modifications are needed.
3. Rotate valve holder to bring display to the front.
4. Mask down viewing aperture to column width.
5. See page 51 for EM87 data.

SUBSTITUTION FOR

UU6

UU6 DATA

**F.W. Rectifier
4V, 1-4A Heater**

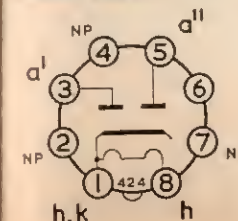
Typical Operation

I_a	120	mA
$V_{in(r.m.s.)}$	350	V
V_{out}	375	V
C_{res}	16	μF
R_{lim}	50	Ω

Bulb

Max. diameter	32 mm
Max. seated height	84 mm

Mazda Octal



FIT UU8

Plug in replacement

Notes:

1. UU8 bulb is larger. Max. diameter 54 mm. Max. seated height 101 mm.
2. UU8 heater current is double. I_h 2.8 A. Check transformer for overheating and V_h drop.
3. See page 103 for UU8 data.
4. UU6 and UU8 valves manufactured before 1951 had a metallised bulb. The metallising was connected to Pin 6.

SUBSTITUTION FOR

UU7

UU7 DATA

**F.W. Rectifier
4V, 2-3A Heater**

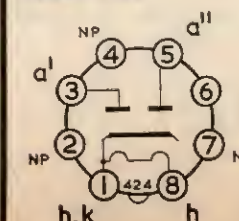
Ratings

$V_{a(max)}$	350	V
$I_{a(max)}$	180	mA

Bulb

Max. diameter	54 mm
Max. seated height	100 mm

Mazda Octal



FIT UU8

Plug in replacement

Notes:

1. UU8 bulb is wider. Max. diameter 54 mm.
2. UU8 heater current is 0.5A higher. I_h 2.8 A. Check transformer for overheating and V_h drop.
3. See page 103 for UU8 data.
4. UU7 and UU8 valves manufactured before 1951 had a metallised bulb. The metallising was connected to Pin 6.

SUBSTITUTION FOR

UU9

and EZ40

SUBSTITUTION FOR

6L19

UU9 DATA	FIT 2 × BY105	6L19 DATA	FIT ECC81																								
<p>F.W. Rectifier 6.3V, 0.58A Heater</p> <p>Typical Operation</p> <table> <tr><td>I_a</td><td>90 mA</td></tr> <tr><td>$V_{in(r.m.s.)}$</td><td>350 V</td></tr> <tr><td>V_{out}</td><td>340 V</td></tr> <tr><td>C_{res}</td><td>50 μF</td></tr> <tr><td>R_{lim}</td><td>300 Ω</td></tr> </table>	I_a	90 mA	$V_{in(r.m.s.)}$	350 V	V_{out}	340 V	C_{res}	50 μF	R_{lim}	300 Ω	<p>Change to Silicon Rectifiers</p> <p>Notes:</p> <ol style="list-style-type: none"> The two Mazda BY105 Silicon Rectifiers may be soldered to the old valve socket as shown below. Since the BY105 forward resistance is lower than UU9, it will be necessary to increase the value of the smoothing resistor to keep HT output at its original voltage. 	<p>AF Double Triode 6.3V, 0.4A Heater</p> <p>Typical Operation each section</p> <table> <tr><td>$V_{a(b)}$</td><td>260 V</td></tr> <tr><td>V_{g1}</td><td>-2 V</td></tr> <tr><td>I_a</td><td>1.1 mA</td></tr> <tr><td>R_a</td><td>100 kΩ</td></tr> <tr><td>R_k</td><td>1.8 kΩ</td></tr> <tr><td>g_m</td><td>3.4 mA/V</td></tr> <tr><td>μ</td><td>55</td></tr> </table>	$V_{a(b)}$	260 V	V_{g1}	-2 V	I_a	1.1 mA	R_a	100 k Ω	R_k	1.8 k Ω	g_m	3.4 mA/V	μ	55	<p>Change socket</p> <p>Notes:</p> <ol style="list-style-type: none"> Change valve socket to B9A. Usually no circuit modifications needed. Should audio instability occur, due to the higher slope of ECC81 reduce the value of the first section anode load resistance. It may be necessary to halve the original value of the load.
I_a	90 mA																										
$V_{in(r.m.s.)}$	350 V																										
V_{out}	340 V																										
C_{res}	50 μF																										
R_{lim}	300 Ω																										
$V_{a(b)}$	260 V																										
V_{g1}	-2 V																										
I_a	1.1 mA																										
R_a	100 k Ω																										
R_k	1.8 k Ω																										
g_m	3.4 mA/V																										
μ	55																										
<p>B8A</p>		<p>B8A</p>	<p>B8A</p>																								



VALVE and CRT

This equivalents list is published by Thorn-AEI Radio Valves & Tubes, Ltd., for convenience of customers and, although every care has been taken in its preparation, no responsibility or liability is assumed or accepted for the accuracy of the information.

The list includes all entertainment valve and CRT types for which there is a Thorn-AEI equivalent. **Current**, **Obsolescent** and **Obsolete** types are included, and therefore reference to the other sections of this book is necessary if it is desired to establish the availability classification of any particular type. Picture Tubes are grouped together at the end of the list.

Before making a replacement, it is advisable to study the published data on the valve type concerned to ensure continued operation within the published rating. This equivalents list is not intended to guarantee any degree of equivalence as regards secondary parameters.

EQUIVALENTS LIST

VALVE EQUIVALENTS

Index	M A Z D A		Brimar	European	American	Others
0A2	...	—	0A2	150C2	0A2	STV150-30
0A3	...	—	VR75/30	—	0A3	KD21
0B2	...	—	0B2	108C1	0B2	STV108-30
0C3	...	—	VR105/30	—	0C3	KD24
0D3	...	—	VR150/30	150C3	0D3	GD150A/S
0Z4	...	—	0Z4	—	0Z4	—
See also letter O						
1A3	...	1D13	—	DA90	1A3	—
1A5G	...	—	1A5G	—	1A5G	—
1A7G	...	—	1A7G	DK32	1A7G	X14
1AB6	...	1C3	DK96	DK96	1AB6	X25
1AC6	...	1C2	DK92	DK92	1AC6	X20
1AH5	...	1FD1	DAF96	DAF96	1AH5	ZD25
1AJ4	...	1F1	DF96	DF96	1AJ4	W25
1C1	...	1C1	DK91	DK91	1R5	X17
1C2	...	1C2	DK92	DK92	1AC6	X20
1C3	...	1C3	DK96	DK96	1AB6	X25
1C5GT	...	—	1C5GT	DL35	1C5GT	N14
1D5	...	U4020	—	—	C10B	40SUA, RZ, UR1C
1D6	...	—	1D6	—	—	—
1D13	...	1D13	—	DA90	1A3	—
1F1	...	1F1	DF96	DF96	1AJ4	W25
1F2	...	1F2	DF92	DF92	1L4	—
1F3	...	1F3	DF91	DF91	1T4	W17
1FD1	...	1FD1	DAF96	DAF96	1AH5	ZD25
1FD9	...	1FD9	DAF91	DAF91	1S5	ZD17
1H5GT	...	—	1H5GT	DAC32	1H5GT	HD14
1L4	...	1F2	DF92	DF92	1L4	—
1LA6E	...	—	1LA6E	—	1LA6E	—
1LD5	...	—	1LD5	—	1LD5	—
1LN5	...	—	1LN5	—	1LN5	—
1M1	...	1M1	DM71	DM71	1N3	Y25
1M3	...	1M1	—	DM70	1M3	—
1N3	...	1M1	DM71	DM71	1N3	Y25
1N5GT	...	—	1N5GT	DF33	1N5GT	Z14

VALVE EQUIVALENTS

Index	M A Z D A		Brimar	European	American	Others
1P1	...	1P1	DL96	DL96	DL96	3C4
1P10	...	1P10	DL92	DL92	DL92	3S4
1P11	...	1P11	DL94	DL94	DL94	3V4
1R5	...	1C1	DK91	DK91	DK91	1R5
1S2	...	—	DY86	DY86	DY86	1S2
1S2A	...	—	DY87	DY87	DY87	1S2A
1S4	...	—	1S4, DL91	DL91	DL91	1S4
1S5	...	1FD9	DAF91	DAF91	DAF91	1S5
1T2	...	—	R16	—	—	1T2
1T4	...	1F3	DF91	DF91	DF91	1T4
1U5	...	—	—	—	—	1U5
1X2B	...	—	—	—	—	1X2B
2A3	...	—	—	—	—	2A3
2B35	...	6D1	—	—	EA50	2B35
2D21	...	—	—	—	EN91	2D21
2T/270K	...	—	—	—	—	6305
2J2	...	U26	—	—	—	HR1, HR2
2L2	...	U25	—	—	—	U49
3A5	...	—	—	—	—	U47
3C4	...	1P1	DL96	DL96	DCC90	3A5
3D6	...	—	—	—	—	3C4
3Q4	...	—	—	—	—	N25
3Q5GT	...	—	—	—	—	—
3S4	...	1P10	DL92	DL92	DL92	3Q4
3V4	...	1P11	DL94	DL94	DL94	3Q5GT
4CM4	...	—	—	—	—	DL33
4D1	...	HL1320	—	—	—	DL92
4DL4	...	—	—	—	—	DL94
4FY5	...	—	—	—	—	3S4
4XP	...	PP3-250	—	—	—	3V4
5A/160H	...	6F12	EF91	SD3, 6AM6, EF91	EF91	4CM4
5A/160K	...	6F12	EF91	SD3, 6AM6, EF91	EF91	—
5AQ4	...	—	—	—	—	—
5B250A	...	—	—	—	—	—
5R4GY	...	—	—	—	—	—

VALVE EQUIVALENTS

Index	M A Z D A	Brimar	European	American	Others
5U4G	...	—	5U4G	GZ31	5U4G U52
5V4G	...	—	5V4G	—	52KU
5Y3GT	...	—	5Y3GT	—	U50
5Z3	...	—	5Z3	—	—
5Z4G	...	—	5Z4G	GZ30	5Z4G R52
6/30L2	...	6/30L2	ECC804	ECC804	—
6A3	...	—	6A3	—	6A3
6A7/E	...	—	6A7/E	—	6A7/E
6A8G	...	—	6A8G	—	6A8G
6ABS	...	—	ECL80	ECL80	6ABS X63
6AF4A	...	—	6AF4A	—	6AF4A
6AG6G	...	—	6AG6G, EL33	EL33	6AG6G
6AJS	...	6C12	ECH81	ECH81	6AJS
6AK5	...	—	6AK5, EF95	EF95	6AK5
6AK6	...	—	6AK6	—	6AK6
6AK8	...	6LD12	EABC80	EABC80	6AK8
6AL5	...	6D2	EB91	EB91	6AL5
6AM4	...	—	6AM4	—	6AM4
6AM5	...	—	6AM5	—	6AM5
6AM6	...	6F12	EF91	EF91	6AM6
6AQ4	...	6L34	EC91	EC91	6AQ4
6AQ5	...	—	6AQ5, EL90	EL90	6AQ5
6AQ8	...	6L12	ECC85	ECC85	6AQ8
6AT6	...	—	EBC90	EBC90	6AT6
6AU6	...	—	6AU6	EF94	6AU6
6AV6	...	—	6AV6	EBC91	6AV6
6B4G	...	—	6B4G	—	6B4G
6B7/E	...	—	6B7/E	—	6B7/E
6BSGT	...	—	6BSGT	—	6BSGT
6BA6	...	—	6BA6	EF93	6BA6
6BD7A	...	6LD13	EBC81	EBC81	6BD7A
6BE6	...	—	6BE6, EK90	EK90	6BE6
6BG6G	...	—	6BG6G	—	6BG6G
6BH6	...	—	6BH6	—	6BH6
6BJ6	...	—	6BJ6	—	6BJ6

VALVE EQUIVALENTS

Index	M A Z D A	Brimar	European	American	Others
6BK4	...	—	6BK4	—	6BK4
6BK8	...	—	EF86	EF86	6BK8
6BL8	...	—	6BL8	—	6BL8
6BM8	...	6PL12	ECL82	ECL82	6BM8
6BQ5	...	6P15	EL84	EL84	6BQ5
6BQ7A	...	—	6BQ7A	—	6BQ7A
6BR5	...	—	EM80	EM80	6BR5
6BR7	...	—	6BR7	—	6BR7
6BR8	...	—	6BR8	—	6BR8
6BS7	...	—	6BS7	—	6BS7
6BT4	...	UU9	EZ40	EZ40	6BT4
6BW6	...	—	6BW6	—	6BW6
6BW7	...	—	6BW7	—	6BW7
6BX6	...	—	EF80	EF80	6BX6
6BY7	...	6F26	EF85	EF85	6BY7
6C4	...	—	6C4, EC90	EC90	6C4
6C5G	...	—	6C5G	—	6C5G
6C6	...	—	6C6	—	6C6
6C9	...	6C9	—	—	6C9
6C10	...	6C10	ECH42	ECH42	6C10
6C12	...	6C12	ECH81	ECH81	6C12
6C15	...	6C15	—	—	6C15
6C16	...	6C16	ECF80	ECF80	6C16
6C18	...	6C18	—	—	6C18
6C31	...	6C31	—	—	6C31
6CA4	...	UU12	—	—	6CA4
6CA7	...	—	EL34	EL34	6CA7
6CD6G	...	—	6CD6G	—	6CD6G
6CF8	...	6F22	EF86	EF86	6CF8
6CH6	...	—	6CH6, ELS21	ELS21	6CH6
6CJ5	...	6F16	EF41	EF41	6CJ5
6CK5	...	—	EL41	EL41	6CK5
6CL6	...	—	6CL6	—	6CL6
6CQ6	...	—	9D6, EF92	EF92	6CQ6
6CM4	...	—	EC86	EC86	6CM4

VALVE EQUIVALENTS

Index	M A Z D A	Brimar	European	American	Others
6CS6	...	EH90	EH90	6CS6	—
6CU7	... 8C10	ECH42	ECH42	6CU7	X150, 62TH
6CV7	... 6LD3	EBC41	EBC41	6CV7	DH150, 62DDT, DH718
6CW7	... 6L16	ECC84	ECC84	6CW7	—
6D1	... 6D1	—	EA50	—	2B35, SD61
6D2	... 6D2	EB91	EB91	6A15	D77, D152, DD6
6D6	...	—	—	6D6	—
6DA5	...	EM81	EM81	6DA5	—
6DA6	...	EF89	EF89	6DA6	—
6DC8	... 6FD12	EBF89	EBF89	6DC8	—
6DJ8	...	—	ECC88	6DJ8	—
6DL4	...	—	EC88	6DL4	—
6DL5	...	EL95	EL95	6DL5	—
6E5GT	...	—	6E5GT	6E5GT	—
6EC7	... 6F18	—	—	6EC7	W739
6EH7	... 6F29	EF183	EF183	6EH7	—
6EJ7	... 6F30	EF184	EF184	6EJ7	—
6EL7	... 6F23	—	EF812	6EL7	Z749
6ES8	...	—	ECC189	6ES8	—
6F1	... 6F1	—	—	—	—
6F6G	...	—	6F6G	6F6G	KT63
6F11	... 6F11	—	—	—	—
6F12	... 6F12	EF91	8D3, 6AM6, EF91	6AM6	5A/160H, 5A/160K, PM07, SP6, Z77, HP6
6F13	... 6F13	—	—	—	—
6F14	... 6F14	—	—	—	—
6F15	... 6F15	—	—	—	—
6F16	... 6F16	EF41	EF41	6CJ5	62VP, W150
6F18	... 6F18	—	—	6EC7	W739
6F19	... 6F19	—	—	—	—
6F21	...	—	9D6, EF92	6CQ6	W77, VP6, E2016, 6F21
6F22	... 6F22	EF86	EF86	6267	Z729
6F23	... 6F23	—	—	6EL7	Z749
6F24	... 6F24	—	—	—	—
6F25	... 6F25	—	—	—	—
6F26	... 6F26	EF85	EF85	6BY7	W719

VALVE EQUIVALENTS

Index	M A Z D A	Brimar	European	American	Others
6F28	... 6F28	—	EF80	—	—
6F29	... 6F29	EF183	EF183	6EH7	—
6F30	... 6F30	EF184	EF184	6EJ7	—
6FD12	... 6FD12	EBF89	EBF89	6DC8	—
6FG6	...	EM84	EM84	6FG6	—
6FY5	...	—	EC97	6FY5	—
6G5G	... 6M1	—	6U5G	6G5G	6H5, 63ME, VFT6
6GA8	... 6/30L2	ECC804	ECC804	6GA8	B729
6GV7	... 6C18	—	ECF805	6GV7	—
6GV8	...	—	ECL85	6GV8	—
6GW8	...	ECL88	ECL86	6GW8	—
6H5	... 6M1	—	6U5G	6H5G	6G5G, 63ME, VFT6, Y61, Y63
6H6GT	...	—	6H6GT	6H6GT	D63
6HU6	...	EM87	EM87	6HU6	—
6HU8	...	ELL80	ELL80	6HU8	—
6J5G	...	—	6J5G	6J5G	L63
6J5GT	...	—	6J5GT	6J5GT	—
6J6	...	—	6J6	6J6	—
6J7G	...	—	6J7G	6J7G	KTZ63, Z63
6J7GT	...	—	6J7GT	6J7GT	—
6JX8	...	ECH84	ECH84	6JX8	—
6K6G	...	—	6K6G	6K6G	—
6K7G	...	—	6K7G	6K7G	KTW63, W63
6K7GT	...	—	6K7GT	6K7GT	—
6K8G	...	ECH35	6K8G	6K8G	OM10, Z61M, X65, X147
6K8GT	...	—	6K8GT	6K8GT	—
6K25	... 6K25	—	—	—	—
6L1	... 6L1	—	—	—	—
6L6G	...	—	6L6G	6L6G	KT66
6L6GA	...	—	6L6GA	—	—
6L7G	...	—	6L7G	6L7G	—
6L12	... 6L12	ECC85	ECC85	6AQ8	R719
6L13	... 6L13	ECC83	12AX7	ECC83	B339, 12DT7, E2164
6L15	... 6L15	—	—	ECC805	—
6L16	... 6L16	ECC84	ECC84	6CW7	—

VALVE EQUIVALENTS

Index	M A Z D A	Brimar	European	American	Others
6L18	6L18	—	—	—	—
6L19	6L19	—	—	—	—
6L34	6L34	EC91	EC91	6AQ4	—
6LD3	6LD3	EBC41	EBC41	6CV7	DH150, 62DDT, DH718
6LD12	6LD12	EABC80	EABC80	6AK8	DH719, 6T8
6LD13	6LD13	EBC81	EBC81	6BD7A	—
6LD20	6LD20	—	—	—	—
6M1	6M1	—	6U5G	—	6G5G, 63ME, VFT6, Y61, Y63
6M2	6M2	—	EM35	—	—
6N7G	—	—	6N7G	—	—
6N8	—	EBF80	EBF80	6N8	WD709, ZD152
6P1	6P1	—	—	—	—
6P15	6P15	EL84	EL84	6BQ5	N709
6P17	—	—	EL91	6AM5	N77, N144, 7D9, 16A, 6P17
6P25	6P25	—	—	—	—
6P26	6P26	—	—	—	—
6P28	6P28	—	—	—	—
6PL12	6PL12	ECL82	ECL82	6BMS	—
6Q7G	—	—	—	6Q7G	DH63
6Q7GT	—	—	—	6Q7GT	—
6R7G	—	—	—	6R7G	DL63
6S2	—	EY86	EY86	6S2	—
6S2A	—	EY87	EY87	6S2A	—
6SC7	—	—	—	6SC7	—
6SC7GT	—	—	—	6SC7GT	—
6SG7	—	—	—	6SG7	—
6SJ7	—	—	—	6SJ7	—
6SK7	—	—	—	6SK7	—
6SL7GT	—	—	—	6SL7GT	—
6SN7GT	—	—	ECC32	6SN7GT	B65, 13D2
6SQ7	—	—	—	6SQ7	—
6T8	6LD12	EABC80	EABC80	6AK8	DH719
6U4GT	—	—	—	6U4GT	—
6U5/6G5	—	—	—	6U5/6G5	—
6U5G	6M1	—	—	6U5G	6G5G, 6H5, 63ME, VFT6, Y61, Y63
6U7G	—	—	—	6U7G	—

VALVE EQUIVALENTS

Index	M A Z D A	Brimar	European	American	Others
6U8	—	—	ECF82	6U8	—
6V4	—	EZ80	EZ80	6V4	—
6V6G	—	—	—	6V6G	—
6V6GT	—	—	—	6V6GT	—
6X2	—	EY51	EY51	6X2	U43, U151, SU61
6X4	—	—	—	6X4	U78
6X5GT	—	—	—	6X5GT	U70, U147
7A2	AC/Pen	—	—	—	MKT4, MP/PEN, A70B, APP4A, KT42, N40, P4VA, PEN4VA
7A3	AC2/Pen	—	—	—	APP4B, PEN4VB, A70C, N41, PENA4, PT4, 42MP/PEN, KT41
7A7	—	—	—	7A7	—
7AN7	30L1	PCC84	PCC84	7AN7	B319
7B6	—	—	—	—	DH81, DL82
7B7	—	—	—	7B7	W149
7C5	—	—	—	7C5	N148
7C6	—	—	—	7C6	DH149
7D3	—	—	—	7D3	40PPA
7D5	—	—	—	—	N30, PP13A, PTA
7D6	Pen383	—	—	—	PP35, C70D, PEN38C, PEN3520
7D8	Pen1340	—	—	—	PEN13C
7D9	—	—	—	EL91	6AM5
7D10	—	—	—	EL821	6CH6
7D11	—	—	—	—	—
7DJ8	—	—	—	PCC88	7DJ8
7ED7	30F5	—	—	PF818	7ED7
7EK7	30L15	—	—	PCC805	7EK7
7E88	—	PCC189	PCC189	PCC189	7E88
7FC7	—	PCC89	PCC89	PCC89	7FC7
7GV7	30C18	PCF805	—	PCF805	7GV7
7H7	—	—	—	—	7H7
7HG8	—	—	—	—	Superseded by 8HG8
7K7	—	—	—	—	7K7
7R7	—	—	—	—	7R7
7S7	—	—	—	—	7S7
7Y4	—	—	—	—	7Y4
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ECC91	... —	—	6J6	ECC91	6J6	—
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PCL85	—	PCL85	PCL85	PCL85	18GV8
PCL86	—	PCL86	PCL86	PCL86	—
PCL88	30PL14	—	—	PCL88	—
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GUARANTEES

VALVES 3 months	PICTURE TUBES 24 months*	SEMICONDUCTORS 12 months
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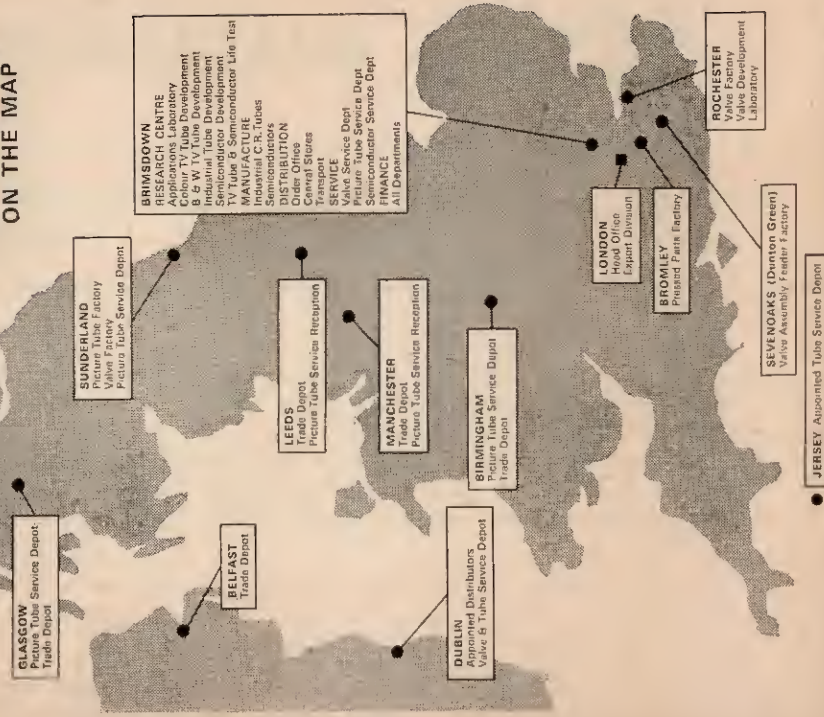
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To avoid delays and inconvenience to service customers please remember that Thorn-AEI Service Departments are equipped to handle **only Valves, Tubes and Semiconductors** which are products of the company **THORN-AEI RADIO VALVES & TUBES LTD.**

MAZDA

RESEARCH CENTRES

Brimmsdown

Colour TV Tube Development Laboratory
Black and White TV Tube Development Laboratory
Industrial Tube Development Laboratory
Semiconductor Development Laboratory
Picture Tube Life Testing Department
Semiconductor Life Testing Department
APPLICATIONS LABORATORY (for all devices)

Rochester

Valve Development Laboratory
Valve Life Testing Department

MAZDA

TRADE TECHNICAL LIAISON

MAZDA REPRESENTATIVES

Mazda Valve Representatives are active throughout The British Isles and Eire calling on radio wholesalers and retailers. Although Mazda do not operate Retailer Accounts, the Mazda Representatives endeavour to maintain close liaison with Dealers' service departments.

Retailers who would like to receive a visit from their Mazda Valve Representative are invited to write or telephone to the address below.

MAZDA TECHNICAL LIAISON OFFICER

The Mazda T.L.O. is available to trade service departments to investigate any serious complaints of a repetitive nature involving Mazda valves or picture tubes.

Retailers wishing to use this service must collect some factual evidence before an investigation can start.

e.g. Valve or Tube Type
Set make and model
Description of failure
Percentage of such failures
Quantity of the particular model maintained
Samples of failed valves

An investigation may then be requested via the Mazda Valve Representative or in writing direct to the address on this page. The Mazda T.L.O. will collect and analyse the evidence, confer with the Mazda and setmaker laboratories, factories and service departments and recommend corrective action.

MAZDA MAINTENANCE SALES DEPARTMENT

Thorn-AEI Radio Valves & Tubes Ltd,
7 Soho Square, London, W.1. Telephone: GERrard 5233



SERVICE DEPOTS

for examination of guarantee claims

VALVES & SEMICONDUCTORS	All U.K.	MAZDA VALVE SERVICE, Brimsdown, Enfield, Middlesex	Tel.: HOWard 1201
		Eire	<i>Appointed service depot for Mazda</i> Kelly & Sheil, Ltd., United Works, Distillery Road, Dublin, N.E.2	Tel.: Dublin 371621
PICTURE TUBES	London	MAZDA CRT SERVICE Brimsdown, Enfield, Middlesex	Tel.: HOWard 1201
	Birmingham	MAZDA CRT SERVICE 24 Sheepcote Street, Birmingham, 15	Tel.: B'ham MIDland 5291
	Glasgow	MAZDA CRT SERVICE 517 Lawmoor Street, Glasgow, C.5	Tel.: Glasgow SOUth 5151
	Leeds	<i>CRT Reception only</i> MAZDA WHOLESALER DEPOT 3 Ring Road, Lower Wortley, Leeds, 2	Tel.: Leeds 630441
	Manchester	<i>CRT Reception only</i> MAZDA WHOLESALER DEPOT Thorn House, Derby Street, Cheetham, Manchester, 8	Tel.: DEAnsgate 2499
	Sunderland	MAZDA CRT SERVICE Thorn-AEI Factory A, Pallion New Road, Sunderland	Tel.: Sunderland 70401
	Channel Islands	<i>Appointed CRT service depot for Mazda</i> J. J. Eastick & Sons, Ltd., St. Helier, Jersey	Tel.: Jersey Central 22901
	Eire	<i>Appointed service depot for Mazda</i> Kelly & Sheil, Ltd., United Works, Distillery Road, Dublin, N.E.2	Tel.: Dublin 371621

PURCHASE TAX 25%

Applicable within the United Kingdom only

Valve List Price	Tax	Total s. d.	Valve List Price	Tax	Total s. d.	Valve List Price	Tax	Total £ s. d.	Valve List Price	Tax	Total £ s. d.
7/-	1/2	8 2	11/-	1/10	12 10	15/-	2/6	17 6	20/-	3/3	1 3 3
7/6	1/3	8 9	11/6	1/11	13 5	16/-	2/8	18 8	21/-	3/5	1 4 5
8/-	1/4	9 4	12/-	2/-	14 0	16/6	2/9	19 3	21/6	3/6	1 5 0
8/6	1/5	9 11	12/6	2/1	14 7	17/-	2/10	19 10	22/6	3/8	1 6 2
9/-	1/6	10 6	13/-	2/2	15 2	17/6	2/11	1 0 5	24/-	4/-	1 8 0
9/6	1/7	11 1	13/6	2/3	15 9	18/-	3/-	1 1 0	25/-	4/1	1 9 1
10/-	1/8	11 8	14/-	2/4	16 4	18/6	3/1	1 1 7	27/6	4/6	1 12 0
10/6	1/9	12 3	14/6	2/5	16 11	19/-	3/2	1 2 2	30/-	4/11	1 14 11
									35/-	5/9	2 0 9

This table, together with the List Prices printed on Mazda valve cartons, will enable the outside engineer to price up jobs at the customer's premises. The table is valid for the 25% rate of purchase tax only, which was applicable at the time of going to press.



Valves & Picture Tubes



THORN - AEI RADIO VALVES & TUBES LTD · 7 SOHO SQUARE LONDON W1, GERrard 5233