MAZDA

DATA BOOKLET 1970

valves & picture tubes

1970—1971
DATA BOOKLET

MAZDA

VALVES AND PICTURE TUBES

Maintenance Sales Dept.
Thorn Radio Valves
and Tubes, Ltd.
7 Soho Square
London, W1V 6DN

Telephone 01-437 5233
Telex 261680

Returns

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

NOT THIS ADDRESS

PRICES

Please refer to separate MAZDA Price Guide (TRVT/M1) obtainable on request from the address on this page.

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.

KEEP YOUR OLD MAZDA BOOKLETS

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

Publication TRVT/M2/F

WPG. 50M. 1/70

Printed in Great Britain

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ADDITIONAL TYPES

These types have been added since the last edition

MAZDA VALVES

Colour TV

PCF200
PCH200

Monochrome TV

30FL2
PCL805/85

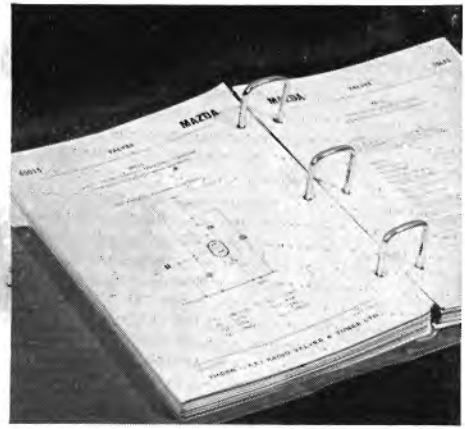
MAZDA PICTURE TUBES

Colour TV	Monochrome TV
A49–11X	A50–120W/R
A49–191X	A61–120W/R
A55–14X	
A63–11X	CME1202 R
	CME1713 R
	CME2013 R
	CME2413 R

SETMAKER INFORMATION AVAILABLE TO DEALERS

MAZDA

DESIGN DATA HANDBOOK



It contains in two volumes comprehensive data on all *Current* and *Maintenance* types of MAZDA entertainment valves and picture tubes. 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 tube 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 RADIO VALVES & TUBES LTD

Publicity Department

7 Soho Square, London, W1V 6DN

KEY TO ABBREVIATIONS

RATING AND OPERATING CONDITIONS

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

KEY TO ABBREVIATIONS

BASE CONNECTIONS

a	anode
a′	anode of first section
a″	anode of second section
a‴	anode of third section
a_d	anode of diode section
a_t	anode of triode section
bp	beam plates
ct	centre tap
d	diode
f	filament
g	grid
g_1	grid nearest cathode (e.g. control grid)
g_2	second grid from cathode (e.g. screen grid)
g_3	third grid from cathode (e.g. suppressor grid)
g_t	grid of triode section
h	heater, heptode or hexode
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 holden socket be left unconnected.**
k	cathode
k′	cathode of first section
k″	cathode of second section
M	metallising
NC	no connection
NP	no pin
p	pentode
q	tetrode
s	internal shield
SC	side contact
sg	sparkguard ring
t	triode or fluorescent target
TC	top cap

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. *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)

Letters. *Class of valve,*

C	Frequency changer with special oscillator section
D	Signal diode(s)
F	Voltage amplifier tetrode or pentode
FD	Voltage amplifier tetrode or pentode with diode(s)
FL	Voltage amplifier tetrode or pentode with voltage amplifier triode
K	Small gas triode or tetrode
L	Voltage amplifier triode or double triode including oscillator triode
LD	Voltage amplifier triode with diode(s)
M	Tuning Indicator
P	Power amplifier valve, tetrode or pentode
PL	Power amplifier valve, tetrode or pentode with voltage amplifier triode

Final number. *Distinguishes between different valves in the same class.*

POWER RECTIFIER VALVES

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

Letters. *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.

e.g. V193 has a 19V heater

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:—

First letter. *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	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). G was formerly used for indicating a 5V heater.

Second and subsequent letters. *Construction and/or application of the valve,*

- **A** Diode (excluding rectifier)
- **B** Double diode with common cathode (excluding rectifiers)
- **C** Triode (excluding power output triode)
- **D** Power output triode
- **E** Tetrode (excluding power & output tetrode)
- **F** Pentode (excluding power output pentode)

Second and subsequent letters *Continued*

- **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, and are placed in alphabetical order.

First figure. *Type of base,*

- **1** Miscellaneous
- **2** Miniature 10-pin (B10B)
- **3** International octal
- **5** Magnoval (B9D) and Novar (B9E)—520 and above
- **8** Noval (B9A)
- **9** Miniature 7-pin (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.

Remaining two figures. *Development 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. CME1908/A47-14W

MAZDA SYSTEM

Television type picture tubes are designated by a letter classification followed by a number.
e.g. CME2013 R

Letters

CME Indicates a monochrome tube having magnetic deflection and electrostatic focus.

CRM Indicates a monochrome tube having magnetic deflection and focus.

CTA Indicates a tube for colour television display.

Numbers

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.

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.
S or R indicates the type of Sparkguard base fitted.

EUROPEAN SYSTEM

The type nomenclature consists of one letter and number joined by a hyphen to a number and a final letter, e.g. A50–120W/R

First Letter

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

First Number

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

47 Represents a 47 cm (19 in.) faceplate
50 Represents a 50 cm (20 in.) faceplate
59 Represents a 59 cm (23 in.) faceplate
61 Represents a 61 cm (24 in.) faceplate

Second Number

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 and for tri-phosphor screens "X" will be used.

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

Suffix Letter

S or R after an oblique stroke indicates the type of Sparkguard base fitted.

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

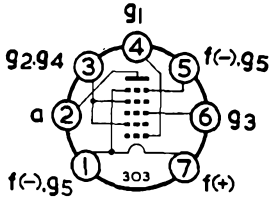
IC1

Pentagrid 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	μA/V
r_a	600	k Ω

B7G



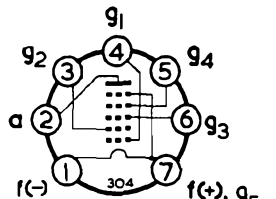
IC3

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 Ω
$R_{g2(osc)}$	33	k Ω
$R_{g1(osc)}$	27	k Ω
g_c	300	μA/V
r_a	800	k Ω

B7G



IF1

HF Pentode
Variable-mu IF Amplifier
1·4V, 25mA Filament

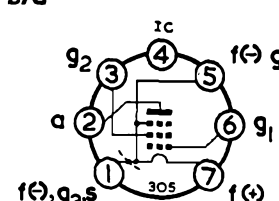
Rating

$p_{a(max)}$	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



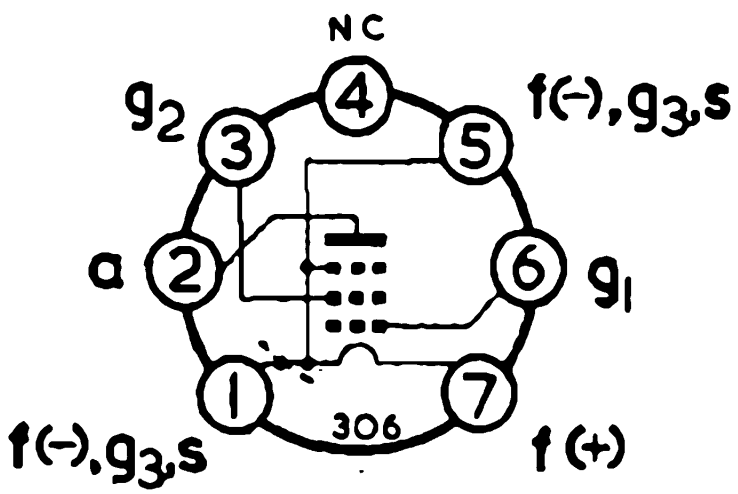
1F3

HF Pentode
Variable-mu IF 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



1FD1

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

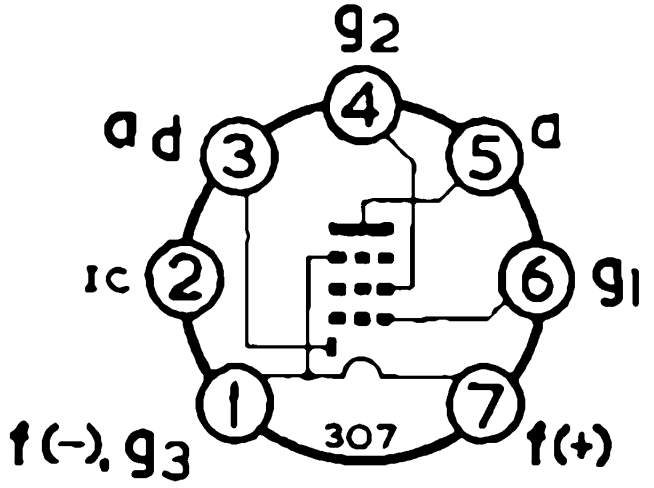
Rating (Pentode)

$p_{a(max)}$	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	μA/V
μ_{g1-g2}	16	

B7G



1FD9

Diode Pentode
Audio Amplifier
1·4V, 50mA Filament

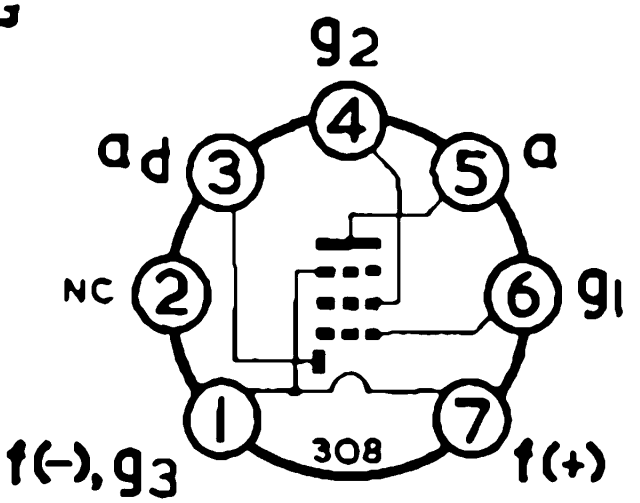
Rating (Pentode)

$P_{a(max)}$	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	μA/V
r_a	500	kΩ

B7G



IPI

Audio Output Pentode
1·4V, 50mA or
2·8V, 25mA Filament

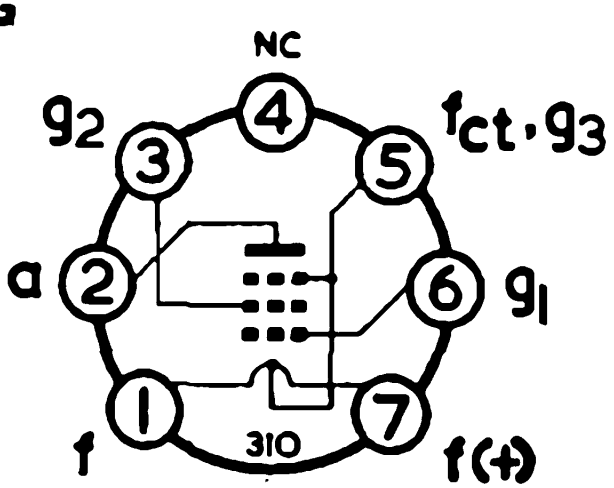
Rating

$P_{a(max)}$	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 Ω
R_a	13	k Ω
P_{out}	200	mW

B7G



IP10

Audio Output Pentode
1·4V, 100mA or
2·8V, 50mA Filament

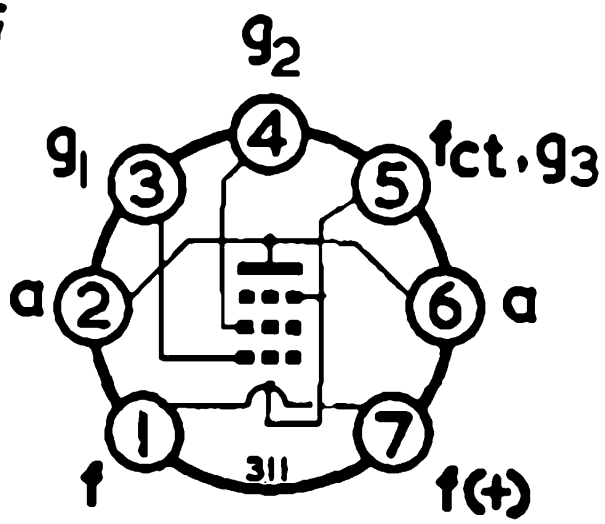
Rating

$p_{a(max)}$	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 Ω
R_a	8	k Ω
P_{out}	270	mW

B7G



IP11

Audio Output Pentode
1·4V, 100mA or
2·8V, 50mA Filament

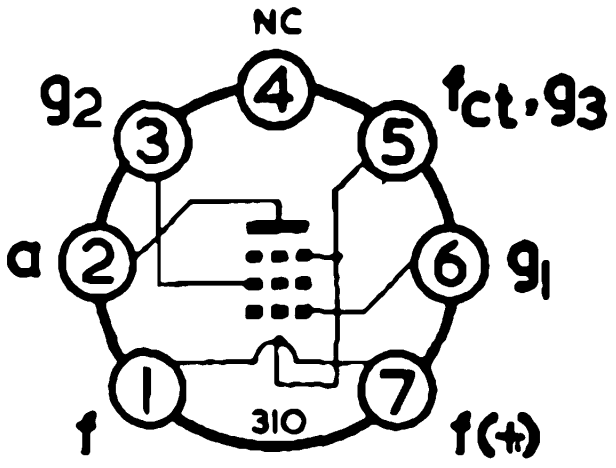
Rating

$p_{a(max)}$	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 Ω
R_a	10	k Ω
P_{out}	270	mW

B7G



6/30L2

Double Triode
General Purpose
6·3V, 0·3A Heater

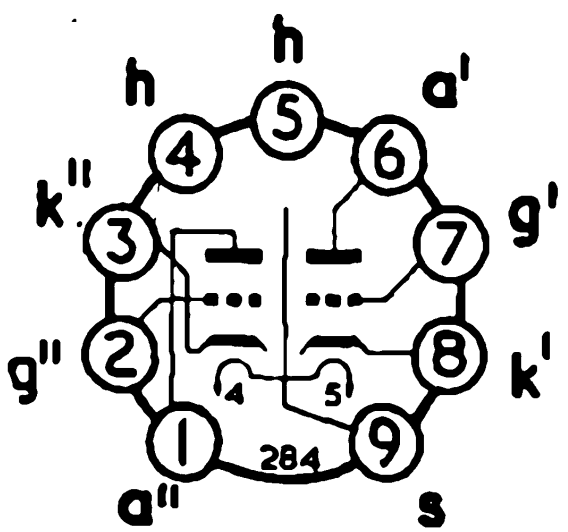
Ratings

$V_{a(max)}$	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



6BW7

VHF Pentode
IF and Video Stages
6·3V, 0·3A Heater

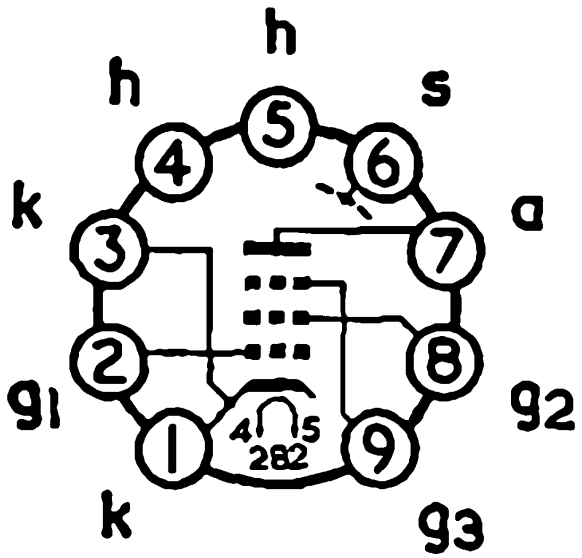
Rating

$p_{a(max)}$	2·75	W

Typical Operation

V_a	250	V
V_{g_2}	250	V
I_a	9·5	mA
I_{g_2}	3·5	mA
R_k	180	Ω
g_m	8·5	mA/V
r_a	750	kΩ
$\mu_{g_1-g_2}$	70	

B9A



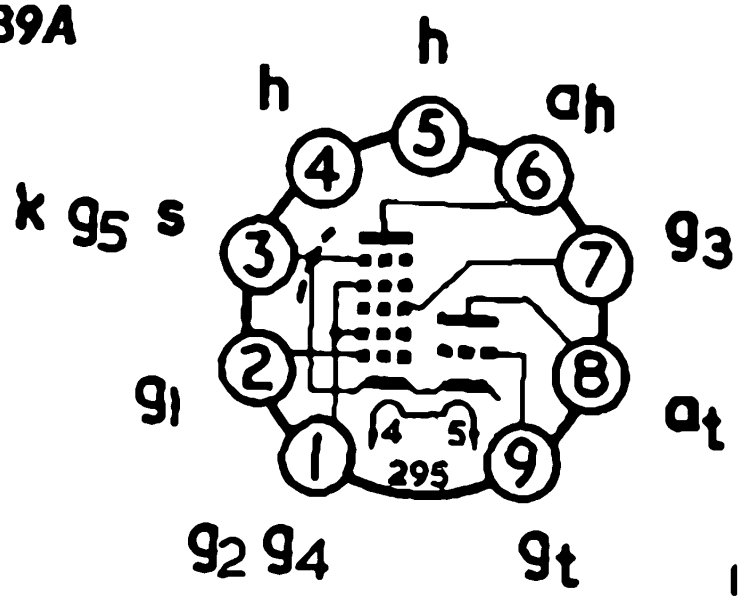
6C12

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	...	kΩ
R_{gt+g3}	47		kΩ
R_{g3+g4}	...	22	kΩ
R_k	140		Ω
g_c	...	0·775	mA/V

B9A



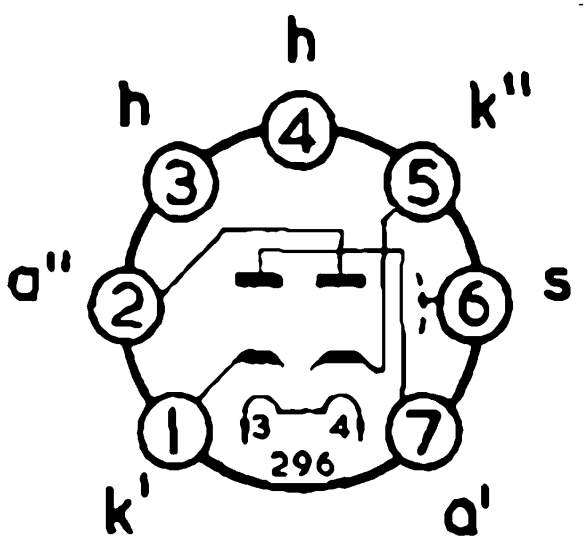
6D2

Double Diode
IF Amplifier
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



6F12

HF Pentode
IF Amplifier
6·3V, 0·3A Heater

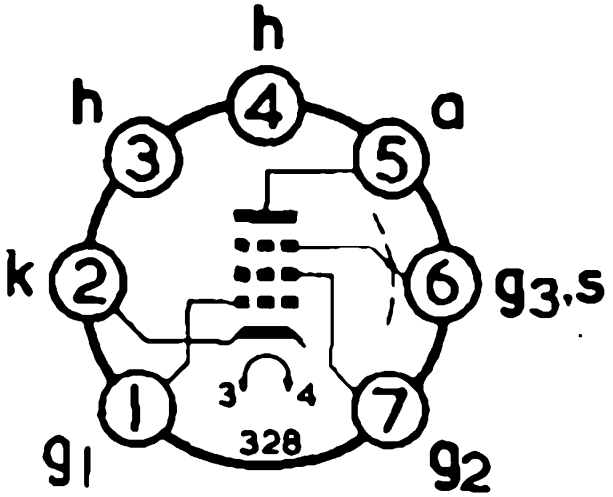
Rating

$P_{a(max)}$	2·5	W

Typical Operation

V_a	250	V
V_{g3}	0	V
V_{g2}	250	V
V_{g1}	−2	V
I_a	10	mA
I_{g2}	2·5	mA
g_m	7·5	mA/V
r_a	1	MΩ

B7G



6F23

HF Pentode
IF Amplifier
6·3V, 0·3A Heater

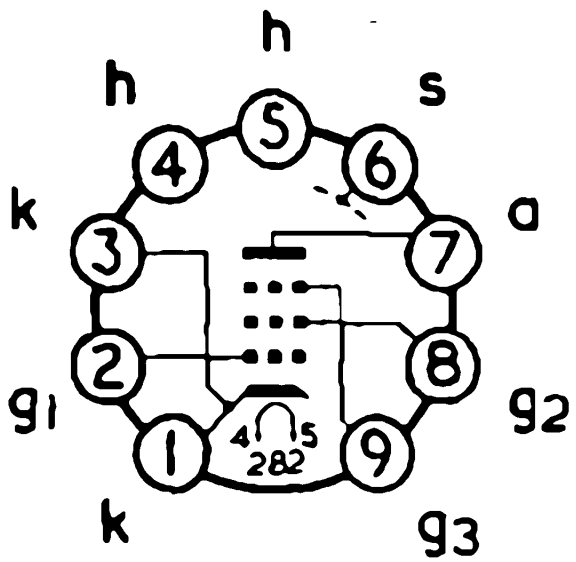
Rating

$P_{a(max)}$	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

B9A



6F24

HF Frame Grid Pentode
IF Amplifier
6·3V, 0·3A Heater

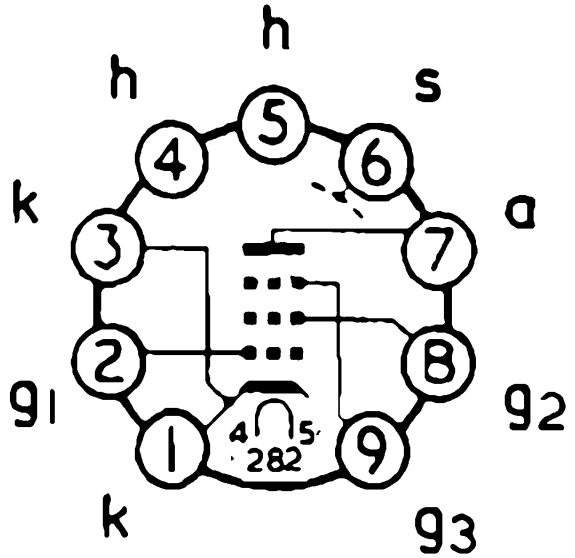
Rating

$P_{a(max)}$	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

B9A



6F26

HF Pentode
Variable-mu IF Amplifier
6·3V, 0·3A Heater

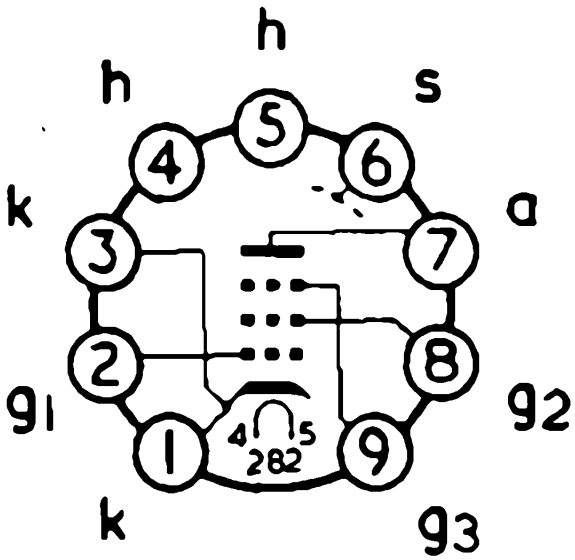
Rating

$P_{a(max)}$	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

B9A



6F28

Frame Grid Beam Tetrode
Video Output
6·3V, 0·3A Heater

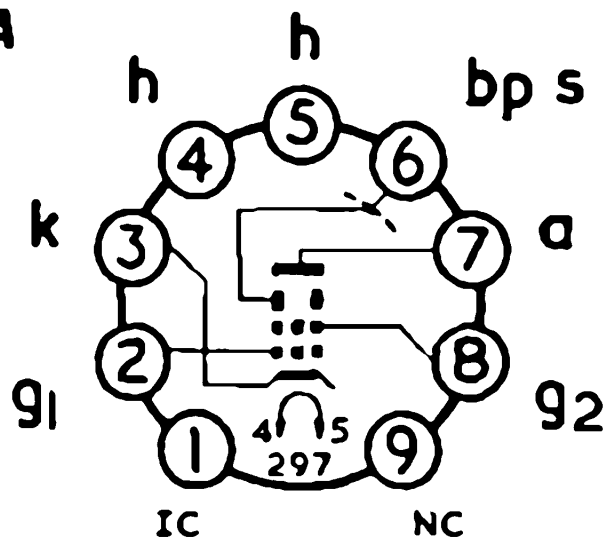
Rating

$P_{a(max)}$	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

B9A



6F29

HF Frame Grid Pentode Variable–mu IF Amplifier 6·3V, 0·3A Heater

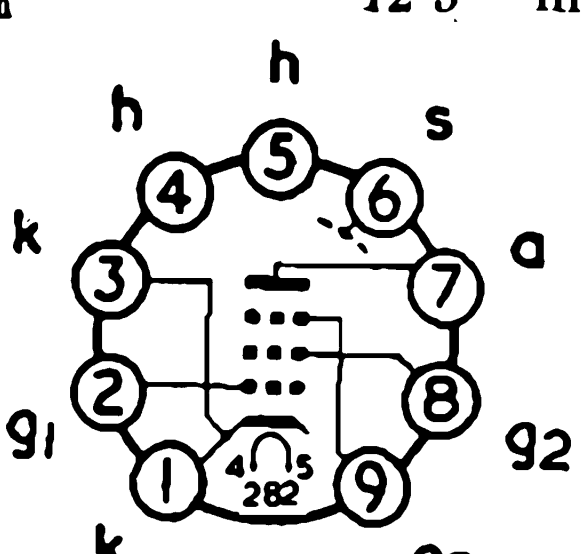
Rating

$P_{a(max)}$	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

HF Frame Grid Pentode
IF Amplifier
6·3V, 0·3A Heater

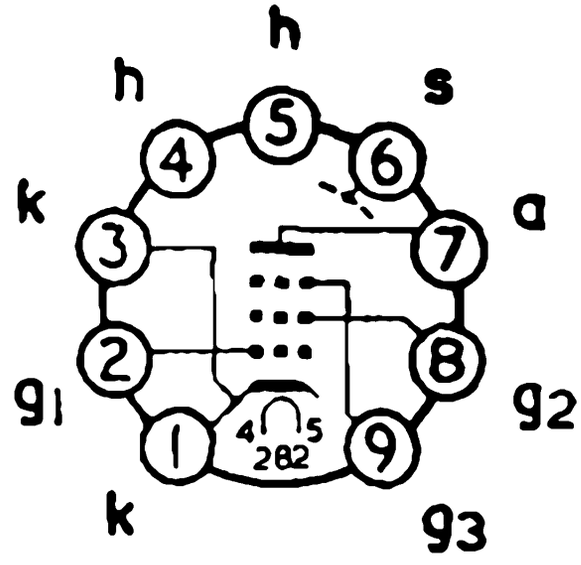
Rating

$P_{a(max)}$	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
Variable–mu Amplifier
6·3V, 0·3A Heater

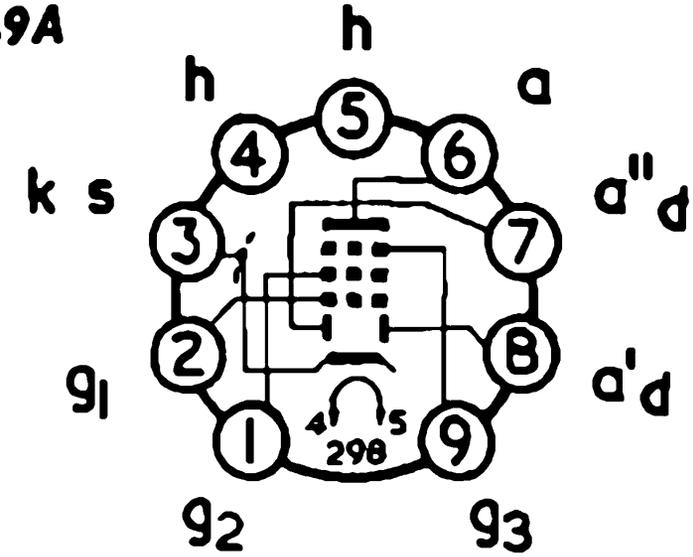
Rating (Pentode)

$P_{a(max)}$	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



6L12

VHF Double Triode
6·3V, 0·435A Heater

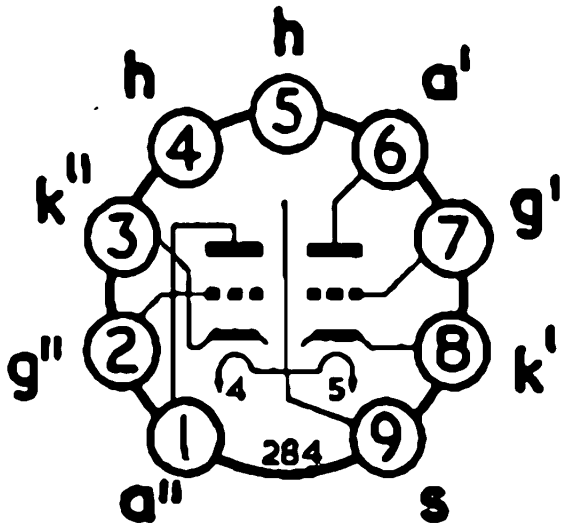
Rating

$P_{a(max)}$		
(*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

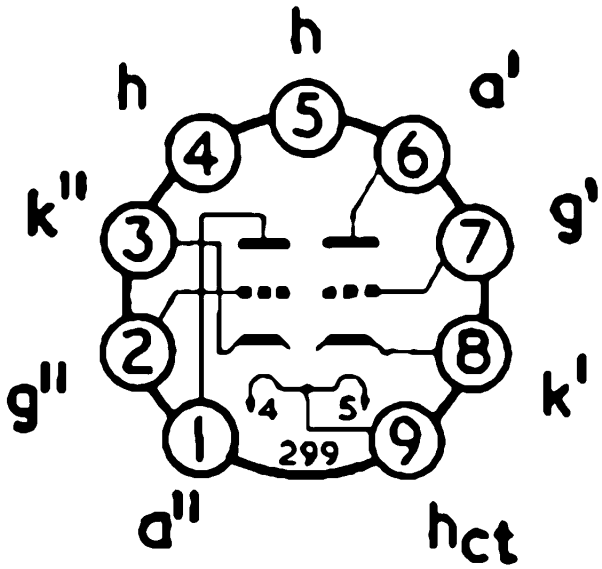
Rating

$P_{a(max)}$		
(*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



6LD12

Triple Diode Triode
Audio Amplifier
6·3V, 0·45A Heater

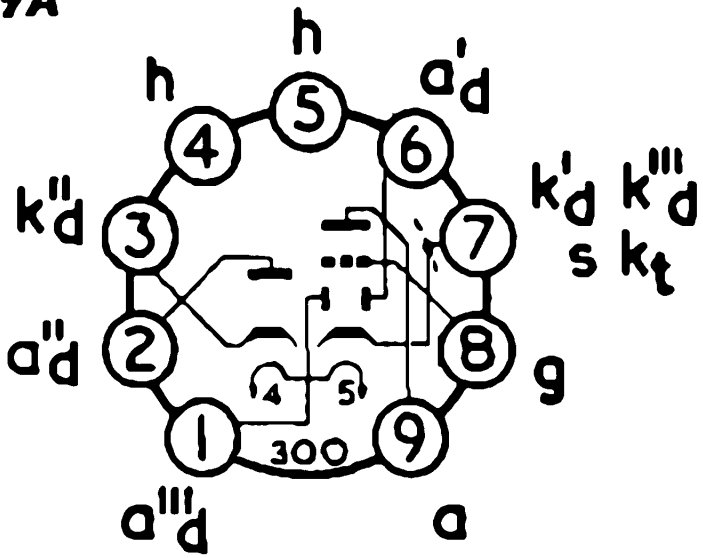
Rating (Triode)

$p_{a(max)}$	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, 0·23A Heater

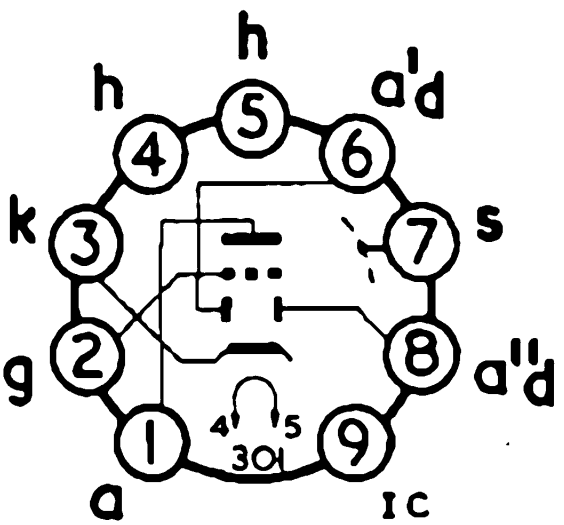
Rating (Triode)

$P_{a(max)}$	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

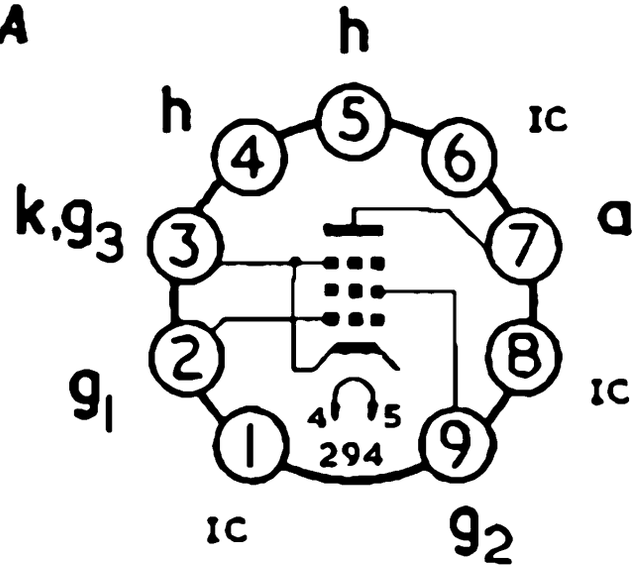
Rating

$P_{a(max)}$	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	kΩ
g_m	11·3	mA/V
r_a	38	kΩ
P_{out}	5·4	W

B9A

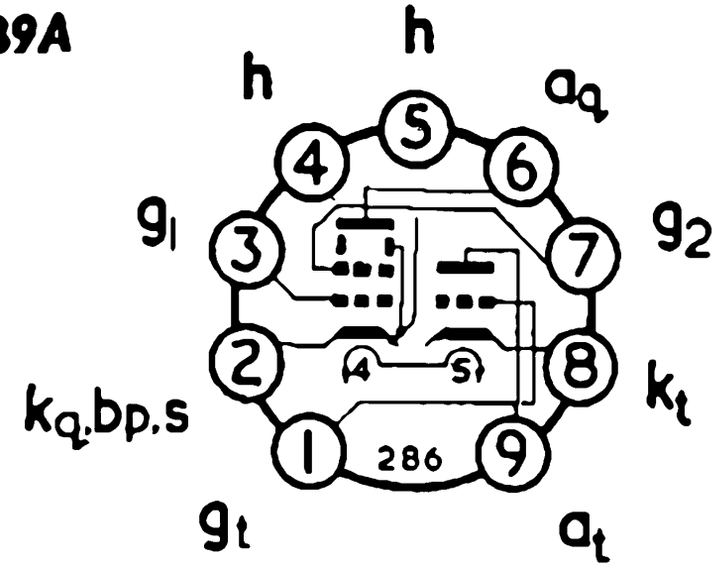


6PL12

Triode Beam Tetrode
Audio or Field Output
6·3V, 0·78A Heater

Rating	Triode	Tetrode	
$P_{a(max)}$	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	kΩ
R_k	...	390	Ω
g_m	2·5	6·4	mA/V
μ	70	...	
P_{out}		3·5	W

B9A



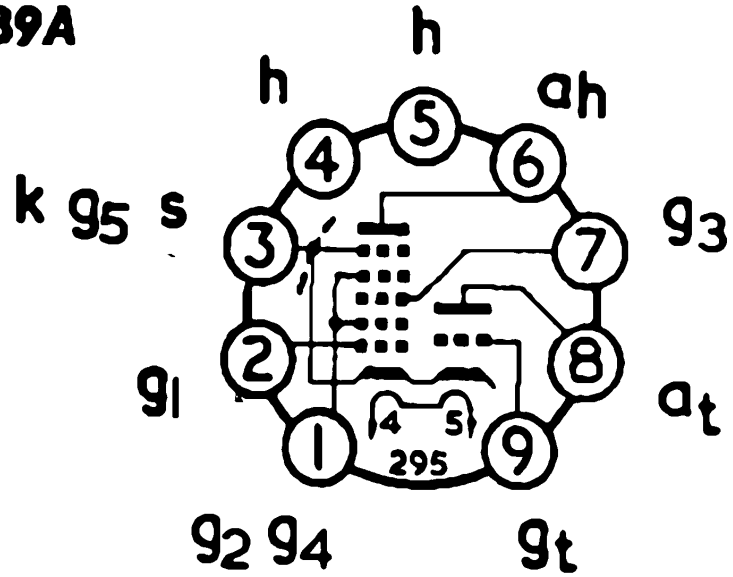
10C14

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+gt}	47		k Ω
R_k	150		Ω
g_c	...	0·75	mA/V

B9A



10F1

HF Screened Pentode IF Amplifier 0·1A, 22V Heater

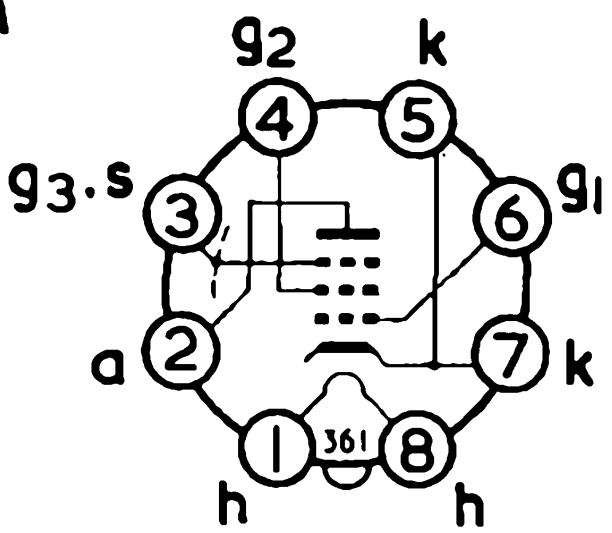
Rating

$p_{a(max)}$	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



10FD12

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

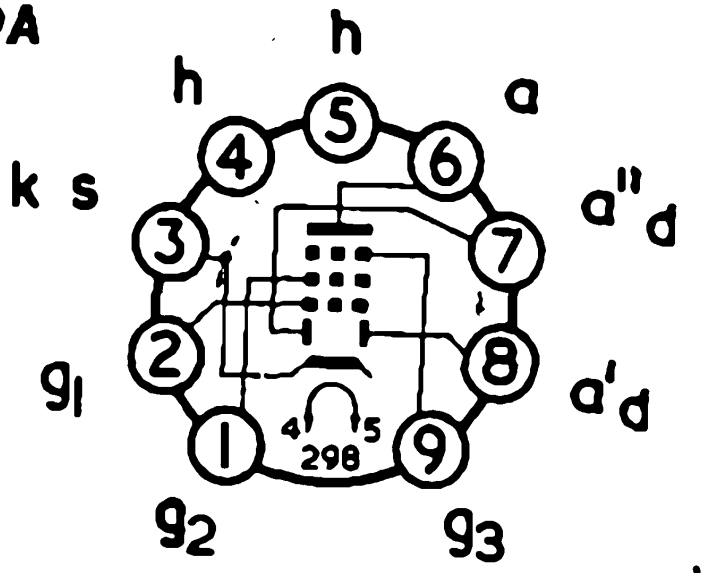
Rating (Pentode)

$P_{a(max)}$	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	kΩ
R_k	105	Ω
g_m	4·5	mA/V
r_a	600	kΩ

B9A



10L14

VHF Double Triode
0·1A, 26V Heater

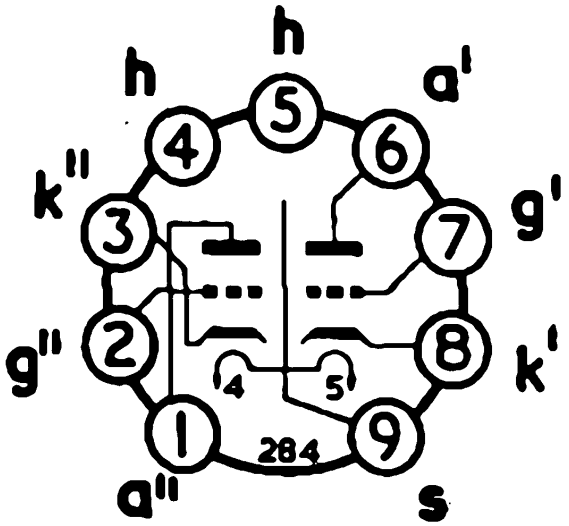
Rating

$p_{a(max)}$	(*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



10LD12

Triple Diode Triode
0·1A, 28V Heater

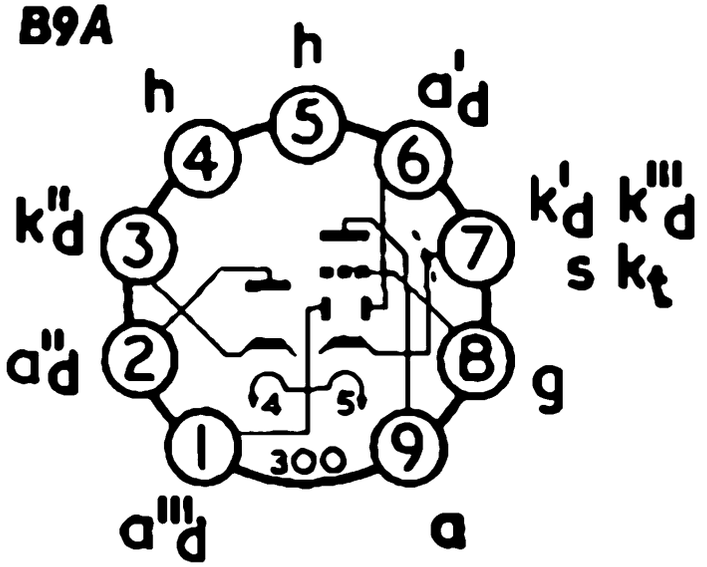
Rating (Triode)

$p_{a(max)}$	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	

B9A



10P18

Audio Output Pentode
0·1A, 45V Heater

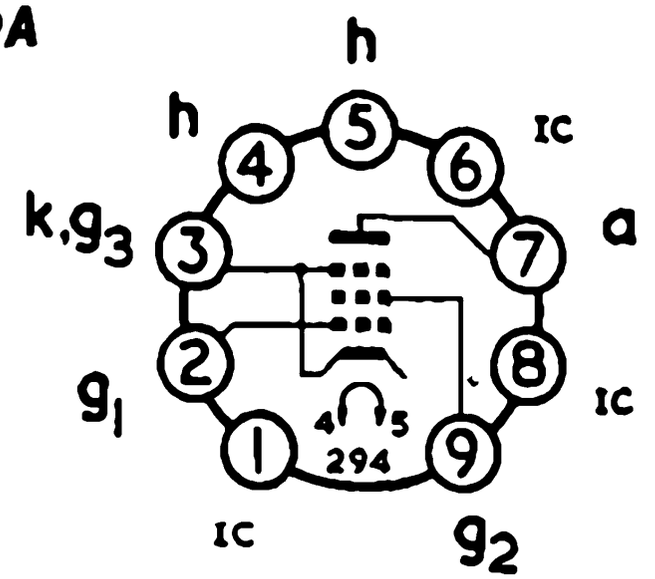
Rating

$p_{a(max)}$	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
r_a	23	k Ω
g_m	10	mA/V
P_{out}	5·2	W

B9A

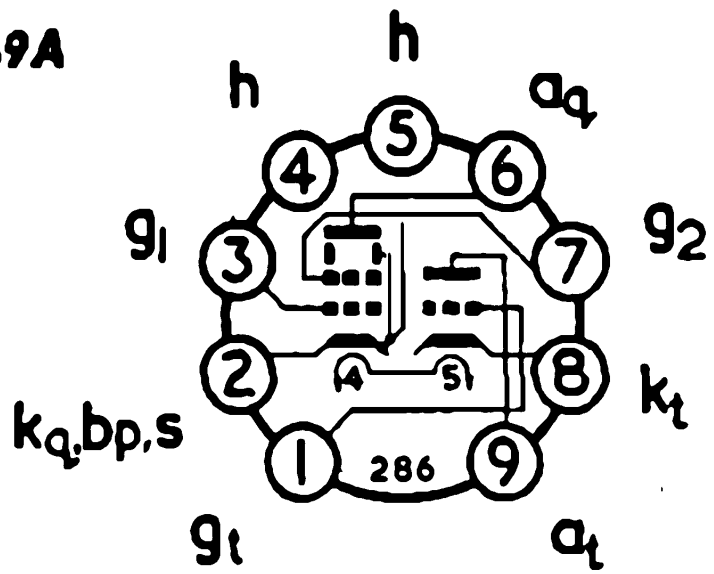


10PL12

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

B9A

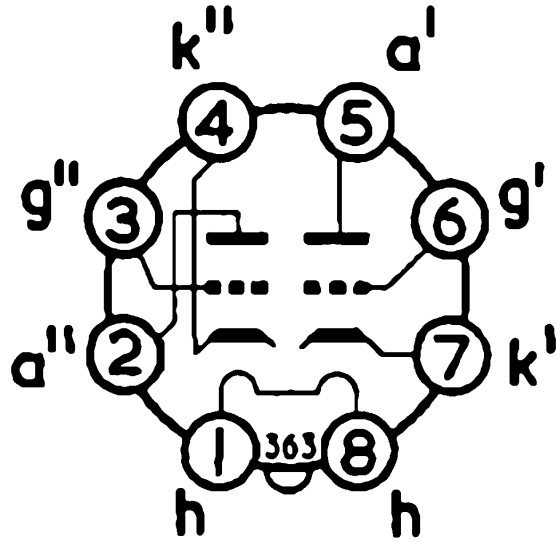


20L1

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



20P4

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

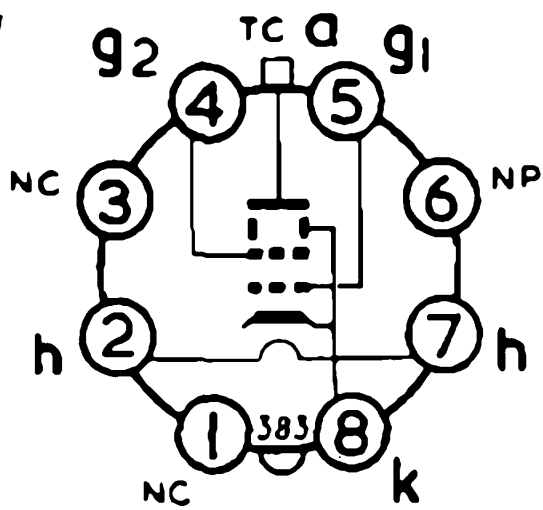
Ratings

$V_{a(max)}$	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



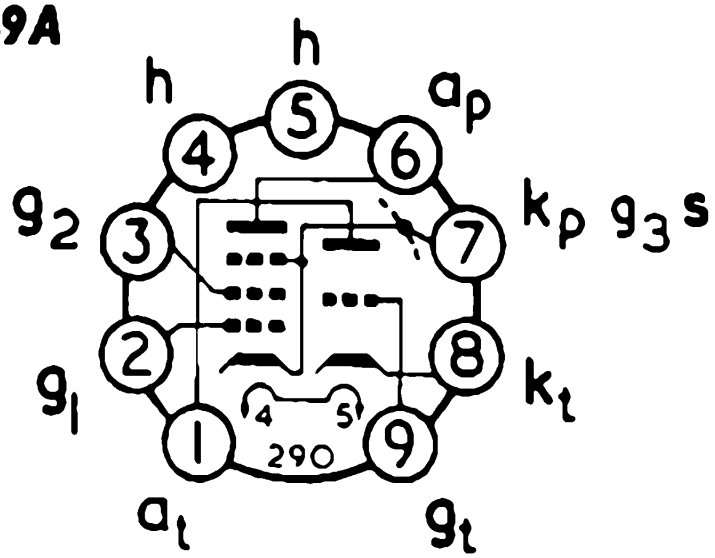
30C1

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_o	...	2	mA/V
μ	20	...	

B9A



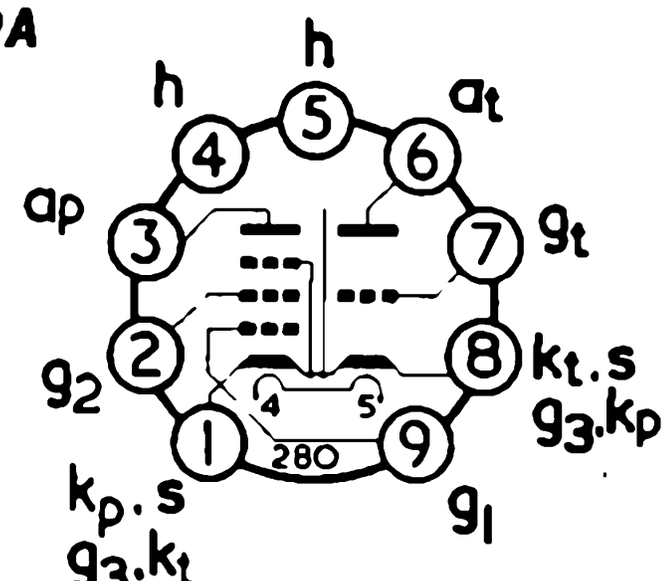
30C15

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



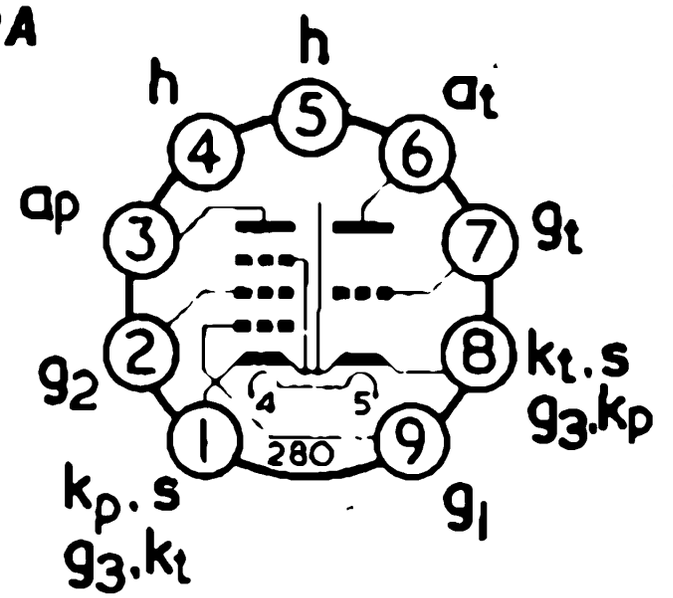
30C17

Frame Grid Triode Pentode
VHF 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	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



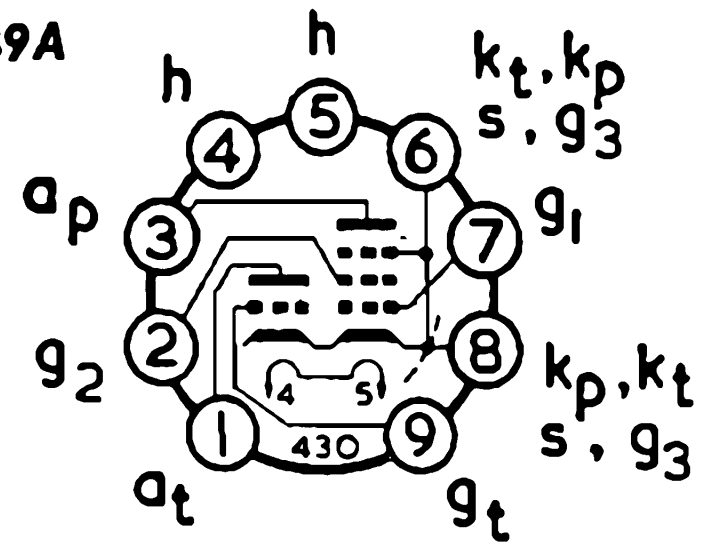
30C18

Triode Frame Grid Pentode VHF Variable-mu 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	...	

B9A



30F5

HF Screened Pentode IF Amplifier 0·3A, 7·3V Heater

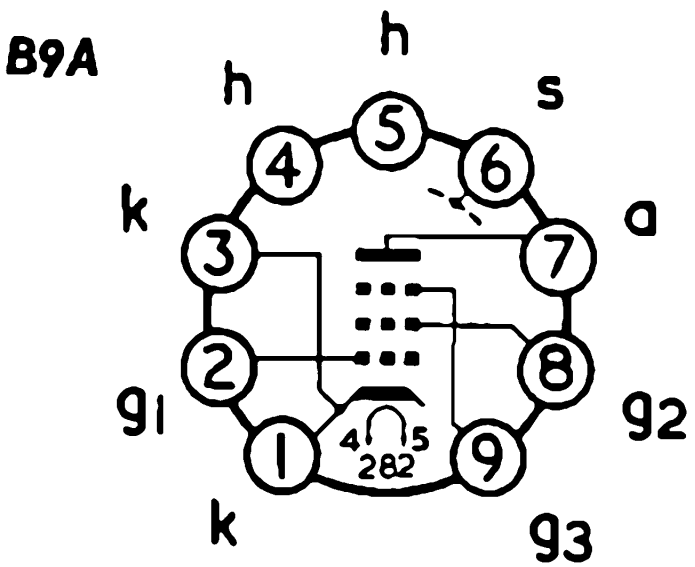
Rating

$P_{a(max)}$	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
R_k	150	Ω
g_m	8·8	mA/V

B9A

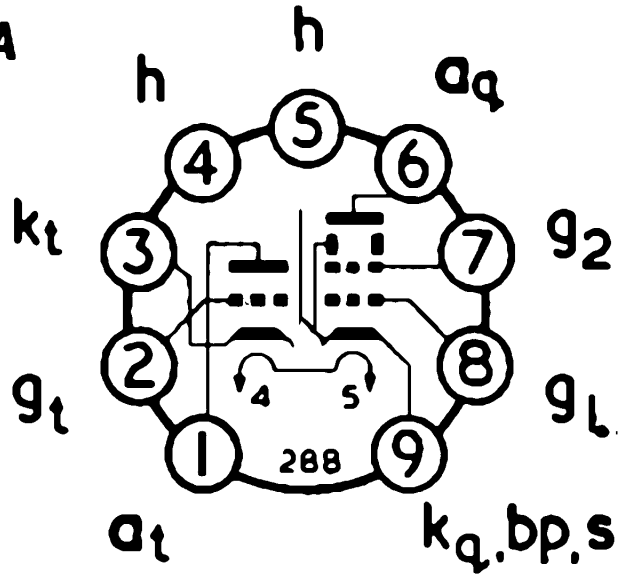


30FL1

Triode Beam Tetrode
Multi-purpose Triode
Video or Synch. Separator
0·3A, 9·4V Heater

	Triode	Tetrode	
Rating			
$P_{a(max)}$	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

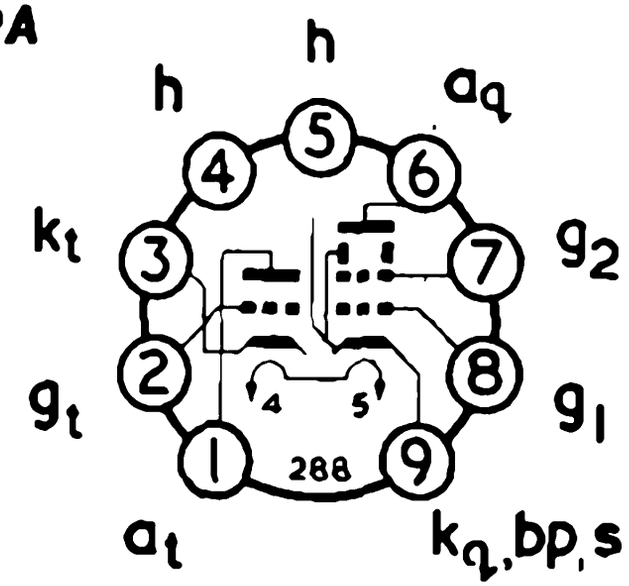


30FL2

Triode Beam Tetrode
Line Osc. Synch. Separator
0.3A, 10.4V Heater

	Triode	Tetrode	
Rating			
$p_{a(max)}$	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

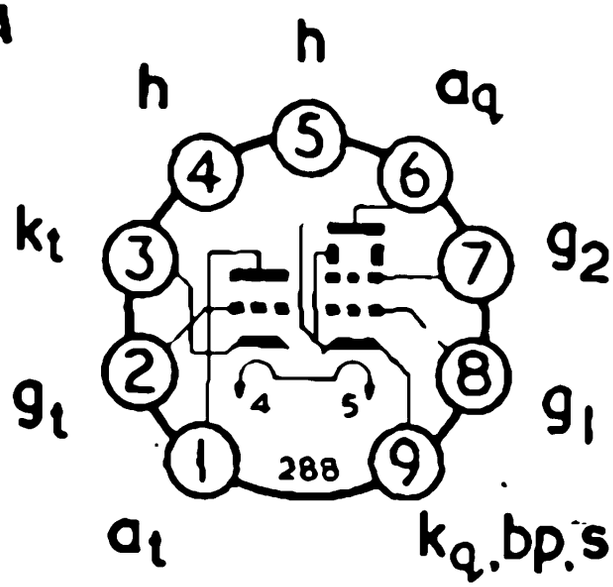


30FL12

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	...	

B9A

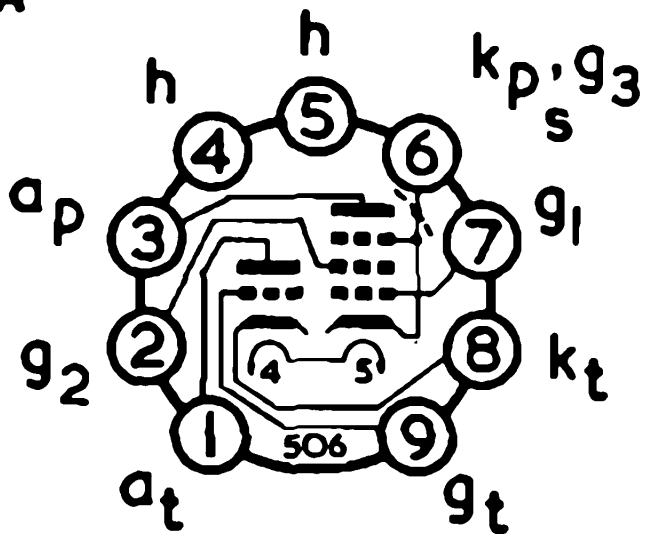


30FL14

Triode HF Pentode
IF 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	...	

B9A



30L1

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

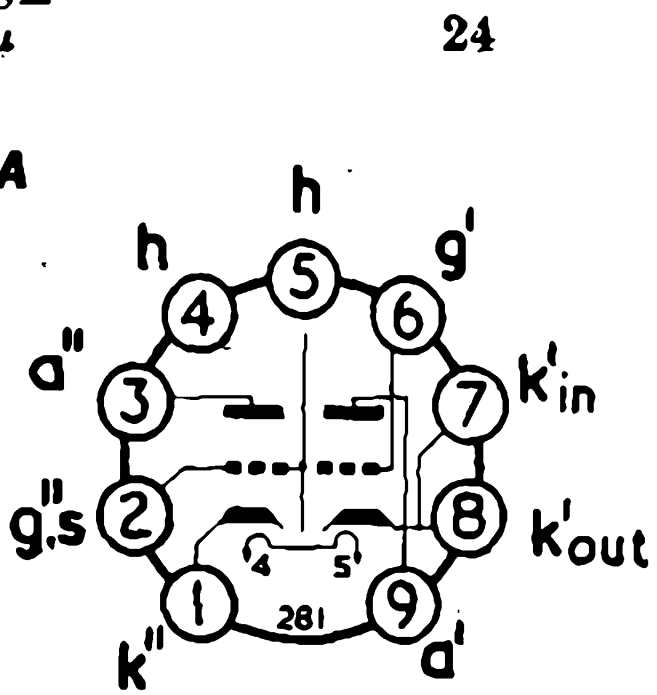
Rating

$P_{a(max)}$ (*Either 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	

B9A



30L15

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

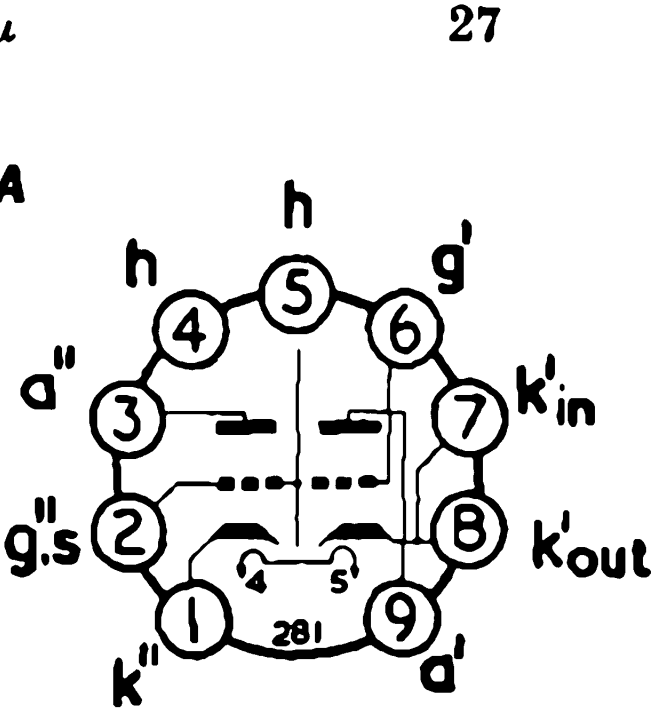
Rating (each section)

$P_{a(max)}$	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	

B9A



30L17

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

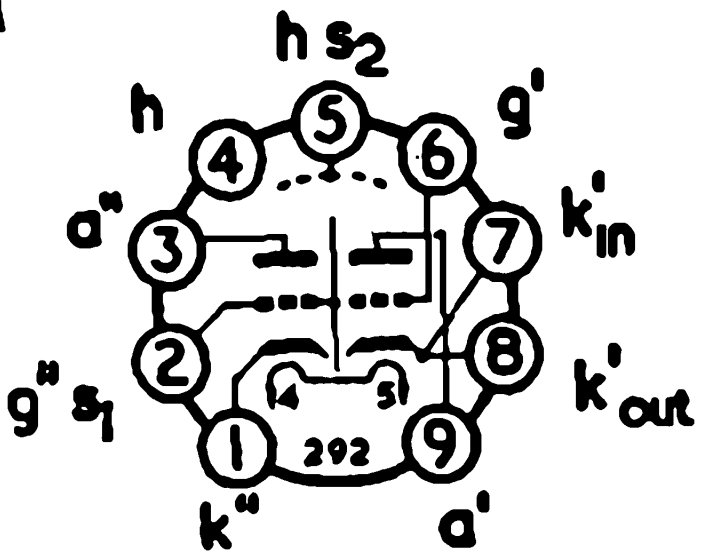
Rating (each section)

$P_{a(max)}$	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	

B9A



30P4MR

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

Ratings

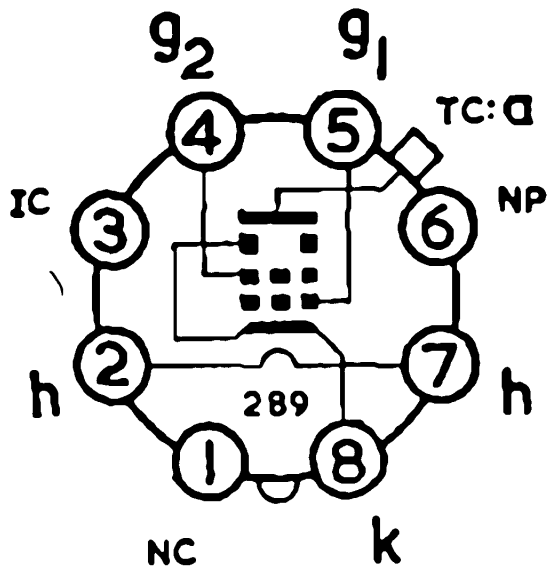
$V_{a(max)}$	400	V
$p_{a(max)}$	10	W
$V_{g2(max)}$	250	V
$p_{g2(max)}$	4	W
$I_{k(max)}$	160	mA
$v_{a\ (pk+)max}$	6·5	kV

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.

Int. Octal



30P12

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

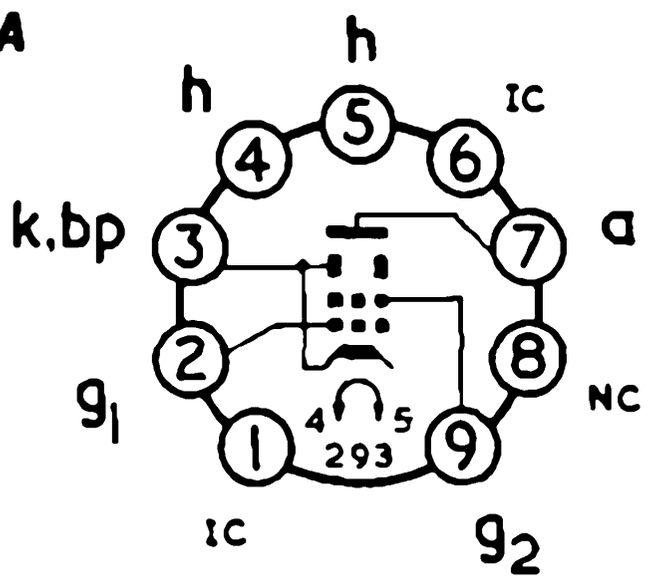
Rating

$P_{a(max)}$	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	kΩ
P_{out}	2·25	W

B9A



30P16

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

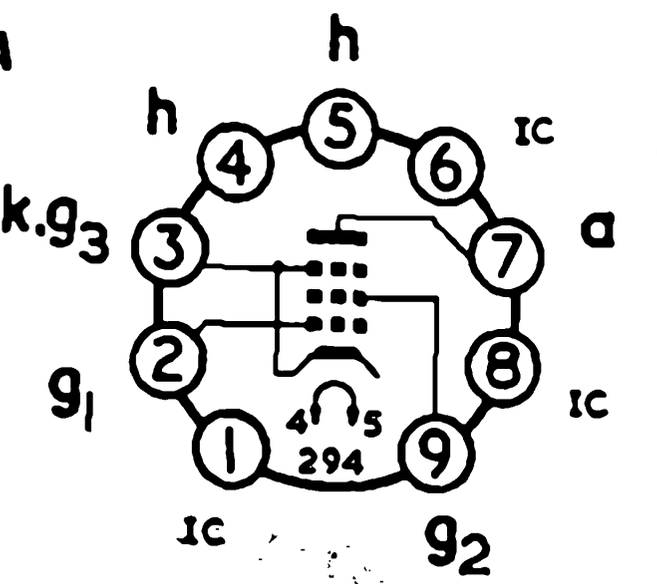
Rating

$P_{a(max)}$	9	W

Typical Operation

V_a	200	V
V_{g2}	200	V
V_{g1}	−14·4	V
$I_{a(o)}$	45	mA
$I_{g2(o)}$	8·5	mA
R_a	4	kΩ
g_m	7·6	mA/V
r_a	24	kΩ
P_{out}	4·2	W

B9A



30P18

Field Output Pentode
0·3A, 15V Heater

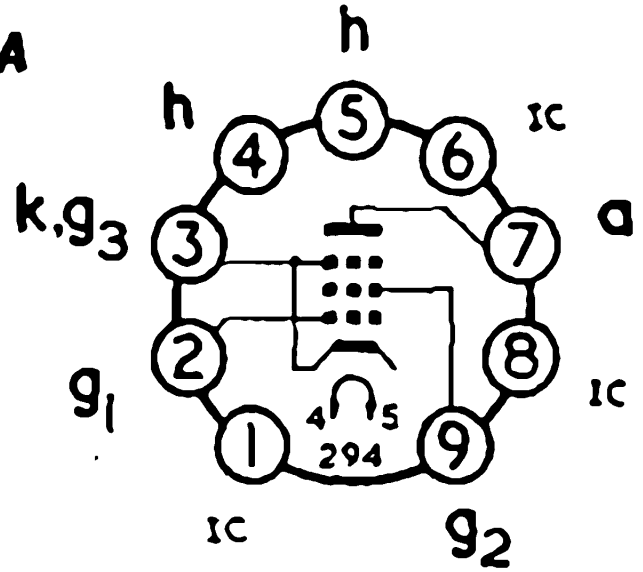
Rating

$P_{a(max)}$	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

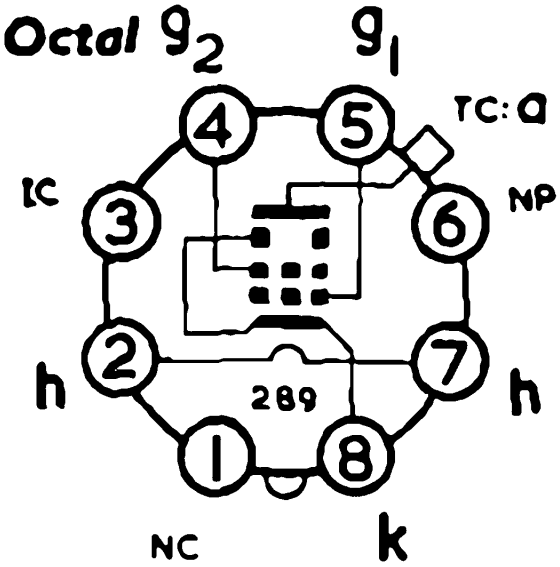
Ratings

$P_{a(max)}$ ($P_{g2} \leqslant 4W$)	11	W
$P_{g2(max)}$ ($P_a \leqslant 7W$)	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)

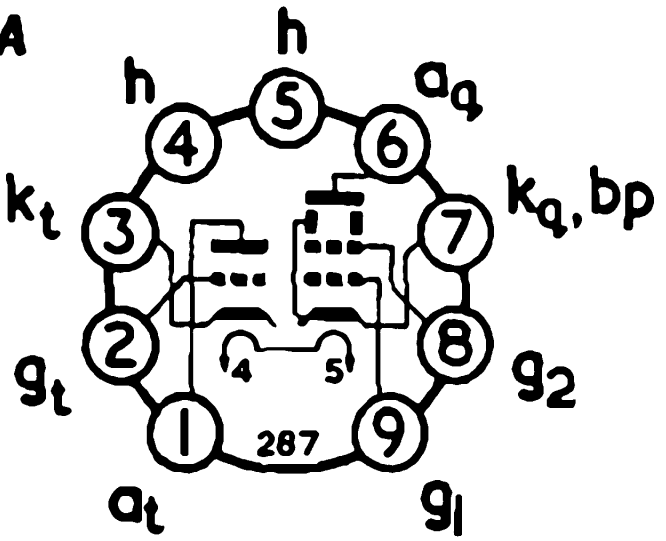
$P_{a(max)}$	5·5	W

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 13.

B9A

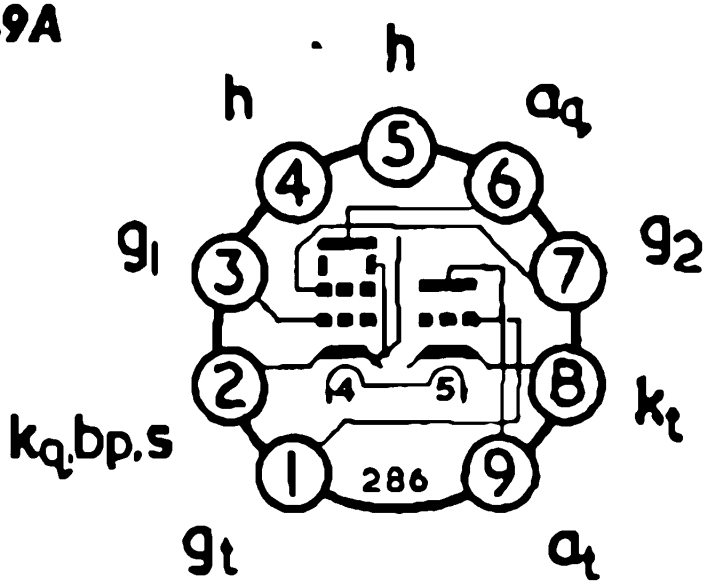


30PL13

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
I_a	10	45	mA
g_m	4·3	7·5	mA/V
μ	18	...	

B9A

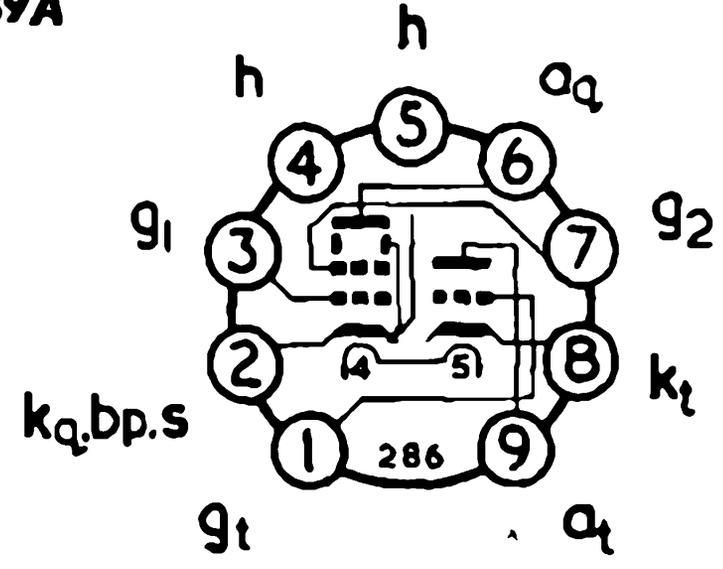


30PL14

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

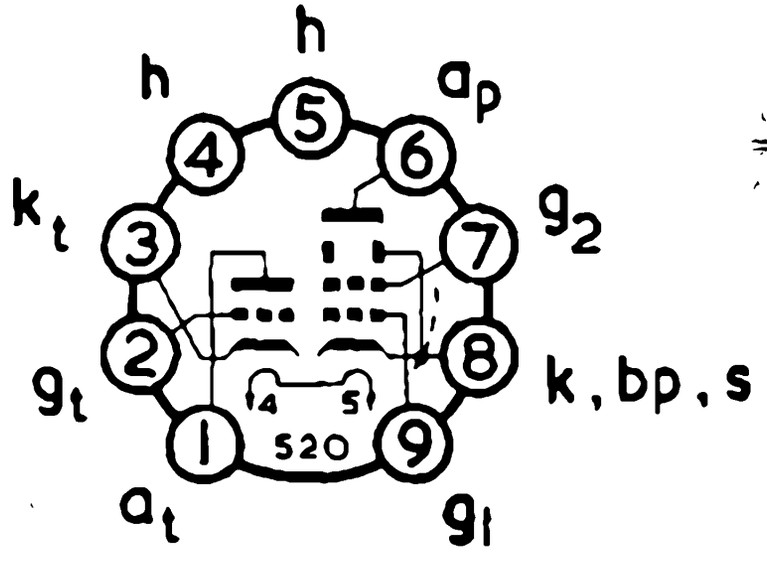


30PL15

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



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

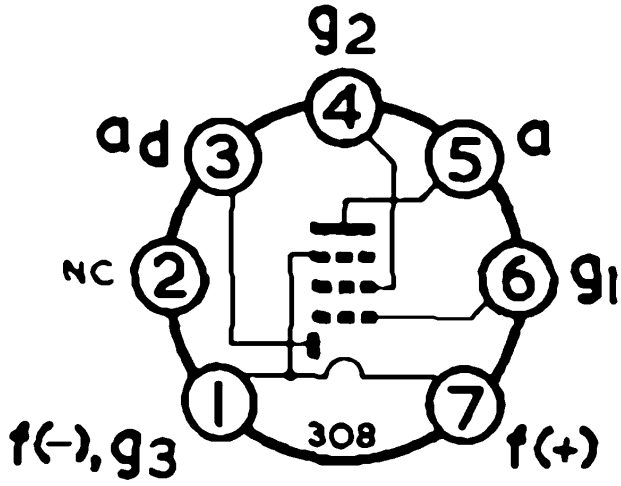
Rating (Pentode)

$P_{a(max)}$	250	mW

Characteristics (Pentode)

V_a	90	V
V_{g3}	90	V
V_{g1}	0	V
I_a	2·7	mA
I_{g3}	630	μA
g_m	720	μA/V
r_a	500	k Ω

B7G



DAF96

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

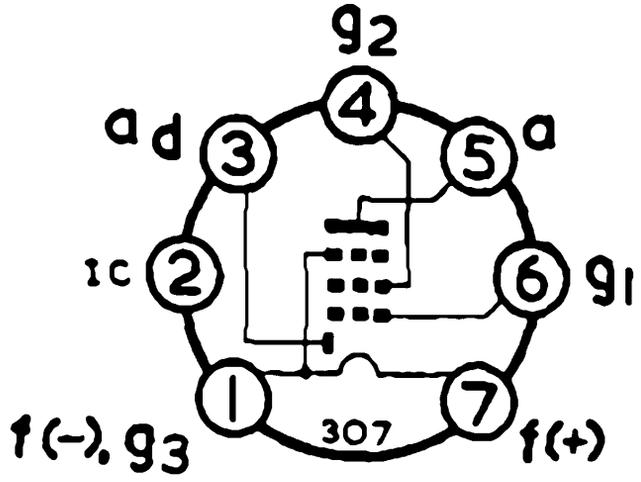
Rating (Pentode)

$p_{a(max)}$	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	μA/V
μ_{g1-g2}	16	

B7G



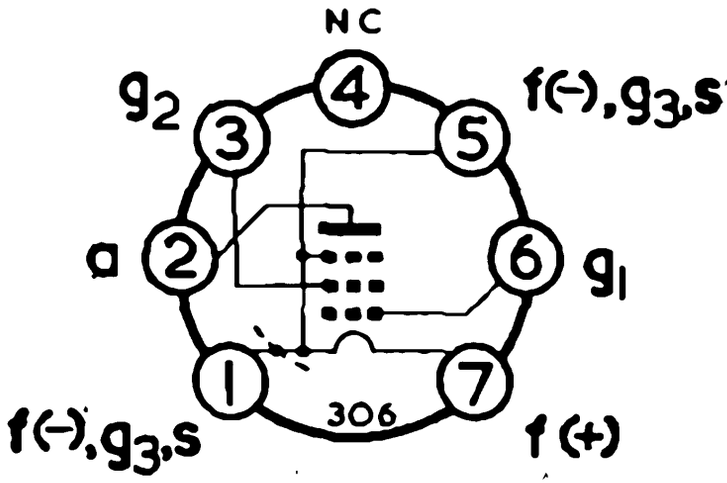
DF91

HF Pentode
Variable-mu IF 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	kΩ

B7G



DF96

HF Pentode
Variable-mu IF Amplifier
1·4V, 25mA Filament

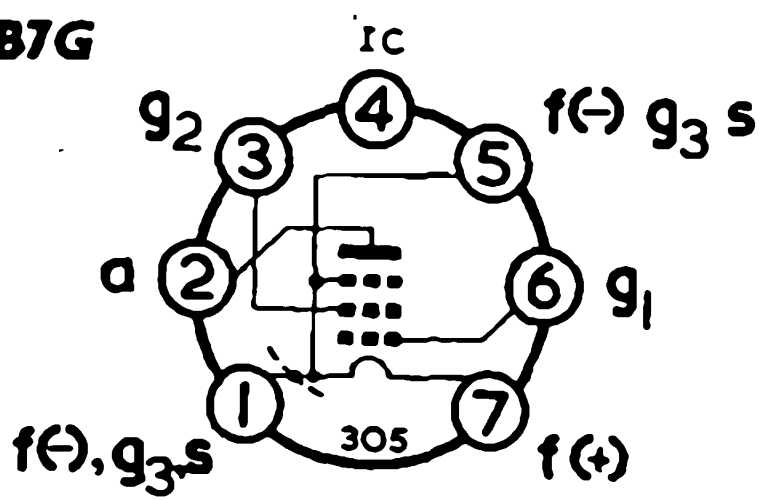
Rating

$P_{a(max)}$	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



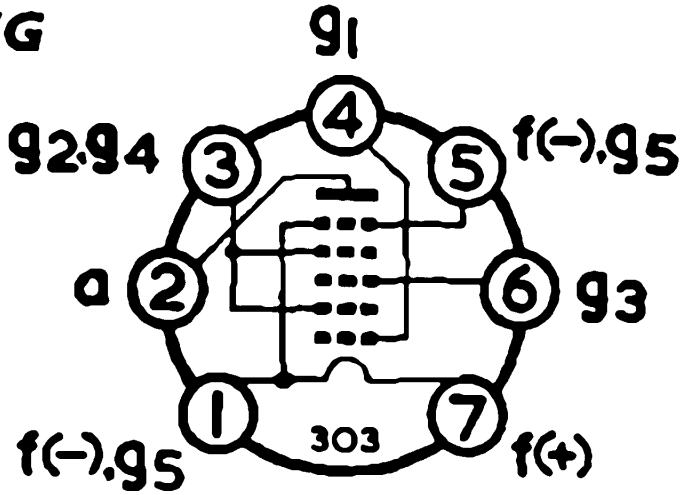
DK91

HF 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	μA/V
r_a	600	k Ω

B7G



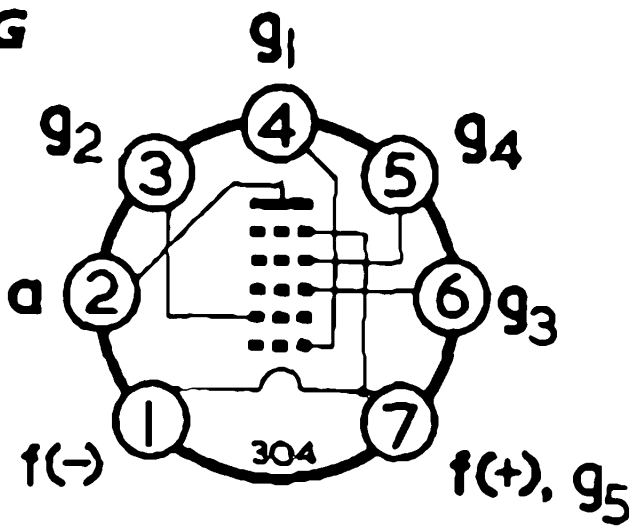
DK96

HF 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 Ω
$R_{g2(osc)}$	33	k Ω
$R_{g1(osc)}$	27	k Ω
g_c	300	μA/V
r_a	800	k Ω

B7G



DL92

Audio Output Pentode
1·4V, 100mA, or
2·8V, 50mA Filament

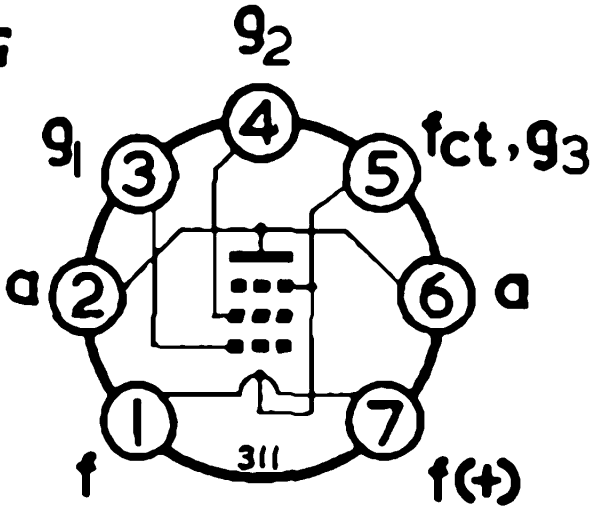
Rating

$P_{a(max)}$	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 Ω
R_a	8	k Ω
P_{out}	270	mW

B7G



DL94

Audio Output Pentode
1·4V, 100mA, or
2·8V, 50mA Filament

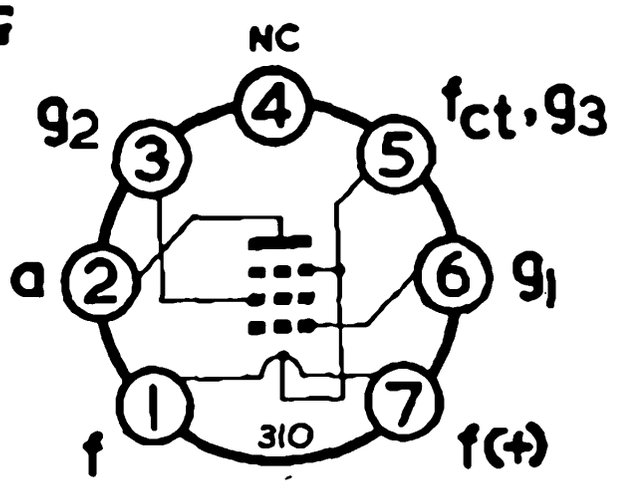
Rating

$P_{a(max)}$	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 Ω
R_a	10	k Ω
P_{out}	270	mW

B7G



DL96

Audio Output Pentode
1·4V, 50mA, or
2·8V, 25mA Filament

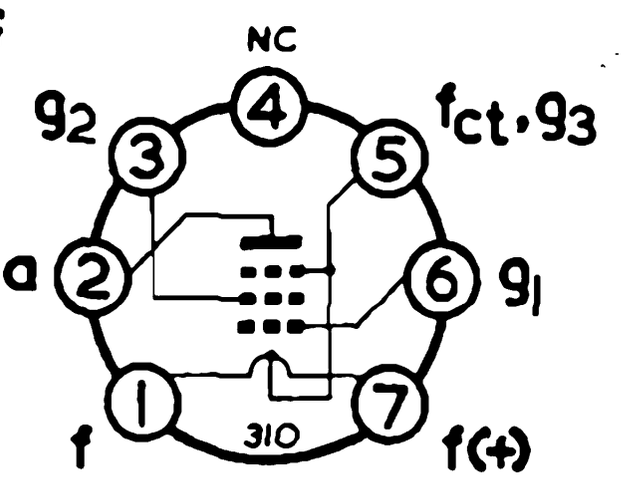
Rating

$P_{a(max)}$	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 Ω
R_a	13	k Ω
P_{out}	200	mW

B7G



DY86/87

EHT Rectifier
1·4V, 0·55A Heater

Ratings (pulse operation)

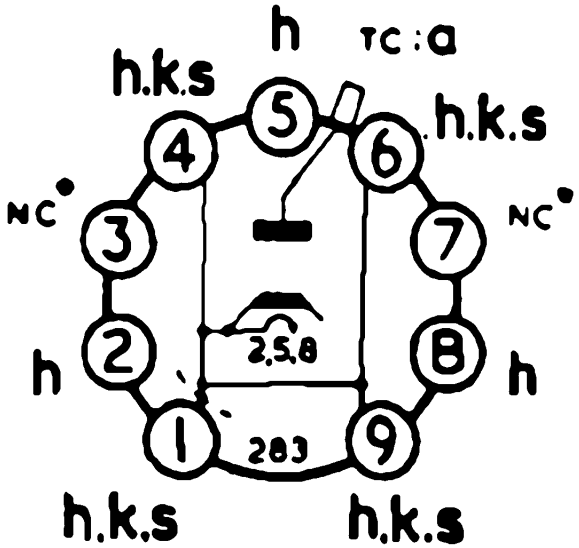
$P.I.V._{max}$	22	kV
$I_{out(max)}$	800	μA
$i_{out(pk)max}$	40	mA
$C_{(max)}$	2,000	pF

Note

The DY87 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. Valves sold as DY86/87 are all siliconised.

B9A

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



DY802

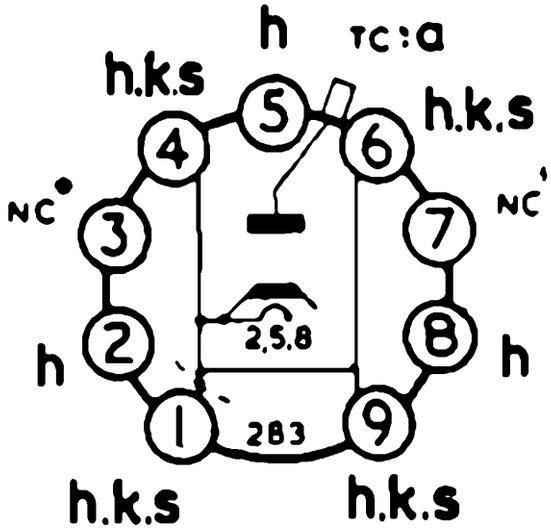
EHT Rectifier
1·4V, 0·55A Heater

Ratings (pulse operation)

$P.I.V._{max}$	25	kV
$i_{a(pk)max}$	50	mA
$I_{out(max)}$	0·5	mA
$C_{(max)}$	2,000	pF

B9A

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



EABC80

Triple Diode Triode
Audio Amplifier
6·3V, 0·45A Heater

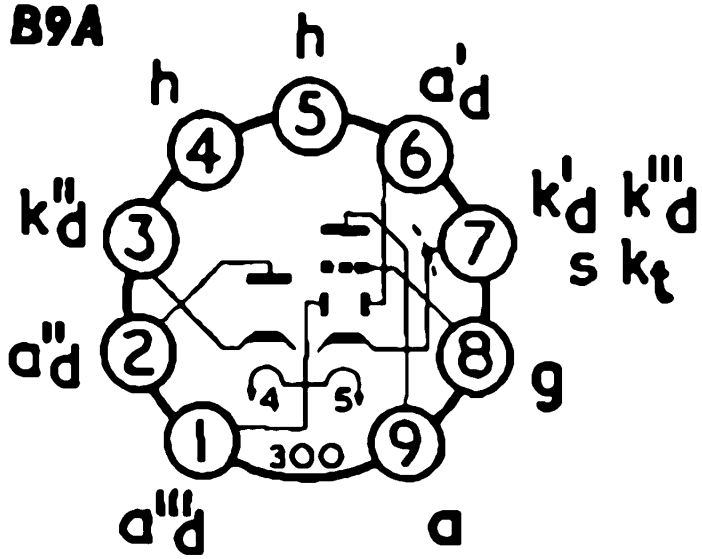
Rating (Triode)

$P_{a(max)}$	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



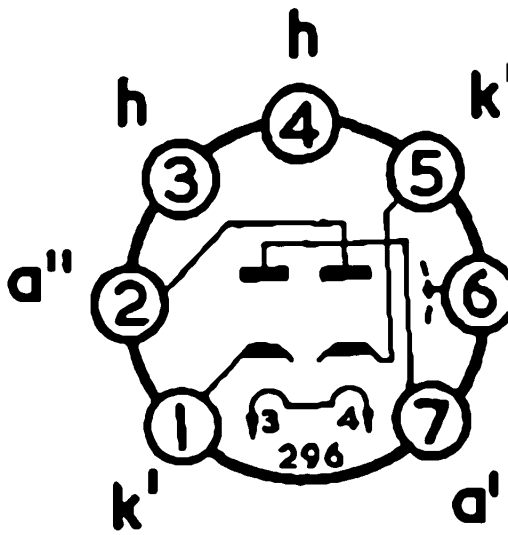
EB91

Double Diode
6·3V, 0·3A Heater

Ratings (each)

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

B7G



EBC81

Double Diode Triode
Audio Amplifier
6·3V, 0·3A Heater

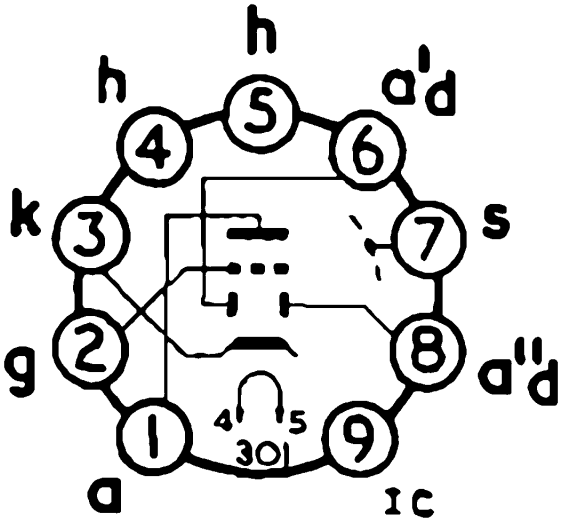
Rating (Triode)

$P_{a(max)}$	1	W

Characteristics (Triode)

V_a	100	V
V_g	−0·7	V
I_a	0·8	mA
g_m	1·4	mA/V
μ	75	
r_a	54	kΩ

B9A



EBC90

Double Diode Triode
Audio Amplifier
6·3V, 0·3A Heater

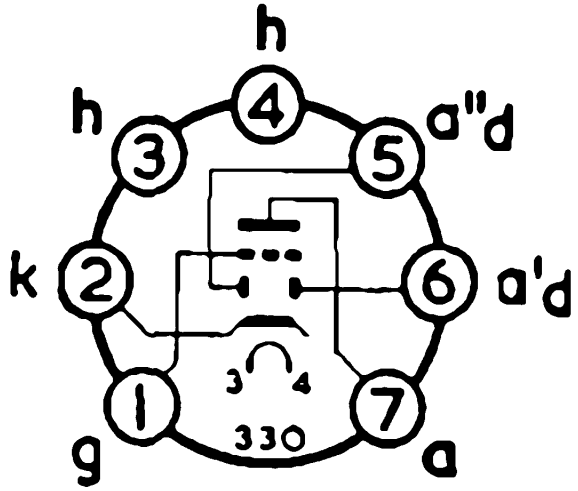
Rating (Triode)

$P_{a(max)}$	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 IF Amplifier
6·3V, 0·3A Heater

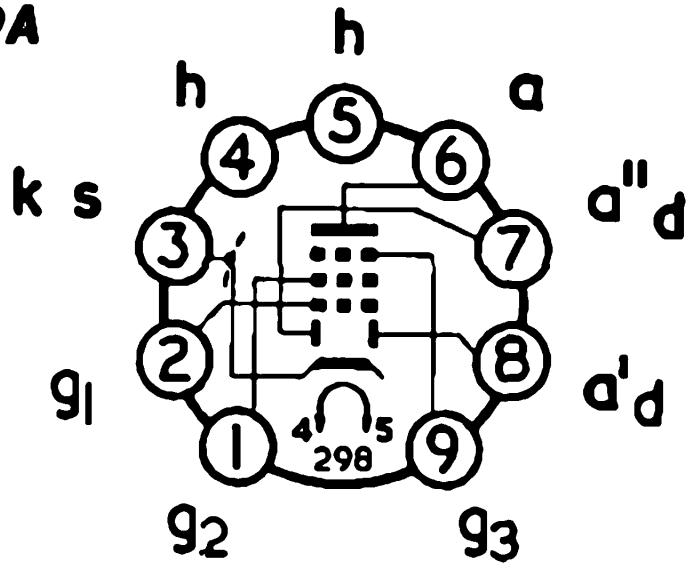
Rating (Pentode)

$P_{a(max)}$	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 IF Amplifier 6·3V, 0·3A Heater

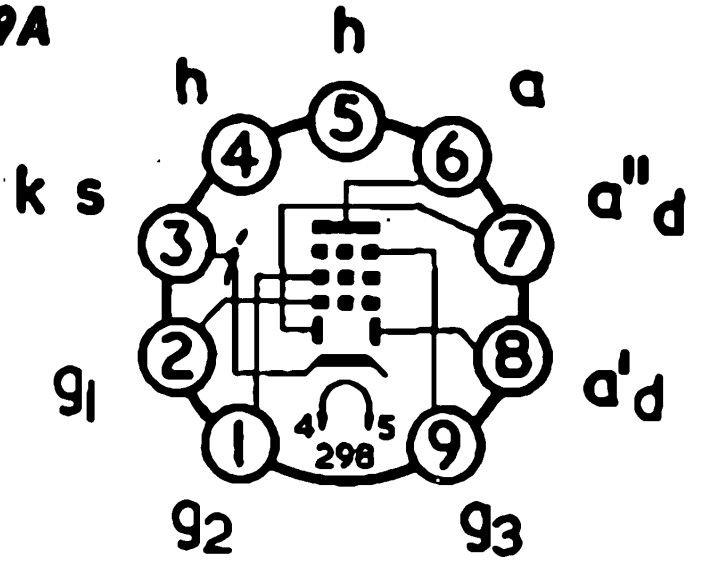
Rating (Pentode)

$P_{a(max)}$	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

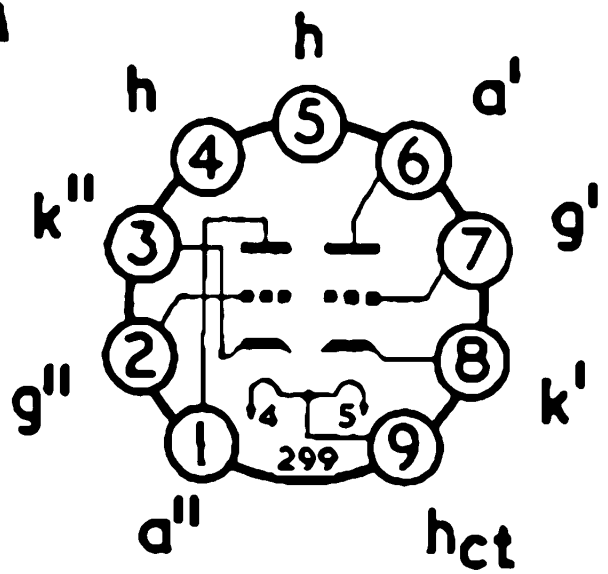
Rating (each section)

$P_{a(max)}$	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

AF Double Triode
Audio Amplifier
6·3V, 0·3A or
12·6V, 0·15A Heater

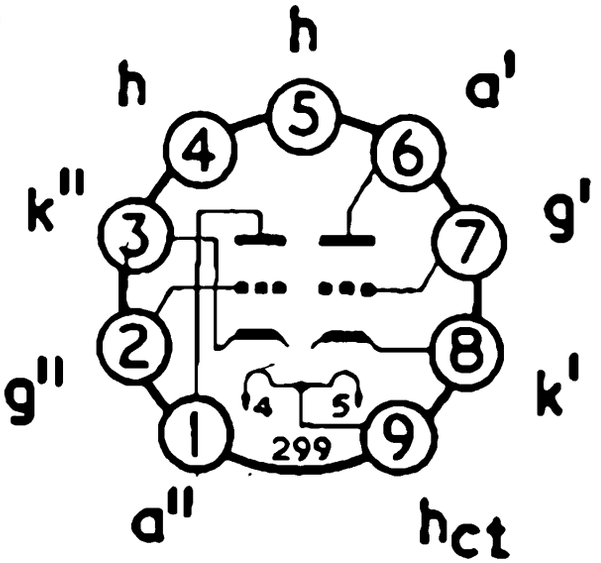
Rating (each section)

$P_{a(max)}$	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

AF Double Triode
High–μ Audio Amplifier
6·3V, 0·3A or
12·6V, 0·15A Heater

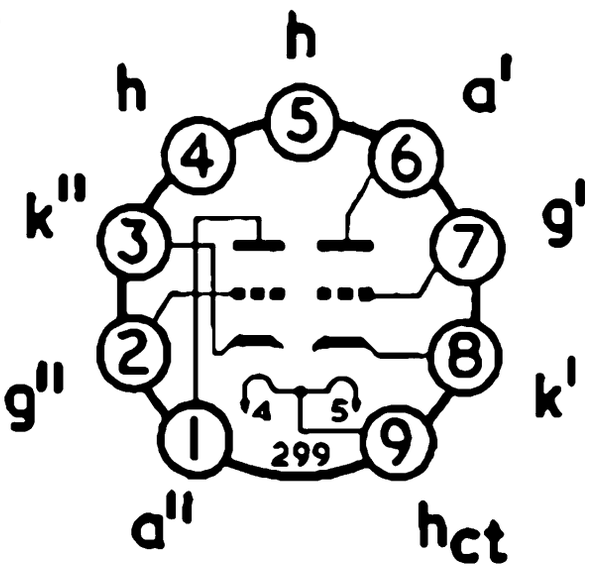
Rating (each section)

$P_{a(max)}$	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



ECC84

VHF Double Triode Cascode Amplifier 6·3V, 0·33A Heater

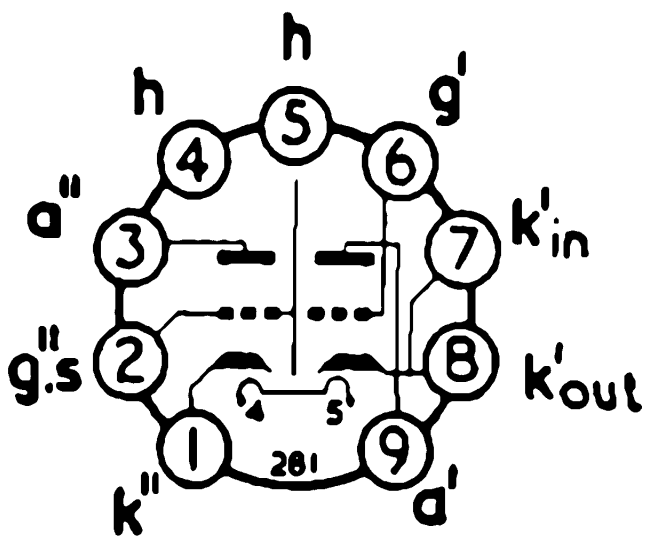
Rating (each section)

$P_{a(max)}$	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	

B9A



ECC85

VHF Double Triode 6·3V, 0·435A Heater

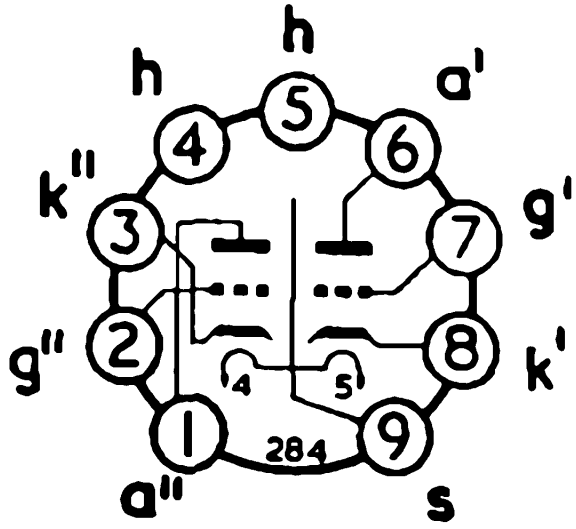
Rating

$P_{a(max)}$		
(*Either Anode*)	2·5	W
(*Both Anodes*)	4·5	W

Typical Operation (each)

	Amplifier	Mixer/Osc.	
$V_{a(b)}$	250	250	V
V_g	−2	...	V
I_a	10	5·2	mA
R_a	1·8	12	k Ω
R_g	...	1	M Ω
g_m	6	...	mA/V
g_c	...	2·3	mA/V
r_a	9·7	22	k Ω

B9A



ECC804

Double Triode
General Purpose
6·3V, 0·3A Heater

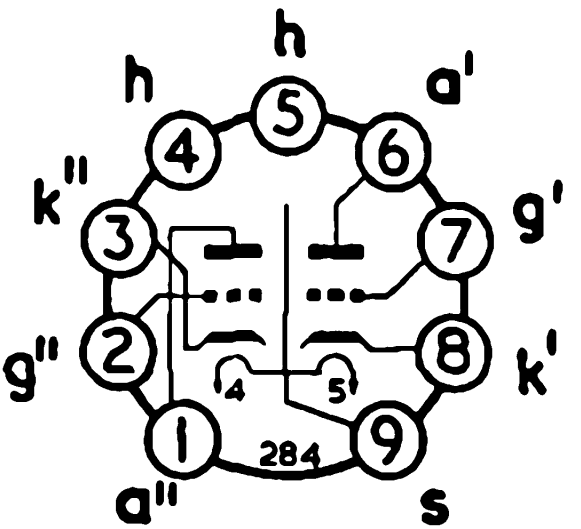
Ratings

$V_{a(max)}$	250	V
$P_{a(max)}$		
(*Either Anode*)	2·0	W
(*Both Anodes*)	2·5	W

Characteristics (each section)

V_a	200	V
V_g	−7·7	V
I_a	10	mA
g_m	3·4	mA/V
μ	18	

B9A



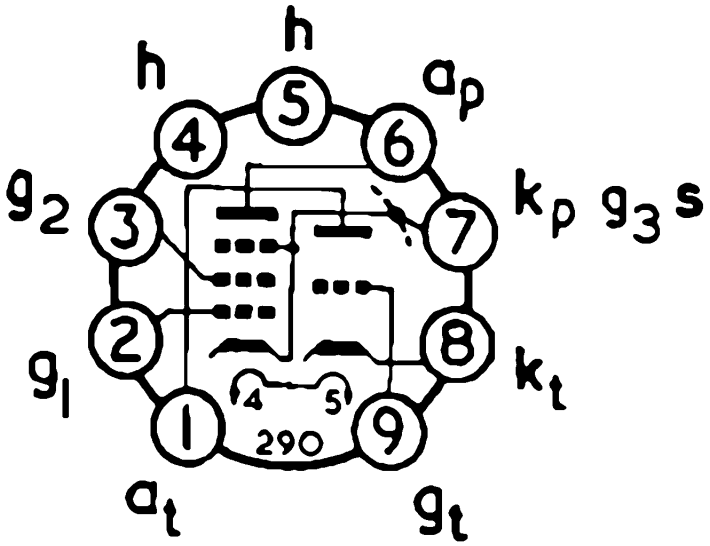
ECF80

Triode Pentode
VHF Frequency Changer
6·3V, 0·43A 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_{g1}	...	33	k Ω
g_c	...	2·0	mA/V
μ	20	...	

B9A



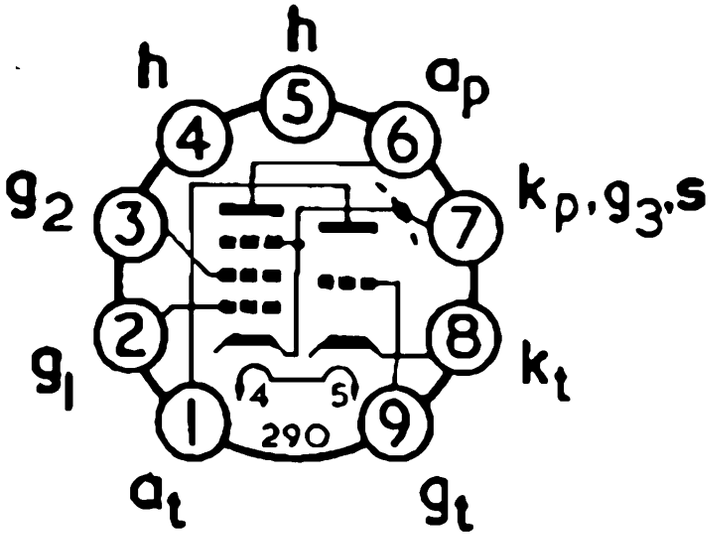
ECF82

Triode Pentode
VHF Frequency Changer
6·3V, 0·45A Heater

Typical Operation

	Triode	Pentode	
V_a	100	170	V
V_{g2}	...	110	V
$V_{het(pk)}$	...	3	V
I_a	7	...	mA
I_{g2}	...	2	mA
R_g	27	270	k Ω
g_c	...	1·6	mA/V
μ	40	...	

B9A



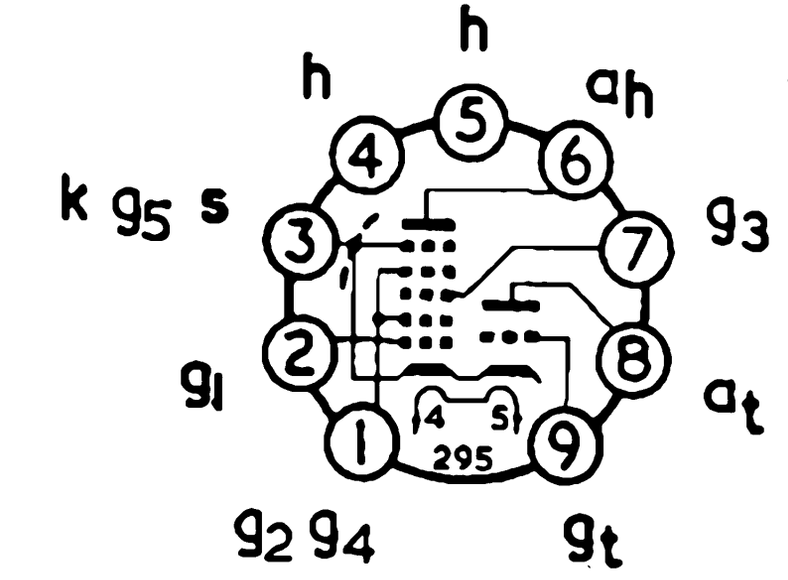
ECH81

Triode Heptode
HF 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_o	...	0·775	mA/V

B9A

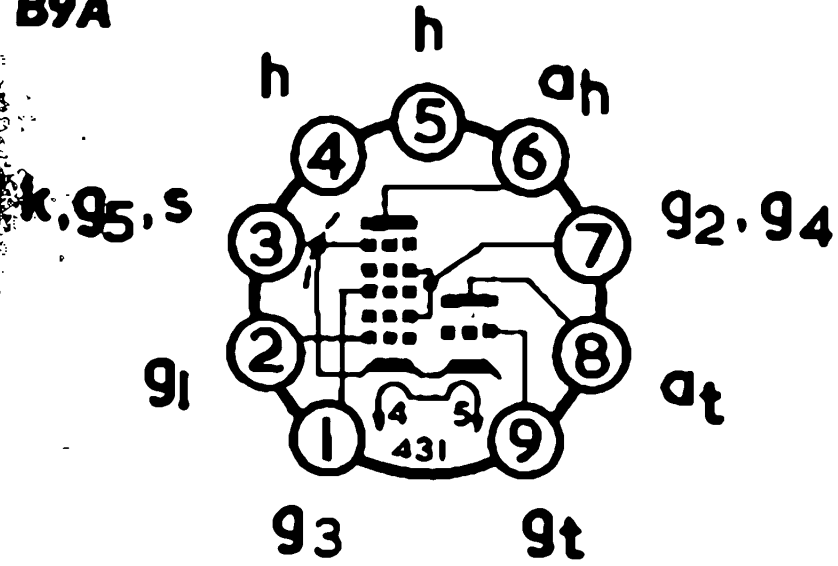


ECH84

Triode Heptode
Synch Separator
6·3V, 0·3A Heater

	Triode	Heptode	
Rating			
$P_{a(max)}$	1·3	1·7	W
Characteristics			
V_a	50	135	V
V_{g2}	...	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	...	

B9A

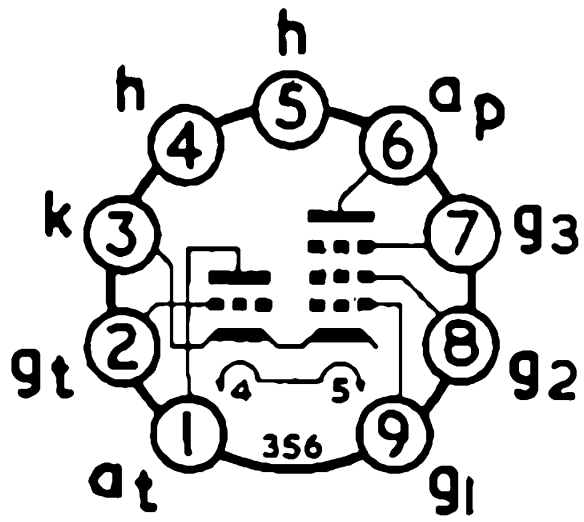


ECL80

Triode Pentode
Audio or Field Output
6·3V, 0·3A Heater

	Triode	Pentode	
Rating			
$P_{a(max)}$	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	kΩ
r_a	12·5	150	kΩ
g_m	1·4	3·3	mA/V
P_{out}	...	1·4	W

B9A

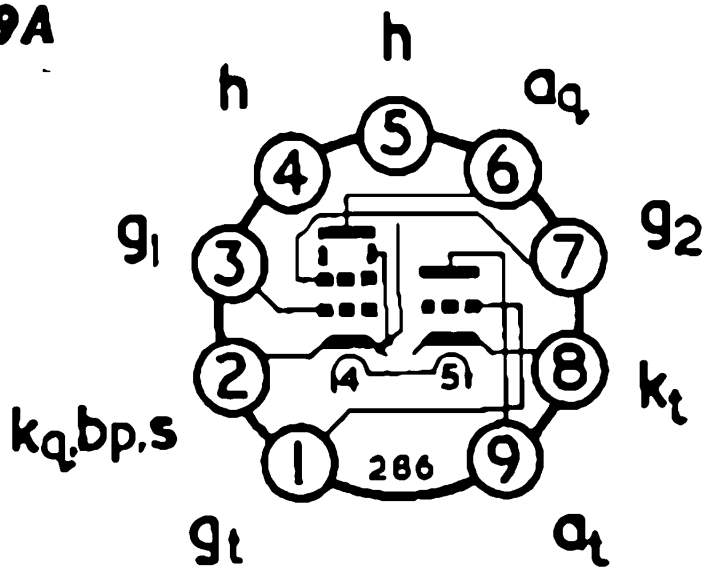


ECL82

Triode Pentode
Audio or Field Output
6·3V, 0·78A Heater

Rating	Triode	Pentode	
$P_{a(max)}$	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

B9A

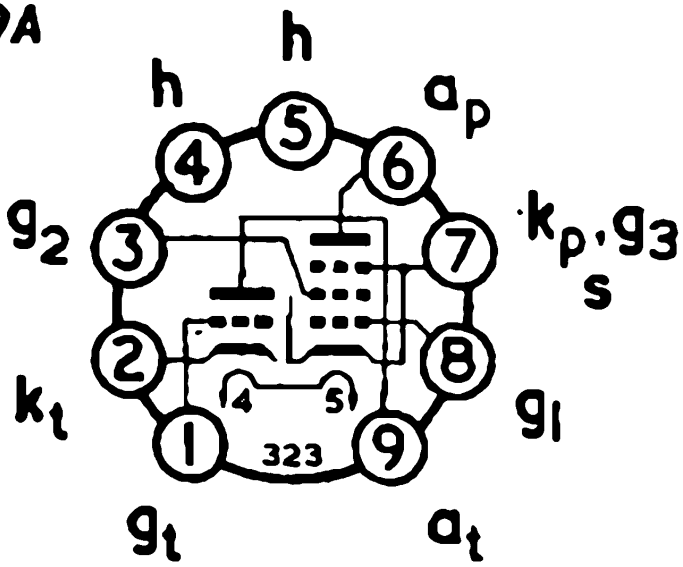


ECL86

Triode Pentode
Audio Amp and Output
6·3V, 0·66A Heater

	Triode	Pentode	
Rating			
$P_{a(max)}$	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

B9A



EF80

HF Pentode
IF Amplifier
6·3V, 0·3A Heater

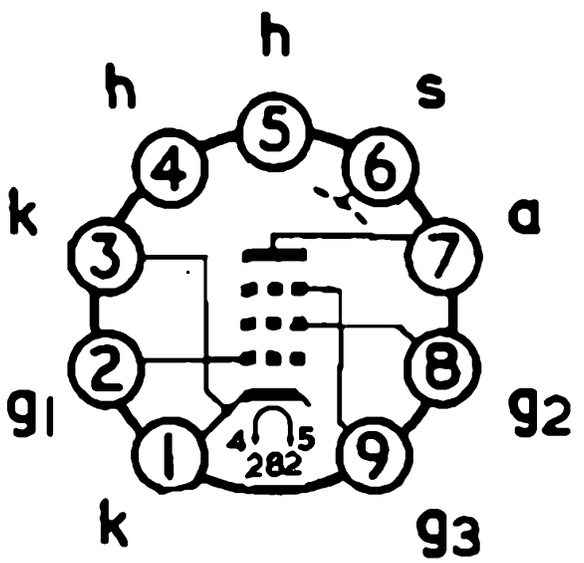
Rating

$P_{a(max)}$	2·5	W

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

B9A



EF85

HF Pentode
Variable-mu IF Amplifier
6·3V, 0·3A Heater

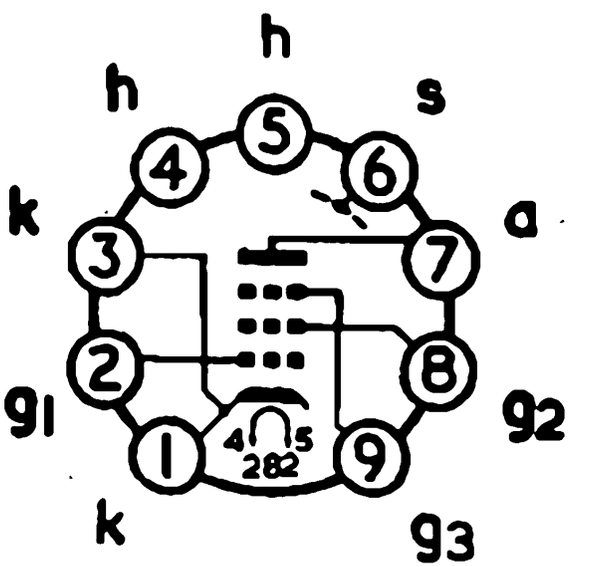
Rating

$P_{a(max)}$	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

B9A



EF86

Audio Pentode
Low Noise Pre-amplifier
6·3V, 0·2A Heater

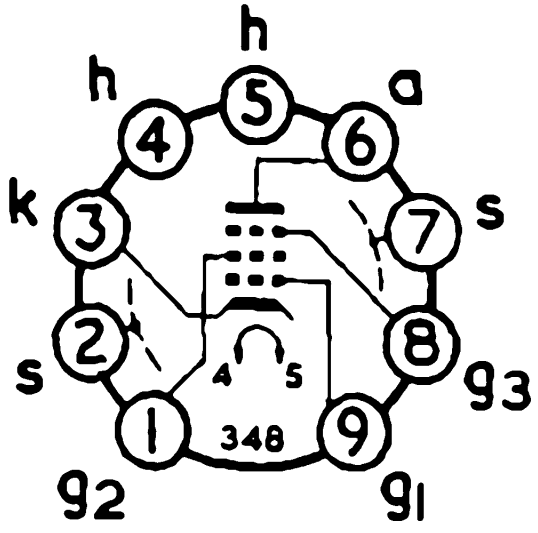
Rating

$P_{a(max)}$	1	W

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	MΩ

B9A



EF89

VHF Pentode
Variable–mu IF Amplifier
6·3V, 0·2A Heater

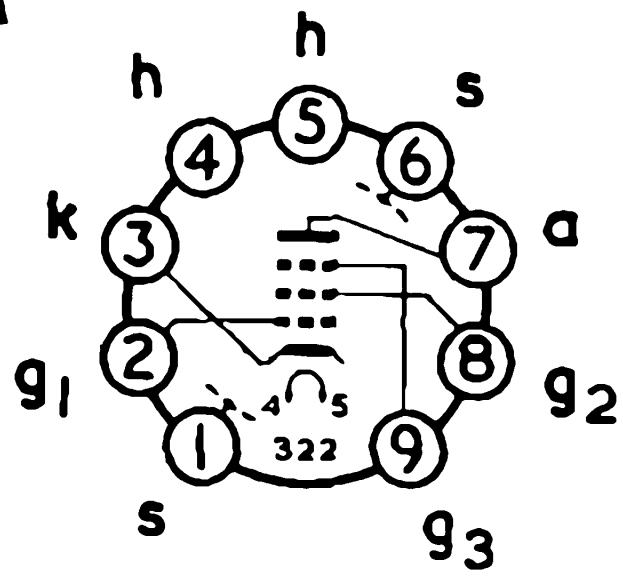
Rating

$P_{a(max)}$	2·25	W

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	MΩ
R_k	160	Ω

B9A



EF91

HF IF Amplifier Pentode
6·3V, 0·3A Heater

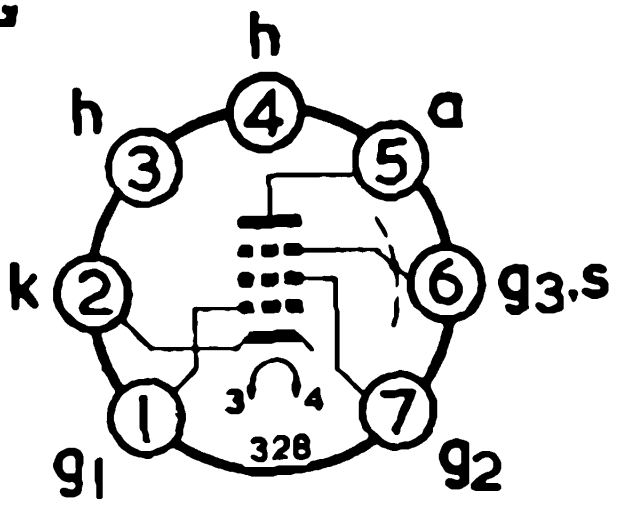
Rating

$P_{a(max)}$	2·5	W

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

B7G



EF183

HF Frame Grid Pentode
Variable-mu IF Amplifier
6·3V, 0·3A Heater

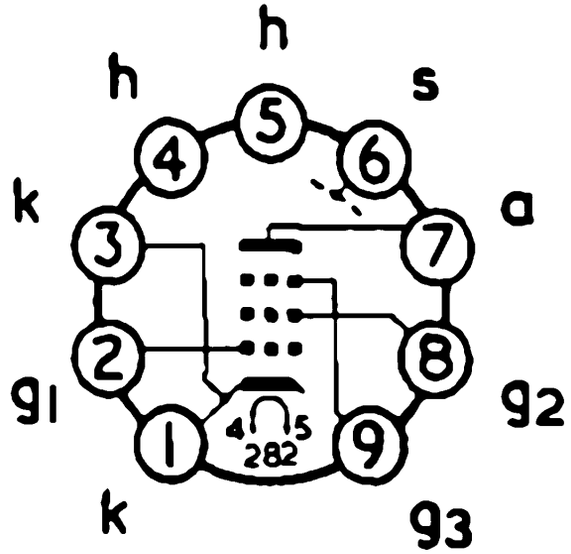
Rating

$P_{a(max)}$	2·5	W

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_{g1}	24	k Ω
R_k	120	Ω
g_m	12·5	mA/V

B9A



EF184

HF Frame Grid Pentode
IF Amplifier
6·3V, 0·3A Heater

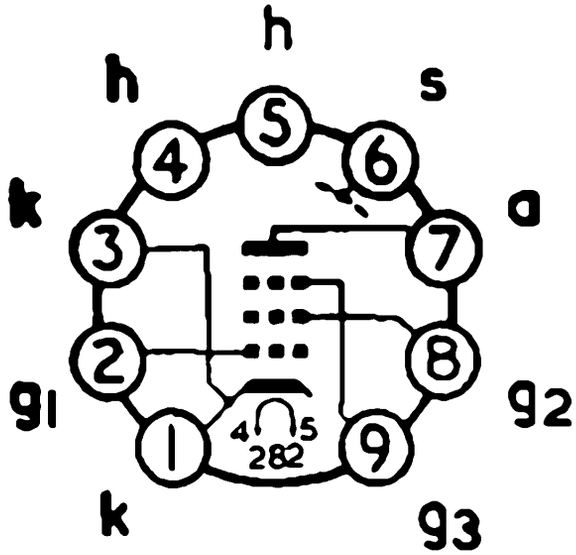
Rating

$P_{a(max)}$	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



EH90

HF Dual Control Heptode
6·3V, 0·3A Heater

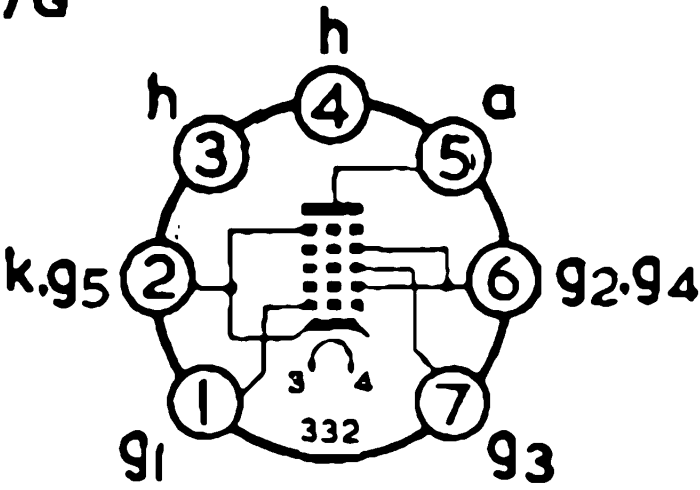
Rating

$P_{a(max)}$		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

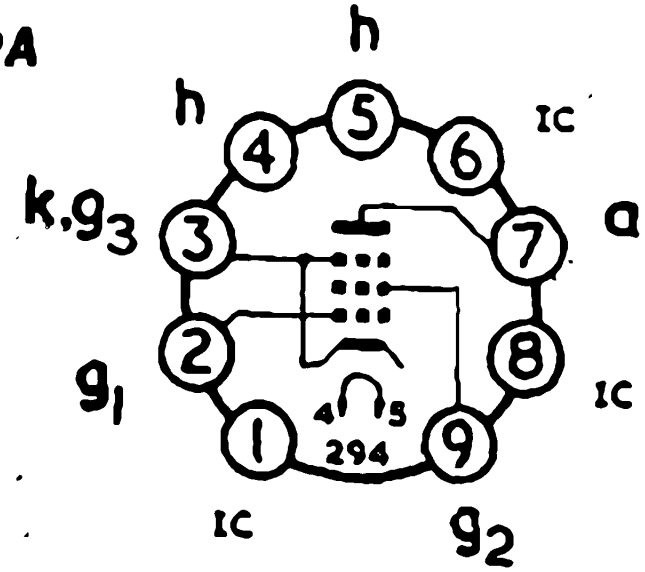
Rating

$P_{a(max)}$	12	W

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



EM87

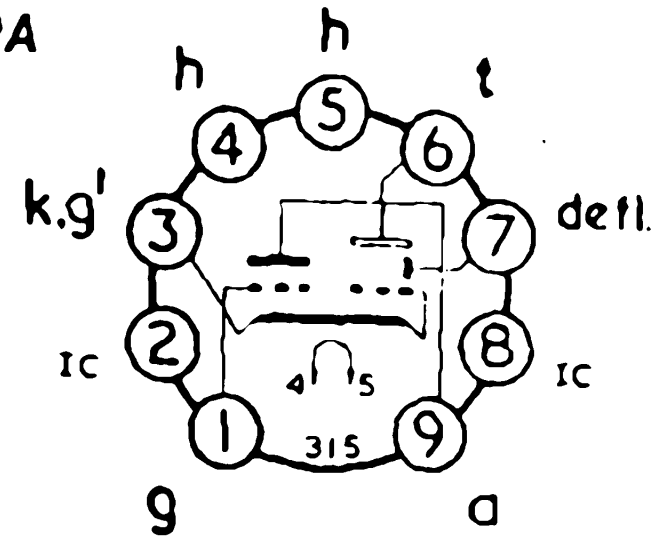
Tuning Indicator
Side Viewed Column Display
6·3V, 0·3A Heater

Typical Operation

V_b	250		V
V_t	250		V
R_a	100		k Ω
$V_{g(b)}$	0	−10	V
I_a	2	0·5	mA
I_t	1·0	1·8	mA
L*	21	0	mm

* *Length of column.*

B9A



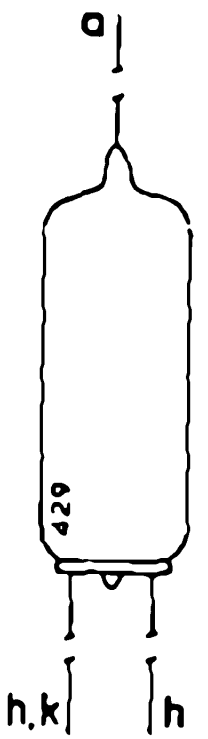
EY51

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



EY86/87

EHT Rectifier

6·3V, 0·09A Heater

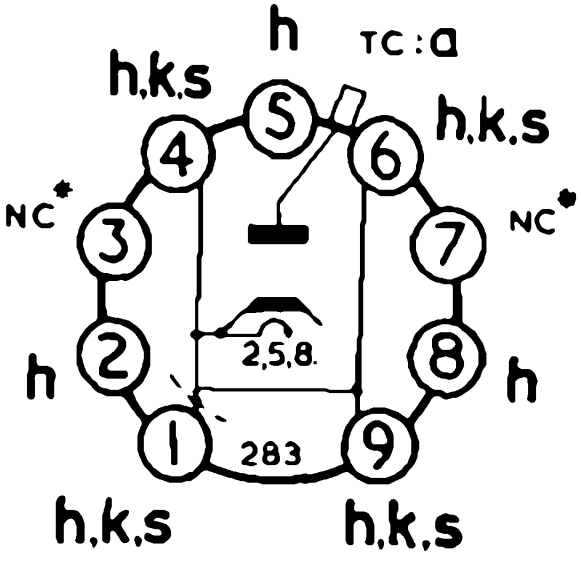
Ratings (pulse operation)

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

Note

The EY87 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. Valves sold as EY86/87 are all siliconised.

B9A * *Should not be earthed. May be connected to adjacent heater pins.*



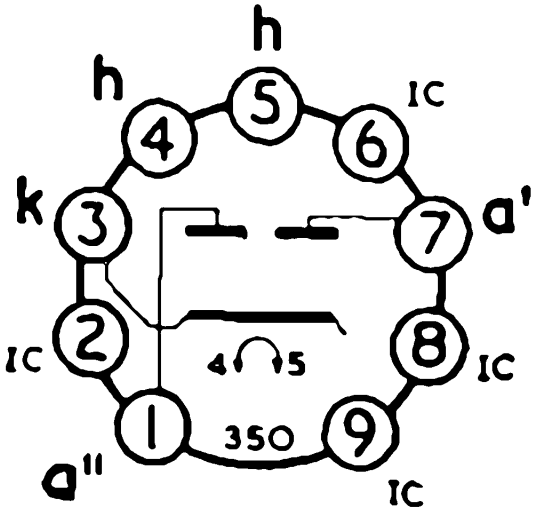
EZ80

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



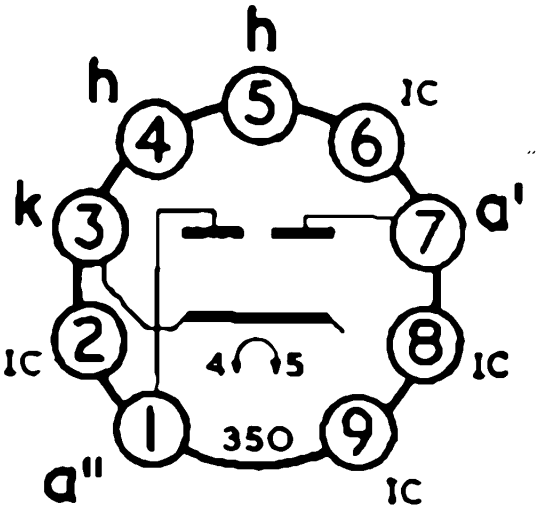
EZ81

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



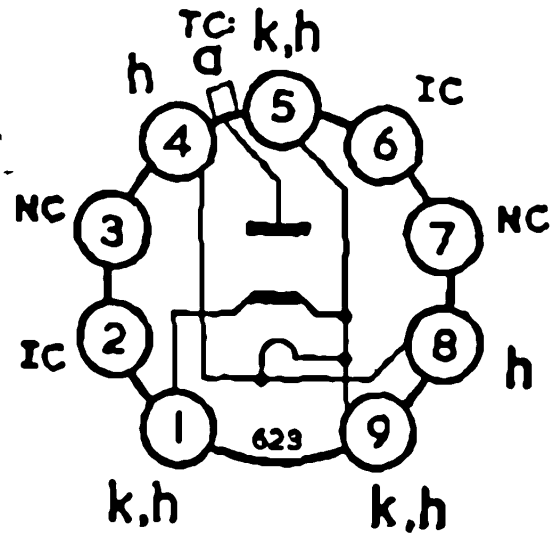
GY501

EHT Rectifier
Colour TV
0·4A, 3·15V Heater

Ratings

$P.I.V._{max}$	31	kV
$V_{out(max)}$	25	kV
$I_{a(out)max}$	1·7	mA

B9D



PC86

Frame Grid Triode
UHF Self-Oscillating Mixer
0·3A, 3·8V Heater

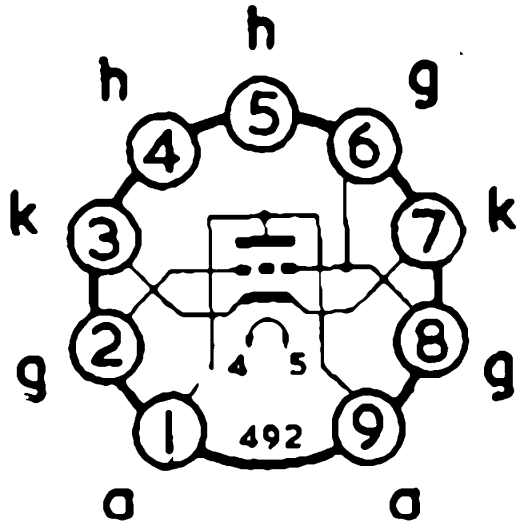
Rating

$P_{a(max)}$	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
g_c	5·5	mA/V

B9A



PC88

Frame Grid Triode
UHF Grounded Grid Amplifier
0·3A, 3·8V Heater

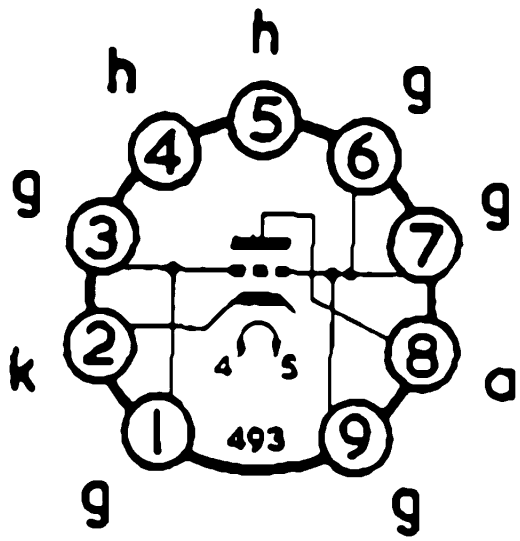
Rating

$P_{a(max)}$	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	k Ω
μ	65	

B9A



PC97

Frame Grid Triode
VHF Variable-mu Amplifier
0·3A, 4·5V Heater

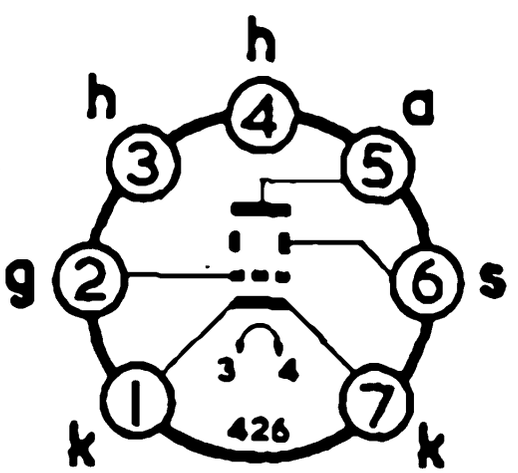
Rating

$P_{a(max)}$	2·2	W

Typical Operation

$V_{a(b)}$	135	V
I_a	11	mA
R_a	1	k Ω
R_k	82	Ω
g_m	13	mA/V
μ	65	
r_a	5	k Ω

B7G



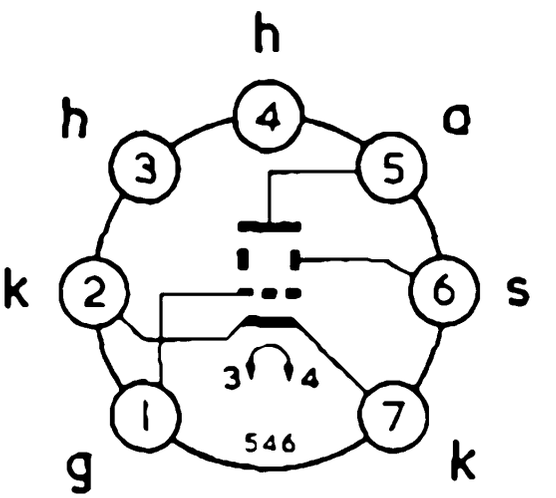
PC900

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	μA
V_g	−1	V
g_m	14·5	mA/V
μ	72	

B7G



PCC84

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

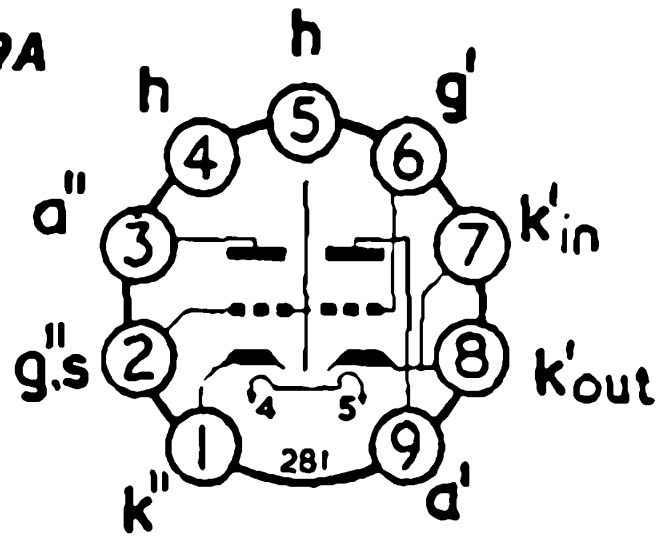
Rating (each section)

$P_{a(max)}$	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	

B9A



PCC85

VHF Double Triode
Colour TV Multi-Purpose
0·3A, 9·0V Heater

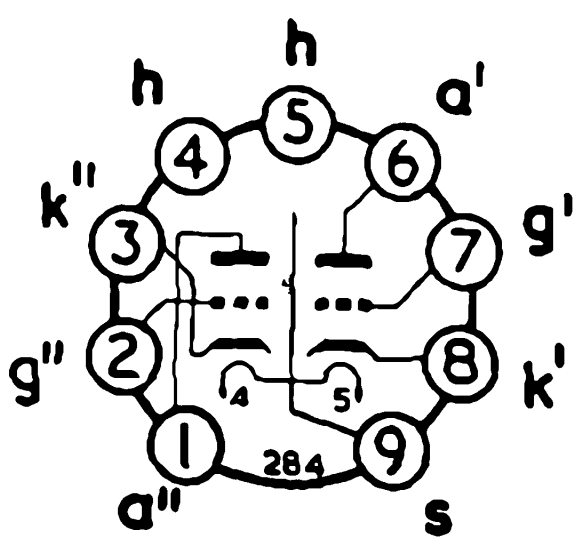
Rating

$P_{a(max)}$	(Either)	2·5	W
	(Both)	4·5	W

Typical Operation

	Amp.	Osc/mix	
$V_{a(b)}$	170	170	V
V_g	−1·4	...	V
I_a	8·7	4·8	mA
R_a	1·5	4·7	kΩ
R_g	...	1	MΩ
g_m	6	...	mA/V
g_c	...	2·2	mA/V
μ	50	...	

B9A



PCC88

Frame Grid Double Triode
VHF Cascode Amplifier
Colour TV Difference Amps
0·3A, 7·0V Heater

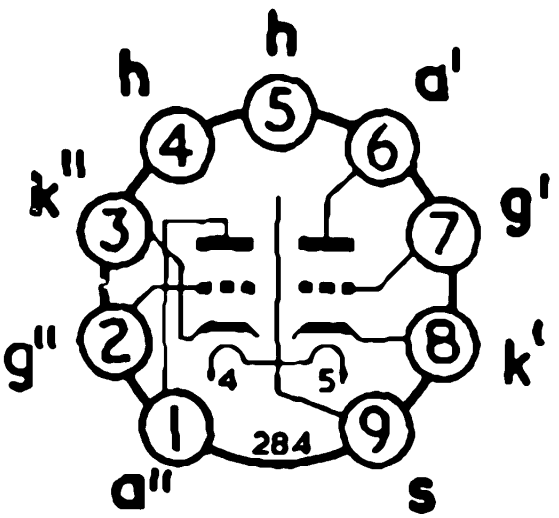
Rating (each section)

$P_{a(max)}$	1·8	W

Characteristics (each section)

V_a	90	V
V_g	−1·3	V
I_a	15	mA
g_m	12·5	mA/V
μ	33	

B9A



PCC89

Frame Grid Double Triode
VHF Cascode
Variable-mu Amplifier
0·3A, 7·5V Heater

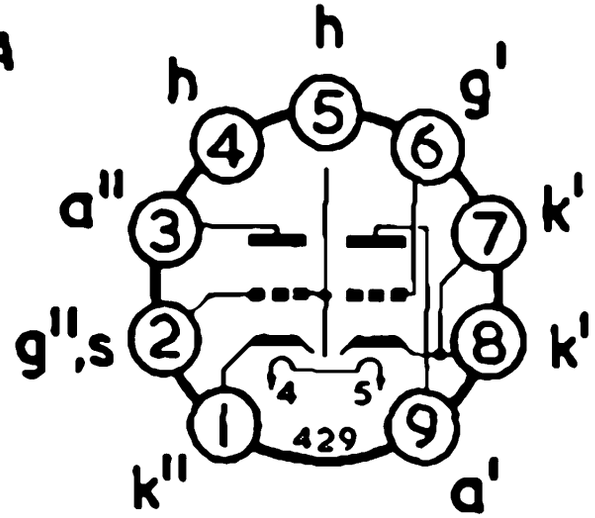
Rating (each section)

$P_{a(max)}$	1·8	W

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

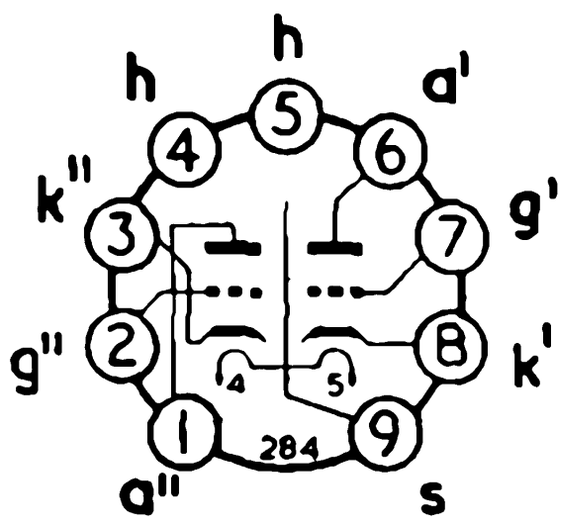
Ratings (each section)

$P_{a(max)}$	1·8	W

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

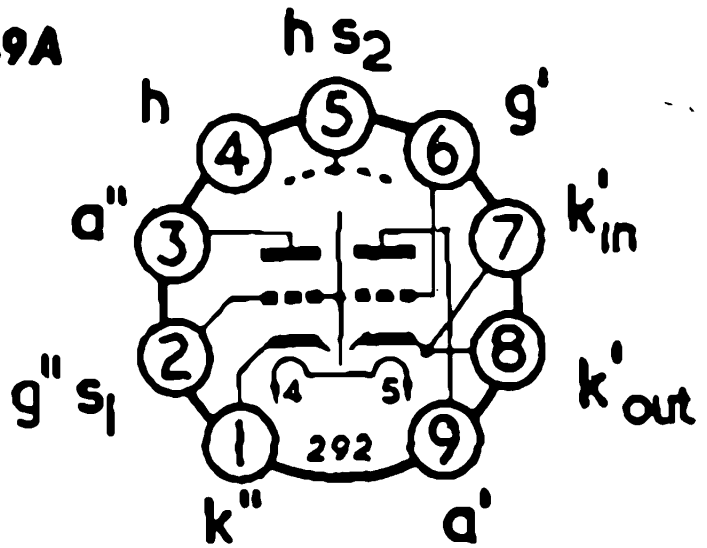
Ratings (each section)

$P_{a(max)}$	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	

B9A



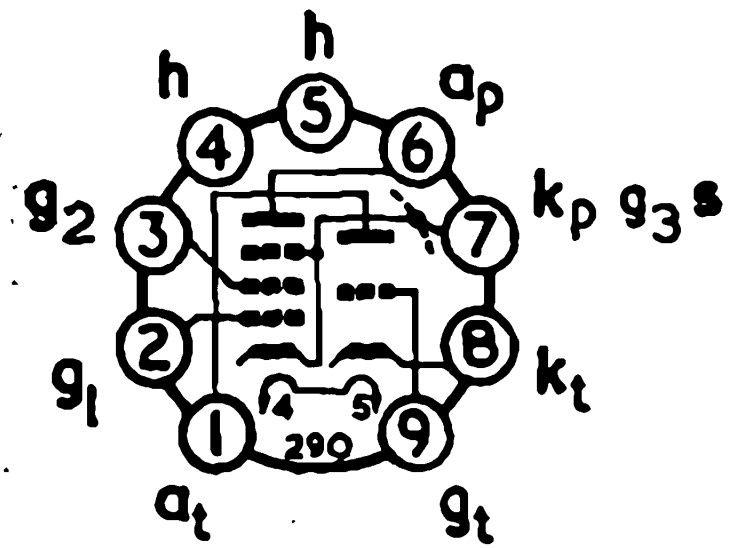
PCF80

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



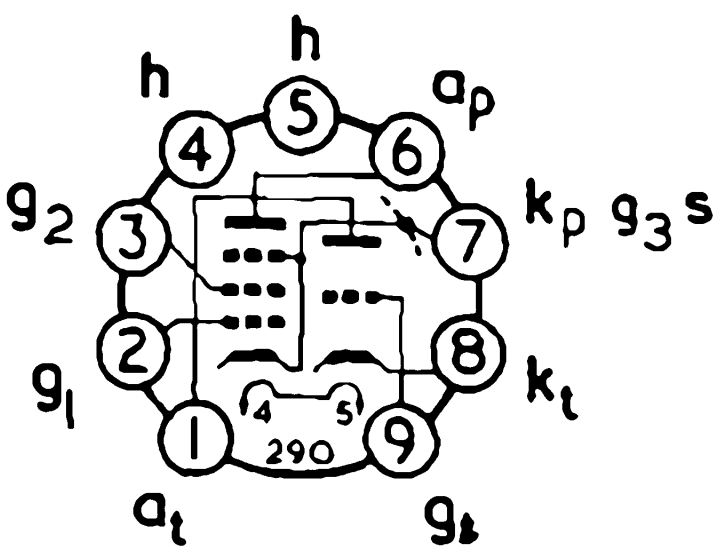
PCF82

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

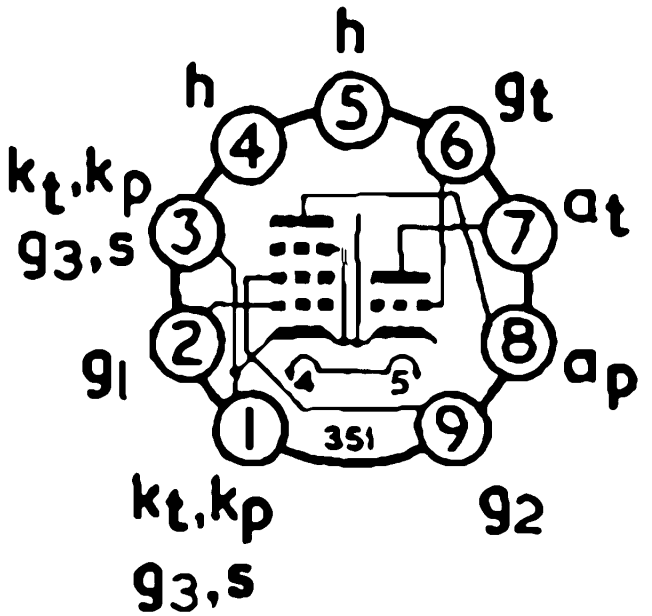


PCF86

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

	Triode	Pentode	
Rating			
$P_{a(max)}$	1·5	2	W
Typical Operation			
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



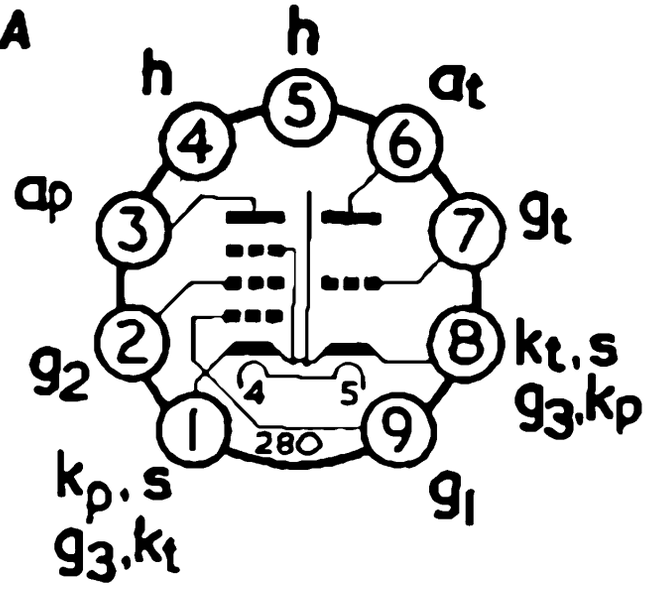
PCF87

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	2,200	k Ω
R_{g2}	...	27	k Ω
R_a	...	5·6	k Ω
g_e	...	4·8	mA/V
g_m	5·5	...	mA/V
μ	20	...	

B9A



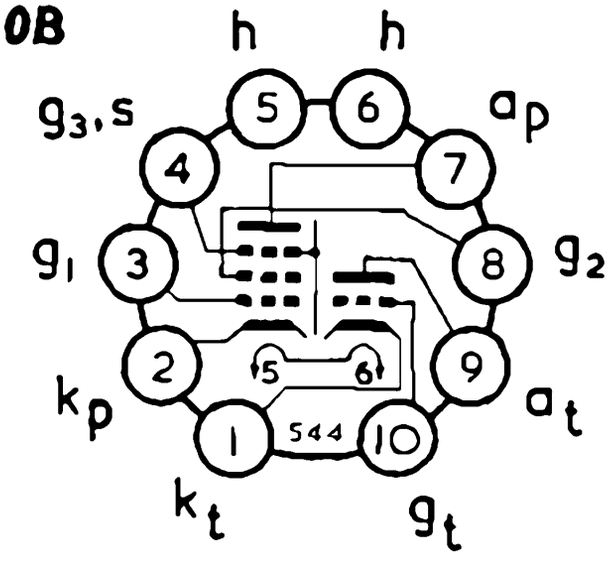
PCF200

Triode Pentode
HF Amp and GP Triode
Colour TV Chrominance Amp
0·3A, 8·0V Heater

Typical Operation

	Triode	Pentode	
V_a	170	160	V
V_{g2}	...	135	V
V_{g1}	−1·0	−1·7	V
I_a	8·5	13	mA
g_m	5·0	14	mA/V
μ	60		

B10B



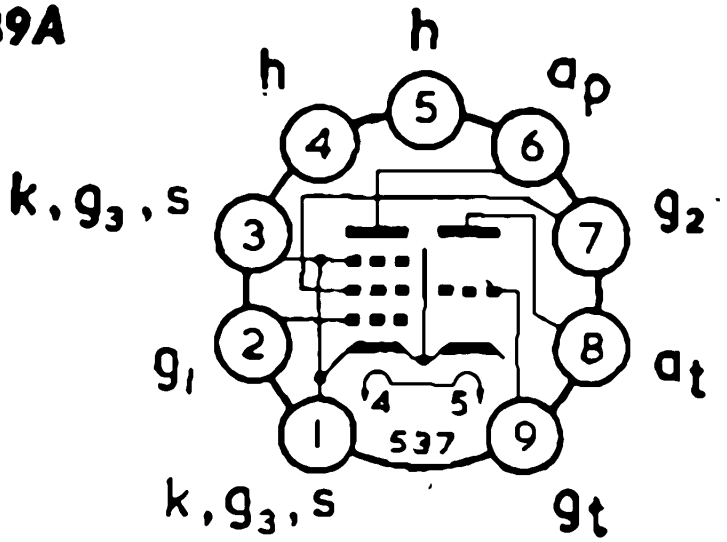
PCF801

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	MΩ
g_c	...	5	mA/V
g_m	3·7	...	mA/V
μ	20	...	

B9A

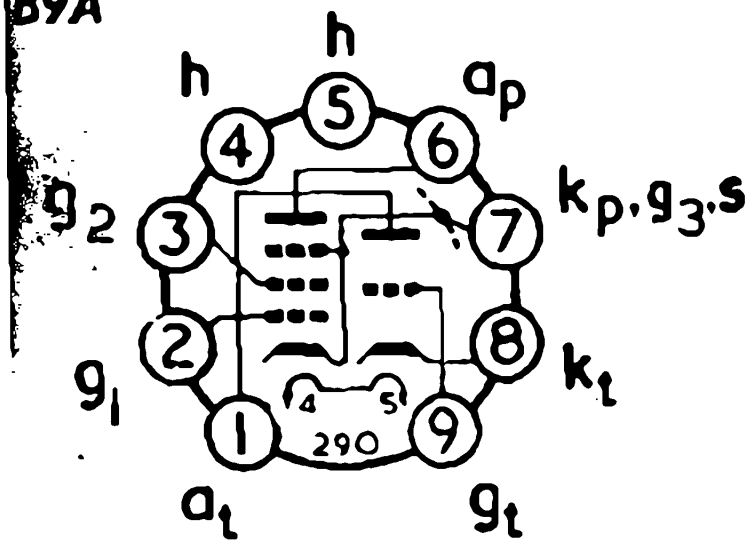


PCF802

Pentode Line Oscillator Triode Reactance Valve Colour TV 0·3A, 9V Heater

	Triode	Pentode	
Rating			
$P_{a(max)}$	1·5	1·2	W
Characteristics			
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



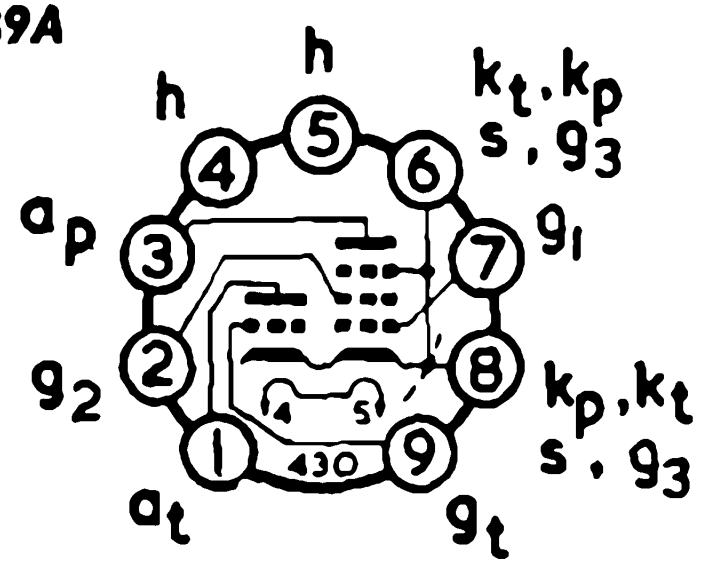
PCF805

Triode Frame Grid Pentode VHF Variable-mu 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	...	

B9A

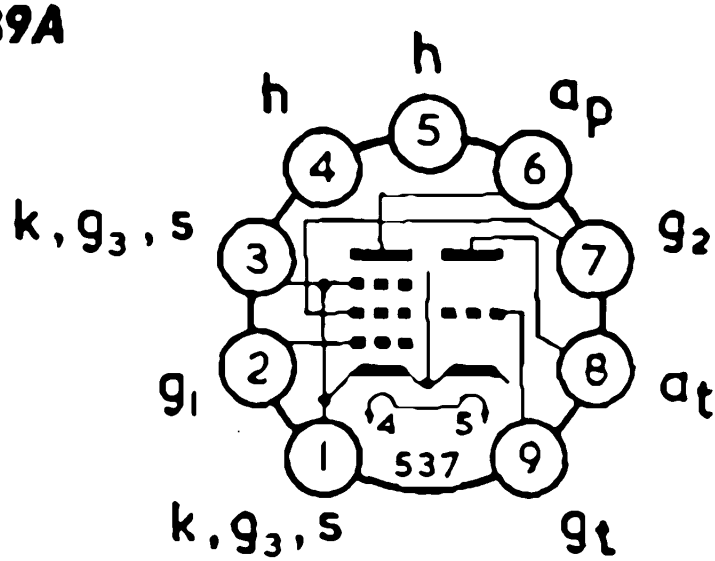


PCF806

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	...	

B9A

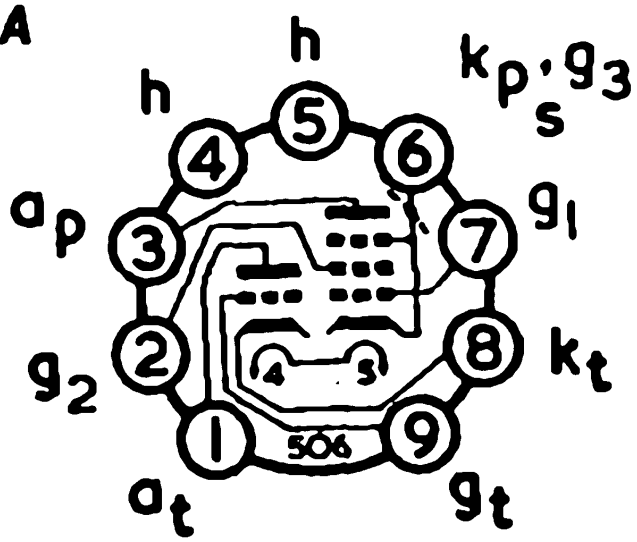


PCF808

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	...	

B9A



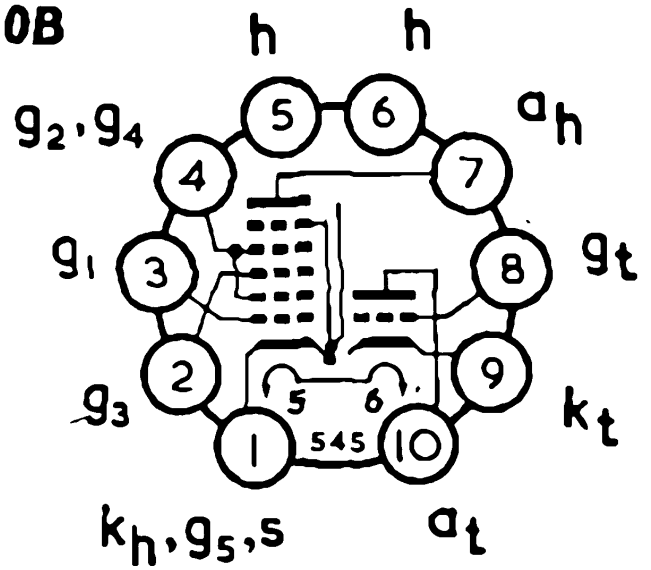
PCH200

VHF Triode Heptode Colour TV Syne Separator 0·3A, 8·5V Heater

Characteristics

	Triode	Heptode
V_a	100	14
V_{g2}	...	14
V_{g1}	−1·0	...
I_a	9·0	0·8
μ	50	...
g_m	8·8	...

B10B

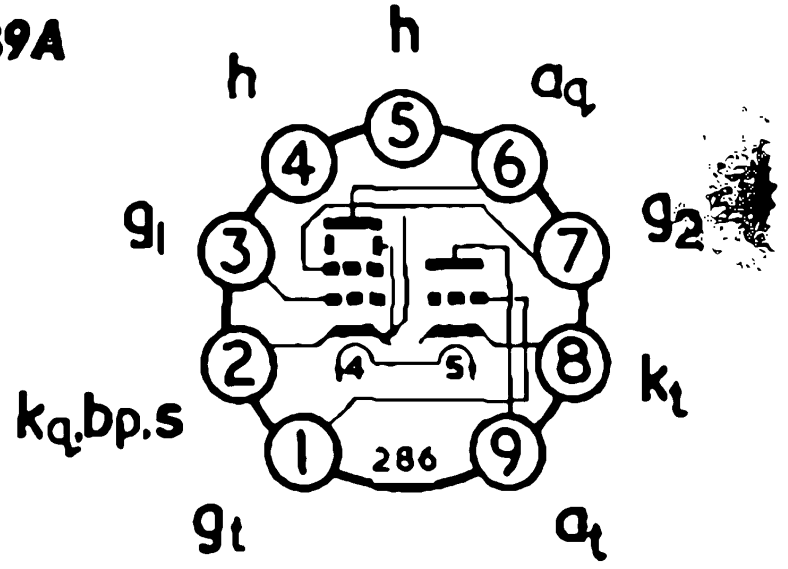


PCL82

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

B9A

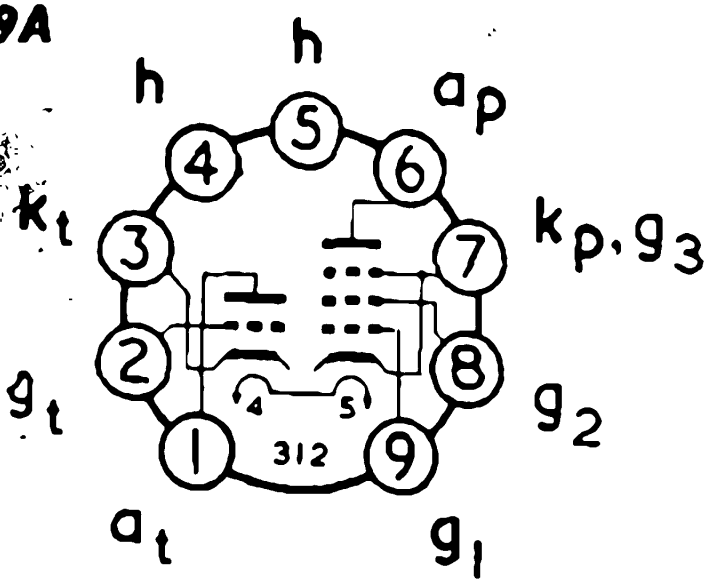


PCL83

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	...	5·5	k Ω
P_{out}	...	2·2	W

B9A

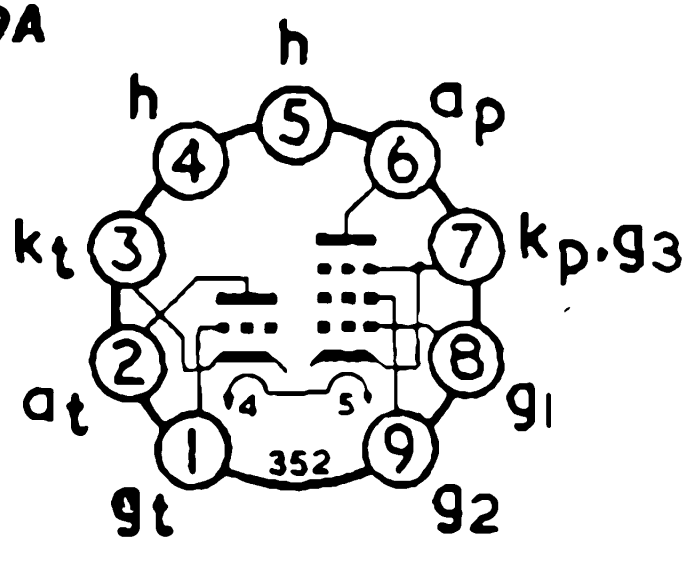


PCL84

Triode Pentode
Colour TV Chroma 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	...	

B9A

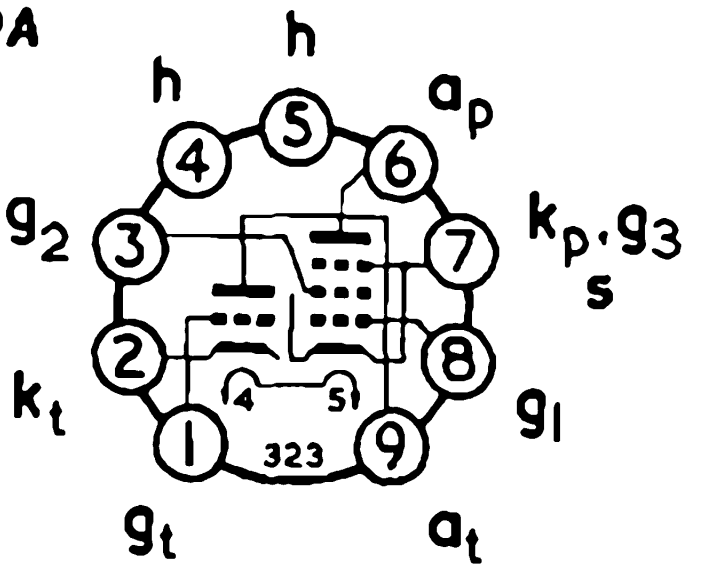


PCL86

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

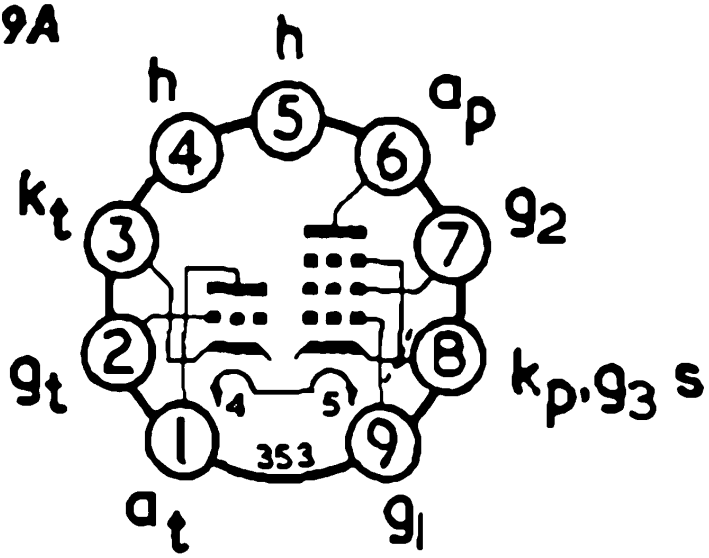


PCL805/85

Triode Pentode Field Output 0·3A, 18V Heater

	Triode	Pentode	
Rating			
$P_{a(max)}$	0·5	8	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	7·25	mA/V
μ	60	...	

B9A



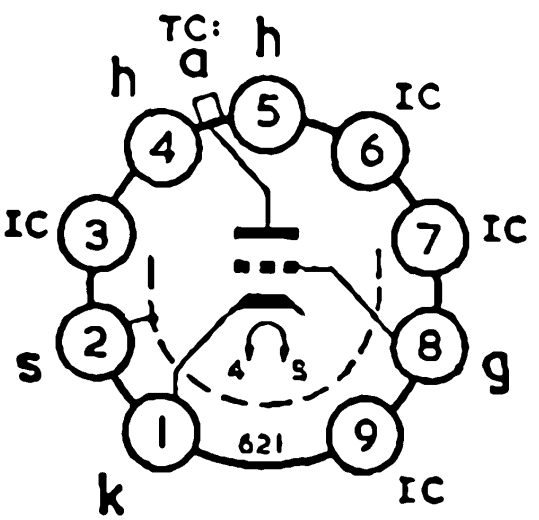
PD500

Shunt Stabiliser Triode
Colour TV EHT
0·3A, 7·3V Heater

Characteristics

V_a	25	kV
V_g (I_a = 1·5mA)	−7 to −30	V
$V_{g(max)}$ (I_a = 0·1mA)	−40	V
$\Delta V_{g(max)}$ (I_a = 0·1 to 1·5mA)	10	V

B9D

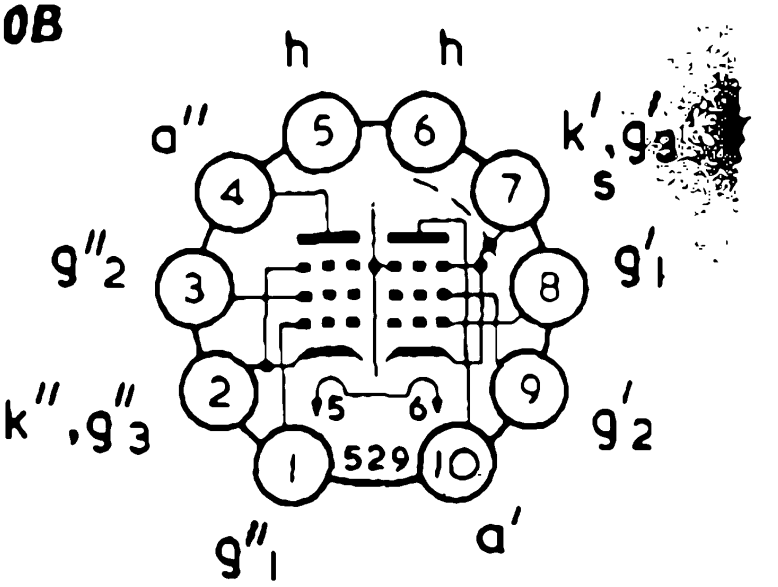


PFL200

Double Pentode
Sync. Sep. and Video Output
0·3A, 16·5V Heater

Rating	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	kΩ

B10B



PL36

Line Output Pentode
0·3A, 25V Heater

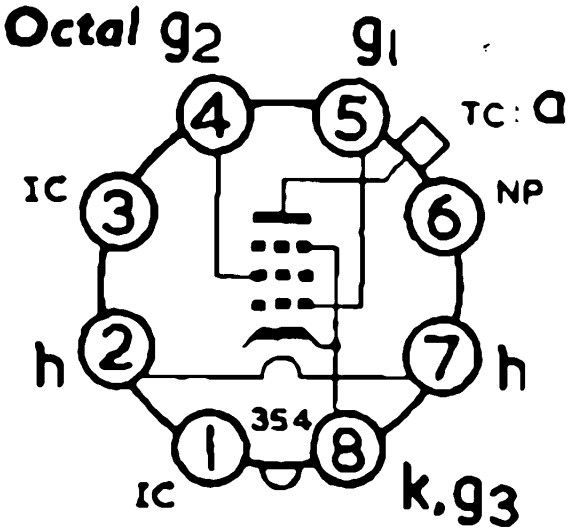
Rating

$P_{a(max)}$	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	kΩ

Int. Octal



PL81

Line Output Pentode
0·3A, 21·5V Heater

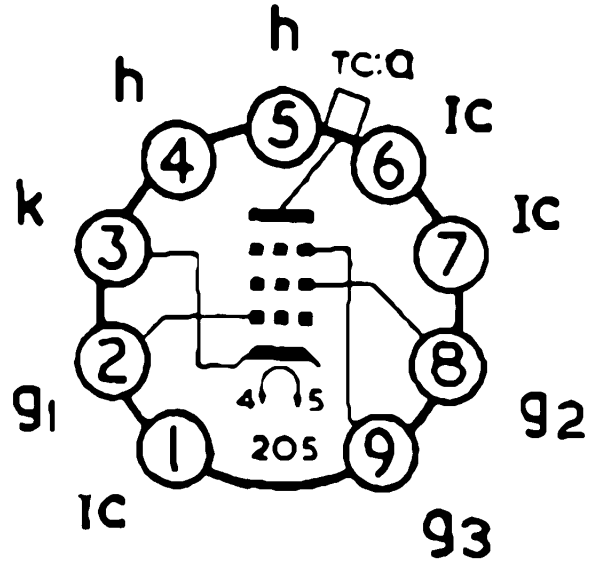
Ratings

$P_{a(max)}$	8	W
$P_a + P_{g2(max)}$	10	W

Characteristics

V_a	170	V
V_{g2}	0	V
V_{g2}	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

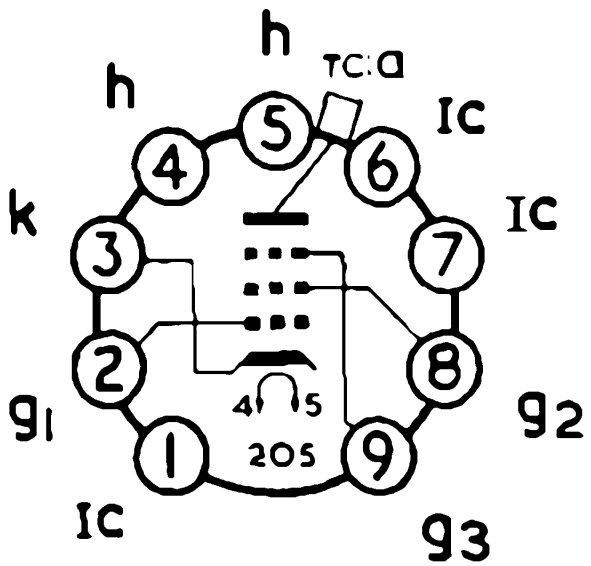
Ratings

$p_{a(max)}$ ($p_{g2} \leqslant 2$ W)	7·5	W
$p_{a(max)}$ ($p_{g2} = 4.5$ W)	5	W

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

B9A



PL82

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

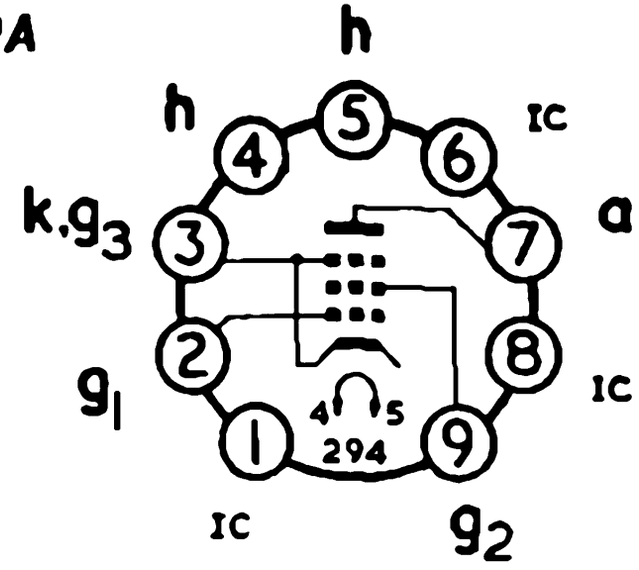
Rating

$P_{a(max)}$	9	W

Typical Operation

V_a	200	V
V_{g2}	200	V
V_{g1}	−14·4	V
$I_{a(o)}$	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

B9A



PL83

Video Output Pentode
0·3A, 15V Heater

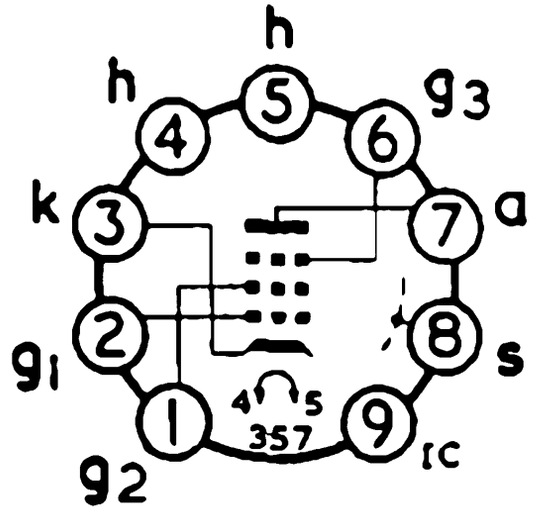
Rating

$P_{a(max)}$	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

B9A



PL84

Field Output Pentode
0·3A, 15V Heater

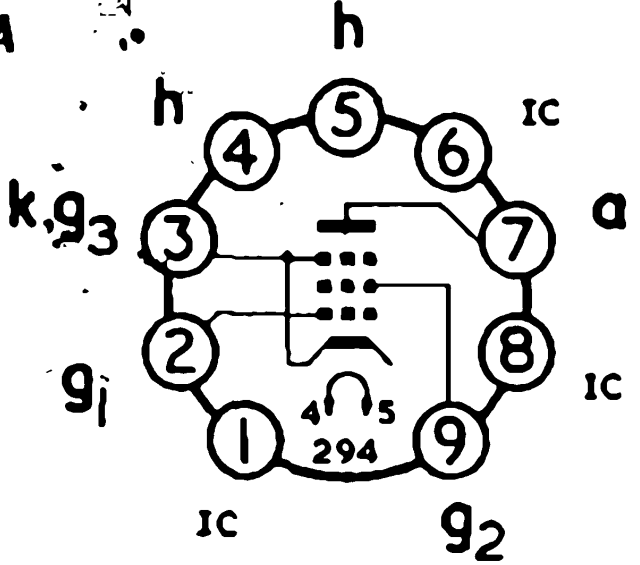
Rating

$P_{a(max)}$	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

B9A



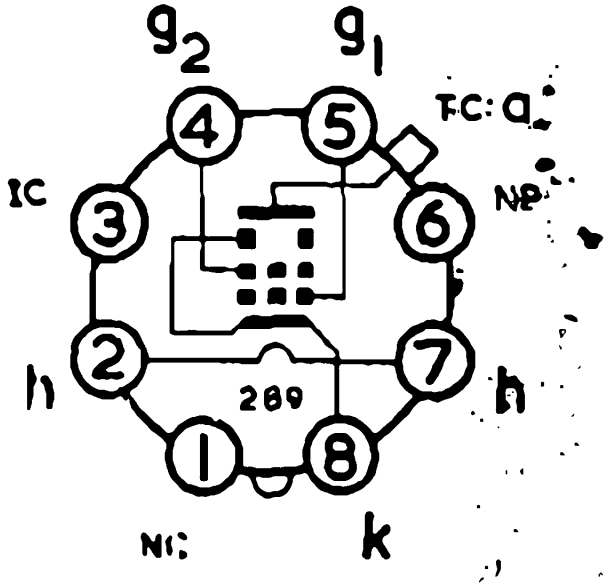
PL302

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

Ratings

$p_{a(max)}$ ($p_{g2} < 4$ W)	11	W
$p_{g2(max)}$ ($p_a < 7$ 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



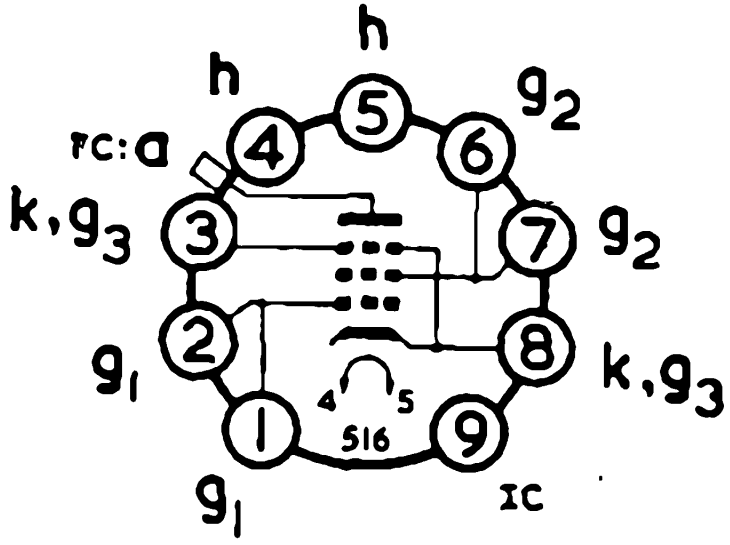
PL500

Line Output Pentode
0·3A, 27V Heater

Ratings

$p_{a(max)}$ ($p_{g2} \leqslant 4$ W)	12	W
$p_{g2(max)}$ ($p_a \leqslant 8$ 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



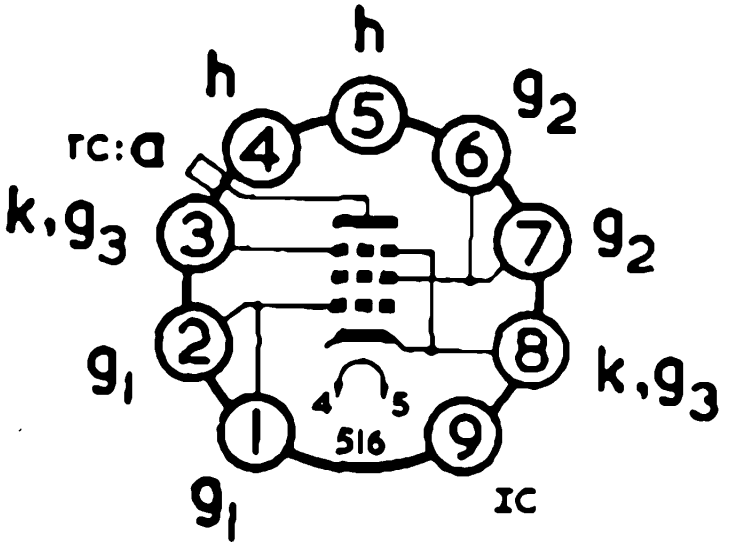
PL504

Line Output Pentode
0·3A, 27V Heater

Ratings

$P_{a(max)}$ ($p_{g2} \leqslant 4$ W)	16	W
$P_{g2(max)}$ ($p_a \leqslant 11$ W)	5	W
$V_{a(max)}$	250	V
$V_{g2(max)}$	250	V
$v_{a(pk)max}$	7	kV
$V_{h\text{-}k(r.m.s.)max}$	220	V
$I_{k(max)}$	250	mA

B9D



PL508

Field Output Pentode
Colour TV
0·3A, 17V Heater

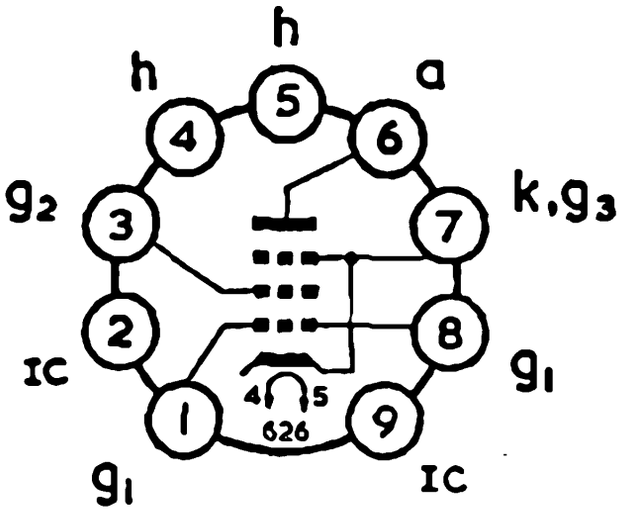
Ratings

$P_{a(max)}$	12	W

Characteristics

V_a	190	V
V_{g2}	190	V
I_a	60	mA
I_{g2}	4·5	mA
V_{g1}	−17	V
g_m	9	mA/V
μ_{g1-g2}	7	
r_a	10	k Ω

B9D



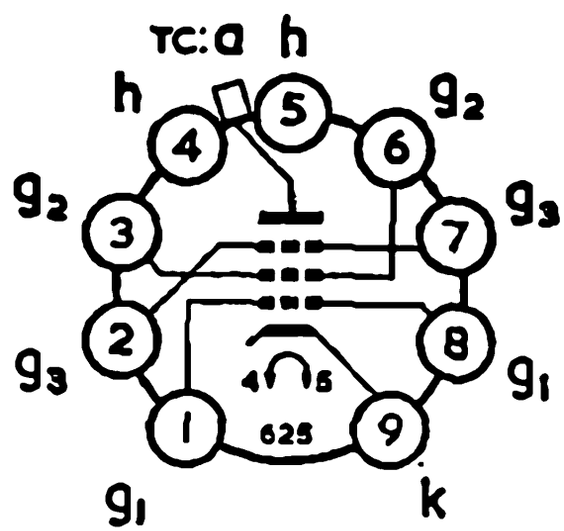
PL509

Line Output Pentode
Colour TV
0·3A, 40V Heater

Ratings

$P_{a(max)}$	30	W
$P_{g2(max)}$	7	W
$V_{a(b)max}$	700	V
$V_{a(pk)max}$	7	kV
$V_{g3(max)}$	50	V
$V_{g2(b)max}$	700	V
$V_{g2(max)}$	250	V
$V_{h-k(max)}$	250	V
$I_{k(max)}$	500	mA

B9D



PL802

Video Output Pentode
Colour TV
0·3A, 16V Heater

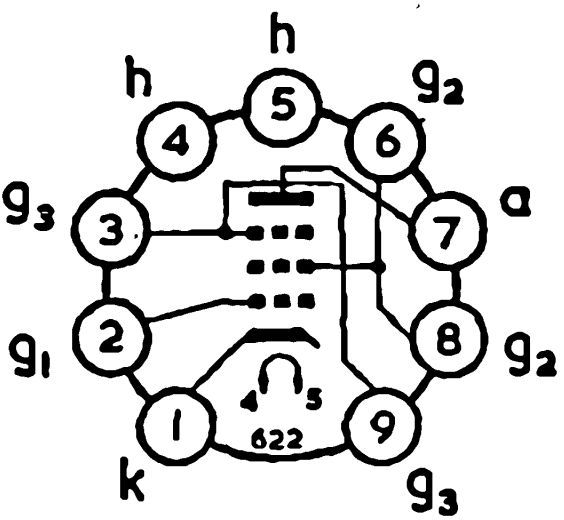
Rating

$P_{a(max)}$	6	W

Characteristics

V_a	170	V
V_{g3}	0	V
V_{g2}	170	V
V_{g1}	−0·9	V
I_a	30	mA
I_{g2}	6·5	mA
g_m	40	mA/V
r_a	45	k Ω
μ_{g1-g2}	70	

B9A



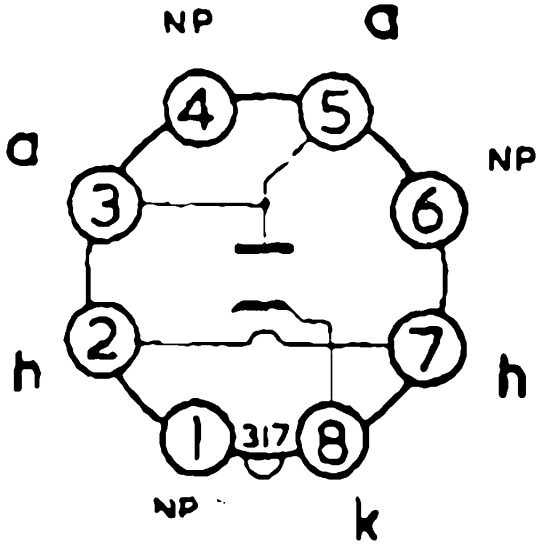
PY32

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



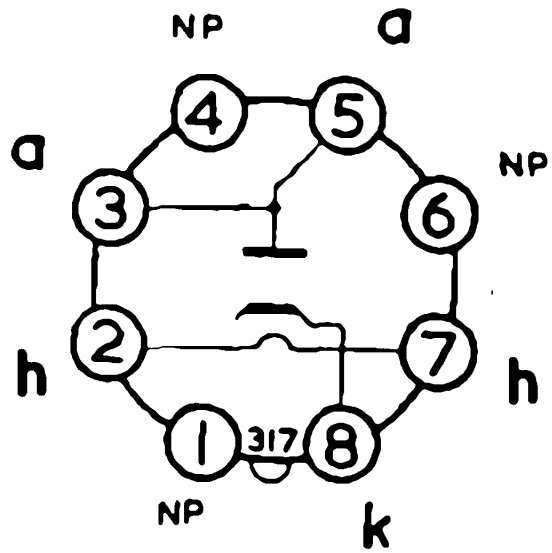
PY33

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



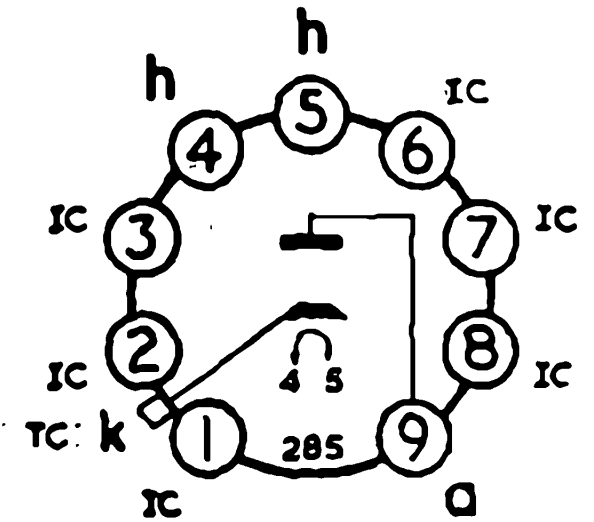
PY81/800

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



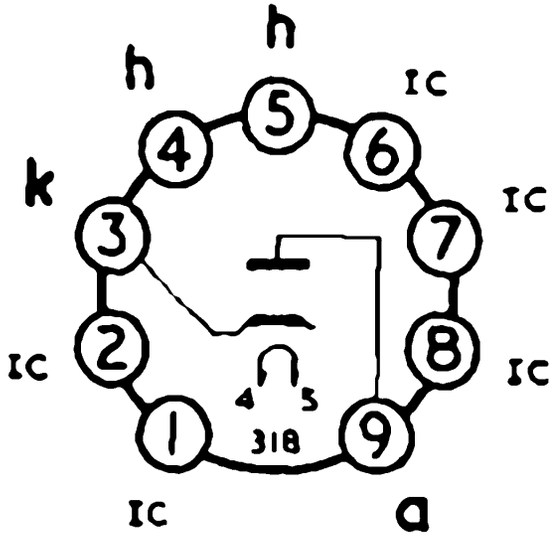
PY82

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



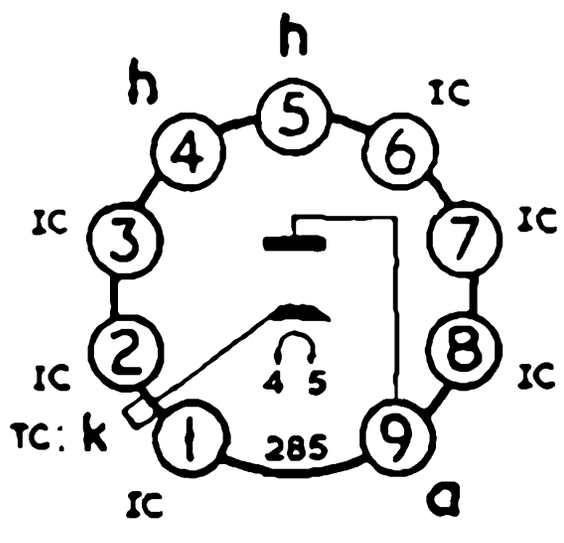
PY83

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

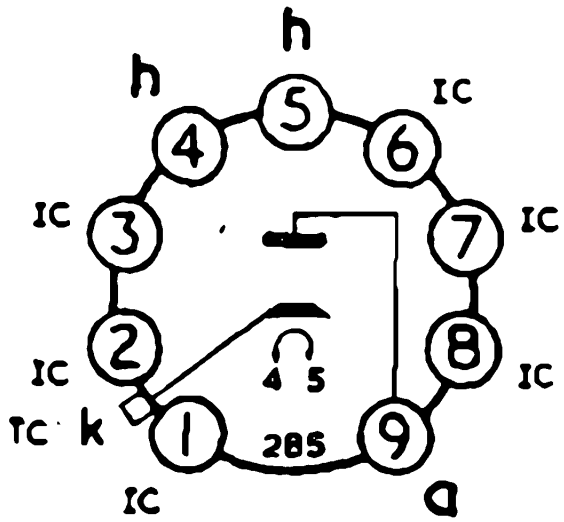
Efficiency Diode
0·3A, 30V Heater

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



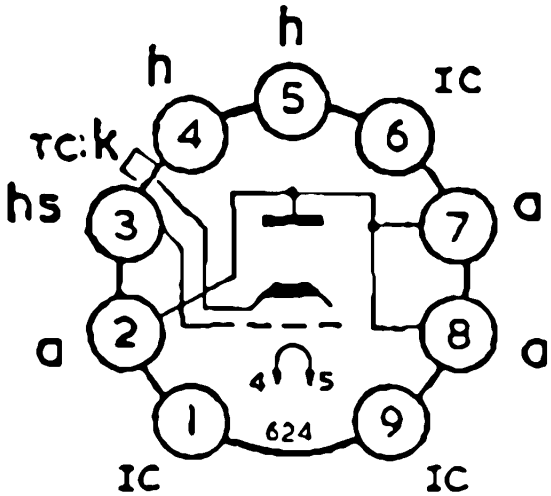
PY500

Efficiency Diode
Colour TV
0·3A, 42V Heater

Ratings

$P.I.V._{max}$	5·6	kV
$I_{a(max)}$	440	mA
$i_{a(pk)max}$	800	mA
$v_{h-k(pk)max}$	6·3	kV
$p_{a(max)}$	11	W

B9D



PY801

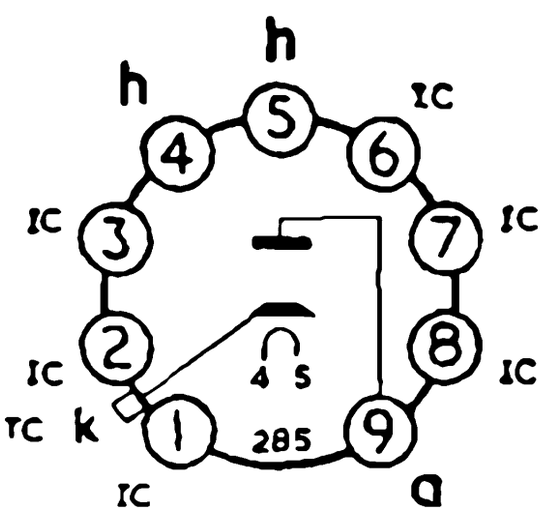
Efficiency Diode
0·3A, 19V Heater

For use with 110° tubes

Ratings

$P.I.V._{max}$	5·5	kV
$I_{a(max)}$	175	mA
$i_{a(pk)max}$	450	mA
$V_{h-k(pk)max}$	5·5	kV

B9A



U25

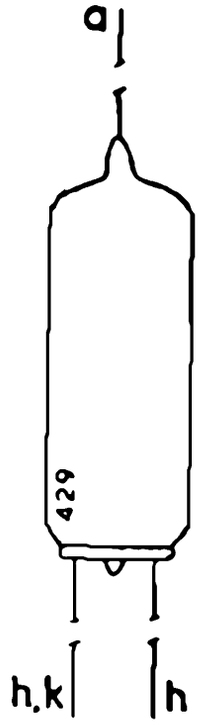
EHT Rectifier
2V, 0·2A Heater

Ratings (Pulse Operation)

$P.I.V._{max}$	19	kV
$i_{a(pk)max}$	25	mA
$I_{a(max)}$	0·2	mA
V_{out}	16	kV

Wired in

Lead glass bulb since Dec. 1965.



U26

EHT Rectifier
2V, 0·35A Heater

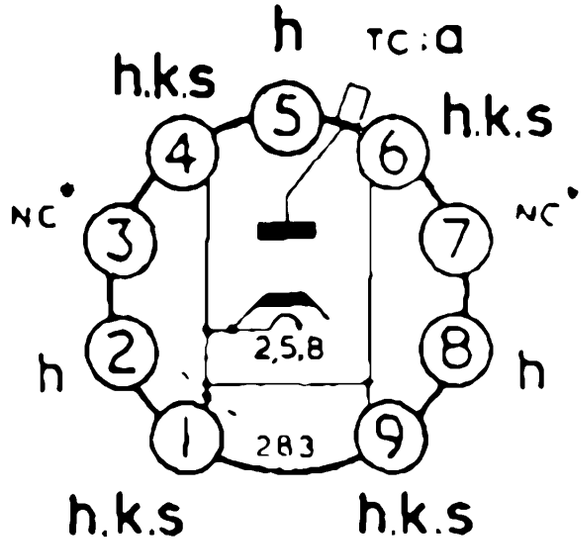
Ratings (Pulse Operation)

$P.I.V._{max}$	23·5	kV
$I_{a(max)}$	0·2	mA
$i_{a(pk)max}$	60	mA

B9A

Lead glass bulb.

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



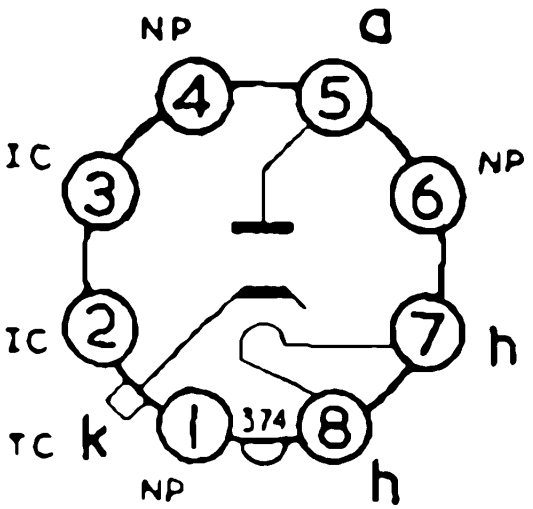
U191

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



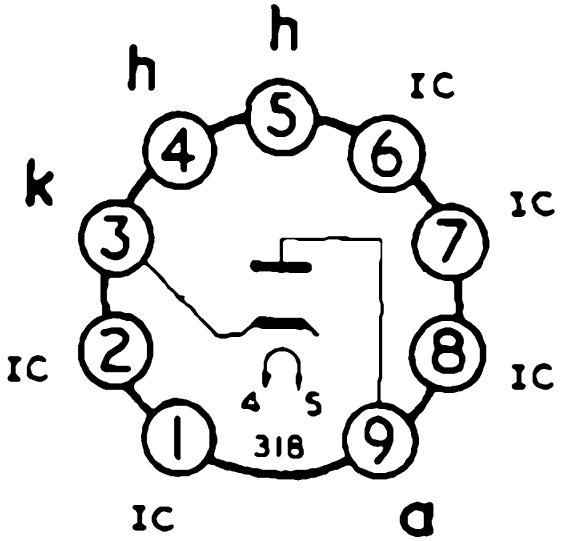
U192

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



U193

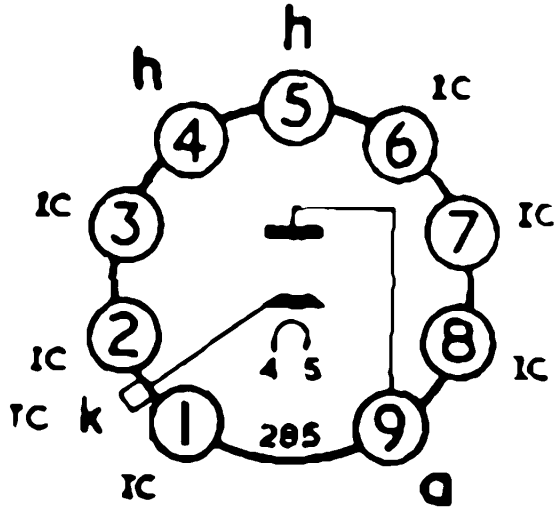
Efficiency Diode
0·3A, 19V Heater

For use with 110° tubes

Ratings

P.I.V.$_{max}$	5·5	kV
$I_{a(max)}$	175	mA
$i_{a(pk)max}$	450	mA
$v_{h-k(pk)max}$	5·5	kV

B9A



U251

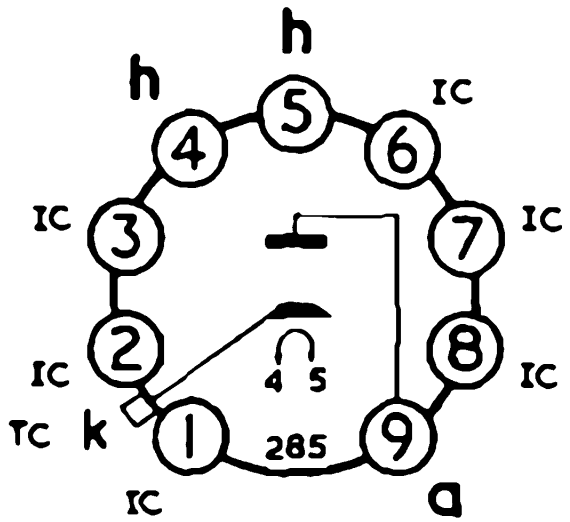
Efficiency Diode
0·3A, 25V Heater

Ratings

$P.I.V._{max}$	7	kV
$I_{a(max)}$	120	mA
$V_{h-k(max)}$	2	kV

Rating applies only to use as an Efficiency Diode.

B9A



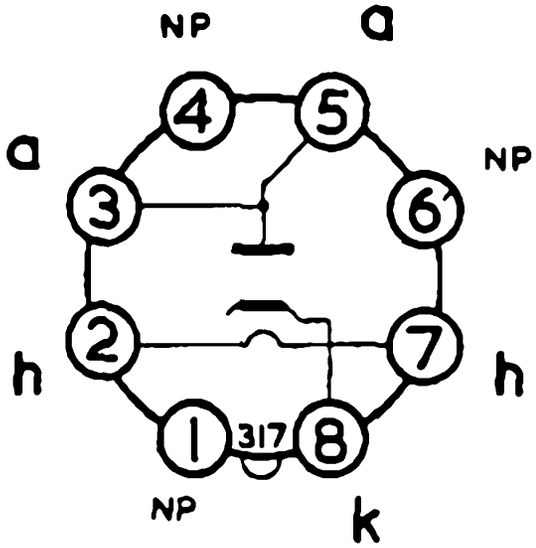
U291

Half Wave Rectifier
0·3A, 29V Heater

Typical Operation

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

Int. Octal



U301

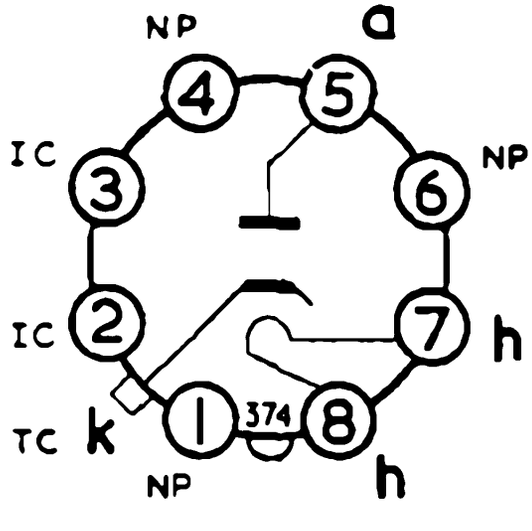
Efficiency Diode
0·2A, 28V Heater

Ratings

$P.I.V._{max}$	4·5	kV
$I_{a(max)}$	150	mA
$V_{h-k(max)}$	900	V

Rating applies only to use as an Efficiency Diode.

Int. Octal



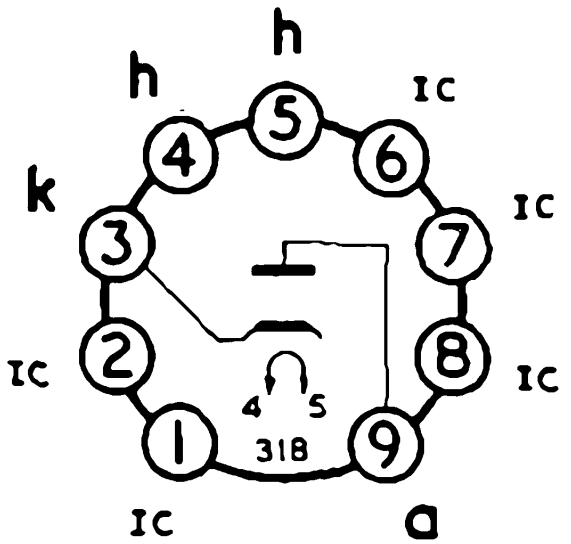
U381

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



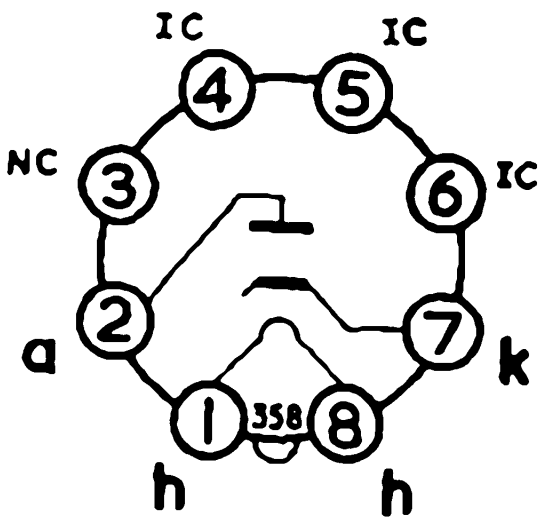
U404

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



UBF89

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

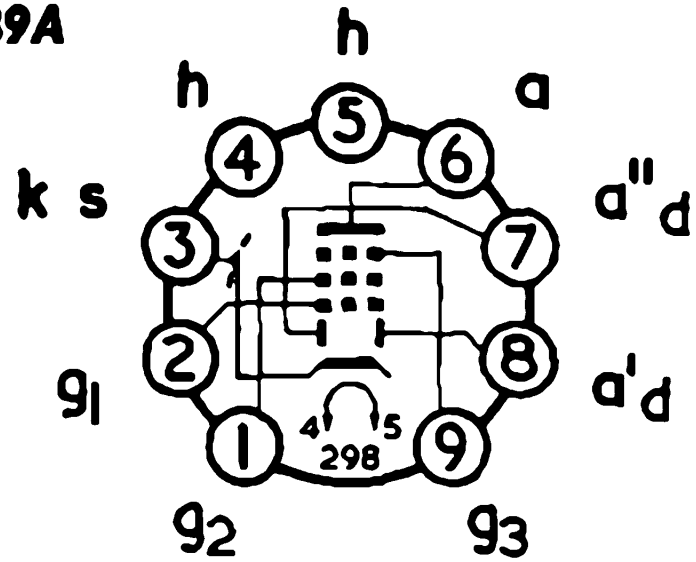
Rating (Pentode)

$p_{a(max)}$	2·25	W

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	kΩ
R_k	105	Ω
g_m	4·5	mA/V

B9A



UCC85

VHF Double Triode
0·1A, 26V Heater

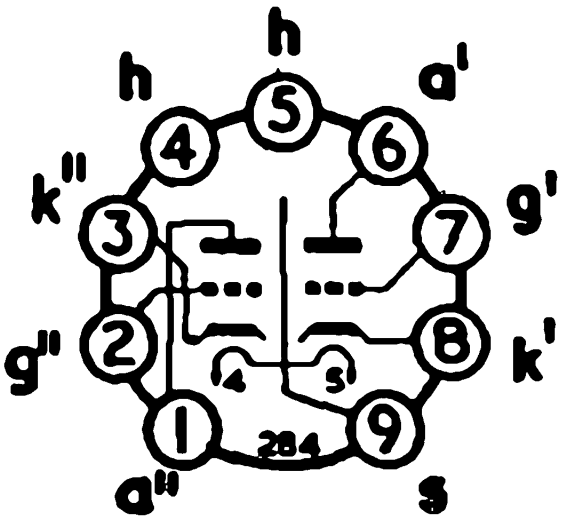
Rating

$P_{a(max)}$	(Either)	2·5	W
	(Both)	4·5	W

Typical Operation

	Amp.	Osc/mix	
$V_{a(b)}$	170	170	V
V_g	−1·4	...	V
I_a	8·7	4·8	
R_a	1·5	4·7	kΩ
R_g	...	1	MΩ
g_m	6	...	mA/V
g_c	...	2·2	mA/V
μ	...	50	

B9A



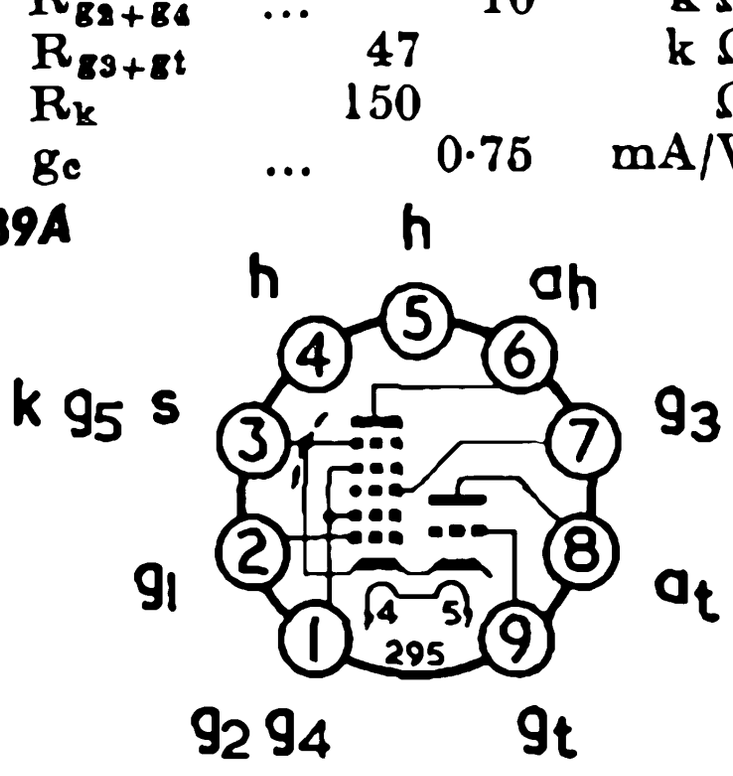
UCH81

Triode Heptode
HF 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	...	kΩ
R_{g2+g4}	...	10	kΩ
R_{g3+gt}	47		kΩ
R_k	150		Ω
g_c	...	0·75	mA/V

B9A

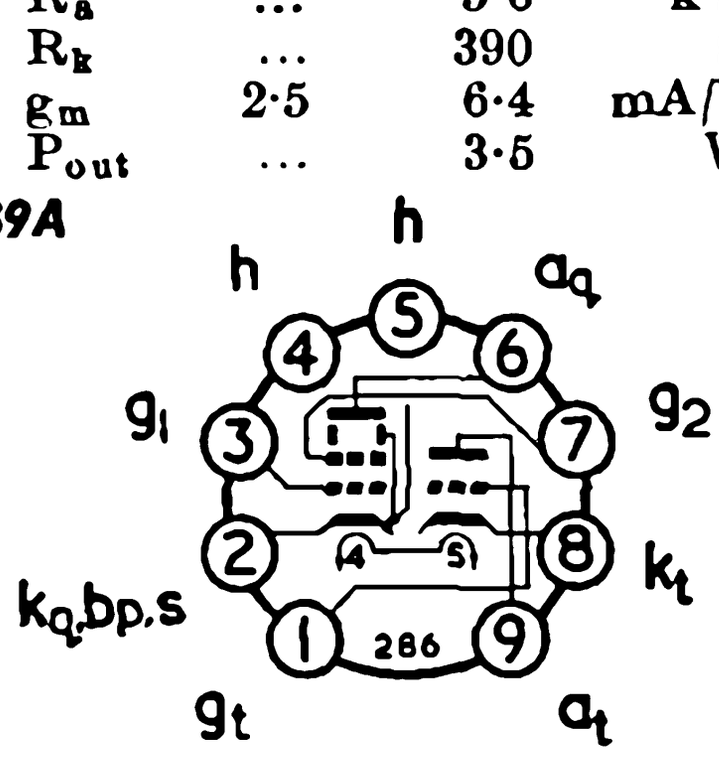


UCL82

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	kΩ
R_k	...	390	Ω
g_m	2·5	6·4	mA/V
P_{out}	...	3·5	W

B9A

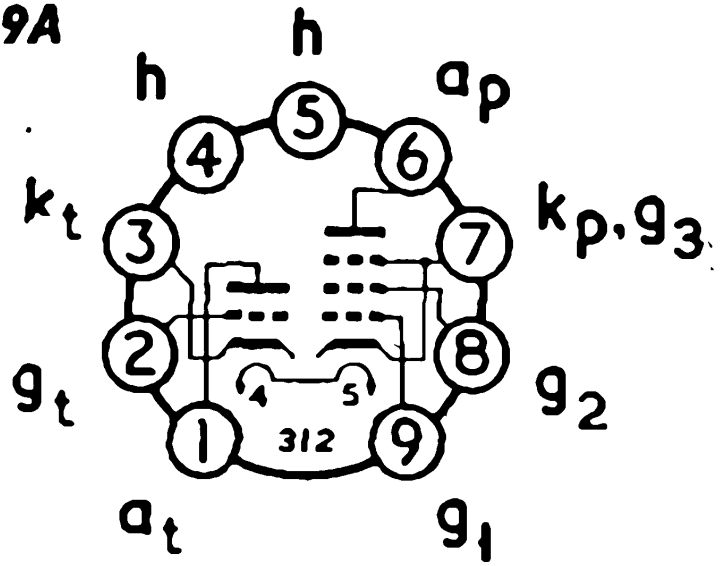


UCL83

Triode 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	...	

B9A



UF89

HF Pentode
Variable-mu IF Amplifier
0·1A, 12·6V Heater

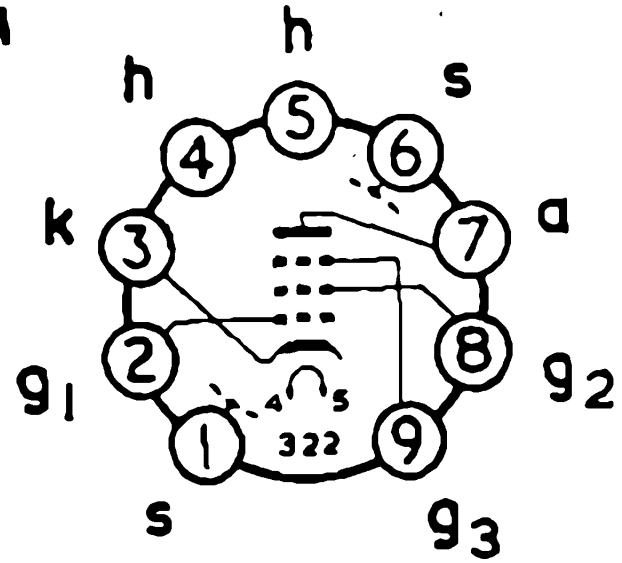
Rating

$P_{a(max)}$	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

B9A



UL84

Audio Output Pentode
0·1A, 45V Heater

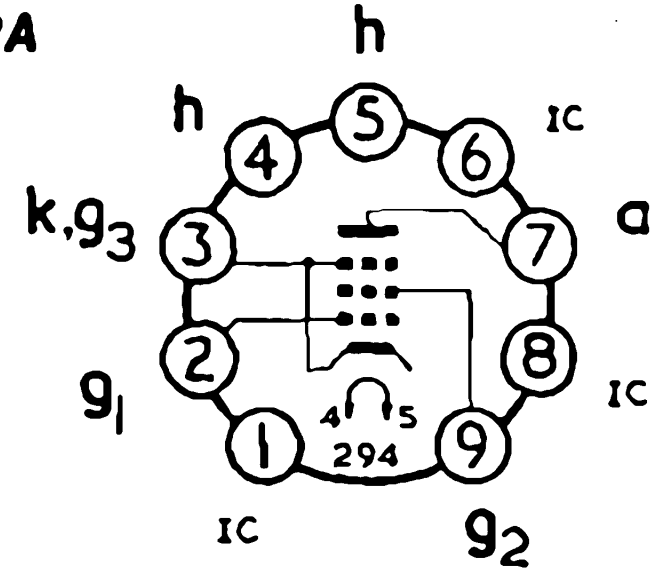
Rating

$P_{a(max)}$	12	W

Typical Operation

V_a	160	V
V_{g2}	170	V
V_{g1}	−12·5	V
$I_{a(o)}$	70	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

B9A



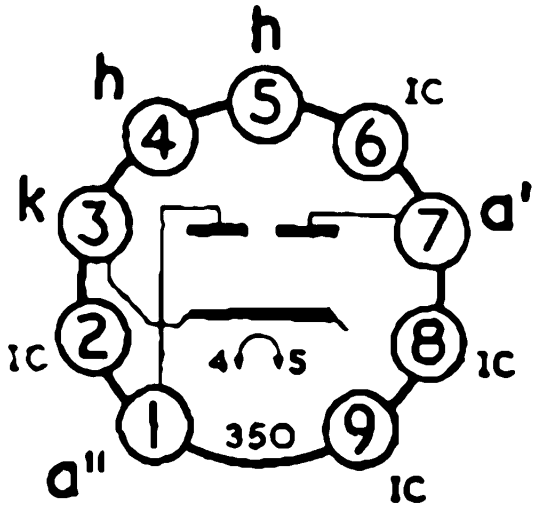
UU12

Full Wave 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



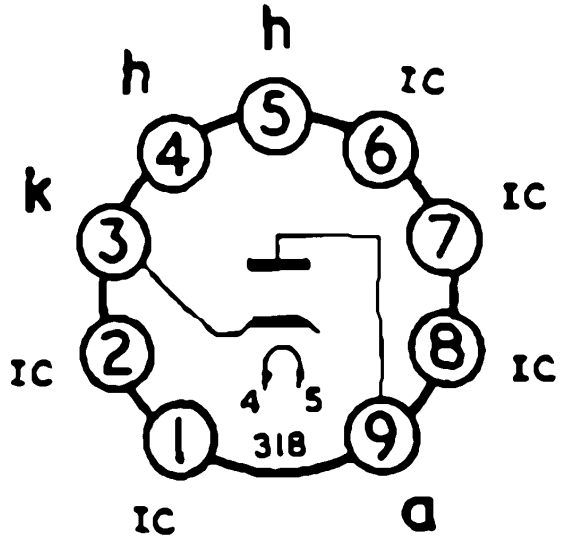
UY85

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



REMINDER

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
AEI industrial semiconductors
Test meters
Food mixers
etc.
to the

MAZDA VALVE
SERVICE DEPT.
BRIMSDOWN

The MAZDA colour tube screening room at Brimsdown

MAZDA colour picture tubes are manufactured by

THORN COLOUR TUBES LTD

CURRENT AND MAINTENANCE TYPES

MAZDA

PICTURE TUBES

for Television

ALL BASE DIAGRAMS ARE VIEWED FROM THE FREE END OF PINS

see page 8 for TUBE NOMENCLATURES

A47–13W/S

CME1906 S

19 in. TWIN PANEL
Bonded Glass Cap Protected
0·3A, 6·3V Heater

Features

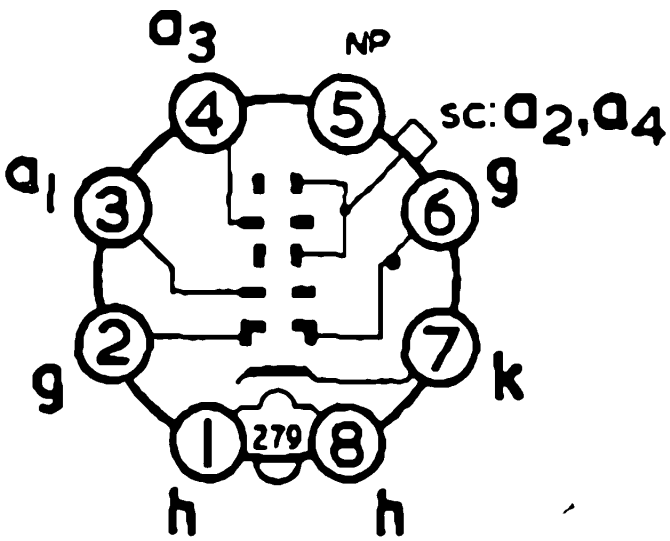
- Integral mounting ears
- Short neck
- 110° deflection
- Electrostatic focus
- External 'dag
- Aluminised screen
- Tinted bulb and panel, light transmission 65%
- Maximum Neck diameter 29·4 mm
- Maximum Overall length 317 mm

Typical Operation

$V_{a_{2+a_4}}$	18	kV
V_{a_1}	500	V
V_{a_3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard S Base

CT8 side contact



A47–14W/S

CME1908 S

19 in. UNPROTECTED*
0·3A, 6·3V Heater

Features

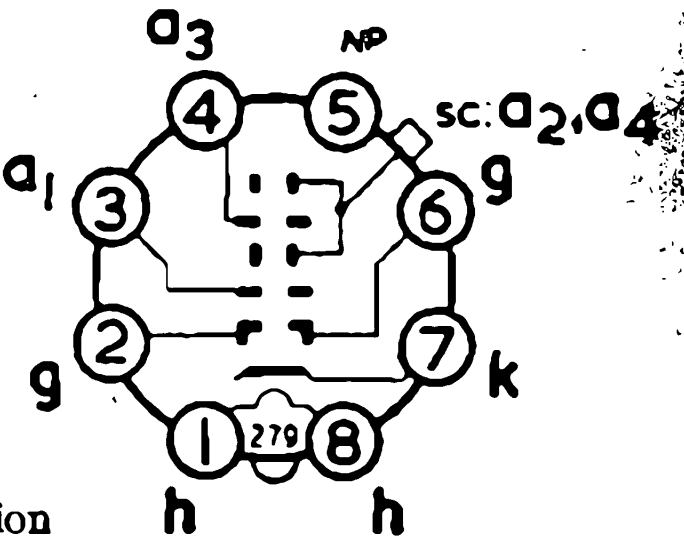
Short neck
110° deflection
Electrostatic focus
External 'dag
Aluminised screen
Grey glass,
light transmission
50 %
Maximum Neck
diameter 29·4 mm
Maximum Overall
length 309 mm

Typical Operation

V_{a2+a4}	18	kV
V_{a1}	500	V
V_{a3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard S Base

CT8 side contact



* Requires implosion protection

A49–11X

Replaces A49-15X, A49-18X, CTA1950

19 in. RIMGUARD I Colour Tube
Metal Shell Protected
6·3V, 0·9A Heater

Features

Shadow-mask, 3 guns

Mounting lugs

90° deflection

Electrostatic focus

R.G.B. phosphor dots

Aluminised screen

Grey glass,
light transmission 54%

Maximum Neck diameter 37·8 mm

Maximum Overall length 457·5 mm

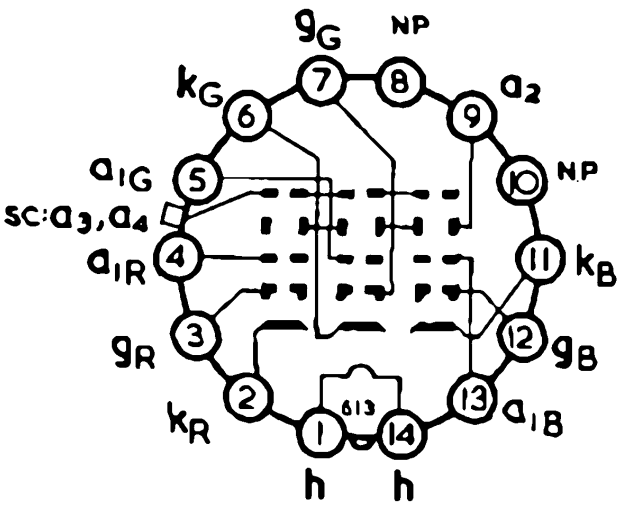
Typical Operation

V_{a3+a4}	25 kV
V_{a2}	4·2 to 5·0 kV
V_{a1} (at V_g −100 V)*	210 to 495 V
V_g (at V_{a1} 300 V)*	−65 to −135 V

*for visual extinction of focused raster

B14G short spigot base

CT8 side contact



A49–191X

Replaces A49-120X, A49-200X, CTA1951

19 in. RIMGUARD III Colour Tube
Metal Shell Protected
6·3V, 0·9A Heater

Features

Push-through
Shadow-mask, 3 guns
Mounting lugs
90° deflection
Electrostatic focus
R.G.B. phosphor dots
Aluminised screen
Grey glass,
light transmission 54%
Maximum Neck diameter 37·8 mm
Maximum Overall length 463 mm

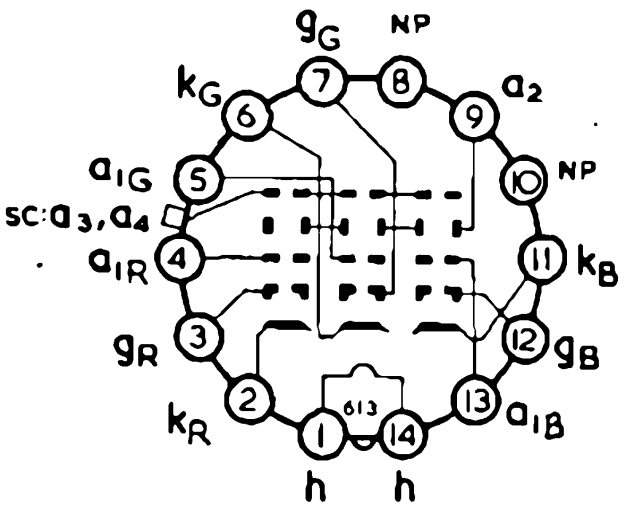
Typical Operation

V_{a3+a4}	25 kV
V_{a2}	4·2 to 5·0 kV
V_{a1} (at V_g −150 V)*	255 to 655 V
V_g (at V_{a1} 300 V)*	−75 to −173 V

*for visual extinction of focused spot

B14G Base

CT8 side contact



A50–120W/R

CME2013 R

20 in. RIMGUARD III
Metal Shell Protected
0·3A, 6·3V Heater

Features

4 : 3 aspect ratio
Mounting lugs
110° deflection
Electrostatic focus
Straight gun
External 'dag
Aluminised screen
Grey glass,
light transmission 45%
Maximum Neck diameter 29·4 mm
Maximum Overall length 319 mm

Warning

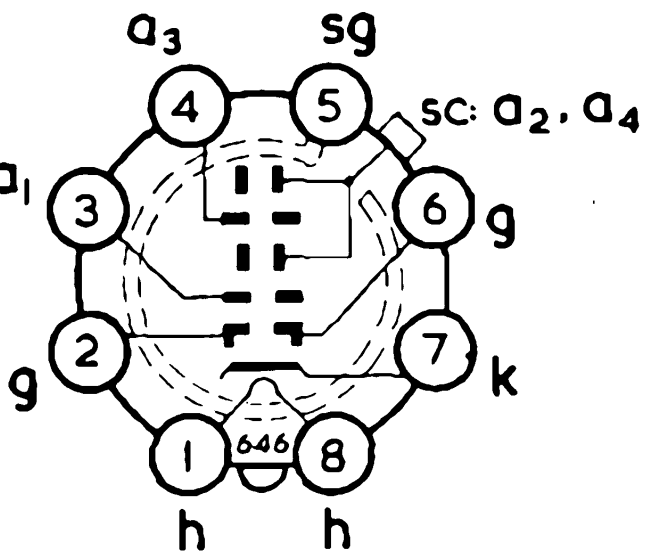
Sparkguard R tubes **may** only be used in sets providing protection circuit, as on page 99.

Typical Operation

V_{a2+a4}	18	kV
V_{a1}	500	V
V_{a3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkgard R Base

CT8 side contact



A55–14X

Replaces A55-141X, CTA2250

22 in. RIMGUARD III Colour Tube
Metal Shell Protected
6·3V, 0·9A Heater

Features

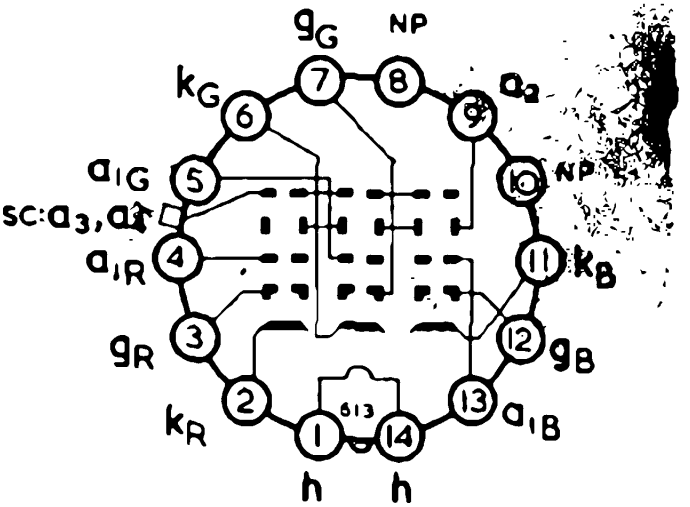
Push-through
Shadow-mask, 3 guns
Mounting lugs
90° deflection
Electrostatic focus
R.G.B. phosphor dots
Aluminised screen
Grey glass,
light transmission 52 %
Maximum Neck diameter 37·8 mm
Maximum Overall length 493 mm

Typical Operation

V_{a3+a4} 25 kV
V_{a2} 4·2 to 5·0 kV
V_{g1} (at V_g −150 V)*
285 to 685 V
V_g (at V_{a1} 400 V)*
−95 to −190 V
*for visual extinction of focused spot

B14G Base

CT8 side contact



A59–13W/S

CME2306 S

23 in. TWIN PANEL
Bonded Glass Cap Protected
0·3A, 6·3V Heater

Features

Integral mounting ears

Short neck

110° deflection

Electrostatic focus

External 'dag

Aluminised screen

Tinted bulb and panel, light transmission 45%

Maximum Neck diameter 29·4 mm

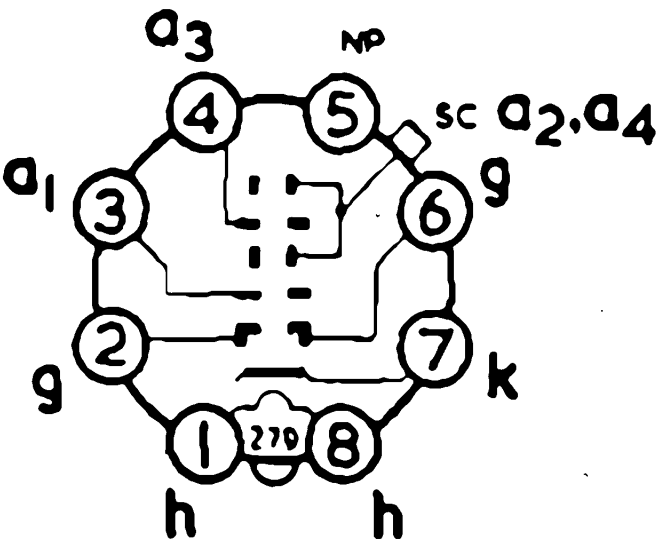
Maximum Overall length 374 mm

Typical Operation

V_{a2+a4}	18	kV
V_{a1}	500	V
V_{a3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard S Base

CT8 side contact



A59–15W/S

CME2308 S

23 in. UNPROTECTED*
0·3A, 6·3V Heater

Features

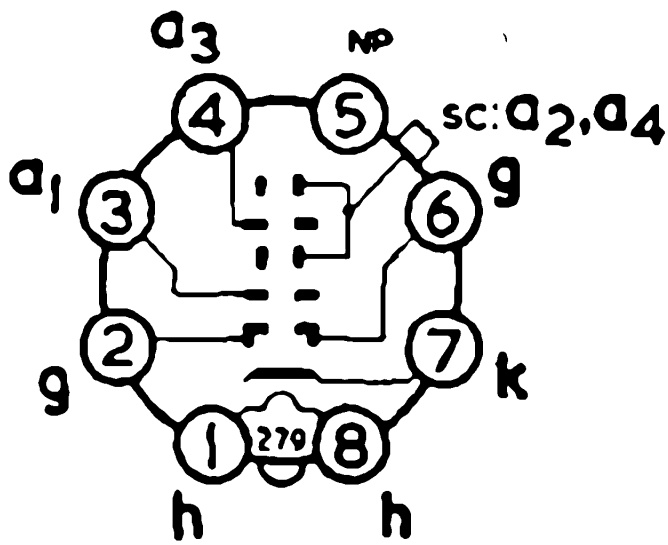
Short neck
110° deflection
Electrostatic focus
External 'dag
Aluminised screen
Grey glass,
light transmission 45%
Maximum Neck diameter 29·4 mm
Maximum Overall length 367 mm

Typical Operation

$V_{a_2+a_4}$	18	kV
V_{a_1}	500	V
V_{a_3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard S Base

CT8 side contact



* Requires implosion protection

A59–23W/S
A59–23W/R

CME2313 S
CME2313 R

23 in. RIMGUARD III
Metal Shell Protected
0·3A, 6·3V Heater

Features

- Push-through presentation
- Mounting lugs
- 110° deflection
- Electrostatic focus
- External 'dag
- Aluminised screen
- Grey glass, light transmission 45%
- Maximum Neck diameter 29·4 mm
- Maximum Overall length 367 mm

Warning

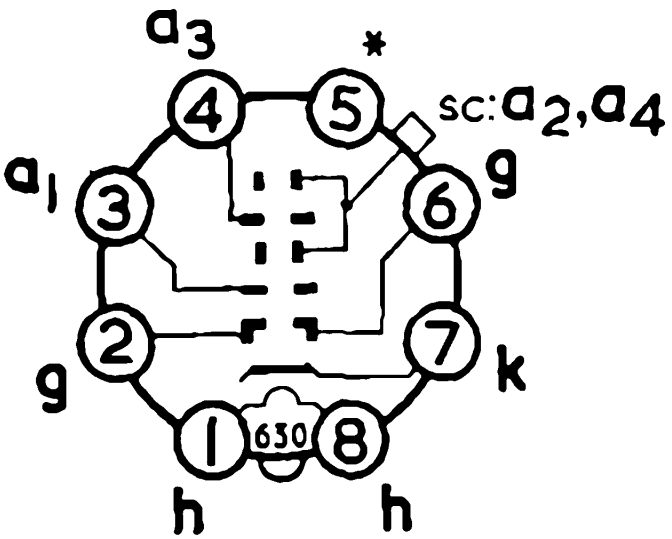
Sparkguard R tubes may only be used in sets providing protection circuit, as on page 99.

Typical Operation

V_{a2+a4}	18	kV
V_{a1}	500	V
V_{a3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard S or R Base

CT8 side contact



• NP for Sparkguard S Sg for Sparkguard R

A61–120W/R

CME2413 R

24 in. RIMGUARD III
Metal Shell Protected
0·3A, 6·3V Heater

Features

Integral mounting lugs

Electrostatic focus

110° deflection
Straight gun

External 'dag

Grey glass, light transmission 52%

Maximum Neck diameter 29·4 mm
Maximum Overall length 370 mm

Warning

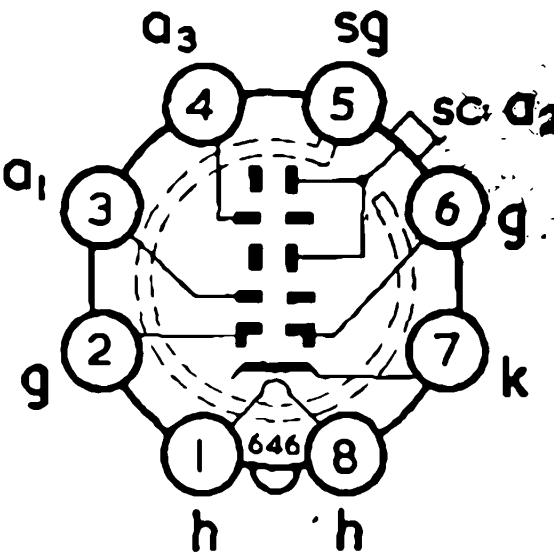
Sparkguard R tubes may only be used in sets providing protection circuit, as on page 99.

Typical Operation

$V_{a_2+a_1}$	18	kV
V_{a_1}	500	V
V_{a_3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard R Base

CT8 side contact



A63–11X

Replaces A63-13X, A63-16X, A63-17X, CTA2550

25 in. RIMGUARD I Colour Tube
Metal Shell Protected
6·3V, 0·3A Heater

Features

Shadow-mask, 3 guns
Mounting lugs
90° deflection
Electrostatic focus
R.G.B. phosphor dots
Aluminised screen
Grey glass,
light transmission 52%

Maximum Neck diameter 37·8 mm

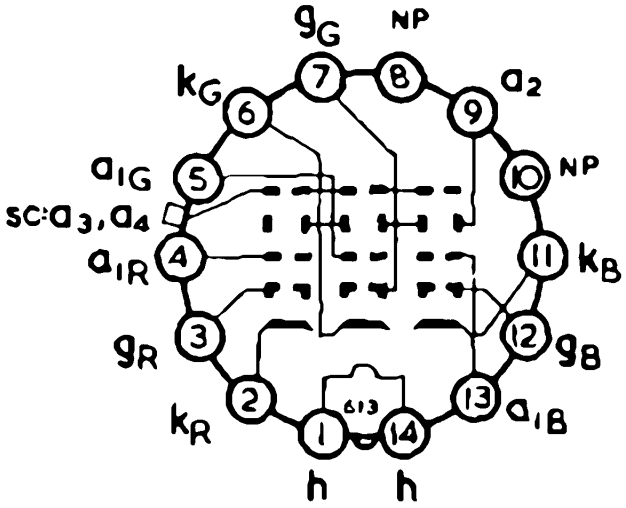
Maximum Overall length 530·5 mm

Typical Operation

V_{a3+4} 25 kV
V_{a2} 4·2 to 5·0 kV
V_{a1} (at V_g − 100 V)* 210 to 495 V
V_g (at V_{a1} 300 V)* −65 to −135 V
*for visual extinction of focused raster

B14G Short Spigot Base

CT8 side contact



A63–200X

25 in. RIMGUARD III Colour Tube
Metal Shell Protected
6·3V, 0·9A Heater

Features

Push-through
Shadow-mask, 3 guns
Mounting lugs
90° deflection
Electrostatic focus
R.G.B. phosphor dots
Aluminised screen
Grey glass,
light transmission 52%
Maximum Neck diameter 37·8 mm
Maximum Overall length 535·4 mm

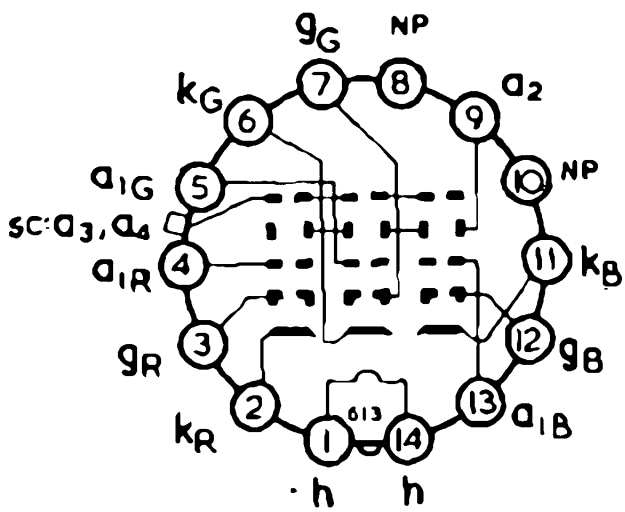
Typical Operation

V_{a3+a4}	25 kV
V_{a2}	4·2 to 5·0 kV
V_{a1} (at V_g −150 V)*	255 to 655 V
V_g (at V_{a1} 300 V)*	−75 to −175 V

*for visual extinction of focused spot

B14G Base

CT8 side contact



A65–11W/S

CME2501 S

25 in. RIMGUARD 1
Metal Shell Protected
0·3A, 6·3V Heater

Features

Integral mounting lugs

110° deflection

Electrostatic focus

External 'dag

Aluminised screen

Grey glass, light transmission 42%

Maximum Neck diameter 29·4 mm

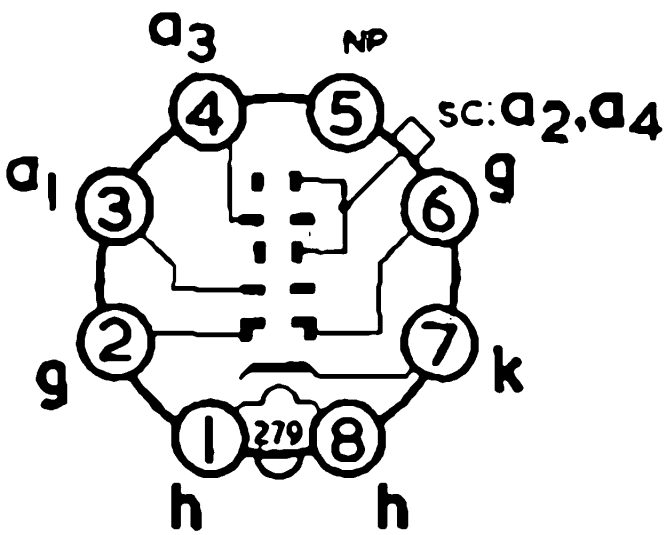
Maximum Overall length 389 mm

Typical Operation

$V_{a_{2+a_4}}$	18	kV
V_{a_1}	500	V
V_{a_3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard S Base

CT8 side contact



AW47–90

CME1902

19 in. UNPROTECTED*
0·3A, 6·3V Heater

Features

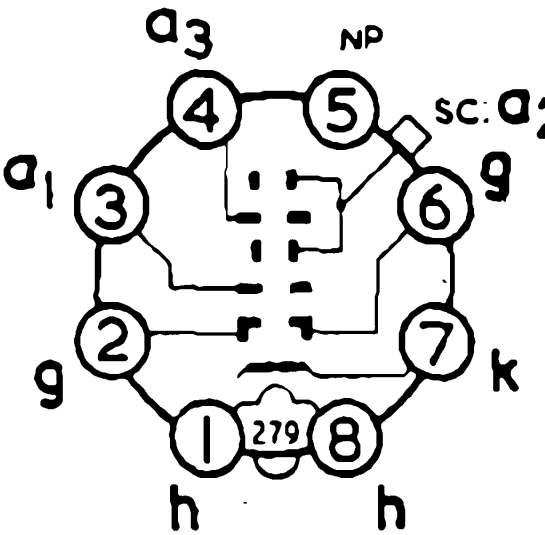
110° deflection
Electrostatic focus
External 'dag
Aluminised screen
Grey glass, light transmission 75%
Maximum Neck diameter 29·4 mm
Maximum Overall length 330 mm

Typical Operation

V_{a2+a4}	16	kV
V_{a1}	400	V
V_{a3} (focus)	0 to 400	V
V_k for cut-off	35 to 78	V

B8H Base

CT8 side contact



* Requires implosion protection.

AW47–91/S

CME1903 S

19 in. UNPROTECTED*
0·3A, 6·3V Heater

Features

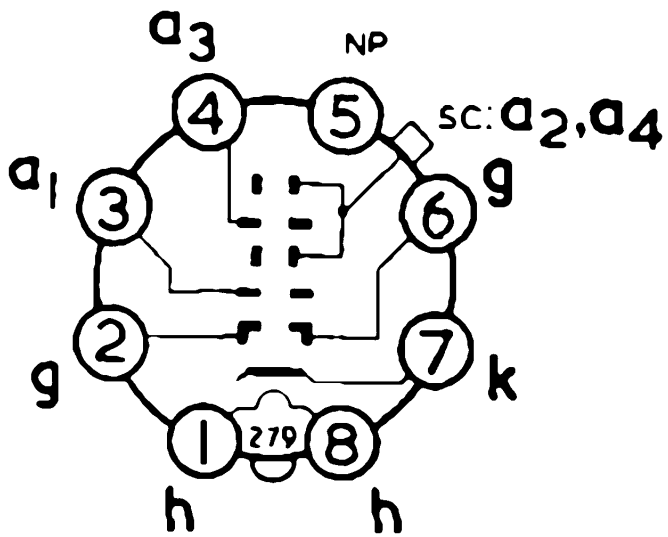
Short neck
110° deflection
Electrostatic focus
External 'dag
Aluminised screen
Grey glass,
light transmission 75%
Maximum Neck diameter 29·4 mm
Maximum Overall length 309 mm

Typical Operation

V_{a2+a4}	18	kV
V_{a1}	500	V
V_{a3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard S Base

CT8 side contact



* Requires implosion protection.

AW59–90

CME2302

23 in. UNPROTECTED*
0·3A, 6·3V Heater

Features

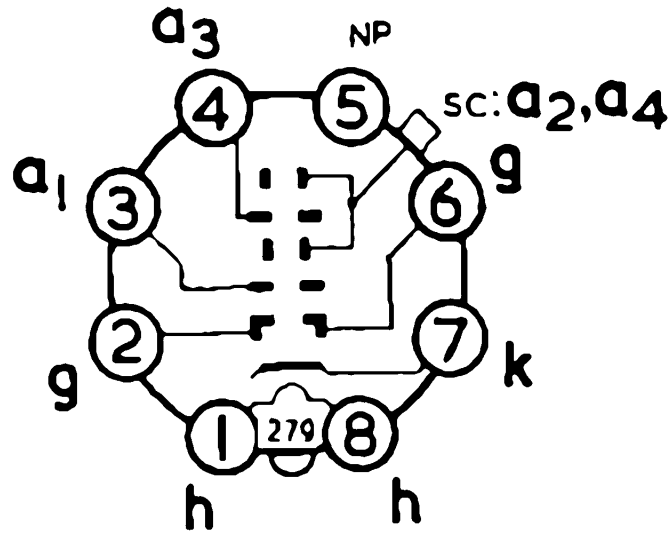
110° deflection
Electrostatic focus
External 'dag
Aluminised screen
Grey glass, light transmission 74%
Maximum Neck diameter 29·4 mm
Maximum Overall length 386 mm

Typical Operation

V_{a2+a4}	16	kV
V_{a1}	400	V
V_{a3} (focus)	0 to 400	V
V_k for cut-off	35 to 78	V

B8H Base

CT8 side contact



* Requires implosion protection.

CME1101

11 in. RIMGUARD I
Metal Shell Protected
0·3A, 6·3V Heater

Features

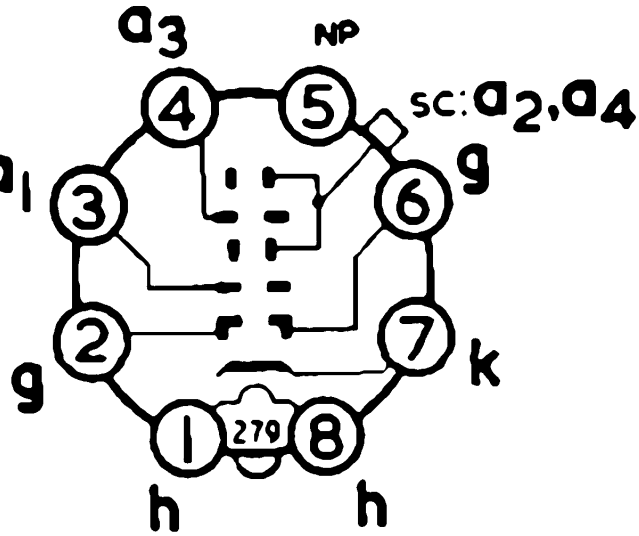
Integral mounting lugs
Rectangular face
110° deflection
Electrostatic focus
Straight gun
External 'dag
Aluminised screen
Grey glass, light transmission 50%
Maximum Neck diameter 29·4 mm
Maximum Overall length 234 mm

Typical Operation

$V_{a_2+a_4}$	12	kV
V_{a_1}	400	V
V_{a_3} (focus)	0 to 400	V
V_k for cut-off	35 to 78	V

B8H Base

CT8 side contact



CME1201 S

12 in. RIMBAND
Metal Band Protected
0·3A, 6·3V Heater

Features

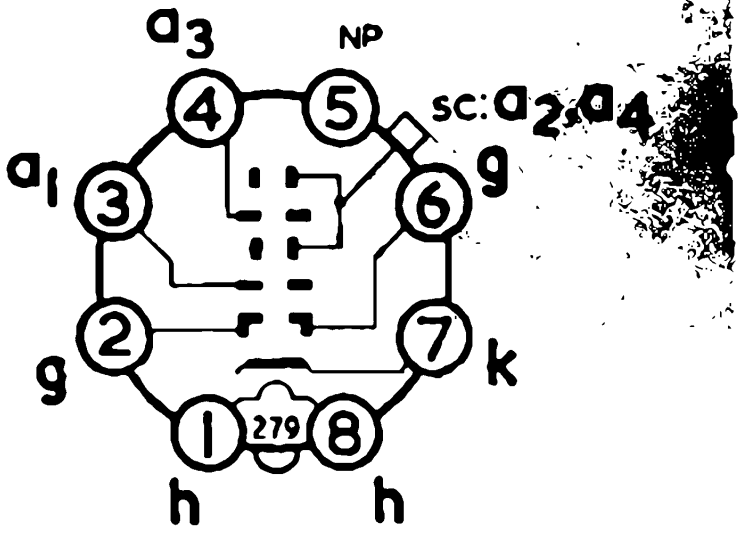
110° deflection
Electrostatic focus
Straight gun
External 'dag
Aluminised screen
Grey glass,
light transmission
50 %
Maximum Neck
diameter 29·4 mm
Maximum Overall
length 243 mm

Typical Operation

$V_{a_2+a_4}$	12	kV
V_{a_1}	400	V
V_{a_3} (focus)	0 to 400	V
V_k for cut-off	36 to 66	V

B8H Sparkguard S Base

CT8 side contact



CME1202 R

12 in. RIMGUARD Metal Band Protected 0·3A, 6·3V Heater

Features

- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass, light transmission 52%
- Maximum Neck diameter 29·4 mm
- Maximum Overall length 243·0 mm

Operating

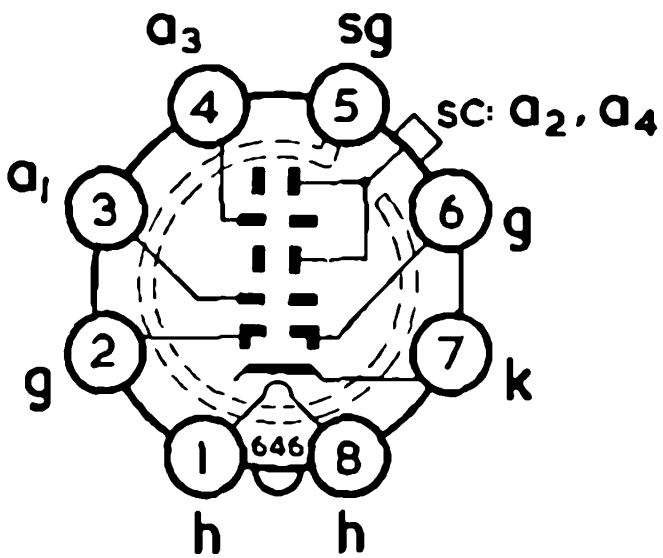
Sparkguard R tubes may only be used in sets providing protection circuit, as on page 99.

Typical Operation

$V_{a_2+a_4}$	12	kV
V_{a_1}	400	V
V_{a_3} (focus)	0 to 400	V
V_k for cut-off	36 to 66	V

B8H Sparkguard R Base

CT8 side contact



CME1601 S

16 in. UNPROTECTED*
0·3A, 6·3V Heater

Features

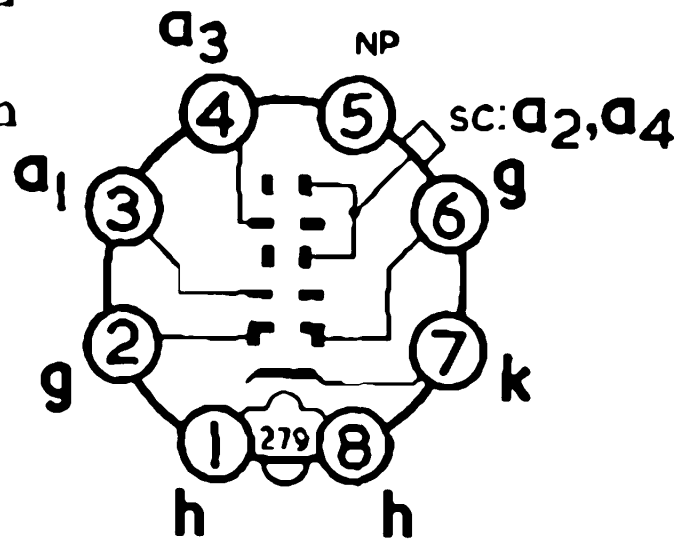
Short neck
110° deflection
Electrostatic focus
Straight gun
External 'dag
Aluminised screen
Grey glass,
light transmission
65%
Maximum Neck
diameter 29·4 mm
Maximum Overall
length 278·5 mm

Typical Operation

V_{a2+a4}	16	kV
V_{a1}	500	V
V_{a3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard S Base

CT8 side contact



• Requires implosion protection.

CME1602 S

16 in. RIMGUARD II
Metal Shell Protected
0·3A, 6·3V Heater

Features

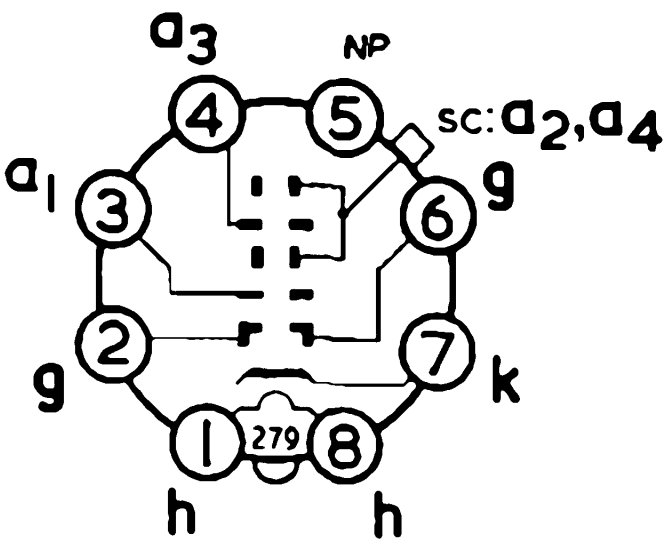
Two-part anti-implosion shell
Mounting lugs
110° deflection
Electrostatic focus
External 'dag
Aluminised screen
Grey glass, light transmission 65%
Maximum Neck diameter 29·4 mm
Maximum Overall length 278·5 mm

Typical Operation

V_{a2+a4}	16	kV
V_{a1}	500	V
V_{a3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard S Base

CT8 side contact



CME1702

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

Features

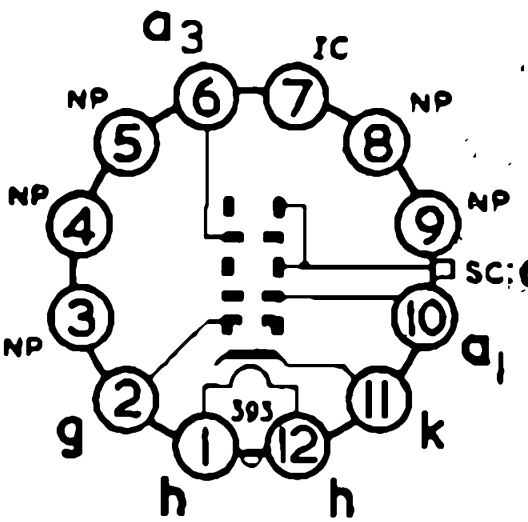
90° deflection
Electrostatic focus
Straight gun
External 'dag
Aluminised screen
Grey glass,
light transmission 74%
Maximum Neck
diameter 38 mm
Maximum Overall
length 383 mm

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.

CME1703

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

Features

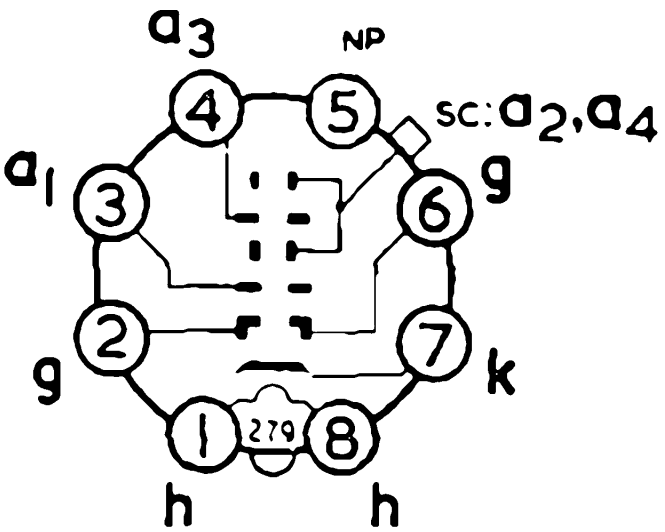
110° deflection
Electrostatic focus
Straight gun
External 'dag
Aluminised screen
Grey glass,
light transmission 75%
Maximum Neck
diameter 29·4 mm
Maximum Overall
length 324 mm

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

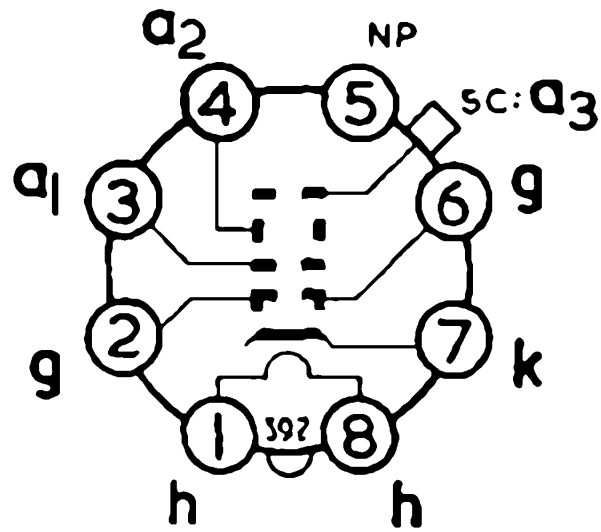
Short neck
110° deflection
Electrostatic focus
External 'dag
Aluminised screen
Grey glass,
light transmission
75%
Maximum Neck
diameter 29·4 mm
Maximum Overall
length 290·5 mm

Typical Operation

V_{a2}	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



* Requires implosion protection.

CME 1713R

17 in. RIMGUARD III Metal Shell Protected 0·3A, 6·3V Heater

Features

Push-through
Mounting lugs
110° deflection
Electrostatic focus
4 : 3 aspect ratio
Aluminised screen
Grey glass, light transmission 48%
Maximum Neck diameter 29·4 mm
Maximum Overall length 291 mm

Warning

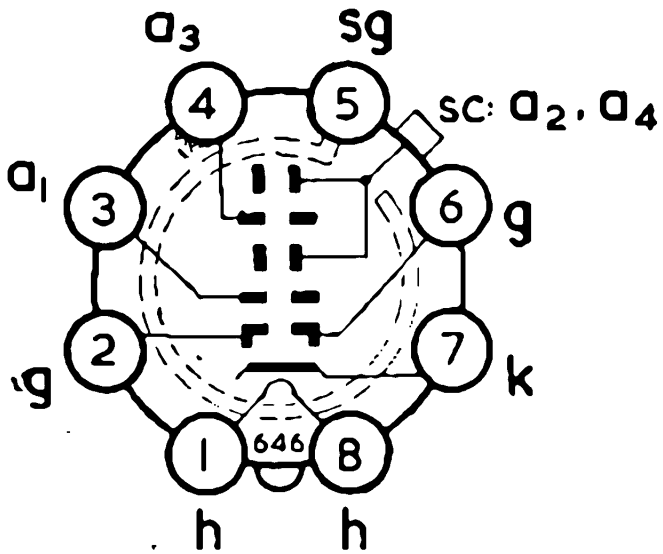
Sparkguard R tubes may only be used in sets providing protection circuit, as on page 99.

Typical Operation

$V_{a_2+a_4}$	17	kV
V_{a_1}	500	V
V_{a_3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard R Base

CT8 side contact



CME1902

19 in. UNPROTECTED*
0·3A, 6·3V Heater

Features

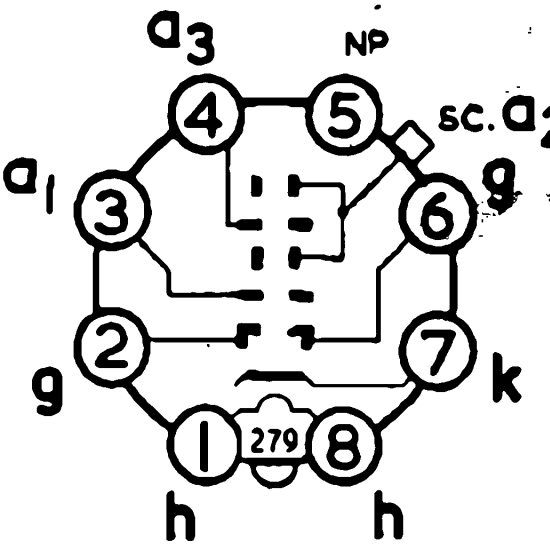
110° deflection
Electrostatic focus
Straight gun
External 'dag
Aluminised screen
Grey glass,
light transmission 75%
Maximum Neck diameter 29·4 mm
Maximum Overall length 330 mm

Typical Operation

V_{a2+a4}	16	kV
V_{a1}	400	V
V_{a3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Base

CT8 side contact



• Requires implosion protection.

CME1903 S

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

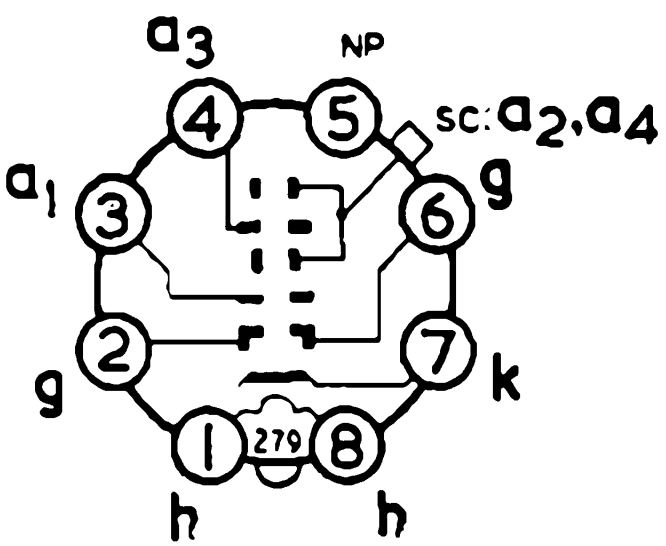
Maximum Overall
length 309 mm

Typical Operation

V_{a2+a4}	18	kV
V_{a1}	500	V
V_{a3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard S Base

CT8 side contact



* Requires implosion protection.

CME1905 S

19 in. RIMGUARD I
Metal Shell Protected
0·3A, 6·3V Heater

Features

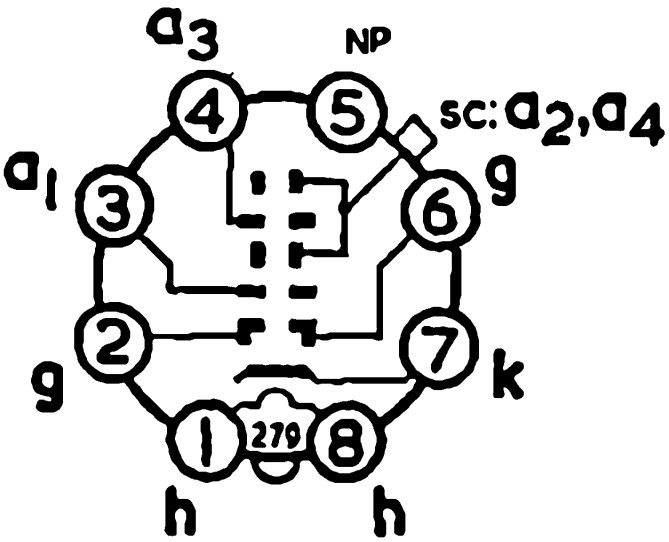
- Integral mounting lugs
- 110° deflection
- Electrostatic focus
- External 'dag
- Aluminised screen
- Grey glass, light transmission 50%
- Maximum Neck diameter 29·4 mm
- Maximum Overall length 309 mm

Typical Operation

V_{a2+a4}	18	kV
V_{a1}	500	V
V_{a3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard S Base

CT8 side contact



CME1906 S

19 in. TWIN PANEL
Bonded Glass Cap Protected
0·3A, 6·3V Heater

Features

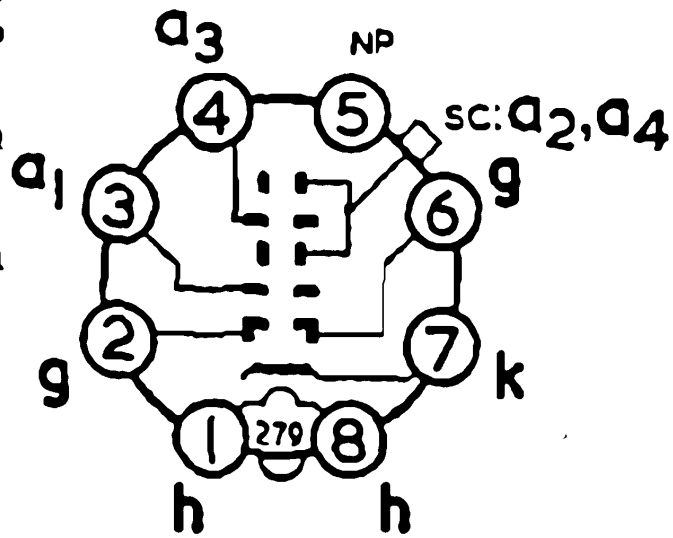
Glass twin panel
Short neck
110° deflection
Electrostatic focus
Straight gun
External 'dag
Aluminised screen
Grey glass, bulb and panel, light transmission 65%
Maximum Neck diameter 29·4 mm
Maximum Overall length 317 mm

Typical Operation

$V_{a_2+a_4}$	18	kV
V_{a_1}	500	V
V_{a_3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard S Base

CT8 side contact



CME1907 S

19 in. RIMGUARD II
Metal Shell Protected
0·3A, 6·3V Heater

Features

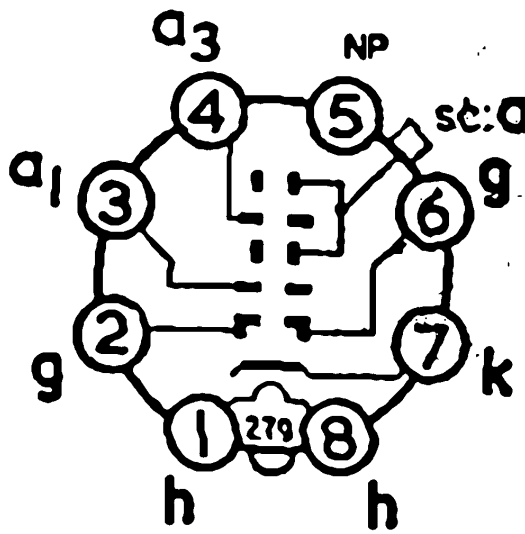
Two-part anti-implosion shell
Mounting lugs
110° deflection
Electrostatic focus
External 'dag
Aluminised screen
Grey glass, light transmission 50%
Maximum Neck diameter 29·4 mm
Maximum Overall length 309 mm

Typical Operation

$V_{a_2+a_4}$	18	kV
V_{a_1}	500	V
V_{a_3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard S Base

CT8 side contact



CME1908 S

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

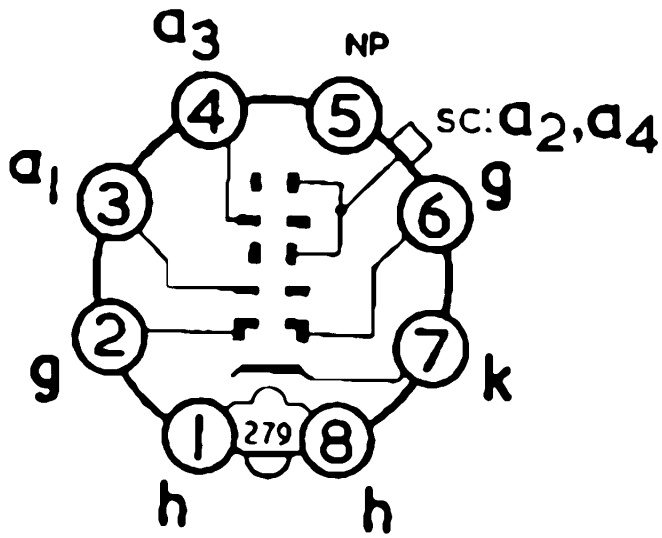
Maximum Overall length 309 mm

Typical Operation

$V_{a_2+a_4}$	18	kV
V_{a_1}	500	V
V_{a_3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard S Base

CT8 side contact



• Requires implosion protection.

CME1913 S & CME1913 R

19 in. RIMGUARD III
Metal Shell Protected
0·3A, 6·3V Heater

Features

- Push-through presentation
- 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

Warning

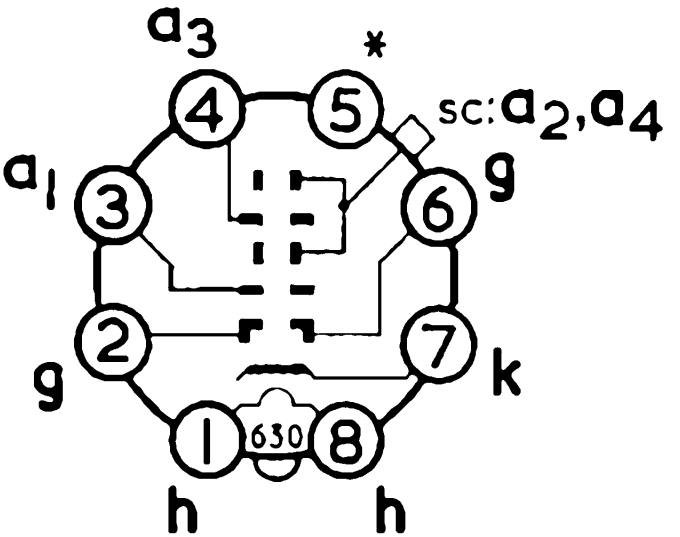
Sparkguard R tubes may only be used in sets providing protection circuit, as on page 99.

Typical Operation

$V_{a_2+a_4}$	18	kV
V_{a_1}	500	V
V_{a_3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard S or R Base

CT8 side contact



CME2013 R

20 in. RIMGUARD III
Metal Shell Protected
0·3A, 6.3V Heater

Features

Push-through
Integral mounting lugs
4 : 3 aspect ratio
110° deflection
Electrostatic focus
External 'dag
Aluminised screen
Grey glass, light transmission 41%
Maximum Neck diameter 29·4 mm
Maximum Overall length 319 mm

Warning

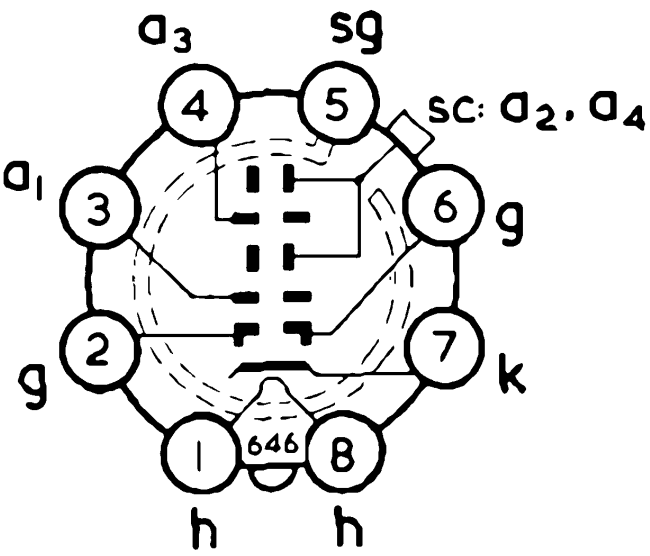
Sparkguard R tubes may only be used in sets providing protection circuit, as on page 99.

Typical Operation

$V_{a_2+a_4}$	18	kV
V_{a_1}	500	V
V_{a_3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard R Base

CT8 side contact



CME2101

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

Features

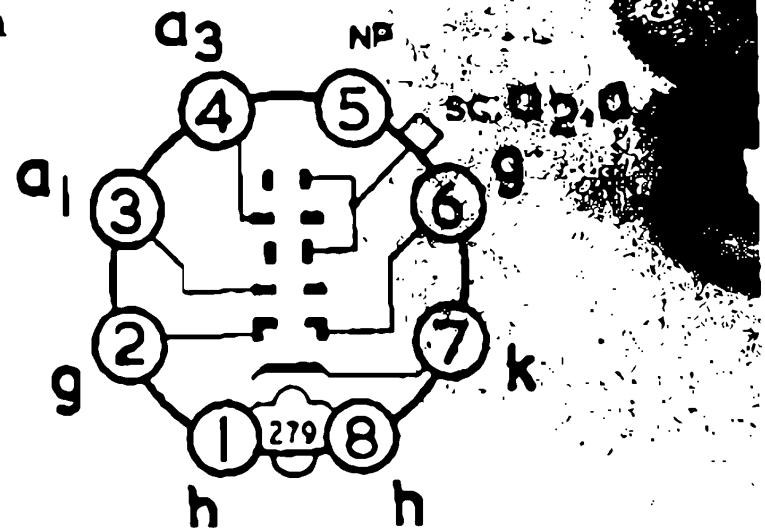
110° deflection
Electrostatic focus
Straight gun
External 'dag
Aluminised screen
Grey glass,
light transmission
74%
Maximum Neck
diameter 29·4 mm
Maximum Overall
length 378 mm

Typical Operation

V_{a2+a4}	14	kV
V_{a1}	300	
V_{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

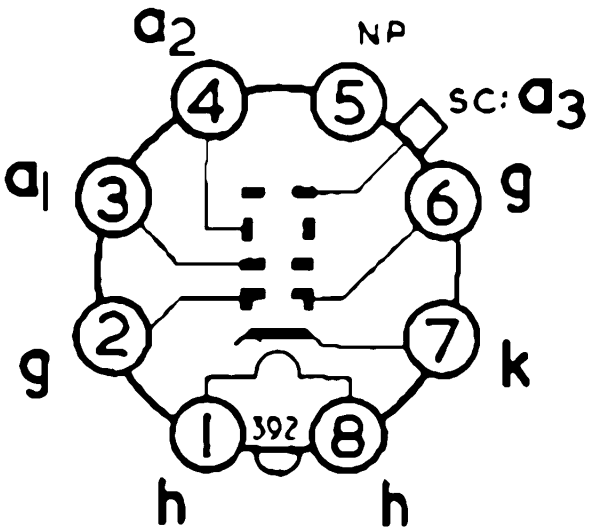
- Short neck
- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass, light transmission 74%
- Maximum Neck diameter 29·4 mm
- Maximum Overall length 344·5 mm

Typical Operation

V_{a3}	16	kV
V_{a1}	500	V
V_{a2} (focus)	0 to 400	V
V_k for cut-off	31 to 69	V

B8H Base

CT8 side contact



* Requires implosion protection.

CME2301

23 in. UNPROTECTED*
0·3A, 12·6V Heater

Features

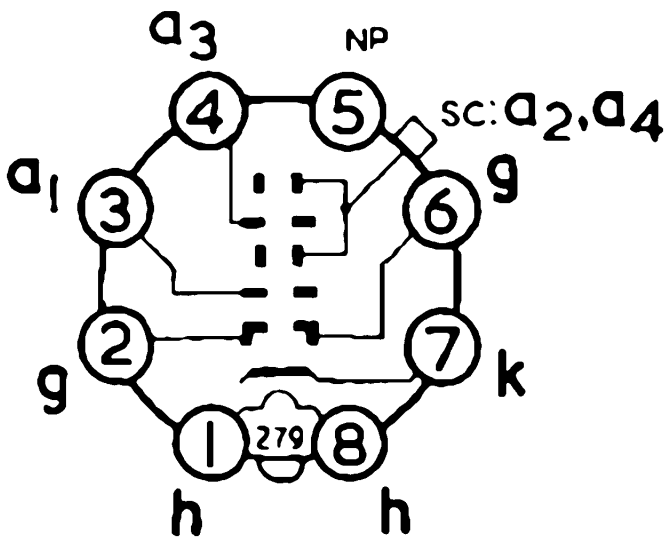
110° deflection
Electrostatic focus
Straight gun
External 'dag
Aluminised screen
Grey glass, light transmission 75%
Maximum Neck diameter 29·4 mm
Maximum Overall length 386 mm

Typical Operation

V_{a2+a4}	16	kV
V_{a1}	500	V
V_{a3} (focus)	0 to 400	V
V_k for cut-off	38 to 69	V

B8H Base

CT8 side contact



* Requires implosion protection.

CME2302

23 in. UNPROTECTED*
0·3A, 6·3V Heater

Features

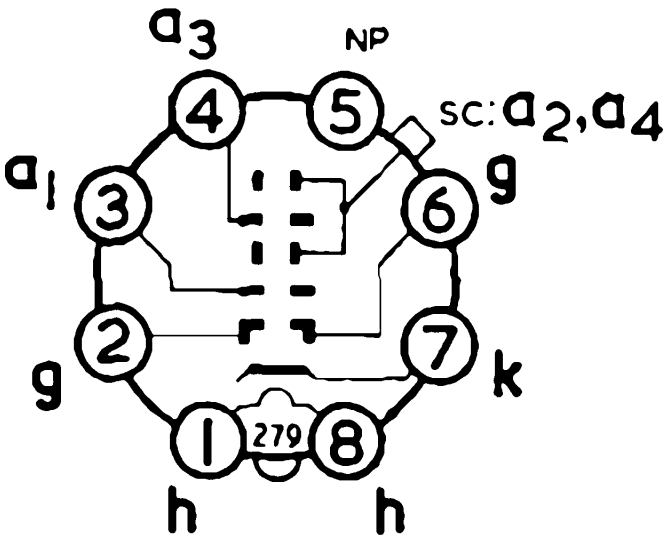
110° deflection
Electrostatic focus
Straight gun
External 'dag
Aluminised screen
Grey glass, light transmission 74%
Maximum Neck diameter 29·4 mm
Maximum Overall length 386 mm

Typical Operation

$V_{a_{2+a_4}}$	16	kV
V_{a_1}	400	V
V_{a_3} (focus)	0 to 400	V
V_k for cut-off	35 to 78	V

B8H Base

CT8 side contact



* Requires implosion protection.

CME2305 S

23 in. RIMGUARD I
Metal Shell Protected
0·3A, 6·3V Heater

Features

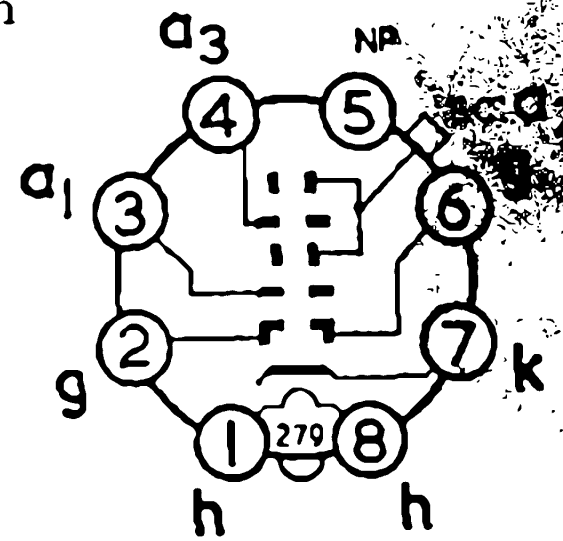
Integral mounting lugs
110° deflection
Electrostatic focus
External 'dag
Aluminised screen
Grey glass, light transmission approx. 45%
Maximum Neck diameter 29·4 mm
Maximum Overall length 367 mm

Typical Operation

$V_{a_2+a_4}$	18	kV
V_{a_1}	500	
V_{a_3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard S Base

CT8 side contact



CME2306 S

23 in. TWIN PANEL
Bonded Glass Cap Protected
[illegible] 6·3V Heater

[illegible]tures

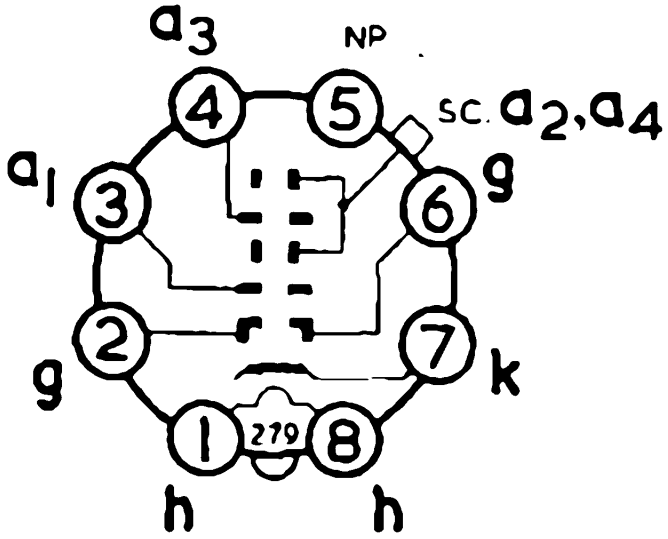
- [illegible]lass twin panel
- [illegible]hort neck
- [illegible]110° deflection
- [illegible]lectrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass, bulb and panel, [illegible]ght transmission 45%
- [illegible]mum Neck diameter 29·4 mm
- [illegible]aximum Overall length 374 mm

Typical Operation

$V_{a_2+a_4}$	18	kV
V_{a_1}	500	V
V_{a_3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard S Base

CT8 side contact



CME2308 S

23 in. UNPROTECTED*
0·3A, 6·3V Heater

Features

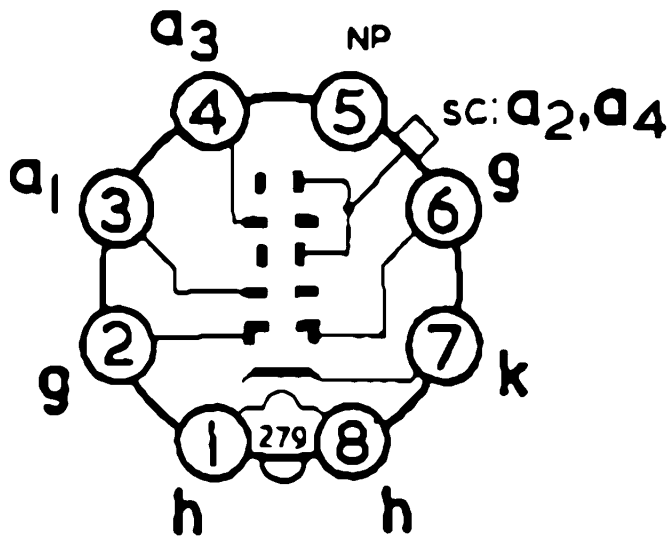
Dark screen
Short neck
110° deflection
Electrostatic focus
Straight gun
External 'dag
Aluminised screen
Grey glass, light transmission 45%
Maximum Neck diameter 29·4 mm
Maximum Overall length 367 mm

Typical Operation

V_{a2+a4}	18	kV
V_{a1}	500	V
V_{a3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard S Base

CT8 side contact



* Requires implosion protection.

CME2312 S

23 in. RIMGUARD II
Metal Shell Protected
0·3A, 6·3V Heater

Features

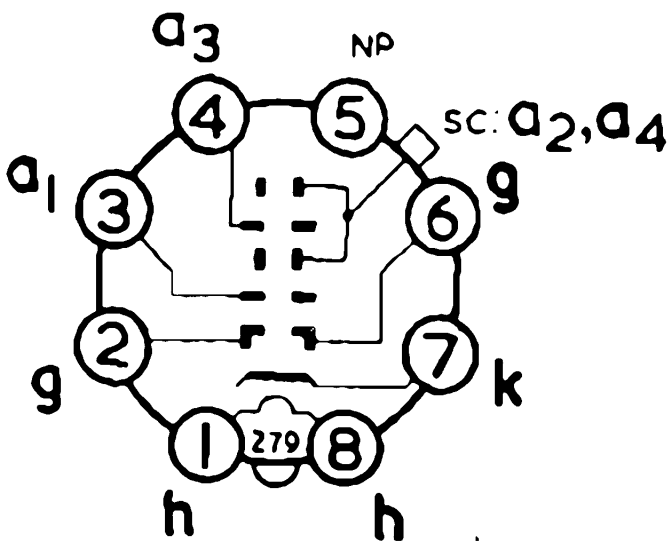
Two-part anti-implosion shell
Mounting lugs
110° deflection
Electrostatic focus
External 'dag
Aluminised screen
Grey glass, light transmission 45%
Maximum Neck diameter 29·4 mm
Maximum Overall length 367 mm

Typical Operation

V_{a2+a4}	18	kV
V_{a1}	500	V
V_{a3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard S Base

CT8 side contact



CME2313 S & CME2313 R

23 in. RIMGUARD III
Metal Shell Protected
0·3A, 6·3V Heater

Features

- Push-through presentation
- Mounting lugs
- 110° deflection
- Electrostatic focus
- External 'dag
- Aluminised screen
- Grey glass, light transmission 45%
- Maximum Neck diameter 29·4 mm
- Maximum Overall length 367 mm

Warning

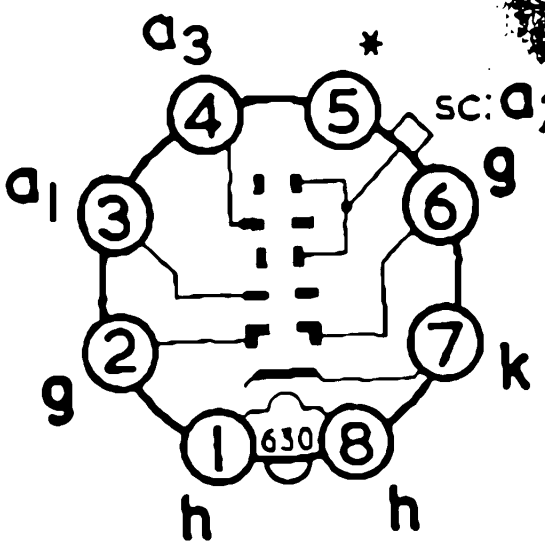
Sparkguard R tubes may only be used in sets providing protection circuit, as on page 99.

Typical Operation

$V_{a_2+a_4}$	18	kV
V_{a_1}	500	V
V_{a_3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard S or R Base

CT8 side contact



• NP for Sparkguard S Sg for Sparkguard R

CME2413 R

24 in. RIMGUARD III
Metal Shell Protected
0·3A, 6·3V Heater

Features

- Push-through
- Integral mounting lugs
- 110° deflection
- Electrostatic focus
- External 'dag
- Aluminised screen
- Grey glass, light transmission 52%

Maximum Neck diameter 29·4 mm

Maximum Overall length 370 mm

Warning

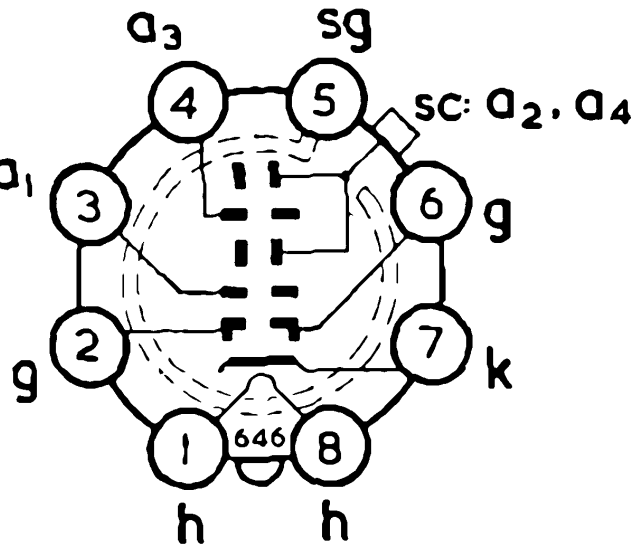
Sparkguard R tubes may only be used in sets providing protection circuit, as on page 99.

Typical Operation

$V_{a_2+a_4}$	18	kV
V_{a_1}	500	V
V_{a_3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard R Base

CT8 side contact



CME2501 S

25 in. RIMGUARD I
Metal Shell Protected
0·3A, 6·3V Heater

Features

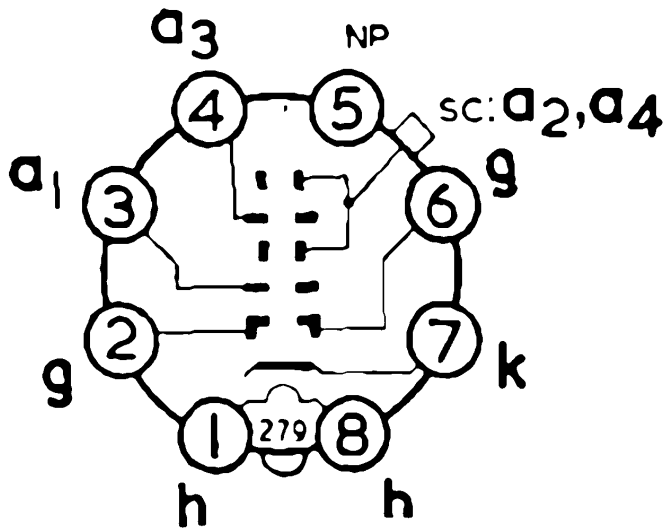
Integral mounting lugs
110° deflection
Electrostatic focus
External 'dag
Aluminised screen
Grey glass,
light transmission
approx. 42%
Maximum Neck
diameter 29·4 mm
Maximum Overall
length 389 mm

Typical Operation

$V_{a_2+a_4}$	18	kV
V_{a_1}	500	V
V_{a_3} (focus)	0 to 400	V
V_k for cut-off	45 to 80	V

B8H Sparkguard S Base

CT8 side contact



CRM141 & CRM142

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

Features

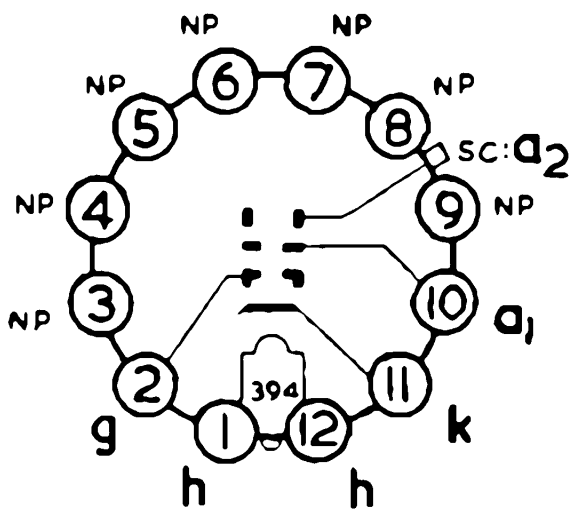
Round face
67° deflection
Magnetic focus
Ion-trap gun
Aluminised screen
Clear bulb CRM141
Tinted bulb CRM142
Maximum Neck diameter 35 mm
Maximum Overall length 474 mm

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.

CRM171 & CRM172

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

Features

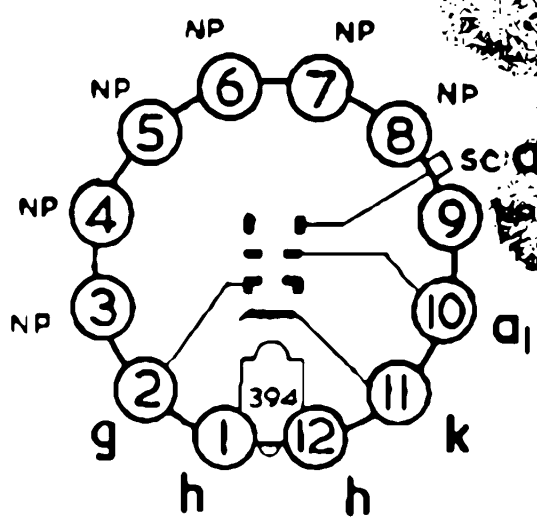
70° deflection
Magnetic focus
Ion-trap gun
External 'dag
CRM172 only
Aluminised screen
Grey glass,
light transmission
75 %
Maximum Neck
diameter 35 mm
Maximum Overall
length 501 mm

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

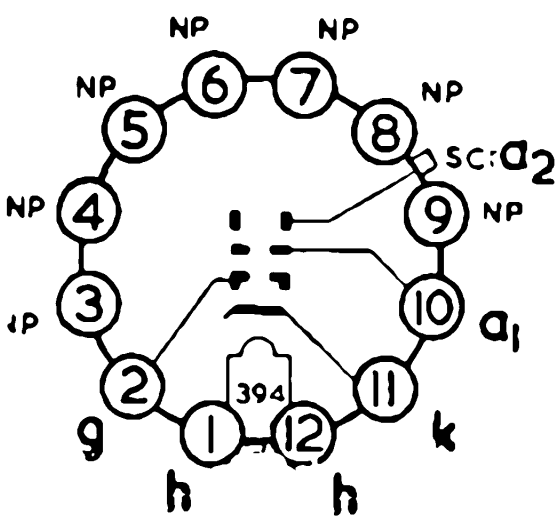
90° deflection
Magnetic focus
Ion-trap gun
External 'dag
Aluminised screen
Grey glass,
light transmission 75%
Maximum Neck
diameter 38 mm
Maximum Overall
length 427 mm

Typical Operation

V_{a_2}	16	kV
V_{a_1}	300	V
V_g for cut-off	−30 to −72	V

B12A Base

CT8 side contact



Requires implosion protection.

CRM174

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

Features

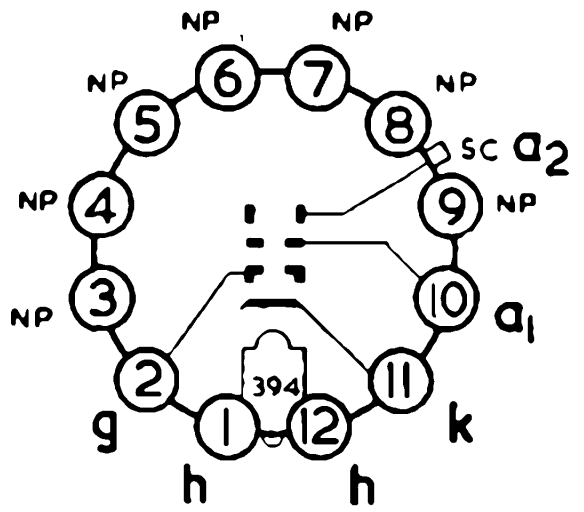
70° deflection
Magnetic focus
Ion-trap gun
External 'dag
Aluminised screen
Grey glass, light transmission 74%
Maximum Neck diameter 38 mm
Maximum Overall length 501 mm

Typical Operation

V_{a_2}	16	kV
V_{a_1}	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

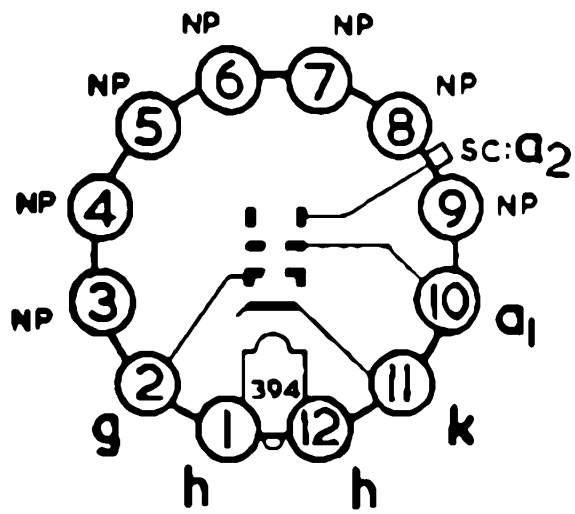
70° deflection
Magnetic focus
Ion-trap gun
External 'dag
Aluminised screen
Grey glass, light transmission 75%
Maximum Neck diameter 38 mm
Maximum Overall length 597 mm

Typical Operation

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

B12A Base

CT8 side contact



* Requires implosion protection.

CRM212

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

Features

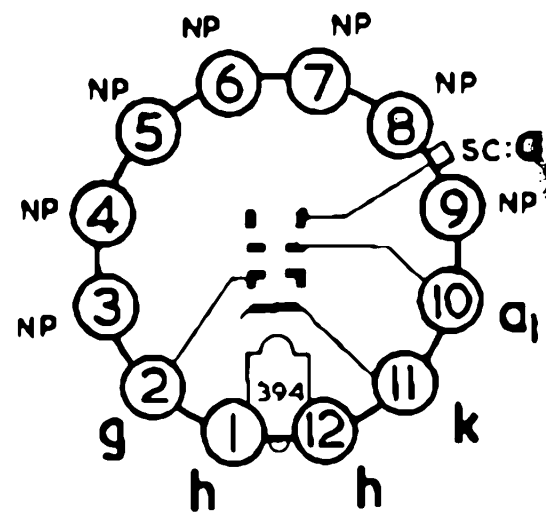
90° deflection
Magnetic focus
Ion-trap gun
External 'dag
Aluminised screen
Grey glass, light transmission 75%
Maximum Neck diameter 38 mm
Maximum Overall length 520 mm

Typical Operation

V_{a_2}	18	kV
V_{a_1}	300	V
V_g for cut-off	−30 to −72	V

B12A Base

CT8 side contact



* Requires implosion protection.

CTA1950	CTA1951
19 in. RIMGUARD I	19 in. RIMGUARD III
See A49-11X	**See A49-191X**
direct equivalent	comparable

CTA2250	CTA2550
22 in. RIMGUARD III	25 in. RIMGUARD I
See A55-14X	**See A63-11X**
comparable	direct equivalent

FENBRIDGE GUARDS ON MAZDA TUBES

Fenbridge Guards were 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 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 Monica Plastics Limited, Northbridge Road, Berkhamsted, Herts. Telephone: Berkhamsted 5303

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. Protective spectacles 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.

SPARKGUARD S

B8H CRT Base for Circuit Protection

Introduced February, 1966
for valve receivers

1. Description

A metal plate within the B8H tube base, which is taken out to a flat side tag, forms a spark gap to a_1 and a_3 only. The plastic of Sparkguard S is coloured black.

2. Identification

Suffix S after type number, e.g. CME2313 S.

3. Sets using Sparkguard S protection

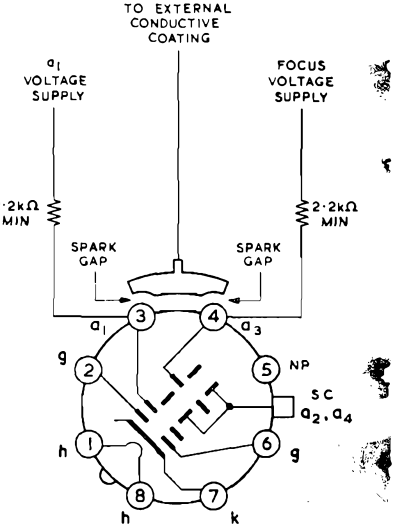
Circuit protection depends on replacement tube being a type with suffix S. Only MAZDA tubes fit Sparkguard S.

4. Sets NOT using Sparkguard S protection

Tubes with Sparkguard S can be used in any set without circuit modification, but in sets designed for Sparkguard R protection the side tag must be bonded to pin 5 on the tube socket.

5. Protection Circuit

This CRT base incorporates spark gaps which are only fully effective when used with the recommended resistors in the connecting leads. These resistors, preferably solid carbon, should have a minimum surface leakage path between leads of 10 mm (e.g. at least $\frac{1}{2}$ W size).



Circuit for Sparkguard S

S tubes may replace R tubes — see note 4.

SPARKGUARD R

B8H CRT Base for Circuit Protection

Introduced 1968
for transistor receivers

6. Description

A metal ring within the B8H base, which is taken out to pin 5, forms a spark gap to all electrodes except a_2 and a_4. The plastic of Sparkguard R is coloured light blue.

7. Identification

Suffix *R* after type number, e.g. *CME2313 R.*

8. Sets using Sparkguard R protection

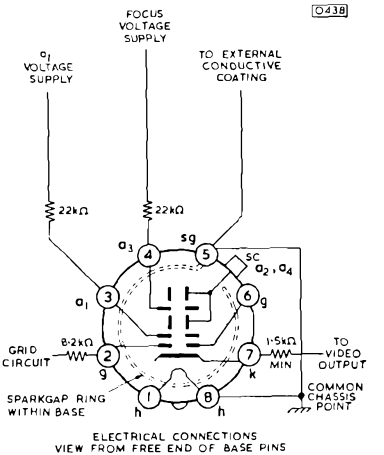
Full circuit protection depends on the replacement tube being a type suffix R. If using a tube with suffix S, see note 4 on opposite page.

9. Sets NOT using Sparkguard R protection

Tubes with Sparkguard R base must NOT be used unless the set is modified according to the diagram on the right.

10. Protection Circuit

This CRT base incorporates spark gaps which are only fully effective when used with the recommended resistors in the connecting leads. These resistors, preferably solid carbon, should have a minimum surface leakage path between leads of 10 mm (e.g. at least ½ W size).



Circuit for Sparkguard R

R tubes may NOT replace S tubes — except as note 9.

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 dealers' service departments to investigate any complaints concerning the quality of MAZDA valves or picture tubes.

Retailers wishing to use this service should first collect as much factual evidence as possible.

An investigation may then be requested via the MAZDA Valve Representative or in writing direct to the address on this page. If urgent, dealers are welcome to telephone direct to the MAZDA T.L.O. at the same address. The MAZDA T.L.O. will collect and analyse the evidence, confer wth the MAZDA and setmaker laboratories, factories and service departments and recommend corrective action.

MAZDA MAINTENANCE SALES DEPARTMENT

Thorn Radio Valves & Tubes Ltd,

7 Soho Square, London, W1V 6DN. Telephone: 01-437 5233

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 fuller data on *Obsolescent* types, please refer to earlier editions of this booklet.

MAZDA

OBSOLESCENT

VALVES and PICTURE TUBES

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
1C2	HF Pentagrid	1·4	0·05	85	30	—	0·7	—
1M1	Side Viewed Tuning Indic. Ball & Line	1·4	0·025	90	—	0	0·25	—
6C10	HF Troide Hexode FC	6·3	0·23	(T) 250 (H) 250	— 85	— −2	4·8 3·0	— 0·75 gc
6D1	TV Signal Diode	6·3	0·15	350 P.I.V.	—	—	5	—
6F1	HF Screened Pentode	6·3	0·35	200	200	−1·8	10	9
6F13	HF 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	HF Vari-mu Pentode	6·3	0·2	250	100	−2·5	7	2·3
6F18	HF Vari-mu Pentode	6·3	0·2	175	100	−1·3	12	4·4
6K25	Thyratron (Helium gas)	6·3	1	400	—	—	2·5	—
6L18	HF Oscillator Triode	6·3	0·3	250	μ17	Ra 47 kΩ	4·5	—
6LD20	Double Diode AF Triode	6·3	0·25	(T)260	μ31·5	−3	2	3·4
6P25	AF Beam Tetrode	6·3	1·1	258	258	—	40	8·8

VALVE TYPE	BASE	PIN CONNECTIONS									
		1	2	3	4	5	6	7	8	9	TC
1C2	B7G	f(−)	a	g_2	g_1	g_4	g_3	f(+)	—	—	—
1M1	B8D	g	IC	NC	f	f	NC	NC	a	—	—
6C10	B8A	h	a_h	a_t	g_t g_3	g_2 g_4	g_1	K.s.	h	—	—
6D1	B3G	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	—	—
6F18	B9A	k	g_1	k	h	h	s	a	g_2	g_3	—
6K25	I.Oct.	M	h	a	NC	g	NC	h	k	—	—
6L18	B8A	h	a	IC	s	IC	g	k	h	—	—
6LD20	B8A	h	a_t	g_1	s	a″ d	a′ d	k	h	—	—
6P25	I.Oct.	M	h	a	g_2	g_1	NP	h	k	—	—

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
10C2	VHF Triode Pentode	28	0·1	(T) 80 (P) 135	μ17 135	$V_{het(pk)}$ 3·25	5 5	2 gc
10D2	Signal Double Diode	19	0·1	P.I.V. 500	—	—	max. 9	—
10F9	HF Vari-mu Pentode	13	0·1	175	100	−2·5	7	2·3
10F18	HF Vari-mu Pentode	13	0·1	175	100	−1·3	12	4·4
10LD3	Double diode AF Triode	14	0·1	(T)100	—	−0·7	0·8	1·4
10LD11	Double Diode AF Triode	15	0·1	(T)150	- -	−2·25	1·25	—
10LD13	Double Diode AF Triode	13	0·1	(T)100	—	−0·7	0·8	1·4
10P13	AF Beam Tetrode	40	0·1	180	150	−6·3	29	7·4
10P14	AF Beam Tetrode	40	0·1	165	175	−9·4	42	7·2
20D1	TV Det. Double Diode Separate Cathodes	9·5	0·2	P.I.V. 500	—	—	max. 50	—
20F2	HF Pentode	11	0·2	250	135	−1·3	27	10·6
20P3	AF Output Beam Tetrode	20	0·2	175	185	—	42	7·2
20P5	AF Beam Tetrode	20	0·2	180	180	−6·3	29	7·4

VALVE TYPE	BASE	PIN CONNECTIONS									
		1	2	3	4	5	6	7	8	9	TC
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	—	—
10F18	B9A	k	g_1	k	h	h	s	a	g_2	g_3	—
10LD3	B8A	h	a	g_1	s	a''_d	a''_d	k	h	—	—
10LD11	B8A	h	a	g_1	s	a''_d	a''_d	k	h	—	—
10LD13	B9A	a	g	l	h	h	a'_d	s	a''_d	I C	—
10P13	B8A	h	a	I C	I C	g_2	g_1	k	h	—	—
10P14	I.Oct.	N C	h	a	g_2	g_1	N P	h	k	—	—
20D1	B7G	k′	a″	h	h	k″	s	a′	—	—	—
20F2	B8A	h	a	s	g_3	g_2	g_1	k	h	—	—
20P3	I.Oct.	N C	h	a	g_2	g_1	N P	h	k	—	—
20P5	B8A	h	a	I C	I C	g_2	g_1	k	h	—	—

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
DK92	HF Pentagrid FC	1·4	0·05	85	30	—	0·7	—
DM71	Tuning Indicator Ball and Line Display	1·4	0·025	90	—	0	0·25	—
ECH42	HF Triode Hexode FC	6·3	0·23	(T) 250 (H) 250	— 85	— −2	4·8 3	— 0·75 gc
EM84	Side Viewed Tuning Indicator, Column Display	6·3	0·21	250	V_t 250	−22 no sig	0·06 no sig	I_t 1·8
SP41	VHF Pentode	4	0·95	200	200	−1·5	10·9	8·5
SP42	Video Output Pentode	4	0·95	200	140	−1·25	27	8·5
SP61	VHF Pentode	6·3	0·6	200	200	−1·5	10·9	—
U801	Multiple Rectifier	80	0·2	P.I.V. 1,500		—	Total 300	—
UABC80	Triple Diode AF Triode	28	0·1	(T) 200	—	−2·3	1	104
UBC81	Double Diode AF Triode	13	0·1	(T) 100	—	−0·7	0·8	1·4
UU8	FW Rectifier	4	2·8	350	C_{res} 16μF	R_{lim} 40Ω	250 (max.)	

VALVE TYPE	BASE	PIN CONNECTIONS									
		1	2	3	4	5	6	7	8	9	TC
DK92	B7G	f—	a	g_2	g_1	g_4	g_3	f,g_5	—	—	—
DM71	B8D	g	IC	NC	f	f	NC	NC	a	—	—
ECH42	B8A	h	a_h	a_t	g_t g_3	g_2 g_4	g_1	k, s	h	—	—
EM84	B9A	g	I C	k, g′	h	h	t	defl	IC	a	—
SP41	M.Oct.	h	k	a	g_2	g_3	M	NP	h	—	g_1
SP42	M.Oct.	h	k	a	g_2	g_3	M	NP	h	—	g_1
SP61	M.Oct.	h	k	a	g_2	g_3	M	NP	h	—	g_1
U801	I.Oct.	k′	h	a'_1	a'_2	a''_1	a''_2	h	k″	—	—
UABC80	B9A	a'''_d	a''_d	k''_d	h	h	a'_d	s,k_t k'_d k'''_d	g	a	—
UBC81	B9A	a	g	k	h	h	a′ d	s	a''_d	IC	—
UU8	M.Oct.	h k	NC	a′	NC	a″	NC or M	NC	h	—	—

TUBE TYPE	DESCRIPTION All tubes are unprotected	HEATER		TYPICAL OPERATION		
		V_h Volts	I_h Amps	V_{g2} kV	V_{a1} Volts	V_{g1} for cut-off
CME141	14 in Rect, 70°, alum	12·6	0·3	12	300	−30 to −72
CME1402	14 in Rect, 90°, alum	12·6	0·3	12	300	−30 to −72
CRM93	9 in Rnd, 57°, alum	12·6	0·3	9	300	−30 to −72
CRM121B	12 in Rnd, 57°	2	1·3	9	—	−45 to −98
CRM123	12 in Rnd, 57°, alum	2	1·3	9	—	−45 to −98
CRM124	12 in Rnd, 57°, alum	12·6	0·3	10	300	−30 to −72
CRM143	14 in Rect, 70°, alum	12·6	0·3	12	300	−30 to −72
CRM151	15 in Rnd, 51°, alum	2	1·3	12	—	−50 to −127
CRM152B	15 in Rnd, 67°, alum	2	1·4	12	—	−59 to −127
CRM153	15 in Rnd, 67°, alum	12·6	0·3	14	300	−30 to −72

PICTURE TUBES

TUBE TYPE	BASE	PIN CONNECTIONS												
		1	2	3	4	5	6	7	8	9	10	11	12	S.C.
CME141	B12A	h	g	NP	NP	NP	a_3	IC	NP	NP	a_1	k	h	a_2 a_4
CME1402	B12A	h	g	NP	NP	NP	a_3	IC	NP	NP	a_1	k	h	a_2 a_4
CRM93	B12A	h	g	NP	NP	NP	NP	NP	NP	NP	a_1	k	h	a_2
CRM121B	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	a_1	k	h	a_2
CRM143	B12A	h	g	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	NC	k	h	a
CRM153	B12A	h	g	NP	NP	NP	NP	NP	NP	NP	a_1	k	h	a_2

EDISWAN Type B 4 in. gas focused electrostatic tube first produced in 1930.

EDISWAN-MAZDA

40 YEARS IN CATHODE RAY TUBES 1930-1970

EDISWAN-MAZDA is Britain's only cathode ray tube manufacturer with 40 years continuous and ever-expanding production.

After the earlier laboratory-made Ediswan Type A series, the Ponders End factory commenced production of Type B for commercial sale in 1930. At this time experimental television transmissions were on the Baird 30-line system, but realising the limitations of mechanically scanned displays Ediswan engineers were looking ahead to the higher definition EMI 180-line and the Baird 240-line systems. Ediswan data sheets, even as early as the Type B tube, claim that they are "suitable for the reception of television images".

In 1936 entertainment television really began, with daily BBC broadcasts alternately on 240 lines and the Marconi-EMI 405-line system, still in use today. First generation receivers were dual-standard, using electrostatically deflected tubes, like the 12-in. Ediswan 12H, but in the same year EDISWAN-MAZDA were first in the world to go into quantity production with a magnetically deflected television tube Type 9MH.

Since 1955, when production moved to Sunderland, MAZDA have made 12,000,000 tubes.

MAZDA, BRITAIN'S MOST EXPERIENCED CRT MAKER

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.

MAZDA

BTH

COSMOS

EDISWAN

OBSOLETE

VALVES and PICTURE TUBES

★ With historical notes

OBSOLETE VALVES

★A	Ediswan Diode Fleming Oscillation Valve
A45	Cosmos Bright Emitter GP Triode
AC/DD	Detector Double Diode
★AC/G	Cosmos (Green Spot) Short-path HF 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. Sector disp
★AC/P	Detector, Video or AF Triode
AC/P1	AF Triode
AC/P4	Ediswan Scanning O/P 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
AR	Ediswan GP Amateur Receiving Bright Emitter Triode
AR(HF)	Ediswan HF Bright Emitter Triode (red line)
AR(LF)	Ediswan AF Bright Emitter Triode (green line)
ARO6	Ediswan GP Triode (dull emitter)
ARO6(HF)	Ediswan HF Triode (red line)
ARO6(LF)	Ediswan AF or Det Triode (green line on base)

★A	The World's first valve for commercial sale. 1906.
★AC/G	Britain's first "close-spaced" valve. 1925.
★AC/HL/DDD	The World's first Triple Diode Triode. 1933.
★AC/P	Longest recorded valve life, 232,592 hours by BBC, 1935 to 1961
★AC/Pen	Britain s first indirectly heated Pentode. 1930.
★AC/S	Britain's first indirectly heated Screened Grid Valve. 1928.
★AC/TH1	Britain's first Triode Hexode. 1937.
★AC/TP	Britain's first Triode Pentode. 1933.

OBSOLETE VALVES

ARDE	Ediswan GP Amateur Receiving Dull Emitter Triode
ARDE(HF)	Ediswan HF Triode (dull emitter)
ARDE(LF)	Ediswan AF or Det Triode (dull emitter)
B2	B.T.H. AF Bright Emitter Power Triode
B3	B.T.H. GP Bright Emitter Triode
B4	B.T.H. AF Output Triode (dull emitter)
B4H	B.T.H. GP Triode (high impedance)
B5	B.T.H. GP Triode (dull emitter)
B5H	B.T.H. HF Triode (high impedance)
B6	B.T H. AF O/P Triode (dull emitter)
B7	B.T.H. AF O/P Triode (dull emitter)
B11	B.T.H. AF Output Triode
BT1	Mazda Relay Thyratron
BD4	Mazda Mercury Rectifying Valve
BU10–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
DE11	Cosmos GP Triode (dull emitter)
DE50	Cosmos GP Triode
DE55	Cosmos GP Triode (dull emit.)
DF92	HF Battery Pentode
DR2	Ediswan Detector Triode
EBC41	Double Diode AF Triode, p. 133
EC91	VHF Triode. See p. 120
EC92	VHF Triode. See p. 121
ECH35	HF Triode Hexode Mixer
ECLL800	AF Triode Double Pentode. See p. 121
EF41	Variable-mu HF Pentode
ELL80	Double AF O/P Pentode. See p. 122
EL95	Audio Output Pentode
EM34	Tuning Indicator (End viewed Double Sector Display)
EM80	Tuning Indicator } Side viewed
EM81	Tuning Indicator } Fan Display
EM85	Tuning Indicator } See p. 122

★D1 Britain's first Television Detector Diode. 1937.
★DC2/HL/DD to DC2/SG/VM World's first range of low consumption (0.1A) DC mains valves. 1931.

OBSOLETE VALVES

ES1	Ediswan Industrial GP Bright Emitter Triode
ES2	Ediswan Ind. GP B/E Triode
EZ40	FW Rectifier. See p. 128
GP2	Ediswan GP Triode
GP4	Ediswan GP Triode
GP210	B.T.H. and Ediswan Det. 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
★HE/AC1	Ediswan Grid Controller Helium Timebase Relay
HF210	B.T.H. and Ediswan HF Triode
HF407	B.T.H. HF Triode
HF410	Ediswan HF Triode
HF 607	B.T.H. HF Triode
HF610	Ediswan HF Triode
HL2	HF, Video 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. p. 123
HL42DD	Dble. 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 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 Det. Triode
LF410A	Ediswan AF and detector Triode
M141LF	Ediswan AF Triode
M141RC	Ediswan Voltage Ampl. Triode
ME41	Tuning Indicator } End viewed
ME91	Tuning Indicator } Sector
ME920	Tuning Indicator } Display
★MR/AC1	Ediswan Grid Controlled Mercury Vapour Timebase Relay
MU1	Ediswan HT Mercury Vapour half wave rectifier
MU2	Ediswan EHT Mercury Rect.
P41	VHF Oscillator Triode
P61	VHF Oscillator Triode
P215	AF Output Triode
P220	AF Output Triode

★ HE/AC1, MR/AC1 for 30-line TV, 1963

OBSOLETE VALVES

P220A	AF Output Triode
P227	AF Output Pentode
P240	AF Output Triode
P245	AF Output Triode
P415	AF Output Triode
P425	AF Output Triode
P615	AF Output Triode
P625A	AF Output Triode
P625B	AF Output Triode
P650	AF Output Triode
PA20	AF Output Triode
PA40	AF Class AB Output Triode
PD220	AF Class B Double Triode
PD220A	AF Class B Double Triode
Pen24	AF Output Pentode
Pen25	AF Output Pentode
Pen44	AF Output Beam Tetrode
Pen45	AF Output Beam Tetrode. p .123
Pen45DD	Double Diode Beam Tetrode
Pen46	Line Output Beam Tetrode
Pen141	AF Output Pentode
Pen220	AF Output Pentode
Pen220A	AF Output Pentode
Pen230	AF Output Pentode
Pen231	AF Output Pentode
Pen383	AF Output Beam Tetrode
Pen384	AF Output Beam Tetrode
Pen425	AF Output Pentode
Pen453DD	Double Diode Beam Tetrode
Pen1340	AF Output Pentode (car radio)
Pen3520	AF Output Pentode
Pen3820	AF Output Beam Tetrode
PenDD1360	Double Diode AF Pentode (car)
PenDD4020	Double Diode Output Pentode
PenDD4021	Double Diode Beam Tetrode
PP3/250	AF Output Triode
PP3/425	AF Output Triode
PP3/521	AF Output Triode
PP5/400	AF Output Triode
PV2	Ediswan AF Output Triode
PV4	Ediswan AF Output Triode (dull emitter)
PV5(DE)	Ediswan AF Output Triode (dull emitter)
PV6(DE)	Ediswan AF Output Triode (dull emitter)
PV8(DE)	Ediswan AF Output Triode (dull emitter)
PV215	Ediswan Power Triode
PV225	Ediswan Power Triode
PV410	Ediswan Power Triode
PV425	Ediswan Power Triode
PV610	Ediswan Power Triode
PV625	Ediswan Power Triode
PX650	AF Output Pentode
QP25	Audio Output, Class B, Double Pentode
QP230	Audio Output, Class B, Double Pentode
★QP240	Audio Output, Class B, Double Pentode

★QP240 The World's first Double Pentode valve. 1933.

OBSOLETE VALVES

★R	Ediswan GP Bright Emitter Triode (top pip)
R	B.T.H. GP Bright Emitter Triode
RC2	Ediswan AF Triode for RC coupling
RC210	Ediswan AF Triode
RC210	B.T.H. Detector Triode
RC410	Ediswan AF Triode
RC610	Ediswan AF Triode
RC607	B.T.H. Detector Triode
S215A	HF Screened Grid
S215B	HF Screened Grid
S215VM	Variable-mu HF Screened Grid
SG207	B.T.H. and Ediswan HF Screened Grid
SG215	HF Screened Grid
SG410	Ediswan HF Screened Grid
SG610	Ediswan HF Screened Grid
SP16/B	Cosmos (Blue Spot) HF High Gain Shortpath Triode
SP16/G	Cosmos (Green Spot) HF Shortpath Triode
SP16/R	Cosmos (Red Spot) GP Shortpath Triode
SP18/B	Cosmos (Blue Spot) HF Shortpath Triode
SP18/G	Cosmos (Green Spot) GP Shortpath Triode
SP18/R	Cosmos (Red Spot) AF Output Triode
SP18/RR	Cosmos (Double Red Spot) AF Power Shortpath Triode
SP20/PA1	Cosmos AF Power Triode
SP22	HF Screened Pentode
SP41/U	Cosmos Half-wave Shortpath Rectifier
SP42/U	Cosmos Full-wave Shortpath Rectifier
SP43/U	Cosmos Half-wave Shortpath Rectifier
SP45/U	Cosmos Half-wave Shortpath Rectifier
SP55/R	Cosmos (Red Spot) AF Output Triode
SP55/B	Cosmos (Blue Spot)
SP141	HF Screened Pentode
SP181	HF Screened Pentode
SP210	HF Screened Pentode
SP215	HF Screened Pentode
SP610/B	Cosmos (Blue Spot) Shortpath High Gain HF Triode
SP610/G	Cosmos (Green Spot) Shortpath HF Triode
SP610/PA1	Cosmos Shortpath AF Power Triode
SP610/RR	Cosmos (Double Red Spot) Shortpath AF Power Triode
SP1320	HF Screened Pentode
SP2220	Noise or AFC Control Pentode
T11	Timebase Thyratron. See p. 124
T21	Timebase Thyratron. See p. 124

★R The first quantity-produced valve on sale to public in Britain.

OBSOLETE VALVES

★T31	Timebase Thyratron. See p. 124
T32	Timebase Thyratron. See p. 124
T41	Timebase Thyratron. See p. 124
TH41	HF Triode Heptode Mixer
TH233	HF Triode Heptode Mixer
TH2320	HF Triode Heptode Mixer
TH2321	HF Triode Heptode Mixer
TP22	HF Triode Pentode Mixer
TP23	HF Triode Pentode Mixer
TP25	HF Triode Pentode Mixer
TP26	HF Triode Pentode Mixer
TP2620	HF Triode Pentode Mixer
TP1340	HF Triode Pentode Mixer (car)
TS215	B.T.H. AF Triode
U21	Slow heating EHT Rectifier
U22	Slow heating EHT Rectifier
U24	EHT Rectifier. See p. 124
U30/250	Half-wave Rectifier
U65/550	Half-wave Rectifier
U75/300	Half-wave Rectifier
U150/1100	Mazda Hot-Cathode Mercury Vapour Rectifier
U201	Half-wave Rectifier
U222	Ediswan Full-wave Rectifier
U235	Ediswan Full-wave Rectifier
U281	TV Efficiency Diode. See p. 125
U282	TV Efficiency Diode. See p. 125
U403	Half-wave Rectifier
U4020	Half-wave Rectifier
UBC41	Double Diode AF Triode. See p. 135
UC92	HF Triode
UCH42	HF Triode Hexode FC. See p. 126
UD41	HT Doubling Rectifier
UF80	HF Pentode. See p. 126
UL41	AF Output Pentode. See p. 127
UM35	Tuning Indicator (Maltese +)
UU2	Full-wave Rectifier
UU3	FW Rectifier. See p. 127
UU4	FW Rectifier. See p. 127
UU5	FW Rectifier. See p. 127
UU6	FW Rectifier. See p. 128
UU7	FW Rectifier. See p. 128
UU9	FW Rectifier. See p. 128
UU10	FW Rectifier
UU30/250	FW Rectifier
UU60/250	FW Rectifier. See p. 127
UU120/350	FW Rectifier. See p. 127
UU120/500	FW Rectifier. See p. 127
UY41	Half-wave Rectifier. See p. 129
V226	HF Power Pentode
V312	AF Pre-amp Triode
V503	Class AB Output Triode
V914	HF Double Diode
VP22	Vari-mu HF Pentode
VP23	Vari-mu HF Pentode
VP41	Vari-mu HF Pentode
VP133	Vari-mu HF Pentode
VP210	Vari-mu HF Pentode
VP215	Vari-mu HF Pentode
VP1320	Vari-mu HF Pentode
VP1321	Vari-mu HF Pentode
VP1322	Vari-mu HF Pentode

★T31 Britain's first Thyratron designed specially for 405-line TV time bases. 1936.

1D13	Battery HF Diode
1F2	Battery HF Pentode
6C9	HF Triode Heptode. See p. 129
6C31	HF Triode Heptode
6D1	TV Signal Diode See p. 130
6D3	Slow Heating Diode
6F11	HF Pentode. See p. 130
6F16	Variable-mu HF Pentode
6F19	Vari-mu HF Pentode. See p. 131
6F20	Variable-mu HF Pentode
6F25	Vari-mu HF Pentode. See p. 131
6F32	Screened HF Pentode (Industrl.)
6K23	Timebase Thyratron
6L1	GP Double Triode for TV
6L15	VHF Double Triode. See p. 132
6L19	AF Double Triode. See p. 132
6L34	VHF Triode. See p. 133
6LD3	Double Diode AF Triode. See p. 133
6M1	Tuning Indicator (End viewed Sector Display)
6M2	Tuning Indicator (End viewed Maltese Cross)
6P1	AF Output Beam Tetrode. See p. 134
6P26	AF Output Beam Tetrode. See p. 134
6P28	Line Output Beam Tetrode. See p. 135
10C1	HF Triode Heptode
10F3	Screened HF Pentode
10L1	VHF Grounded Grid Triode

VALVES

10LD3	Double Diode AF Triode. See p. 135
10M1	Tuning Indicator (Sector Display)
10M2	Tuning Indicator (End viewed Maltese Cross Display)
12E1	Ediswan Beam Tetrode Stabiliser
20P1	Line Output Beam Tetrode. See p. 136
30C13	VHF Triode Pentode Mixer
30F27	VHF Variable-mu Tetrode
30FL13	Triode Beam Tetrode Sync Sep
30P4	Line Output Beam Tetrode. See p. 136

★9MH	9 in. round, 45°, triode, not aluminised, clear glass,	V_h 2·0 V, I_h 1·5 A
12MH	12 in. round, 45°, triode, not aluminised, clear glass,	V_h 2·0 V, I_h 1·5 A
AW59–91 ..	23 in. Unprotected, 110°, aluminised, 75% glass,	V_h 6·3 V, I_h 0·3 A
CME1901 ..	19 in. Unprotected, 110°, aluminised, 75% glass,	V_h 12·6 V, I_h 0·3 A
CME2303 ..	23 in. Unprotected, 110°, aluminised, 75% glass,	V_h 6·3 V, I_h 0·3 A
CME2307 ..	23 in. Twin Panel	See page 120
CRM71	7 in. round, 54°, triode, not aluminised, clear glass,	V_h 2·0 V, I_h 1·4 A
CRM91	9 in. round, 64°, triode, not aluminised, clear glass,	V_h 2·0 V, I_h 1·4 A
CRM92	9 in. round, 57°, triode, not aluminised, clear glass,	V_h 2·0 V, I_h 1·4 A
CRM92A ..	9 in. round, 57°, triode, not aluminised, clear glass,	V_h 2·0 V, I_h 1·4 A
CRM121 ..	12 in. round, 57°, triode, not aluminised, clear glass,	V_h 2·0 V, I_h 1·4 A
CRM121A ..	12 in. round, 57°, triode, not aluminised, clear glass,	V_h 2·0 V, I_h 1·4 A
CRM152A ..	15 in. round, 67°, triode, aluminised, clear glass,	V_h 2·0 V, I_h 1·4 A
CRM122 ..	12 in. round, 57°, triode, not aluminised	V_h 7·3 V, I_h 0·3 A
CRM144	14 in. rect. 70°, tetrode, aluminised, 75% glass,	V_h 12·6 V, I_h 0·3 A

★9MH World's first magnetically deflected TV picture tube to be produced in quantity. 1936.

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 89 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 EC91

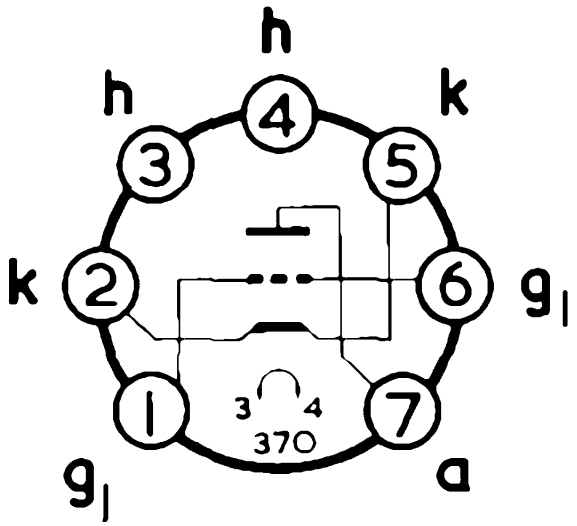
EC91 DATA

VHF Triode
6·3V, 0·3A Heater

Typical Operation

V_a	250	V
V_{g1}	−1·5	V
I_a	10	mA
g_m	8·5	mA/V
μ	90	

B7G



FIT BRIMAR 6AM4

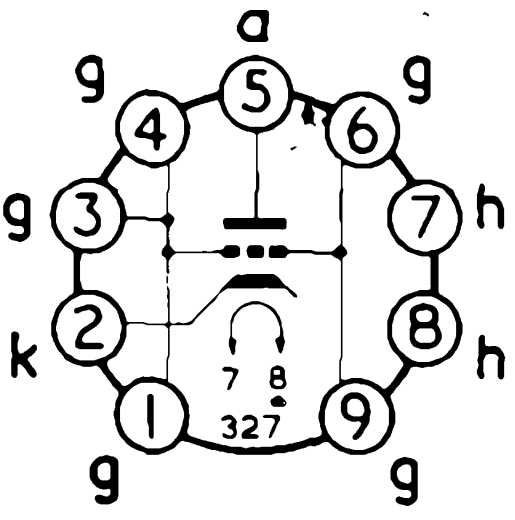
Change socket

Notes:

1. Similar characteristics but the UHF 6AM4 has lower ratings and lower capacitances.
2. Change socket to B9A
3. Check conditions and alignment.

V_a	200	V
I_a	10	mA
μ	85	

B9A



SUBSTITUTION FOR EC92

EC92 DATA

VHF Triode
6·3V, 0·15A Heater

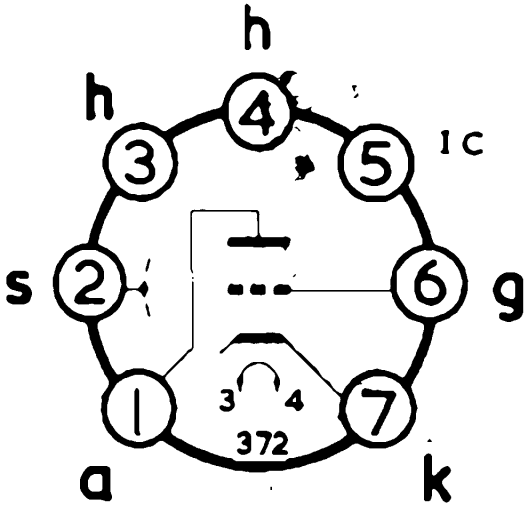
Rating

$P_{a(max)}$	2·5	W

Typical Operation

V_a	250	V
V_g	−2	V
I_a	10	mA
g_m	5·5	mA/V

B7G



FIT ECC81

Change socket

Notes:

1. Change socket to B9A
2. Use only one of the ECC81 triodes.
3. Characteristics are identical to EC92.
4. Connect heaters in parallel by bonding pins 4 and 5.
5. See page 36 for ECC81 data and base connections.

SUBSTITUTION FOR ECLL800

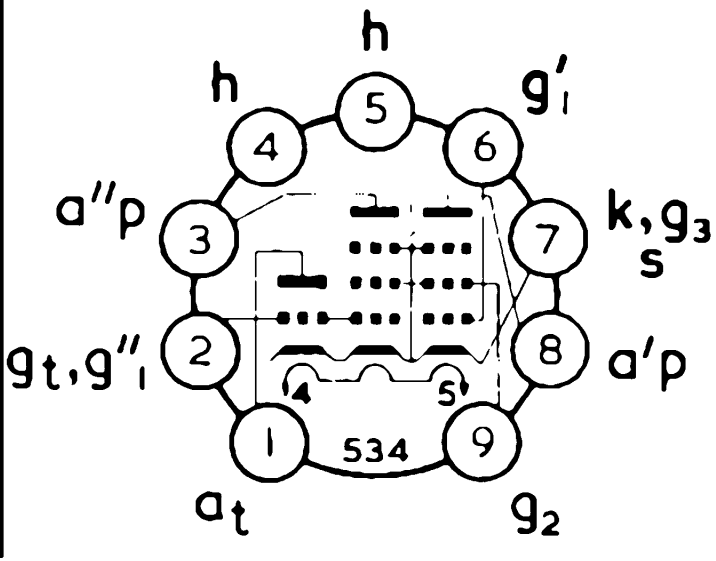
ECLL800 DATA

Triode Double Pentode Phase Inverter and AF Output
6·3V, 0·6A Heater

Typical Operation
in push-pull Class B

	(Pentodes)	
V_a	250	V
V_{g_2}	250	V
V_{g_1}	−11·5	V
I_a	2 × 29	mA
R_{a-a}	10	kΩ
$P_{out(a-a)}$	9·2	W

B9A



FIT 2 × ECL86

Add one socket

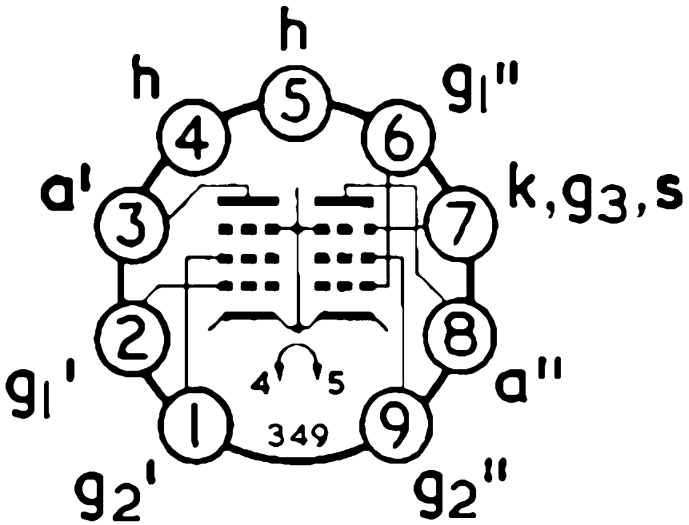
Notes:

1. Fit an additional B9A socket wired for ECL86 pentode only.
2. Change wiring of existing B9A socket for ECL86 triode and pentode.
3. No component changes required.
4. See page 40 for ECL86 data and base connections.

SUBSTITUTION FOR ELL80

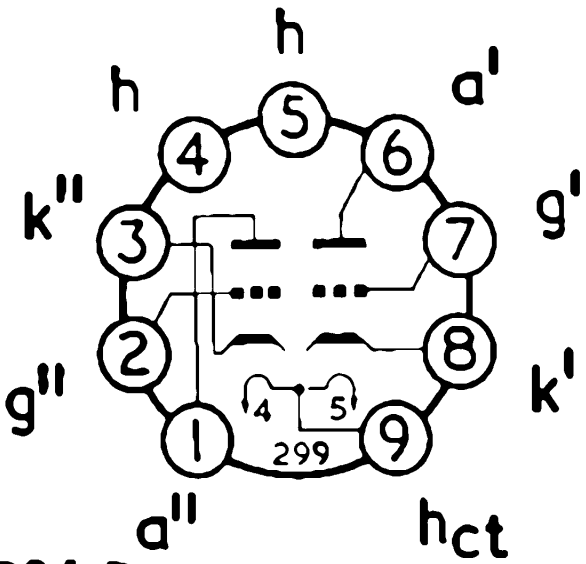
Former socket connections

ELL80



B9A Base

ECC83



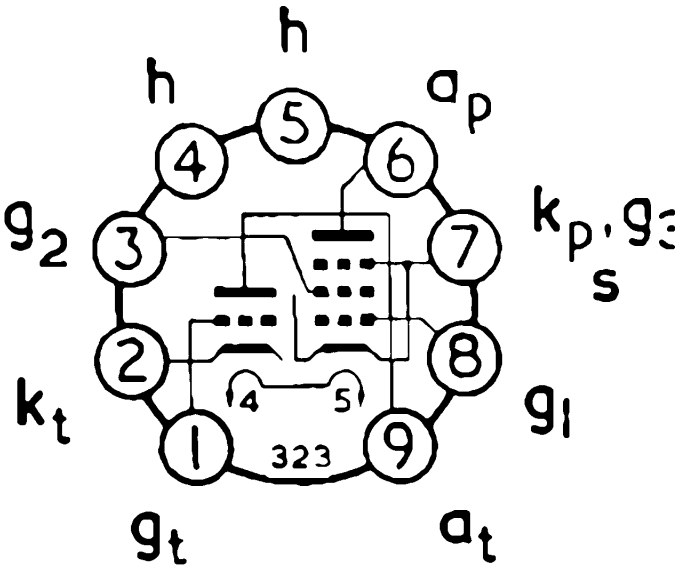
B9A Base

FIT 2 x ECL86

Rewire existing sockets

Note:
In push-pull and stereo amplifiers the ELL80 was usually driven by an ECC83. The replacement of the ECC83 and ELL80 by two ECL86's requires only the rewiring of the two valve bases concerned.

ECL86



B9A Base

SUBSTITUTION FOR EM85

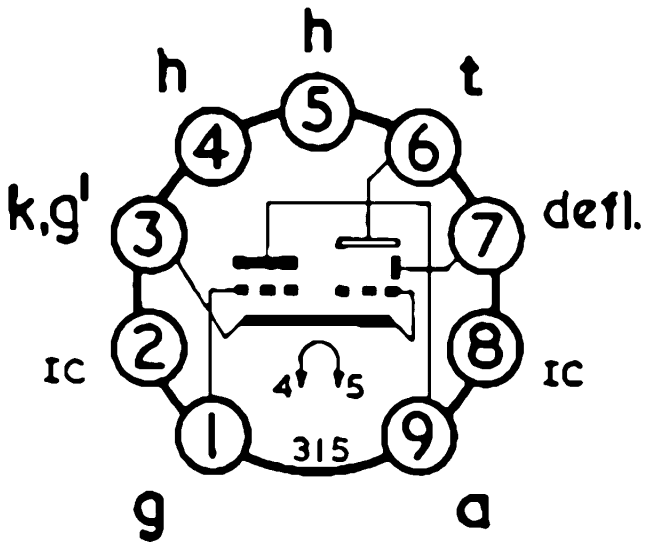
EM85 DATA

Tuning Indicator
Fan Display
6·3V, 0·3A Heater

Typical Operation

$V_{a(b)}$	200		V
V_t	200		V
R_a	470		kΩ
V_g	0	−14	V
I_a	0·4	0·1	mA
I_t	1·4		mA
θ	100	0	°

B9A



FIT EM87

Plug in replacement

Notes:

1. EM87 produces a 'Column' display, whereas EM85 used a side viewed '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 43 for EM87 data.

SUBSTITUTION FOR HL41DD

HL41DD DATA

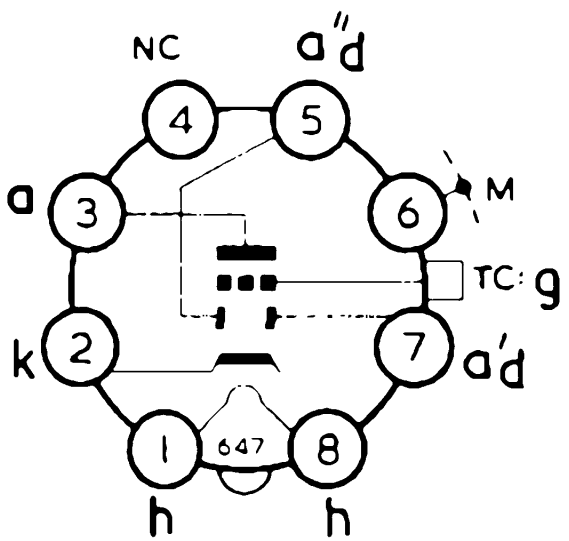
Double Diode
AF Triode
Det. and AF Amplifier
4V, 0·65A Heater

Typical Operation

(*Triode*)

$V_{a(b)}$	250	V
I_a	3·2	mA
R_k	1	kΩ
R_a	30	kΩ
Voltage gain	20	

MAZDA Octal



FIT 6LD20

Change socket

Notes:

1. Change socket to B8A.
2. Increase heater voltage to 6·3 V by fitting additional transformer, or over-winding on existing mains transformer.
3. See page 102 for 6LD20 data and base connections.

SUBSTITUTION FOR Pen 45

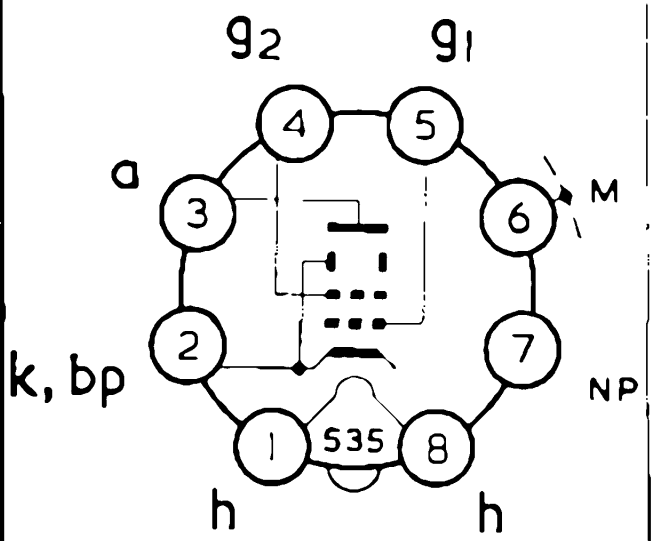
Pen 45 DATA

AF Output Tetrode 4V, 1·75A Heater

Typical Operation

$V_{a(b)}$	250	V
V_{g2}	250	V
V_{g1}	−8·5	V
I_a	40	mA
I_{g2}	8	mA
R_a	5	kΩ
P_{out}	4·5	W

MAZDA Octal



FIT 6P25

Change socket and heater voltage

Notes:

1. Change socket to International Octal.
2. Increase heater supply voltage to 6·3 V by fitting additional transformer, or over-winding on existing mains transformer.
3. See page 102 for 6P25 data and base connections.

SUBSTITUTION FOR T41

and T11, T21, T31, T32

T41 DATA

Thyratron
4V, 1·5A Heater

Ratings

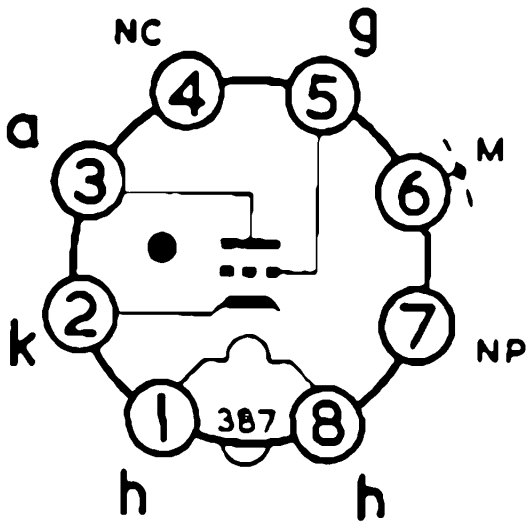
$V_{a(max)}$	400	V
$i_{a(pk)max}$	500	mA

Typical Operation

Control Ratio	20	
R_g	30	kΩ
$I_{a(mean)}$	2·5	mA

Helium gas

MAZDA Octal



FIT 6K25

Change socket and heater voltage

Notes:

1. Change socket to International Octal.
2. Increase heater supply voltage to 6·3 V by fitting additional transformer, or over-winding on existing mains transformer.
3. See page 102 for 6K25 data and base connections.

SUBSTITUTION FOR U24

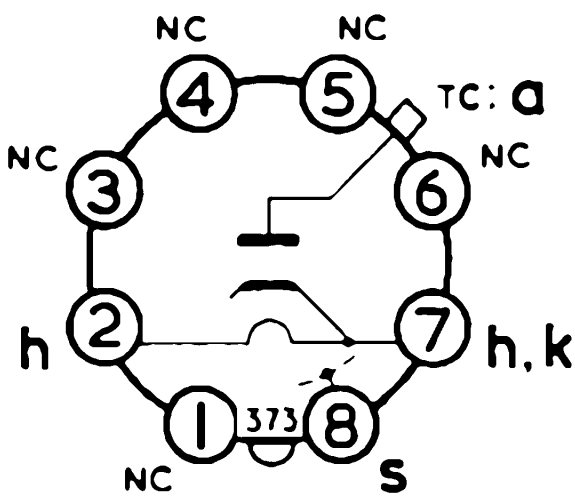
U24 DATA

EHT Rectifier
2V, 0·15A Heater

Ratings
(Pulse Operation)

$P.I.V._{(max)}$	20	kV
$I_{a(max)}$	0·1	mA
$i_{a(pk)max}$	15	mA

Int. Octal



FIT U25

Solder in

Notes:

1. Solder flying leads of U25 heater to existing socket.
   h_K lead to pin 7.
   h lead to pin 2.
2. Solder U25 top lead (anode) to existing top cap.
3. See page 62 for U25 data and connections.

SUBSTITUTION FOR U281

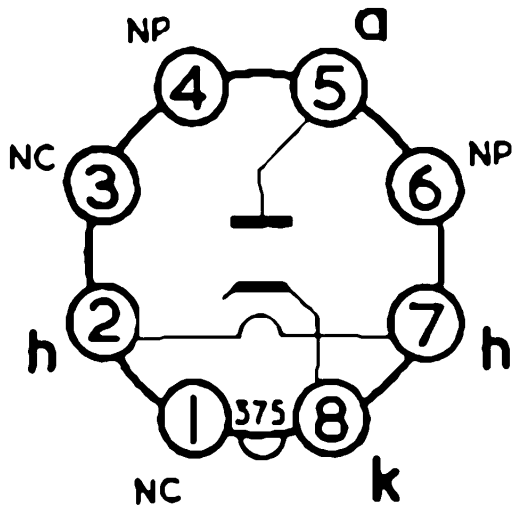
U281 DATA

Efficiency Diode
0·2A, 28V Heater

Ratings

$P.I.V._{(max)}$	3	kV
$I_{a(max)}$	150	mA
$V_{h-k(max)}$	400	V

Int. Octal



FIT U301

Rewire socket

Notes:

1. U301 has higher ratings.
2. Same socket but different connections.
3. U301 will require provision of a top cap cathode connection.
4. See page 64 for U301 data and base connections.

SUBSTITUTION FOR U282

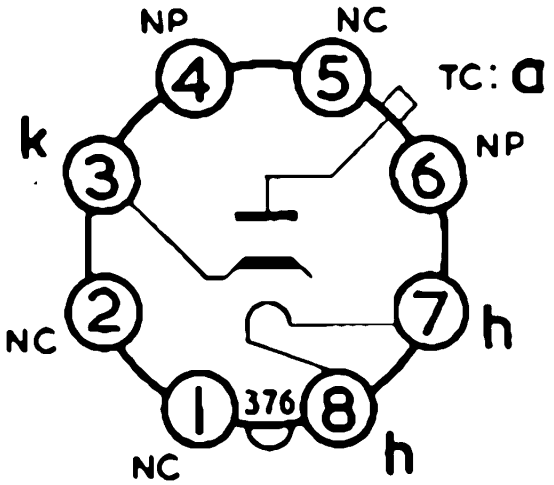
U282 DATA

Efficiency Diode
0·2A, 28V Heater

Ratings

$P.I.V._{(max)}$	4·5	kV
$I_{a(max)}$	150	mA
$V_{h-k(max)}$	400	V

Int. Octal



FIT U301

Rewire socket

Notes:

1. Same socket but different connections.
2. U301 will require provision of a top cap cathode connection.
3. See page 64 for U301 data and base connections.

SUBSTITUTION FOR UCH42

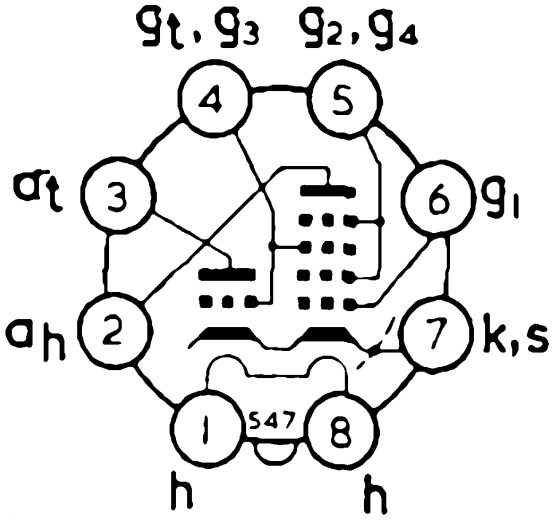
UCH42 DATA

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	V
I_a	5·2	3	mA
I_{g2+g4}	...	3	mA
R_a	22	...	kΩ
R_g	47	...	kΩ

B8A



FIT 10C14

Change socket

Notes:

1. Change socket to B9A.
2. Reduce heater chain dropper by 50Ω.
3. Re-align RF circuits.
4. See page 19 for 10C14 data and base connections.

SUBSTITUTION FOR UF80

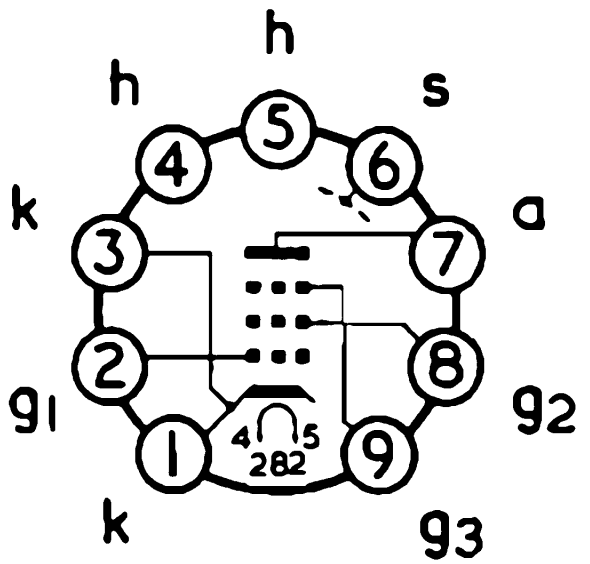
UF80 DATA

HF Pentode
19V, 0·1A Heater

Typical Operation

V_a	200	V
V_{g2}	200	V
V_{g1}	−2·5	V
I_a	10	mA
g_m	7·1	mA/V

B9A



FIT 10FI

Change socket

Notes:

1. Change socket to B8A.
2. 10FI heater drops 22 V in a 0·1 A heater chain, but no modification should be necessary.
3. See page 19 for 10FI data and base connections.

SUBSTITUTION FOR UL41

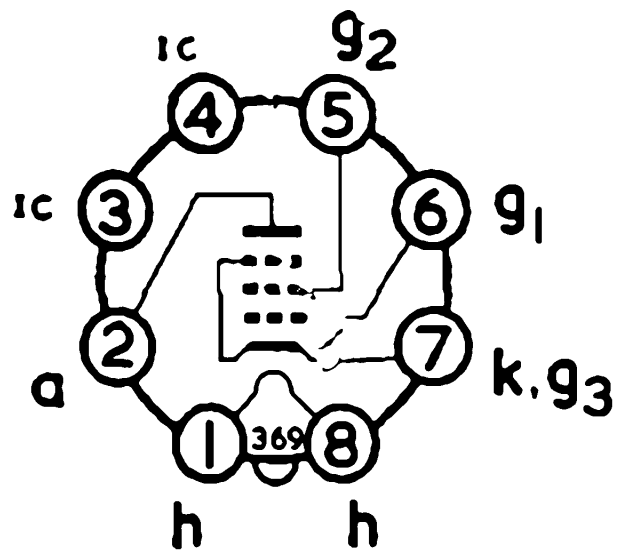
UL41 DATA

Audio Output Pentode 0·1A, 45V Heater

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
g_m	9·5	mA/V
P_{out}	4·2	W

B8A



FIT 10P18

Change socket

Notes:

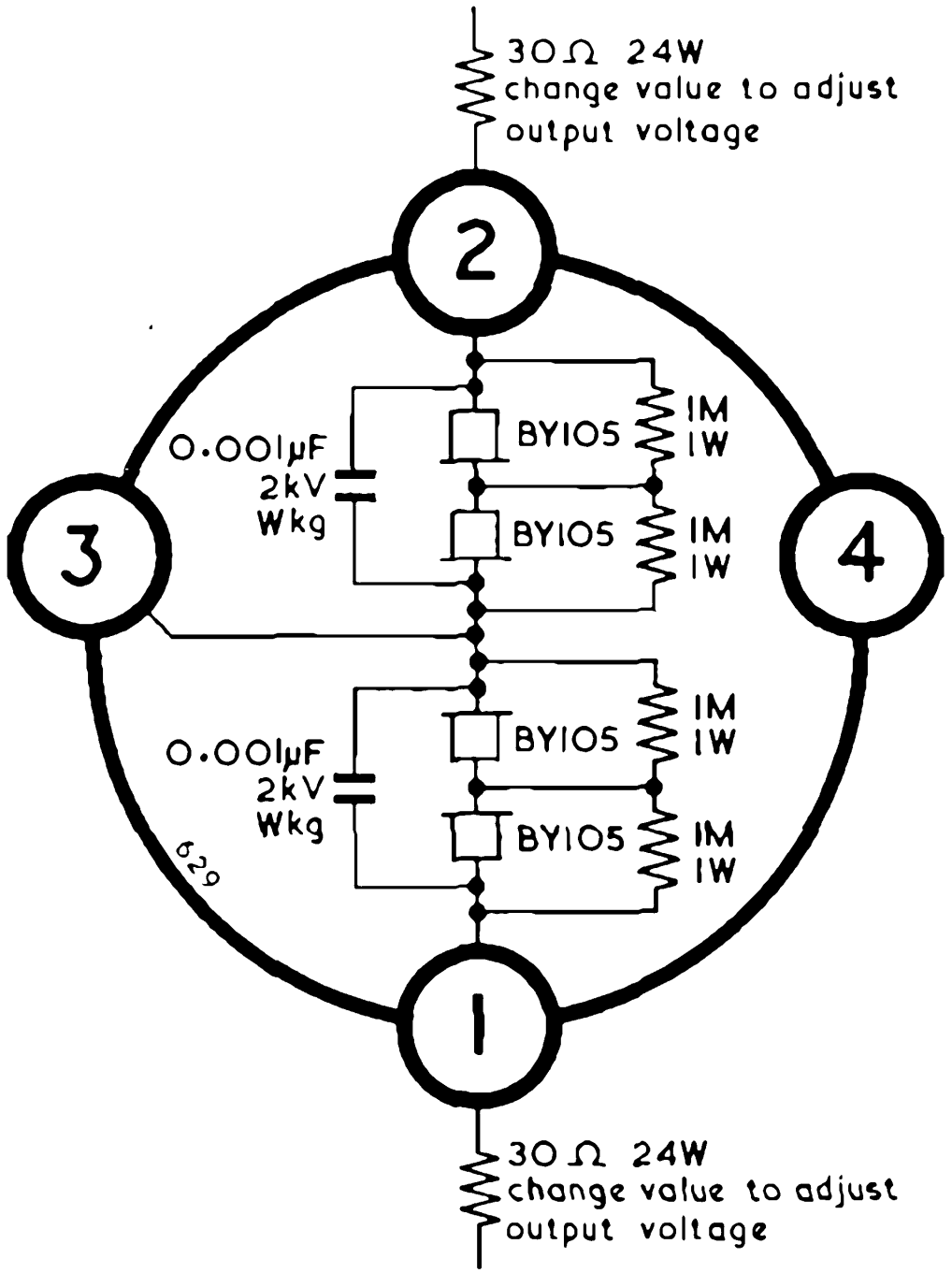
1. Change socket to B9A.
2. Check operating conditions.
3. See page 20 for 10P18 data and base connections.

SUBSTITUTION FOR UU5

and UU3 UU4 UU60/250 UU120/350 UU120/500

FIT 4 × BY105 + Protective Components

New components required in this change to silicon rectifiers are shown connected to the underside of existing UU5 socket.



SUBSTITUTION FOR UU6 & UU7

UU6 and UU7 DATA

F.W. Rectifiers
4V Heaters

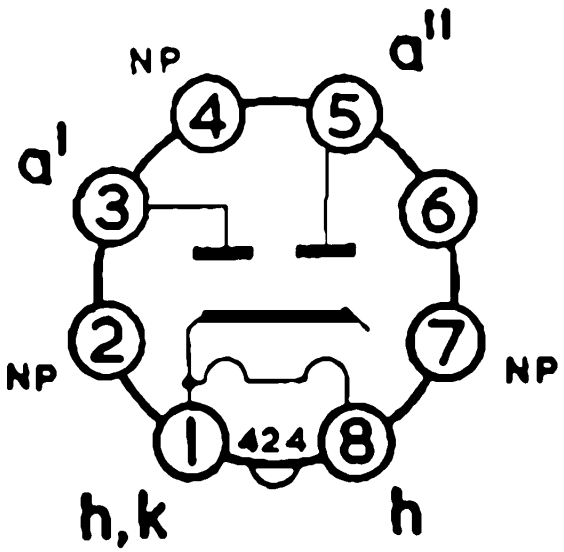
	UU6	UU7	
Ratings			
I_h	1·4	2·3	A
$V_{a(max)}$	350	350	V
$I_{a(max)}$	120	180	mA

Bulbs

Max. diameter
32 45 mm

Max. seated height
84 100 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 higher.
   I_h 2·8 A
   Check transformer for overheating and V_h drop.
3. See page 106 for UU8 data.
4. UU6, UU7 and UU8 valves manufactured before 1951 had a metallised bulb. The metallising was connected to Pin 6.

SUBSTITUTION FOR UU9 and EZ40

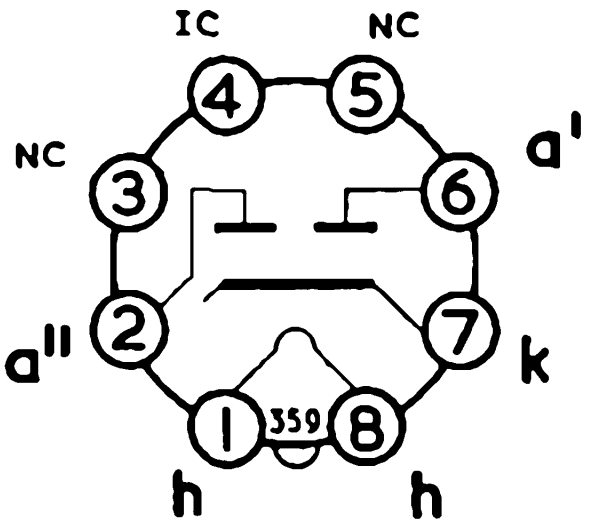
UU9 DATA

F.W. Rectifier
6·3V, 0·58A Heater

Typical Operation

I_a	90	mA
$V_{in(r.m.s.)}$	350	V
V_{out}	340	V
C_{res}	50	μF
R_{lim}	300	Ω

B8A



FIT EZ80

Change socket

Notes:

1. Change socket to B9A.
2. See page 44 for EZ80 data and base connections.

SUBSTITUTION FOR UY41

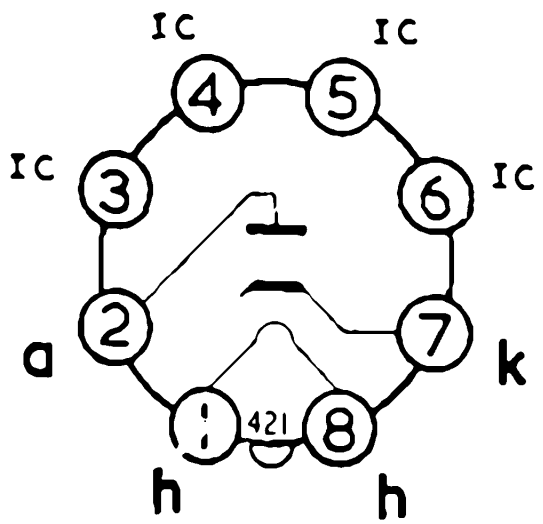
UY41 DATA

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



FIT U381

Change socket

Notes:

1. Change socket to B9A.
2. Reduce heater chain dropper by 70Ω.
3. Check HT output voltage and, if necessary, reduce it by increasing series resistance.
4. See page 64 for U381 data and base connections.

SUBSTITUTION FOR 6C9

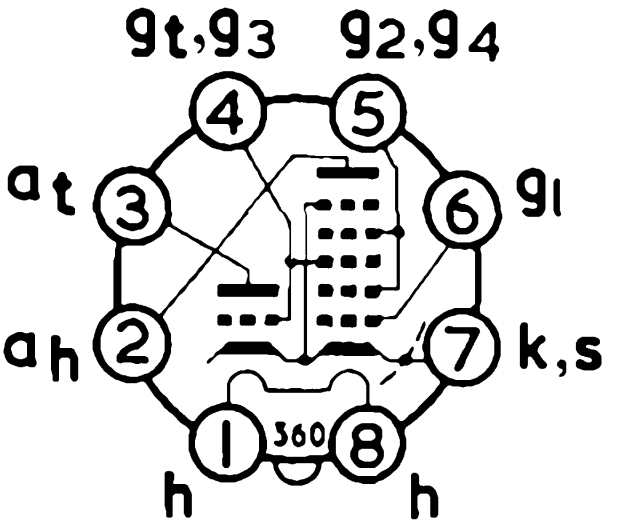
6C9 DATA

HF Triode Heptode Frequency Changer 6·3V, 0·45A Heater

Typical Operation (Heptode)

$V_{a(b)}$	250	V
$V_{g2,\ g4}$	100	V
V_{g1}	−2·5	V
I_a	3	mA
I_{g2}	6	mA

B8A



FIT 6C12

Change socket

Notes:

1. Change socket to B9A.
2. Check circuit alignment.
3. See page 13 for 6C12 data and base connections.

SUBSTITUTION FOR 6D1 and EA50

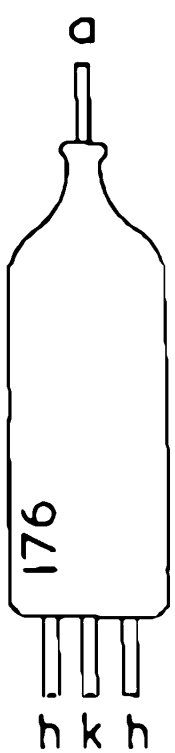
6D1 DATA

TV Detector Diode 6·3V, 0·3A Heater

Ratings

I_a	5	mA
P.I.V.$_{(max)}$	350	V

B3G



FIT 6D2

Change socket

Notes:

1. Use either diode in a 6D2.
2. Characteristics are identical, but double-ended construction of 6DI may have been an essential feature in some applications.
3. Inter-electrode capacitance of 6D2 is higher.
4. See page 14 for 6D2 data and base connections.

SUBSTITUTION FOR 6F11

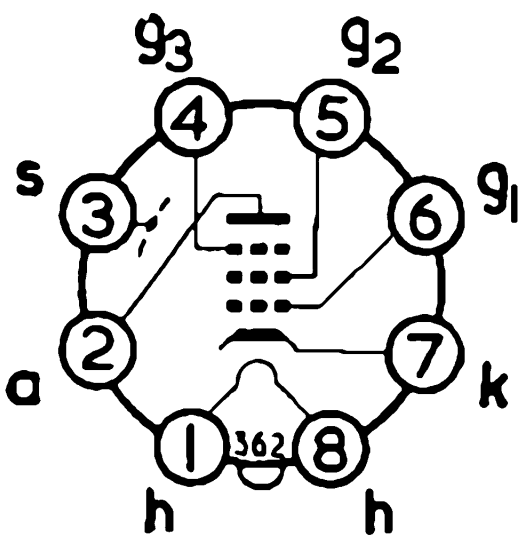
6F11 DATA

HF Pentode
6·3V, 0·2A Heater

Typical Operation

$V_{a(b)}$	250	V
V_{g3}	0	V
V_{g2}	100	V
V_{g1}	−1·8	V
I_a	4·4	mA
I_{g2}	1·35	mA
g_m	2·2	mA/V

B8A



FIT 6F15

Plug in replacement

Notes:

1. It may be necessary to adjust bias condition. 6F15 Typical Operation is

$V_{a(b)}$	250	V
V_{g1}	−2·5	V
V_{g2}	100	V
I_a	7	mA
I_{g2}	2	mA

2. See page 102 for other data on 6F15.

SUBSTITUTION FOR 6F19

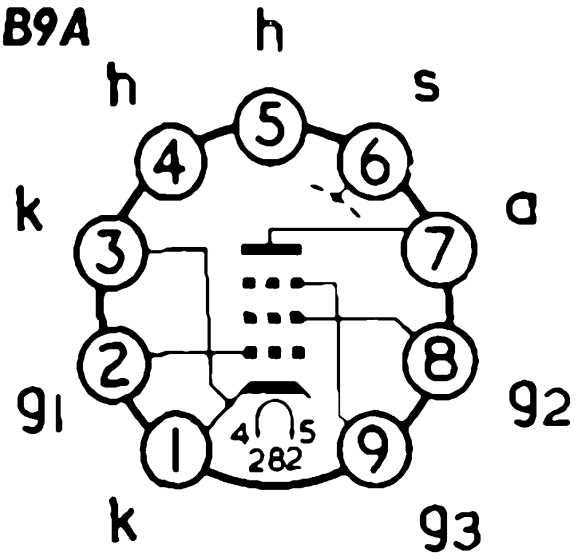
6F19 DATA

HF Pentode
Vari-mu Amplifier
6·3V, 0·3A Heater

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

B9A



FIT 6F26

Plug in replacement

Notes:

1. Differences between these valves are insignificant for maintenance purposes.
2. See page 15 for 6F26 data.

SUBSTITUTION FOR 6F25

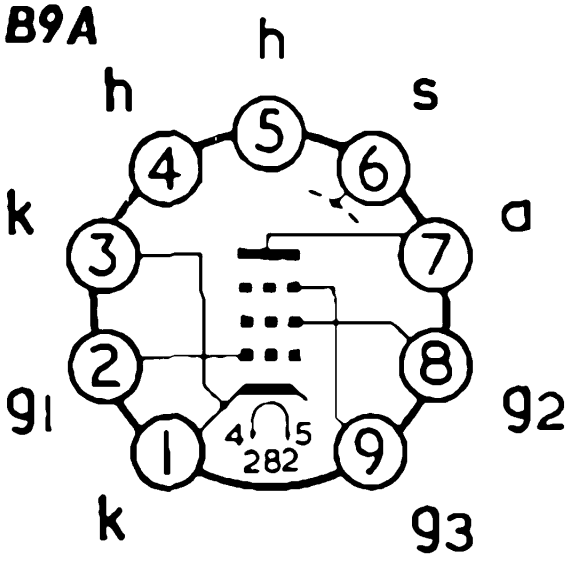
6F25 DATA

Frame Grid Pentode
Vari-mu
HF Amplifier
6·3V, 0·3A Heater

Typical Operation

$V_{a(b)}$	200	V
V_a	170	V
V_{g2}	90	V
V_{g1}	−1·5	V
I_a	11·5	mA
I_{g2}	2·8	mA
R_{g2}	39	kΩ
R_k	100	Ω
g_m	12·5	mA/V

B9A



FIT 6F29

Plug in replacement

Notes:

1. The 6F29 has slightly higher (1pF or less), input and output capacitances.
2. See page 16 for 6F29 data.

SUBSTITUTION FOR 6L15 and ECC805

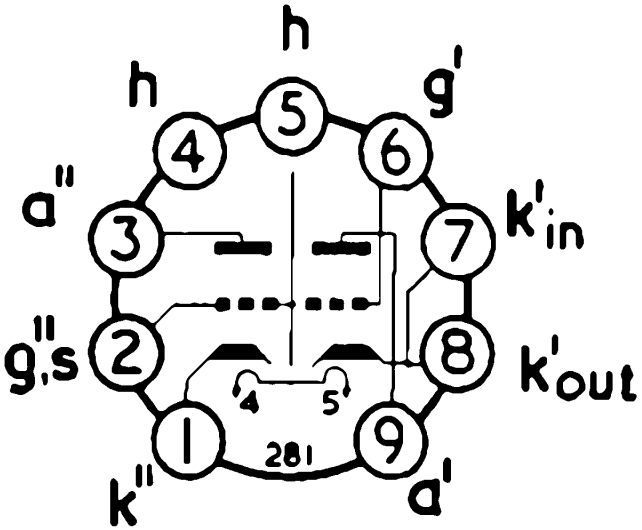
6L15 DATA

Double Triode
VHF Cascode
Vari-mu Amplifier
6·3V, 0·33A Heater

Characteristics (each section)

V_a	90	V
V_g	−1·2	V
I_a	15	mA
g_m	9	mA/V
μ	27	

B9A



FIT 30L15

Change heater voltage

Notes:

1. Same base and connections but increase heater supply to 7·0 V.
2. See page 25 for 30L15 data.

SUBSTITUTION FOR 6L19

6L19 DATA

AF Double Triode

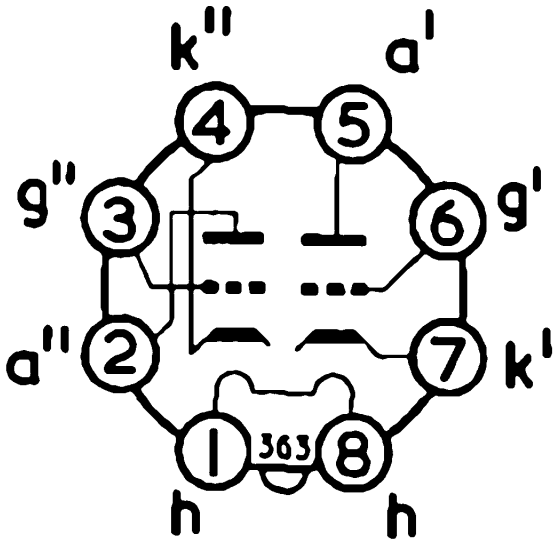
6·3V, 0·4A Heater

Typical Operation each section

$V_{a(b)}$	260	V
V_{g1}	−2	V
I_a	1·1	mA
R_a	100	kΩ
R_k	1·8	kΩ

Voltage gain 38

B8A



FIT ECC81

Change socket

Notes:

1. Change valve socket to B9A.
2. Usually no circuit modifications needed.
3. 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.
4. See page 36 for ECC81 base connections.

SUBSTITUTION FOR 6L34
and 6AQ4

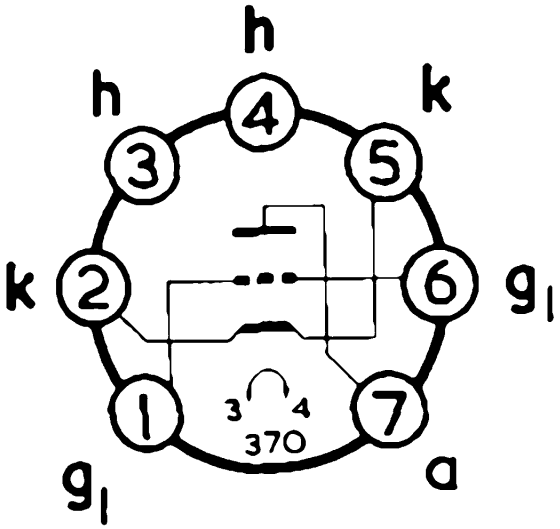
6L34 DATA

VHF Triode Grounded Grid Amplifier 6·3V, 0·3A Heater

Typical Operation

V_a	250	V
V_{g1}	−1·5	V
I_a	10	mA
g_m	8·5	mA/V
μ	90	

B7G



FIT BRIMAR 6AM4

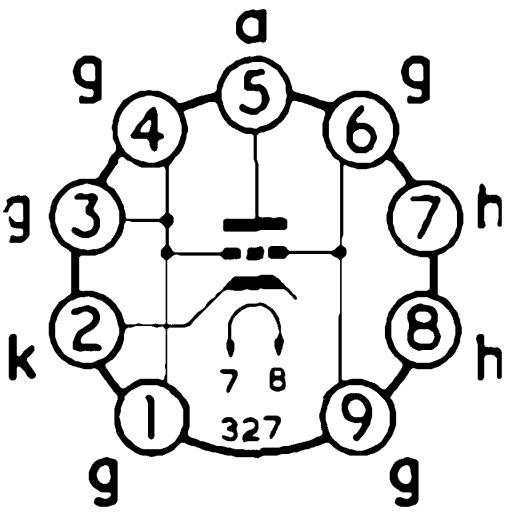
Change socket

Notes:

1. Similar characteristics, but the UHF 6AM4 has lower ratings and lower capacitances.
2. Change socket to B9A.
3. Check conditions and alignment.

V_a	200	V
I_a	10	mA
μ	85	

B9A



SUBSTITUTION FOR 6LD3 and EBC41

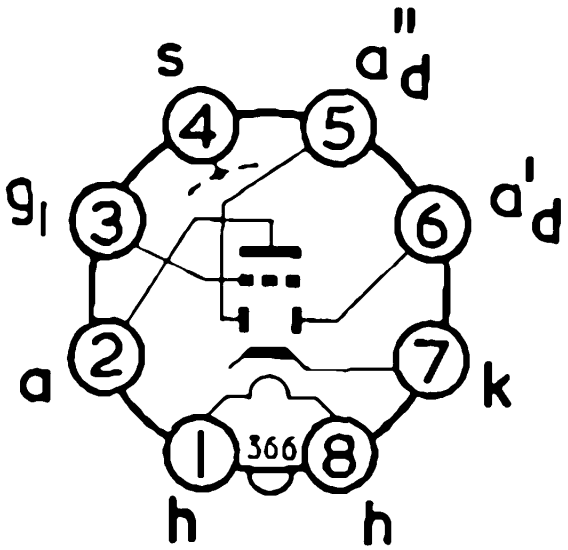
6LD3 DATA

Double Diode Triode
Audio Amplifier
6·3V, 0·23A Heater

Characteristics (Triode)

V_a	100	V
V_g	−0·7	V
I_a	0·8	mA
r_a	54	kΩ
g_m	1·4	mA/V
μ	75	

B8A



FIT 6LD13

Change socket

Notes:

1. Change socket to B9A.
2. Characteristics are identical.
3. See page 18 for 6LD13 base connections.

SUBSTITUTION FOR 6P1

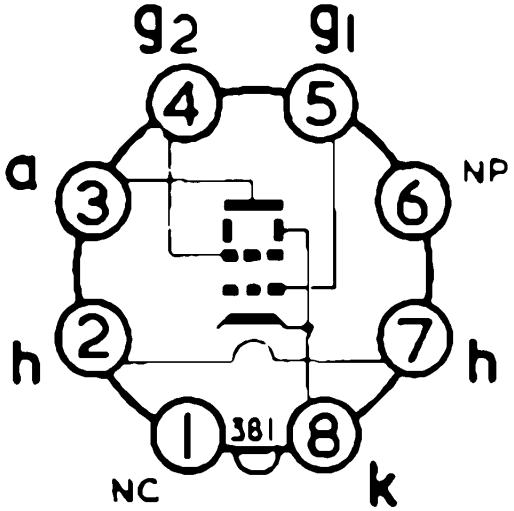
6P1 DATA

AF Beam Tetrode
Audio Output
6·3V, 0·8A Heater

Typical Operation

V_a	250	V
V_{g2}	250	V
V_{g1}	−8·5	V
I_a	40	mA
I_{g2}	7·5	mA
g_m	8·8	mA/V
P_{out}	4·2	W
R_a	5	kΩ

Int. Octal



FIT 6P15

Change socket

Notes:

1. Change socket to B9A.
2. See page 18 for 6P15 data and base connections.

SUBSTITUTION FOR 6P26

6P26 DATA

AF Output Tetrode
6·3V, 0·6A Heater

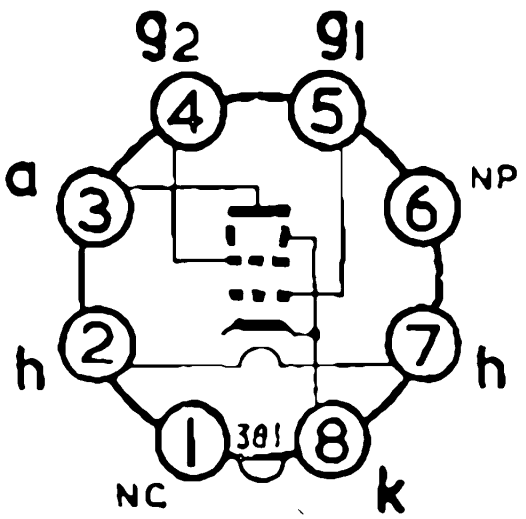
Typical Operation

$V_{a(b)}$	250	V
V_{g2}	250	V
V_{g1}	−8·5	V
$I_{a(o)}$	40	mA
R_a	5·2	kΩ
P_{out}	4·5	W

Bulb

Max. diameter
32 mm
Max. seated height
77 mm

Int. Octal



FIT 6P25

Plug in replacement

Notes:

1. 6P25 bulb is larger
   Max. diameter
   45 mm
   Max. seated height
   109 mm
2. 6P25 heater current is 0·5 A higher. Check mains transformer for overheating and V_h drop.
3. Connect 6P25 metallising to earth via pin no. 1.
4. See page 102 for 6P25 data.

SUBSTITUTION FOR 6P28

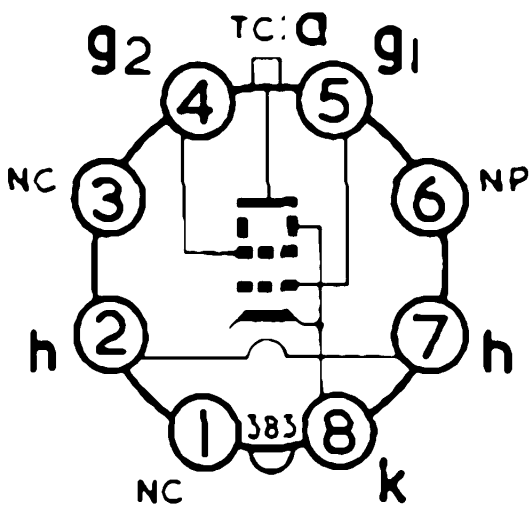
6P28 DATA

Beam Tetrode
Line Output
6·3V, 1·1A Heater

Typical Operation

V_a	350	V
V_{g2}	250	V
V_{g1}	−8·8	V
I_a	72	mA
I_{g2}	16	mA

Int. Octal



FIT EDISWAN EL504

Change socket

Notes:

1. EL504 is in the Ediswan export range. Only available in UK by special order.
2. Change socket to B9D.
3. Insert a decoupled screen resistor to reduce EL504 anode current to 6P28 level, e.g. if screen running at 250 V, reduce to 100 V by adding 30 kΩ, 1 W resistor.
4. EL504 heater is 6·3V, 0·8 A.
5. See PL504 page 57 for other EL504 data and base connections.

SUBSTITUTION FOR 10LD3

and UBC41

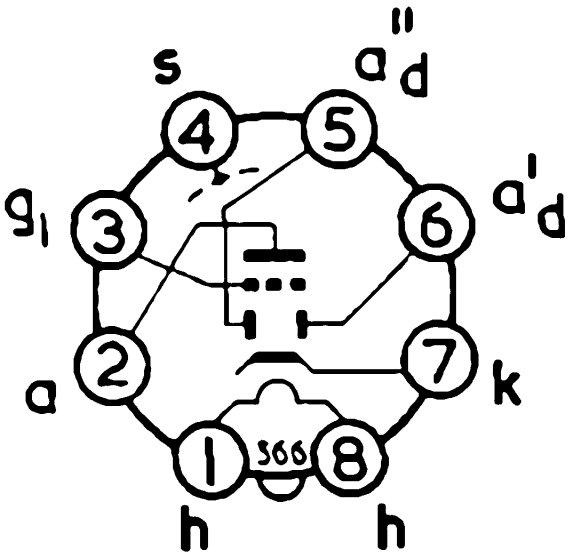
10LD3 DATA

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

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



FIT 10LD12

Change socket

Notes:

1. Change socket to B9A.
2. Use triode and diodes 2 and 3.
3. Reduce heater chain dropper by 140 Ω.
4. See page 20 for 10LD12 data and base connections.

SUBSTITUTION FOR 20P1

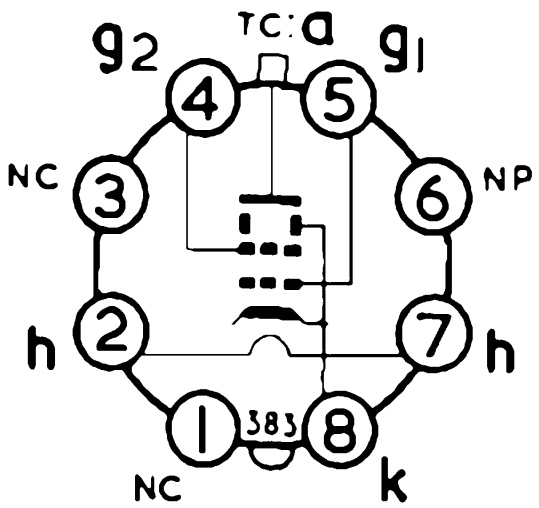
20P1 DATA

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

Characteristics

V_a	150	V
V_{g2}	150	V
I_a	100	mA
g_m	7·3	mA/V

Int. Octal



FIT 20P4

Plug in replacement

Notes:

1. Anode and screen dissipation of 20P4 are 10 W and 4 W, compared with 15 W and 5 W for 20P1.
2. ESSENTIAL to check operating conditions to avoid over-running 20P4.
3. See page 21 for 20P4 data.

SUBSTITUTION FOR 30P4
and 25GF6

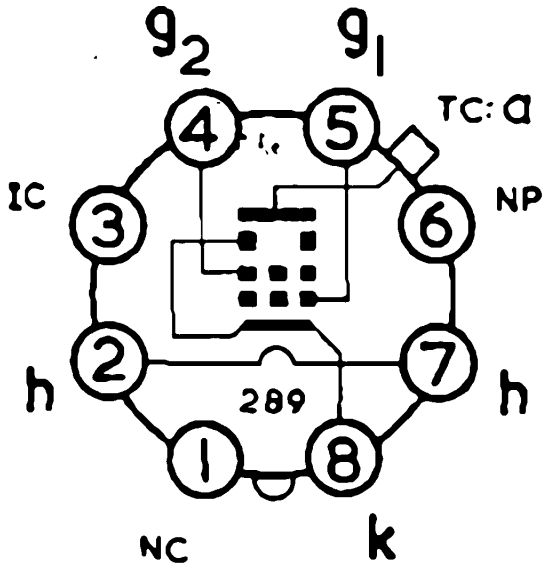
30P4 DATA

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

Int. Octal



FIT 30P19

Plug in replacement

Notes:

1. Some Murphy TVs with single valve line time bases have used the specially selected 30P4MR.
2. In these sets, 30P4MR should be used as a replacement.
3. In all other sets, 30P19 is a direct replacement for 30P4.
4. See page 27 for 30P19 data.

This equivalents list is published by Thorn 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 types for which there is a MAZDA or Brimar equivalent. *Current, Obsolescent* and *Obsolete* types are included. MAZDA valve types which are still available at time of going to press are shown in **bold print.** Picture Tubes are given in a separate 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.

MAZDA

VALVE EQUIVALENTS LIST

VALVE EQUIVALENTS

Index	MAZDA		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	DK96	1AB6	X25
1AC6 ...	**1C2**	**DK92**	DK92, 1AC6	DK92	1AC6	X20
1AH5 ...	**1FD1**	**DAF96**	DAF96	DAF96	1AH5	ZD25
1AJ4 ...	**1F1**	**DF96**	DF96	DF96	1AJ4	W25
1C1 ...	**1C1**	**DK91**	DK91, 1R5	DK91	1R5	X17
1C2 ...	**1C2**	**DK92**	DK92, 1AC6	DK92	1AC6	X20
1C3 ...	**1C3**	**DK96**	DK96	DK96	1AB6	X25
1C5GT ...	—	—	1C5GT	DL35	1C5GT	N14
1D5 ...	U4020	—	1D5	—	C10B	40SUA, RZ, UR1C
1D6 ...	—	—	1D6	—	—	—
1D13 ...	1D13	—	—	DA90	1A3	—
1F1 ...	**1F1**	**DF96**	DF96	DF96	1AJ4	W25
1F2 ...	1F2	DF92	1L4	DF92	1L4	—
1F3 ...	**1F3**	**DF91**	1T4, DF91	DF91	1T4	W17
1FD1 ...	**1FD1**	**DAF96**	DAF96	DAF96	1AH5	ZD25
1FD9 ...	**1FD9**	**DAF91**	1S5, DAF91	DAF91	1S5	ZD17
1H5GT ...	—	—	1H5GT	DAC32	1H5GT	HD14
1L4 ...	1F2	DF92	1L4	DF92	1L4	—
1LA6E ...	—	—	1LA6E	—	1LA6E	—
1LD5 ...	—	—	1LD5	—	1LD5	—
1LN5 ...	—	—	1LN5	—	1LN5	—
1M1 ...	**1M1**	**DM71**	—	DM71	1N3	Y25
1M3 ...	**1M1**	—	DM70	DM70	1M3	—
1N3 ...	**1M1**	**DM71**	—	DM71	1N3	Y25
1N5GT ...	—	—	1N5GT	DF33	1N5GT	Z14

Index	MAZDA		Brimar	European	American	Others
1P1 ...	**1P1**	**DL96**	DL96	DL96	3C4	N25
1P10 ...	**1P10**	**DL92**	DL92, 3S4	DL92	3S4	N17
1P11 ...	**1P11**	**DL94**	DL94, 3V4	DL94	3V4	N19
1R5 ...	1C1	**DK91**	DK91, IR5	DK91	1R5	X17
1S2 ...	—	**DY86/87**	DY86/87	DY86	1S2	—
1S2A ...	—	**DY86/87**	DY86/87	DY87	1S2A	—
1S4 ...	—	—	1S4, DL91	DL91	1S4	—
1S5 ...	**1FD9**	**DAF91**	1S5, DAF91	DAF91	1S5	ZD17
1T2 ...	—	—	R16	—	1T2	U37
1T4 ...	**1F3**	**DF91**	DF91, 1T4	DF91	1T4	W17
1U5 ...	—	—	1U5	—	1U5	—
1X2B ...	—	—	R19	—	1X2B	—
2A3 ...	—	—	2A3	—	—	—
2B35 ...	6D1	—	—	EA50	2B35	SD61
2D21 ...	—	—	2D21	EN91	2D21	20A3
2T/270K ...	—	—	R10	—	6305	HR1, HR2
2J2 ...	**U26**	—	R20	KY80	2J2	U49
2L2 ...	**U25**	—	—	KY50	2L2	U47
3A5 ...	—	—	DCC90, 3A5	DCC90	3A5	—
3C4 ...	**1P1**	**DL96**	DL96	DL96	3C4	N25
3D6 ...	—	—	3D6	—	—	—
3Q4 ...	—	—	3Q4	DL95	3Q4	N18
3Q5GT ...	—	—	3Q5GT	DL33	3Q5GT	N16
3S4 ...	**1P10**	**DL92**	3S4, DL92	DL92	3S4	N17
3V4 ...	**1P11**	**DL94**	3V4, DL94	DL94	3V4	N19
4CM4 ...	—	**PC86**	PC86	PC86	4CM4	—
4D1 ...	HL1320	—	4D1	—	—	C30B, DA, HL13C
4DL4 ...	—	**PC88**	PC88	PC88	4DL4	—
4FY5 ...	—	**PC97**	PC97	PC97	4FY5	—
4HA5 ...	—	**PC900**	PC900	PC900	4HA5	—
4XP ...	PP3-250	—	—	—	—	AC044, LP4, PX4, P12-250, S30C
5AQ4 ...	—	—	—	GZ32	5AQ4	—
5B250A ...	—	—	807	QV05-25	807	—

MAZDA types in **BOLD** available at time of printing.

VALVE EQUIVALENTS

Index	MAZDA		Brimar	European	American	Others
5R4GY	—	—	5R4GY	—	5R4GY	—
5U4G	—	—	5U4G	GZ31	5U4G	U52
5V4G	—	—	5V4G	—	—	52KU
5Y3GT	—	—	5Y3GT	—	5Y3GT	U50
5Z3	—	—	5Z3	—	5Z3	—
5Z4G	—	—	5Z4G	GZ30	5Z4G	R52
6/30L2	**6/30L2**	**ECC804**	ECC804	ECC804	6GA8	B729
6A3	—	—	6A3	—	6A3	—
6A7/E	—	—	6A7/E	—	6A7/E	—
6A8G	—	—	6A8G	—	6A8G	X63
6AB8	—	**ECL80**	ECL80	ECL80	6AB8	63TP, LN152
6AF4A	—	—	6AF4A	—	6AF4A	—
6AG6G	—	—	6AG6G, EL33	EL33	6AG6G	N147, KT61
6AJ8	**6C12**	**ECH81**	ECH81	ECH81	6AJ8	X719
6AK5	—	—	6AK5, EF95	EF95	6AK5	DP61, PM05
6AK6	—	—	6AK6	—	6AK6	—
6AK8	**6LD12**	**EABC80**	EABC80	EABC80	6AK8	DH719, 6T8
6AL3	—	—	—	EY88	6AL3	—
6AL5	**6D2**	**EB91**	6AL5, EB91	EB91	6AL5	D77, D152, DD6
6AM4	—	—	6AM4	—	6AM4	—
6AM5	—	—	6AM5	EL91	6AM5	N77, N144, 7D9, 6P17, 16A
6AM6	**6F12**	**EF91**	8D3, 6AM6, EF91	EF91	6AM6	5A/160H, 5A/160K, Z77, PM07, HP6, SP6
6AQ4	6L34	EC91	—	EC91	6AQ4	—
6AQ5	—	—	6AQ5, EL90	EL90	6AQ5	BPM04, N727
6AQ8	**6L12**	**ECC85**	ECC85	ECC85	6AQ8	B719
6AT6	—	**EBC90**	6AT6	EBC90	6AT6	DH77
6AU6	—	—	6AU6	EF94	6AU6	—
6AV6	—	—	6AV6	EBC91	6AV6	—
6B4G	—	—	6B4G	—	6B4G	—
6B7/E	—	—	6B7/E	—	6B7/E	—
6B8GT	—	—	6B8GT	—	6B8GT	—
6BA6	—	—	6BA6	EF93	6BA6	PM04, W727
6BD7A	**6LD13**	**EBC81**	EBC81	EBC81	6BD7A	—
6BE6	—	—	6BE6, EK90	EK90	6BE6	HM04, X77, X727
6BG6G	—	—	6BG6G	—	6BG6G	—

Index	MAZDA		Brimar	European	American	Others
6BH6	—	—	6BH6	—	6BH6	—
6BJ6	—	—	6BJ6	—	6BJ6	—
6BK4	—	—	6BK4	—	6BK4	—
6BK8	—	**EF86**	EF86	EF86	6267	—
6BL8	—	—	6BL8	—	6BL8	—
6BM8	**6PL12**	**ECL82**	ECL82	ECL82	6BM8	—
6BQ5	**6P15**	**EL84**	EL84	EL84	6BQ5	N709
6BQ7A	—	—	6BQ7A	—	6BQ7A	—
6BR5	—	EM80	—	EM80	6BR5	65ME
6BR7	—	—	6BR7	—	6BR7	8D5
6BR8	—	—	6BR8	—	6BR8	—
6BS7	—	—	6BS7	—	6BS7	8D7
6BT4	UU9	EZ40	EZ40	EZ40	6BT4	66KU, U150, U718
6BW6	—	—	6BW6	—	6BW6	—
6BW7	—	—	6BW7	—	6BW7	8D6
6BX6	—	**EF80**	EF80	EF80	6BX6	Z152, Z719
6BY7	**6F26**	**EF85**	EF85	EF85	6BY7	W719
6C4	—	—	6C4, EC90	EC90	6C4	L77
6C5G	—	—	6C5G	—	6C5G	—
6C6	—	—	6C6	—	6C6	—
6C9	6C9	—	—	—	—	—
6C10	**6C10**	**ECH42**	ECH42	ECH42	6CU7	X150, 62TH
6C12	**6C12**	**ECH81**	ECH81	ECH81	6AJ8	X719
6C15	6C15	—	—	ECF800	—	—
6C16	6C16	**ECF80**	ECF80	ECF80	—	—
6C18	6C18	—	—	ECF805	6GV7	—
6C31	6C31	—	—	—	—	—
6CA4	**UU12**	**EZ81**	EZ81	EZ81	6CA4	U709
6CA7	—	—	EL34	EL34	6CA7	—
6CD6G	—	—	6CD6G	—	6CD6G	—
6CF8	6F22	**EF86**	EF86	EF86	6CF8	6267, Z729
6CH6	—	—	6CH6, EL821	EL821	6CH6	7D10
6CJ5	6F16	EF41	EF41	EF41	6CJ5	62VP, W150
6CK5	—	—	EL41	EL41	6CK5	N150, 67PT
6CL6	—	—	6CL6	—	—	—

MAZDA types in **BOLD** available at time of printing.

VALVE EQUIVALENTS

Index	MAZDA		Brimar	European	American	Others
6CQ6	—	—	9D6, EF92	EF92	6CQ6	W77, VP6, E2016, 6F21
6CM4	—	—	EC86	EC86	6CM4	—
6CS6	—	**EH90**	—	EH90	6CS6	—
6CU7	**6C10**	**ECH42**	ECH42	ECH42	6CU7	X150, 62TH
6CV7	6LD3	EBC41	EBC41	EBC41	6CV7	DH150, 62DDT, DH718
6CW7	6L16	**ECC84**	ECC84	ECC84	6CW7	—
6D1	6D1	—	—	EA50	—	2B35, SD61
6D2	**6D2**	**EB91**	EB91	EB91	6AL5	D77, D152, DD6
6D6	—	—	6D6	—	6D6	—
6DA5	—	EM81	EM81	EM81	6DA5	—
6DA6	—	**EF89**	EF89	EF89	6DA6	—
6DC8	**6FD12**	**EBF89**	EBF89	EBF89	6DC8	—
6DJ8	—	—	ECC88	ECC88	6DJ8	—
6DL4	—	—	EC88	EC88	6DL4	—
6DL5	—	EL95	—	EL95	6DL5	—
6DX8	—	—	—	ECL84	6DX8	—
6E5GT	—	—	6E5GT	—	6E5GT	—
6EC7	**6F18**	—	—	—	6EC7	W739
6EH7	**6F29**	**EF183**	EF183	EF183	6EH7	—
6EJ7	**6F30**	**EF184**	EF184	EF184	6EJ7	—
6EL7	**6F23**	—	—	EF812	6EL7	Z749
6ES8	—	—	ECC189	ECC189	6ES8	—
6F1	**6F1**	—	—	—	—	—
6F6G	—	—	6F6G	—	6F6G	KT63
6F11	6F11	—	—	—	—	—
6F12	**6F12**	**EF91**	8D3, 6AM6, EF91	EF91	6AM6	5A/160H, 5A/160K, PM07, SP6, Z77, HP6
6F13	**6F13**	—	—	—	—	—
6F14	**6F14**	—	—	—	—	—
6F15	**6F15**	—	—	—	—	—
6F16	6F16	EF41	EF41	EF41	6CJ5	62VP, W150
6F18	**6F18**	—	—	—	6EC7	W739
6F19	**6F26**	—	—	—	—	—
6F21	—	—	9D6, EF92	EF92	6CQ6	W77, VP6, E2016, 6F21
6F22	6F22	**EF86**	EF86	EF86	6267	Z729
6F23	**6F23**	—	—	EF812	6EL7	Z749

 MAZDA types in **BOLD** available at time of printing.

Index	MAZDA		Brimar	European	American	Others
6F24	**6F24**	—	—	EF814	—	—
6F25	6F25	—	—	EF811	—	—
6F26	**6F26**	**EF85**	EF85	EF85	6BY7	W719
6F28	**6F28**	—	—	EE80	—	—
6F29	**6F29**	**EF183**	EF183	EF183	6EH7	—
6F30	**6F30**	**EF184**	EF184	EF184	6EJ7	—
6FD12	**6FD12**	**EBF89**	EBF89	EBF89	6DC8	—
6FG6	—	**EM84**	EM84	EM84	6FG6	—
6FL2	—	—	—	ECF812	—	—
6FY5	—	—	EC97	EC97	6FY5	—
6G5G	6M1	—	6U5G	—	6U5G	6G5G, 6H5, 63ME, VFT6
6GA8	**6/30L2**	**ECC804**	ECC804	ECC804	6GA8	B729
6HG8	—	—	—	ECF86	6HG8	—
6GV7	6C18	—	—	ECF805	6GV7	—
6GV8	—	—	—	ECL85	6GV8	—
6GW8	—	**ECL86**	ECL86	ECL86	6GW8	—
6H5	6M1	—	6U5G	—	6U5G	6G5G, 63ME, VFT6, Y61, Y63
6H6GT	—	—	6H6GT	EB34	6H6GT	D63
6HU6	—	**EM87**	EM87	EM87	6HU6	—
6HU8	—	ELL80	ELL80	ELL80	6HU8	—
6J5G	—	—	6J5G	—	6J5G	L63
6J5GT	—	—	6J5GT	—	6J5GT	—
6J6	—	—	6J6	ECC91	6J6	—
6J7G	—	—	6J7G	—	6J7G	KTZ63, Z63
6J7GT	—	—	6J7GT	—	6J7GT	—
6JX8	—	**ECH84**	ECH84	ECH84	6JX8	—
6K6G	—	—	6K6G	—	6K6G	—
6K7G	—	—	6K7G	—	6K7G	KTW63, W63
6K7GT	—	—	6K7GT	—	6K7GT	—
6K8G	—	ECH35	6K8G	ECH35	6K8G	OM10, Z61M, X65, X147
6K8GT	—	—	6K8GT	—	6K8GT	—
6K25	6K25	—	—	—	—	—
6L1	6L1	—	—	—	—	—
6L6G	—	—	6L6G	—	6L6G	KT66
6L6GA	—	—	6L6GA	—	—	—

MAZDA types in **BOLD** available at time of printing.

VALVE EQUIVALENTS

Index	MAZDA		Brimar	European	American	Others
6L7G	—	—	6L7G	—	6L7G	—
6L12	**6L12**	**ECC85**	ECC85	ECC85	6AQ8	B719
6L13	**6L13**	**ECC83**	12AX7	ECC83	12AX7	B339, 12DT7, E2164
6L15	6L15	—	—	ECC805	—	—
6L16	6L16	**ECC84**	ECC84	ECC84	6CW7	—
6L18	**6L18**	—	—	—	—	—
6L19	6L19	—	—	—	—	—
6L34	6L34	EC91	—	EC91	6AQ4	—
6LD3	6LD3	EBC41	**EBC41**	EBC41	6CV7	DH150, 62DDT, DH718
6LD12	**6LD12**	**EABC80**	EABC80	EABC80	6AK8	DH719, 6T8
6LD13	**6LD13**	**EBC81**	EBC81	EBC81	6BD7A	—
6LD20	**6LD20**	—	—	—	—	—
6M1	6M1	—	6UG5	—	6UG5	6G5G, 63ME, VFT6, Y61, Y63
6M2	6M2	—	—	**EM35**	—	—
6N7G	—	—	6N7G	—	6N7G	—
6N8	—	**EBF80**	EBF80	EBF80	6N8	WD709, ZD152
6P1	6P1	—	—	—	—	—
6P15	**6P15**	**EL84**	EL84	EL84	6BQ5	N709
6P17	—	—	6AM5	EL91	6AM5	N77, N144, 7D9, 16A, 6P17
6P25	**6P25**	—	—	—	—	—
6P26	6P26	—	—	—	—	—
6P28	6P28	—	—	—	—	—
6PL12	**6PL12**	**ECL82**	ECL82	ECL82	6BM8	—
6Q7G	—	—	6Q7G	—	6Q7G	DH63
6Q7GT	—	—	6Q7GT	—	6Q7GT	—
6R7G	—	—	6R7G	—	6R7G	DL63
6S2	—	**EY86/87**	EY86/87	EY86	6S2	—
6S2A	—	**EY86/87**	EY86/87	EY87	6S2A	—
6SC7	—	—	6SC7	—	6SC7	—
6SC7GT	—	—	6SC7GT	—	6SC7GT	—
6SG7	—	—	6SG7	—	6SG7	—
6SJ7	—	—	6SJ7	—	6SJ7	—
6SK7	—	—	6SK7	—	6SK7	—
6SL7GT	—	—	6SL7GT	—	6SL7GT	—
6SN7GT	—	—	6SN7GT	ECC32	6SN7GT	B65, 13D2

Index	MAZDA		Brimar	European	American	Others
6SQ7 ...	—	—	6SQ7	—	6SQ7	—
6T8 ...	**6LD12**	**EABC80**	EABC80	EABC80	6AK8	DH719
6U4GT ...	—	—	6U4GT	—	6U4GT	—
6U5/6G5 ...	—	—	6U5/6G5	—	6U5/6G5	—
6U5G ...	6M1	—	6U5G	—	6U5G	6G5G, 6H5, 63ME, VFT6, Y61, Y63
6U7G ...	—	—	6U7G	—	6U7G	—
6U8 ...	—	—	ECF82	ECF82	6U8	—
6V4 ...	—	**EZ80**	EZ80	EZ80	6V4	—
6V6G ...	—	—	6V6G	—	6V6G	—
6V6GT ...	—	—	6V6GT	—	6V6GT	—
6X2 ...	—	**EY51**	R12, EY51	EY51	6X2	U43, U151, SU61
6X4 ...	—	—	6X4	EZ90	6X4	U78
6X5GT ...	—	—	6X5GT, EZ35	EZ35	6X5GT	U70, U147
7A2 ...	AC/Pen	—	7A2	—	—	MKT4, MP/PEN, A70B, APP4A, KT42, N40, P4VA, PEN4VA
7A3 ...	AC2/Pen	—	7A3	—	—	APP4B, PEN4VB, A70C, N41, PENA4, PT4, 42MP/PEN, KT41
7A7 ...	—	—	7A7	—	7A7	—
7AN7 ...	**30L1**	**PCC84**	PCC84	PCC84	7AN7	B319
7B6 ...	—	—	7B6	—	—	DH81, DL82
7B7 ...	—	—	7B7	—	7B7	W149
7C5 ...	—	—	7C5	—	7C5	N148
7C6 ...	—	—	7C6	—	7C6	DH149
7D3 ...	—	—	7D3	—	7D3	40PPA
7D5 ...	—	—	7D5	—	—	N30, PP13A, PTA
7D6 ...	Pen383	—	7D6	—	—	PP35, C70D, PEN36C, PEN3520
7D8 ...	Pen1340	—	7D8	—	—	PEN13C
7D9 ...	—	—	6AM5	EL91	6AM5	N77, N144, 16A, 6P17
7D10 ...	—	—	6CH6, EL821	EL821	6CH6	—
7D11 ...	—	—	7D11	—	—	KT88
7DJ8 ...	—	—	PCC88	PCC88	7DJ8	—
7ED7 ...	**30F5**	—	—	PF818	7ED7	Z329
7EK7 ...	**30L15**	—	—	PCC805	7EK7	B349
7ES8 ...	—	**PCC189**	PCC189	PCC189	7ES8	—
7FC7 ...	—	**PCC89**	PCC89	PCC89	7FC7	—
7GV7 ...	**30C18**	**PCF805**	—	PCF805	7GV7	—
7H7 ...	—	—	7H7	—	7H7	W81, W143, W148

MAZDA types in **BOLD** available at time of printing.

VALVE EQUIVALENTS

Index	MAZDA	Brimar	European	American	Others
7HG8 ...	—	Superseded by 8HG8			
7K7 ...	—	— 7K7	—	7K7	—
7R7 ...	—	— 7R7	—	7R7	—
7S7 ...	—	— 7S7	—	7S7	X81, X148
7Y4 ...	—	— 7Y4	—	—	U82, U149
7Z4 ...	—	— 7Z4	—	7Z4	—
8A1 ...	AC/SG	— 8A1	—	—	SPT4A, MSPEN, MSP4, AC/S2/PEN, HP4101C
8D2 ...	—	— 8D2	—	—	13SPA, C50B, SP13C
8D3 ...	**6F12**	**EF91** 8D3, 6AM6, EF91	EF91	6AM6	5A/160H, 5A/160K, HP6, SP6, Z77
8D5 ...	—	— 6BR7	—	6BR7	—
8D6 ...	—	— 6BW7	—	6BW7	—
8D7 ...	—	— 6BS7	—	6BS7	—
8D8 ...	—	— 8D8	—	8D8	—
8GJ7 ...	—	**PCF801** PCF801	PCF801	8GJ7	—
8HG8 ...	—	**PCF86** PCF86	PCF86	8HG8	—
9A8 ...	**30C1**	**PCF80** PCF80	PCF80	9A8	LZ319, LZ329
9AQ8 ...	—	— PCC85	PCC85	9AQ8	—
9BW6 ...	—	— 9BW6	—	9BW6	—
9D2 ...	VP1322	— 9D2	—	—	13VPA, C50N, VP13C
9D6 ...	—	— 9D6, EF92	EF92	6CQ6	VP6, W77, E2016, 6F21
9D7 ...	—	— 9D7	—	9D7	—
9ED4 ...	—	**PD500** —	PD500	9ED4	—
9EN7 ...	**30C15**	— —	PCF800	9EN7	LZ339
9GB8 ...	**30FL1**	— —	PCE800	9GB8	LN339
9JW8 ...	—	**PCF802** PCF802	PCF802	9JW8	—
9U8 ...	—	**PCF82** PCF82	PCF82	9U8	—
10C1 ...	10C1	— —	—	—	X118, X145
10C2 ...	**10C2**	— —	—	—	—
10C14 ...	**10C14**	**UCH81** UCH81	UCH81	19D8	X119
10D1 ...	—	— 10D1	—	—	—
10D2 ...	**10D2**	— —	—	—	—
10F1 ...	**10F1**	— —	—	—	Z145
10F3 ...	10F3	— —	—	—	—
10F9 ...	**10F9**	— —	—	—	W118, W145
10F18 ..	**10F18**	— —	—	13EC7	W119

Index	MAZDA		Brimar	European	American	Others
10FD12	**10FD12**	**UBF89**	UBF89	UBF89	19FL8	WD119
10L1	10L1	—	—	—	—	—
10L14	**10L14**	**UCC85**	UCC85	UCC85	—	B109
10LD3	**10LD3**	UBC41	UBC41	UBC41	14L7	DH142, 141DDT, DH118
10LD11	**10LD11**	—	—	—	—	DL145
10LD12	**10LD12**	**UABC80**	UABC80	UABC80	—	DH109
10LD13	**10LD13**	**UBC81**	UBC81	UBC81	—	DH119
10M1	10M1	—	—	—	—	—
10M2	10M2	UM35	—	UM35	—	—
10P13	**10P13**	—	—	—	—	N145, N118
10P14	**10P14**	—	—	—	—	—
10P18	**10P18**	**UL84**	UL84	UL84	45B5	N119
10PL12	**10PL12**	**UCL82**	UCL82	UCL82	50BM8	LN119
11A2	AC/HL/DD		—	—	—	—
11D3	HL/DD/1320		11D3	—	—	13DHA, HAD, TDD13C
11D5	—	—	11D5	—	—	—
12A6	—	—	12A6	—	12A6	—
12AC5	—	—	UF41	UF41	12AC5	121VP, W142
12AC6	—	—	12AC6	—	12AC6	—
12AD6	—	—	12AD6	—	12AD6	—
12AE6	—	—	12AE6	—	12AE6	—
12AH8	—	—	12AH8	—	12AH8	20D3
12AT6	—	—	12AT6	HBC90	12AT6	—
12AT7	—	**ECC81**	12AT7, ECC81	ECC81	12AT7	B152, B309, E2157
12AU6	—	—	12AU6	HF94	12AU6	—
12AU7	—	**ECC82**	12AU7, ECC82	ECC82	12AU7	B329, E2163
12AV6	—	—	12AV6	HBC91	12AV6	—
12AX7	**6L13**	**ECC83**	12AX7, ECC83	ECC83	12AX7	B339, 12DT7 E2164
12BA6	—	—	12BA6	HF93	12BA6	—
12BE6	—	—	12BE6	HK90	12BE6	—
12BH7	—	—	12BH7	—	12BH7	—
12BL6	—	—	12BL6	—	12BL6	—
12C8GT	—	—	12C8GT	—	12C8GT	—
12DT7	**6L13**	**ECC83**	12AX7, ECC83	ECC83	12AX7	B339, E2164
12FB5	**30P12**	—	—	PL801	12FB5	N369

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Index	MAZDA		Brimar	European	American	Others
12J5GT ...	—	—	12J5GT	—	12J5GT	—
12J7GT ...	—	—	12J7GT	—	12J7GT	—
12K5 ...	—	—	12K5	—	12K5	—
12K7GT ...	—	—	12K7GT	—	12K7GT	KTW74M, W76
12K8GT ...	—	—	12K8GT	—	12K8GT	X71M, X76M
12Q7GT ...	—	—	12Q7GT	—	12Q7GT	DL74M, DH76
12SJ7 ...	—	—	12SJ7	—	12SJ7	—
12SK7 ...	—	—	12SK7	—	12SK7	—
12SL7GT ...	—	—	12SL7GT	—	12SL7GT	—
12SN7GT ...	—	—	12SN7GT	—	12SN7GT	B36
12SQ7 ...	—	—	12SQ7	—	12SQ7	—
12SR7 ...	—	—	12SR7	—	12SR7	—
12U5G ...	—	—	12U5G	—	12U5G	—
13D1 ...	—	—	13D1	—	—	—
13D2 ...	—	—	6SN7GT	ECC32	6SN7GT	B65
13D3 ...	—	—	13D3	—	—	—
13D8 ...	—	—	13D8	—	—	—
13D9 ...	—	—	13D9	—	—	—
13DHA ...	HL/DD/1320		11D3	—	—	HAD, TDD13C
13EC7 ...	**10F18**	—	—	—	13EC7	W119
13GC3 ...	**30PL1**	—	—	PCL80i	13GC8	LN319
13SPA ...	—	—	8D2	—	—	C50B, SP13C
13VPA ...	VP1322	—	9D2	—	—	C50N, VP13C
14B6 ...	—	—	14B6	—	14B6	—
14GW8 ...	—	**PCL86**	PCL86	PCL86	14GW8	—
14H7 ...	—	—	14H7	—	14H7	—
14R7 ...	—	—	14R7	—	14R7	—
14K7 ...	—	UCH42	UCH42	UCH42	14K7	X142, 141TH
14L7 ...	**10LD3**	UBC41	UBC41	UBC41	14L7	DH142, 141DDT, DH118
14S7 ...	—	—	14S7	—	14S7	—
15A2 ...	—	—	15A2	—	15A2	41MPG, A80A, FC4, MX40, VHT4, X42
15A6 ...	—	**PL83**	PL83	PL83	15A6	—
15CW5 ...	**30P18**	**PL84**	PL84	PL84	15CW5	N379
15D1 ...	—	—	15D1	—	—	—
15D2 ...	—	—	15D2	—	—	—

Index	MAZDA	Brimar	European	American	Others
15DQ8	—	**PCL84** PCL84	PCL84	15DQ8	—
16A	—	— 6AM5	EL91	6AM5	7D9, N77, N144, 6P17
16A5	**30P16**	**PL82** PL82	PL82	16A5	N154, N329
16A8	30PL12	**PCL82** PCL82	PCL82	16A8	—
16GK8	**30PL13**	— —	PCL800	16GK8	—
17KW6	—	**PL508** —	PL508	17KW6	—
17Z3	—	**PY81/800** PY81/800	PY81/800	17Z3	U153
18	—	— 18	—	18	—
18D2	—	— 18D2	—	—	—
18D3	—	— ECF804	ECF804	—	—
18GV8	—	**PCL805/85** PCL805/85	PCL805/85	18GV8	—
19AQ5	—	— 19AQ5	—	19AQ5	—
19BG6G	—	— 19BG6G	—	19BG6G	—
19BR5	—	— UM80	UM80	19BR5	—
19CS4	**U191**	— —	PY301	19CS4	U339
19D8	**10C14**	UCH81 UCH81	UCH81	19D8	X119
19FL8	**10FD12**	**UBF89** UBF89	UBF89	19FL8	WD119
19SU	**U192**	**PY82** PY82	PY82	19Y3	U154, U319
19T8	—	— 19T8	—	—	—
19Y3	**U192**	**PY82** PY82	PY82	19Y3	19SU, U154, U319
20A3	—	— 2D21	EN91	2D21	—
20D1	**20D1**	— —	—	—	—
20D2	—	— 20D2	—	—	—
20D3	—	— 12AH8	—	12AH8	—
20D4	—	— 20D4	—	—	—
20F2	**20F2**	— —	—	—	—
20L1	**20L1**	— —	—	—	—
20P1	20P1	— —	—	—	—
20P3	**20P3**	— —	—	—	—
20P4	**20P4**	— —	CL30	—	—
20P5	**20P5**	— —	—	—	—
21A6	—	**PL81** PL81	PL81	21A6	N152, N359
25A6G	—	— 25A6G	—	—	—
25E5	—	**PL36** PL36	PL36	25E5	—
25GF6	**30P4**	— —	—	25GF6	N308

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25L6GT ...	—	—	25L6GT	—	25L6GT	KT32
25SN7GT ...	—	—	25SN7GT	—	—	—
25U4GT ...	—	—	25U4GT	—	25U4GT	—
25Z4 ...	—	—	25Z4	—	25Z4	U31
27GB5 ...	—	**PL500**	PL500	PL500	27GB5	—
30AE3 ...	—	**PY88**	PY88	PY88	30AE3	—
30C1 ...	**30C1**	**PCF80**	PCF80	PCF80	9A8	LZ319, LZ329
30C15 ...	**30C15**	—	—	PCF800	9EN7	LZ339
30C17 ...	**30C17**	**PCF87**	—	PCF87	—	—
30C18 ...	**30C18**	**PCF805**	PCF805	PCF805	7GV7	—
30F5 ...	**30F5**	—	—	PF818	7ED7	Z329
30F27 ...	30F27	—	—	PE81	—	—
30FL1 ...	**30FL1**	—	—	PCE800	9GB8	LN339
30FL2 ...	**30FL2**	—	—	PCF812	—	—
30FL12 ...	**30FL12**	—	PCE82	PCE82	—	—
30FL14 ...	**30FL14**	**PCF808**	—	PCF808	—	—
30L1 ...	**30L1**	**PCC84**	PCC84	PCC84	7AN7	B319
30L15 ...	**30L15**	—	—	PCC805	7EK7	B349
30L17 ...	**30L17**	**PCC806**	—	PCC806	—	—
30P4MR ...	**30P4MR**	—	—	—	—	—
30P12 ...	**30P12**	—	—	PL801	12FB5	N369
30P16 ...	**30P16**	**PL82**	PL82	PL82	16A5	N154, N329
30P18 ...	**30P18**	**PL84**	PL84	PL84	15CW5	N379
30P19 ...	**30P19**	**PL302**	PL302	PL302	—	N389
30PL1 ...	**30PL1**	—	—	PCL801	13GC8	LN319
30PL12 ...	30PL12	**PCL82**	PCL82	PCL82	16A8	—
30PL13 ...	**30PL13**	—	—	PCL800	16GK8	—
30PL14 ...	**30PL14**	—	—	PCL88	—	LN329
30PL15 ...	**30PL15**	—	—	—	—	—
31A3 ...	—	UY41	UY41	UY41	31A3	U142, 311SU
35A5 ...	—	—	35A5	—	35A5	—
35L6GT ...	—	—	35L6GT	—	35L6GT	—
35W4 ...	—	—	35W4, HY90	HY90	35W4	—
35Z3 ...	—	—	35Z3	—	35Z3	—
35Z4GT ...	—	—	35Z4GT	—	35Z4GT	U74, U76

Index	MAZDA		Brimar	European	American	Others
38A3	**U381**	**UY85**	UY85	UY85	38A3	U119
40PPA	—	—	7D3	—	7D3	—
40SUA	U4020	—	1D5	—	—	C10B, RZ, UR1C
41MH	AC2/HL	—	—	—	—	41MRC
41MPG	—	—	15A2	—	15A2	A80A, FC4, MX40, VHT4, X42
41MRC	AC2/HL	—	—	—	—	41MH
41STH	AC/TH1	—	—	—	—	—
42E	—	—	42E	—	—	—
42EC4	—	**PY500**	—	PY500	42EC4	—
42MP/PEN	AC2/Pen	—	7A3	—	7A3	APP4B, N41, KT41, PENA4, PEN4VB, PT4, A70C
43E	—	—	43E	—	—	—
43IU	UU5	—	R2	—	—	MU14
44IU	UU5	—	R3	—	—	MU14
45A5	—	UL41	UL41	UL41	45A5	N142, 451PT
45B5	**10P18**	**UL84**	UL84	UL84	45B5	N119
50A5	—	—	50A5	—	50A5	—
50BM8	**10PL12**	**UCL82**	UCL82	UCL82	50BM8	LN119
50C5	—	—	50C5	HL92	50C5	—
50CD6G	—	—	50CD6G	—	50CD6G	—
50L6GT	—	—	50L6GT	—	50L6GT	KT71
52KU	—	—	5V4G	—	5V4G	52KU
62DDT	6LD3	EBC41	EBC41	EBC41	6CV7	DH150, DH718
62TH	**6C10**	**ECH42**	ECH42	ECH42	6CU7	X150
62VP	6F16	EF41	EF41	EF41	6CJ5	W150
63ME	6M1	—	6U5G	—	6U5G	6G5G, 6H5, VFT6, Y61, Y63
63TP	—	**ECL80**	ECL80	ECL80	6AB8	LN152
64ME	—	EM34	—	EM34	—	—
65ME	—	EM80	EM80	EM80	6BR5	—
66KU	UU9	EZ40	EZ40	EZ40	6BT4	U150, U718
67PT	—	—	EL41	EL41	6CK5	N150
75	—	—	75	—	75	—
76	—	—	76	—	—	—
77/E	—	—	77/E	—	—	—
78/E	—	—	78/E	—	78/E	—
80	—	—	80	—	80	—

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80S	—	—	80S	—	—	—
83	—	—	83	—	—	—
83V	—	—	83V	—	—	—
108C1	—	—	OB2	108C1	OB2	STV108-30
121VP	—	—	UF41	UF41	12AC5	W142
141DDT	10LD3	UBC41	UBC41	UBC41	14L7	DH142, DH118
141TH	—	UCH42	UCH42	UCH42	14K7	X142
150C2	—	—	OA2	—	OA2	STV150-30
150C3	—	—	VR150/30	150C3	OD3	GD150A/S
202STH	TH2321	—	—	—	—	302THA, C36B, C36C, C36A
210VPT	VP210	—	—	—	—	VPT2
240QP	QP230	—	—	—	—	—
302THA	TH2321	—	—	—	—	202STH, C36B, C36C, C36A
311SU	—	UY41	UY41	UY41	31A3	U142
442BU	UU5	—	R2	—	—	DW4-350, U14
451PT	—	UL41	UL41	UL41	45A5	N142
460BU	UU5	—	R3, R2	—	—	1561, DW4-500, U14
506BU	UU5	—	R1	—	—	1821, U10
807	—	—	807	QV05-25	807	5B250A
1561	UU5	—	R3	—	—	DW4-500, U14, MU14, 431U
1629	—	—	1629	—	—	—
1821	UU5	—	R1	—	—	U10
1867	UU5	—	R2, R3	—	—	DW4-350, MU14, R42, 431U, DW4-500
5763	—	—	5763	—	5763	QV03-12
6080	—	—	6080	ECC230	6080	—
6146	—	—	6146	QV06-20	6146	—
6267	6F22	EF86	EF86, 6267	EF86	6267	Z729
6305	—	—	R10	—	6305	2T/270K, HR1, HR2
6374	—	—	—	—	6374	—
7558	—	—	7558	—	7558	—

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A11B	...	UU5	—	R2
A11C	...	UU5	—	R3
A11D	...	UU5	—	R2
A30B	...	AC2/HL	—	—
A50M	...	AC/VP1	—	—
A70B	...	AC/Pen	—	7A2
A70C	...	AC2/Pen	—	7A3
A80A	...	—	—	15A2
AC/HL	...	AC/HL	—	—
AC/HL/DD		AC/HL/DD		—
ACO44	...	PP3-250	—	—
AC/P	...	AC/P	—	—
AC/P4	...	AC/P4	—	—
AC/Pen	...	AC/Pen	—	7A2
AC/S2/PEN		AC/SG	—	8A1
AC/SG	...	AC/SG	—	8A1
AC/SG/VM	...	AC/SG/VM	—	—
AC/TH1	...	AC/TH1	—	—
AC/TP	...	AC/TP	—	—
AC/VP1	...	AC/VP1	—	—
AC/VP2	...	AC/VP2	—	—
AC2/HL	...	AC2/HL	—	—
AC2/Pen	...	AC2/Pen	—	7A3
AC2/Pen/DD		AC2/Pen/DD		—
AC4/Pen	...	AC4/Pen	—	—
AC5/Pen	...	AC5/Pen	—	—
AC5/Pen/DD		AC5/Pen/DD		—
APP4A	...	AC/Pen	—	7A2
APP4B	...	AC2/Pen	—	7A3
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European	American	Others
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—	—	1867, IW4–500, MU14
—	—	1867, IW4–350, R42
—	—	—
—	—	—
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—	—	PEN4VB, N41, PENA4, KT41, APP4B, PT4, 42MP/PEN
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—	—	D4, MH4, HL4
—	—	MHD4, 11A2, DDT, DDT4, DH42, H4D
—	—	4XP, LP4, PX4, P12–250, S30C
—	—	—
—	—	—
—	—	KT42, N40, P4VA, PEN4VA, A70B, MKT4, MP/PEN, APP4A
—	—	SPT4A, MS/PEN, MSP4, HP4101C
—	—	AC/S2/PEN, HP4101C, SPT4A, MS/PEN, MSP4
—	—	MM4V, AS4125
—	—	41STH
—	—	TP4
—	—	VPT4B, VP4, VP4A, MVSPEN, A50M
—	—	W42, VP41, MVSPENB
—	—	41MH, A30B, HLA1, NH41
—	—	A70C, PEN4VB, N41, PENA4, KT41, APP4B, PT4, 42MP/PEN
—	—	PT4D, DDPP4B, DN41
—	—	—
—	—	PT10
—	—	—
—	—	N40, P4VA, PEN4VA, A70B, MKT4, MP/PEN, KT42
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Index	MAZDA		Brimar	European	American	Others
AS4125	AC/SG/VM	—	—	—	—	—
B36	—	—	12SN7GT	—	12SN7GT	—
B65	—	—	6SN7GT	ECC32	6SN7GT	13D2
B109	**10L14**	**UCC85**	UCC85	UCC85	—	—
B152	—	**ECC81**	12AT7, ECC81	ECC81	12AT7	B309, E2157
B309	—	**ECC81**	12AT7, ECC81	ECC81	12AT7	B152, E2157
B319	**30L1**	**PCC84**	PCC84	PCC84	7AN7	—
B329	—	**ECC82**	12AU7, ECC82	ECC82	12AU7	E2163
B339	6L13	**ECC83**	12AX7, ECC83	ECC83	12AX7	12DT7, E2164
B349	30L15	—	—	PCC805	7EK7	—
B719	**6L12**	**ECC85**	ECC85	ECC85	6AQ8	—
B729	**6/30L2**	**ECC804**	ECC804	ECC804	6GA8	—
BPM04	—	—	6AQ5	EL90	6AQ5	N727
BVA132	HL23DD	—	—	—	—	—
BVA142	VP23	—	—	—	—	—
BVA162	Pen25	—	—	—	—	—
BVA172	TP25	—	—	—	—	—
BVA211	UU5	—	—	—	—	—
BVA214	UU5	—	—	—	—	—
BVA215	UU5	—	—	—	—	—
BVA216	UU5	—	—	—	—	—
C10B	U4020	—	1D5	—	C10B	RZ, UR1C
C30B	HL1320	—	4D1	—	—	DA, HL13C
C36A	TH2321	—	—	—	—	202STH, 302THA, C36B, C36C
C36B	TH2321	—	—	—	—	202STH, 302THA, C36A, C36C
C36C	TH2321	—	—	—	—	202STH, 302THA, C36B, C36A
C50B	—	—	8D2	—	—	SP13C, 13SPA
C50N	VP1322	—	9D2	—	—	13VPA, VP13C
C70D	Pen383	—	7D6	—	—	PP35, PEN36C, PEN3520
CL30	**20P4**	—	—	CL30	—	—
CY30	**U301**	—	—	CY30	—	—
CY31	U201	—	—	CY31	—	—
D1	D1	—	—	—	—	T4D
D4	AC/HL	—	—	—	—	—
D15	—	—	D15	—	—	—

Index	MAZDA		Brimar	European	American	Others
D63	—	—	6H6GT	EB34	6H6GT	—
D77	**6D2**	**EB91**	EB91, 6AL5	EB91	6AL5	D152, DD6
D152	**6D2**	**EB91**	EB91, 6AL5	EB91	6AL5	D77, DD6
DA	HL1320	—	4D1	—	—	C30B, HL13C
DA90	1D13	—	—	DA90	1A3	—
DAC32	—	—	1H5GT	DAC32	1H5GT	HD14
DAF91	**1FD9**	**DAF91**	1S5, DAF91	DAF91	1S5	ZD17
DAF96	**1FD1**	**DAF96**	DAF96, 1AH5	DAF96	1AH5	ZD25
DCC90	—	—	DCC90, 3A5	DCC90	3A5	—
DD6	**6D2**	**EB91**	EB91, 6AL5	EB91	6AL5	D77, D152
DD41	DD41	—	—	—	—	—
DDPP4B	AC2/Pen/DD		—	—	—	—
DDT	AC/HL/DD—		—	—	—	—
DDT4	AC/HL/DD—		—	—	—	—
DF33	—	—	1N5GT	DF33	1N5GT	Z14
DF91	**1F3**	**DF91**	DF91, 1T4	DF91	1T4	W17
DF92	1F2	DF92	1L4	DF92	1L4	—
DF96	**1F1**	**DF96**	DF96	DF96	1AJ4	W25
DH42	AC/HL/DD—		—	—	—	—
DH63	—	—	6Q7G	—	6Q7G	—
DH76	—	—	12Q7GT	—	12Q7GT	DL74M
DH77	—	**EBC90**	6AT6	EBC90	6AT6	—
DH81	—	—	7B6	—	7B6	DL82
DH109	**10LD12**	**UABC80**	UABC80	UABC80	—	—
DH118	**10LD3**	UBC41	UBC41	UBC41	14L7	141DDT, DH142
DH119	**10LD13**	**UBC81**	UBC81	UBC81	—	—
DH142	**10LD3**	UBC41	UBC41	UBC41	14L7	141DDT, DH118
DH147	—	—	6R7G	—	6R7G	OM4, DL63
DH149	—	—	7C6	—	7C6	—
DH150	6LD3	EBC41	EBC41	EBC41	6CV7	62DDT, DH718
DH718	6LD3	EBC41	EBC41	EBC41	6CV7	62DDT, DH150
DH719	**6LD12**	**EABC80**	EABC80	EABC80	6AK8	6T8
DK32	—	—	1A7G	DK32	1A7G	X14
DK91	**1C1**	**DK91**	DK91, 1R5	DK91	1R5	X17
DK92	**1C2**	**DK92**	DK92, 1AC6	DK92	1AC6	X20

MAZDA types in **BOLD** available at time of printing.

VALVE EQUIVALENTS

Index	MAZDA		Brimar	European	American	Others
DK96	**1C3**	**DK96**	DK96	DK96	1AB6	X25
DL33	—	—	3Q5GT	DL33	3Q5GT	N16
DL35	—	—	1C5GT	DL35	1C5GT	N14
DL63	—	—	6R7G	—	6R7G	DH147, OM4
DL74M	—	—	12Q7GT	—	12Q7GT	DH76
DL82	—	—	7B6	—	7B6	DH81
DL91	—	—	1S4, DL91	DL91	1S4	—
DL92	**1P10**	**DL92**	DL92, 3S4	DL92	3S4	N17
DL94	**1P11**	**DL94**	DL94, 3V4	DL94	3V4	N19
DL95	—	—	3Q4	—	3Q4	N18
DL96	**1P1**	**DL96**	DL96	DL96	3C4	N25
DL145	**10LD11**	—	—	—	—	—
DM70	—	—	DM70	DM70	1M3	—
DM71	**1M1**	**DM71**	—	DM71	1N3	Y25
DN41	AC2/Pen/DD		—	—	—	—
DO24	PP5-400	—	—	—	—	P27-500
DP61	—	—	6AK5, EF95	EF95	6AK5	PM05
DW2	UU5	—	R1	—	—	506BU, 1821
DW3	UU5	—	R2	—	—	DW4-350
DW4-350	UU5	—	R2, R3	—	—	431U, U14, MU14, R4, 1561/1867
DW4-500	UU5	—	R3	—	—	U14, MU14, 431U, 1561
DY86	—	**DY86**	DY86	DY86	1S2	—
DY87	—	**DY87**	DY87	DY87	1S2A	—
DY802	—	**DY802**	—	DY802	—	—
E2016	—	—	9D6	EF92	6CQ6	W77, VP6
E2157	—	**ECC81**	12AT7, ECC81	ECC81	12AT7	B152, B309
E2163	—	**ECC82**	12AU7, ECC82	ECC82	12AU7	B329
E2164	**6L13**	**ECC83**	12AX7, ECC83	ECC83	12AX7	B339, 12DT7
EA50	6D1	—	—	—	—	SD61
EABC80	**6LD12**	**EABC80**	EABC80	EABC80	6AK8	DH719, 6T8
EB34	—	—	6H6GT	EB34	6H6GT	—
EB91	**6D2**	**EB91**	EB91, 6AL5	EB91	6AL5	D77, D152, DD6
EBC41	6LD3	EBC41	EBC41	EBC41	6CV7	62DDT, DH150, DH718
EBC81	**6LD13**	**EBC80**	EBC81	EBC81	6BD7A	—
EBC90	—	**EBC90**	6AT6	EBC90	6AT6	DH77
EBC91	—	—	6AV6	EBC91	6AV6	—

Index	MAZDA		Brimar	European	American	Others
EBF80	—	**EBF80**	EBF80	EBF80	6N8	WD709, ZD152
EBF89	**6FD12**	**EBF89**	EBF89	EBF89	6DC8	—
EC86	—	—	EC86	EC86	6CM4	—
EC88	—	—	EC88	EC88	6DL4	—
EC90	—	—	6C4	EC90	6C4	L77
EC91	6L34	EC91	—	EC91	6AQ4	—
EC92	—	EC92	—	EC92	—	—
EC97	—	—	EC97	EC97	6FY5	—
ECC32	—	—	6SN7GT	ECC32	6SN7GT	B65, 13D2
ECC81	—	**ECC81**	12AT7, ECC81	ECC81	—	B152, B309, E2157
ECC82	—	**ECC82**	12AU7, ECC82	ECC82	12AU7	B329, E2163
ECC83	**6L13**	**ECC83**	12AX7, ECC83	ECC83	12AX7	B339, 12DT7, E2164
ECC84	6L16	**ECC84**	ECC84	ECC84	6CW7	—
ECC85	**6L12**	**ECC85**	ECC85	ECC85	6AQ8	B719
ECC88	—	—	ECC88	ECC88	6DJ8	—
ECC91	—	—	6J6	ECC91	6J6	—
ECC189	—	—	ECC189	ECC189	6ES8	—
ECC230	—	—	6080	ECC230	6080	—
ECC804	**6/30L2**	**ECC804**	ECC804	ECC804	6GA8	B729
ECC805	6L15	—	—	ECC805	—	—
ECC807	—	—	ECC807	ECC807	—	—
ECF80	6C16	**ECF80**	ECF80	ECF80	—	—
ECF82	—	**ECF82**	ECF82	ECF82	6U8	—
ECF86	—	—	—	ECF86	6HG8	—
ECF800	6C15	—	—	ECF800	—	—
ECF804	—	—	ECF804	ECF804	—	18D3
ECF805	6C18	—	—	ECF805	6GV7	—
ECF812	—	—	—	ECF812	6FL2	
ECH35	—	ECH35	6K8G	ECH35	6K8G	OM10, X61M, X65, X147
ECH42	**6C10**	**ECH42**	ECH42	ECH42	6CU7	X150 62TH
ECH81	**6C12**	**ECH81**	ECH81	ECH81	6AJ8	X719
ECH84	—	**ECH84**	ECH84	ECH84	6JX8	—
ECL80	—	**ECL80**	ECL80	ECL80	6AB8	LN152, 63TP
ECL82	**6PL12**	**ECL82**	ECL82	ECL82	6BM8	—
ECL83	—	—	ECL83	ECL83	—	—

MAZDA types in **BOLD** available at time of printing.

VALVE EQUIVALENTS

Index	MAZDA		Brimar	European	American	Others
ECL84	—	—	—	ECL84	6DX8	—
ECL85	—	—	—	ECL85	8GV8	—
ECL86	—	**ECL86**	ECL86	ECL86	6GW8	—
ECLL800	—	—	—	ECLL800	—	—
EE80	**6F28**	—	—	EE80	—	—
EF41	6F16	EF41	EF41	EF41	6CJ5	62VP, W150
EF80	—	**EF80**	EF80	EF80	6BX6	Z152, Z719
EF85	**6F26**	**EF85**	EF85	EF85	6BY7	W719
EF86	6F22	**EF86**	EF86	EF86	6267	Z729
EF89	—	**EF89**	EF89	EF89	6DA6	—
EF91	**6F12**	**EF91**	8D3, 6AM6, EF91	EF91	6AM6	5A/160H, 5A/160K, Z77, PM07, HP6, SP6
EF92	—	—	9D6, EF92	EF92	6CQ6	W77, VP6, 6F21
EF93	—	—	6BA6, EF93	EF93	6BA6	PM04, W727
EF94	—	—	6AU6	EF94	6AU6	—
EF95	—	—	6AK5, EF95	EF95	6AK5	DP61, PM05
EF183	**6F29**	**EF183**	EF183	EF183	6EH7	—
EF184	**6F30**	**EF184**	EF184	EF184	6EJ7	—
EF804	—	—	EF804	EF804	—	—
EF811	6F25	—	—	EF811	—	—
EF812	**6F23**	—	—	EF812	6EL7	Z749
EF814	**6F24**	—	—	EF814	—	—
EH90	—	**EH90**	EH90	EH90	6CS6	—
EK90	—	—	6BE6, EK90	EK90	6BE6	HM04, X77, X727
EL33	—	—	6AG6G, EL33	EL33	6AG6G	N147, KT61, OM9
EL34	—	—	EL34	EL34	6CA7	—
EL41	—	—	EL41	EL41	6CK5	N150, 67PT
EL84	**6P15**	**EL84**	EL84	EL84	6BQ5	N709
EL90	—	—	6AQ5, EL90	EL90	6AQ5	N727
EL91	—	—	6AM5	EL91	6AM5	N77, N144, 7D9, 6P17
EL95	—	EL95	—	EL95	6DL5	—
EL506	—	—	EL506	EL506	—	—
EL821	—	—	6CH6, EL821	EL821	6CH6	7D10
ELL80	—	ELL80	ELL80	ELL80	6HU8	—
EM34	—	EM34	—	EM34	—	64ME
EM35	6M2	—	—	EM35	—	—

Index	MAZDA		Brimar	European	American	Others
EM71	—	—	EM71	EM71	—	—
EM80	—	EM80	—	EM80	6BR5	65ME
EM81	—	EM81	EM81	EM81	6DA5	—
EM84	—	EM84	EM84	EM84	6FG6	—
EM85	—	EM85	EM85	EM85	—	—
EM87	—	**EM87**	EM87	EM87	6HU6	—
EM840	—	—	EM840	EM840	—	—
EN91	—	—	2D21	EN91	2D21	2OA3
EY51	—	**EY51**	R12, EY51	EY51	6X2	SU61, U43, U151
EY83	—	—	EY83	EY83	—	—
EY84	—	—	R18	EY84	—	—
EY86	—	**EY86/87**	EY86/87	EY86	6S2	—
EY87	—	**EY86/87**	EY86/87	EY87	6S2A	—
EY88	—	—	—	EY88	6AL3	—
EZ35	—	—	6X5GT, EZ35	EZ35	6X5GT	U70, U147
EZ40	UU9	EZ40	EZ40	EZ40	6BT4	U150, U718
EZ80	—	**EZ80**	EZ80	EZ80	6V4	—
EZ81	**UU12**	**EZ81**	EZ81	EZ81	6CA4	U709
EZ90	—	—	6X4, EZ90	EZ90	6X4	U78
FC4	—	—	15A2	—	—	41MPG, A80A, X42, MX40, VHT4
GD150A/S	—	—	VR150/30	—	OD3	150C3
GY501	—	**GY501**	—	GY501	—	—
GZ30	—	—	5Z4G	GZ30	5Z4G	R52
GZ31	—	—	5U4G	GZ31	5U4G	U52
GZ32	—	—	—	GZ32	5AQ4	52KU
GZ34	—	—	GZ34	GZ34	5AR4	—
H4D	AC/HL/DD		—	—	—	—
HABC80	—	—	HABC80	HABC80	—	—
HAD	HL/DD/1320		11D3	—	—	13DHA, TDD13C
HBC90	—	—	12AT6	HBC90	12AT6	—
HBC91	—	—	12AV6	HBC91	12AV6	—
HD14	—	—	1H5GT	DAC32	1H5GT	—
HF93	—	—	12BA6	HF93	12BA6	—
HF94	—	—	12AU6	HF94	12AU6	—
HK90	—	—	12BE6	HK90	12BE6	—

MAZDA types in **BOLD** available at time of printing.

VALVE EQUIVALENTS

Index	MAZDA		Brimar	European	American	Others
HL4 ...	AC/HL	—	—	—	—	—
HL13C ...	HL1320	—	4D1	—	—	C30B, DA
HL23 ...	HL23	—	—	—	—	—
HL23DD ...	HL23DD	—	—	—	—	—
HL41 ...	HL41	—	—	—	—	—
HL41DD ...	HL41DD	—	—	—	—	—
HL92 ...	—	—	50C5	HL92	50C5	—
HL133DD ...	HL133DD	—	—	—	—	—
HL1320 ...	HL1320	—	4D1	—	—	C30B, DA, HL13C
HLA1 ...	AC2/HL	—	—	—	—	—
HL/DD/1320	HL/DD/1320		11D3	—	—	13DHA, HAD, TDD13C
HMO4 ...	—	—	6BE6, EK90	EK90	6BE6	X77, X727
HP6 ...	**6F12**	**EF91**	8D3, 6AM6, EF91	EF91	6AM6	5A/160H, 5A/160K, PMO7, Z77, SP6,
HP4101C ...	AC/SG	—	8A1	—	—	AC/S2/PEN, SPT4A, MSPEN, MSP4
HR1 ...	—	—	R10	—	6305	HR2, 2T/270K
HR2 ...	—	—	R10	—	6304	HR1, 2T/270K
HY90 ...	—	—	HY90	HY90	—	—
IW3 ...	UU5	—	R2	—	—	1867, IW4-350, R42
IW4 ...	UU5	—	R3	—	—	IW4-500, R42
IW4-350 ...	UU5	—	R2	—	—	R42, 1867
IW4-500 ...	UU5	—	R3	—	—	43IU, MU14, R42
KD21 ...	—	—	VR75/30	—	OA3	—
KD24 ...	—	—	VR105/30	—	—	—
KT32 ...	—	—	25L6GT	—	25L6GT	—
KT41 ...	AC2/Pen	—	7A3	—	—	42MP/PEN, PEN4VB, N41, PENA4, PT4, APP4B, A70C
KT42 ...	AC/Pen	—	7A2	—	—	N40, P4VA, MKT4, MP/PEN, PEN4VA, A70B, APP4A
KT61 ...	—	—	6AG6G, EL33	EL33	6AG6G	N147, OM9
KT63 ...	—	—	6F6G	—	6F6G	—
KT66 ...	—	—	6L6G	—	6L6G	—
KT71 ...	—	—	50L6GT	—	50L6GT	—
KT88 ...	—	—	7D11	—	7D11	—
KTW63 ...	—	—	6K7G	—	6K7G	W63
KTW74M ...	—	—	12K7GT	—	12K7GT	W76
KTZ63 ...	—	—	6J7G	—	6J7G	Z63
KY50 ...	**U25**	—	—	KY50	2L2	U47

Index	MAZDA		Brimar	European	American	Others
KY80 ...	**U28**	—	R20	KY80	2J2	U49
L2 ...	L2	—	—	—	—	—
L63 ...	—	—	6J5G	—	6J5G	—
L77 ...	—	—	6C4	EC90	6C4	—
LN119 ...	**10PL12**	**UCL82**	UCL82	UCL82	50BM8	—
LN152 ...	—	**ECL80**	ECL80	ECL80	6AB8	**63TP**
LN309 ...	—	**PCL83**	PCL83	PCL83	—	—
LN319 ...	**30PL1**	—	—	PCL801	13GC8	LN319
LN329 ...	**30PL14**	—	—	PCL88	—	—
LN339 ...	**30FL1**	—	—	PCE800	9GB8	—
LP4 ...	PP3-250	—	—	—	—	4XP, ACO44, PX4, P12-250, S30C
LZ319 ...	**30C1**	**PCF80**	PCF80	PCF80	9A8	LZ329
LZ329 ...	**30C1**	**PCF80**	PCF80	PCF80	9A8	LZ319
LZ339 ...	**30C15**	—	—	PCF800	9EN7	—
ME41 ...	ME41	—	—	—	—	—
MH4 ...	AC/HL	—	—	—	—	—
MH41 ...	AC2/HL	—	—	—	—	—
MHD4 ...	AC/HL/DD	—	—	—	—	—
MKT4 ...	AC/Pen	—	7A2	—	—	A70B, APP4A, KT42, N40, P4VA, PEN4VA, MP/PEN
MM4V ...	AC/SG/VM	—	—	—	—	—
MP/PEN ...	AC/Pen	—	7A2	—	—	A70B, MKT4, APP4A, KT42, N40, P4VA, PEN4VA
MSP4 ...	AC/SG	—	8A1	—	—	AC/S2/PEN, SPT4A, MS/PEN, HP4101C
MS/PEN ...	AC/SG	—	8A1	—	—	HP4101C, AC/S2/PEN, MSP4, SPT4A
MU12 ...	UU5	—	R2	—	—	1867, 1W4-350, R42
MU14 ...	UU5	—	R3	—	—	431U, 1W4-500, U141
MVS/PEN ...	AC/VP1	—	—	—	—	—
MVSP/PEN/B	AC/VP2	—	—	—	—	—
MX40 ...	—	—	15A2	—	—	FC4, 41MPG, A80A, VHT4, X42
N14 ...	—	—	1C5GT	DL35	1C5GT	—
N16 ...	—	—	3Q5GT	DL33	3Q5GT	—
N17 ...	**1P10**	**DL92**	DL92, 3S4	DL92	3S4	—
N18 ...	—	—	3Q4	DL95	3Q4	—
N19 ...	**1P11**	**DL94**	DL94, 3V4	DL94	3V4	—
N25 ...	**1P1**	**DL96**	DL96	DL96	3C4	—
N30 ...	—	—	7D5	—	—	PP13A, PTA

MAZDA types in **BOLD** available at time of printing.

VALVE EQUIVALENTS

Index	MAZDA		Brimar	European	American	Others
N40	—	—	7A2	—	—	—
N41	AC2/Pen	—	7A3	—	—	PENA4, PEN4VB, PT4, APP4B, A70C, 42MP/PEN, PT4
N77	—	—	6AM5	EL91	6AM5	N144, 7D9, 16A, 6P17
N118	**10P13**	—	—	—	—	N145
N119	**10P18**	**UL84**	UL84	UL84	45B5	—
N142	—	UL41	UL41	UL41	45A5	451PT
N144	—	—	6AM5	EL91	6AM5	N77, 7D9, 16A, 6P17
N145	**10P13**	—	—	—	—	N118
N147	—	—	6AG6G, EL33	EL33	6AG6G	KT61, OM9
N148	—	—	7C5	—	7C5	—
N150	—	—	EL41	EL41	6CK5	67PT
N152	—	**PL81**	PL81	PL81	21A6	N359
N154	**30P16**	**PL82**	PL82	PL82	16A5	N329
N308	**30P4MR**	—	—	—	25GF6	—
N329	**30P16**	**PL82**	PL82	PL82	16A5	N154
N359	—	**PL81**	PL81	PL81	21A6	N152
N369	**30P12**	—	—	PL801	12FB5	N369
N379	**30P18**	**PL84**	PL84	PL84	15CW5	—
N389	**30P19**	**PL302**	PL302	PL302	—	—
N709	**6P15**	**EL84**	EL84	EL84	6BQ5	—
N727	—	—	6AQ5, EL90	EL90	6AQ5	BPM04
OM4	—	—	6R7G	DL63	6R7G	DH147
OM9	—	—	6AG6G, EL33	EL33	6AG6G	KT61, N147
OM10	—	—	6K8G	ECH35	6K8G	X61M, X65, X147
See also figure 0						
P4VA	AC/Pen	—	7A2	—	—	MP/PEN, N40, PEN4VA, A70B, APP4A, KT42, MKT4
P12–250	PP3–250	—	—	—	—	4XP, ACO44, LP4, PX4
P27–500	PP5–400	—	—	—	—	DO24
P41	P41	—	—	—	—	—
P61	P61	—	—	—	—	—
PC86	—	**PC86**	PC86	PC86	4CM4	—
PC88	—	**PC88**	PC88	PC88	4DL4	—
PC97	—	**PC97**	PC97	PC97	4FY5	—
PC900	—	**PC900**	PC900	PC900	4HA5	—
PCC84	**30L1**	**PCC84**	PCC84	PCC84	7AN7	B319

 MAZDA types in **BOLD** available at time of printing.

Index	MAZDA		Brimar	European	American	Others
PCC85 ...	—	**PCC85**	PCC85	PCC85	9AQ8	—
PCC88 ...	—	**PCC88**	PCC88	PCC88	7DJ8	—
PCC89 ...	—	**PCC89**	PCC89	PCC89	7FC7	—
PCC189 ...	—	**PCC189**	PCC189	PCC189	7ES8	—
PCC805 ...	**30L15**	—	—	PCC805	7EK7	—
PCC806 ...	**30L17**	**PCC806**	—	PCC806	—	—
PCE82 ...	**30FL12**	—	PCE82	PCE82	—	—
PCE800 ...	**30FL1**	—	—	PCE800	9GB8	LN339
PCF80 ...	**30C1**	**PCF80**	PCF80	PCF80	9A8	LZ319, LZ329
PCF82 ...	—	**PCF82**	PCF82	PCF82	9U8	—
PCF86 ...	—	**PCF86**	PCF86	PCF86	8HG8	—
PCF87 ...	**30C17**	**PCF87**	—	PCF87	—	—
PCF200 ...	—	**PCF200**	—	PCF200	8X9	—
PCF800 ...	**30C15**	—	—	PCF800	9EN7	LZ339
PCF801 ...	—	**PCF801**	PCF801	PCF801	8GJ7	—
PCF802 ...	—	**PCF802**	PCF802	PCF802	9JW8	—
PCF805 ...	**30C18**	**PCF805**	—	PCF805	7GV7	—
PCF806 ...	—	**PCF806**	PCF806	PCF806	—	—
PCF808 ...	**30FL14**	**PCF808**	—	PCF808	—	—
PCF812 ...	**30FL2**	—	—	PCF812	—	—
PCH200 ...	—	**PCH200**	—	PCH200	9V9	—
PCL82 ...	30PL12	**PCL82**	PCL82	PCL82	16A8	—
PCL83 ...	—	**PCL83**	PCL83	PCL83	—	LN309
PCL84 ...	—	**PCL84**	PCL84	PCL84	15DQ8	—
PCL85 ...	—	**PCL805/85**	PCL805/85	PCL805/85	18GV8	—
PCL86 ...	—	**PCL86**	PCL86	PCL86	14GW8	—
PCL88 ...	**30PL14**	—	—	PCL88	—	LN329
PCL800 ...	**30PL13**	—	—	PCL800	16GK8	—
PCL801 ...	**30PL1**	—	—	PCL801	13GC8	LN319
PCL805 ...	—	**PCL805**	PCL805	PCL805	—	—
PD500 ...	—	**PD500**	—	PD500	9ED4	—
PE81 ...	30F27	—	—	PE81	—	—
Pen4VA ...	AC/Pen	—	7A2	—	—	P4VA, N40, A70B, APP4A, KT42, 42MP/PEN, KT41, N41, PENA4, PT4, APP4B, A70C
Pen4VB ...	AC2/Pen	—	7A3	—	—	
Pen13C ...	Pen1340	—	7D8	—	—	—

MAZDA types in **BOLD** available at time of printing.

VALVE EQUIVALENTS

Index	MAZDA	Brimar	European	American	Others
Pen25	Pen25	—	—	—	—
Pen36C	Pen383	—	7D6	—	—	C70D, PEN3520, PP35
Pen44	Pen44	—	—	—	—	—
Pen45	Pen45	—	—	—	—	—
Pen45DD	Pen45DD	—	—	—	—	—
Pen46	Pen46	—	—	—	—	—
Pen220	Pen220	—	—	—	—	PENB1, PM22A, PP2, PT2
Pen383	Pen383	—	7D6	—	—	C70D, PEN3520, PP35, PEN36C
Pen1340	Pen1340	—	7D8	—	—	PEN13C
Pen3520	Pen383	—	7D6	—	—	C70D, PEN36C PP35
PenA4	AC2/Pen	—	7A3	—	—	PEN4VB, KT41, N41, PT4, APP4B, A70C, 42MP/PEN
PenB1	Pen220	—	—	—	—	PM22A, PP2, PT2
PF818	**30F5**	—	—	PF818	7ED7	Z329
PFL200	—	**PFL200**	PFL200	PFL200	—	—
PL36	—	**PL36**	PL36	PL36	25E5	—
PL81	—	**PL81**	PL81	PL81	21A6	N152, N359
PL81A	—	**PL81A**	PL81A	PL81A	—	—
PL82	**30P16**	**PL82**	PL82	PL82	16A5	N154, N329
PL83	—	**PL83**	PL83	PL83	15A6	—
PL84	**30P18**	**PL84**	PL84	PL84	15CW5	N379
PL302	**30P19**	**PL302**	PL302	PL302	—	N389
PL500	—	**PL500**	PL500	PL500	27GB5	—
PL504	—	**PL504**	—	PL504	—	—
PL508	—	**PL508**	—	PL508	17KW6	—
PL509	—	**PL509**	—	PL509	—	—
PL801	**30P12**	—	—	PL801	12FB5	N369
PL802	—	**PL802**	—	PL802	—	—
PM84	—	—	PM84	PM84	—	—
PM04	—	—	6BA6	EF93	6BA6	W727
PM05	—	—	6AK5	EF95	6AK5	DP61
PM07	**6F12**	**EF91**	8D3	EF91	6AM6	SP6, HP6, Z77, 5A/160H, 5A/160K
PM22A	Pen220	—	—	—	—	PP2, PT2, PENB1
PP2	Pen220	—	—	—	—	PM22A, PT2, PENB1
PP3-250	PP3-250	—	—	—	—	4XP, ACO44, LP4, PX4, P12-250, S30C
PP5-400	PP5-400	—	—	—	—	P27-500, DO24

Index	MAZDA		Brimar	European	American	Others
PP13A ...	—	—	7D5	—	—	N30, PTA
PP35 ...	Pen383	—	7D6	—	—	C70D, PEN36C, PEN3520
PT2 ...	Pen220	—	—	—	—	PP2, PENB1, PM22A
PT4 ...	AC2/Pen	—	7A3	—	—	PEN4VB, KT41, PENA4, N41, APP4B, A70C, 42MP/PEN
PT4D ...	AC2/Pen/DD		—	—	—	DN41, DDPP4B
PT10 ...	AC5/Pen	—	—	—	—	—
PTA ...	—	—	7D5	—	—	N30, PP13A
PX4 ...	PP3-250	—	—	—	—	4XP, ACO44, LP4, P12-250
PY32 ...	**U291**	**PY32**	PY32	PY32	—	—
PY33 ...	—	**PY33**	PY33	PY33	—	—
PY81 ...	—	**PY81/800**	PY81/800	PY81/800	17Z3	U153
PY82 ...	**U192**	**PY82**	PY82	PY82	19Y3	19SU, U319, U154
PY83 ...	—	**PY83**	PY83	PY83	—	—
PY88 ...	—	**PY88**	PY88	PY88	30AE3	—
PY301 ...	**U191**	—	—	PY301	19CS4	U339
PY500 ...	—	**PY500**	—	PY500	42EC4	—
PY800 ...	—	**PY81/800**	—	PY800	—	—
PY801 ...	**U193**	**PY801**	PY801	PY801	—	U349
QP25 ...	QP25	—	—	—	—	—
QP230 ...	QP230	—	—	—	—	240QP
QV03-12 ...	—	—	5763	—	5763	—
QV05-25 ...	—	—	807	—	807	5B250A
QV06-20 ...	—	—	6146	—	6146	—
R1 ...	UU5	—	R1	—	—	506RU, U10
R2 ...	UU5	—	R2, R3	—	—	IW4-350, DW4-500, 1561, 1867, MU14, R42
R8 ...	UU5	—	R3	—	—	IW4-500, DW4-500, 1561, 431U, MU14
R4A ...	UU5	—	R3	—	—	DW4-500, MU14, U14, 431U ,1561
R10 ...	—	—	R10	—	6305	2T/270K, HR1, HR2
R11 ...	—	—	R11	—	—	—
R12 ...	—	**EY51**	R12, EY51	EY51	6X2	SU61, U43, U151
R16 ...	—	—	R16	—	1T2	U37
R17 ...	—	—	R17	—	—	—
R18 ...	—	—	R18	EY84	—	—
R19 ...	—	—	R19	—	1X2B	—
R20 ...	**U26**	—	R20	KY80	2T2	U49

MAZDA types in **BOLD** available at time of printing.

VALVE EQUIVALENTS

Index	MAZDA		Brimar	European	American	Others
R42	UU5	—	R2	—	—	431U, 1867
R52	—	—	5Z4G	GZ30	5Z4G	—
RZ	U4020	—	1D5	—	—	C10B, UR1C
S30C	PP3-250	—	—	—	—	4XP, ACO44, LP4, PX4, P12-250
SD61	6D1	—	—	—	2B35	—
SP6	**6F12**	**EF91**	8D3, 6AM6, EF91	EF91	6AM6	PM07, Z77, 5A/160H, HP6, 5A/160K
SP13C	—	—	8D2	—	—	C50B, 13SPA
SP41	**SP41**	—	—	—	—	—
SP42	**SP42**	—	—	—	—	—
SP61	**SP61**	—	—	—	—	—
SPT4A	AC/SG	—	8A1	—	—	AC/S2/PEN, MS/PEN, MSP4, HP4101C
STV108-30	—	—	OB2	108C1	OB2	—
STV150-30	—	—	OA2	150C2	OA2	—
SU61	—	**EY51**	R12, EY51	EY51	6X2	U43, U151
T4D	D1	—	—	—	—	—
T41	T41	—	—	—	—	—
TDD13C	HL/DD/1320		11D3	—	—	13DHA, HAD
TH4A	ACTH1	—	—	—	—	TH4B
TH4B	ACTH1	—	—	—	—	TH4A
TH41	TH41	—	—	—	—	—
TH2321	TH2321	—	—	—	—	202STH, 302THA, C36B, C36C, C36A
TP4	AC/TP	—	—	—	—	—
TP22	TP22	—	—	—	—	—
TP25	TP25	—	—	—	—	—
U10	UU5	—	R1	—	—	506BU
U14	UU5	—	R3	—	—	1561, DW4-500
U21	U21	—	—	—	—	—
U22	U22	—	—	—	—	—
U24	U24	—	—	—	—	—
U25	**U25**	—	—	KY50	2L2	U47
U26	**U26**	—	R20	KY80	2J2	U49
U31	—	—	25Z4	—	25Z4	—
U37	—	—	R16	—	1T2	—
U43	—	**EY51**	R12, EY51	EY51	6X2	U151
U47	**U25**	—	—	KY50	2L2	U47

 MAZDA types in **BOLD** available at time of printing.

Index	MAZDA		Brimar	European	American	Others
U49	**U26**	—	R20	KY80	2J2	U49
U50	—	—	5Y3GT	—	5Y3GT	—
U52	—	—	5U4G	G231	5U4G	—
U70	—	—	6X5GT, EZ35	EZ35	6X5GT	U147
U74	—	—	35Z4GT	—	35Z4GT	U76
U76	—	—	35Z4GT	—	35Z4GT	U74
U78	—	—	6X4, EZ90	EZ90	6X4	—
U82	—	—	7Y4	—	—	U149
U118	**U404**	—	—	—	—	U145
U119	**U381**	**UY85**	UY85	UY85	38A3	—
U142	—	UY41	UY41	UY41	31A3	311SU
U145	**U404**	—	—	—	—	—
U147	—	—	6X5GT, EZ35	EZ35	6X5GT	U70
U149	—	—	7Y4	—	—	U82
U150	UU9	EZ40	EZ40	EZ40	6BT4	66KU, U718
U151	—	**EY51**	R12, EY51	EY51	6X2	SU61, U43
U153	—	**PY81/800**	PY81/800	PY81, PY800	17Z3	—
U154	**U192**	**PY82**	PY82	PY82	19Y3	19SU, U319
U191	**U191**	—	—	PY301	19CS4	U339
U192	**U192**	**PY82**	PY82	PY82	19Y3	19SU, U154, U319
U193	**U193**	**PY801**	PY801	PY801	—	U349
U201	U201	—	—	CY31	—	—
U251	**U251**	—	—	—	—	U329
U281	U281	—	—	—	—	—
U282	U282	—	—	—	—	—
U291	**U291**	**PY32**	PY32	PY32	—	—
U301	**U301**	—	—	CY30	—	—
U319	**U192**	**PY82**	PY82	PY82	19Y3	19SU, U154
U329	**U251**	—	—	—	—	—
U339	**U191**	—	—	PY301	19CS4	U339
U349	**U193**	**PY801**	PY801	PY801	—	—
U381	**U381**	**UY85**	UY85	UY85	38A3	U119
U404	**U404**	—	—	—	—	U118, U145
U709	**UU12**	**EZ81**	EZ81	EZ81	6CA4	—
U718	UU9	EZ40	EZ40	EZ40	6BT4	66KU

MAZDA types in **BOLD** available at time of printing.

VALVE EQUIVALENTS

Index	MAZDA	Brimar	European	American	Others
U801	**U801**	—	—	—	—
U4020	U4020	—	1D5	—	40SUA, C10B, RZ, UR1C
UABC80	**10LD12**	**UABC80**	UABC80	UABC80	—	DH109
UBC41	**10LD3**	UBC41	UBC41	UBC41	14L7	DH142, 141DDT, DH118
UBC81	**10LD13**	**UBC81**	UBC81	UBC81	—	DH119
UBF89	**10FD12**	**UBF89**	UBF89	UBF89	19FL8	WD119
UC92	—	UC92	—	UC92	—	—
UCC85	**10L14**	**UCC85**	UCC85	UCC85	—	B109
UCH42	—	UCH42	UCH42	UCH42	14K7	X142, 141TH
UCH81	**10C14**	**UCH81**	UCH81	UCH81	19D8	X119
UCL82	**10PL12**	**UCL82**	UCL82	UCL82	50BM8	LN119
UCL83	—	**UCL83**	UCL83	UCL83	—	—
UF41	—	—	UF41	UF41	12AC5	121VP, W142
UF80	—	—	UF80	UF80	—	—
UF89	—	**UF89**	UF89	UF89	—	—
UL41	—	UL41	UL41	UL41	45A5	451PT, N142
UL84	**10P18**	**UL84**	UL84	UL84	45B5	N119
UM35	10M2	UM35	—	UM35	—	—
UM80	—	—	UM80	UM80	19BR5	—
UR1C	U4020	—	1D5	—	—	40SUA, C10B, RZ
UU3	UU3	—	R2, R3	—	—	1867, IW4—350, MU12, R42
UU4	UU4	—	R2, R3	—	—	1867, IW4-350, MU12, R42
UU5	UU5	—	R3	—	—	431U, MU14, IW4-500, U14
UU6	UU6	—	—	—	—	—
UU7	UU7	—	—	—	—	—
UU8	**UU8**	—	—	—	—	—
UU9	UU9	EZ40	EZ40	EZ40	6BT4	U150, U718
UU12	**UU12**	**EZ81**	EZ81	EZ81	6CA4	U709
UU60/250	UU5	—	R2	—	—	1867, R42, IW4-350
UU120/350	UU5	—	R2, R3	—	—	1867, R42, IW4-350, DW4-350, MU14
UU120/500	UU5	—	R3	—	—	DW4-500, 1561
UY41	—	UY41	UY41	UY41	31A3	U142, 311SU
UY85	**U381**	**UY85**	UY85	UY85	38A3	U119
VFT6	6M1	—	6U5G	—	6U5G	6G5G, 6H5, VFT6, Y61, Y63
VHT4	—	—	15A2	—	—	FC4, 41MPG, A80A, MX40, X42

Index	MAZDA		Brimar	European	American	Others
VP4	AC/VP1	—	—	—	—	VP4A
VP4A	—	—	—	—	—	VP4
VP6	—	—	9D6, EF92	EF92	6CQ6	W77, E2016, 6F21
VP13C	VP1322	—	9D2	—	—	13VPA, C50N
VP23	VP23	—	—	—	—	—
VP41	AC/VP2	—	—	—	—	—
VP133	VP133	—	—	—	—	—
VP210	VP210	—	—	—	—	VPT2, 210VPT
VP1322	VP1322	—	9D2	—	—	13VPA, VP13C
VPT2	VP210	—	—	—	—	210VPT
VPT4B	AC/VP1	—	—	—	—	—
VR75/30	—	—	VR75/30	—	OA3	KD21
VR105/30	—	—	VR105/30	—	OC3	KD24
VR150/30	—	—	VR150/30	—	OD3	GD150A/S, 150C3
W17	**1F3**	**DF91**	1T4, DF91	DF91	1T4	—
W25	**1F1**	**DF96**	DF96	DF96	1AJ4	—
W42	AC/VP2	—	—	—	—	—
W63	—	—	6K7G	—	6K7G	KTW63
W76	—	—	12K7GT	—	12K7GT	KTW74M
W77	—	—	9D6, EF92	EF92	6CQ6	VP6, E2016, 6F21
W81	—	—	7H7	—	7H7	W143, W148
W118	**10F9**	—	—	—	—	W145
W119	10F18	—	—	—	13EC7	—
W142	—	—	UF41	UF41	12AC5	121VP
W143	—	—	7H7	—	7H7	W81, W148
W145	**10F9**	—	—	—	—	W118
W148	—	—	7H7	—	7H7	W81, W143
W149	—	—	7B7	—	—	—
W150	6F16	EF41	EF41	EF41	6CJ5	62VP
W719	**6F26**	**EF85**	EF85	EF85	6BY7	—
W727	—	—	6BA6	EF93	6BA6	PM04
W739	**6F18**	—	—	—	6EC7	—
WD119	**10FD12**	**UBF89**	UBF89	UBF89	19FL8	—
WD709	—	**EBF80**	EBF80	EBF80	6N8	ZD152
X14	—	—	1A7G	DK32	1A7G	—

MAZDA types in **BOLD** available at time of printing.

VALVE EQUIVALENTS

Index	MAZDA		Brimar	European	American	Others
X17	**1C1**	**DK91**	DK91	DK91	1R5	—
X20	**1C2**	**DK92**	DK92	DK92	1AC6	—
X25	**1C3**	**DK96**	DK96	DK96	1AB6	—
X42	—	—	15A2	—	—	VHT4, FC4, 41MPG, A80A, MX40
X61M	—	ECH35	6K8G	ECH35	6K8G	OM10, X65, X147
X63	—	—	6A8G	—	6A8G	—
X65	—	ECH35	6K8G	ECH35	6K8G	OM10, X61M, X147
X71M	—	—	12K8GT	—	12K8GT	X76M
X76M	—	—	12K8GT	—	12K8GT	X71M
X77	—	—	6BE6, EK90	EK90	6BE6	HM04, X727
X81	—	—	7S7	—	—	X148
X118	10C1	—	—	—	—	X145
X119	**10C14**	**UCH81**	UCH81	UCH81	19D8	—
X142	—	UCH42	UCH42	UCH42	14K7	141TH
X145	10C1	—	—	—	—	X118
X147	—	ECH35	6K8G	ECH35	6K8G	OM10, X61M, X65
X148	—	—	7S7	—	—	X81
X150	**6C10**	**ECH42**	ECH42	ECH42	6CU7	62TH
X719	**6C12**	**ECH81**	ECH81	ECH81	6AJ8	—
X727	—	—	6BE6, EK90	EK90	6BE6	HM04, X77
Y25	1M1	DM71	—	DM71	1N3	—
Y61	6M1	—	6U5G	—	6U5G	6G5G, Y63, 6H5, 63ME, VFT6
Y63	6M1	—	6U5G	—	6U5G	6G5G, Y61, 6H5, 63ME, VFT6
Z14	—	—	1N5GT	DF33	1N5GT	—
Z83	—	—	6J7G	—	6J7G	KTZ63
Z77	**6F12**	**EF91**	8D3	EF91	6AM6	SP6, PM07, 5A/160H, 5A/160K, HP8
Z145	**10F1**	—	—	—	—	—
Z152	—	**EF80**	EF80	EF80	6BX6	Z719
Z329	**30F5**	—	—	PF818	7ED7	Z329
Z719	—	**EF80**	EF80	EF80	6BX6	Z152
Z729	6F22	**EF86**	EF86, 6267	EF86	6267	—
Z749	**6F23**	—	—	EF812	6EJ7	—
ZD17	**1FD9**	**DAF91**	1S5	DAF91	1S5	—
ZD25	**1FD1**	**DAF96**	DAF96	DAF96	1AH5	—
ZD152	—	**EBF80**	EBF80	EBF80	6NS	WD709

 MAZDA types in **BOLD** available at time of printing.

MAZDA

PICTURE TUBE

DIRECT REPLACEMENTS

without circuit modifications

This list includes all picture tubes for which there are available MAZDA replacements (*Current, Maintenance* and *Obsolescent* types at time of going to press). Both **Direct Equivalents** and **Comparables** are included, but in no case is a circuit modification required.

Every care has been taken in compilation of the list but no responsibility or liability is assumed or accepted for the accuracy of the information.

NOTES

a In 300 mA heater chains only
b Replacement is shorter
c Discard ion trap and any associated lead
d Fit and adjust ion trap
e In *Deep Scene* sets, ensure Rimguard frame is connected
f Replacement has darker glass
g Replacement is not aluminised

Index	MAZDA replacement	Equivalent or Comparable	
17AR P4	CRM174	Comparable	**Note a**
17AS P4	CRM174	Comparable	**Note a**
17CV P4	CME1703	Comparable	**Note a**
21DK P4	CME2101	Comparable	**Note a**
21DK P4A	CME2101	Comparable	**Note a**
23DG P4	CME2306 S	Comparable	
23DH P4	CME2306 S	Comparable	
23S P4	CME2306 S	Comparable	**b**
25U P22	A63–11 X	Direct equivalent	
171K	CRM174	Comparable	**a**
7205A	CME1402	Direct equivalent	
7404A	CRM172	Direct equivalent	
7405A	CME1703	Direct equivalent	
7406A	CME1705	Direct equivalent	
7502A	CRM212	Direct equivalent	
7503A	CME2101	Direct equivalent	
7504A	CME2104	Direct equivalent	
7601A	CME1903 S	Comparable	**a, b**
7701A	CME2301	Direct equivalent	
A31–18W	CME1201	Direct equivalent	
A40–11W	CME1601 S	Direct equivalent	
A40–12W	CME1602 S	Direct equivalent	
A44–120W/R	CME1713 R	Direct equivalent	
A44–121W/R	CME1713 R	Comparable	
A47–11W	CME1905 S	Comparable	
A47–13W	CME1906 S	Direct equivalent	
A47–14W	CME1908 S	Direct equivalent	
A47–15W	CME1906 S	Comparable	
A47–17W	CME1905 S	Direct equivalent	
A47–18W	CME1905 S	Comparable	

Index	MAZDA replacement	Equivalent or Comparable	
A47–25W	CME1907 S	Direct equivalent	
A47–26W	CME1913 S	Comparable	**e**
A47–26W/R	CME1913 R	Comparable	
A47–27W	CME1913 S	Comparable	
A47–28W	CME1913 S	Direct equivalent	
A47–28W/R	CME1913 R	Direct equivalent	
A49–11X	A49–11X	MAZDA type	
A49–15X	A49–11X	Comparable	
A49–18X	A49–11X	Comparable	
A49–120X	A49–191X	Comparable	
A49–191X	A49–191X	MAZDA type	
A49–200X	A49–191X	Comparable	
A50–120W/R	CME2013 R	Direct equivalent	
A55–14X	A55–14X	MAZDA type	
A55–141X	A55–14X	Comparable	
A59–11W	CME2305 S	Comparable	
A59–12W	CME2305 S	Direct equivalent	
A59–13W	CME2306 S	Direct equivalent	
A59–14W	CME2306 S	Comparable	
A59–15W	CME2308	Direct equivalent	
A59–16W	CME2306 S	Comparable	
A59–22W	CME2313 S	Comparable	
A59–23W	CME2313 S	Direct equivalent	
A59–23W/R	CME2313 R	Direct equivalent	
A59–25W	CME2312 S	Direct equivalent	
A61–120W/R	CME2413 R	Direct equivalent	
A63–11X	A63–11X	MAZDA type	
A63–16X	A63–11X	Comparable	
A63–17X	A63–11X	Comparable	
A63–120X	A63–200X	Comparable	

Index	MAZDA replacement	Equivalent or Comparable	
A63–200X	A63–200X	MAZDA type	
A65–11W	CME2501	Direct equivalent	
AW43–80	CME1702	Comparable	**a, b, c**
AW43–80Z	CME1702	Comparable	**a, b**
AW43–88	CME1703	Comparable	**a**
AW43–89	CME1705	Comparable	**a**
AW47–90	CME1902	Direct equivalent	
AW47–91	CME1903 S	Direct equivalent	
AW47–97	CME1903 S	Comparable	**a, b**
AW53–88	CME2101	Comparable	**a**
AW53–89	CME2104	Comparable	**a**
AW59–90	CME2302	Direct equivalent	
AW59–91	CME2308 S	Comparable	**f**
AW59–95	CME2301	Direct equivalent	
C12A	CRM121 B	Direct equivalent	
C17/1A	CRM174	Comparable	**a**
C17/5A	CME1702	Comparable	**a, b, c**
C17/7A	CME1703	Comparable	**a**
C17AA	CME1703	Comparable	**a**
C17FM	CRM174	Comparable	**b**
C17SM	CME1702	Comparable	**a,b**
C19/7A	CME1902	Direct equivalent	
C19/10A	CME1903 S	Direct equivalent	
C19/10AP	CME1906 S	Direct equivalent	
C19AK	CME1902	Direct equivalent	
C21/1A	CRM212	Comparable	**a**
C21/7A	CME2101	Comparable	**a**
C21AA	CME2101	Comparable	**a**
C21TM	CRM212	Direct equivalent	
C23/7A	CME2302	Direct equivalent	

Index	MAZDA replacement	Equivalent or Comparable	
C23/10A	CME2308 S	Comparable	**f**
C23/10AP	CME2306 S	Direct equivalent	
C23AK	CME2302	Direct equivalent	
C23AKT	CME2306 S	Comparable	**b**
CME1101	CME1101	MAZDA type	
CME1201	CME1201 S	MAZDA type	**b**
CME1202	CME1202 R	MAZDA type	
CME1402	CME1402	MAZDA type	
CME1601	CME1601 S	MAZDA type	
CME1602	CME1602 S	MAZDA type	
CME1702	CME1702	MAZDA type	
CME1703	CME1703	MAZDA type	
CME1705	CME1705	MAZDA type	
CME1706	CME1703	Comparable	**a**
CME1713	CME1713 R	MAZDA type	
CME1901	CME1903 S	Comparable	**a, b**
CME1902	CME1902	MAZDA type	
CME1903	CME1903 S	MAZDA type	
CME1905	CME1905 S	MAZDA type	
CME1906	CME1906 S	MAZDA type	
CME1907	CME1907 S	MAZDA type	
CME1908	CME1908 S	MAZDA type	
CME1913 R	CME1913 R	MAZDA type	
CME1913 S	CME1913 S	MAZDA type	
CME2013	CME2013 R	MAZDA type	
CME2101	CME2101	MAZDA type	
CME2104	CME2014	MAZDA type	
CME2301	CME2301	MAZDA type	
CME2302	CME2302	MAZDA type	
CME2303	CME2308 S	Comparable	**f**

Index	MAZDA replacement	Equivalent or Comparable	
CME2305	CME2305 S	MAZDA type	
CME2306	CME2306 S	MAZDA type	
CME2307	CME2306 S	Comparable	*page120*
CME2308	CME2308 S	MAZDA type	
CME2312	CME2312 S	MAZDA type	
CME2313 R	CME2313 R	MAZDA type	
CME2313 S	CME2313 S	MAZDA type	
CME2413	CME2413 R	MAZDA type	
CME2501	CME2501 S	MAZDA type	
CRM 93	CRM93	MAZDA type	
CRM121	CRM121B	Comparable	
CRM121A	CRM121B	Comparable	
CRM121B	CRM121B	MAZDA type	
CRM123	CRM121B	Comparable	**g**
CRM141	CRM141/142	MAZDA type	
CRM142	CRM141/142	MAZDA type	
CRM143	CRM143	MAZDA type	
CRM151	CRM151	MAZDA type	
CRM152A	CRM152B	Comparable	**f**
CRM152B	CRM152B	MAZDA type	

Index	MAZDA replacement	Equivalent or Comparable	
CRM153	CRM153	MAZDA type	
CRM171	CRM171	MAZDA type	
CRM172	CRM172	MAZDA type	
CRM173	CRM173	MAZDA type	
CRM174	CRM174	MAZDA type	
CRM211	CRM211	MAZDA type	
CRM212	CRM212	MAZDA type	
CTA1950	A49–11X	Direct equivalent	
CTA1951	A49–191X	Comparable	
CTA2250	A55–14X	Comparable	
CTA25550	A63–11X	Direct equivalent	
MW43–64	CRM174	Comparable	**a**
MW43–69	CRM174	Comparable	**a**
MW43–69Z	CRM174	Comparable	**a, d**
T908	CRM174	Comparable	**a**
T911	CRM174	Comparable	**a**
T914	CRM174	Comparable	**a**
TR17/7	CRM174	Comparable	**a, d**
TR17/8	CRM174	Comparable	**a, d**
TR17/21	CRM174	Comparable	**a**
TR17/22	CRM174	Comparable	**a**

MAZDA GUARANTEES

VALVES	MONOCHROME TUBES	COLOUR TUBES
No registration	*No registration*	*Registration essential*
Free Guarantee 3 MONTHS	**Free Guarantee 2 YEARS**	**Chargeable Guarantee 4 YEARS or Free Guarantee 1 YEAR**
Claims on BVA Forms	*Claims on guarantee cards*	*Claims on Dealer Returns Notes*

MAZDA valves and picture tubes are guaranteed against faulty material or manufacturing defects for the above periods from the date of installation. Under the four-year Guarantee, all replacement colour tubes are guaranteed for the unexpired portion of the original four-year period.

No other guarantee or warranty is given or implied. This guarantee covers operation only within the manufacturers' published rating and does not cover misuse, consequential or accidental damage, or loss or injury however arising.

MAZDA

SERVICE DEPOTS

for examination of guarantee claims

VALVES AND SEMICONDUCTORS

All U.K.
MAZDA VALVE SERVICE
Brimsdown, Enfield, Middlesex
Tel.: 01-804 1201

Eire
Appointed service depot for MAZDA
Kelly & Shiel, Ltd., United Works,
Distillery Road, Dublin, 3
Tel.: Dublin 371621

PICTURE TUBES

London
MAZDA CRT SERVICE
Brimsdown, Enfield, Middlesex
Tel.: 01-804 1201

Birmingham
MAZDA CRT SERVICE
Aston Church Rd., Saltley, Birmingham, 8
Tel.: 021-327 1535

Leeds
CRT Reception only
MAZDA WHOLESALER DEPOT
3 Ring Road, Lower Wortley, Leeds, 12
Tel.: 0532 636321

Manchester
CRT Reception only
MAZDA WHOLESALER DEPOT
2 Claytonbrook Road, Clayton,
Manchester, 11
Tel.: 061-832 2499

Sunderland
MAZDA CRT SERVICE
Factory A, Pallion New Road, Sunderland
Tel.: 0783 70401

Glasgow
MAZDA CRT SERVICE
517 Lawmoor Street, Glasgow, C.5
Tel.: 041-429 5151

Belfast
CRT Reception only
Electrical Industries (N.I.), Ltd.
37 Corporation Street, Belfast BT1 [redacted]H
Tel.: 0232 33402

Channel Islands
Appointed CRT service depot for MAZDA
J. J. Eastick (Electrical Wholesalers) Ltd.,
St. Helier, Jersey
Tel.: 0534 22901

Eire
Appointed service depot for MAZDA
Kelly & Shiel, Ltd., United Works,
Distillery Road, Dublin, 3
Tel.: Dublin 371621

PURCHASE TAX 36⅔%

Applicable within the United Kingdom only

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

This table, together with the Recommended Retail 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 36⅔% rate of purchase tax only, which was applicable from 22nd November, 1968.

MAZDA

DATA BOOKLET 1970

valves & picture tubes