# MAZDA

# Valves & Picture Tubes

DATA
BOOKLET
1966

YOUR MAZDA WHOLESALER

1966
DATA BOOKLET

MAZDA

VALVES AND
PICTURE TUBES

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

*Telephone* GERrard 5233
*Telex* 261680

*Returns*

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

**NOT THIS ADDRESS**

Publication TAEI/M/2D

**PRICES**

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

**RESALE PRICE MAINTENANCE**

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

**AVAILABILITY**

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

**ADDITIONAL DATA**

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

**SEMICONDUCTORS**

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

**KEEP YOUR OLD MAZDA BOOKLETS**

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

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Printed in Great Britain

# CONTENTS

# NEW TYPES

These types have been added since the last edition

## MAZDA VALVES



## MAZDA PICTURE TUBES

# 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 indicators) |
| $p_{a(max)}$ | 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 |
| $\theta$ | Deflection Angle |
| $\mu$ | 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 holder 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 |
| 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 indicates heater or filament rating,*

| | |
|---|---|
| **1** | 1·4 V (parallel or series) |
| **6** | 6·3 V (parallel or series) |
| **10** | 0·1 A (series) |
| **20** | 0·2 A (series) |
| **30** | 0·3 A (series) |

*Following letter or letter sequence indicates class of valve,*

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

*Final number distinguishes between different valves in same class.*

### POWER RECTIFIER VALVES

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

*Letters indicate class of rectifier,*

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

*Final numbers distinguish between different valves in the same class.*

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



# EUROPEAN

## NOMENCLATURE FOR VALVES

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

*The first letter indicates the filament or heater rating,*

| *Letter* | *Filament or Heater Rating* | *Operation* |
|---|---|---|
| **D** | ⩽1·4 V | Series or Parallel Supply |
| **E** | 6·3 V | Series or Parallel Supply |
| **G** | Others | Miscellaneous |
| **H** | 0·15 A | Series Supply |
| **L** | 0·45 A | Series Supply |
| **P** | 0·3 A | Series Supply |
| **U** | 0·1 A | Series Supply |
| **X** | 0·6 A | Series Supply |

The following letters have formerly also been used A(4V), B(0·18A), C(0·2A), F(12·6V), K(2V), and V(50mA).

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

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

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

*The first figure indicates the type of base,*

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

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

*The remaining two figures are a serial number*

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

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

# NOMENCLATURES
# for
# TELEVISION PICTURE TUBES

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

e.g. CME 1906/A47–13W

## MAZDA SYSTEM

Television type picture tubes are designated by a letter classification followed by a number.

e.g. CME 1906

*Letter classification*

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

**CRM** Indicates the tube has magnetic deflection and focus.

*Number classification*

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

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

## EUROPEAN SYSTEM

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

*First Letter classification*

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

*First Number classification*

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

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

*Second Number classification*

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

*Final Letter*

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

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



*Assembling MAZDA valves at Sunderland "A" factory.*

## CURRENT AND MAINTENANCE TYPES

MAZDA

# VALVES

## NUMERICAL

**ALL BASE DIAGRAMS ARE VIEWED FROM THE FREE END OF PINS**

**see page 6 for MAZDA NOMENCLATURE**

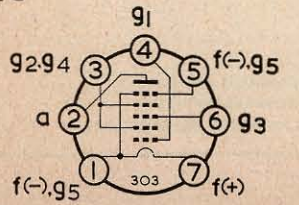
# IC1

**Pentagrid F.C.**
**1·4V, 50mA Filament**

***Typical Operation***

| | | |
|---|---|---|
| $V_a$ | 90 | V |
| $V_{g2+g4}$ | 67·5 | V |
| $V_{g3}$ | 0 | V |
| $I_a$ | 1·6 | mA |
| $I_{g2+g4}$ | 3·2 | mA |
| $R_{g1}$ | 100 | k Ω |
| $g_c$ | 300 | μA/V |
| $r_a$ | 600 | k Ω |

***B7G***



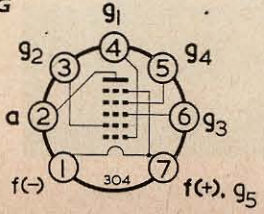

# IC2

**Pentagrid F.C.**
**1·4V, 50mA Filament**

***Typical Operation***

| | | |
|---|---|---|
| $V_a$ | 85 | V |
| $V_{g4}$ | 60 | V |
| $V_{g3}$ | 0 | V |
| $V_{g2(osc)}$ | 30 | V |
| $I_a$ | 0·7 | mA |
| $I_{g2(osc)}$ | 1·6 | mA |
| $I_{g4}$ | 150 | μA |
| $R_{g4}$ | 180 | k Ω |
| $R_{g2(osc)}$ | 33 | k Ω |
| $R_{g1(osc)}$ | 27 | k Ω |
| $g_c$ | 325 | μA/V |
| $r_a$ | 650 | k Ω |

***B7G***



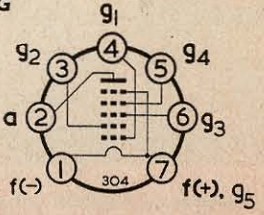

# IC3

**Pentagrid F.C.**
**1·4V, 25mA Filament**

***Typical Operation***

| | | |
|---|---|---|
| $V_a$ | 85 | V |
| $V_{g4}$ | 68 | V |
| $V_{g3}$ | 0 | V |
| $V_{g2(osc)}$ | 35 | V |
| $I_a$ | 0·6 | mA |
| $I_{g2(osc)}$ | 1·5 | mA |
| $I_{g4}$ | 140 | μA |
| $R_{g4}$ | 120 | k Ω |
| $R_{g2(osc)}$ | 33 | k Ω |
| $R_{g1(osc)}$ | 27 | k Ω |
| $g_c$ | 300 | μA/V |
| $r_a$ | 800 | k Ω |

***B7G***






# IF1

**HF Pentode**
**Vari–mu Amplifier**
**1·4V, 25mA Filament**

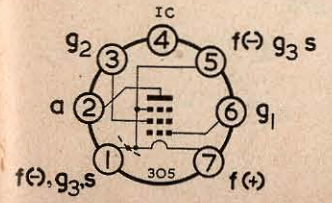
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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***



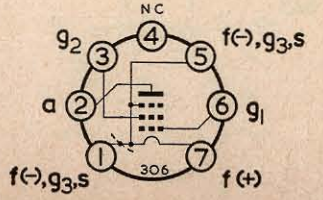

# IF3

**HF Pentode**
**Vari–mu Amplifier**
**1·4V, 50mA Filament**

***Typical Operation***

| | | |
|---|---|---|
| $V_a$ | 90 | V |
| $V_{g2}$ | 67·5 | V |
| $V_{g1}$ | 0 | V |
| $I_a$ | 3·5 | mA |
| $I_{g2}$ | 1·4 | mA |
| $g_m$ | 0·9 | mA/V |
| $r_a$ | 500 | k Ω |

***B7G***




# IFD1

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

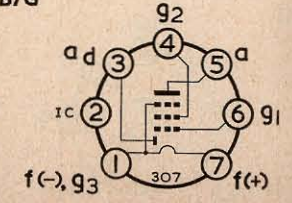
***Rating (Pentode)***

| | | |
|---|---|---|
| $P_{a(max)}$ | 30 | mW |

***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 |
| $\mu_{g1-g2}$ | 16 | |

***B7G***



# IFD9

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

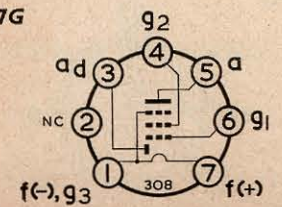
***Rating (Pentode)***

| | | |
|---|---|---|
| $P_{a(max)}$ | 250 | mW |

***Characteristics (Pentode)***

| | | |
|---|---|---|
| $V_a$ | 90 | V |
| $V_{g2}$ | 90 | V |
| $V_{g1}$ | 0 | V |
| $I_a$ | 2·7 | mA |
| $I_{g2}$ | 630 | μA |
| $g_m$ | 720 | μA/V |
| $r_a$ | 500 | kΩ |

***B7G***




# IMI

**Tuning Indicator**
**Ball and Line Display**
**1·4V, 25mA Filament**

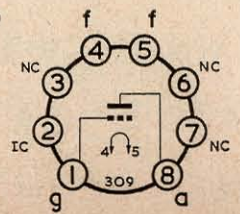
***Typical Operation (Battery)***

| | Pin 5 earthed | Pin 4 earthed | |
|---|---|---|---|
| $V_a$ | 60 | 90 | V |
| $V_g$ | 0 | 0 | V |
| $I_a$ | 120 | 250 | μA |
| $V_g$ for cut-off | −8 | −13·5 | V |

***Typical Operation (Mains)***

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

***B8D***




# IPI

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

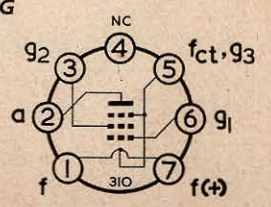
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 600 | mW |

***Typical Operation (Parallel Filament)***

| | | |
|---|---|---|
| $V_a$ | 85 | V |
| $V_{g2}$ | 85 | V |
| $V_{g1}$ | −5·2 | V |
| $I_a(o)$ | 5 | mA |
| $I_{g2}(o)$ | 0·9 | mA |
| $g_m$ | 1·4 | mA/V |
| $r_a$ | 150 | kΩ |
| $R_a$ | 13 | kΩ |
| $P_{out}$ | 200 | mW |

***B7G***






# IP10

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

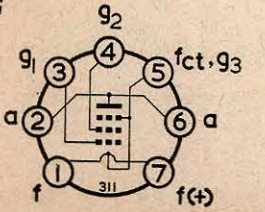
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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 | kΩ |
| $R_a$ | 8 | kΩ |
| $P_{out}$ | 270 | mW |

***B7G***




# IP11

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

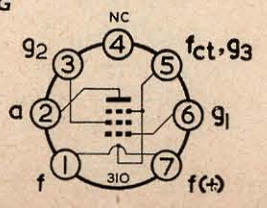
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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 | kΩ |
| $R_a$ | 10 | kΩ |
| $P_{out}$ | 270 | mW |

***B7G***



# 6/30L2 - ECC804

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

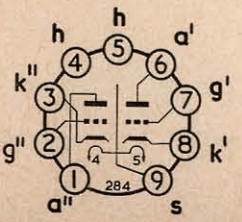
***Ratings***

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

***Characteristics (each)***

| | | |
|---|---|---|
| $V_a$ | 200 | V |
| $V_g$ | −7·7 | V |
| $I_a$ | 10 | mA |
| $g_m$ | 3·4 | mA/V |
| $\mu$ | 18 | |

***B9A***

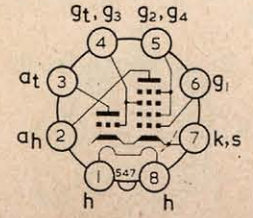



# 6C10

**HF Triode Hexode**
**Frequency Changer**
**6·3V, 0·23A Heater**

***Typical Operation***

| | Triode | Hexode | |
|---|---|---|---|
| $V_{a(b)}$ | 250 | 250 | V |
| $V_{g_2}$ | ... | 85 | V |
| $V_{g_1}$ | ... | −2 | V |
| $I_a$ | 4·8 | 3 | mA |
| $I_{g_2}$ | ... | 3 | mA |
| $R_a$ | 33 | ... | kΩ |
| $R_{gt+g_3}$ | 47 | | kΩ |
| $R_k$ | 180 | | Ω |
| $g_c$ | ... | 0·75 | mA/V |



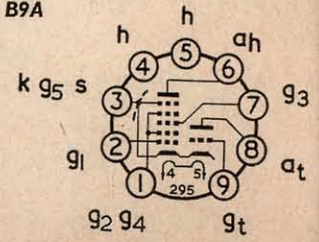

# 6C12

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

***Typical Operation***

| | Triode | Heptode | |
|---|---|---|---|
| $V_{a(b)}$ | 250 | 250 | V |
| $V_{g_2}$ | ... | 103 | V |
| $V_{g_1}$ | ... | −2 | V |
| $I_a$ | 4·5 | 3·25 | mA |
| $I_{g_2}$ | ... | 6·7 | mA |
| $R_a$ | 33 | ... | kΩ |
| $R_{gt+g_3}$ | 47 | | kΩ |
| $R_{g_2+g_4}$ | ... | 22 | kΩ |
| $R_k$ | 140 | | Ω |
| $g_c$ | ... | 0·775 | mA/V |

***B9A***





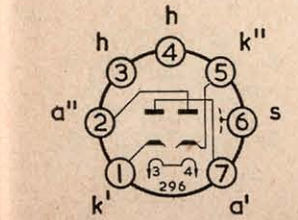

# 6D2

**Double Diode**
**6·3V, 0·3A Heater**

***Ratings (each)***

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

***B7G***




# 6F12

**HF Pentode**
**6·3V, 0·3A Heater**

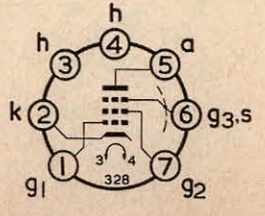
***Rating***

| | | |
|---|---|---|
| $p_{a(max)}$ | 2·5 | W |

***Typical Operation***

| | | |
|---|---|---|
| $V_a$ | 250 | V |
| $V_{g_3}$ | 0 | V |
| $V_{g_2}$ | 250 | V |
| $V_{g_1}$ | −2 | V |
| $I_a$ | 10 | mA |
| $I_{g_2}$ | 2·5 | mA |
| $g_m$ | 7·5 | mA/V |
| $r_a$ | 1 | MΩ |

***B7G***




# 6F18

**HF Pentode**
**Variable-mu Amplifier**
**6·3V, 0·2A Heater**

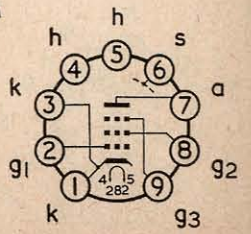
***Rating***

| | | |
|---|---|---|
| $p_{a(max)}$ | 2·25 | W |

***Typical Operation***

| | | |
|---|---|---|
| $V_a$ | 175 | V |
| $V_g$ | 0 | V |
| $V_{g_2}$ | 100 | V |
| $V_{g_1}$ | −1·3 | V |
| $I_a$ | 12 | mA |
| $I_{g_2}$ | 3·5 | mA |
| $g_m$ | 4·4 | mA/V |
| $r_a$ | 400 | kΩ |

***B9A***



# 6F19

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

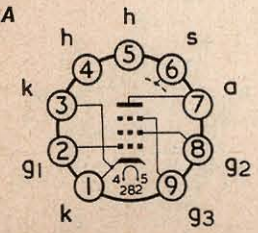
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 2·5 | W |

***Typical Operation***

| | | |
|---|---|---|
| $V_a$ | 250 | V |
| $V_g$ | 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***




# 6F23

**HF Pentode**
**6·3V, 0·3A Heater**

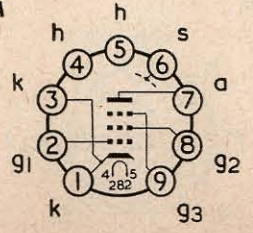
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 3 | W |

***Typical Operation***

| | | |
|---|---|---|
| $V_a$ | 170 | V |
| $V_{g3}$ | 0 | V |
| $V_{g2}$ | 170 | V |
| $V_{g1}$ | −1·9 | V |
| $I_a$ | 10 | mA |
| $I_{g2}$ | 2·6 | mA |
| $g_m$ | 9·2 | mA/V |
| $R_k$ | 150 | Ω |

***B9A***




# 6F24

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

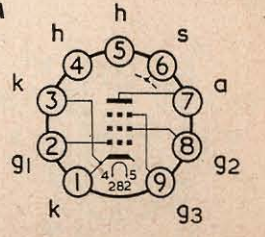
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 2·5 | W |

***Typical Operation***

| | | |
|---|---|---|
| $V_a$ | 170 | V |
| $V_{g3}$ | 0 | V |
| $V_{g2}$ | 170 | V |
| $V_{g1}$ | −1·9 | V |
| $I_a$ | 10 | mA |
| $I_{g2}$ | 2·7 | mA |
| $R_k$ | 150 | Ω |
| $g_m$ | 15 | mA/V |

***B9A***






# 6F25

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

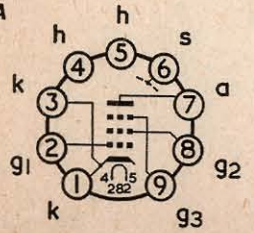
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 2·5 | W |

***Typical Operation***

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

***B9A***




# 6F26

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

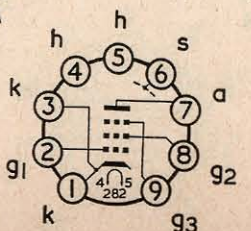
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 2·5 | W |

***Typical Operation***

| | | |
|---|---|---|
| $V_a$ | 250 | V |
| $V_{g3}$ | 0 | V |
| $V_{g2}$ | 100 | V |
| $V_{g1}$ | −2 | V |
| $I_a$ | 10 | mA |
| $I_{g2}$ | 2·5 | mA |
| $g_m$ | 6 | mA/V |
| $r_a$ | 500 | k Ω |

***B9A***




# 6F28

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

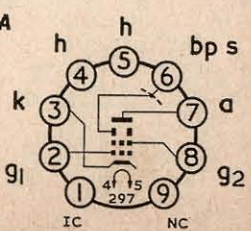
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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

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

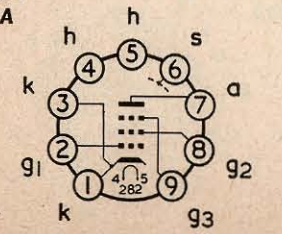
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 2·5 | W |

***Typical Operation***

| | | |
|---|---|---|
| $V_{a(b)}$ | 200 | V |
| $V_a$ | 188 | V |
| $V_{g2}$ | 92 | V |
| $V_{g1}$ | −2 | V |
| $I_a$ | 12 | mA |
| $I_{g2}$ | 4·5 | mA |
| $R_{g2}$ | 24 | k Ω |
| $R_k$ | 120 | Ω |
| $g_m$ | 12·5 | mA/V |

***B9A***




# 6F30

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

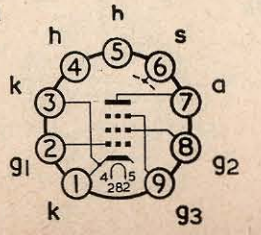
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 2·5 | W |

***Typical Operation***

| | | |
|---|---|---|
| $V_a$ | 200 | V |
| $V_{g3}$ | 0 | V |
| $V_{g2}$ | 200 | V |
| $V_{g1}$ | −2·5 | V |
| $I_a$ | 10 | mA |
| $I_{g2}$ | 4·1 | mA |
| $R_k$ | 180 | Ω |
| $g_m$ | 15 | mA/V |
| $r_a$ | 380 | k Ω |

***B9A***




# 6FD12

**Double Diode HF Pentode**
**Vari–mu Amplifier**
**6·3V, 0·3A Heater**

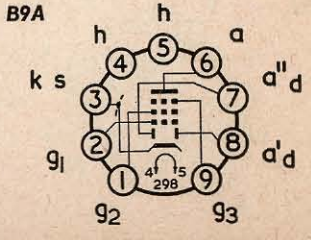
***Rating (Pentode)***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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***






# 6K25

**Thyratron**
**6·3V, 1A Heater**

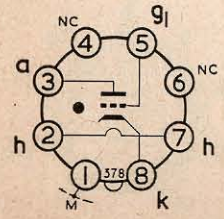
***Ratings***

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

***Typical Operation***

| | | |
|---|---|---|
| Control Ratio | 20 | |
| $R_g$ | 30 | k Ω |
| $I_{a(av)}$ | 2·5 | mA |

***Int. Octal***




# 6L12

**VHF Double Triode**
**6·3V, 0·435A Heater**

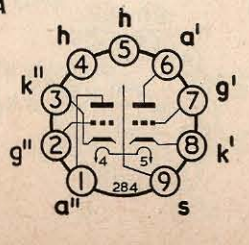
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ (*Either Anode*) | 2·5 | W |
| $P_{a(max)}$ (*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**

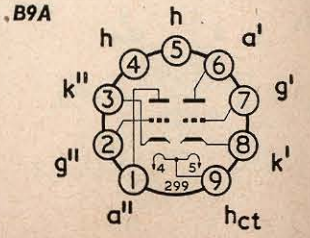
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ (*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 |
| $\mu$ | 100 | |
| $r_a$ | 62·5 | k Ω |

***B9A***



# 6LD3

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

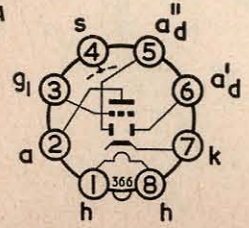
***Rating (Triode)***

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

***Typical Operation (Triode)***

| | | |
|---|---|---|
| $V_a$ | 100 | V |
| $V_g$ | −0·7 | V |
| $I_a$ | 0·8 | mA |
| $r_a$ | 54 | k Ω |
| $g_m$ | 1·4 | mA/V |
| $\mu$ | 75 | |

***B8A***




# 6LD12

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

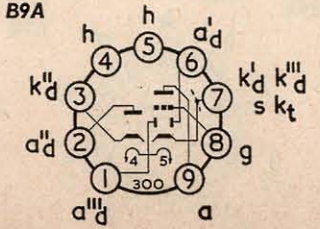
***Rating (Triode)***

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

***Characteristics (Triode)***

| | | |
|---|---|---|
| $V_a$ | 100 | V |
| $V_g$ | −1 | V |
| $I_a$ | 0·8 | mA |
| $r_a$ | 48 | k Ω |
| $g_m$ | 1·45 | mA/V |
| $\mu$ | 70 | |

***B9A***




# 6LD13

**Double Diode Triode**
**Audio Amplifier**
**6·3V, 0·2A Heater**

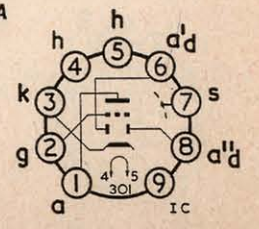
***Rating (Triode)***

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

***Characteristics (Triode)***

| | | |
|---|---|---|
| $V_a$ | 100 | V |
| $V_g$ | −0·7 | V |
| $I_a$ | 0·8 | mA |
| $r_a$ | 54 | k Ω |
| $g_m$ | 1·4 | mA/V |
| $\mu$ | 75 | |

***B9A***






# 6P15

**Audio Output Pentode**
**6·3V, 0·76A Heater**

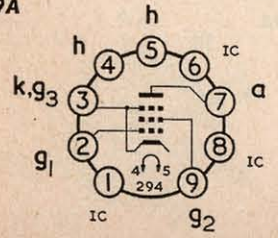
***Rating***

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

***Typical Operation***

| | | |
|---|---|---|
| $V_{a(b)}$ | 250 | V |
| $V_{g2}$ | 250 | V |
| $V_{g1}$ | −7·3 | V |
| $I_a$ | 48 | mA |
| $I_{g2}$ | 5·5 | mA |
| $R_a$ | 4 | k Ω |
| $g_m$ | 11·3 | mA/V |
| $r_a$ | 38 | k Ω |
| $P_{out}$ | 5·4 | W |

***B9A***




# 6P25

**Beam Tetrode**
**Audio Output**
**6·3V, 1·1A Heater**

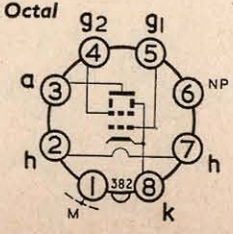
***Rating***

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

***Typical Operation***

| | | |
|---|---|---|
| $V_a$ | 258 | V |
| $V_{g2}$ | 258 | V |
| $I_a$ | 40 | mA |
| $I_{g2}$ | 8 | mA |
| $R_a$ | 5·1 | k Ω |
| $R_k$ | 180 | Ω |
| $g_m$ | 8·8 | mA/V |
| $P_{out}$ | 4·6 | W |

***Int. Octal***




# 6PL12

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

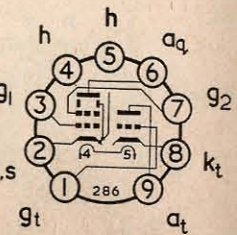
***Rating***

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

***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 |
| $\mu$ | 70 | … | |
| $P_{out}$ | … | 3·5 | W |

***B9A***



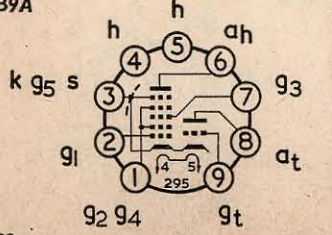
# 10C14

**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 | ... | kΩ |
| $R_{g2+g4}$ | ... | 10 | kΩ |
| $R_{g3+gt}$ | 47 | | kΩ |
| $R_k$ | 150 | | Ω |
| $g_c$ | ... | 0·75 | mA/V |

***B9A***




# 10F1

**HF Screened Pentode**
**0·1A, 22V Heater**

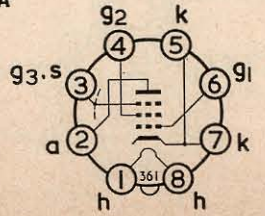
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 3·5 | W |

***Typical Operation***

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

***B8A***




# 10F18

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

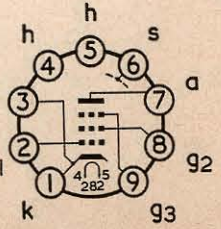
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 2·25 | W |

***Typical Operation***

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

***B9A***






# 10FD12

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

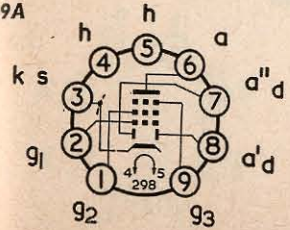
***Rating (Pentode)***

| | | |
|---|---|---|
| $P_{a(max)}$ | 2·25 | W |

***Typical Operation (Pentode)***

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

***B9A***




# 10L14

**VHF Double Triode**
**0·1A, 26V Heater**

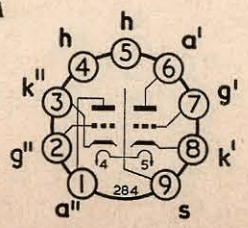
***Rating***

| | | | |
|---|---|---|---|
| $P_{a(max)}$ | (*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 | kΩ |
| $R_g$ | ... | 1 | MΩ |
| $g_m$ | 6 | ... | mA/V |
| $g_c$ | ... | 2·2 | mA/V |
| $r_a$ | 8·4 | 16 | kΩ |

***B9A***




# 10LD3

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

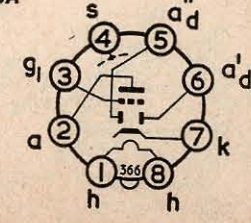
***Rating (Triode)***

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

***Characteristics (Triode)***

| | | |
|---|---|---|
| $V_a$ | 100 | V |
| $V_{g1}$ | −0·7 | V |
| $I_a$ | 0·8 | mA |
| $r_a$ | 54 | kΩ |
| $g_m$ | 1·4 | mA/V |
| $\mu$ | 75 | |

***B8A***



# 10LD12

**Triple Diode Triode**
**0·1A, 28V Heater**

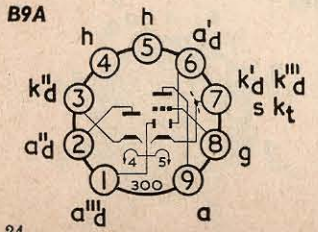
*Rating (Triode)*

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

*Characteristics (Triode)*

| | | |
|---|---|---|
| $V_a$ | 200 | V |
| $V_g$ | −2·3 | V |
| $I_a$ | 1 | mA |
| $r_a$ | 50 | kΩ |
| $g_m$ | 1·4 | mA/V |
| $\mu$ | 70 | |

*B9A*




# 10LD13

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

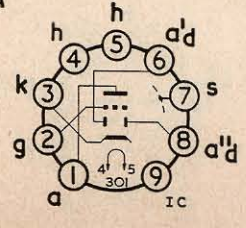
*Rating (Triode)*

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

*Characteristics (Triode)*

| | | |
|---|---|---|
| $V_a$ | 100 | V |
| $V_g$ | −0·7 | V |
| $I_a$ | 0·8 | mA |
| $r_a$ | 54 | kΩ |
| $g_m$ | 1·4 | mA/V |
| $\mu$ | 75 | |

*B9A*




# 10P13

**Beam Tetrode**
**Audio Output**
**0·1A, 40V Heater**

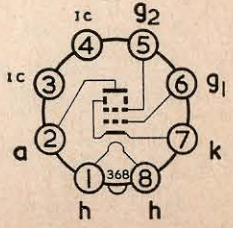
*Rating*

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

*Typical Operation*

| | | |
|---|---|---|
| $V_a$ | 180 | V |
| $V_{g2}$ | 150 | V |
| $V_{g1}$ | −6·3 | V |
| $I_a$ | 29 | mA |
| $I_{g2}$ | 5·8 | mA |
| $R_a$ | 5·4 | kΩ |
| $g_m$ | 7·4 | mA/V |
| $P_{out}$ | 2·6 | W |

*B8A*






# 10P14

**Beam Tetrode**
**Audio Output**
**0·1A, 40V Heater**

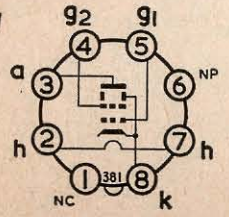
*Rating*

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

*Typical Operation*

| | | |
|---|---|---|
| $V_a$ | 165 | V |
| $V_{g2}$ | 175 | V |
| $V_{g1}$ | −9·4 | V |
| $I_a$ | 42 | mA |
| $I_{g2}$ | 10·5 | mA |
| $R_a$ | 3·5 | kΩ |
| $g_m$ | 7·2 | mA/V |
| $P_{out}$ | 3·4 | W |

*Int. Octal*




# 10P18

**Audio Output Pentode**
**0·1A, 45V Heater**

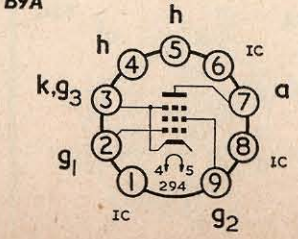
*Rating*

| | | |
|---|---|---|
| $P_{a(max)}$ | 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 | kΩ |
| $g_m$ | 10 | mA/V |
| $r_a$ | 23 | kΩ |
| $P_{out}$ | 5·2 | W |

*B9A*

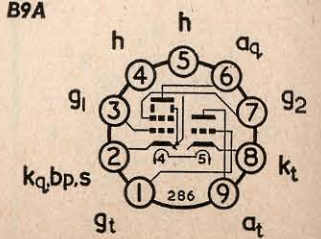



# 10PL12

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

| | Triode | Tetrode | |
|---|---|---|---|
| *Rating* | | | |
| $P_{a(max)}$ | 1 | 7 | W |
| *Characteristics* | | | |
| $V_a$ | 100 | 200 | V |
| $V_{g2}$ | ... | 200 | V |
| $V_{g1}$ | 0 | −16 | V |
| $I_a$ | 3·5 | 35 | mA |
| $I_{g2}$ | ... | 7 | mA |
| $R_k$ | ... | 390 | Ω |
| $R_a$ | ... | 5·6 | kΩ |
| $g_m$ | 2·5 | 6·4 | mA/V |
| $P_{out}$ | ... | 3·5 | W |

*B9A*



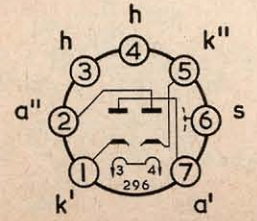
# 20D1

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

***Ratings (each)***

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

***B7G***




# 20L1

**AF Double Triode**
**0·2A, 12·6V Heater**

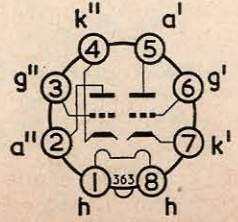
***Rating***

| | | |
|---|---|---|
| $p_{a(max)}$ | | |
| (*Either Anode*) | 3 | W |
| (*Both Anodes*) | 4 | W |

***Characteristics (each)***

| | | |
|---|---|---|
| $V_a$ | 200 | V |
| $V_g$ | −8·5 | V |
| $I_a$ | 10 | mA |
| $g_m$ | 2·8 | mA/V |
| $\mu$ | 16 | |
| $r_a$ | 5·7 | k Ω |

***B8A***




# 20P3

**AF Output Beam Tetrode**
**0·2A, 20V Heater**

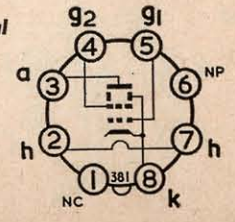
***Rating***

| | | |
|---|---|---|
| $p_{a(max)}$ | 10 | W |

***Typical Operation***

| | | |
|---|---|---|
| $V_{a(b)}$ | 175 | V |
| $V_{g_2}$ | 185 | V |
| $I_a(o)$ | 42 | mA |
| $I_{g_2}(o)$ | 10·5 | mA |
| $R_a$ | 4 | k Ω |
| $R_k$ | 180 | Ω |
| $g_m$ | 7·2 | mA/V |
| $P_{out}$ | 2·8 | W |

***Int. Octal***






# 20P4

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

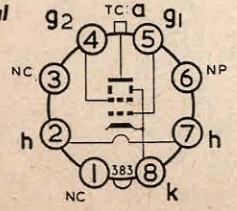
***Ratings***

| | | |
|---|---|---|
| $V_{a(max)}$ | 400 | V |
| $p_{a(max)}$ | 10 | W |
| $V_{g_2(max)}$ | 250 | V |
| $p_{g_2(max)}$ | 4 | W |
| $V_{a\ (pk+)max}$ | 6 | kV |

***Note***

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

***Int. Octal***




# 20P5

**Beam Tetrode**
**Audio Output**
**0·2A, 20V Heater**

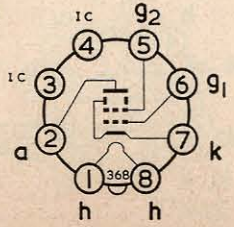
***Rating***

| | | |
|---|---|---|
| $p_{a(max)}$ | 6 | W |

***Typical Operation***

| | | |
|---|---|---|
| $V_a$ | 180 | V |
| $V_{g_2}$ | 150 | V |
| $V_{g_1}$ | −6·3 | V |
| $I_a(o)$ | 29 | mA |
| $I_{g_2}(o)$ | 5·8 | mA |
| $R_a$ | 5·4 | k Ω |
| $g_m$ | 7·4 | mA/V |
| $P_{out}$ | 2·6 | W |

***B8A***



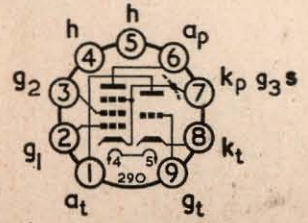
# 30C1

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

***Typical Operation***

| | Triode | Pentode | |
|---|---|---|---|
| $V_a$ | 120 | 170 | V |
| $V_{g2}$ | ... | 145 | V |
| $V_{het(pk)}$ | ... | 5 | V |
| $I_a$ | 6 | 6·8 | mA |
| $I_{g2}$ | ... | 2 | mA |
| $R_g$ | ... | 33 | kΩ |
| $g_c$ | ... | 2 | mA/V |
| $\mu$ | 20 | ... | |

***B9A***



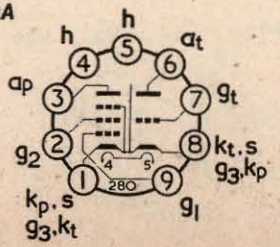

# 30C15

**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 |
| $\mu$ | 20 | ... | |

***B9A***



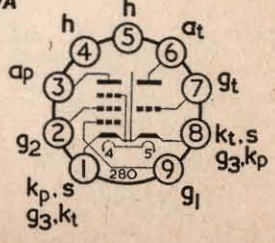

# 30C17

**Frame Grid Triode Pentode**
**VHF Vari-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 | kΩ |
| $R_{g2}$ | ... | 27 | kΩ |
| $R_a$ | ... | 5·6 | kΩ |
| $g_c$ | ... | 4·8 | mA/V |
| $g_m$ | 5·5 | ... | mA/V |
| $\mu$ | 20 | ... | |

***B9A***





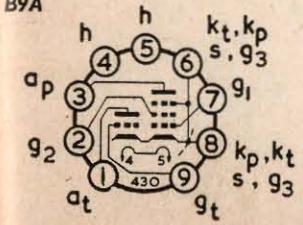

# 30C18

**Triode Frame Grid Pentode**
**VHF Vari-mu F.C.**
**0·3A, 7·4V Heater**

***Typical Operation***

| | Triode | Pentode | |
|---|---|---|---|
| $V_a$ | 77 | 155 | V |
| $V_{g2}$ | ... | 135 | V |
| $I_a$ | 7·8 | 7·8 | mA |
| $I_{g2}$ | ... | 2·4 | mA |
| $R_{g1}$ | 47 | 2,200 | kΩ |
| $R_{g2}$ | ... | 27 | kΩ |
| $R_a$ | ... | 5·6 | kΩ |
| $g_c$ | ... | 4·7 | mA/V |
| $g_m$ | 4·5 | ... | mA/V |
| $\mu$ | 17 | ... | |

***B9A***




# 30F5

**HF Screened Pentode**
**0·3A, 7·3V Heater**

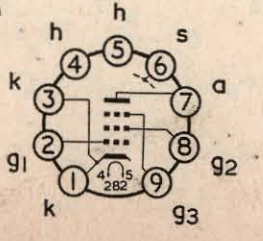
***Rating***

| | | |
|---|---|---|
| Pa(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***

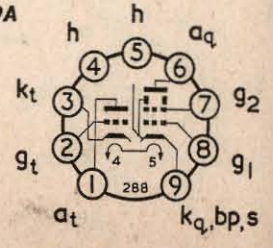



# 30FL1

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

| | Triode | Tetrode | |
|---|---|---|---|
| ***Rating*** | | | |
| Pa(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 |
| $\mu$ | 18 | ... | |

***B9A***

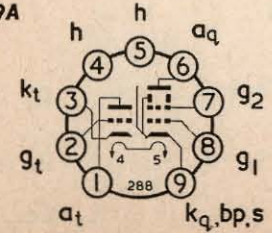


# 30FL12

**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 |
| $\mu$ | 18 | ... | |

***B9A***

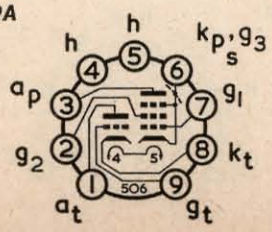



# 30FL14

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

| | Triode | Pentode | |
|---|---|---|---|
| ***Rating*** | | | |
| $P_{a(max)}$ | 2·0 | 2·0 | W |
| ***Characteristics*** | | | |
| $V_a$ | 100 | 160 | V |
| $V_{g2}$ | ... | 160 | V |
| $V_{g1}$ | −3·0 | −1·7 | V |
| $I_a$ | 14 | 12 | mA |
| $I_{g2}$ | ... | 4·0 | mA |
| $g_m$ | 5·5 | 14·5 | mA/V |
| $r_a$ | 3·1 | ... | kΩ |
| $\mu$ | 17 | ... | |

***B9A***

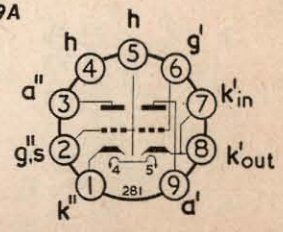



# 30L1

**VHF Double Triode**
**Cascade 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 |
| $\mu$ | 24 | |

***B9A***



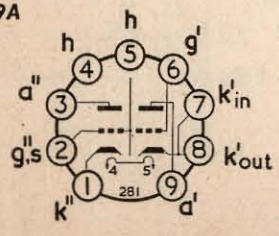



# 30L15

**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 |
| $\mu$ | 27 | |

***B9A***

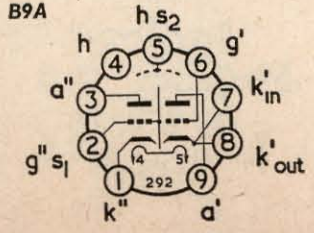



# 30L17

**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 |
| $\mu$ | 40 | |

***B9A***




# 30P4MR

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

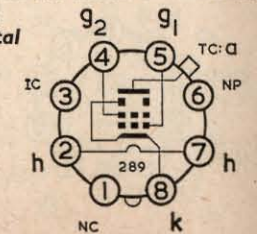
| | | |
|---|---|---|
| ***Ratings*** | | |
| $V_{a(max)}$ | 400 | V |
| $P_{a(max)}$ | 10 | W |
| $V_{g2(max)}$ | 250 | V |
| $P_{g2(max)}$ | 4 | W |
| $I_{k(max)}$ | 160 | mA |
| $V_{a\ (pk+)max}$ | 6·5 | kV |

***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**

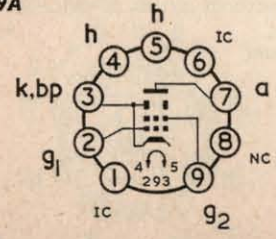
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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**

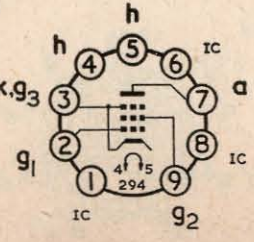
***Rating***

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

***Typical Operation***

| | | |
|---|---|---|
| $V_a$ | 200 | V |
| $V_{g2}$ | 200 | V |
| $V_{g1}$ | −14·4 | V |
| $I_a$ | 45 | mA |
| $I_{g2}$ | 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**

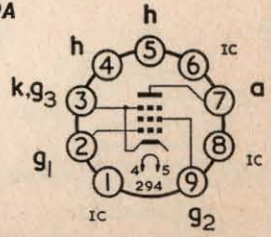
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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 | kΩ |
| $g_m$ | 10 | mA/V |
| $r_a$ | 23 | kΩ |
| $P_{out}$ | 5·2 | W |

***B9A***






# 30P19

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

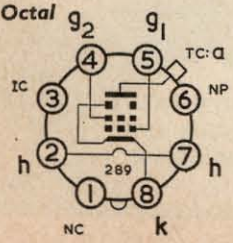
***Ratings***

| | | |
|---|---|---|
| $P_{a(max)}$ ($P_{g2} \leqslant 4W$) | 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)***

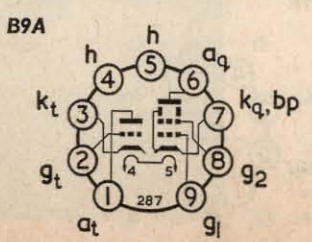
| | | |
|---|---|---|
| $P_{a(max)}$ | 5·5 | W |

***Typical Operation (Tetrode)***

| | | |
|---|---|---|
| $V_a$ | 180 | V |
| $V_{g2}$ | 190 | V |
| $I_a$ | 28 | mA |
| $I_{g2}$ | 6·5 | mA |
| $R_a$ | 6·2 | kΩ |
| $R_k$ | 270 | Ω |
| $P_{out}$ | 2·2 | W |

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

***B9A***

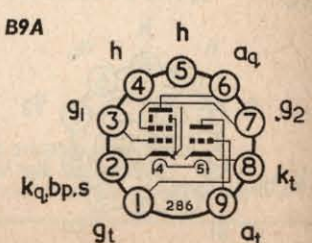



# 30PL13

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

| | Triode | Tetrode | |
|---|---|---|---|
| ***Rating*** | | | |
| $P_{a(max)}$ | 1 | 7 | W |
| ***Characteristics*** | | | |
| $V_a$ | 100 | 170 | V |
| $V_{g2}$ | ... | 170 | V |
| $V_{g1}$ | −2·2 | −13 | V |
| $I_a$ | 10 | 45 | mA |
| $g_m$ | 4·3 | 7·5 | mA/V |
| $\mu$ | 18 | ... | |

***B9A***

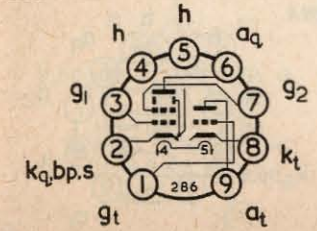


# 30PL14

**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 |
| $\mu$ | 18 | ... | |

***B9A***

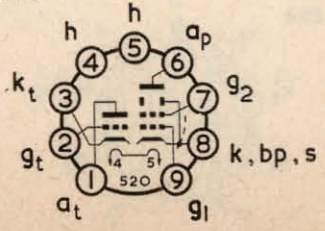



# 30PL15

**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 |
| $\mu$ | 18 | ... | |

***B9A***



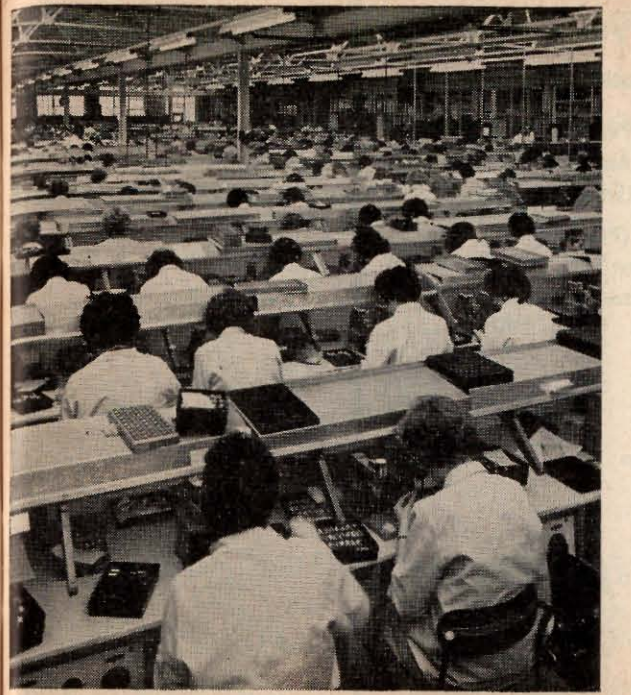

# REMINDER

**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
etc.
to the

MAZDA VALVE
SERVICE DEPT.
BRIMSDOWN





*Assembling MAZDA valves at the Rochester factory.*

**CURRENT AND MAINTENANCE TYPES**

MAZDA

# VALVES

## ALPHABETICAL

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

# DAF91

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

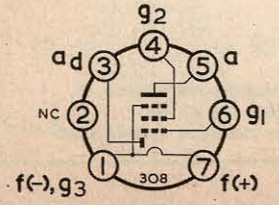
***Rating (Pentode)***

| | | |
|---|---|---|
| $p_{a(max)}$ | 250 | mW |

***Characteristics (Pentode)***

| | | |
|---|---|---|
| $V_a$ | 90 | V |
| $V_{g2}$ | 90 | V |
| $V_{g1}$ | 0 | V |
| $I_a$ | 2·7 | mA |
| $I_{g2}$ | 630 | μA |
| $g_m$ | 720 | μA/V |
| $r_a$ | 500 | kΩ |

***B7G***




# DAF96

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

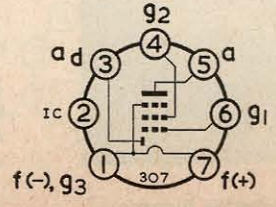
***Rating (Pentode)***

| | | |
|---|---|---|
| $p_{a(max)}$ | 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 |
| $\mu_{g1-g2}$ | 16 | |

***B7G***



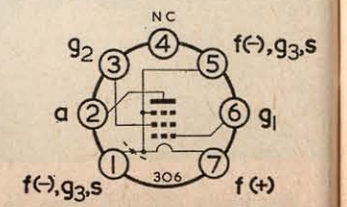

# DF91

**HF Pentode**
**Variable-mu Amplifier**
**1·4V, 50mA Filament**

***Typical Operation***

| | | |
|---|---|---|
| $V_a$ | 90 | V |
| $V_{g2}$ | 67·5 | V |
| $V_{g1}$ | 0 | V |
| $I_a$ | 3·5 | mA |
| $I_{g2}$ | 1·4 | mA |
| $g_m$ | 0·9 | mA/V |
| $r_a$ | 500 | kΩ |

***B7G***






# DF96

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

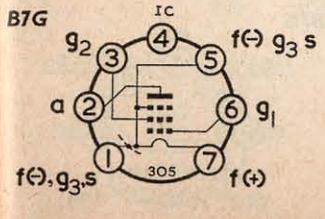
***Rating***

| | | |
|---|---|---|
| $p_{a(max)}$ | 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 | kΩ |
| $g_m$ | 0·85 | mA/V |
| $r_a$ | 1 | MΩ |

***B7G***



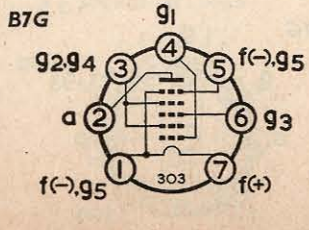

# DK91

**Pentagrid Frequency Changer**
**1·4V, 50mA Filament**

***Typical Operation***

| | | |
|---|---|---|
| $V_a$ | 90 | V |
| $V_{g2+g4}$ | 67·5 | V |
| $V_{g3}$ | 0 | V |
| $I_a$ | 1·6 | mA |
| $I_{g2+g4}$ | 3·2 | mA |
| $R_{g1}$ | 100 | kΩ |
| $g_c$ | 300 | μA/V |
| $r_a$ | 600 | kΩ |

***B7G***



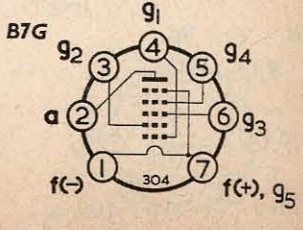

# DK92

**Pentagrid Frequency Changer**
**1·4V, 50mA Filament**

***Typical Operation***

| | | |
|---|---|---|
| $V_a$ | 85 | V |
| $V_{g4}$ | 60 | V |
| $V_{g3}$ | 0 | V |
| $V_{g2(osc)}$ | 30 | V |
| $I_a$ | 0·7 | mA |
| $I_{g2(osc)}$ | 1·6 | mA |
| $I_{g4}$ | 150 | μA |
| $R_{g4}$ | 180 | kΩ |
| $R_{g2(osc)}$ | 33 | kΩ |
| $R_{g1(osc)}$ | 27 | kΩ |
| $g_c$ | 325 | μA/V |
| $r_a$ | 650 | kΩ |

***B7G***



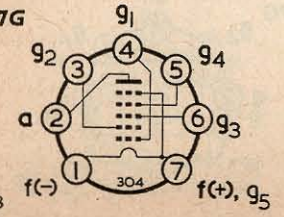
# DK96

**Pentagrid Frequency Changer**
**1·4V, 25mA Filament**

***Typical Operation***

| | | |
|---|---|---|
| $V_a$ | 85 | V |
| $V_{g4}$ | 68 | V |
| $V_{g3}$ | 0 | V |
| $V_{g2(osc)}$ | 35 | V |
| $I_a$ | 0·6 | mA |
| $I_{g2(osc)}$ | 1·5 | mA |
| $I_{g4}$ | 140 | μA |
| $R_{g4}$ | 120 | kΩ |
| $R_{g2(osc)}$ | 33 | kΩ |
| $R_{g1(osc)}$ | 27 | kΩ |
| $g_c$ | 300 | μA/V |
| $r_a$ | 800 | kΩ |

***B7G***




# DL92

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

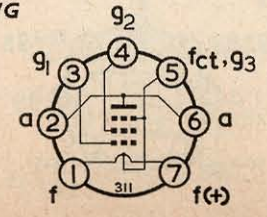
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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 | kΩ |
| $R_a$ | 8 | kΩ |
| $P_{out}$ | 270 | mW |

***B7G***




# DL94

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

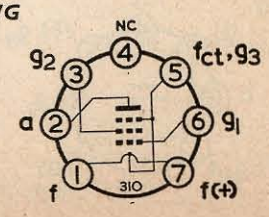
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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 | kΩ |
| $R_a$ | 10 | kΩ |
| $P_{out}$ | 270 | mW |

***B7G***






# DL96

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

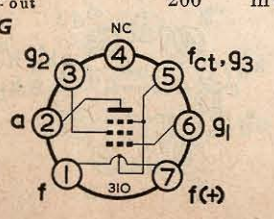
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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 | kΩ |
| $R_a$ | 13 | kΩ |
| $P_{out}$ | 200 | mW |

***B7G***




# DM71

**Tuning Indicator**
**Ball and Line Display**
**1·4V, 25mA Filament**

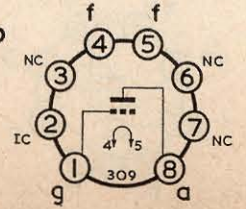
***Typical Operation (Battery)***

| | Pin 5 earthed | Pin 4 earthed | |
|---|---|---|---|
| $V_a$ | 60 | 90 | V |
| $V_g$ | 0 | 0 | V |
| $I_a$ | 120 | 250 | μA |
| $V_g$ for cut-off | −8 | −13·5 | V |

***Typical Operation (Mains)***

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

***B8D***




# DY86

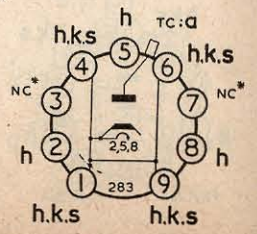
**EHT Rectifier**
**1·4V, 0·55A Heater**

***Ratings (pulse operation)***

| | | |
|---|---|---|
| P.I.V.max | 22 | kV |
| $I_{a(max)}$ | 800 | μA |
| $i_{a(pk)max}$ | 40 | mA |
| $C_{(max)}$ | 2000 | pF |

***B9A***

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



# DY87

**EHT Rectifier**
**1·4V, 0·55A Heater**

***Ratings (pulse operation)***

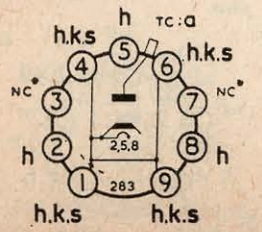
| | | |
|---|---|---|
| P.I.V.max | 22 | kV |
| $I_{out(max)}$ | 800 | μA |
| $i_{out\ (pk)max}$ | 40 | mA |
| $C_{(max)}$ | 2 000 | pF |

***Note***

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

***B9A***

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






# EABC80

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

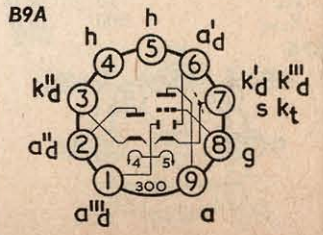
***Rating (Triode)***

| | | |
|---|---|---|
| $p_{a(max)}$ | 1 | W |

***Characteristics (Triode)***

| | | |
|---|---|---|
| $V_a$ | 100 | V |
| $V_g$ | −1 | V |
| $I_a$ | 0·8 | mA |
| $r_a$ | 48 | kΩ |
| $g_m$ | 1·45 | mA/V |
| μ | 70 | |

***B9A***



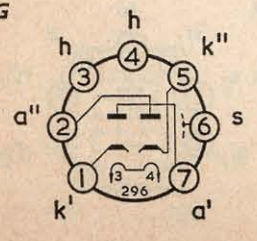

# EB91

**Double Diode**
**6·3V, 0·3A Heater**

***Ratings (each)***

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

***B7G***




# EBC41

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

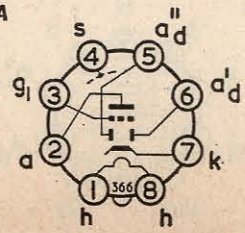
***Rating (Triode)***

| | | |
|---|---|---|
| $p_{a(max)}$ | 1 | W |

***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***




# EBC81

**Double Diode Triode**
**Audio Amplifier**
**6·3V, 0·2A Heater**

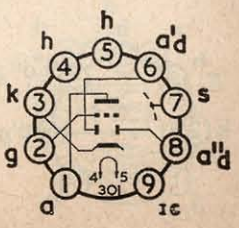
***Rating (Triode)***

| | | |
|---|---|---|
| $p_{a(max)}$ | 1 | W |

***Characteristics (Triode)***

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

***B9A***



# EBC90

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

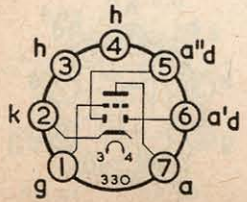
*Rating (Triode)*

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

*Characteristics (Triode)*

| | | |
|---|---|---|
| $V_a$ | 250 | V |
| $V_g$ | −3 | V |
| $I_a$ | 1 | mA |
| $g_m$ | 1·2 | mA/V |
| $\mu$ | 70 | |
| $r_a$ | 58 | kΩ |

*B7G*




# EBF80

**Double Diode HF Pentode**
**Variable-mu Amplifier**
**6·3V, 0·3A Heater**

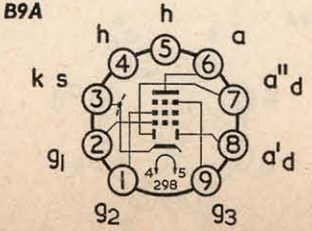
*Rating (Pentode)*

| | | |
|---|---|---|
| $P_{a(max)}$ | 1·5 | W |

*Typical Operation (Pentode)*

| | | |
|---|---|---|
| $V_a$ | 250 | V |
| $V_{g3}$ | 0 | V |
| $V_{g2}$ | 85 | V |
| $V_{g1}$ | −2 | V |
| $I_a$ | 5 | mA |
| $I_{g2}$ | 1·75 | mA |
| $R_{g2}$ | 95 | kΩ |
| $R_k$ | 300 | Ω |
| $g_m$ | 2·2 | mA/V |
| $\mu_{g1-g2}$ | 18 | |

*B9A*




# EBF89

**Double Diode HF Pentode**
**Variable-mu Amplifier**
**6·3V, 0·3A Heater**

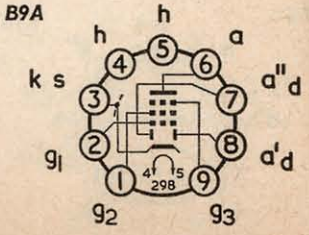
*Rating (Pentode)*

| | | |
|---|---|---|
| $P_{a(max)}$ | 2·25 | W |

*Typical Operation (Pentode)*

| | | |
|---|---|---|
| $V_a = V_{g2(b)}$ | 200 | V |
| $V_{g3}$ | 0 | V |
| $V_{g1}$ | −1·5 | V |
| $I_a$ | 11 | mA |
| $I_{g2}$ | 3·3 | mA |
| $R_{g2}$ | 30 | kΩ |
| $R_k$ | 105 | Ω |
| $g_m$ | 4·5 | mA/V |
| $r_a$ | 600 | kΩ |

*B9A*






# ECC81

**VHF Double Triode**
**6·3V, 0·3A or**
**12·6V, 0·15A Heater**

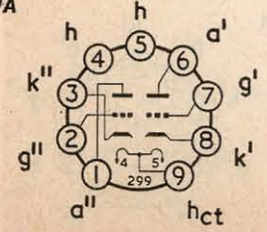
*Rating (each section)*

| | | |
|---|---|---|
| $P_{a(max)}$ | 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 |
| $\mu$ | 60 | |
| $r_a$ | 11 | kΩ |

*B9A*




# ECC82

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

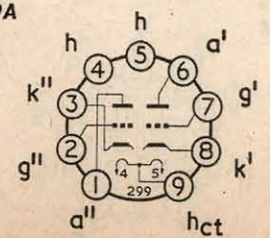
*Rating (each section)*

| | | |
|---|---|---|
| $P_{a(max)}$ | 2·75 | W |

*Characteristics (each section)*

| | | |
|---|---|---|
| $V_a$ | 250 | V |
| $V_g$ | −8·5 | V |
| $I_a$ | 10·5 | mA |
| $g_m$ | 2·2 | mA/V |
| $\mu$ | 17 | |
| $r_a$ | 7·7 | kΩ |

*B9A*




# ECC83

**Double Triode**
**High-$\mu$ Audio Amplifier**
**6·3V, 0·3A or**
**12·6V, 0·15A Heater**

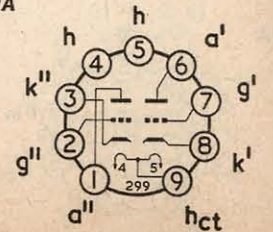
*Rating (each section)*

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

*Characteristics (each section)*

| | | |
|---|---|---|
| $V_a$ | 250 | V |
| $V_g$ | −2 | V |
| $I_a$ | 1·2 | mA |
| $g_m$ | 1·6 | mA/V |
| $\mu$ | 100 | |
| $r_a$ | 62·5 | kΩ |

*B9A*



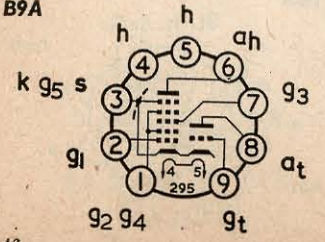
# ECH81

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

***Typical Operation***

| | Triode | Heptode | |
|---|---|---|---|
| $V_{a(b)}$ | 250 | 250 | V |
| $V_{g2}$ | ... | 103 | V |
| $V_{g1}$ | ... | −2 | V |
| $I_a$ | 4·5 | 3·25 | mA |
| $I_{g2}$ | ... | 6·7 | mA |
| $R_a$ | 33 | ... | kΩ |
| $R_{g2+g4}$ | ... | 22 | kΩ |
| $R_{gt+g3}$ | 47 | | kΩ |
| $R_k$ | 140 | | Ω |
| $g_c$ | ... | 0·775 | mA/V |

***B9A***

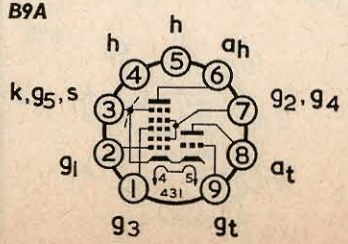



# ECH84

**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 |
| $V_{g3}$ | ... | 0 | V |
| $V_{g2+g4}$ | ... | 14 | V |
| $V_{g1}$ | 0 | 0 | V |
| $I_a$ | 3 | 1·7 | mA |
| $I_{g2+g4}$ | ... | 0·9 | mA |
| $g_m$ | 3·7 | 2·2 | mA/V |
| $\mu$ | 50 | ... | |

***B9A***

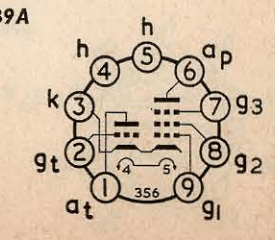



# ECL80

**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***



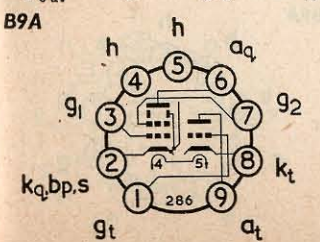



# ECL82

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

| | 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 |
| $\mu$ | 70 | ... | |
| $P_{out}$ | ... | 3·5 | W |

***B9A***

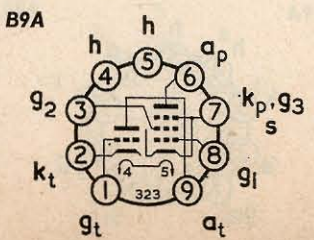



# ECL86

**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 | kΩ |
| $R_k$ | ... | 170 | Ω |
| $g_m$ | 1·6 | 10 | mA/V |
| $\mu$ | 100 | ... | |
| $P_{out}$ | ... | 4 | W |

***B9A***

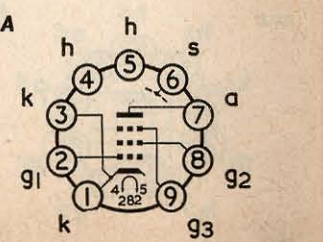



# EF80

**HF Pentode**
**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 | kΩ |

***B9A***



# EF85

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

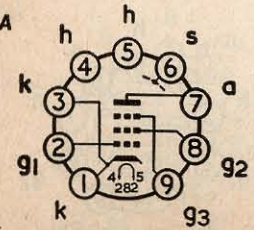
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 2·5 | W |

***Typical Operation***

| | | |
|---|---|---|
| $V_a$ | 250 | V |
| $V_{g3}$ | 0 | V |
| $V_{g2}$ | 100 | V |
| $V_{g1}$ | −2 | V |
| $I_a$ | 10 | mA |
| $I_{g2}$ | 2·5 | mA |
| $g_m$ | 6 | mA/V |
| $r_a$ | 500 | k Ω |

***B9A***




# EF86

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

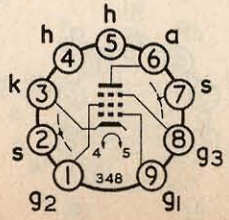
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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

**HF Pentode**
**Variable–mu Amplifier**
**6·3V, 0·2A Heater**

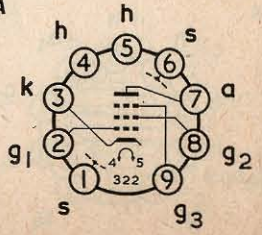
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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 Pentode**
**6·3V, 0·3A Heater**

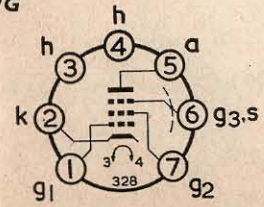
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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 | MΩ |

***B7G***




# EF183

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

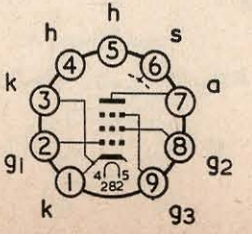
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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 |
| $R_{g2}$ | 24 | kΩ |
| $R_k$ | 120 | Ω |
| $g_m$ | 12·5 | mA/V |

***B9A***




# EF184

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

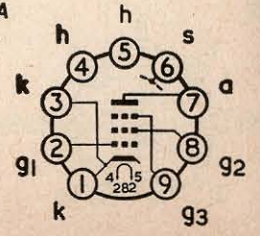
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 2·5 | W |

***Typical Operation***

| | | |
|---|---|---|
| $V_a$ | 200 | V |
| $V_{g3}$ | 0 | V |
| $V_{g2}$ | 200 | V |
| $V_{g1}$ | −2·5 | V |
| $I_a$ | 10 | mA |
| $I_{g2}$ | 4·1 | mA |
| $R_k$ | 180 | Ω |
| $g_m$ | 15 | mA/V |
| $r_a$ | 380 | kΩ |

***B9A***



# EH90

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

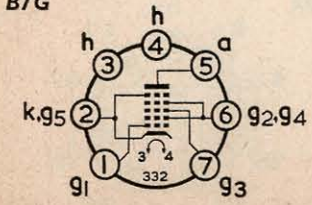
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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**

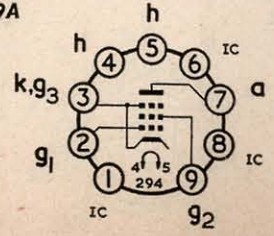
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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 | kΩ |
| $P_{out}$ | 5·4 | W |

***B9A***




# ELL80

**Double Pentode**
**Audio Output**
**6·3V, 0·55A Heater**

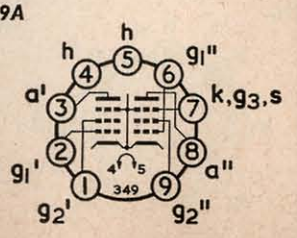
***Rating (each section)***

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

***Typical Operation (each section)***

| | | |
|---|---|---|
| $V_{a(b)}$ | 250 | V |
| $V_{g2}$ | 250 | V |
| $V_{g1}$ | −9 | V |
| $I_a$ | 24 | mA |
| $I_{g2}$ | 4·5 | mA |
| $R_a$ | 10 | k Ω |
| $g_m$ | 6 | mA/V |
| $r_a$ | 80 | k Ω |
| $P_{out}$ | 3 | W |

***B9A***






# EM84

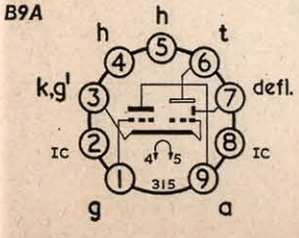
**Tuning Indicator**
**Column Display**
**6·3V, 0·21A Heater**

***Typical Operation***

| | | | |
|---|---|---|---|
| $V_{a(b)}$ | 250 | | V |
| $V_t$ | 250 | | V |
| $R_a$ | 470 | | k Ω |
| $V_g$ | 0 | −22 | V |
| $I_a$ | 450 | 60 | μA |
| $I_t$ | 1·0 | 1·8 | mA |
| L* | 21 | 0 | mm |

* *Length of column*

***B9A***




# EM87

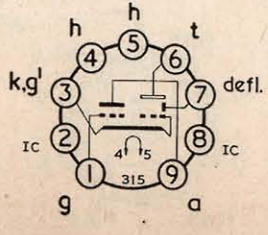
**Tuning Indicator**
**Column Display**
**6·3V, 0·3A Heater**

***Typical Operation***

| | | | |
|---|---|---|---|
| $V_b$ | 250 | | V |
| $V_t$ | 250 | | V |
| $R_a$ | 100 | | 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***



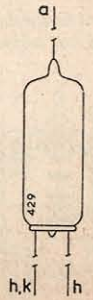

# EY51

**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

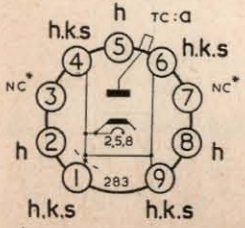
**EHT Rectifier**
**6·3V, 0·09A Heater**

***Ratings (pulse operation)***

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

***B9A***

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




# EY87

**EHT Rectifier**
**6·3V, 0·09A Heater**

***Ratings (pulse operation)***

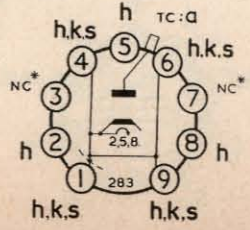
| | | |
|---|---|---|
| P.I.V.max | 22 | kV |
| $I_{a(max)}$ | 800 | μA |
| $i_{a(pk)max}$ | 40 | mA |

***Note***

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

***B9A***

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



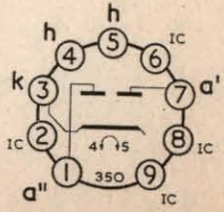

# EZ80

**Full Wave Rectifier**
**6·3V, 0·6A Heater**

***Typical Operation***

| | | |
|---|---|---|
| $I_a$ | 90 | mA |
| $V_{in(r.m.s.)}$ | 350 | V |
| $V_{out}$ | 360 | V |
| $C_{res}$ | 50 | μF |
| $R_{lim}$ | 300 | Ω |

***B9A***





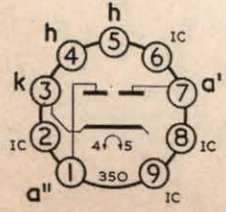

# EZ81

**Full Wave Rectifier**
**6·3V, 1A Heater**

***Typical Operation***

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

***B9A***




# PC86

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

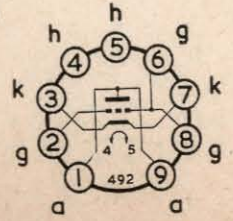
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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 |
| $V_{osc(r.m.s.)}$ | 2·5 | V |
| $g_c$ | 5·5 | mA/V |

***B9A***




# PC88

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

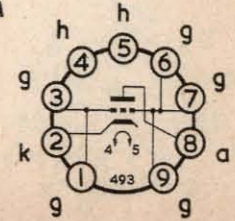
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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 | kΩ |
| μ | 65 | |

***B9A***



# PC97

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

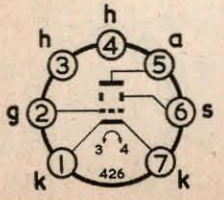
*Rating*

| | | |
|---|---|---|
| $P_{a(max)}$ | 2·2 | W |

*Typical Operation*

| | | |
|---|---|---|
| $V_{a(b)}$ | 135 | V |
| $I_a$ | 10·5 | mA |
| $R_a$ | 1 | kΩ |
| $R_k$ | 82 | Ω |
| $g_m$ | 13 | mA/V |
| $\mu$ | 65 | |
| $r_a$ | 5 | kΩ |

*B7G*



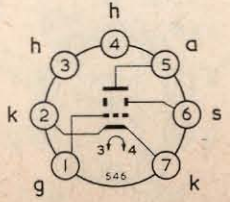

# PC900

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

*Typical Operation*

| | | |
|---|---|---|
| $V_b$ | 200 | V |
| $R_a$ | 5·6 | kΩ |
| $R_k$ | 82 | Ω |
| $I_a$ | 11·5 | mA |
| $I_g$ | 0 | μA |
| $V_g$ | −1 | V |
| $g_m$ | 14·5 | mA/V |
| $\mu$ | 72 | |

*B7G*




# PCC84

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

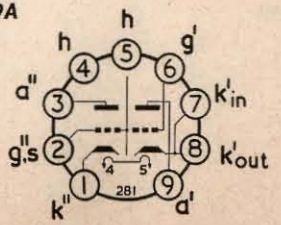
*Rating (each section)*

| | | |
|---|---|---|
| $P_{a(max)}$ | 2 | W |

*Characteristics (each section)*

| | | |
|---|---|---|
| $V_a$ | 90 | V |
| $V_g$ | −1·5 | V |
| $I_a$ | 12 | mA |
| $g_m$ | 6 | mA/V |
| $\mu$ | 24 | |

*B9A*






# PCC89

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

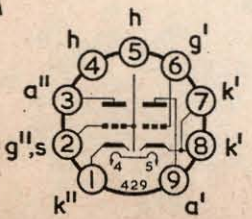
*Rating (each section)*

| | | |
|---|---|---|
| $P_{a(max)}$ | 1·8 | W |

*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**

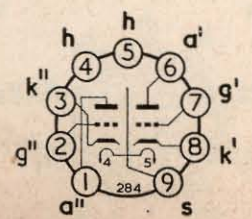
*Ratings (each section)*

| | | |
|---|---|---|
| $P_{a(max)}$ | 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 | kΩ |
| $\mu$ | 34 | |
| $V_g(g_m/_{100})$ | −9 | V |

*B9A*




# PCC806

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

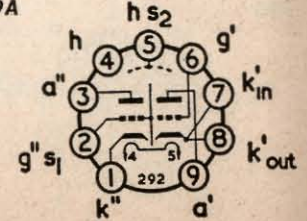
*Rating (each section)*

| | | |
|---|---|---|
| $P_{a(max)}$ | 1·6 | W |

*Characteristics (each section)*

| | | |
|---|---|---|
| $V_a$ | 75 | V |
| $V_g$ | 0·75 | V |
| $I_a$ | 15 | mA |
| $g_m$ | 16·5 | mA/V |
| $\mu$ | 40 | |

*B9A*



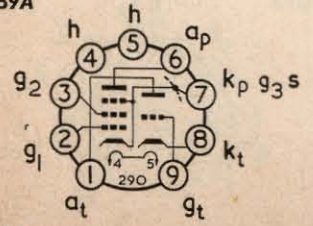
# PCF80

**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 |
| $\mu$ | 20 | ... | |

***B9A***



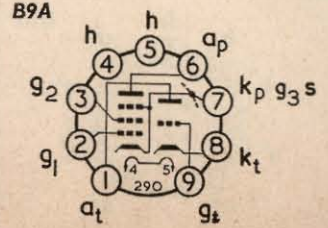

# PCF82

**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***

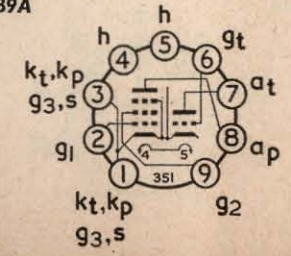



# PCF86

**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***





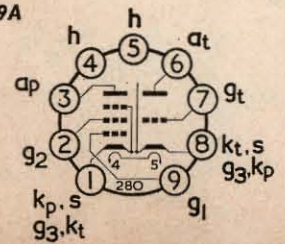

# PCF87

**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 | 2200 | k Ω |
| $R_{g2}$ | ... | 27 | k Ω |
| $R_a$ | ... | 5·6 | k Ω |
| $g_c$ | ... | 4·8 | mA/V |
| $g_m$ | 5·5 | ... | mA/V |
| $\mu$ | 20 | ... | |

***B9A***



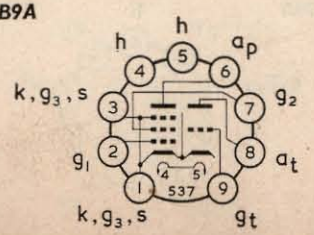

# PCF801

**Triode Frame Grid Pentode**
**VHF Variable-mu F.C.**
**0·3A, 8·5V Heater**

***Typical Operation***

| | Triode | Pentode | |
|---|---|---|---|
| $V_b$ | 200 | 200 | V |
| $V_{g1}$ | −3 | −1·4 | V |
| $I_a$ | 16 | 10 | mA |
| $I_{g2}$ | ... | 3 | mA |
| $R_a$ | 8·2 | 2·7 | k Ω |
| $R_{g2}$ | ... | 27 | k Ω |
| $R_{g1}$ | 10 | 0·1 | MΩ |
| $g_c$ | ... | 5 | mA/V |
| $g_m$ | 3·7 | ... | mA/V |
| $\mu$ | 20 | ... | |

***B9A***

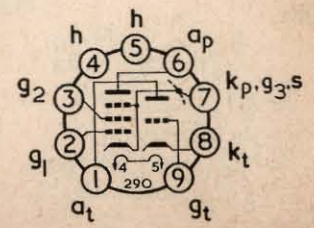



# PCF802

**Pentode Line Oscillator**
**Triode Reactance Valve**
**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***



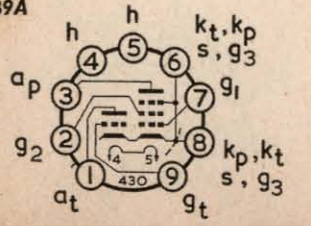
# PCF805

**Triode Frame Grid Pentode**
**VHF Variable-mu**
**Frequency Changer**
**0·3A, 7·4V Heater**

***Typical Operation***

| | Triode | Pentode | |
|---|---|---|---|
| $V_a$ | 77 | 155 | V |
| $V_{g_2}$ | ... | 135 | V |
| $I_a$ | 7·8 | 7·8 | mA |
| $I_{g_2}$ | ... | 2·4 | mA |
| $R_{g_1}$ | 47 | 2,200 | kΩ |
| $R_{g_2}$ | ... | 27 | kΩ |
| $R_a$ | ... | 5·6 | kΩ |
| $g_c$ | ... | 4·7 | mA/V |
| $g_m$ | 5·5 | ... | mA/V |
| $\mu$ | 17 | ... | |

***B9A***

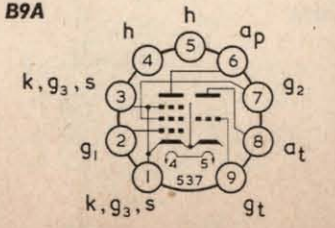



# PCF806

**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 |
| $V_{g_2}$ | ... | 150 | V |
| $V_{g_1}$ | −3 | −1·2 | V |
| $I_a$ | 14 | 10 | mA |
| $I_{g_2}$ | ... | 3·3 | mA |
| $g_m$ | 5·5 | 12 | mA/V |
| $r_a$ | ... | >350 | kΩ |
| $\mu$ | 17 | ... | |

***B9A***

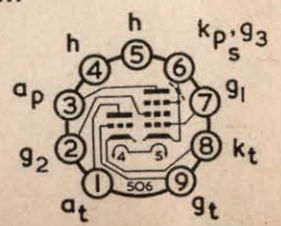



# PCF808

**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 |
| $V_{g_2}$ | ... | 160 | V |
| $V_{g_1}$ | −3·0 | −1·7 | V |
| $I_a$ | 14 | 12 | mA |
| $I_{g_2}$ | ... | 4·0 | mA |
| $g_m$ | 5·5 | 14·5 | mA/V |
| $r_a$ | 3·1 | ... | kΩ |
| $\mu$ | 17 | ... | |

***B9A***



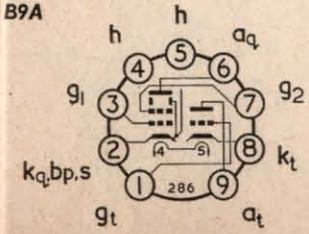



# PCL82

**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 |
| $V_{g_2}$ | ... | 170 | V |
| $V_{g_1}$ | 0 | −11·5 | V |
| $I_a$ | 3·5 | 41 | mA |
| $I_{g_2}$ | ... | 8 | mA |
| $R_a$ | ... | 3·9 | kΩ |
| $R_k$ | ... | 230 | Ω |
| $g_m$ | 2·5 | 7·5 | mA/V |
| $P_{out}$ | ... | 3·3 | W |

***B9A***

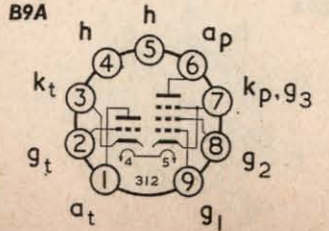



# PCL83

**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 |
| $V_{g_2}$ | ... | 170 | V |
| $V_{g_1}$ | −8·5 | −9·5 | V |
| $I_a$ | 10·5 | 30 | mA |
| $I_{g_2}$ | ... | 5 | mA |
| $g_m$ | 2·2 | 5·5 | mA/V |
| $r_a$ | 7·7 | 53 | kΩ |
| $R_a$ | ... | 5·5 | kΩ |
| $P_{out}$ | ... | 2·2 | W |

***B9A***

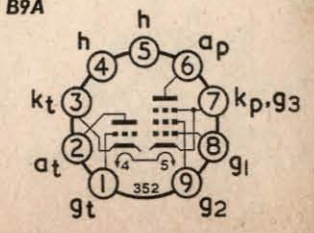



# PCL84

**Triode Pentode**
**Video Output**
**0·3A, 15V Heater**

| | Triode | Pentode | |
|---|---|---|---|
| ***Rating*** | | | |
| $P_{a(max)}$ | 1 | 4 | W |
| ***Characteristics*** | | | |
| $V_a$ | 200 | 200 | V |
| $V_{g_2}$ | ... | 200 | V |
| $V_{g_1}$ | −1·7 | −2·9 | V |
| $I_a$ | 3 | 18 | mA |
| $I_{g_2}$ | ... | 3 | mA |
| $g_m$ | 4·0 | 10·4 | mA/V |
| $r_a$ | 16·2 | 130 | kΩ |
| $\mu$ | 65 | ... | |

***B9A***

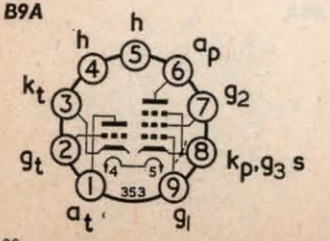


# PCL85

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

| | Triode | Pentode | |
|---|---|---|---|
| ***Rating*** | | | |
| $P_{a(max)}$ | 0·5 | 7 | W |
| ***Characteristics*** | | | |
| $V_a$ | 100 | 170 | V |
| $V_{g2}$ | ... | 170 | V |
| $V_{g1}$ | −0·85 | −15 | V |
| $I_a$ | 5 | 41 | mA |
| $g_m$ | 5·5 | 7·5 | mA/V |
| $\mu$ | 60 | ... | |

***B9A***

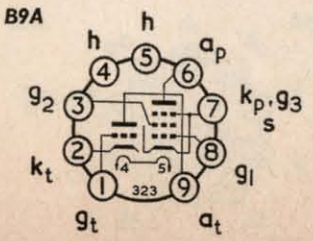



# PCL86

**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 | kΩ |
| $R_{g1}$ | 10 | ... | MΩ |
| $R_k$ | ... | 120 | Ω |
| $g_m$ | ... | 10·5 | mA/V |
| $\mu$ | 100 | ... | |
| $P_{out}$ | ... | 3·8 | W |

***B9A***

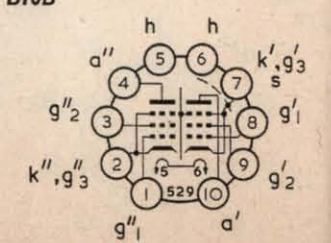



# PFL200

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

| ***Ratings*** | F Section″ | L Section′ | |
|---|---|---|---|
| $P_{a(max)}$ | 1·5 | 5 | W |
| ***Characteristics*** | | | |
| $V_a$ | 150 | 170 | V |
| $V_{g2}$ | 150 | 170 | V |
| $V_{g1}$ | −2·3 | −2·6 | V |
| $I_a$ | 10 | 30 | mA |
| $I_{g2}$ | 3 | 6·5 | mA |
| $g_m$ | 8·5 | 21 | mA/V |
| $\mu_{g1-g2}$ | 35 | 32 | |
| $r_a$ | 160 | 40 | kΩ |

***B10B***






# PL36

**Line Output Pentode**
**0·3A, 25V Heater**

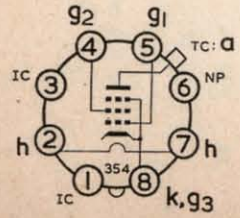
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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**

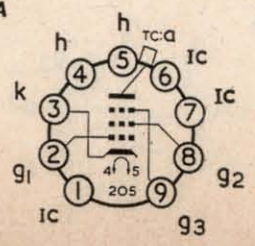
***Rating***

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

***Characteristics***

| | | |
|---|---|---|
| $V_a$ | 170 | V |
| $V_{g3}$ | 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***



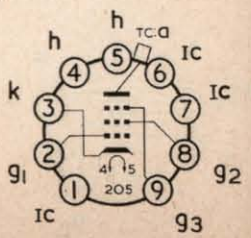

# PL81A

**Line Output Pentode**
**Portable Television Receivers**
**0·3A, 21·5V Heater**

***Characteristics***

| | | |
|---|---|---|
| $V_a$ | 170 | V |
| $V_{g2}$ | 170 | V |
| $V_{g1}$ | −24·3 | V |
| $I_a$ | 45 | mA |
| $I_{g2}$ | 2·2 | mA |
| $g_m$ | 6·2 | mA/V |
| $r_a$ | 13 | kΩ |

***B9A***



# PL82

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

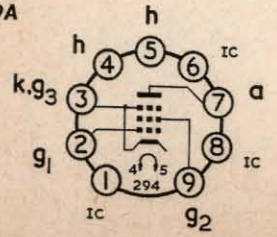
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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

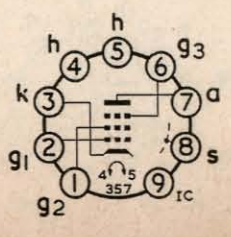
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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

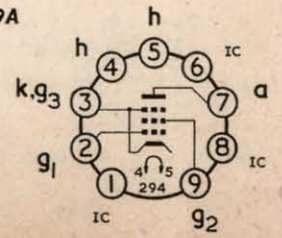
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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***





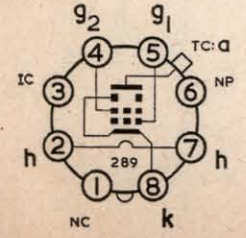

# PL302

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

***Ratings***

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



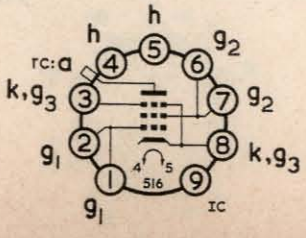

# PL500

## 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***



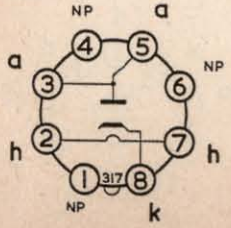
# PY32

**Half Wave Rectifier**
**0·3A, 29V Heater**

***Typical Operation***

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

***Int. Octal***



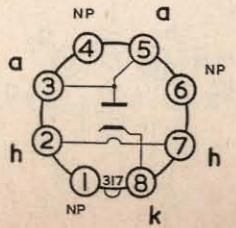

# PY33

**Half Wave Rectifier**
**0·3A, 29V Heater**

***Typical Operation***

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

***Int. Octal***



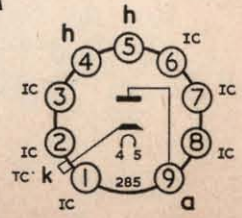

# PY81

**Efficiency Diode**
**0·3A, 17V Heater**

***Ratings***

| | | |
|---|---|---|
| P.I.V.max | 4·75 | kV |
| $I_{a(av)max}$ | 150 | mA |
| $V_{h-k(pk)max}$ | 4·75 | kV |

***B9A***





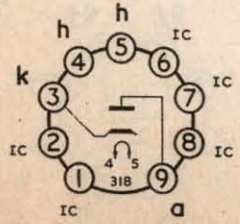

# PY82

**Half Wave Rectifier**
**0·3A, 19V Heater**

***Typical Operation***

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

***B9A***



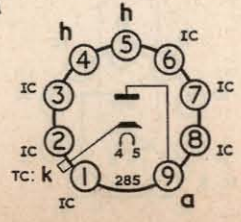

# PY83

**Efficiency Diode**
**0·3A, 20V Heater**

***Ratings***

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

***B9A***




# PY88

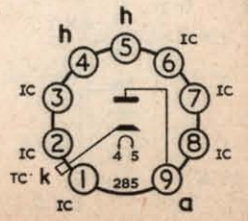
**Efficiency Diode**
**0·3A, 30V Heater**

For use with 110° tubes

***Ratings***

| | | |
|---|---|---|
| P.I.V.max | 6·6 | kV |
| $I_{a(av)max}$ | 220 | mA |
| $V_{h-k(pk)max}$ | 6·6 | kV |

***B9A***



# PY800

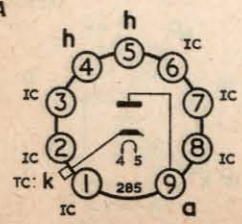
## Efficiency Diode
## 0·3A, 19V Heater

For use with 110° tubes

***Ratings***

| | | |
|---|---|---|
| $P.I.V._{max}$ | 5·25 | kV |
| $I_{a(max)}$ | 150 | mA |
| $i_{a(pk)max}$ | 350 | mA |
| $v_{h-k(pk)max}$ | 5·75 | kV |

***B9A***






# PY801

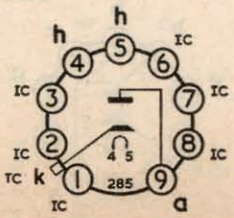
## Efficiency Diode
## 0·3A, 19V Heater

For use with 110° tubes

***Ratings***

| | | |
|---|---|---|
| $P.I.V._{max}$ | 5·5 | kV |
| $I_{a(max)}$ | 150 | mA |
| $i_{a(pk)max}$ | 450 | mA |
| $v_{h-k(pk)max}$ | 5·5 | kV |

***B9A***




# SP41

## VHF Pentode
## 4V, 0·95A Heater

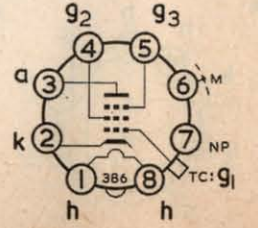
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 4·5 | W |

***Typical Operation***

| | | |
|---|---|---|
| $V_{a(b)}$ | 200 | V |
| $V_{g3}$ | 0 | V |
| $V_{g2}$ | 200 | V |
| $V_{g1}$ | −1·5 | V |
| $I_a$ | 10·9 | mA |
| $I_{g2}$ | 2·7 | mA |
| $g_m$ | 8·5 | mA/V |
| $r_a$ | 700 | k Ω |

***Mazda Octal***




# SP61

## VHF Pentode
## 6·3V, 0·6A Heater

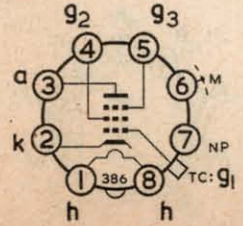
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 4·5 | W |

***Typical Operation***

| | | |
|---|---|---|
| $V_{a(b)}$ | 200 | V |
| $V_{g3}$ | 0 | V |
| $V_{g2}$ | 200 | V |
| $V_{g1}$ | −1·5 | V |
| $I_a$ | 10·9 | mA |
| $I_{g2}$ | 2·7 | mA |
| $g_m$ | 8·5 | mA/V |
| $r_a$ | 700 | k Ω |

***Mazda Octal***




# 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***


# U26

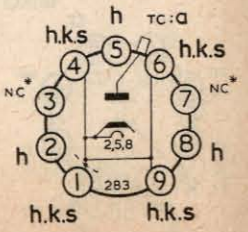
## EHT Rectifier
## 2V, 0·35A Heater

***Ratings (Pulse Operation)***

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

***B9A***

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



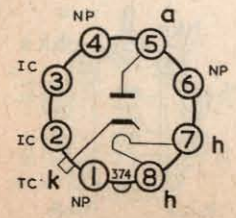
# U191

**Efficiency Diode**
**0·3A, 19V Heater**

***Ratings***

| | | |
|---|---|---|
| $P.I.V._{max}$ | 5 | kV |
| $I_{a(max)}$ | 150 | mA |
| $i_{a(pk)max}$ | 450 | mA |
| $V_{h-k(pk)max}$ | 5 | kV |

***Int. Octal***





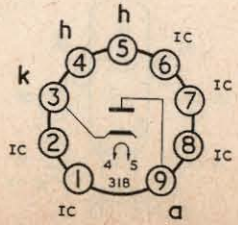

# U192

**H.W. Rectifier**
**0·3A, 19V Heater**

***Typical Operation***

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

***B9A***



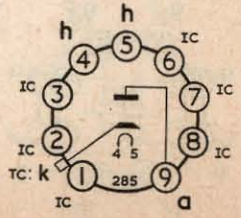

# U193

**Efficiency Diode**
**0·3A, 19V Heater**
For use with 110° tubes

***Ratings***

| | | |
|---|---|---|
| $P.I.V._{max}$ | 5·5 | kV |
| $I_{a(max)}$ | 150 | mA |
| $i_{a(pk)max}$ | 450 | mA |
| $V_{h-k(pk)max}$ | 5·5 | kV |

***B9A***




# U251

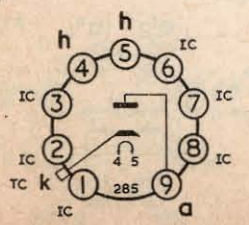
**Efficiency Diode**
**0·3A, 25V Heater**

***Ratings***

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

*Rating applies only to use as an Efficiency Diode.*

***B9A***



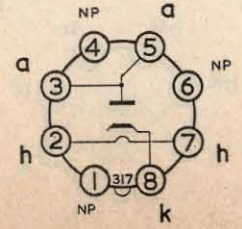

# U291

**H.W. Rectifier**
**0·3A, 29V Heater**

***Typical Operation***

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

***Int. Octal***




# U301

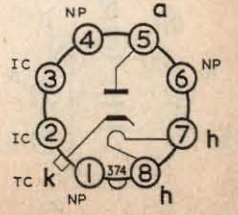
**Efficiency Diode**
**0·2A, 28V Heater**

***Ratings***

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

*Rating applies only to use as an Efficiency Diode.*

***Int. Octal***



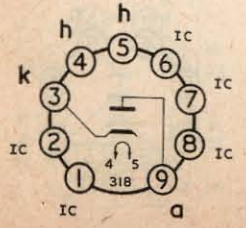
# U381

**H.W. Rectifier**
**0·1A, 38V Heater**

***Typical Operation***

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

***B9A***



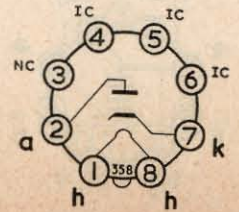

# U404

**Half Wave Rectifier**
**0·1A, 40V Heater**

***Typical Operation***

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

***B8A***



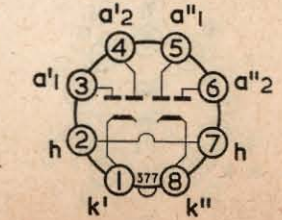

# U801

**Multiple Rectifier**
**0·2A, 80V Heater**

***Typical Operation***

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

***Int. Octal***






# UABC80

**Triple Diode Triode**
**0·1A, 28V Heater**

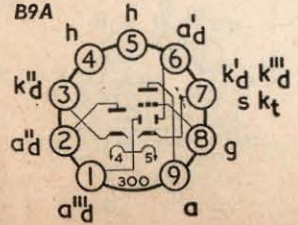
***Rating (Triode)***

| | | |
|---|---|---|
| Pa(max) | 1 | W |

***Characteristics (Triode)***

| | | |
|---|---|---|
| $V_a$ | 200 | V |
| $V_g$ | −2·3 | V |
| $I_a$ | 1 | mA |
| $r_a$ | 50 | kΩ |
| $g_m$ | 1·4 | mA/V |
| μ | 70 | |

***B9A***




# UBC41

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

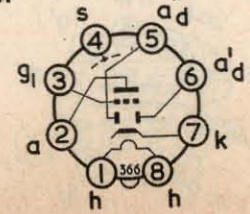
***Rating (Triode)***

| | | |
|---|---|---|
| Pa(max) | 1 | W |

***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***




# UBC81

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

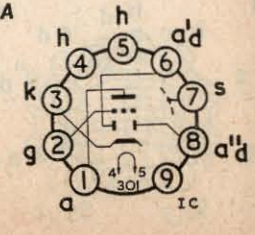
***Rating***

| | | |
|---|---|---|
| Pa(max) | 1 | W |

***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 | |

***B9A***



# UBF89

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

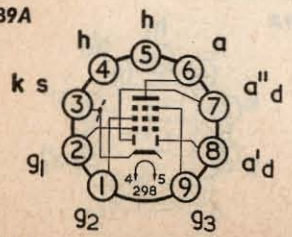
***Rating (Pentode)***

| | | |
|---|---|---|
| $P_{a(max)}$ | 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**

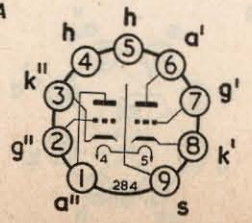
***Rating***

| | | | |
|---|---|---|---|
| $P_{a(max)}$ | (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 | mA |
| $R_a$ | 1·5 | 4·7 | kΩ |
| $R_g$ | ... | 1 | MΩ |
| $g_m$ | 6 | ... | mA/V |
| $g_c$ | ... | 2·2 | mA/V |
| $\mu$ | 50 | ... | |

***B9A***



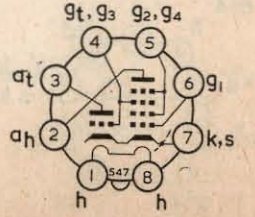

# UCH42

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

***Typical Operation***

| | Triode | Hexode | |
|---|---|---|---|
| $V_{a(b)}$ | 200 | 200 | V |
| $V_{g2+g4}$ | ... | 85 | V |
| $V_{g1}$ | 0 | −2 | mV |
| $I_a$ | 5·2 | 3 | mA |
| $I_{g2+g4}$ | ... | 3 | mA |
| $R_a$ | 22 | ... | kΩ |
| $R_g$ | 47 | ... | kΩ |
| $R_k$ | ... | 180 | Ω |
| $g_c$ | ... | 0·75 | mA/V |

***B8A***





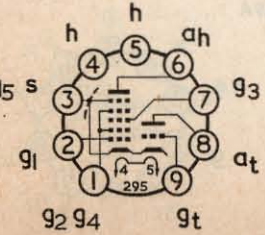

# UCH81

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

***Typical Operation***

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

***B9A***

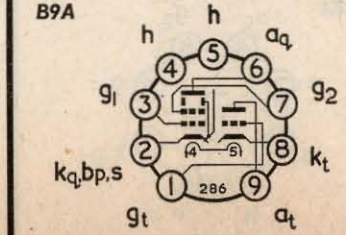



# UCL82

**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***

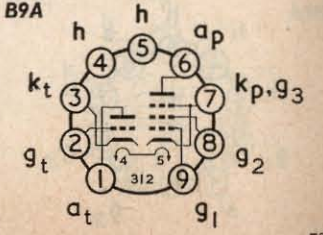



# UCL83

**Triode Output Pentode**
**Audio Output**
**0·1A, 38V Heater**

| | Triode | Pentode | |
|---|---|---|---|
| ***Rating*** | | | |
| $P_{a(max)}$ | 3·5 | 5·4 | W |
| ***Characteristics*** | | | |
| $V_a$ | 170 | 170 | V |
| $V_{g2}$ | ... | 170 | V |
| $V_{g1}$ | −1·5 | −9·5 | V |
| $I_a$ | 1·6 | 30 | mA |
| $I_{g2}$ | ... | 5 | mA |
| $g_m$ | 2·1 | 5·5 | mA/V |
| $r_a$ | 40 | 53 | kΩ |
| $\mu$ | 82 | ... | |

***B9A***



# UF89

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

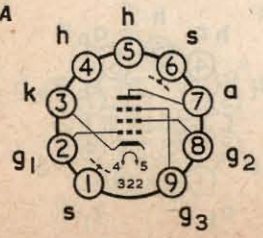
***Rating***

| | | |
|---|---|---|
| $P_{a(max)}$ | 2·25 | W |

***Typical Operation***

| | | |
|---|---|---|
| $V_{a(b)}$ | 170 | V |
| $V_{g_2}$ | 110 | V |
| $V_{g_1}$ | −2 | V |
| $I_a$ | 11 | mA |
| $I_{g_2}$ | 3·9 | mA |
| $g_m$ | 3·8 | mA/V |
| $r_a$ | 450 | k Ω |

***B9A***




# UL41

**Audio Output Pentode**
**0·1A, 45V Heater**

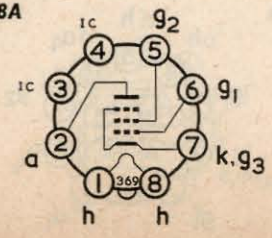
***Rating***

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

***Typical Operation***

| | | |
|---|---|---|
| $V_a$ | 170 | V |
| $V_{g_2}$ | 170 | V |
| $V_{g_1}$ | −10·4 | V |
| $I_a$ | 53 | mA |
| $I_{g_2}$ | 10 | mA |
| $R_a$ | 3 | k Ω |
| $r_a$ | 20 | k Ω |
| $g_m$ | 9·5 | mA/V |
| $P_{out}$ | 4·2 | W |

***B8A***




# UL84

**Audio Output Pentode**
**0·1A, 45V Heater**

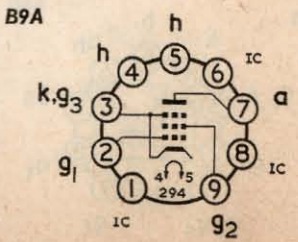
***Rating***

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

***Typical Operation***

| | | |
|---|---|---|
| $V_a$ | 160 | V |
| $V_{g_2}$ | 170 | V |
| $V_{g_1}$ | −12·5 | V |
| $I_{a(o)}$ | 70 | mA |
| $I_{g_2(o)}$ | 5 | mA |
| $R_a$ | 2·2 | k Ω |
| $r_a$ | 23 | k Ω |
| $g_m$ | 10 | mA/V |
| $P_{out}$ | 5·2 | W |

***B9A***





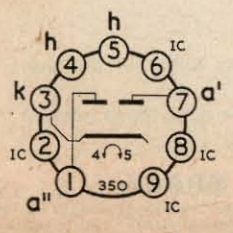

# UU12

**F.W. Rectifier**
**6·3V, 1·0A Heater**

***Typical Operation***

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

***B9A***



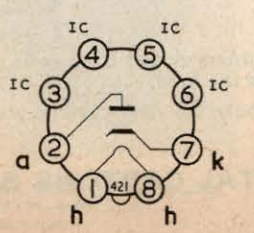

# UY41

**Half Wave Rectifier**
**0·1A, 31V Heater**

***Typical Operation***

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

***B8A***



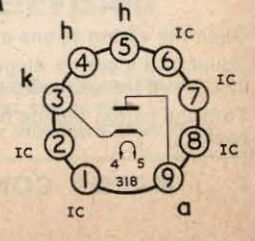

# UY85

**Half Wave Rectifier**
**0·1A, 38V Heater**

***Typical Operation***

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

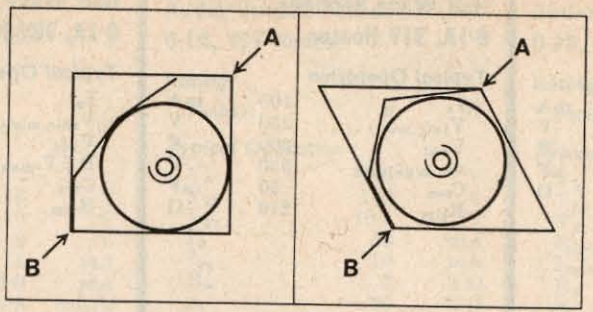
***B9A***



# UNPACKING VALVES

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

**Used for Valves with Bases**
**B7G**
**B8A**
**B8D**
**B9A**
**B10B**



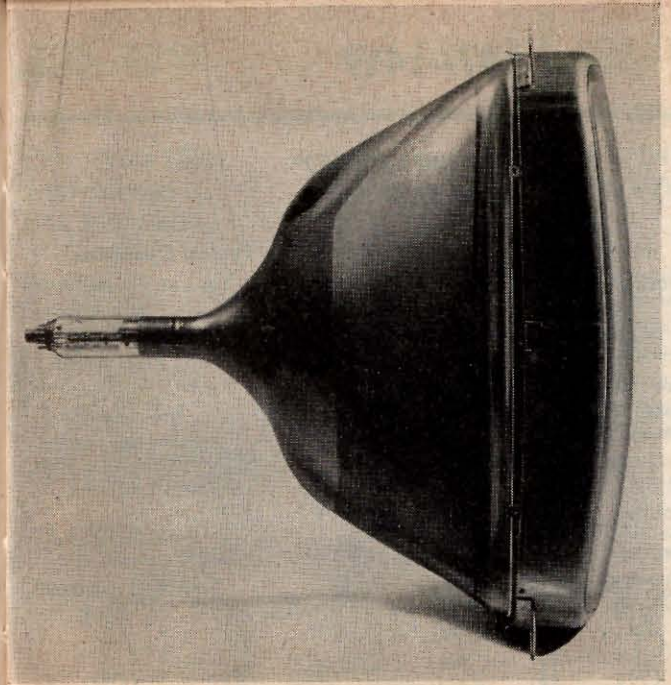

**MAZDA CONTINENTAL CARTONS introduced March 1965**

## QUICK PROCEDURE

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

**MAZDA CONTINENTAL CARTONS SAVE 36% SPACE**





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

**CURRENT AND MAINTENANCE TYPES**

**MAZDA**

# PICTURE TUBES

## for Television

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

# A47–13W

CME1906

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

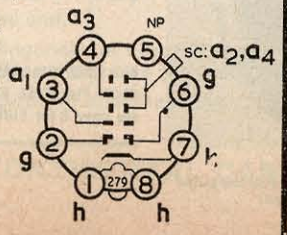
***Features***

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

***Typical Operation***

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

***B8H*** Base,
CT8 side contact






# A47–14W

CME1908

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

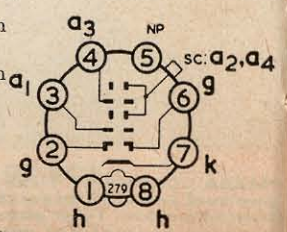
***Features***

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

***Typical Operation***

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

***B8H*** Base,
CT8 side contact




* Requires implosion protection.

# A59–13W

CME2306

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

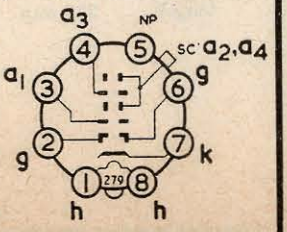
***Features***

- Short neck
- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Tinted bulb and panel, light transmission 40%
- Maximum Neck diameter 29·4 mm
- Maximum Overall length 374 mm

***Typical Operation***

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

***B8H*** Base,
CT8 side contact




# A59–15W

CME2308

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

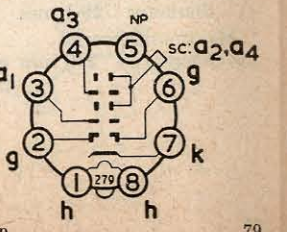
***Features***

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

***Typical Operation***

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

***B8H*** Base,
CT8 side contact




* Requires implosion protection.

# A65–11W

CME2501

**25 in. RIMGUARD**
**Metal Shell Reinforced**
**0·3A, 6·3V Heater**

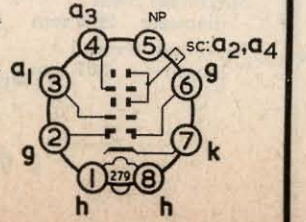
***Features***

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

***Typical Operation***

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

***B8H*** Base,
CT8 side contact






# AW47–90

CME1902

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

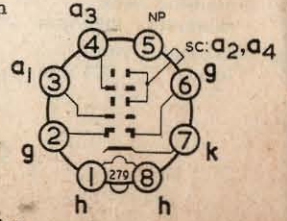
***Features***

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

***Typical Operation***

| | | |
|---|---|---|
| $V_{a_2 + a_4}$ | 16 | kV |
| $V_{a_1}$ | 400 | V |
| $V_{a_3}$ (focus) av | 200 | V |
| $V_g$ for cut-off | −38 to −94 | V |

***B8H*** Base,
CT8 side contact




* Requires implosion protection.

# AW47–91

CME1903

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

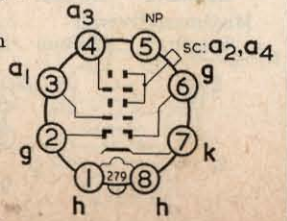
***Features***

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

***Typical Operation***

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

***B8H*** Base,
CT8 side contact




* Requires implosion protection.

# AW59–90

CME2302

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

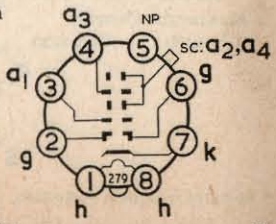
***Features***

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

***Typical Operation***

| | | |
|---|---|---|
| $V_{a_2 + a_4}$ | 16 | kV |
| $V_{a_1}$ | 400 | V |
| $V_{a_3}$ (focus) av | 200 | V |
| $V_g$ for cut-off | −38 to −94 | V |

***B8H*** Base,
CT8 side contact




* Requires implosion protection.

# AW59–91

CME2303

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

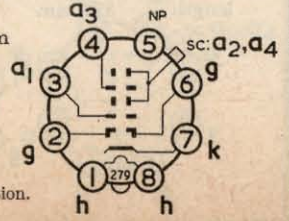
***Features***

- Short neck
- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass, light transmission 75%
- Maximum Neck diameter 29·4 mm
- Maximum Overall length 365 mm

***Typical Operation***

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

***B8H*** Base,
CT8 side contact




* Requires implosion protection.



# CME141

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

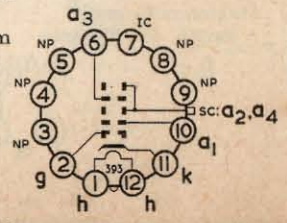
***Features***

- Rectangular face
- 70° deflection
- Electrostatic focus
- Ion-trap gun
- External 'dag
- Aluminised screen
- Grey glass, light transmission 76%
- Maximum Neck diameter 38 mm
- Maximum Overall length 420 mm

***Typical Operation***

| | | |
|---|---|---|
| $V_{a_2 + a_4}$ | 12 | kV |
| $V_{a_1}$ | 300 | V |
| $V_{a_3}$ (focus) av | 100 | V |
| $V_g$ for cut-off | −30 to −72 | V |

***B12A*** Base,
CT8 side contact




* Requires implosion protection.

# CME1101

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

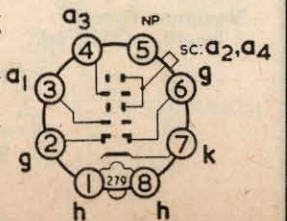
***Features***

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

***Typical Operation***

| | | |
|---|---|---|
| $V_{a_2 + a_4}$ | 12 | kV |
| $V_{a_1}$ | 400 | V |
| $V_{a_3}$ (focus) av | 200 | V |
| $V_g$ for cut-off | −38 to −94 | V |

***B8H*** Base,
CT8 side contact




# CME1201

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

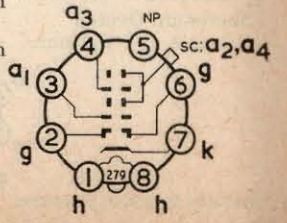
***Features***

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

***Typical Operation***

| | | |
|---|---|---|
| $V_{a_2 + a_4}$ | 12 | kV |
| $V_{a_1}$ | 400 | V |
| $V_{a_3}$ (focus) av | 200 | V |
| $V_g$ for cut-off | −40 to −76 | V |

***B8H*** Base,
CT8 side contact



# CME1402

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

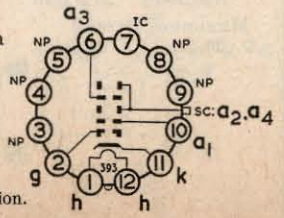
***Features***

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

***Typical Operation***

| | | |
|---|---|---|
| $V_{a_2 + a_4}$ | 12 | kV |
| $V_{a_1}$ | 300 | V |
| $V_{a_3}$ (focus) av | 100 | V |
| $V_g$ for cut-off | −30 to −72 | V |

***B12A*** Base, CT8 side contact




* Requires implosion protection.



# CME1601

## 16 in. UNPROTECTED*
## 0·3A, 6·3V Heater

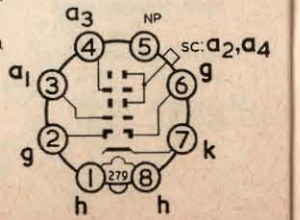
***Features***

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***

| | | |
|---|---|---|
| $V_{a_2 + a_4}$ | 16 | kV |
| $V_{a_1}$ | 400 | V |
| $V_{a_3}$ (focus) av | 220 | V |
| $V_g$ for cut-off | −40 to −77 | V |

***B8H*** Base, CT8 side contact




* Requires implosion protection.

# CME1702

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

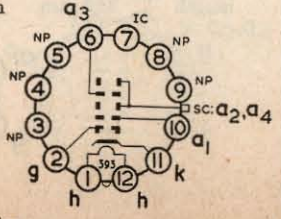
***Features***

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***

| | | |
|---|---|---|
| $V_{a_2 + a_4}$ | 14 | kV |
| $V_{a_1}$ | 300 | V |
| $V_{a_3}$ (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

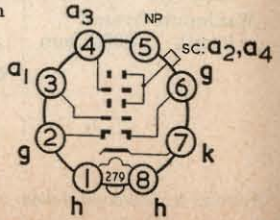
***Features***

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***

| | | |
|---|---|---|
| $V_{a_2 + a_4}$ | 14 | kV |
| $V_{a_1}$ | 300 | V |
| $V_{a_3}$ (focus) av | 100 | V |
| $V_g$ for cut-off | −30 to −72 | V |

***B8H*** Base, CT8 side contact




* Requires implosion protection.

# CME1705

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

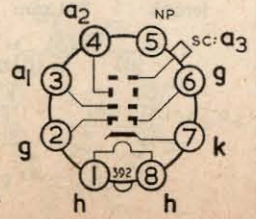
***Features***

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

***Typical Operation***

| | | |
|---|---|---|
| $V_{a_3}$ | 15 | kV |
| $V_{a_1}$ | 450 | V |
| $V_{a_2}$ (focus) av | 100 | V |
| $V_g$ for cut-off | −30 to −72 | V |

***B8H*** Base, CT8 side contact




* Requires implosion protection.



# CME1901

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

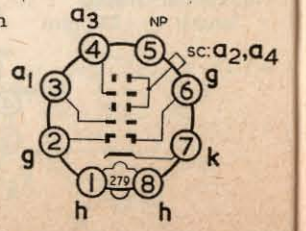
***Features***

- 114° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass, light transmission 75%
- Maximum Neck diameter 29·4 mm
- Maximum Overall length 322 mm

***Typical Operation***

| | | |
|---|---|---|
| $V_{a_2 + a_4}$ | 16 | kV |
| $V_{a_1}$ | 450 | V |
| $V_{a_3}$ (focus) av | 180 | V |
| $V_g$ for cut-off | −38 to −72 | V |

***B8H*** Base, CT8 side contact




* Requires implosion protection.

# CME1902

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

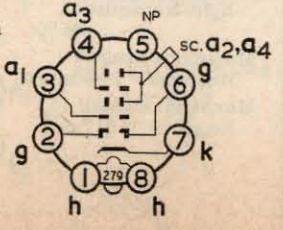
***Features***

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

***Typical Operation***

| | | |
|---|---|---|
| $V_{a_2 + a_4}$ | 16 | kV |
| $V_{a_1}$ | 400 | V |
| $V_{a_3}$ (focus) av | 200 | V |
| $V_g$ for cut-off | −38 to −94 | V |

***B8H*** Base, CT8 side contact




* Requires implosion protection.

# CME1903

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

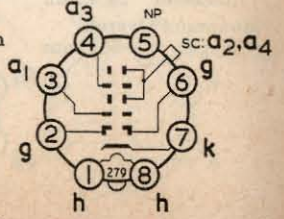
***Features***

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

***Typical Operation***

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

***B8H*** Base, CT8 side contact




* Requires implosion protection.

# CME1905

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

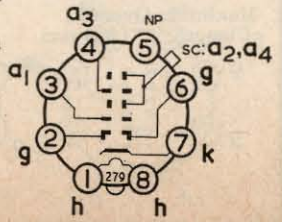
***Features***

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

***Typical Operation***

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

***B8H*** Base,
CT8 side contact






# CME1906

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

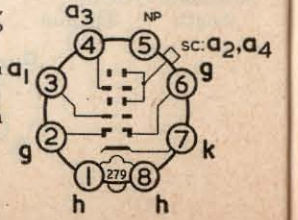
***Features***

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

***Typical Operation***

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

***B8H*** Base,
CT8 side contact




# CME1908

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

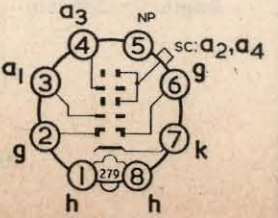
***Features***

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

***Typical Operation***

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

***B8H*** Base,
CT8 side contact




* Requires implosion protection.

# CME2101

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

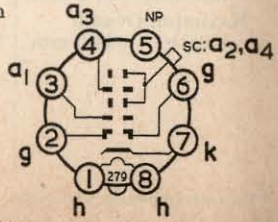
***Features***

- 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***

| | | |
|---|---|---|
| $V_{a_2+a_4}$ | 14 | kV |
| $V_{a_1}$ | 300 | V |
| $V_{a_3}$ (focus) av | 100 | V |
| $V_g$ for cut-off | −30 to −72 | V |

***B8H*** Base,
CT8 side contact




* Requires implosion protection.

# CME2104

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

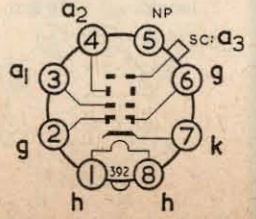
***Features***

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

***Typical Operation***

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

***B8H*** Base, CT8 side contact




* Requires implosion protection.



# CME2301

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

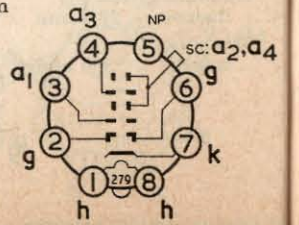
***Features***

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 |
| $V_{a1}$ | 450 | V |
| $V_{a3}$ (focus) av | 180 | V |
| $V_g$ for cut-off | −38 to −72 | V |

***B8H*** Base, CT8 side contact




* Requires implosion protection.

# CME2302

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

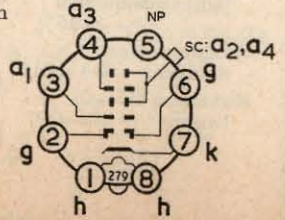
***Features***

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

***Typical Operation***

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

***B8H*** Base, CT8 side contact




* Requires implosion protection.

# CME2303

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

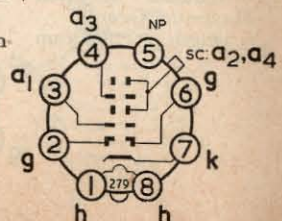
***Features***

Short neck
110° deflection
Electrostatic focus
Straight gun
External 'dag
Aluminised screen
Grey glass, light transmission 75%
Maximum Neck diameter 29·4 mm
Maximum Overall length 365 mm

***Typical Operation***

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

***B8H*** Base, CT8 side contact




* Requires implosion protection.

# CME2305

## 23 in. RIMGUARD
## Metal Shell Reinforced
## 0·3A, 6·3V Heater

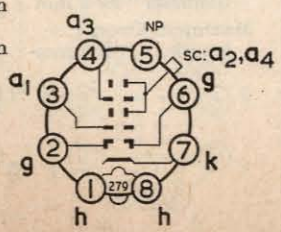
***Features***

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

***Typical Operation***

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

***B8H*** Base,
CT8 side contact






# CME2306

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

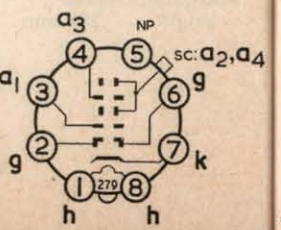
***Features***

- Glass twin panel
- Short neck
- 110° deflection
- Electrostatic focus
- Straight gun
- External 'dag
- Aluminised screen
- Grey glass, bulb and panel, light transmission 45%
- Maximum Neck diameter 29·4 mm
- Maximum Overall length 374 mm

***Typical Operation***

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

***B8H*** Base,
CT8 side contact




# CME2308

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

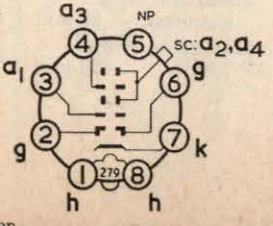
***Features***

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

***Typical Operation***

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

***B8H*** Base,
CT8 side contact




* Requires implosion protection.

# CME2501

## 25 in. RIMGUARD
## Metal Shell Reinforced
## 0·3A, 6·3V Heater

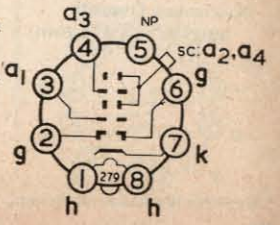
***Features***

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

***Typical Operation***

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

***B8H*** Base,
CT8 side contact



# CRM141 & 142

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

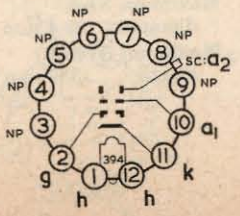
***Features***

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

***Typical Operation***

| | | |
|---|---|---|
| $V_{a_2}$ | 12 | kV |
| $V_{a_1}$ | 300 | V |
| $V_g$ for cut-off | −30 to −72 | V |

***B12A*** Base,
CT2 side contact




* Requires implosion protection.



# CRM144

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

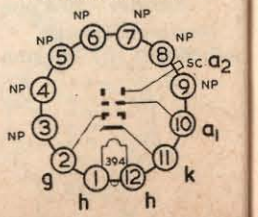
***Features***

Rectangular face
70° deflection
Magnetic focus
Ion-trap gun
External 'dag
Aluminised screen
Grey glass, light transmission 75%
Maximum Neck diameter 38 mm
Maximum Overall length 438 mm

***Typical Operation***

| | | |
|---|---|---|
| $V_{a_2}$ | 12 | kV |
| $V_{a_1}$ | 300 | V |
| $V_g$ for cut-off | −30 to −72 | V |

***B12A*** Base,
CT8 side contact




* Requires implosion protection.

# CRM171 & 172

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

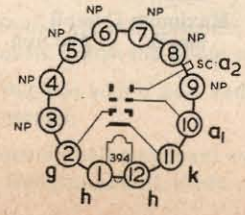
***Features***

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

***Typical Operation***

| | | |
|---|---|---|
| $V_{a_2}$ | 16 | kV |
| $V_{a_1}$ | 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**

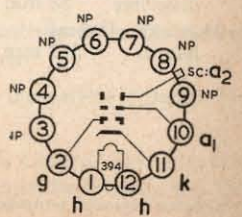
***Features***

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.

# CRM211

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

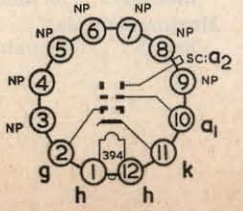
***Features***

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***

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

***B12A*** Base,
CT8 side contact




* Requires implosion protection.



# CRM212

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

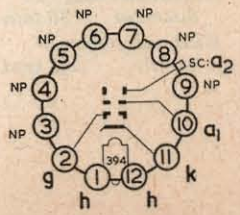
***Features***

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.

# FENBRIDGE GUARDS ON MAZDA TUBES

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

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

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

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

## CARE OF FENBRIDGE GUARDS

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

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

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

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

# FITTING FENBRIDGE CAPS

## Replacing CRT

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

## Replacing Fenbridge Cap

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



### AVAILABLE TO ORDER

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

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

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

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 |
| 6C9 | H.F. Triode Heptode | 6·3 | 0·45 | (T) 250<br>(H) 250 | 100 | −2·5 | 5<br>3 | 2·2<br>(gc) 0·65 |
| 6D1 | Signal Diode | 6·3 | 0·15 | 350 P.I.V. max. | — | — | 5 | — |
| 6F1 | H.F. Screened Pentode | 6·3 | 0·35 | 200 | 200 | −1·8 | 10 | 9 |
| 6F13 | H.F. Screened Pentode | 6·3 | 0·35 | 200 | 200 | −1·8 | 10 | 9 |
| 6F14 | Video Output Pentode | 6·3 | 0·35 | 250 | 135 | −1·3 | 27 | 10·6 |
| 6F15 | H.F. Screened Pentode | 6·3 | 0·2 | 250 | 100 | −2·5 | 7 | 2·3 |
| 6L18 | H.F. Oscillator Triode | 6·3 | 0·3 | 250 | μ17 | −5 | 4·5 | 7·6 |
| 6L34 | V.H.F. Triode | 6·3 | 0·3 | 250 | — | −1·5 | 10 | 8·5 |
| 6LD20 | Double Diode A.F. Triode | 6·3 | 0·25 | 260 | μ31·5 | −3 | 2 | 3·4 |
| 6M1 | Tuning Indicator Sector Display | 6·3 | 0·3 | 250 | $V_t$ 250 | −0·5 | 0·23 | — |
| 6P28 | Line Output Beam Tetrode | 6·3 | 1·1 | 350 | 250 | −8·8 | 72 | 9·5 |



| VALVE TYPE | BASE | PIN CONNECTIONS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | TC |
| 6C9 | B8A | h | $a_h$ | $a_t$ | $g_t$, $g_3$ | $g_2$, $g_4$ | $g_1$ | k, s, $g_5$ | h | — | — |
| 6D1 | B8G | h | k | h | — | — | — | — | — | — | a |
| 6F1 | B8A | h | a | $g_3$, s | $g_2$ | k | $g_1$ | k | h | — | — |
| 6F13 | B8A | h | a | s | $g_3$ | $g_2$ | $g_1$ | k | h | — | — |
| 6F14 | B8A | h | a | s | $g_3$ | $g_2$ | $g_1$ | k | h | — | — |
| 6F15 | B8A | h | a | s | $g_3$ | $g_2$ | $g_1$ | k | h | — | — |
| 6L18 | B8A | h | a | IC | s | IC | g | k | h | — | — |
| 6L34 | B7G | g | k | h | h | k | g | a | — | — | — |
| 6LD20 | B8A | h | $a_t$ | $g_1$ | s | a″ d | a′ d | k | h | — | — |
| 6M1 | I.Oct. | NP | h | a | t | g | NP | h | k | — | — |
| 6P28 | I.Oct. | NC | h | NC | $g_2$ | $g_1$ | NP | h | k | — | a |

| VALVE TYPE | DESCRIPTION | HEATER | | TYPICAL OPERATION | | | | |
|---|---|---|---|---|---|---|---|---|
| | | $V_h$ V | $I_h$ A | $V_{a(b)}$ V | $V_{g2}$ V | $V_{g1}$ V | $I_a$ mA | $g_m$ mA/V |
| 10C1 | H.F. Triode Heptode | 28 | 0·1 | (T) 80<br>(H) 175 | —<br>100 | —<br>−2·5 | 5<br>3 | 2·2<br>(gc) 0·65 |
| 10C2 | V.H.F. Triode Pentode | 28 | 0·1 | (T) 80<br>(P) 135 | $\mu$17<br>135 | $V_{het(pk)}$<br>3·25 | 5<br>5 | (gc) 2 |
| 10D2 | Signal Double Diode | 19 | 0·1 | P.I.V. 500 | — | — | max. 9 | — |
| 10F9 | H.F. Vari-mu Pentode | 13 | 0·1 | 175 | 100 | −2·5 | 7 | 2·3 |
| 10LD11 | Double Diode Triode | 15 | 0·1 | 150 | — | −2·25 | 6 | 3·4 |
| 20F2 | H.F. Pentode | 11 | 0·2 | 250 | 135 | −1·3 | 27 | 10·6 |
| 20P1 | Line Output Beam Tetrode | 38 | 0·2 | 150 | 150 | — | 100 | 7·3 |
| SP42 | A.F. Output Pentode | 4 | 0·95 | 200 | 140 | −1·25 | 27 | — |
| T41 | Thyratron | 4 | 1·5A | Control Ratio 20<br>$R_g$ 30 kΩ<br>$I_a$ (mean) 2·5 mA | | | | — |
| U281 | T.V. Efficiency Diode | 28 | 0·2 | P.I.V. 3,000 | — | — | max. 150 | — |
| U282 | T.V. Efficiency Diode | 28 | 0·2 | P.I.V. 4,500 | — | — | max. 150 | — |
| UU5 | Full-Wave Rectifier | 4 | 2·3 | $V_{in(r.m.s.)}$ 500V<br>$V_{out}$ 580V<br>$C_{res}$ 8$\mu$F | | | 120 | — |
| UU8 | Full-Wave Rectifier | 4 | 2·8 | 350 | $C_{res}$ 16$\mu$F | $R_{lim}$ 40Ω | — | 250 |

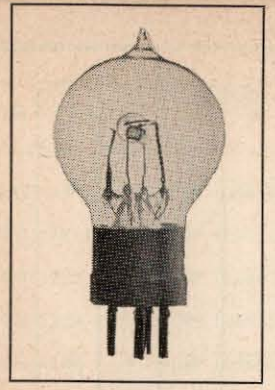


| VALVE TYPE | BASE | PIN CONNECTIONS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | TC |
| 10C1 | B8A | h | $a_h$ | $a_t$ | $g_t$, $g_3$ | $g_2$, $g_4$ | $g_1$ | k, s, $g_5$ | h | — | — |
| 10C2 | B8A | h | $a_p$ | $a_t$ | $g_t$ | $g_2$ | $g_1$ | k, s, $g_3$ | h | — | — |
| 10D2 | B7G | k′ | a″ | h | h | k″ | s | a′ | — | — | — |
| 10F9 | B8A | h | a | s | $g_3$ | $g_2$ | $g_1$ | k | h | — | — |
| 10LD11 | B8A | h | a | $g_1$ | s | a″ d | a′ d | k | h | — | — |
| 20F2 | B8A | h | a | s | $g_3$ | $g_2$ | $g_1$ | k | h | — | — |
| 20P1 | Int.Oct. | NC | h | NC | $g_2$ | $g_1$ | NP | h | k, bp | — | a |
| SP42 | M.Oct. | h | k | a | $g_2$ | $g_3$ | M | NP | h | — | $g_1$ |
| T41 | M.Oct. | h | k | a | NC | g | M | NP | h | — | — |
| U281 | I.Oct. | NC | h | NC | NP | a | NP | h | k | — | — |
| U282 | I.Oct. | NC | NC | k | NP | NC | NP | h | h | — | a |
| UU5 | Brit.4p | a′ | a″ | h, k | h | — | — | — | — | — | — |
| UU8 | M.Oct. | h, k | NC | a′ | NC | a″ | NC or M | NC | h | — | — |

| TUBE TYPE | DESCRIPTION | HEATER | | TYPICAL OPERATION | | |
|---|---|---|---|---|---|---|
| | | $V_h$ Volts | $I_h$ Amps | $V_{a2}$ kV | $V_{a1}$ Volts | $V_{g1}$ for cut-off |
| CRM93 | 9″ Rnd, 57°, alum | 12·6 | 0·3 | 9 | 300 | −30 to −72 |
| CRM121B | 12″ Rnd, 57° | 2 | 1·3 | 9 | — | −45 to −98 |
| CRM122 | 12″ Rnd, 57° | 7·3 | 0·3 | 9 | — | −45 to −98 |
| CRM123 | 12″ Rnd, 57°, alum | 2 | 1·3 | 9 | — | −45 to −98 |
| CRM124 | 12″ Rnd, 57°, alum | 12·6 | 0·3 | 10 | 300 | −30 to −72 |
| CRM143 | 14″ Rect, 70°, alum | 12·6 | 0·3 | 12 | 300 | −30 to −72 |
| CRM151 | 15″ Rnd, 51°, alum | 2 | 1·3 | 12 | — | −50 to −127 |
| CRM152B | 15″ Rnd, 67°, alum | 2 | 1·4 | 12 | — | −59 to −127 |
| CRM153 | 15″ Rnd, 67°, alum | 12·6 | 0·3 | 14 | 300 | −30 to −72 |
| CRM174 | 17″ Rect, 70°, alum | 12·6 | 0·3 | 16 | 300 | −30 to −72 |



| TUBE TYPE | BASE | PIN CONNECTIONS | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | S.C. |
| CRM93 | B12A | h | g | NP | NP | NP | NP | NP | NP | NP | $a_1$ | k | h | $a_2$ |
| CRM121B | MO | h | NP | k | NP | g | NP | NP | h | — | — | — | — | a |
| CRM122 | MO | h | NP | k | NP | g | NP | NP | h | — | — | — | — | a |
| CRM123 | MO | h | NP | k | NP | g | NP | NP | h | — | — | — | — | a |
| CRM124 | B12A | h | g | NP | NP | NP | NP | NP | NP | NP | $a_1$ | 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 | $a_2$ |
| CRM174 | B12A | h | g | NP | NP | NP | NP | NP | NP | NP | $a_1$ | k | h | $a_2$ |



**Royal Ediswan ES1 bright emitter triode**

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

# 50 YEARS OF VALVE MANUFACTURE EDISWAN MAZDA

## 1916 to 1966

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

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

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



## UNOBTAINABLE

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

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

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

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

MAZDA

# OBSOLETE

## VALVES and PICTURE TUBES

# OBSOLETE VALVES

| | |
|---|---|
| AC/DD | Detector Double Diode |
| AC/G | Cosmos (Green Spot) Shortpath Voltage Triode |
| AC/HL | Detector or AF Triode |
| AC/HL/DD | Double Diode AF Triode |
| AC/HL/DDD | Triple Diode AF Triode |
| AC/ME | Tuning Indicator |
| AC/P* | Detector or AF Triode |
| AC/P1 | AF Triode |
| AC/P4 | E/S Scanning Output Triode |
| AC/PA1 | Cosmos AF Power Triode |
| AC/PA2 | Cosmos AF Power Triode |
| AC/Pen (5 pin) | Audio Output Pentode |
| AC/Pen (7 pin) | Audio Output Pentode |
| AC/R | Cosmos (Red Spot) AF Power Shortpath Triode |
| AC/S | Cosmos HF Screened Grid |
| AC/S1/VM | Variable-mu HF Screened Grid |
| AC/S2 | HF Screened Grid |
| AC/S2 Pen | HF Mixer Pentode |
| AC/SG | HF Screened Grid |
| AC/SG/VM | Variable-mu HF Screened Grid |
| AC/SP1 | Noise or AFC Control Pentode |
| AC/SP3 | VHF or Video Pentode |
| AC/TH1 | HF Triode Heptode Mixer |
| AC/TH1A | HF Triode Heptode Mixer |
| AC/TP | HF Triode Pentode Mixer |
| AC/VP1 (5 pin) | Vari-mu HF Pentode |
| AC/VP1 (7 pin) | Vari-mu HF Pentode |
| AC/VP2 | Vari-mu HF Pentode |
| AC/X | Cosmos HF Triode |
| AC2/HL | Detector or AF Triode |
| AC2/Pen | Audio Output Pentode |
| AC2/Pen/DD | Double Diode, AF Pentode |
| AC4/Pen | Audio Output Beam Tetrode |
| AC5/Pen | Audio Output Beam Tetrode |
| AC5/Pen/DD | Double Diode Beam Tetrode |
| AC6/Pen | Line Output Beam Tetrode |
| B2 | B.T.H. AF Power Triode |
| B4 | B.T.H. AF Voltage Triode |
| BD4 | Mazda Mercury Rectifying Valve |
| BU10 to BU800/6 | Ediswan Barretters |
| D1 | TV Signal Diode |
| DC/HL | Detector or AF Triode |
| DC/P | AF Output Triode |
| DC/Pen | AF Output Pentode |
| DC/SG | HF Screened Grid |
| DC2/HL/DD | Double Diode AF Triode |
| DC2/P | AF Output Triode |
| DC2/Pen | AF Output Pentode |
| DC2/SG | HF Screened Grid |
| DC2/SG/VM | Variable-mu HF Screened Grid |
| DC3/HL | Detector or AF Triode |
| DD41 | HF Signal Double Diode |
| DD101 | HF Signal Double Diode |
| DD207 | HF Signal Double Diode |
| DD620 | HF Signal Double Diode |
| DE50 | Cosmos General Purpose Triode |
| DF92 | HF Battery Pentode |

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



# OBSOLETE VALVES

| | |
|---|---|
| EC91 | VHF Triode |
| EC92 | VHF Triode |
| ECH35 | HF Triode Hexode Mixer |
| EF41 | Variable-mu HF Pentode |
| EL95 | Audio Output Pentode |
| EM34 | Tuning Indicator (Double Sector Display) |
| EM80 | Tuning Indicator (Fan Display) |
| EM81 | Tuning Indicator (Fan Display) |
| EM85 | Tuning Indicator (Fan Display) See page 114 |
| EZ40 | FW Rectifier |
| EZ80 | FW Rectifier |
| GP210 | B.T.H. and Ediswan Detector Triode |
| GP407 | B.T.H. GP Triode |
| GP607 | B.T.H. GP Triode |
| FC141 | HF Mixer Pentagrid |
| H2 | HF or AF Triode |
| H141D | Diode AF Triode |
| H210 | HF or AF Triode |
| H607 | Detector and HF Triode |
| H610 | HF or AF Triode |
| HF210 | B.T.H. and Ediswan H.F. Triode |
| HF407 | B.T.H. HF Triode |
| HF410 | Ediswan HF Triode |
| HF607 | B.T.H. HF Triode |
| HF610 | Ediswan HF Triode |
| HL2 | HF or AF Triode |
| HL21DD | Double Diode AF Triode |
| HL22 | HF or AF Triode |
| HL22DD | Double Diode AF Triode |
| HL23 | HF or AF Triode |
| HL23DD | Double Diode AF Triode |
| HL41 | AF Triode |
| HL41DD | Double Diode AF Triode |
| HL42DD | Double Diode Vari-mu AF Triode |
| HL133 | AF Triode |
| HL133DD | Double Diode AF Triode |
| HL210 | HF or AF Triode |
| HL607 | Detector and LF Amplifier |
| HL610 | Detector and LF Amplifier |
| HL1320 | Detector or AF Triode |
| HL/DD/1320 | Double Diode AF Triode |
| HTB1 | Ediswan Barretter for use with U222 |
| L2 | HF or AF Triode |
| L2DD | Double Diode AF Triode |
| L21DD | Double Diode AF Triode |
| L22DD | Double Diode AF Triode |
| L210 | Amplifying Detector Triode |
| LF210 | Ediswan GP Triode |
| LF215 | AF Output Pentode |
| LF407 | B.T.H. AF Triode |
| LF410 | Ediswan AF and detector Triode |
| LF410A | Ediswan AF and detector Triode |
| M141LF | Ediswan AF Triode |
| M141RC | Ediswan Voltage amplifying Triode |
| ME41 | Tuning Indicator |
| ME91 | Tuning Indicator |
| ME920 | Tuning Indicator |

| | |
|---|---|
| MU2 | Ediswan EHT Mercury Vapour Rectifier |
| P41 | VHF Oscillator Triode |
| P61 | VHF Oscillator Triode |
| P215 | AF Output Triode |
| P220 | AF Output Triode |
| 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 |
| 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 |
| 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 |
| RC2 | Ediswan GP Triode |
| 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/R | Cosmos (Red Spot) GP Shortpath Triode |
| SP16/G | Cosmos (Green Spot) HF Shortpath Triode |
| SP16/B | Cosmos (Blue Spot) HF High Gain Shortpath 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 |
| SP141 | HF Screened Pentode |
| SP181 | HF Screened Pentode |
| SP210 | HF Screened Pentode |
| SP215 | HF Screened Pentode |
| SP610/G | Cosmos (Green Spot) Shortpath HF Triode |
| SP610/B | Cosmos (Blue Spot) Shortpath High Gain HF Triode |
| SP610/RR | Cosmos (Double Red Spot) Shortpath AF Power Triode |
| SP610/PA1 | Cosmos Shortpath AF Power Triode |
| SP1320 | HF Screened Pentode |
| SP2220 | Noise or AFC Control Pentode |
| T11 | Timebase Thyratron |
| T21 | Timebase Thyratron |
| T31 | Timebase Thyratron |
| 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 |
| TP1340 | HF Triode Pentode Mixer (car radio) |
| TP2620 | HF Triode Pentode Mixer |
| TS215 | B.T.H. AF Triode |
| U21 | Slow heating EHT Rectifier |
| U22 | Slow heating EHT Rectifier |
| U24 | EHT Rectifier |
| U30/250 | HW Rectifier |
| U65/550 | HW Rectifier |

# OBSOLETE VALVES

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



# OBSOLETE PICTURE TUBES

| | | |
|---|---|---|
| 9MH | .. | 9 in. round, 45°, triode, not aluminised, clear glass, $V_h$ 2·0 V |
| 12MH | .. | 12 in. round, 45°, triode, not aluminised, clear glass, $V_h$ 2·0 V |
| CME2307 | .. | 23 in. Twin Panel See page 114 |
| CRM71 | .. | 7 in. round, 54°, triode, not aluminised, clear glass, $V_h$ 2·0 V |
| CRM91 | .. | 9 in. round, 64°, triode, not aluminised, clear glass, $V_h$ 2·0 V |
| CRM92 | .. | 9 in. round, 57°, triode, not aluminised, clear glass, $V_h$ 2·0 V |
| CRM92A | .. | 9 in. round, 57°, triode, not aluminised, clear glass, $V_h$ 2·0 V |
| CRM121 | .. | 12 in. round, 57°, triode, not aluminised, clear glass, $V_h$ 2·0 V |
| CRM121A | .. | 12 in. round, 57°, triode, not aluminised, clear glass, $V_h$ 2·0 V |
| CRM152A | .. | 15 in. round, 67°, triode, aluminised, clear glass, $V_h$ 2·0 V |

# SUBSTITUTION FOR CME2307
and 23SP4

CME2307 DATA

## 23 in. RECTANGULAR All Glass Twin Panel 0·3A, 6·3V Heater

***Features***

110° deflection
Electrostatic focus
Straight gun
External 'dag
Grey bulb and panel
Max. Neck diameter 29·4 mm
Max. overall length 395 mm

***Typical Operation and Base Connections***

As CME2306.

***23SP4***

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

**FIT CME2306**

***Plug in replacement***

Notes:

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



# SUBSTITUTION FOR EM85

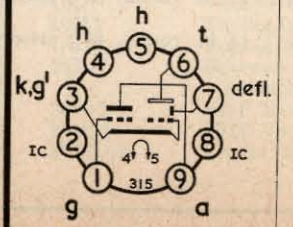
EM85 DATA

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

***Typical Operation***

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

***B9A***




**FIT EM87**

***Plug in replacement***

Notes:

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

# SUBSTITUTION FOR UU6

UU6 DATA

## F.W. Rectifier 4V, 1·4A Heater

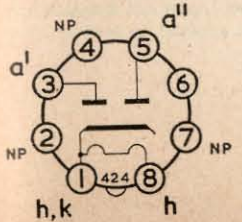
***Typical Operation***

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

***Bulb***

Max. diameter 32 mm
Max. seated height 84 mm

***Mazda Octal***




**FIT UU8**

***Plug in replacement***

Notes:

1. UU8 bulb is larger
   Max. diameter 54 mm
   Max. seated height 101 mm
2. UU8 heater current is double
   $I_h$ 2·8 A
   Check transformer for overheating and $V_h$ drop.
3. See page 103 for UU8 data.
4. UU6 and UU8 valves manufactured before 1951 had a metallised bulb. The metallising was connected to Pin 6.

# SUBSTITUTION FOR UU7

UU7 DATA

## F.W. Rectifier 4V, 2·3A Heater

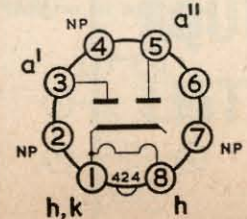
***Ratings***

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

***Bulb***

Max. diameter 45 mm
Max. seated height 100 mm

***Mazda Octal***




**FIT UU8**

***Plug in replacement***

Notes:

1. UU8 bulb is wider
   Max. diameter 54 mm
2. UU8 heater current is 0·5A higher.
   $I_h$ 2·8 A
   Check transformer for overheating and $V_h$ drop.
3. See page 103 for UU8 data.
4. UU7 and UU8 valves manufactured before 1951 had a metallised bulb. The metallising was connected to Pin 6.

# SUBSTITUTION FOR UU9 and EZ40

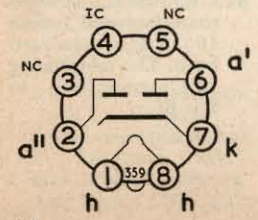
## UU9 DATA

**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***

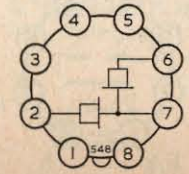



## FIT 2 × BY105

***Change to Silicon Rectifiers***

Notes:

1. The two Mazda BY105 Silicon Rectifiers may be soldered to the old valve socket as shown below.
2. Since the BY105 forward resistance is lower than UU9, it will be necessary to increase the value of the smoothing resistor to keep HT output at its original voltage.






# SUBSTITUTION FOR 6L19

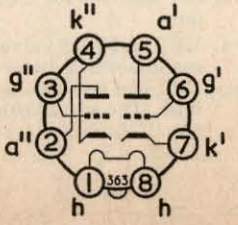
## 6L19 DATA

**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 |
| $g_m$ | 3·4 | mA/V |
| $\mu$ | 55 | |

***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.

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

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

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

MAZDA

# VALVE and CRT

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| Z77 | 6F12 | EF91 | 8D3 | EF91 | 6AM6 | SP6, PM07, 5A/160H, 5A/160K, HP6 |
| 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 | 6EL7 | — |
| ZD17 | 1FD9 | DAF91 | 1S5 | DAF91 | 1S5 | — |
| ZD25 | 1FD1 | DAF96 | DAF96 | DAF96 | 1AH5 | — |
| ZD152 | — | EBF80 | EBF80 | EBF80 | 6NS | WD709 |





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| 7205A | CME1402 | — | — | — | 7205A |
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| A47–14W | CME1908 | A47–14W | — | A47–14W | — |
| A47–17W | CME1905 | — | — | A47–17W | — |
| A59–12W | CME2305 | — | — | A59–12W | — |
| A59–13W | CME2306 | A59–13W | A59–13W | A59–13W | C23/10AP |
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# MAZDA GUARANTEES

| VALVES | PICTURE TUBES | SEMICONDUCTORS |
|---|---|---|
| 3 months | 24 months* | 12 months |

Mazda valves, picture tubes and semiconductors are guaranteed by Thorn–AEI Radio Valves and Tubes Limited against faulty material or manufacturing defects for the above periods from the date of installation.

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.

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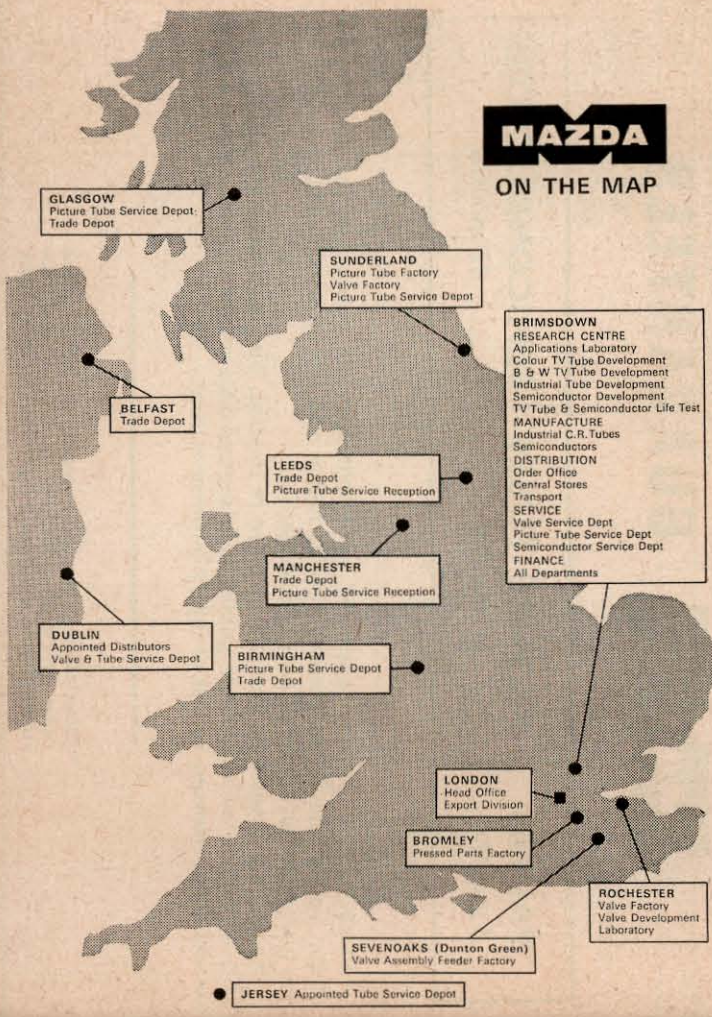
* Effective on all Mazda picture tubes with guarantee cards previously stamped by Mazda Guarantee Registry with a date on or after 1st January, 1965.




# DEALERS

## SAVE TIME FOR YOUR CUSTOMERS

## THE SERVICE DEPOTS

## OF

## THORN–AEI RADIO VALVES AND TUBES LTD.

## *DO* **NOT** *HANDLE THE PRODUCTS OF*

# AEI
# THORN
# STC

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

MAZDA

# RESEARCH CENTRES

## Brimsdown

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

## Rochester

Valve Development Laboratory
Valve Life Testing Department



MAZDA

# TRADE TECHNICAL LIAISON

### MAZDA REPRESENTATIVES

Mazda Valve Representatives are active throughout The British Isles and Eire calling on radio wholesalers and retailers. Although Mazda do not operate Retailer Accounts, the Mazda Representatives endeavour to maintain close liaison with Dealers' service departments.
Retailers who would like to receive a visit from their Mazda Valve Representative are invited to write or telephone to the address below.

### MAZDA TECHNICAL LIAISON OFFICER

The Mazda T.L.O. is available to trade service departments to investigate any serious complaints of a repetitive nature involving Mazda valves or picture tubes.
Retailers wishing to use this service must collect some factual evidence before an investigation can start.

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

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

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

MAZDA

# SERVICE DEPOTS

**for examination of guarantee claims**

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

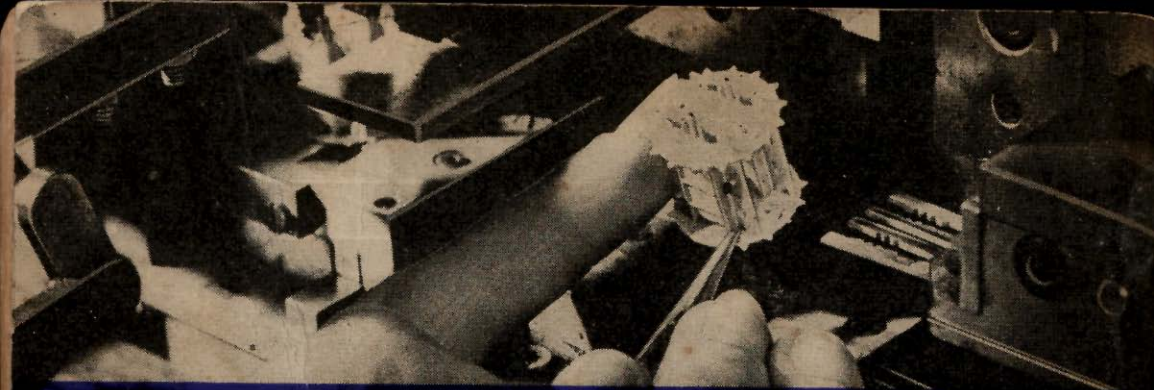


# PURCHASE TAX 25%

**Applicable within the United Kingdom only**

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

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



# Valves & Picture Tubes

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