



## ELECTRONIC TUBE REFERENCE

## EM84

Tuning Indicator electronic tube

CONSOLIDATED TECHNICAL DATA

2 SECTIONS

CONSTRUCTION

TRIODE-TUNING INDICATOR

Magic-band tuning indicator with integral triode amplifier and elongated fluorescent display whose illuminated length indicates receiver tuning or signal level.

## GENERAL CHARACTERISTICS

|                     |                   |                      |               |
|---------------------|-------------------|----------------------|---------------|
| BASE DESIGNATION    | Noval             | BASE PINS            | 9             |
| NOMINAL HEATER      | 6.3 V / 210 mA    | PARALLEL HEATER      | – / –         |
| HEATING             | Indirect          | SERIES OPERATION     | Not specified |
| CATHODE ARRANGEMENT | Separate cathodes | SECTION CONSTRUCTION | Dissimilar    |

## SECTION RATINGS

|                                                                                 |       |
|---------------------------------------------------------------------------------|-------|
| SECTION 1 Triode                                                                |       |
| MAXIMUM PLATE VOLTAGE                                                           | 300 V |
| MAXIMUM PLATE DISSIPATION                                                       | 0.5 W |
| <i>Published section ratings and characteristics promoted where applicable.</i> |       |

|                                                                                 |       |
|---------------------------------------------------------------------------------|-------|
| SECTION 2 Tuning Indicator                                                      |       |
| MAXIMUM PLATE VOLTAGE                                                           | 300 V |
| MAXIMUM PLATE DISSIPATION                                                       | 0.5 W |
| MAXIMUM CATHODE CURRENT                                                         | 3 mA  |
| <i>Published section ratings and characteristics promoted where applicable.</i> |       |

Tuning indicator with integral triode amplifier. Indirectly heated Mazda/Belvu receiving tube; descriptive text translated to English from the French source.



## SOURCE OPERATING CONDITIONS

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# 1953 La Radiotechnique

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1953 LA RADIOTECHNIQUE

## Section 1 · Triode

## CHARACTERISTICS

| PARAMETER      | PUBLISHED VALUE | CONDITION / NOTE        |
|----------------|-----------------|-------------------------|
| Heater voltage | 6.3 V           | Published nominal value |
| Heater current | 210 mA          | Published nominal value |



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# 195X Tesla

Published test conditions and operating points. Values on this page are preserved as reported by this source.

195X TESLA

## Section 1 · Triode

## CHARACTERISTICS

| PARAMETER      | PUBLISHED VALUE | CONDITION / NOTE        |
|----------------|-----------------|-------------------------|
| Heater voltage | 6.3 V           | Published nominal value |
| Heater current | 210 mA          | Published nominal value |



## SOURCE OPERATING CONDITIONS

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# 1963 Amperex Condensed

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1963 AMPEREX CONDENSED

Section 2 · Tuning Indicator

| OTHER                           |                                  |                  |
|---------------------------------|----------------------------------|------------------|
| PARAMETER                       | PUBLISHED VALUE                  | CONDITION / NOTE |
| Plate and target supply voltage | 250 V                            | TuningIndicator  |
| Target current                  | 1.1 mA                           | TuningIndicator  |
| Series resistance               | 0.47 MΩ                          | TuningIndicator  |
| Display pattern                 | Converging dual fluorescent bars | TuningIndicator  |

| CHARACTERISTIC                 |                 |                  |
|--------------------------------|-----------------|------------------|
| PARAMETER                      | PUBLISHED VALUE | CONDITION / NOTE |
| Grid bias end of control range | -7 V            | TuningIndicator  |



SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

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# 1963 Philips Electron Tubes Handbook V1a

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1963 PHILIPS ELECTRON TUBES HANDBOOK V1A

Section 1 · Triode

| OTHER                      |                 |                  |
|----------------------------|-----------------|------------------|
| PARAMETER                  | PUBLISHED VALUE | CONDITION / NOTE |
| Supply voltage             | 250 V           | TriodeSection    |
| Display/anode voltage      | 250 V           | TriodeSection    |
| Anode/display resistor     | 470 k0hm        | TriodeSection    |
| Grid resistor              | 3 M0hm          | TriodeSection    |
| Grid voltage               | 0 V             | TriodeSection    |
| Grid voltage               | -22 V           | TriodeSection    |
| Plate-plus-display current | 0.45 mA         | GridVoltage=0V   |
| Plate-plus-display current | 0.06 mA         | GridVoltage=-22V |

1963 PHILIPS ELECTRON TUBES HANDBOOK V1A

## Section 2 · Tuning Indicator

| OTHER             |                 |                  |
|-------------------|-----------------|------------------|
| PARAMETER         | PUBLISHED VALUE | CONDITION / NOTE |
| Indicator current | 1 mA            | GridVoltage=0V   |
| Indicator current | 1.8 mA          | GridVoltage=-22V |
| Shadow length     | 21 mm           | GridVoltage=0V   |
| Shadow length     | 0 mm            | GridVoltage=-22V |



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### SOURCE OPERATING CONDITIONS

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# 1967 Mullard Receiving Tubes for Maintenance

Published test conditions and operating points. Values on this page are preserved as reported by this source.

### 1967 MULLARD RECEIVING TUBES FOR MAINTENANCE

## Section 2 · Tuning Indicator

| OTHER                 |                 |                              |
|-----------------------|-----------------|------------------------------|
| PARAMETER             | PUBLISHED VALUE | CONDITION / NOTE             |
| Ra                    | 470 k0          | TYPICAL OPERATING CONDITIONS |
| Vg                    | 22 V            | TYPICAL OPERATING CONDITIONS |
| Valh, max             | 550 V           | TYPICAL OPERATING CONDITIONS |
| Va max                | 300 V           | TYPICAL OPERATING CONDITIONS |
| Vg max. (Ig=          | 1.3 V           | TYPICAL OPERATING CONDITIONS |
| EM8                   | 4               | TYPICAL OPERATING CONDITIONS |
| VOLTAGE INDICATOR EM8 | 4               | TYPICAL OPERATING CONDITIONS |
| Vg(V)                 | 0 V             | TYPICAL OPERATING CONDITIONS |



SOURCE DATA APPENDIX

# 1968 Mazda Belvu

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1968 MAZDA BELVU  
Section 1 · Triode

| OTHER                                                                                   |                 |                  |
|-----------------------------------------------------------------------------------------|-----------------|------------------|
| PARAMETER                                                                               | PUBLISHED VALUE | CONDITION / NOTE |
| Tension filament _ ...<br>mercermsrererrrenceenseensenrensesaseencesesssscennesunes VÊ  | 6.3 V           | —                |
| Tension d'anode à courant nul .....<br>rrrevereesensesserrienreesss Va DI               | 550 V           | —                |
| Tension d'anode .....s ..... Va                                                         | 300 V           | —                |
| T'ension de l'électrode de commandeàcourant nul ..... Vjbl                              | 550 V           | —                |
| Tension de l'électrode de COMmmANndE .. .....<br>ecceneereaseasseccss VI                | 300 V           | —                |
| Tension de cible pour un courant d''anode nul .....s Veb1                               | 550 V           | —                |
| Tension de CIDIE .....<br>revcoseoseanseanenceeneasusransencscencecseumencenceese<br>VC | 300 V           | —                |
| Dissipation d'An0dE ...s<br>sressesseossssoascsssssusnenensssensecaess P                | 0.5 W           | —                |
| Courant de cathode .....<br>aorercéseoureerenchsessesceonss 1K                          | 3 mA            | —                |
| Tension entre filament et cCathode@<br>.....ssiesseecerercerce VIK                      | 100 V           | —                |
| Tension de grille pour un couränt de + 0,3 pA v VE                                      | 1.3 V           | —                |

| CHARACTERISTIC                                                                     |                 |                  |
|------------------------------------------------------------------------------------|-----------------|------------------|
| PARAMETER                                                                          | PUBLISHED VALUE | CONDITION / NOTE |
| Courant filAmeEnt L....<br>ouserseenenenenenssensareseceocusnean<br>ns ansec00e If | 210 mA          | —                |
| VN =                                                                               | 250 V           | —                |
| le Ve =                                                                            | 250 V           | —                |



## SOURCE OPERATING CONDITIONS

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# 1972 Philips Receiving Tubes

Published test conditions and operating points. Values on this page are preserved as reported by this source.

## 1972 PHILIPS RECEIVING TUBES

## Section 2 · Tuning Indicator

## CHARACTERISTICS

| PARAMETER      | PUBLISHED VALUE | CONDITION / NOTE        |
|----------------|-----------------|-------------------------|
| Heater voltage | 6.3 V           | Published nominal value |
| Heater current | 210 mA          | Published nominal value |

## OTHER

| PARAMETER                  | PUBLISHED VALUE | CONDITION / NOTE                       |
|----------------------------|-----------------|----------------------------------------|
| Maximum plate dissipation  | 0.5 W           | Published or referenced maximum rating |
| Luminescent screen voltage | 250 V           | Published operating condition          |
| Grid supply voltage range  | -22-0 V         | Published                              |



## SOURCE OPERATING CONDITIONS

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# 1999 Philips E-Z

Published test conditions and operating points. Values on this page are preserved as reported by this source.

## 1999 PHILIPS E-Z

## Section 2 · Tuning Indicator

## CHARACTERISTIC

| PARAMETER                  | PUBLISHED VALUE | CONDITION / NOTE                       |
|----------------------------|-----------------|----------------------------------------|
| Published electrical datum | 6.3 V           | Heater voltage $V_i$ 6.3 V             |
| Published electrical datum | 210 mA          | Heater current $I_f$ 210 mA            |
| Published electrical datum | 250 v           | Supply voltage $V_p$ 250 v             |
| Published electrical datum | 250 v           | Luminescent screen voltage $V_g$ 250 v |
| Published electrical datum | 3 M $\Omega$    | Grid resistor $R_g$ 3 M $\Omega$       |

| PARAMETER                  | PUBLISHED VALUE | CONDITION / NOTE                                               |
|----------------------------|-----------------|----------------------------------------------------------------|
| Published electrical datum | <b>-22 V</b>    | Grid supply voltage $V_{og}$ 0 -22 V                           |
| Published electrical datum | <b>0.06 mA</b>  | Amnode and deflection electrode current $I_{a+D}$ 0.45 0.06 mA |
| Published electrical datum | <b>1.8 mA</b>   | Luminescent screen current $I_g$ ~ 1.0 1.8 mA                  |
| Published electrical datum | —               | Shadow length $a$ 2145 0 mm                                    |
| Published electrical datum | —               | $V_{og}(V)$ —30 —20 -0 0                                       |

| OTHER                      |                 |                                                  |
|----------------------------|-----------------|--------------------------------------------------|
| PARAMETER                  | PUBLISHED VALUE | CONDITION / NOTE                                 |
| Published electrical datum | <b>550 V</b>    | Anode voltage $V_{ao}$ max. 550 V                |
| Published electrical datum | <b>300 V</b>    | $V_a$ max. 300 V                                 |
| Published electrical datum | <b>0.5 W</b>    | Anode dissipation $W_y$ max. 0.5 W               |
| Published electrical datum | <b>550 V</b>    | Deflection electrode voltage $V_{Do}$ max. 550 V |
| Published electrical datum | <b>300 V</b>    | $V_p$ max. 300 V                                 |
| Published electrical datum | <b>550 V</b>    | Luminescent screen voltage $V_{oo}$ max. 550 V   |
| Published electrical datum | <b>3 mA</b>     | Cathode current $I_x$ max. 3 mA                  |
| Published electrical datum | <b>3 MQ</b>     | Grid resistor $R_g$ max. 3 MQ                    |
| Published electrical datum | <b>100 V</b>    | Cathode to heater voltage $V_{it}$ max. 100 V    |
| Heater voltage             | <b>6.3 V</b>    | Nominal heater rating                            |
| Heater current             | <b>210 mA</b>   | Nominal heater rating                            |