

ELECTRONIC TUBE REFERENCE

CONSOLIDATED TECHNICAL DATA
2 SECTIONS
CONSTRUCTION
BEAMPOWER-TRIODE

15MF8

Power - TV Vertical Output electronic tube

Combination high-mu triode and beam-power tube designed for television vertical-deflection oscillator and output-amplifier service, with the beam section rated for high positive plate pulses.

GENERAL CHARACTERISTICS

BASE DESIGNATION	12DZ	BASE PINS	12
NOMINAL HEATER	14.7 V / 600 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Dissimilar

12DZ - TERMINAL PINOUT

TERMINAL	SECTION	ELEMENT	STATUS
PIN1	–	H – Heater	CONNECTED
PIN2	B	P – Plate (Anode)	CONNECTED
PIN4	A	P – Plate (Anode)	CONNECTED
PIN6	A	G1 – Control Grid	CONNECTED
PIN7	A	G1 – Control Grid	CONNECTED
PIN8	A	G2 – Screen Grid	CONNECTED
PIN9	A	G3 – Suppressor Grid	CONNECTED
PIN9	A	K – Cathode	CONNECTED
PIN10	B	G1 – Control Grid	CONNECTED
PIN11	B	K – Cathode	CONNECTED
PIN12	–	H – Heater	CONNECTED

SECTION RATINGS

SECTION1 Triode	
PLATE RESISTANCE	14000 Ω
TRANSCONDUCTANCE	0.0041 S
AMPLIFICATION FACTOR	58
MAXIMUM PLATE VOLTAGE	400 V
MAXIMUM PLATE DISSIPATION	2.5 W
MAXIMUM CATHODE CURRENT	30 mA
<i>Heater-variant reference sheet; electrical data explicitly cross-referenced to 6MF8.</i>	

SECTION2 Beam Power	
PLATE RESISTANCE	5000 Ω
TRANSCONDUCTANCE	0.0041 S
MAXIMUM PLATE VOLTAGE	400 V
MAXIMUM SCREEN VOLTAGE	300 V
MAXIMUM PLATE DISSIPATION	12 W
MAXIMUM SCREEN DISSIPATION	2.75 W
MAXIMUM CATHODE CURRENT	75 mA
<i>Heater-variant reference sheet; electrical data explicitly cross-referenced to 6MF8.</i>	

15MF8 — High-Mu Triode and Beam Power Pentode Compactron

A multi-unit compactron vacuum tube containing a high-mu triode and a beam power pentode, designed specifically for vertical-deflection oscillator and vertical-deflection amplifier applications in color television receivers.

Overview

The **15MF8** is a multi-unit vacuum tube of the compactron configuration containing a triode and a beam power pentode (also described as a beam power tube) in a single envelope. The triode section is designed for service as a vertical-deflection oscillator, and the pentode section is designed for service as a vertical-deflection amplifier in color television receivers.

The 15MF8 is electrically identical to the **6MF8** except for its heater characteristics and ratings. It utilizes a 12-pin compactron envelope and requires a standard duodecar 12-contact socket.

Construction, Physical Dimensions, and Basing

The 15MF8 features a **Compactron T-12** glass envelope construction with a button 12-pin base (designation E12-74). The physical dimensions of the tube are:

- **Maximum Diameter:** 1.562 inches
- **Maximum Seated Height:** 2.750 inches
- **Maximum Overall Height:** 3.125 inches

Pinout and Basing Connection (12DZ)

The tube utilizes the **12DZ** basing arrangement. Viewed from the underside of the base, the pin connections are as follows:

Pin	Connection	Symbol
1	Plate (Triode Unit)	PT
2	Heater	H
3	No Connection	NC
4	Plate (Beam Power Unit)	PB
5	No Connection	NC
6	Grid No. 1 (Beam Power Unit)	G1B
7	Grid No. 1 (Beam Power Unit)	G1B
8	Grid No. 2 (Beam Power Unit)	G2B
9	Cathode and Grid No. 3 (Beam Power Unit)	KB, G3B
10	Grid (Triode Unit)	GT
11	Cathode (Triode Unit)	KT
12	Heater	H

Pins 6 and 7 are connected internally, and Pin 9 connects both the cathode and the beam-deflecting electrodes (Grid No. 3) of the beam power unit.

Heater Characteristics and Ratings

The 15MF8 is designed for series-string heater applications. Its heater is designed to operate with either AC or DC power. The heater characteristics are:

- **Heater Voltage (AC or DC):** 14.7 V (for a bogey tube at $I_f = 0.6$ A)
- **Heater Current:** 0.6 ± 0.04 A (or 600 mA)

- **Average Heater Warm-up Time:** 11 seconds

The average heater warm-up time is defined as the time required for the voltage across the heater to reach 80% of its bogey value (11.76 V) when 4 times the bogey heater voltage (58.8 V) is applied to a circuit consisting of the tube heater in series with a resistance equal to 3 times the bogey heater voltage divided by the bogey heater current. This series resistance is calculated as:

$$\text{Series Resistance} = 3 \times \frac{14.7 \text{ V}}{0.6 \text{ A}} = 73.5 \Omega$$

Heater-Cathode Voltage Ratings

The maximum heater-cathode voltage ratings (Design-Maximum Values) are:

- **Heater Negative with Respect to Cathode:**
 - Total DC and Peak: 200 V
- **Heater Positive with Respect to Cathode:**
 - DC: 100 V
 - Total DC and Peak: 200 V

Direct Interelectrode Capacitances

The direct interelectrode capacitances of the 15MF8 are measured without an external shield. The typical values are:

Triode Section

- **Grid to Plate (g to p):** 6.0 pF
- **Input (g to k + h):** 6.5 pF
- **Output (p to k + h):** 1.6 pF

Pentode (Beam Power) Section

- **Grid No. 1 to Plate (g1 to p):** 0.54 pF (Maximum)
- **Input (g1 to k + g2 + g3 + h):** 9.5 pF
- **Output (p to k + g2 + g3 + h):** 7.0 pF

Inter-Section Coupling Capacitances

- **Pentode Grid No. 1 to Triode Plate (g1B to pT):** 0.12 pF (Maximum)
- **Pentode Plate to Triode Plate (pB to pT):** 0.32 pF (Maximum)

Electrical Characteristics and Class A1 Operation

The 15MF8 contains two distinct electrical systems: a high-mu (or medium-mu) triode and a beam power pentode. The typical operating characteristics of each section under Class A1 amplifier conditions are:

Parameter	Triode Unit	Beam Power Unit (Condition 1)	Beam Power Unit (Condition 2)
Plate Voltage	250 V	60 V	250 V
Grid No. 2 (Screen-Grid) Voltage	—	250 V	250 V
Grid No. 1 (Control-Grid) Voltage	-4 V	0 V	-20 V
Plate Current	2.6 mA	200 mA	50 mA
Grid No. 2 Current	—	20 mA	3.5 mA
Transconductance	4100 μ mhos	—	4100 μ mhos
Amplification Factor	58	—	—
Plate Resistance (Approx.)	14,000 Ω	—	5,000 Ω
Grid No. 1 Voltage for $I_b = 10 \mu A$	-6.6 V	—	—
Grid No. 1 Voltage for $I_b = 100 \mu A$	—	—	-65 V

Instantaneous Plate Knee Values

For the beam power unit, the instantaneous plate knee values under specific conditions are:

- **Plate Voltage (E_b):** 60 V
- **Grid No. 2 Voltage (E_{c2}):** 250 V
- **Grid No. 1 Voltage (E_{c1}):** 0 V
- **Plate Current (I_b):** 200 mA
- **Grid No. 2 Current (I_{c2}):** 20 mA

Vertical-Deflection Service Ratings

The 15MF8 is rated under the **Design-Maximum Rating System** for operation in a 525-line, 30-frame television system. The maximum ratings and circuit values for both sections are:

Rating / Parameter	Triode Unit (Oscillator)	Beam Power Unit (Amplifier)
Plate Voltage (Max.)	400 V	400 V
Peak Positive Pulse Plate Voltage (Max.)	—	2500 V

Rating / Parameter	Triode Unit (Oscillator)	Beam Power Unit (Amplifier)
Grid No. 2 Voltage (Max.)	—	300 V
Peak Negative Grid No. 1 Voltage (Max.)	400 V	—
Plate Dissipation (Max.)	2.5 W	12 W
Grid No. 2 Dissipation (Max.)	—	2.75 W
Average Cathode Current (Max.)	30 mA	75 mA
Peak Cathode Current (Max.)	105 mA	260 mA
Peak Power Output (Max.)	2.5 W	—
Bulb Temperature (Max.)	—	200 °C

Pulse Duration and Circuit Protection

- **Pulse Duration:** For the peak positive pulse plate voltage rating of 2500 V on the beam power unit, the pulse duration must not exceed 15% of a vertical scanning cycle, which corresponds to 2.5 milliseconds.
- **Excitation Protection:** In stages operating with grid-leak bias, an adequate bias resistor or other suitable means is required to protect the tube in the absence of excitation.
- **Grid Circuit Resistance Limits:**
 - **For Fixed-Bias Operation:** Beam Power Unit (Amplifier) = 1.0 M Ω (Maximum)
 - **For Cathode-Bias Operation:** Triode Unit (Oscillator) = 2.2 M Ω (Maximum); Beam Power Unit (Amplifier) = 2.2 M Ω (Maximum)

Technical Summary

The **15MF8** is a high-performance **Compactron T-12** multi-unit tube containing a high-mu triode and a beam power pentode, specifically optimized for vertical-deflection oscillator and amplifier applications in color television receivers. It features a series-string heater rated at **14.7 V / 0.6 A** with a controlled 11-second warm-up time, and utilizes a 12-pin duodecar base with a **12DZ** pinout configuration.

The triode section provides an amplification factor of **58** and a transconductance of **4100 μ mhos** under typical Class A1 conditions, while the beam power section offers a plate dissipation rating of **12 W** and can withstand peak positive plate pulses up to **2500 V** in vertical deflection service. The 15MF8 is identical to the **6MF8** except for its heater voltage and current ratings.



SOURCE OPERATING CONDITIONS

1950 Sylvania

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

1950 SYLVANIA

Section 1 · Triode

APPLICATION		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Service	Vertical deflection oscillator	—

1950 SYLVANIA

Section 2 · Beam Power

APPLICATION		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Service	Vertical deflection amplifier	—



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1968 General Electric Co

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

1968 GENERAL ELECTRIC CO

Section 1 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
HeaterOrFilamentVoltageNominal	14.7 V	—
HeaterOrFilamentCurrentNominal	600 mA	—



1975 RCA RC30

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

1975 RCA RC30

Section 1 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	250 V	ClassA
Grid No.1 voltage	-4 V	ClassA
Plate current	2.6 mA	ClassA
Plate voltage maximum	400 V	VerticalDeflection
Plate dissipation	2.5 W	VerticalDeflection
Average cathode current	30 mA	VerticalDeflection
Peak cathode current	105 mA	VerticalDeflection

1975 RCA RC30

Section 2 · Beam Power

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	250 V	PentodeConnection
Screen-grid voltage	250 V	PentodeConnection
Grid No.1 voltage	-20 V	PentodeConnection
Plate current	50 mA	PentodeConnection
Screen-grid current	3.5 mA	PentodeConnection
Peak positive-pulse plate voltage	2500 V	VerticalDeflection
Plate dissipation	12 W	VerticalDeflection
Screen-grid dissipation	2.75 W	VerticalDeflection
Average cathode current	75 mA	VerticalDeflection
Peak cathode current	260 mA	VerticalDeflection

TUBE TINKER

An independent reference for electronic tubes, vacuum tubes, and their source documents.

