



ELECTRONIC TUBE REFERENCE

1703TB

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

CATHODERAY

Electrostatically focused, magnetically deflected cathode-ray tube explicitly intended for radar, monitor, and display service, using a white short-persistence T phosphor and typically operating near 15 kV.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	6.3 V / 300 mA	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Cathode Ray	
MAXIMUM PLATE VOLTAGE	18000 V
<i>Published Ferranti ratings, capacitances, and typical operating data promoted where applicable; additional electrical values retained as parameters.</i>	

1703TB — Rectangular Television Monitor Tube

The **1703TB** is a rectangular monitor tube featuring a 17-inch diagonal, metal-backed screen. It is designed primarily for use in television monitoring equipment. The tube utilizes low-voltage electrostatic focusing and magnetic deflection to display images.

Physical Design and Dimensions

The 1703TB is constructed with a rectangular glass envelope and a metal-backed screen. The standard screen is equipped with a Type 'T' phosphor that produces white fluorescence, though alternative screen phosphors can be supplied.

The physical dimensions and mechanical features of the tube include:

- **Maximum Overall Length:** 490 mm (with a nominal dimension of 480 ± 10 mm).
- **Neck Diameter:** Nominal 37 mm (specified as 36.5 ± 1.5 mm).
- **Screen Dimensions:** The overall diagonal is 422 ± 3 mm, with a width of 390.5 ± 3 mm and a height of 311 ± 3 mm.
- **Useful Screen Area:** Offers a minimum diagonal of 390 mm, a minimum width of 362 mm, and a minimum height of 273 mm.
- **Deflection Angle:** 65 degrees.
- **Mounting Position:** The tube can be mounted in any position.

The tube features an external conductive coating that can be utilized for extra-high tension (E.H.T.) smoothing. It is fitted with a B12A (Duodecal) base and a CT8 cavity-type anode cap.

Heater and Base Connections

The 1703TB is equipped with an indirectly heated cathode. The nominal heater characteristics are:

- **Heater Voltage:** 6.3 V
- **Heater Current:** 0.3 A

Based on these nominal values, the calculated heater power consumption is:

$$\text{Power} = 6.3 \text{ V} \times 0.3 \text{ A} = 1.89 \text{ W}$$

When the tube is configured for series operation, the surge heater voltage must not exceed 9.5 V r.m.s. A current-limiting device must be incorporated into the circuit to restrict the switching surge.

The B12A Duodecal base connections, viewed from the underside, are allocated as follows:

- **Pin 1:** Heater
- **Pin 2:** Grid
- **Pin 3:** No Pin
- **Pin 4:** No Pin
- **Pin 5:** No Pin
- **Pin 6:** 3rd Anode
- **Pin 7:** No Connection
- **Pin 8:** No Pin
- **Pin 9:** No Pin
- **Pin 10:** 1st Anode
- **Pin 11:** Cathode
- **Pin 12:** Heater
- **Side Contact:** 2nd Anode, 4th Anode

Electrical Ratings and Operating Conditions

The operating limits and typical electrical parameters of the 1703TB are defined by specific maximum and minimum ratings to ensure reliable performance in monitoring equipment.

Absolute Maximum and Minimum Ratings

- **Maximum First Anode (A_1) Voltage:** 500 V
- **Minimum First Anode (A_1) Voltage:** 200 V
- **Maximum Combined Second and Fourth Anode ($A_2 + A_4$) Voltage:** 18 kV
- **Minimum Combined Second and Fourth Anode ($A_2 + A_4$) Voltage:** 12 kV
- **Maximum Positive Third Anode (A_3) Voltage:** +500 V
- **Maximum Negative Third Anode (A_3) Voltage:** -500 V
- **Maximum Heater-to-Cathode Voltage (V_{h-k}):** 200 V
- **Maximum Grid-to-Cathode Circuit Resistance (R_{g-k}):** 1.5 M Ω
- **Maximum Heater-to-Cathode Circuit Resistance (R_{h-k}):** 1.0 M Ω

Typical Operating Points

Under typical operating conditions, the tube is configured with the following electrical parameters:

- **Heater Voltage:** 6.3 V
- **First Anode Voltage:** 300 V
- **Second and Fourth Anode Voltage:** 15 kV
- **Third Anode Voltage for Focus:** -300 V to +300 V (the optimum focus point lies within this range)
- **Grid Voltage (V_g) for Visual Cut-off:** -30 V to -90 V

During operation, the modulator (grid) must never be allowed to become positive with respect to the cathode. The only exception is the period immediately following power-off, during which the modulator voltage may rise to a maximum of +1 V.

Capacitances

The interelectrode and external capacitances of the 1703TB are rated as follows:

- **Cathode to all other electrodes (C_{k-all}):** Less than 8 pF
- **Grid to all other electrodes (C_{g-all}):** Less than 8 pF
- **Anode to external conductive coating ($C_{a-ext. coating}$):** Approximately 1500 pF

Technical Summary

The **1703TB** is a 17-inch rectangular monitor tube designed for television monitoring applications. It features a metal-backed screen with a Type 'T' white phosphor, low-voltage electrostatic focusing, and 65-degree magnetic deflection. Operating with a 6.3 V, 0.3 A heater, the tube requires a typical second and fourth anode potential of 15 kV, with a focusing range on the third anode spanning -300 V to +300 V. Its physical design includes a B12A Duodecal base, a CT8 cavity anode cap, and an external conductive coating of approximately 1500 pF for E.H.T. smoothing.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1963 Ferranti

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

1963 FERRANTI

Section 1 · Cathode Ray

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Focusing method	Electrostatic	—
Deflection method	Magnetic	—
Fluorescence	White	—
Persistence	Short	—

CONSTRUCTION		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Phosphor type	T	—

APPLICATION		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Application	Radar / monitor / display CRT	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
First-anode voltage maximum	500 V	—
Second/fourth-anode voltage maximum	18000 V	—
Third-anode positive voltage maximum	500 V	—
Third-anode negative voltage maximum	-500 V	—
Heater-cathode voltage maximum	200 V	—
First-anode operating voltage	300 V	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Second/fourth-anode operating voltage	15000 V	—
Third-anode focus voltage minimum	-300 V	—
Third-anode focus voltage maximum	300 V	—

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Cathode-to-all capacitance maximum	8 pF	—
Grid-to-all capacitance maximum	8 pF	—
External-coating capacitance approximate	1500 pF	—

TUBE TINKER

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

[Catalog](#) [Tube types](#) [Full books](#) [Blog](#) [Feedback & corrections](#)

© 2026 Tube Tinker