MATSUSHITA ELECTRONICS CORPORATION

TAKATSUKI JAPAN

E I A REGISTRATION DATA

Type **3BWP1**

Date issued Octover. 21, 1961

National 3BWP1 is a 3-inch oscilloscope tube with flat face, single gun, electrostatic focus and electrostatic symmetrical deflections.

The tube has the following main features.

Very high deflection sensitivity, permitting the use of smaller amplifiers both for the time-base and the signal examination.

High brilliancy at small spot dimensions is achieved by high-grade phosphor screen.

As a result of these characteristics, the tube is an outstanding type for measuring equipment with a high standard of accuracy.

ELECTRICAL DATA

Heater Voltage	6.3 Volts
Heater Current at 6.3 Volts	0.3 ± 10% Amperes
Focusing Method	Electrostatic
Deflection Method	Electrostatic
Direct Interelectrode Capacitances Approximate	
Grid No. 1 to all other electrodes	6.6 $\mu\mu$F
Cathode to all other electrodes	4.0 $\mu\mu$F
D_1 to D_2	2.6 $\mu\mu$F

from JEDEC release #3576, Jan. 29, 1962

D_3 to D_4	2.0 $\mu\mu$F
D_1 to all other electrodes	6.0 $\mu\mu$F
D_2 to all other electrodes	6.0 $\mu\mu$F
D_3 ot all other electrodes	5.8 $\mu\mu$F
D_4 to all other electrodes	5.8 $\mu\mu$F

OPTICAL DATA

Phospher Munber	P 1
Fluorescente Color	Green
Phosphorescent Color	Green
Persistence	Medium

MECHANICAL DATA

Overall Length	11 1/2 ± 1/8 Inches
Greatest Diameter of Bulb	3 ± 1/16 Inches
Minimum Useful Screen Diameter	2 3/4 Inches
Base	B 12 — 43

Bese Alignment

D_3 — D_4 trace aligns with pin No. 6 and tube axis ±10 degrees.

Positive voltage on D_1 deflects beam approximately toward pin No. 3.

Positive voltage on D_3 deflects beam approximately toward pin No. 12.

Angle between D_1 — D_2 and D_3 — D_4 trace	90 ± 1.5 degrees

MAXIMUM RATING

Accelerator Voltage	2500 Max. Volts DC
Accelerator Input	6 Max. Watts
Grid No. 3 (Focusing Electrode) Voltage	1000 Max. Volts DC
Grid No. 1 Voltages	
Negative-Bias Value	200 Max. Volts DC
Positive-Bias Value	0 Max. Volts DC
Positive Peak Value	2 Max. Volts
Peak Heater-Cathode Voltages	
Heater Negative with Respect to Cathode	180 Max. Volts
Heater Positive with Respect to Cathode	180 Max. Volts

Peak Voltage between Accelerator and any Deflection Electrode ..... 500 Max. Volts

TYPICAL OPERATING CONDITIONS

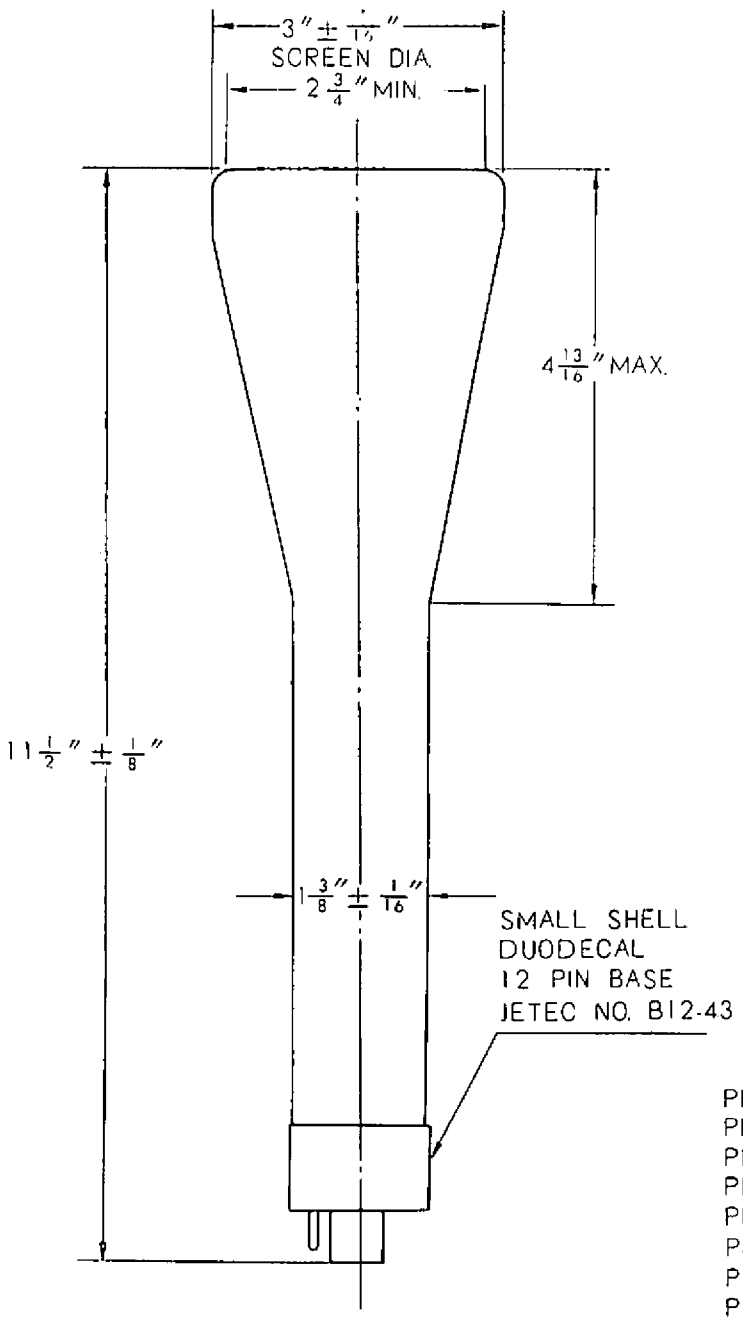
Accelerator Voltage ..... 1500 Volts
Grid No. 3 Voltage (Focusing Voltage) ..... 247 to 397 Volts
Grid No. 1 Voltage (Note 1) ..... −40 to −80 Volts
Deflection Factor :
D_1 and D_2 ..... 62.3 to 75.8 Volts DC per Inch
D_3 and D_4 ..... 42.8 to 52.5 Volts DC per Inch
Useful Scan D_1 — D_2 ..... $2\frac{1}{2}$ Inches
Useful Scan D_3 — D_4 ..... 2 1/4 Inches
Focusing Electrode Current for any Operating Condition: ..... −15 to +10 Microamperes
Spot position (undeflected) (Note 2) ..... 3/16 Inches
For accelerator voltage not shown in the preceeding table, the following can be as a guide.
Focusing Voltage ..... 16.5% to 26.5% of Accelerator Voltage
Grid No. 1 Voltage ..... −2.7% to −5.3% of Accelerator Voltage
Deflection Factor
D_1 and D_2 ..... 41.5 to 50.5 Volts DC per Inch per Kilovolt of Accelerator
D_3 and D_4 ..... 28.5 to 30 Volts DC per Inch per Kilovolt of Accelerator

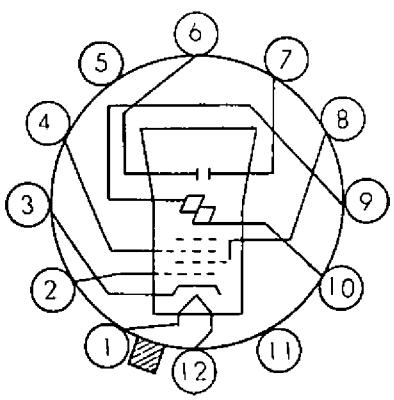
MAXIMUM CIRCUIT VALUES

Grid No. 1 Circuit Resistance ..... 1.5 Max. Megohms
Resistance in any Deflection-Electrode Circuit (Note 3) ..... 5 Max. Megohms

Notes:

1. Visual extinction of undeflected focused spot.
2. Connect free deflecting electrode to anode.
3. It is recommended that the deflecting-electrode-circuit resistances are approximately equal.





BOTTOM VIEW OF BASE CONNECTION

PIN 1 —Heater
PIN 2 —Grid No. 1
PIN 3 —Cathode
PIN 4 —Grid No. 3 (Focusing Electrode)
PIN 5 —N. C.
PIN 6 —Deflecting Electrode D1
PIN 7 —Deflecting Electrode D2
PIN 8 —Accelerator (Grid No. 2 Grid No. 4)
PIN 9 —Deflecting Electrode D4
PIN 10 —Deflecting Electrode D3
PIN 11 —N. C.
PIN 12 —Heater

Matsushita Electronics Corp.
300, Nishiyosumi, Osaka-fu
Takatsuki, Japan.