THE M-O VALVE
COMPANY LIMITED

1400B

comparable Telefunken D14-131, different

GEC

used in Cossor CT531
EM1/5E 5M112

INSTRUMENT
CATHODE RAY TUBE

Mullard 55451

BRIEF DATA

A 14 cm (5½ inch) diagonal rectangular, flat faced, single gun oscilloscope tube with aluminised screen, mesh p.d.a. and side connected deflector plate.

Final anode voltage (p.d.a.)	12	kV
Display area	10 x 8	cm
Y deflection factor (D_Y)	<5.3	V/cm
X deflection factor (D_X)	<11.0	V/cm

HEATER

Heater voltage	6.3	V
Heater current	0.3	A

SCREEN

	1474B	**1496B**
Fluorescence	Green	White
Phosphorescence	Green	Yellowish-green
Persistence	1 – 5 ms	10 – 60 s
E.I.A. phosphor code	P31	P7
GEC phosphor code	74	96
Pro Electron phosphor code	GH	GM

CAPACITANCES (Typical)

Cathode to all other electrodes	5.0	pF
Control grid to all other electrodes	9.0	pF
Deflector plates y1 to y2	1.8	pF
Deflector plates y1 to all electrodes except y2	3.6	pF
Deflector plates y2 to all electrodes except y1	3.6	pF
Deflector plates x1 to x2	3.0	pF
Deflector plates x1 to all electrodes except x2	6.0	pF
Deflector plates x2 to all electrodes except x1	6.0	pF

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RATINGS (Absolute)

		Max	Min	
Fourth anode voltage	V_{a4}	13.5	6.0	kV
Third anode voltage	V_{a3}	2.0	1.0	kV
Ratio	V_{a4}/V_{a3}	10	–	–
Focus voltage	V_{a2}	1.0	–	kV
First anode voltage	V_{a1}	2.0	1.0	kV
Control grid voltage	$-V_g$	200	1.0	V
Y plate to third anode voltage	$V_{y\text{-}a3}$	500	–	V
X plate to third anode voltage	$V_{x\text{-}a3}$	500	–	V
Heater-cathode voltage	$V_{h\text{-}k}$	+150	−150	V
Grid to cathode circuit resistance	$R_{g\text{-}k}$	1.0	–	MΩ
Y deflector plate circuit resistance	$R_{y\text{-}a3}$	100	–	kΩ
X deflector plate circuit resistance	$R_{x\text{-}a3}$	500	–	kΩ

Voltage ratings are to cathode unless otherwise shown.

EQUIPMENT DESIGN RANGE

		Max	Min	
Focus voltage	V_{a2}	290	125	V/kV_{a3}
Control grid voltage for spot cut-off	$-V_{g1}$	67	33	V/kV_{a1}
Y deflection factor (at $V_{a4}/V_{a3} = 10$)	D_y	4.42	3.58	$V/cm/kV_{a3}$
X deflection factor (at $V_{a4}/V_{a3} = 10$)	D_x	9.2	7.1	$V/cm/kV_{a3}$
Astigmatism correction voltage	V_{a3}	+42	−42	V/kV_{a3}
Pattern correction voltage	V_{s2}	+42	−42	V/kV_{a3}
p.d.a. spiral current	I_{a4}	8	–	$\mu A/kV_{a4\text{-}a3}$

TYPICAL OPERATION

Fourth anode voltage	V_{a4}	12	kV
Third anode voltage (nom.)	V_{a3}	1.2	kV
Focus voltage	V_{a2}	150 to 350	V
First anode voltage	V_{a1}	1.2	kV
Control grid voltage for spot cut-off	$-V_{g1}$	40 to 80	V
Nominal neck voltage	V_{s1}	1.2	kV
Nominal geometry voltage	V_{s2}	1.2	kV
Nominal mesh voltage	V_{s3}	1.18	kV
Maximum y deflection factor	D_y	5.3	V/cm
Maximum x deflection factor	D_x	11.0	V/cm
‡Line width (typical) 74 screen		0.4	mm

‡Measured by means of a shrinking raster at the geometric centre of the faceplate, at a beam current of 10 μA.

DISPLAY CHARACTERISTICS (Typical operation unless stated)

Pattern Distortion
With pattern correction applied, the edges of a test raster will lie between two concentric rectangles of 100 x 80 mm and 98 x 78 mm.
The angle between x and y axes will be $90^\circ \pm 1^\circ$ measured at the face centre.

Deflection Linearity
The deflection factor, measured over any 10 mm of deflection in the appropriate axis, will not vary by more than 5% within the central 100 x 80 mm area.

Spot Position
The focused and undeflected spot will fall within a square 10 x 10 mm centred at the geometric centre of the faceplate.

Background Suppression
Background illumination may be reduced and contrast improved by applying a potential of −20 V to s3 with respect to s2.

Orientation
When looking at the screen with pins 1 and 12 of the base uppermost, a positive voltage applied to x1 will deflect the beam to the left and a positive voltage applied to y1 will deflect the beam upwards.

Minimum Scanned Area

x axis	10	cm
y axis	8	cm

Axis Alignment
The electrical x axis of the tube will lie within $\pm 5^\circ$ of the major axis of the faceplate and may be aligned with the axis by means of the field from an axial coil placed about the cone of the tube in the region shown in the outline drawing. The maximum ampere turns required for axis alignment will not exceed $7\sqrt{kV_{a4}}$.

MOUNTING

The tube may be mounted in any position but should not be supported by the base alone. It should, preferably, be held in a suitable resilient mask at the screen and by a clamp round the magnetic shield near the base. The socket should have sufficient freedom of movement to accommodate overall length and base orientation tolerances.

BASE CONNECTIONS

Base:	B12F	Side contact (CT8):	a4
Pin 1:	g	Pin 7:	a1*
2:	k	8:	a3
3:	h	9:	s3
4:	h	10:	a1*
5:	a2	11:	s2
6:	s1	12:	IC

*Pins 7 and 10 must be connected together externally.

Side pin connections (use connector 50LS/156) as viewed from the base and reading clockwise from base pin 12:-

x2 x1 y1 y2

WEIGHT

The weight of the tube alone is approximately 1.15 kgm.

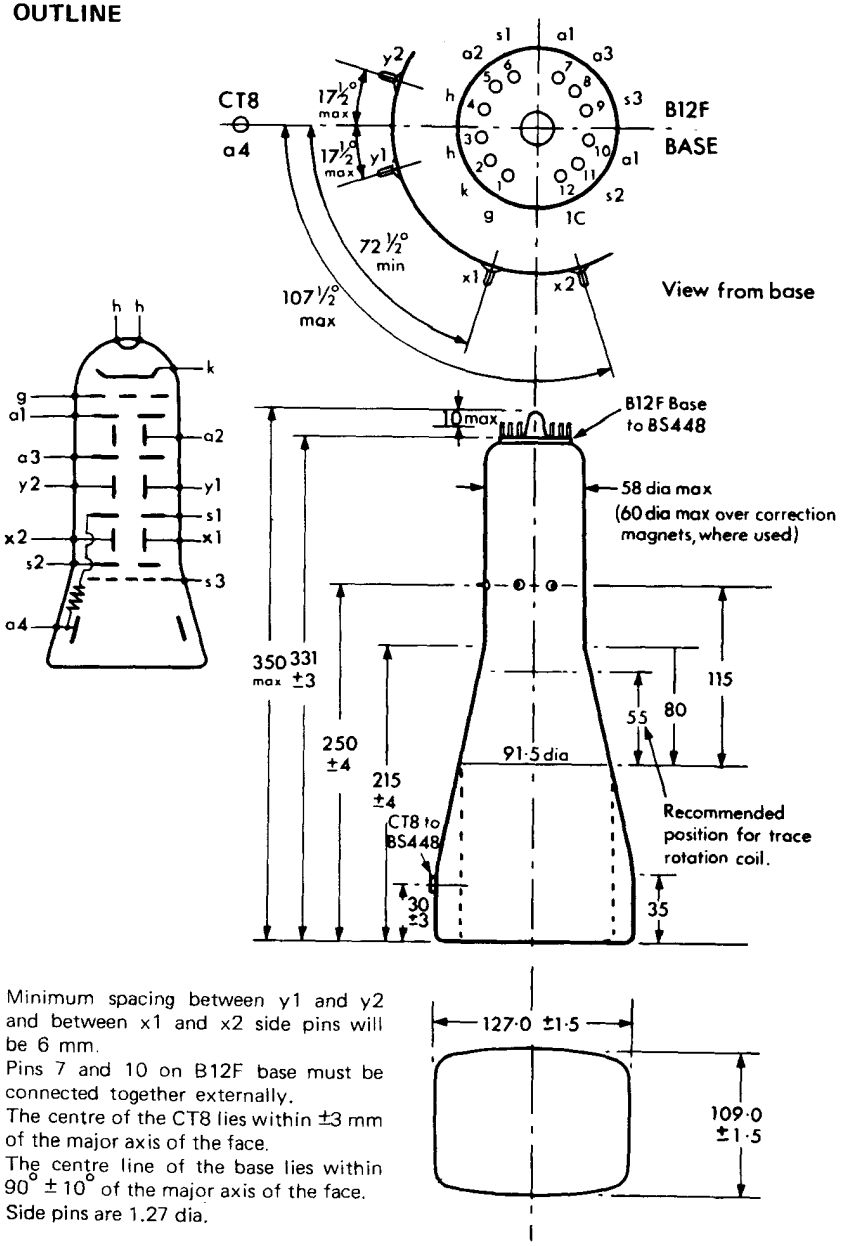
MAGNETIC SHIELD

A suitable magnetic shield with trace rotation coil may be obtained from Magnetic Shields Ltd., Headcorn Road, Staplehurst, Tonbridge, Kent.

WARNING

Care should be taken not to expose the tube to strong magnetic fields either in use or during storage.

OUTLINE



Minimum spacing between y1 and y2 and between x1 and x2 side pins will be 6 mm.
Pins 7 and 10 on B12F base must be connected together externally.
The centre of the CT8 lies within ±3 mm of the major axis of the face.
The centre line of the base lies within $90^{\circ} \pm 10^{\circ}$ of the major axis of the face.
Side pins are 1.27 dia.