RMA Release # 306 Sept. 24, 1942

DU MONT

CATHODE-RAY TUBES

Types 20AP1, 20AP2, 20AP4, 20AP5

(Formerly designated as Types 2532A20, 2532B20, 2532D20, 2532C20)

The Type 20AP Cathode-Ray Tubes are designed for television and other large screen applications. The insulation employed, the type of sealing, and the wide spacing of the lead wires enable these tubes to be operated at high accelerating potentials.

The 20AP types have a glass bulb approximately twenty inches in diameter. The screen will provide a brilliant television picture measuring 11¼ inches by 15 inches, or for oscillographic applications a usable screen diameter of about 17 inches. The shape of the glass bulb has been specially designed to withstand stresses induced by atmospheric pressure, and it is tested in production under a pressure greater than three atmospheres.

CHARACTERISTICS

HEATER				
Voltage, a.c. or d.c.			2.5 volts	
Current			2.1 amperes	
DEFLECTION			Electrostatic	
FOCUS			Electrostatic	
SCREEN	20AP1	20AP2	20AP4	20AP5
Phosphor	P1	P2	P4	P5
Fluorescence	Green	Green	White	Blue
Persistence	Medium	Long	Medium	Short
MECHANICAL CHARACTERISTICS				
Overall Length			27⅞ ±¾ inches	
Maximum Diameter			20 ±⅜ inches	
Bulb			C160Z1C	
Base			12 contact peripheral	
Basing RMA Basing Designation			12A	

The basing is such that:

1. The direction of the trace produced on the screen by deflecting electrodes D_3 and D_4 will not deviate more than ±10° from a plane through the center of the locating key and the axis of the tube, while the angle between the direction of this trace and that of the trace produced on the screen by deflecting electrodes D_1 and D_2 will be 90° ±3°.
2. With deflecting electrode D_1 (pin No. 11) positive with respect to D_2 (pin No. 9) the spot will be deflected approximately toward pin No. 9, while with D_3 (pin No. 12) positive with respect to D_4 (pin No. 8) the spot will be deflected approximately toward pin No. 7.

DIRECT INTERELECTRODE CAPACITANCES	
Control Electrode (grid) to all other electrodes	6.0 uuf
Deflecting Plate D_1 to Deflecting Plate D_2	1.9 uuf
Deflecting Plate D_3 to Deflecting Plate D_4	1.2 uuf
Deflecting Plate D_1 to all other electrodes	8.5 uuf
Deflecting Plate D_3 to all other electrodes	7.4 uuf
D_1 to all other electrodes except D_2	6.6 uuf
D_2 to all other electrodes except D_1	6.9 uuf
D_3 to all other electrodes except D_4	6.2 uuf
D_4 to all other electrodes except D_3	6.2 uuf

RATINGS	
Heater voltage	2.5 volts
Heater current	2.1 ±0.3 amp.
Anode #3 (Intensifier Electrode) voltage (E_{b3})	8000 volts (max.)
Anode #2 (Accelerating Electrode) voltage (E_{b2})	4000 volts (max.)
Anode #1 (Focusing Electrode) voltage (E_{b1})	1800 volts (max.)
Grid (Control Electrode) voltage (E_{c1})	Never positive
Grid Circuit Resistance	1.5 meg. (max.)
Impedance of any deflecting electrode circuit at heater supply frequency	1.0 meg. (max.)

TYPICAL OPERATION

Heater voltage	2.5	2.5	volts
Anode #3 voltage (E_{b3})	4000	8000	volts
Anode #2 voltage (E_{b2})	2000	4000	volts
Anode #1 voltage (E_{b1}) for focus when E_{c1} = 75% cut-off	500	1000	volts ±20%
Grid voltage (E_{c1}) for beam cut-off	—40	—80	volts ±50%
Deflection Factor:			
D_1D_2 Plates	55	110	d.c. volts/inch ±20%
D_3D_4 Plates	55	110	d.c. volts/inch ±20%
Deflection Sensitivity:			
D_1D_2 Plates	0.46	0.23	mm/d.c. volt (av.)
D_3D_4 Plates	0.46	0.23	mm/d.c. volt (av.)

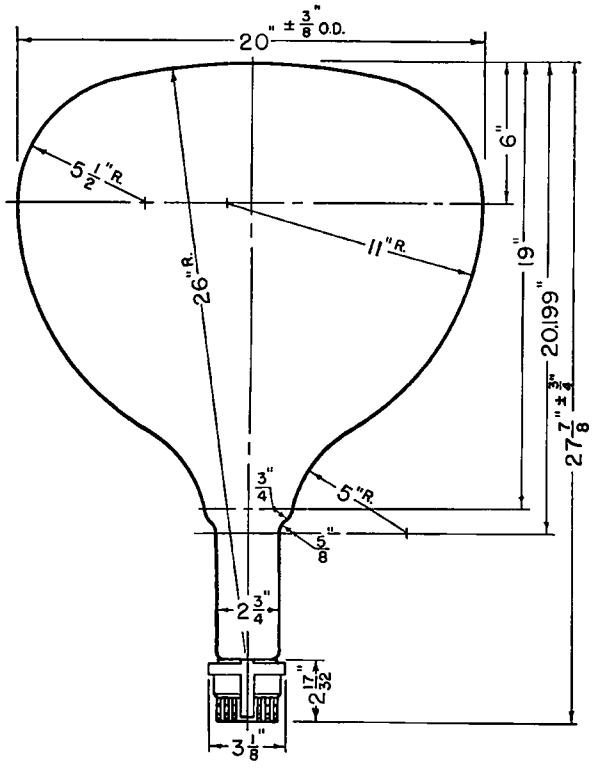
Deflection with Intensifier at Second Anode Potential

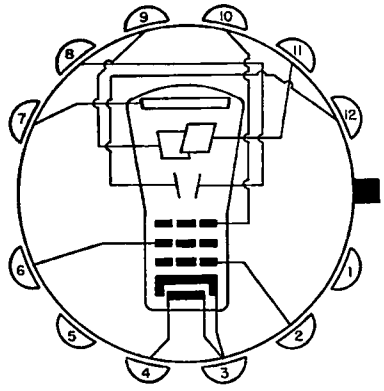
	FACTOR	SENSITIVITY
D_1D_2	22 d.c. volts/kv. in. ±20%	0.12 mm. kv./d.c. volt (av.)
D_3D_4	18 d.c. volts/kv. in ±20%	0.14 mm. kv./d.c. volt (av.)

SPECIAL INSTALLATION NOTES

The 20AP type Cathode-Ray Tubes are mechanically capable of withstanding shocks encountered in ordinary handling and room temperature variations. Because of its large evacuated volume, the glass bulb is under considerable strain due o atmospheric pressure, and the tube must be protected from hard bumps and extreme, sudden changes in temperature. Care should also be taken to avoid scratching the glass bulb since such scratches weaken the glass. It is suggested that a piece of plate glass be placed before the screen on the tube when mounted in television receivers, to protect it from accidental shocks.

The base of the 20AP types fits a twelve-contact socket which can be supported by the base of the cathode-ray tube. The tube may be mounted in any position. One convenient horizontal mounting consists of a rubber block supporting the neck of the bulb, the screen end resting on a padded support, and the socket supported by the base of the tube itself.





Bottom View of Base

Pin #1	No Connection
2	Control Electrode
3	Heater & Cathode
4	Heater
5	No Connection
6	Focusing Electrode
7	Intensifier Electrode
8	Deflection Plate D_4
9	Deflection Plate D_2
10	Accelerating Electrode
11	Deflection Plate D_1
12	Deflection Plate D_3

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