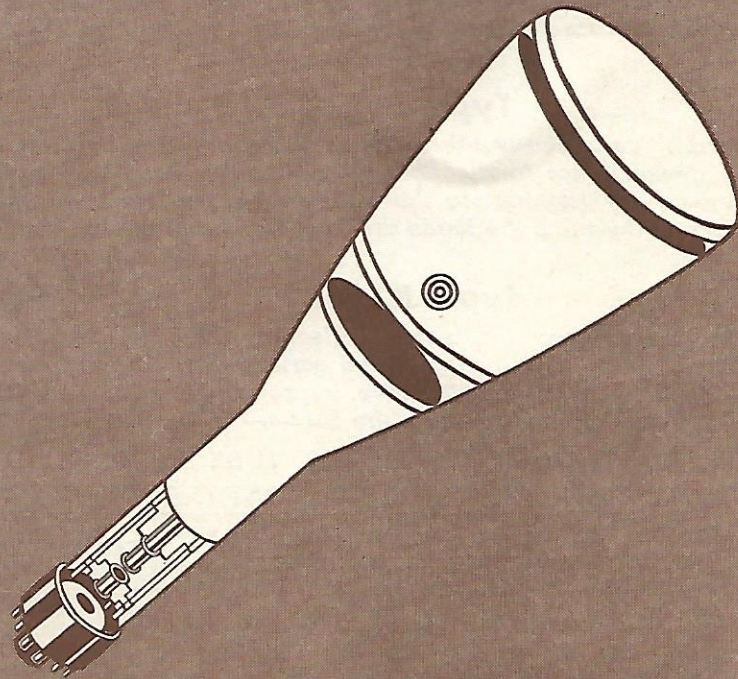


# DUMONT

*Cathode-Ray*

## EQUIPMENT



ALLEN B. DUMONT LABORATORIES, INC

PASSAIC, N.J.



# Industrial Cathode-ray Tubes

## Type 3AP-A

A standard 3" cathode-ray tube, electrostatic deflection and focus, used for applications where simplicity of the equipment is of paramount importance. A small bright spot is obtained at a low accelerating voltage and without balanced deflection.

## Type 3GP-A

A standard 3" cathode-ray tube, electrostatic deflection and focus, with four free deflection plates for balanced, or push-pull, deflection, thus minimizing defocusing. Provides a small spot size and brilliant trace.

## Type 3JP

A standard 3" cathode-ray tube, electrostatic deflection and focus, designed for applications requiring a small short tube with a very high light output and high deflection sensitivity. The intensifier electrode and the high beam-current provide high excitation of the screen.

## Type 5BP-A <sup>magnetic</sup>

A standard 5" cathode-ray tube, <sup>magnetic</sup> deflection and focus, with four free deflection plates for balanced or push-pull deflection. Produces a small bright spot at a moderately low accelerating voltage.

## Type 5CP-A

A standard 5" cathode-ray tube, electrostatic deflection and focus, incorporating an intensifier electrode for maximum brightness and deflection sensitivity. The diheptal base provides excellent insulation for high altitude aircraft installations.

## Type 5LP-A

A standard 5" cathode-ray tube, electrostatic deflection and focus, utilizing the intensifier principle to provide a maximum deflection sensitivity for a given accelerating voltage. Four free deflection plates permit balanced or push-pull deflection.

## Type 5JP-A

A standard 5" cathode-ray tube, electrostatic deflection and focus, specially designed for applications requiring low deflection plate capacitances. By terminating the deflection plate leads in caps on the neck of the tube, the leads are kept short and direct.

## Type K1002

A 9" cathode-ray tube, electrostatic deflection and focus, intended for replacement of tubes of the 2514-9 series which is considered obsolete. The K1002 has a flatter face, improved electrical performance, and is one inch longer than the 2514-9.

TABLE OF INDUSTRIAL CATHODE-RAY TUBE SPECIFICATIONS

TYPE NO.	OVERALL LENGTH inches	RMA BASING	HEATER		TYPICAL OPERATION					
			volts	amp	$E_{b3}^*$	$E_{b2}^*$	$E_{b1}^*$	$E_{c1}^*$	DEFLECTION FACTOR— $D_1D_2^{**}$	DEFLECTION FACTOR— $D_3D_4^{**}$
3AP-A	$11\frac{1}{2} \pm \frac{3}{8}$	7CE	2.5	2.1	.....	1500	430	-50	114	109
3GP-A	$11\frac{1}{2} \pm \frac{3}{8}$	11A	6.3	0.6	.....	1500	350	-50	120	105
3JP	$10 \pm \frac{1}{4}$	14B	6.3	0.6	4000	2000	575	-60	200	148
5BP-A	$16\frac{3}{4} \pm \frac{3}{8}$	11A	6.3	0.6	.....	2000	450	-40	84	76
5CP-A	$16\frac{3}{4} \pm \frac{3}{8}$	14B	6.3	0.6	4000	2000	575	-60	92	79
5JP-A	$16\frac{3}{4} \pm \frac{3}{8}$	11E	6.3	0.6	4000	2000	520	-75	96	96
5LP-A	$16\frac{3}{4} \pm \frac{3}{8}$	11F	6.3	0.6	4000	2000	500	-60	103	90
K1002	$22 \pm \frac{3}{8}$		6.3	0.6	9000	4500	1100	-90	155	118

\*volts d-c \*\*volts per inch

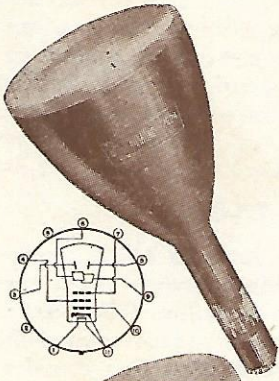


# Television Cathode-ray Tubes



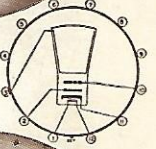
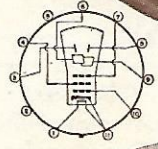
## Type 7EP4

A 7" cathode-ray tube with electrostatic deflection and focus; having a radius of curvature of the face of 15". This tube is designed to give high brilliance and performance in low cost television receivers. The useful picture area is approximately 4 x 5 3/8". Normal  $E_{b2}$  ranges from 2000 to 3000 volts.



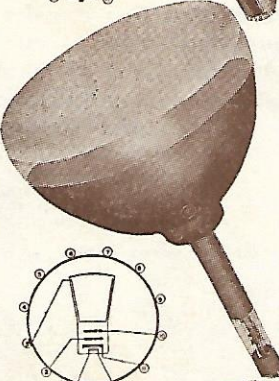
## Type 10CP4

A 10" cathode-ray tube with magnetic deflection and focus; having a radius of curvature of the face of 42". Featured in this tube are: a metallized screen which produces greater light output and contrast, operation without an ion-trap, industry accepted ball-terminal snap contact. The useful picture area is approximately 6 1/2 x 8 5/8". Normal  $E_b$  is 10,000 volts. This tube is designed primarily for medium priced television receivers.



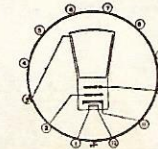
## Type 12JP4

A 12" cathode-ray tube with electrostatic deflection and focus; having a radius of curvature of the face of 20". The useful picture area is approximately 7 3/4 x 10 1/4". Normal  $E_b$  is 8000 volts. This tube is primarily intended for medium priced television receivers.



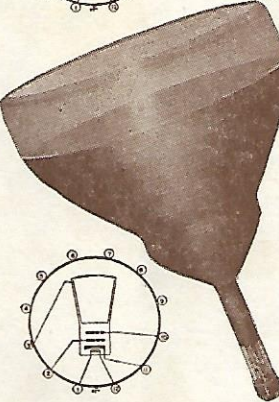
## Type K1003

A 12" cathode-ray tube with electrostatic deflection and focus; having a radius of curvature of the face of 20". The useful picture area is approximately 7 3/4 x 10 1/4". Normal  $E_{b2}$  is 4500 volts. Intensifier  $E_{b3}$  is 8000 volts. Having a flatter screen and generally improved performance, this tube is primarily intended to replace the 14AP4 used in pre-war television receivers.



## Type 15AP4

A 15" cathode-ray tube with magnetic deflection and focus; having a radius of curvature of the face of 60". The useful picture area is approximately 9 x 12". Normal  $E_b$  is 8000 volts. This tube makes possible a large screen, direct view receiver in a cabinet of minimum depth.



## Type 20BP4

A 20" cathode-ray tube with magnetic deflection and focus; having a radius of curvature of the face of 30". The useful picture area is approximately 12 7/8 x 17 1/4". Normal  $E_b$  ranges from 10,000 to 15,000 volts. This tube is designed for direct viewing, large screen television receivers of the deluxe class.

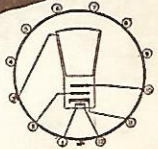
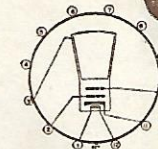


TABLE OF TELEVISION CATHODE-RAY TUBE SPECIFICATIONS

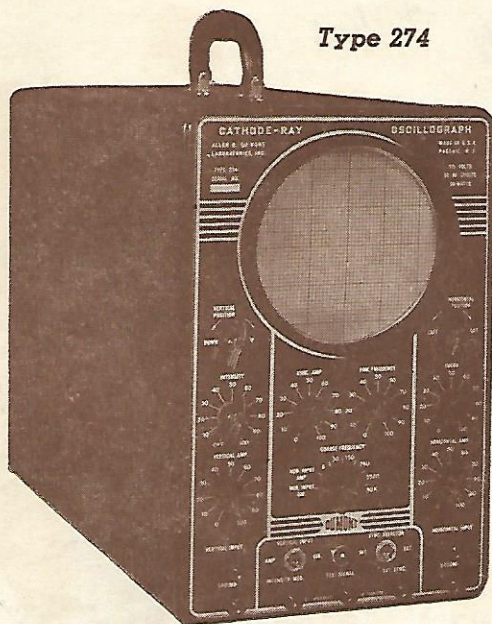
TYPE NO.	OVERALL LENGTH	RMA BASING	HEATER		ELECTROSTATIC					MAGNETIC			
			volts	amp.	$E_{b3}$ *	$E_{b2}$ *	$E_{b1}$ *	D.F.**	D.F.**	$E_{c1}$ *	Grid Dr.	$E_{c2}$ *	$I_{c2}$ †
7EP4	15 1/2 ± 3/8	11D	6.3	0.6	.....	2500	650	110	95	-60	38		
10CP4	16 5/8 ± 3/8	12D	6.3	0.6						-45	38	10,000	250
12JP4	17 1/2 ± 1/2	12D	6.3	0.6						-45	38	10,000	250
K1003	23 1/2 ± 3/4		2.5	2.1	8500	5000	1375	103	159	-100	85		
15AP4	20 1/2 ± 3/8	12D	6.3	0.6						-45	38	12,000	250
20BP4	28 3/8 ± 3/4	12D	6.3	0.6						-45	38	15,000	250

\*volts d-c \*\*volts per inch †microamperes

## INDUSTRIAL AND TELEVISION TUBE CATALOG NUMBERS

TYPE NO.	CAT. NO.	TYPE NO.	CAT. NO.	TYPE NO.	CAT. NO.	TYPE NO.	CAT. NO.
3AP1A	2001-B	5BP11A	2036-B	5LP1A	2055-B	10CP4	2323-D
3AP11A	2006-B	5CP1A	2037-B	5LP2A	2056-B	12JP4	2179-D
3GP1A	2019-B	5CP2A	2038-B	5LP7A	2059-B	K1003P1	2109-D
3GP11A	2024-B	5CP7A	2041-B	5LP11A	2060-B	K1003P2	2110-D
3JP1	2025-B	5CP11A	2042-B	K1002P1	2103-B	K1003P4	2111-D
3JP2	2026-B	5JP1A	2049-B	K1002P2	2104-B	K1003P7	2113-D
3JP7	2029-B	5JP2A	2050-B	K1002P7	2107-B	K1003P11	2114-D
3JP11	2030-B	5JP7A	2053-B	K1002P11	2108-B	15AP4	2185-D
5BP1A	2031-B	5JP11A	2054-B	7EP4	2087-B	20BP4	2194-D





Type 274

### 5" Du Mont Type 274

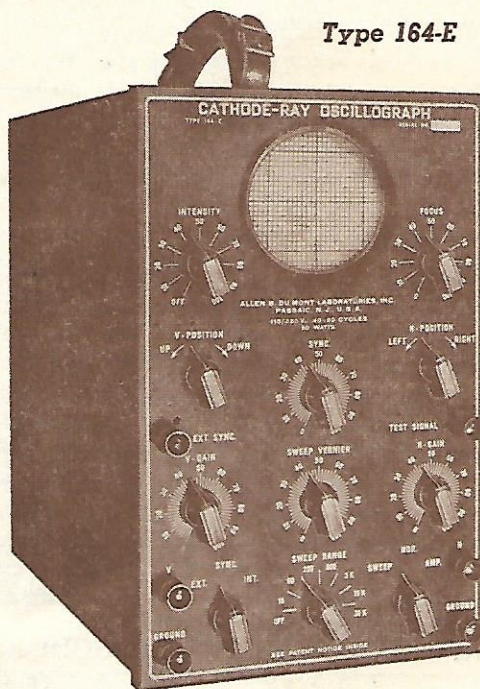
The Du Mont Type 274 Cathode-ray Oscilloscope was developed as an inexpensive general purpose instrument for laboratory, radio service, and educational applications. The Type 274 serves as an excellent nul-indicator on inductance-capacitance bridges, as a means of viewing voltage waveforms, as an output meter, as a means for measuring time and amplitude of pulses, as an indicator in studies of sound, light, electricity, and electronics, and many other general applications.

### 3" Du Mont Type 164-E

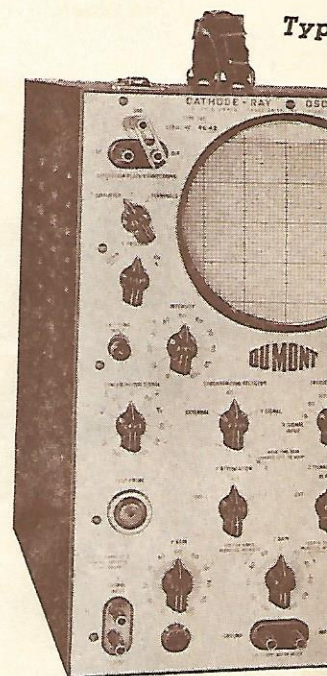
A compact portable instrument especially suitable for laboratory, shop, or field work. The 3" cathode-ray tube operates at an accelerating potential of 1,100 volts, thus providing brilliant well-defined traces. Both amplifiers have uniform frequency response over their operating range; the single-stage vertical amplifier has a voltage gain of approximately 43, the horizontal amplifier, which serves to amplify either sweep or externally applied signals, has a voltage gain of approximately 55. For added convenience, deflection signals may be applied directly to the cathode-ray tube without removing the cabinet.

... Du Mont ...  
Cathode-ray  
Oscillographs

For instrument specifications  
see table on page 6

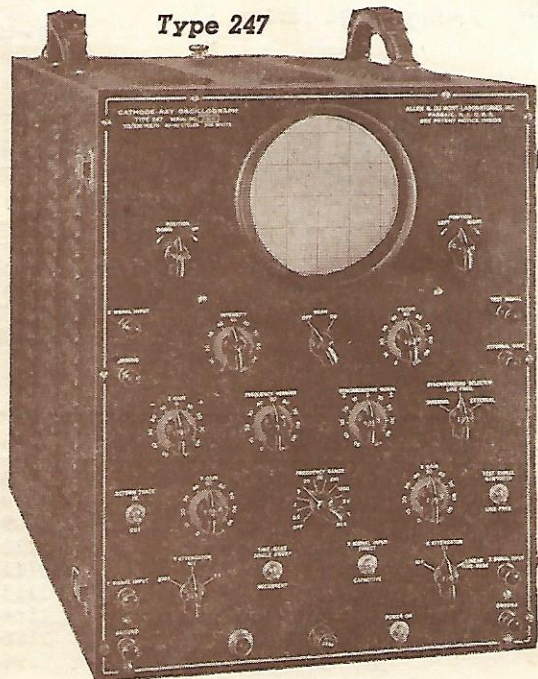


Type 164-E



Type 247

Type 247



### 5" Du Mont

Designed for application requiring the observation of non-sinusoidal waveshapes such as pulses and square waves, the Type 247 features non-linearly balanced deflection amplifiers permit the use of a low-frequency discriminator. Elimination of over-coupling is achieved by the use of a test probe and a beam control circuit. A test probe and a beam control circuit are contained in the removable front cover.

### 5" Du Mont Type 247

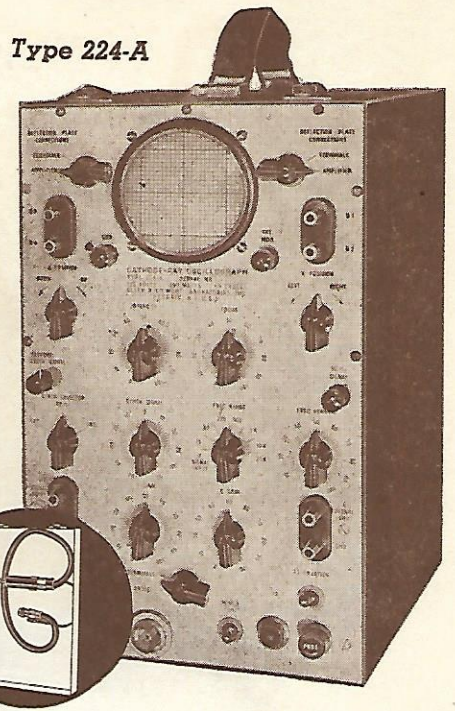
Combining outstanding performance with remarkable flexibility of operation, the Type 247 features an extended time-base range which makes it equally valuable in the study of low-frequency transients as well as r-f signals as high as 500 kc. Another new feature is the beam-control circuit for single sweep which extinguishes the beam, except when plotting a trace . . . a feature which makes it possible to achieve brilliant photographic results when making oscillograms.



### 3" Du Mont Type 224-A

The wide range response of this instrument provides faithful reproduction of all waveforms with steep fronts and resultant large harmonic content, thereby permitting the study of signals, such as pulses and square waves involving frequency components as high as 5 megacycles. Numerous combinations of signal input connections at the front panel provide added flexibility and convenience of operation. A special feature is the provision for intensity modulation of the grid of the cathode-ray tube. Included is a test probe with shielded cable for high frequency work and to eliminate stray pickup.

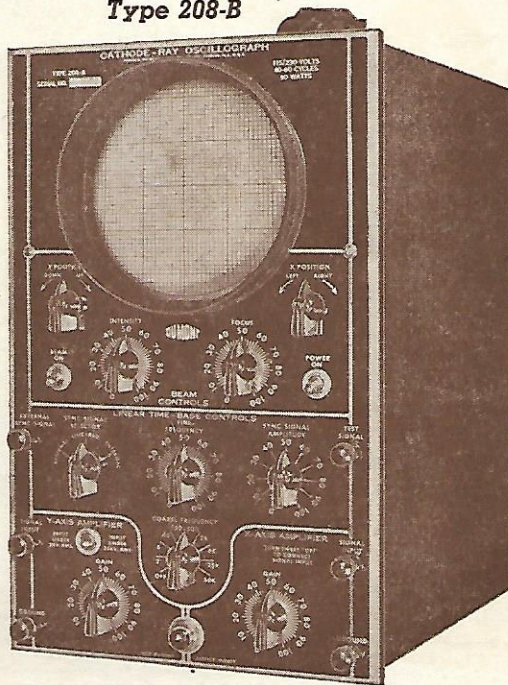
Type 224-A



### 5" Du Mont Type 208-B

A moderately priced 5" instrument embodying many recent improvements that facilitate its application to the great majority of laboratory and production requirements. The Type 208-B is furnished with a 5" intensifier type, high vacuum tube which operates at an accelerating potential of 1,400 volts thus insuring trace brilliance. Freedom from origin distortion, sharp focus at all deflecting frequencies, and a high deflection sensitivity that permits the viewing of moderately low potential signals without the use of amplifiers are additional features. The wide-band amplifiers provide symmetric deflection and are direct coupled to eliminate "electrical backlash."

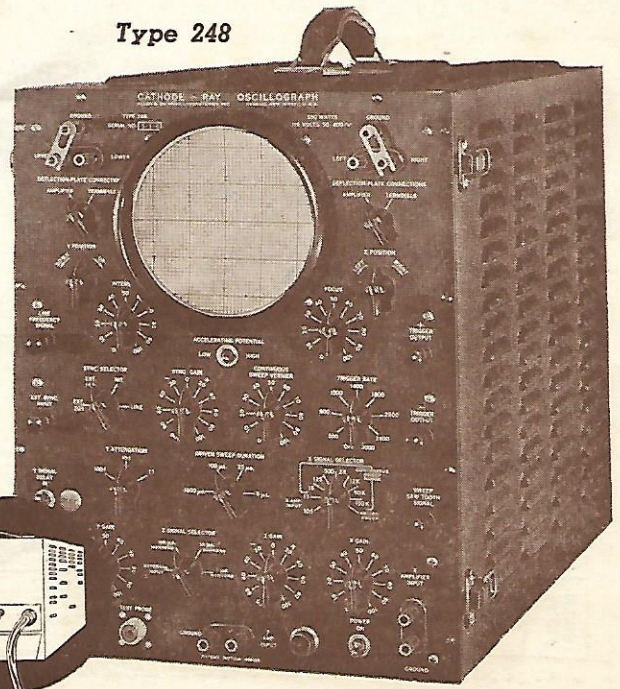
Type 208-B



... Du Mont ...  
For Complete  
Instrumentation

For instrument catalog  
numbers see table  
on page 8

Type 248



Type 241

Type 241 is well adapted for problems involving audio and video frequency signals above the 241 is well adapted for problems involving audio waves. Cathode-loaded input stages to the impedance attenuator thus preventing attenuation at high frequency greatly extends shielded cable, for high frequency work, is

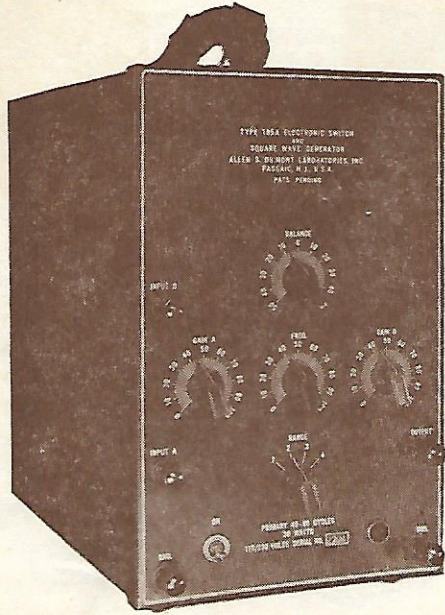
### 5" Du Mont Type 248

Type 248 includes the following special features: driven or "ve" sweep-speeds which exceed one inch per microsecond, al display of non-repetitive transients that produce writing rates three or more inches per microsecond, a one-half microsecond y network which permits observation of the initial part of a transient, a separate trigger oscillator, internally provided timing markers at 1, 10, and 100 microsecond intervals, and a complete and rately housed power supply.



# Auxiliary Instruments

## Du Mont Type 185-A Electronic Switch



The Du Mont Type 185-A is a combined instrument consisting of an Electronic Switch and Square Wave Generator. As an Electronic Switch, it may be used in conjunction with any oscillograph to observe two signals simultaneously on the screen of the cathode-ray tube. As a Square Wave Generator, it may be used to check the frequency response of amplifiers.

For specifications  
see table  
below

## Du Mont Type 215 Linear Time-base Generator

The Du Mont Type 215 linear time-base generator is used to extend the low frequency time-base of any five-inch, balanced deflection, Du Mont oscillograph for the study of continuous low frequency phenomena or transients. Its balanced output signal voltage is adjustable to a maximum undistorted output of approximately 400 volts peak to peak and supplies sweep frequencies from 0.2 to 125 cycles per second with a return trace blanking signal of either positive or negative polarity. The single sweep may be initiated either manually or by the observed signal and its excellent linearity is assured by a compensating circuit.

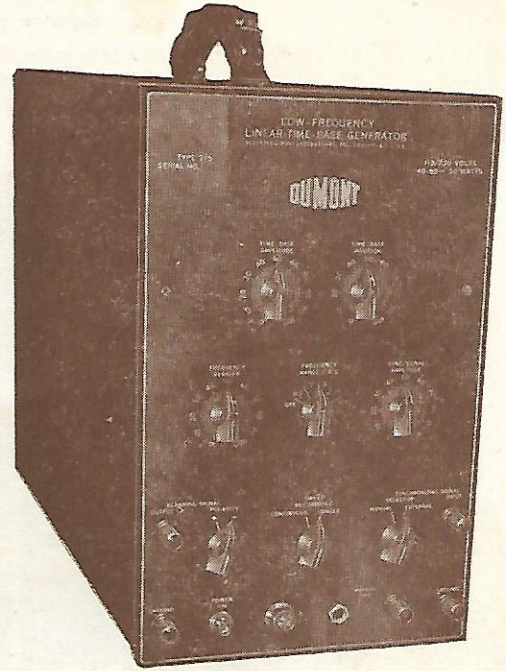
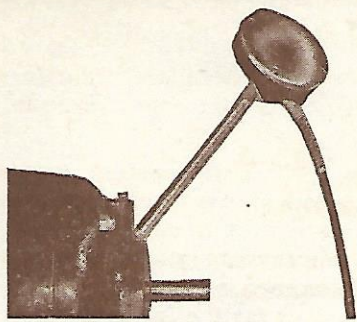


TABLE OF INSTRUMENT SPECIFICATIONS

		164-E	224-A	208-B	241	247	248*	274	185-A
INPUT IMPEDANCE	Y (AMP)	1.0 meg	2.0 meg 30 $\mu$ mf	2.0 meg 30 $\mu$ mf	2.0 meg 40 $\mu$ mf	2 meg 30 $\mu$ mf	1 meg 40 $\mu$ mf	1 meg 40 $\mu$ mf	Switching rate: 10-2000 times/sec. Freq. response: dc-5 kc Voltage gain: 10 Input resistance: 0.1 meg. Output resistance: 50,000 ohms Maximum input voltage: 150v Maximum signal output: 75v (peak to peak) Sq. wave output: 10-500 cps (30v peak to peak) Height: 11½"; Width: 7¾"; Depth: 13"
	X (AMP)	0.8 meg	2.0 meg 30 $\mu$ mf	5.0 meg 25 $\mu$ mf	2.0 meg 40 $\mu$ mf	2 meg 45 $\mu$ mf	1 meg 60 $\mu$ mf	5 meg 40 $\mu$ mf	
FREQ. RANGE	Y (DIR. BAL.)		10.0 meg 20 $\mu$ mf		5.0 meg 20 $\mu$ mf		1 meg 30 $\mu$ mf	0.47 meg 45 $\mu$ mf	
	Y (DIR. UNBAL.)		5.0 meg 25 $\mu$ mf		5.0 meg 25 $\mu$ mf		9.4 meg 15 $\mu$ mf		
DEFLECTION FACTOR	PROBE		1.0 meg 20 $\mu$ mf		1.0 meg 10 $\mu$ mf		4.7 meg 25 $\mu$ mf		
	Y AMP	Expressed in	v (rms)/in.	v (rms)/in.	v (rms)/in.	v (rms)/in.	v (rms)/in.	v (rms)/in.	
LINEAR TIME BASE	X AMP	0.70	0.1	0.01	0.07	0.05	0.1	0.65	
	X AMP	0.55	0.7	0.5	0.70	0.5	2.75	0.65	
DIMENSIONS	Y DIR.	30	25	21	22	20	32.	18.	
	X DIR.	30	28	22	21	25	37.	18.	
DRIVEN	PROBE		0.4		0.70		2.0		
	CONTINUOUS	15-30,000 cps	15-30,000 cps	2-50,000 cps	15-30,000 cps	0.5-50,000 cps	15 cps-150 kc	8 cps-30 kc	
SINGLE SWEEP	SINGLE SWEEP					equiv. to 5 cps-10 kc			
	DRIVEN						5, 25, 100 & 1000 $\mu$ sec.		
HEIGHT	HEIGHT	11¾"	14¼"	15¾"	17¼"	20¼"	16" each unit	14"	
	WIDTH	7¾"	8¾"	8¾"	20¾"	14¾"	13" " "	8¾"	
DEPTH	DEPTH	14"	15½"	20¼"	21"	26¾"	21" " "	19¾"	

\* Type 248 specifications include time delay of 0.5  $\mu$ sec. in vertical channel.





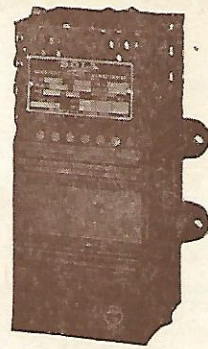
VP-5



Type 277



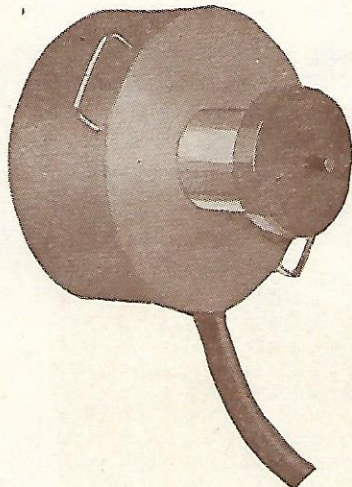
Type 276



Type 283

### Types VP-5 and DP-1 Vibration Pickups

The VP-5 and DP-1 Pickups, used in conjunction with a cathode-ray oscillograph, offer the means for the conversion of mechanical vibrations or displacements into visual patterns on the screen of the CRT, from which both frequency and wave form may be observed; particularly adaptable where such indications are desired for motor balancing, machinery vibrations and their related effects on building structure and for applications where frequency components of mechanical vibrations are to be studied. The response of the VP-5 is proportional to velocity; that of the DP-1 is proportional to displacement.



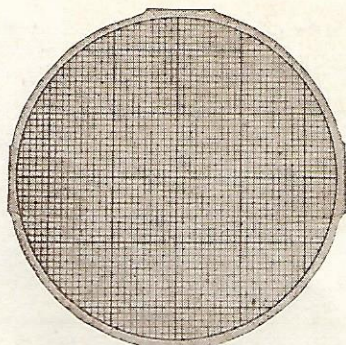
DP-1

### Type 216 Scales and Filters

The Type 216 Calibrated Scales provide a convenient means for making relative and quantitative measurements with the cathode-ray oscillograph. They are mounted on the cathode-ray screen by the celluloid clips which are an integral part of the scale and grasp the wall of the tube, making any additional mounting unnecessary.

### Type 276 Rubber Viewing Hood

The Type 276 Rubber Viewing Hood offers a practical method for shielding the eyes and the tube screen when observation of oscillographic patterns are to be made under unfavorable ambient light conditions. Since it is made of durable soft rubber, it is readily adaptable to any oscillograph equipped with a 5" cathode-ray tube. Its overall length is 10½ inches.



Type 216-C

### Type 277 Microphone

The Type 277 Microphone is a bullet-shaped crystal microphone of unusually high output impedance which makes it readily adaptable for direct connection to cathode-ray oscillographic input circuits. Its directional response is practically circular at all audio frequencies.

### Type 283 Constant-Voltage Transformer

The Sola Constant-Voltage Transformer is recommended where irregularity of supply voltage interferes with the performance of oscillographic equipment. The Type 283 transformer is designed for operation from 60-cycle, single-phase alternating current; and it will deliver a constant secondary output potential of 115 volts for input-potential variations of from 95 to 125 volts. The maximum output rating is 250 volt-amperes.

#### ACCESSORIES' CHARACTERISTICS

TYPE NO.	FREQUENCY RESPONSE	OUTPUT IMPEDANCE	OUTPUT LEVEL
277	Uniform to 10,000 cps	Greater than 0.5 meg.	At 1000 cps: 50 db below 1v/bar eff. sound pressure, or 31.6 mv for 10-bar sound pressure.
VP-5	Square—law to 3,000 cps	Resistive: over 10 meg. Capacitive: 0.005 µf at 23° C. 0.0015 µf at 40° C	30v for 0.001" displacement at 500 cps.
DP-1	Uniform from 1-500 cps. Usable to 7 kc.	Resistive: over 50 meg. Capacitive: 0.005 µf at 25° C. 0.005 µf at 40° C	0.22v for 0.001" motion.

#### TYPE 216 CALIBRATED SCALES

TYPE	DESCRIPTION	CATALOG	CODE
216-A	3" Cal. Scale	1129-A	YECYA
216-C	5" Cal. Scale	1128-A	YECUD
216-D	5" Log. Decrement Scale	1130-A	YECYB
216-E	5" Q Scale	1131-A	YECYC
216-F	5" Polar Coordinate Scale	1132-A	YECYD
216-G	5" Green Filter	1133-A	YECYE
216-H	5" Blue Filter	1134-A	YECYF
216-J	5" Amber Filter	1135-A	YECYG



# CATHODE-RAY TUBE SCREEN DATA

Standard Du Mont cathode-ray tubes are available with five types of screens: P1, P2, P4, P7, and the new P11 screen which replaces the former P5 screen.

The P1 screen produces a green trace of medium persistence. It is well suited for general purpose visual oscillographic work.

The P2 screen produces a bluish-green trace with a long persistent yellow phosphorescence. It is well suited for visual observation of transient signals and very low frequency recurrent signals. With this type screen, a pattern can be observed for a period ranging from a fraction of a second to several minutes after it has been produced depending upon the writing rate of the spot, the accelerating potential, and the level of ambient light.

The P4 screen is generally used for television appli-

cations. It appears white to the eye and its color composition is chosen to cause a minimum of fatigue for periods of long observation.

The P7 screen produces a blue fluorescent trace with a long persistent yellow phosphorescence. It is used for the visual observation of transient signals and very low frequency recurrent signals. The P7 screen is similar to the P2 screen except that it has a higher persistent light output for the lower writing rate and possesses a range difference in color between the initial fluorescent light and the persistent light which makes it possible to filter out the initial bright flash by means of a yellow filter.

The P11 screen is of the short persistent, blue fluorescent type of high photographic activity. The P11 screen has considerably higher photographic and visual efficiency than the P5 screen.

## CATHODE-RAY EQUIPMENT CATALOG NUMBERS

TYPE NO.	DESCRIPTION	CAT. NO.	CODE WORD	TYPE NO.	DESCRIPTION	CAT. NO.	CODE WORD
164-E	115v 40-60 cps with 3AP1A CRT	1064-A	YATOP	247	115v 40-60 cps with 5CP1A CRT	1193-A	YAJDO
164-E	230v 40-60 cps with 3AP1A CRT	1065-A	YATPO	247	230v 40-60 cps with 5CP1A CRT	1194-A	YAJEB
164-E	115v 40-60 cps with 3AP11A CRT	1066-A	YATRY	247	115v 40-60 cps with 5CP11A CRT	1195-A	YAJIC
164-E	230v 40-60 cps with 3AP11A CRT	1067-A	YATYR	247	230v 40-60 cps with 5CP11A CRT	1196-A	YAJOD
185-A	115v 40-60 cps	1072-A	YAUIF	247	115v 40-60 cps with 5CP7A CRT	1197-A	YAJUF
185-A	230v 40-60 cps	1073-A	YAURN	247	230v 40-60 cps with 5CP7A CRT	1198-A	YAJYG
215	115 or 230v 40-60 cps	1189-A	YAGOK	248	115v 50-400 cps with 5JP1A CRT	1199-A	YAJZA
224-A	115v 40-60 cps with 3GP1A CRT and test probe	1191-A	YAIRL	248	115v 50-400 cps with 5JP11A CRT	1200-A	YAKAB
224-A	115v 40-60 cps with 3GP11A CRT and test probe	1203-A	YALCA	248	115v 50-400 cps with 5JP7A CRT	1201-A	YAKBA
208-B	115v 40-60 cps with 5LP1A CRT	1146-A	YEEGD	274	115v 50-60 cps with 5BP1A CRT	1220-A	YALAV
208-B	230v 40-60 cps with 5LP1A CRT	1147-A	YEELJ	274	115v 50-60 cps with 5BP11A CRT	1222-A	YALAX
208-B	115v 40-60 cps with 5LP11A CRT	1148-A	YEEMK	276	Rubber Viewing Hood	1210-A	YALAM
241	115v 50-60 cps with 5JP1A CRT	1192-A	YAJAZ	277	Microphone	1212-A	YALAO
241	115v 50-60 cps with 5JP7A CRT	1204-A	YALDE	283	Constant Voltage Transformer	1214-C	YALAQ
241	115v 50-60 cps with 5JP11A CRT	1205-A	YALEY	DP-1	Displacement Pickup	1076-A	YAVAM
				VP-5	Vibration Pickup	1079-A	YAYMA

## THE DU MONT POLICY

With Du Mont, precision electronics is more than a slogan, it is an accomplishment. From the time Du Mont pioneered the commercial cathode-ray tube to the present moment, there has been steady progress in its performance and use. Much of this progress is directly attributable to the constant research and development program of Du Mont, and to our direct interest in the individual customer problem.

Today Du Mont cathode-ray tubes and oscillographs are functioning in many varied fields and under the most exacting conditions. Their mechanically rugged parts and carefully inspected electrical components, which operate well below rated values, result in durability and high quality performance. The Du Mont trademark means dependability.

Du Mont representatives throughout the United States are willing and ready to furnish you with new equipment and explain the latest advances in

technical applications which have been developed in our laboratories. To keep abreast of the rapid strides in the electronic field, be certain to keep in contact with your Du Mont representative.

Especially is Du Mont anxious to maintain its close customer interest. In an industry where manufacturing specifications are designed for general use, Du Mont welcomes the opportunity to aid in the solution of specific electronic problems. The opinions and suggestions of our customers are of immediate importance to our engineers. The real test of our instruments is the advantages and limitations they have in the hands of the men who use them.

The pages of this catalog partly list the developments of the Allen B. Du Mont Laboratories, Inc., in oscillographs, cathode-ray tubes, and other related instruments and accessories.

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Best buy,  
Du Mont!!!