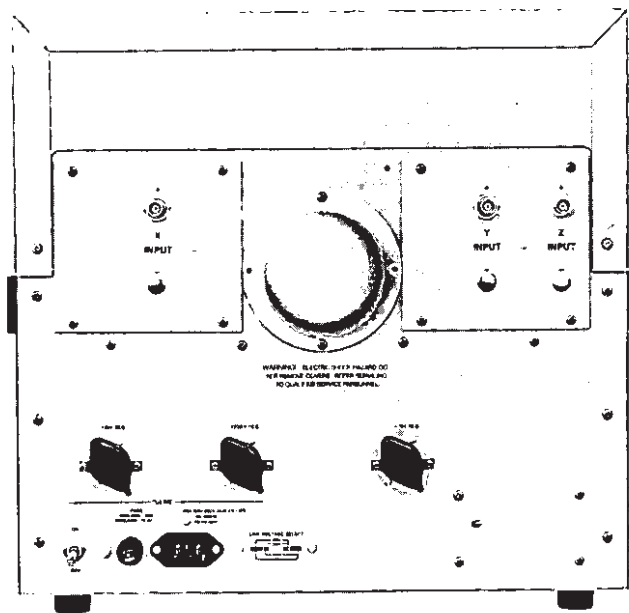
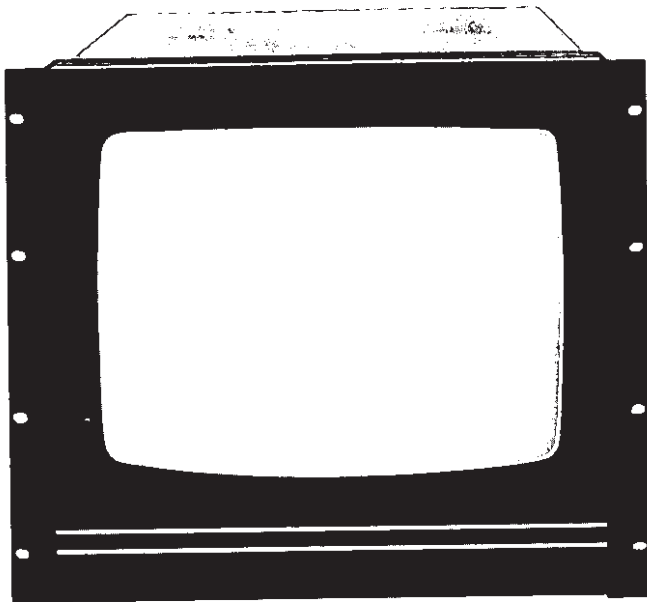


# CATHODE-RAY TUBE DISPLAYS

Instrumentation systems, 43.2 cm (17-inch)

Model 1317A

NEW



Rear panel X, Y, and Z input BNC connectors are mounted on removable panels for easy adaption to any input configuration.

## 1317A Description

### Advanced display performance

The Model 1317A large screen, 43.2 cm diagonal (17-inch) graphic display is the answer to many OEM display requirements because of its unique performance. This high resolution display is ideal for the readout in computer graphic and instrumentation systems because it combines high slewing speed with low power operation.

### High writing speed

Linear writing speed is an unmatched 25.5 cm/ $\mu$ s (10 inches/ $\mu$ s) for visible writing, however, the all solid-state deflection amplifiers are capable of slew rates greater than 255 cm/ $\mu$ s (100 inches/ $\mu$ s) when the spot does not have to be seen. Character stroke writing capability of

less than 100 ns per stroke means that this display can refresh 4096 alphanumeric characters in less than 5 ms. Point plotting time for small steps is less than 200 ns per point minimizing the writing time for dot matrix type character generation. The fast amplifier response simplifies system programming since vectors can be written in random fashion from anywhere in the display area.

### Yokeless deflection

The yokeless, electrostatic deflection system consumes much less power than the multi-winding coils of magnetic systems. Additionally, the much faster response of electrostatic deflection permits more information to be displayed at a refresh rate that eliminates flicker. A sharp, clear display even with the wide-angle deflection and low curvature faceplate is maintained with dynamic focusing. Dynamic correction of focus occurs with changes in beam position and intensity (drive level) at video speeds.

### Designed for OEM systems

This high-quality, large-screen display is designed for easy interfacing to systems needing a high resolution, visual readout. The very large CRT is mounted in a rugged frame that fits in a standard 48.3 cm (19-inch) rack with the attractive front panel flush with the rack. Display controls are conveniently located behind a front panel door under the CRT for easy access.

Rear panel X, Y, and Z input connectors are standard BNC or floating BNC configuration and are mounted on removable panels for easy adaptation to any input configuration. Line power is switch selectable for 100, 120, 220, 240 V ac to match local power requirements. Options for different phosphors, conformal contrast filters with anti-glare surface, Z-axis input changes, and fixed slides are available to permit you to tailor the 1317A display to your specific requirement. For additional convenience, an accessory interconnecting cable containing three color coded coaxial cables is also available.

## 1317A Specifications

### Vertical and horizontal amplifiers

#### Response:

**Rise time:**  $\leq 75$  ns (10% to 90% points) for full screen deflection or less.

**Bandwidth:** dc to 5 MHz (3 dB down at 5 MHz) with 10.2 cm (4 in.) deflection.

**Phase shift:**  $< 0.1^\circ$  to 50 kHz and  $< 1^\circ$  to 250 kHz for full screen signal inputs.

**Deflection factor:** approx. 39.3 mV/cm (100 mV/in.); 1 V p-p for 25.4 cm (10 in.) deflection.

**Gain adjust:** provides continuous deflection factor adjustment from approx. 31.4 mV/cm (80 mV/in.) to 51.2 mV/cm (130 mV/in.).

**Linear writing time:**  $< 39.4$  ns/cm (100 ns/in.).

**Linear writing speed:**  $> 25.4$  cm/ $\mu$ s (10 in./ $\mu$ s).

**Diagonal settling time:** signal settles to within one spot diameter of final value in  $< 500$  ns for any on or off screen movement. Off screen deflection not to exceed one screen diameter.

**Repeatability:**  $< 0.15\%$  error (of full screen) for readdressing a point from any direction on or off screen. Off screen deflection not to exceed one screen diameter.

**Sequential point plotting time:** signal settles to within 0.254 mm (0.010 in.) of final value in  $< 200$  ns for any 2.54 mm (0.10 in.) step.

**Dynamic range:** at least  $\pm 1.5$  screen diameters from center screen.

**Crosstalk:**  $< 0.381$  mm (0.015 in.) with one input terminated in 50 ohms and the other input excited by a 1 V 500 kHz signal.

**Drift:** 1.27 mm/hr (0.05 in./hr) and 2.54 mm (0.10 in.) in 24 hr with covers installed after  $\frac{1}{2}$  hr warmup.

**Spot jitter and motion:**  $< 0.254$  mm (0.010 in.).

**Inputs:** BNC connectors with floating shield. Separate differential inputs (shield grounded) available, see Options.

**Input RC:** driven side 10 k $\Omega$  shunted by approx. 40 pF. Shield input is approx. 47 ohms to ground which can be replaced with 10 k $\Omega$  for differential input. A switchable 50 ohm termination between shield and center conductor is also provided.

**Maximum input:**  $\pm 50$  V (dc + peak ac) with 10 k $\Omega$  internal termination;  $\pm 5$  V (dc + peak ac) with 50 ohm internal termination.

**Polarity:** positive vertical input moves beam up; positive horizontal input moves beam to the right.

**Position:** front panel controls allow zero input to be set off screen in any direction from anywhere within the viewing area.



NEW

### Z-axis amplifier (see options)

**Rise time:** <20 ns (CW bandwidth approx. 15 MHz).

**Blanking range:** 0 to 1 V.

**Blanking polarity:** positive input unblanks CRT, internally reversible for negative unblanking.

**Input:** BNC connector (shield grounded).

**Input RC:** approx. 10 k $\Omega$  shunted by approx. 60 pF. 50 ohm termination may be selected with internal switch.

**Maximum input:**  $\pm 50$  V (dc + peak ac) with 10 k $\Omega$  internal termination.  $\pm 5$  V (dc + peak ac) with 50 ohm internal termination.

**Offset:** internal adjustment provides  $\pm 1$  V offset (continuous) to blanking range.

**Gain adjust:** extends blanking range by over 2.5:1 (continuous).

### Cathode-ray tube

**Type:** post deflection accelerator, approx. 28.5 kV accelerating potential. P31 aluminized phosphor standard (refer to Options for additional phosphors). Electrostatic focus and deflection.

**Viewing area:** 43.2 cm (17 in.) diagonal; approx. 34.3 cm (13.5 in.)  $\times$  26 cm (10.25 in.).

### Resolution:

#### Spot size

Inside quality area	Outside quality area	Quality area
0.51 mm (0.020 in.)	0.76 mm (0.030 in.)	25.4 cm $\times$ 25.4 cm (10 in. $\times$ 10 in.)

**Lines:** approx. 19.7 lines/cm (50 lines/in.) measured with shrinking raster method.

### Light output:

**Line brightness:** approx. 538.2 lx (50 f) at a writing speed of 0.25 cm/ $\mu$ s (0.10 in./ $\mu$ s), 60 Hz refresh rate, P31 phosphor, 0.51 mm (0.020 in.) spot size.

**Geometry:** <3% pincushion and barrel distortion within quality area.

**Linearity:** <3% of full scale along major axis within quality area.

**Phosphor protection:** automatically detects absence of beam deflection and limits beam current to a safe but viewable level.

**Dynamic focus:** automatically corrects spot geometry for position location and beam intensity (video drive level).

**Contrast ratio:** 4:1 or greater with 1076 lx (100 f) ambient light and CRT face in a vertical plane. Measured by photometrically summing the trace and background brightness and then dividing by the background brightness.

**Trace align:** rotates X-axis into geometric alignment with CRT viewing area.

**Orthogonality:** separately aligns Y-axis perpendicular to X-axis.

### Consumer safety protection

**Implosion:** exceeds safety requirements of IEC 348 (IEC 65) and ANSI C39.5 for Electronic Measuring Apparatus.

**High voltage:** anode lead is permanently bonded to CRT.

**X-ray emission:** <0.1 mr/hr. Measured with Victoreen Model 440 RF/C.

The display is being submitted to Underwriters Laboratories for Electronic Data Products listing, thereby meeting OSHA (Subpart S) approval.

### General

**X, Y and Z input connectors:** rear panel BNC female connectors.

**Front panel controls:** Intensity, Position X, Gain X, Position Y, Gain Y, Trace Align, Orthogonality, Focus, and Astigmatism located below the CRT behind a hinged door.

**Line indicator:** lamps mounted behind front panel door and on rear panel.

**Power:** selectable 100, 120, 220, or 240 V ac, +5% - 10%, 48 to 440 Hz, maximum power 115 VA (approx. 100 watts).

**Dimensions:** 425.5 mm (16 $\frac{1}{4}$  in.) wide, 409.6 mm (16 $\frac{1}{8}$  in.) high including feet, 566.7 mm (22 $\frac{3}{8}$  in.) deep.

**Weight:** net, 26.3 kg (58 lb); shipping, 33.4 kg (73 $\frac{1}{2}$  lb).

**Operating environment:** temperature, 0 to +55 $^{\circ}$ C, non-operating -40 $^{\circ}$  to +70 $^{\circ}$ ; humidity, up to 95% relative humidity to 40 $^{\circ}$ C; altitude, up to 4.6 km (15 000 ft), non-operating up to 6.2 km (25 000 ft); shock, 30 g level with 11 ms duration and  $\frac{1}{2}$  sine wave shape; vibration, vibrated in three planes for 15 min. each with 0.254 mm (0.010 in.) excursion, 10 to 55 Hz.

**Accessories supplied:** 0.75 A slow blow fuse for 220 and 240 V operation, one 2.3 m (7.5 ft) power cord, and one Operating and Service Manual.

### Options

**005:** form fitting green contrast filter with anti-glare surface improves trace to background contrast for easier viewing in bright ambient lighting.

**006:** form fitting blue contrast filter with anti-glare surface.

**604:** aluminized P4 phosphor in lieu of P31, open viewing area.

**607:** aluminized P7 phosphor in lieu of P31, open viewing area. Includes amber form fitting contrast filter with anti-glare surface.

**639:** aluminized P39 phosphor in lieu of P31, open viewing area.

**050:** TTL blanking input. High state, +2.5 V to +5 V, blanks any analog Z input. Low level, 0.0 V to 0.8 V, returns blanking to analog Z-axis input.

**051:** differential inputs to X, Y, and Z amplifier. Inputs for each axis through separate BNC connectors (shield grounded).

**052:** four bit binary Z-axis input provides 16 levels of gray (TTL compatible). Settling time  $\leq 300$  ns.

**053:** linear light output changes ( $\pm 20\%$ ) with linear Z-axis drive changes (gamma correction).

**054:** TTL blanking input. Low state, 0.0 V to 0.8 V, blanks any analog Z-axis input. High state, +2.5 V to +5 V, returns blanking to analog Z-axis input.

**055:** fixed slides for EIA Standard 48.3 cm (19 in.) rack.

### Accessories

**Display cable, Model 10488A:** single cable for convenient interconnection between the display and signal source. The display cable contains three color-coded coaxial cables with three male BNC connectors on each end for X, Y, and Z input. Total cable length is approx. 3.6 m (12 ft).

Model number and name	Price
1317A Large Screen Display	\$3050
Option 005: green contrast filter	add \$50
Option 006: blue contrast filter	add \$50
Option 604: aluminized P4 phosphor	add \$25
Option 607: aluminized P7 phosphor/amber filter	add \$100
Option 639: aluminized P39 phosphor	add \$25
Option 050: TTL high state blanks analog Z-input	add \$25
Option 051: diff. inputs to X, Y, and Z amplifiers	add \$25
Option 052: four bit binary Z-axis input	add \$100
Option 053: gamma correction ( $\pm 20\%$ )	add \$50
Option 054: TTL low state blanks analog Z-input	add \$25
Option 055: fixed slides for 48.3 cm (19 in.) rack	add \$100
10488A Display Cable (see Accessories)	\$50