TEKTRONIX®

606 MONITOR

WITH OPTIONS

OPERATORS

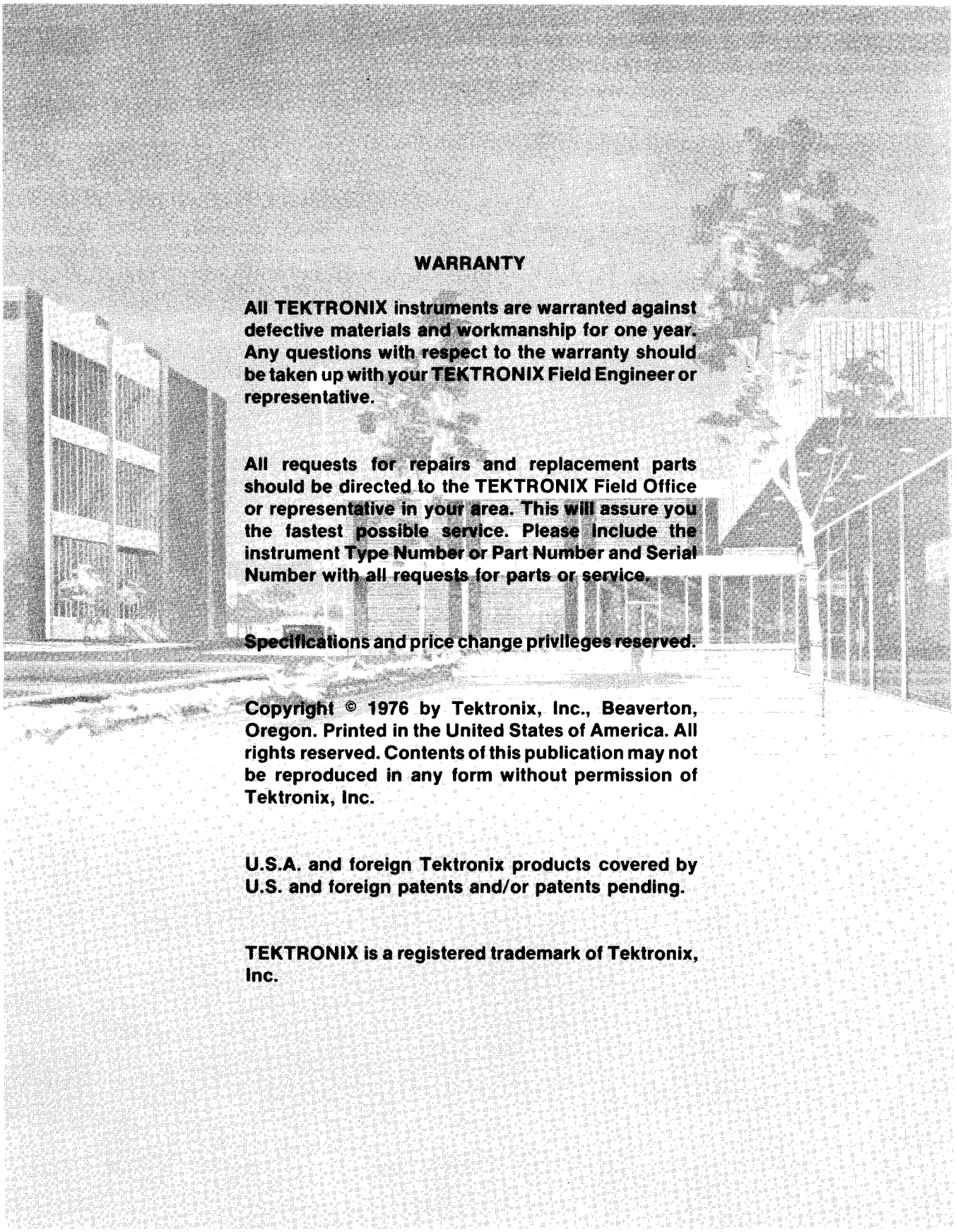
INSTRUCTION MANUAL

Tektronix, Inc.
P.O. Box 500
Beaverton, Oregon 97077

Serial Number _____

070-2024-00

First Printing APRIL 1976



WARRANTY

All TEKTRONIX instruments are warranted against defective materials and workmanship for one year. Any questions with respect to the warranty should be taken up with your TEKTRONIX Field Engineer or representative.

All requests for repairs and replacement parts should be directed to the TEKTRONIX Field Office or representative in your area. This will assure you the fastest possible service. Please include the instrument Type Number or Part Number and Serial Number with all requests for parts or service.

Specifications and price change privileges reserved.

U.S.A. and foreign Tektronix products covered by U.S. and foreign patents and/or patents pending.

TEKTRONIX is a registered trademark of Tektronix, Inc.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

SAFETY SUMMARY

This manual contains safety information which the user must follow to ensure safe operation of the 606 Monitor. Warning information is intended to protect the patient and the operator, and Caution information is intended to protect the instrument. The following are general safety precautions which do not appear elsewhere in this publication and which must be applied during all phases of operation and maintenance.

WARNING

Medical-Dental Applications

Do not use the amplifier INPUTS for direct patient connection. Signal currents at these connectors, as well as leakage currents, may exceed values considered non-hazardous for direct patient connection.

Although this Monitor is not to be used for direct patient connection, interconnection of this instrument with other equipment can result in application of excessive current to the patient. It is extremely important that the equipment be interconnected in accordance with NFPA 76B-T, Tentative Standard for the Safe Use of Electricity in Patient Care Facilities, section 3038, "Signal Transmission Between Appliances".

Do not operate this instrument in the presence of flammable gases or anesthetics. Explosion can result from operation in such an environment.

Ground the Instrument

For electric-shock protection, insert the power-cord plug only in a proper mating power outlet with a grounding (safety-earth) contact. To assure safe grounding during operation in patient-care facilities, the Hospital-Grade power-cord plug supplied with the instrument (Option 6) must be connected only to a power outlet marked "HOSPITAL-GRADE". Refer qualified service personnel to the servicing information sections of the Instruction Manual for additional information.

Before making external connections to this instrument, always ground the instrument first by connecting the power-cord plug to a proper mating power outlet.

Use Correct Fuse

For continued fire-hazard protection, replace fuse only with one of the proper type and rating. Refer fuse replacement to qualified service personnel only.

The following appear in the text of this manual, and are repeated here for emphasis:

WARNING

Do Not Remove Instrument Covers

High voltage is present inside the instrument. To avoid electrical-shock hazard, operating personnel must not remove the protective instrument covers. Component replacement and internal adjustments must be made by qualified service personnel only.

Electric-shock hazard present. Only qualified service personnel may change the input signal requirements. Refer qualified service personnel to the servicing information sections of the 606 Instruction Manual.

Limit Input Signals

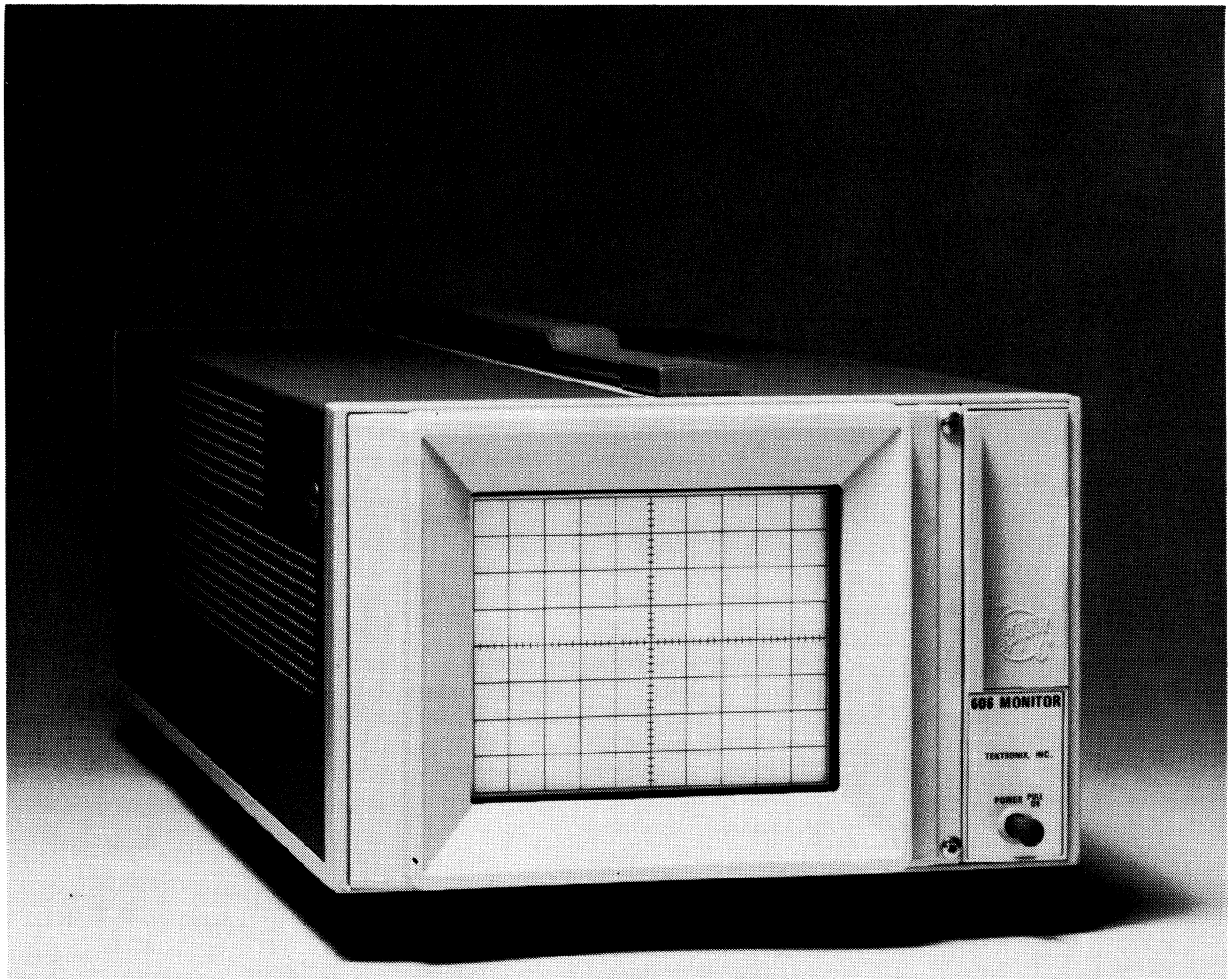
To avoid electric-shock hazard, do not apply input signals of more than 25 volts (dc plus peak ac).

CAUTION

Exercise Care with Intensity Level

A high intensity level combined with a stationary spot will damage the crt phosphor. Therefore, set the INTENSITY control for just enough spot intensity for good visibility.

Be careful to set the proper display intensity; a high-amplitude Z-axis input signal, combined with an excessively high setting of the INTENSITY control, may damage the crt phosphor.



606 FEATURES

The 606 Monitor is a general purpose, high-resolution, X-Y display monitor providing a clear, bright display of analog data. This instrument is designed for display applications as in ultrasonic detection systems, electron microscope systems, radiation and thermal scanning systems, speech therapy, volume and vibration analysis, and medical and bio-physical systems. The 606 Monitor may also be used to provide displays of alpha-numeric and graphic information from computers and other data transmission systems. Resolution of the crt (cathode-ray tube) in this instrument is excellent.

All display axes (vertical, horizontal, and intensity) can be operated differentially or from a single-signal source.

2024-1

@

GENERAL INFORMATION

INTRODUCTION

The Operators Manual contains information necessary to effectively operate the 606 Monitor and is divided into three sections: Section 1 provides a basic description of the 606 with instrument specifications. Section 2 contains operating information for the instrument. Information concerning available options for the 606 Monitor is in section 3 of the manual.

The Instruction Manual provides both operating and servicing information for the 606 Monitor. The Instruction Manual is divided into ten sections. Operating information is covered in the first two sections; servicing information is contained in the remaining eight sections of the manual. Schematic diagrams are located at the rear of the manual and can be unfolded for reference while reading other parts of the manual. The reference designators and symbols used on the schematics are defined on the first page of the Diagrams and Circuit Board Illustrations section. Abbreviations used in the manuals, except for in the parts list and schematic diagrams, comply with the American National Standards Institute Y1.1-1972 publication. The parts list is a computer printout and uses computer-supplied abbreviations.

INSTRUMENT PACKAGING

If the instrument is to be shipped to a Tektronix Service Center for service or repair, attach a tag showing the following: owner (with address) and the name of an individual at your firm that can be contacted, complete instrument type and serial number, and a description of the service required.

Save and re-use the package in which your 606 Monitor was shipped to you. If the original packaging is unfit for use or not available, repackage the instrument as follows:

1. Obtain a carton of corrugated cardboard having inside dimensions of no less than six inches more than the instrument dimensions; this will allow for cushioning. Refer to Table 1-1 for carton test strength requirements.

2. Surround the instrument with polyethylene sheeting to protect the finish of the instrument.

3. Cushion the instrument on all sides by tightly packing dunnage or urethane foam between the carton and the instrument, allowing three inches on all sides.

4. Seal the carton with shipping tape or with an industrial stapler.

Table 1-1
Shipping Carton Test Strength

Gross Weight (lb)	Carton Test Strength (lb)
0 - 10	200
10 - 30	275
30 - 120	375
120 - 140	500
140 - 160	600

DESCRIPTION

The 606 Monitor is a compact, solid-state instrument with excellent resolution providing accurate displays of information from the X, Y, and Z signal inputs.

WARNING

High voltage is present inside the instrument. To avoid electric-shock hazard, operating personnel must not remove the protective instrument covers. Component replacement and internal adjustments must be made by qualified service personnel only.

Vertical and horizontal signals to be displayed on the crt are applied to the Vertical (Y) and Horizontal (X) Amplifiers through the appropriate + (noninverting) and – (inverting) INPUT connectors. Input signals can be either single-ended or differential. These amplifiers process the input signals and provide push-pull outputs to drive the crt deflection plates.

The Z-Axis Amplifier controls the display intensity by providing a voltage to drive the crt control grid. Input signals applied to the +Z (noninverting) and the –Z (inverting) INPUT connectors may be either single-ended or differential.

The High Voltage and Low-Voltage Power Supplies provide all the voltages necessary for operation of this instrument.

The internal Sweep circuit (Option 4) produces a positive-going sawtooth voltage, which is amplified by the Horizontal (X) Amplifier, to provide sweep deflection in the crt. The level of the vertical signal at which triggering occurs is determined by the TRIG SLOPE/LEVEL control. The Sweep circuit also produces an unblanking gate signal coincident with the sawtooth waveform. This gate signal unblanks the crt to permit display presentation.

SPECIFICATION

The electrical specifications listed in Table 1-2 apply when the following conditions are met: (1) The instrument must have been adjusted at an ambient temperature between +20° and +30° C (+68° and +86° F), (2) the instrument must be operating in an ambient temperature between 0° and +50° C (+32° and +122° F), and (3) the instrument must have been operating for at least 20 minutes.

TABLE 1-2
Electrical Characteristics

Characteristic	Performance Requirement
VERTICAL AND HORIZONTAL AMPLIFIERS	
Deflection Factor[1]	
Vertical (Y)	Internally adjustable from 0.5 V, or less, to at least 2.5 V full screen, with step attenuator in 1X position. (Internal step attenuator extends the deflection factor range to at least 12.5 V full screen.)
Horizontal (X)	Internally adjustable from 0.5 V, or less, to at least 2.5 V full screen, with step attenuator in 1X position. (Internal step attenuator extends the deflection factor range to at least 12.5 V full screen.)
Attenuators	Deflection factor reduced five times, within 3%, with 5:1 attenuator in 5X position.
Bandwidth (80% Full-Screen Reference Signal)	Dc to at least 3 MHz.
Rise Time	116 ns or less.
Settling Time	
After Deflection Between Any Two Points on Screen	Crt beam must be within 0.025 cm (0.010 inch) of final position within 500 ns.
After Deflection to Any Place On Screen From Any Position Off Screen (Within 10 cm of Screen Center)	Crt beam must be within 0.025 cm (0.010 inch) of final position within 750 ns.
Common Mode Rejection (Dc to 500 kHz)	
Attenuator at 1X	At least 100:1 cmr ratio for signals of +3 V or −3 V peak, or less.
Attenuator at 5X	At least 40:1 cmr ratio for signals of +15 V or −15 V peak, or less.
Phase Difference (Dc to 500 kHz)	1° or less between X and Y amplifiers. X and Y amplifier gain (v/div) must be set for the same deflection factor.
Input RC (All Inputs)	1 mΩ, within 1%, paralleled by 47 pF or less.

[1]**Only qualified service personnel should change the deflection sensitivity of the amplifiers. See the servicing information sections of the 606 Instruction Manual.**

TABLE 1-2 (CONT.)
Electrical Characteristics

Characteristic	Performance Requirement
Maximum Nondestructive Input Voltage (Fault Condition Only)	+100 V or −100 V (dc plus peak ac).
Position Range (With No Input Signals Applied)	Front panel controls allow spot to be set anywhere within the viewing area.
Position Stability	0.1 cm or less per hour, after 20 minute warmup with covers installed; less than 0.2 cm in 24 hours.
Crosstalk Between X and Y Amplifiers	0.025 cm (0.01 inch), or less, of deflection on the undriven channel with full-screen amplitude of 1 MHz sine wave applied on the other channel. All other inputs grounded or terminated into 50 ohms.
Z-AXIS AMPLIFIER	
Bandwidth	Dc to 10 MHz.
Rise Time	35 ns or less.
Aberrations	5% or less.
Common Mode Rejection (Dc to 500 kHz)	Cmr ratio at least 100:1 with input signals to 5 V peak-to-peak at any setting of the Z-axis gain.
Input RC (Both Inputs)	1 MΩ, within 1%, paralleled by 47 pF or less.
Maximum Nondestructive Input Voltage (Fault Condition Only)	+100 V or −100 V (dc plus peak ac) with crt beam positioned off screen.
Useful Input Voltage[2]	
+ INPUT	Maximum intensity is produced either by an input amplitude of +1 V or less, with internal gain adjustment set at maximum; or +5 V or less with gain set at minimum.
	Crt blanking (cutoff) is produced either by an input amplitude of −1 V or more, with gain set at maximum; or by −5 V or more, with gain set at minimum.
− INPUT	Maximum intensity is produced by an input amplitude of −1 V or less, with gain set at maximum; or −5 V or less with gain set at minimum.
	Crt blanking is produced by an input amplitude of +1 V or more, with gain set at maximum; or by +5 V or more, with gain set at minimum.
Crosstalk Between Z Axis and Deflection Amplifiers.	0.025 cm (0.01 inch), or less, of deflection in X or Y axis with maximum output from Z Axis Amplifier. X and Y inputs grounded or terminated into 50 ohms.

[2] **Only qualified service personnel should change the amplifier sensitivity. See the servicing information sections of the 606 Instruction Manual.**

TABLE 1-2 (Cont.)
Electrical Characteristics

Characteristic	Performance Requirement
CATHODE-RAY TUBE DISPLAY	
Geometry	Bowing or tilt is 0.1 div, or less, full screen.
Center Screen Spot Diameter (Measured with Shrinking Raster Method)	
At 0.1 μA beam current	0.013 cm (0.005 inch), or less.
At 5 μA beam current	0.018 cm (0.007 inch), or less.
Orthogonality	90° within 0.7°.
Phosphor	P31 standard.
Option 76	P7.
Option 78	P11.
Deflection	Electrostatic.
Acceleration Potential	5.625 kV, within 2%.
Graticule	External 8 X 10 cm graticule is standard.
Option 1	Internal 8 X 10 cm unlighted orange graticule.
POWER SOURCE	
Line Voltage Ranges (ac, rms)	
120 V AC Nominal	
Low	90 to 110 V ac.
Med	99 to 121 V ac.
High	108 to 132 V ac.
220 V AC Nominal	
Low	180 to 220 V ac.
Med	198 to 242 V ac.
High	216 to 250 V ac.
Line Frequency	48 to 440 Hz.
Maximum Power Consumption	75 watts; 0.8 amperes, at 120 V ac, 60 Hz.

@

TABLE 1-2 (Cont.)
Electrical Characteristics

Characteristic	Performance Requirement
OPTION 4 SWEEP SYSTEM	
Sweep Range	100 ms/div to 1 μs/div, in decade steps.
Sweep Accuracy Over Center Eight Divisions	Within 3% (VARIABLE fully clockwise);
Linearity of Any Two Division Portion Within Center Eight Divisions	Within 2%, except for first 5% of total sweep length.
VARIABLE (Uncalibrated)	Provides continuously variable sweep rates between calibrated settings. Decreases each sweep rate setting by at least 10:1. Extends slowest sweep rate to at least 1 s/div.
Triggering Sensitivity (With Repetitive Signals)	At least 0.5 div vertical deflection from dc to 2 MHz.

TABLE 1-3
Environmental Characteristics

Characteristic	Performance Requirement
Temperature	
Operating	0° to +50° C (+32° to +122° F).
Nonoperating	–40° to +70° C (–40° to +158° F).
Altitude	
Operating	To 15,000 feet.
Nonoperating	To 50,000 feet.
Transportation	Qualified under National Safe Transit Committee Test Procedure 1A, Category II.

TABLE 1-4
Physical Characteristics

Characteristic	Performance Requirement
Finish	Anodized aluminum panel with gray vinyl-coated frame. Blue vinyl-coated cabinet.
Net Weight	17 lbs (7.7 kgs).
With Option 4	17 lbs 10 oz (8.0 kgs).
Overall Dimensions	See Figure 1-1.
Total Depth of Rack Required for Rackmounting	48.3 cm (19 inches).

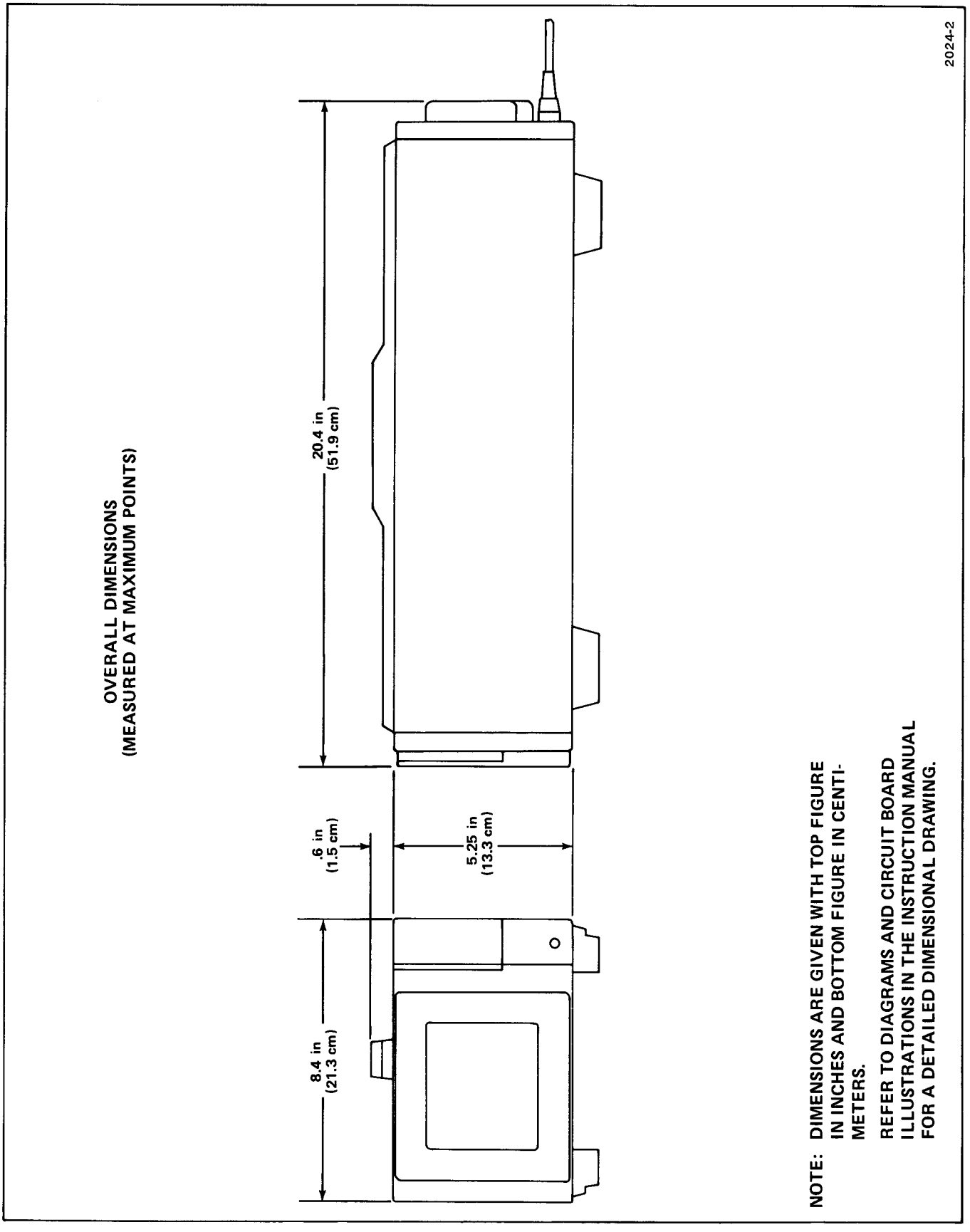


Figure 1-1. 606 Overall dimensional drawing.

STANDARD ACCESSORIES

1 ea . . . . . .Operators Manual

1 ea . . . . . .Instruction Manual

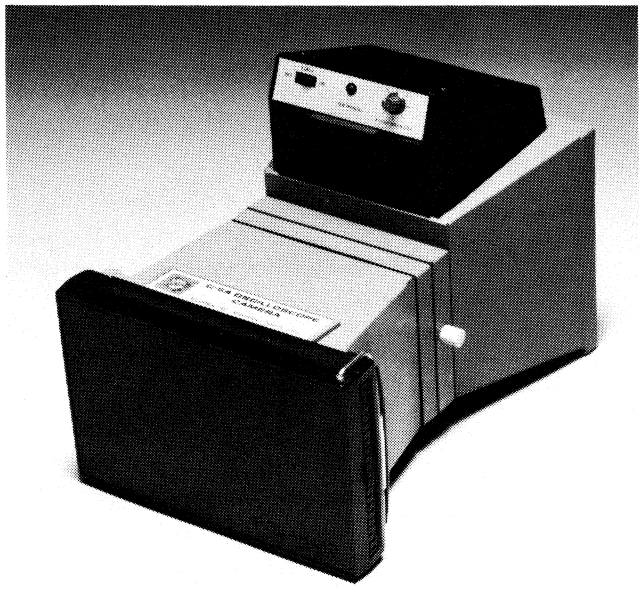
1 ea . . . . . .Marked Crt Shield (8 X 10 cm graticule)

For more detailed information, refer to the tabbed Accessories page in the 606 Instruction Manual.

RECOMMENDED ACCESSORIES

The following accessories have been selected from our catalog specifically for your instrument. They are listed as a convenience to help you meet your measurement needs. For detailed information and prices, refer to a Tektronix Products Catalog or contact your local Tektronix Field Representative.

CAMERAS

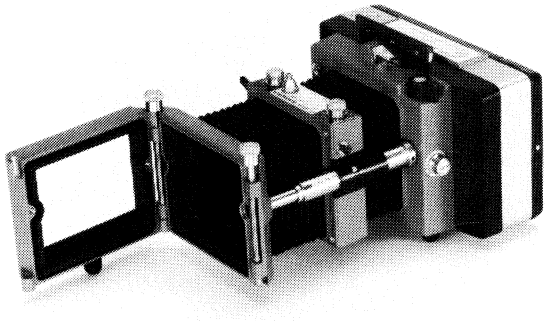


C-5A: The C-5A is a low-cost general-purpose camera with a Polaroid Pack-Film Back, pulsed graticule illumination, and a fixed f/16 lens. Magnification may be set at 0.67 or 0.85.

Order C-5A

C-5A Opt. 1: The C-5A Opt. 1 camera is the C-5A without the pulsed graticule illumination feature.

Order . . . . . C-5A Opt. 1



C-30A: The C-30A is a general purpose, variable magnification camera featuring a moderately fast f/1.9 lens and a mechanical shutter. Shutter speeds: 1 to 1/60 second, plus Bulb and Time. Camera requires adapter 016-0248-00 for use with your Monitor.

Adapter, Order 016-0248-00
Camera with Pack-Film Back, Order C-30A-P
Camera with Roll-Film Back, Order C-30A-R

Electric Shutter Option: The C-30A camera can be ordered with an integral electric shutter in place of the standard mechanical shutter.

Camera with Pack-Film Back, Order C-30A-PE
Camera with Roll-Film Back, Order C-30A-RE

CART

TEK LAB CART MODEL 3: Mobile equipment cart with 14" X 21" top tray, lockable storage drawer, and extra instrument tray.

Order . . . . . .TEK LAB CART MODEL 3

OPERATING INSTRUCTIONS

CONTROLS AND CONNECTORS

Controls and connectors necessary for operation of the 606 Monitor are located on the front and rear panels of the instrument. To make full use of the capabilities of this instrument, the operator should be familiar with the function and use of each external control and connector. The front-panel controls, including the external sweep controls for the Option 4 instrument, are shown and described in Figure 2-1. Brief descriptions of the rear-panel controls and connectors are given in Figure 2-2.

AMBIENT TEMPERATURE CONSIDERATIONS

This instrument can be operated where the ambient air temperature is between 0° and +50°C (+32° and +122°F), and can be stored in ambient temperatures between −40° and +70°C (−40° and +158°F). After being stored in temperatures beyond the operating limits, allow the chassis temperature to return to within the operating limits before applying power. Other environments and mounting configurations, such as mounting in consoles or instrument racks, may require additional cooling measures. (Refer qualified service personnel to the servicing information sections of the 606 Instruction Manual.) Allowing the Monitor to operate at an ambient temperature substantially higher than that specified may result in poor reliability as well as inaccurate performance.

FUNCTIONAL CHECK

The following procedures are provided to aid in obtaining a display on the standard 606 Monitor or the Option 4 version, and may be used as a check of basic instrument operation. The procedures may be used for incoming inspection to verify proper operation, and may also be used by the operator for instrument familiarization. Only instrument functions, and not measurement quantities or specifications, are checked in these procedures. Therefore, a minimum amount of test equipment is required. If performing the Functional Check procedure reveals improper performance or instrument malfunction, first check the operation of associated equipment; then refer to qualified service personnel for repair or adjustment of the instrument.

Test Equipment Required

The following test equipment was used as a basis to write the Functional Check procedures. Other test equipment, which meets these requirements, may be substituted. When other equipment is substituted, the control settings or set up may need to be altered.

1. Power Module

   Description: Tektronix TM 500-series power module with one or more plug-in compartments.

   Type Used: Tektronix TM 501 (used with the FG 503 Function Generator).

2. Function Generator

   Description: Frequency range, one hertz to 50 kilohertz; output amplitude, one volt peak-to-peak into 50 ohms; waveform output, sine wave.

   Type Used: Tektronix FG 503 (used with TM 501 Power Module).

3. Cables (3 Required)

   Description: Length, 42 inches (1 required), 18 inches (2 required); connectors, BNC.

   Type Used: Type RG-58/U, 50-ohm coaxial, Tektronix Part 012-0057-01 (42 inch), Tektronix Part 012-0076-00 (18 inch).

4. T Connector

   Description: Connectors, BNC to BNC.

   Type Used: BNC-to-BNC T connector, Tektronix Part 103-0030-00.

5. Adapter

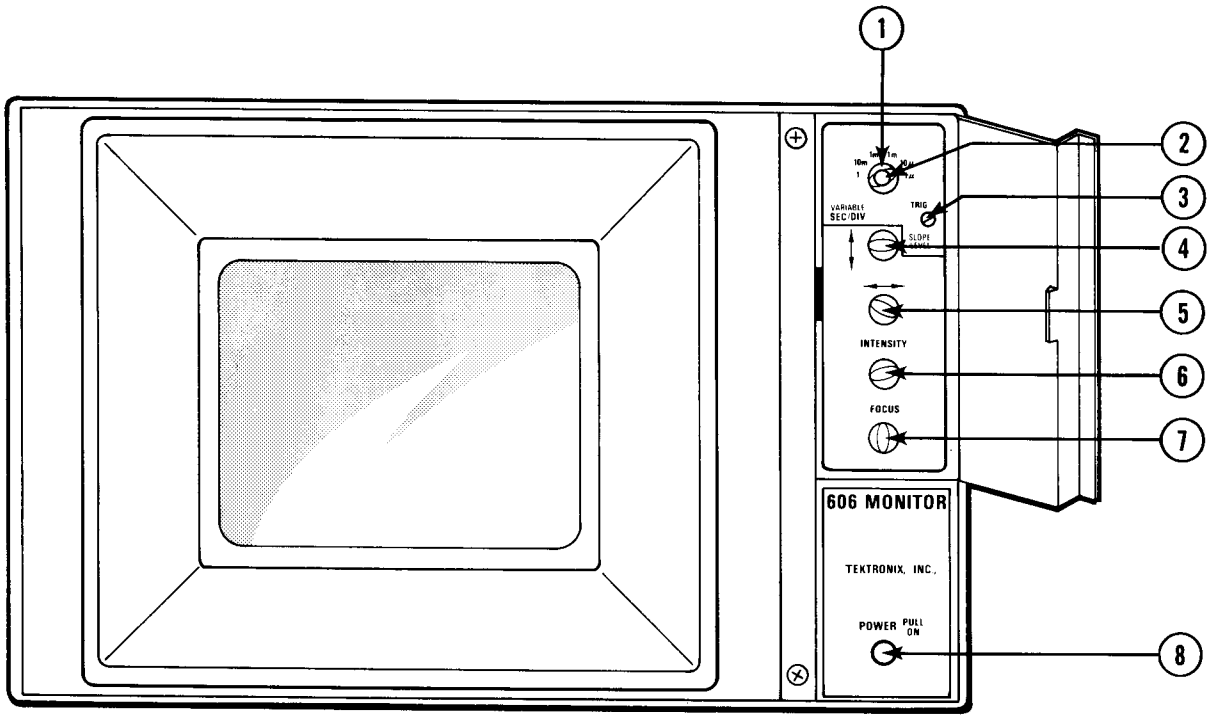
   Description: Connectors, BNC female to BNC female.

   Type Used: BNC female-to-BNC female, Tektronix Part 103-0028-00.

Preliminary Set Up

1. Install the function generator in the power module and turn on the power module.

2. Connect the 606 power cord to a suitable power source.



(1) **SEC/DIV (Option 4 only)**—Selects one of six calibrated sweep rates between 0.1 second/division and 1 microsecond/division in decade steps. (VARIABLE must be fully clockwise for the indicated sweep rate.)

(2) **VARIABLE (Option 4 only)**—Screwdriver adjustment, concentric with the SEC/DIV switch, which provides continuously variable sweep rates between the calibrated steps. Extends the sweep rate range to 1 second/division.

(3) **TRIG SLOPE/LEVEL (Option 4 only)**—Screwdriver adjustment to select the slope and level of the vertical signal from which the sweep is triggered.

(4) **Vertical (↕) Position**—Positions the crt beam in the Y Axis.

(5) **Horizontal (↔) Position**—Positions the crt beam in the X Axis.

(6) **INTENSITY**—Controls brightness of the crt display and is the offset control for the Z-Axis inputs.

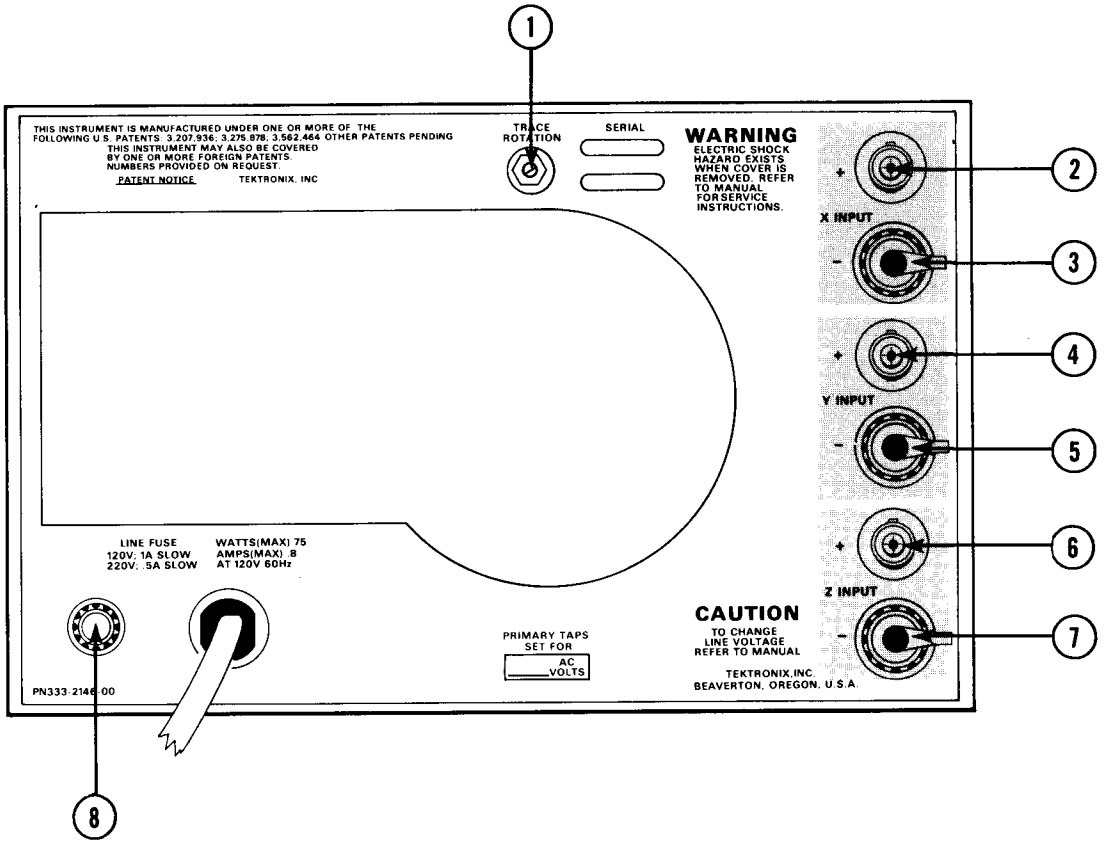
(7) **FOCUS**—Provides adjustment to obtain a well-defined display.

(8) **POWER (PULL ON)**—Controls power to the Monitor. Instrument is on when yellow band is visible.

2024-3

Figure 2-1. Front-panel controls.

@



(1) **TRACE ROTATION**—Adjustment to align the trace with the horizontal axis.

(2) **+ X INPUT**—BNC input connector to allow application of input signals. A positive signal applied deflects beam to the right; a negative signal deflects beam to the left.

(3) **– X INPUT**—BNC input connector. A positive signal applied deflects beam to the left; a negative signal deflects beam to the right.

(4) **+ Y INPUT**—BNC input connector. A positive signal applied deflects beam up; a negative signal deflects beam down.

(5) **– Y INPUT**—BNC input connector. A positive signal applied deflects beam down; a negative signal deflects beam up.

(6) **+ Z INPUT**—BNC input connector. A positive signal applied provides a linear function to increase crt brightness; a negative signal decreases crt brightness.

(7) **– Z INPUT**—BNC input connector. A positive signal applied provides a linear function to decrease crt brightness; a negative signal increases crt brightness.

(8) **LINE FUSE**—120 V: 1A SLOW; 220 V: 0.5 A SLOW. (Line fuse is internal for Option 6 instruments.*)

* **Refer qualified service personnel to the servicing information sections of the 606 Instruction Manual for further information.**

2024-4

Figure 2-2. Rear-panel controls and connectors.

NOTE

Check the line voltage information recorded on the rear panel. If the source voltage is not within this range, refer qualified service personnel to the servicing information sections of the 606 Instruction Manual.

3. Open the access door on the front panel and set the controls as follows:

SEC/DIV (Option 4 only). . . . . .10 μ

Vertical and Horizontal Positions. . . .Midrange

INTENSITY. . . . . .Fully counterclockwise

FOCUS . . . . . .Midrange

POWER (Pull On) . . . . .On (button out)

4. Allow at least one minute for the instrument to warm up.

5. Proceed to the appropriate Functional Check procedure for your instrument.

NOTE

Refer qualified service personnel to the servicing information sections of the 606 Instruction Manual to determine: (1) if your instrument employs an internal sweep (Option 4), and (2) if the amplifier input attenuators are set at 1X.

Instruments Without Internal Sweep

DISPLAY FUNCTIONS

1. Perform the Preliminary Set Up procedure.

2. Notice that a spot will appear on the crt, increasing in brightness as you slowly turn the INTENSITY control clockwise.

CAUTION

A high intensity level combined with a stationary spot will damage the crt phosphor. Therefore, set the INTENSITY control to the minimum necessary for good visibility.

3. Adjust the FOCUS control for a sharp, well-defined display.

4. Turn the vertical and horizontal Position controls and notice that the spot position can be controlled by both Position controls.

DEFLECTION AND Z-AXIS FUNCTIONS

1. Perform the Preliminary Set Up procedure.

2. Set the function generator for a 1-volt (peak-to-peak), 50-kilohertz sine-wave output.

3. Connect the function generator output to the rear-panel + X INPUT connector via the 42-inch cable.

4. Center the display with the horizontal Position control, and check for 8 divisions of horizontal deflection.

5. Remove the grounding cap from the – X INPUT connector.

6. Disconnect the signal from the + X INPUT connector and apply it to the – X INPUT connector.

7. Place the grounding cap on the + X INPUT connector.

8. Center the display with the horizontal Position control.

9. Check for 8 divisions of horizontal deflection.

10. Disconnect the signal from the – X INPUT connector and apply it to the + Y INPUT connector.

11. Center the display on the crt with the vertical Position control.

12. Check for 8 divisions of vertical deflection.

13. Remove the grounding cap from the – Y INPUT connector.

14. Disconnect the signal from the + Y INPUT connector and apply it to the – Y INPUT connector.

15. Place the grounding cap on the + Y INPUT connector.

16. Center the display on the crt with the vertical Position control.

17. Check for 8 divisions of vertical deflection.

18. Adjust the INTENSITY control for a barely-visible display.

19. Remove the grounding caps from the + X INPUT and the + Z INPUT connectors.

20. Disconnect the signal from the – Y INPUT connector and apply it to the + X INPUT and the + Z INPUT connectors via the 42-inch cable, BNC-to-BNC adapter, BNC T connector, and the two 18-inch cables.

21. Place the grounding caps on the – X INPUT and the – Z INPUT connectors.

22. Notice that the right end of the crt display becomes bright, and that the left end disappears.

23. Remove the grounding cap from the – Z INPUT connector.

24. Disconnect the signal from the + Z INPUT connector and apply it to the – Z INPUT connector.

25. Place the grounding cap on the + Z INPUT connector.

26. Notice that the left end of the crt display becomes bright, and that the right end disappears.

27. Disconnect the function generator.

This completes the Functional Check procedure for instruments without Option 4.

Instruments With Internal Sweep (Option 4)

NOTE

The following procedure applies to an Option 4 version of the 606 Monitor that has been properly set for internal sweep operation. Refer qualified service personnel to the servicing information sections of the 606 Instruction Manual to determine if the internal sweep of your instrument has been employed.

DISPLAY FUNCTIONS

1. Perform the Preliminary Set Up procedure.

2. Notice that a trace will appear on the crt, increasing in brightness as you slowly turn the INTENSITY control clockwise.

3. Adjust the FOCUS control for a sharp, well-defined trace.

4. Turn the vertical and horizontal Position controls and notice that the trace position can be controlled by both Position controls.

DEFLECTION AND Z-AXIS FUNCTIONS

1. Perform the Preliminary Set Up procedure.

2. Set the function generator for a 1-volt (peak-to-peak), 50-kilohertz sine-wave output.

3. Connect the function generator output to the rear-panel + Y INPUT connector via the 42-inch cable.

4. Center the display with the vertical Position control. If necessary, adjust the TRIG SLOPE/LEVEL control for a stable display.

5. Check for 8 divisions of vertical deflection.

6. Remove the grounding cap from the – Y INPUT connector.

7. Disconnect the signal from the + Y INPUT and apply it to the – Y INPUT connector.

8. Place the grounding cap on the + Y INPUT connector.

9. Center the display with the vertical Position control. If necessary, adjust the TRIG SLOPE/LEVEL control for a stable display.

10. Check for 8 divisions of vertical deflection.

11. Remove the grounding caps from the + Y INPUT and the + Z INPUT connectors.

12. Disconnect the signal from the – Y INPUT connector and apply it to the + Y INPUT and the + Z INPUT connectors via the 42-inch cable, BNC-to-BNC adapter, BNC T connector and the two 18-inch cables.

13. Place the grounding caps on the – Y INPUT and the – Z INPUT connectors.

14. Notice that only the top portion of the display is visible.

15. Remove the grounding cap from the – Z INPUT connector.

16. Disconnect the signal from the + Z INPUT connector and apply it to the – Z INPUT connector.

17. Place the grounding cap on the + Z INPUT connector.

18. Notice that only the bottom portion of the display is visible.

19. Disconnect the function generator.

This completes the Functional Check procedure for the 606 Monitor with Option 4.

DETAILED OPERATING INFORMATION

Signal Connectors

BNC connectors are provided at the rear of the instrument for application of input signals to the Horizontal (X) and Vertical (Y) Amplifiers for display on the crt, and to the Z-Axis Amplifier to control display intensity. Each amplifier is designed for either single-ended or differential operation. The 606 is shipped from the factory prepared for single-ended operation with a grounding cap connected to the – (inverting) input of each axis. For differential operation, remove the grounding cap and apply the input signals to the BNC connectors of the appropriate axis.

Input Signal Requirements

The vertical (Y) and horizontal (X) deflection factors are set at the factory to one volt for 8 divisions of deflection on each axis. Thus, as shipped, the input signal required for each division of deflection is 0.125 volt.

NOTE

The Functional Check procedure may be used to determine if the vertical and horizontal deflection factors of your particular instrument meet those set at the factory, as stated above.

WARNING

Electric-shock hazard present. Only qualified service personnel should change the input signal requirements. Refer them to the servicing information sections of the 606 Instruction Manual.

The best transient response from the 606 Monitor is achieved when the input signal amplitude to the vertical and horizontal inputs is no greater than that sufficient to provide full-screen deflection.

WARNING

To avoid electric shock, do not apply input signals of more than 25 volts (dc plus peak ac).

NOTE

Should fault conditions occur, the instrument is protected for application of input signals up to 100 volts (dc plus peak ac).

With no signals applied to the + Z INPUT and the − Z INPUT connectors, the intensity of the display is controlled only by the front-panel INTENSITY control. To control the display intensity with an externally applied signal, set the INTENSITY control to about midrange, and apply the input signal to the proper Z INPUT connector.

CAUTION

Exercise care in establishing the correct display intensity; a high-amplitude Z-Axis input signal, combined with an excessively high setting of the INTENSITY control, may damage the crt phosphor.

The input signal required for maximum display intensity, through the + Z INPUT connector, is set at the factory for +1 volt, or less. The input signal required to visually cut off the display intensity through the + Z INPUT connector is set at the factory for −1 volt, or less. The best transient response of the Z-Axis Amplifier is achieved when the input signal is the minimum required to provide the desired intensity change.

Input Attenuation

The Horizontal (X) and Vertical (Y) Amplifier input circuits include a selectable 1X or 5X attenuator, which is set for 1X operation when shipped from the factory. The Z-Axis Amplifier input circuit can also be modified to provide a range of input impedance and attenuation. The desired input attenuation should be selected by qualified service personnel only.

Option 4 Sweep Information

The SEC/DIV switch provides six calibrated sweep rates from 0.1 second to 1 microsecond/division in decade steps (VARIABLE control in the fully clockwise position). The VARIABLE control provides uncalibrated, continuously variable sweep rates between calibrated settings of the SEC/DIV switch.

When making time measurements using the graticule, the area between the second and tenth vertical lines provides the most linear measurement. (See Figure 2-3). Therefore, the first and last divisions of the display should not be used for making accurate time measurements. Position the start of the display to be measured to the second vertical line. Then set the SEC/DIV switch so that the end of the display measurement section falls between the second and tenth vertical line.

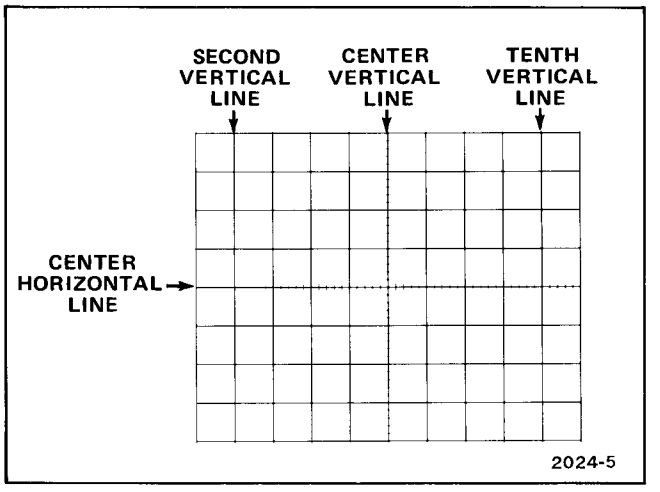


Figure 2-3. Definition of measurement lines on the 606 graticule.

INSTRUMENT OPTIONS

Your instrument may be equipped with one or more instrument options. A brief description of each available option is given in the following discussion. Option information is incorporated into the appropriate sections of the manual. Refer to Table 3-1 and the Table of Contents for location of option information. For further information on instrument options, see your Tektronix Catalog or contact your Tektronix Field Office.

WARNING

High voltage is present inside the instrument. To avoid electric-shock hazard, operating personnel must not remove the protective instrument covers. Component replacement and internal adjustments must be made by qualified service personnel only.

OPTION 1

An internal, unlighted, orange graticule of 8 X 10 centimeters is included on the crt faceplate.

OPTION 3

Deletes the carrying handle and feet.

OPTION 4

Includes an internal X-axis sweep with rates from one second/division to one microsecond/division. Instrument is internally selectable for X-Y or Y-T modes of operation. Refer qualified service personnel to the servicing information sections of the 606 Instruction Manual for further information.

OPTION 6

Standard 606 Monitor which has been modified to meet Underwriter's Laboratory 544 Medical and Dental Equipment requirements. The modifications include warnings required for medical equipment, a hospital grade cord and plug cap, and an internal line fuse. Refer qualified service personnel to the servicing information sections of the 606 Instructions Manual for further information.

OPTION 7

Deletes all protective cabinet panels, the feet, and the handle.

OPTION 76

Uses P7 phosphor in the crt.

OPTION 78

Uses P11 phosphor in the crt.

Table 3-1
Option Information Locator

Instrument Option	Manual Section	Location of Information
Option 1 (Internal Crt Graticule)	3 Instrument Options	Instrument Options All information is contained in this section.
Option 3 (Deletes Handle and Feet)	3 Instrument Options	Instrument Options All information is contained in this section.
Option 4 (Internal Sweep System)	1 General Information	Description Includes a basic description of the optional sweep circuit.
		Specification Table 1-1 contains the electrical characteristics of the optional sweep circuit.
	2 Operating Instructions	Controls and Connectors Figure 2-1 depicts and describes the controls of the optional sweep circuit.
		Functional Check Includes the functional check procedure for those monitors equipped with the optional sweep circuit.
		Detailed Operating Information Includes basic information for making time measurements.
	3 Instrument Options	Instrument Options Introductory page includes a brief description of the internal sweep system option.
Option 6 (Meets UL 544 Requirements)	3 Instrument Options	Instrument Options All information is contained in this section.
Option 7 (Deletes Panels, Feet, and Handle)	3 Instrument Options	Instrument Options All information is contained in this section.
Option 76 (P7 Phosphor)	3 Instrument Options	Instrument Options All information is contained in this section.
Option 78 (P11 Phosphor)	3 Instrument Options	Instrument Options All information is contained in this section.