Tektronix®
COMMITTED TO EXCELLENCE

634 MONITOR
WITH OPTIONS

OPERATORS

INSTRUCTION MANUAL

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

Serial Number _____

070-2560-00

First Printing JULY 1978

WARRANTY

This Tektronix product is warranted against defective materials and workmanship, under normal use, for a period of one year from date of initial shipment. Tektronix will repair or replace, at its option, those products determined to be defective within the warranty period and returned, freight prepaid, to a Tektronix Service Center. There is no implied warranty for fitness of purpose.

Please direct all requests for service or replacement parts to the nearest Tektronix Service Center or Field Office; include the type or part number of the product and its serial number.

Printed in U.S.A. Specification and price change privileges are reserved.

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OPERATORS SAFETY INFORMATION

The following general safety information applies to all operators and service personnel. Specific warnings will be found throughout the manual where they apply and should be followed in each instance.

WARNING statements identify conditions or practices which could result in personal injury or loss of life.

CAUTION statements identify conditions or practices which could result in damage to the equipment or other property.

The word **DANGER** on the equipment identifies areas of immediate hazard which could result in personal injury or loss of life.

The following safety symbols may appear on the equipment:


CAUTION—Refer to manual


DANGER—High voltage


Protective ground (earth) terminal

Other warning symbols where they apply.

AC POWER SOURCE AND CONNECTION

This instrument operates from a single-phase power source and has a three-wire power cord with a two-pole, three-terminal grounding-type connector. The voltage to ground (earth) from either pole of the power source must not exceed the maximum rated operating voltage, 250 volts.

Before making connection to the power source, a qualified service person should verify that the instrument is set to match the voltage of the power source and has a suitable two-pole, three-terminal grounding-type connector.

GROUNDING THE INSTRUMENT

This instrument is safety class 1 equipment (IEC designation). Safety class 1 equipment has a 3-wire power cord with a 3-contact plug for connection to the power source and to protective ground. The plug protective-ground contact connects (through the cord protective-grounding conductor) to the accessible metal parts of the equipment. For electric-shock protection, insert this plug into a socket outlet that has a securely grounded protective-ground contact.*

For medical-dental applications (to assure grounding integrity) the hospital-grade input plug must be inserted only into a mating hospital-grade receptacle with a grounding contact.

To confirm that the socket-outlet ground contact is securely grounded, refer to qualified service personnel.

**IEC: International Electrotechnical Commission*

MEDICAL-DENTAL APPLICATIONS

Do not use the VIDEO 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 instrument is not to be used for direct patient connection, interconnecting this Monitor 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 Areas of Health Care Facilities, section 3038, "Signal Transmission Between Appliances". Also refer to NFPA 70, National Electrical Code, paragraphs 517-120 through 517-122.

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

USE THE PROPER FUSE

Refer fuse replacement to qualified service personnel only. To avoid electric shock and fire hazard, use only the fuse specified in the parts list for your instrument and which is identical in the following respects.

A. Type—Slow blow, fast blow, etc.

B. Voltage rating—250 V, etc.

C. Current rating.

DO NOT REMOVE PROTECTIVE COVERS

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

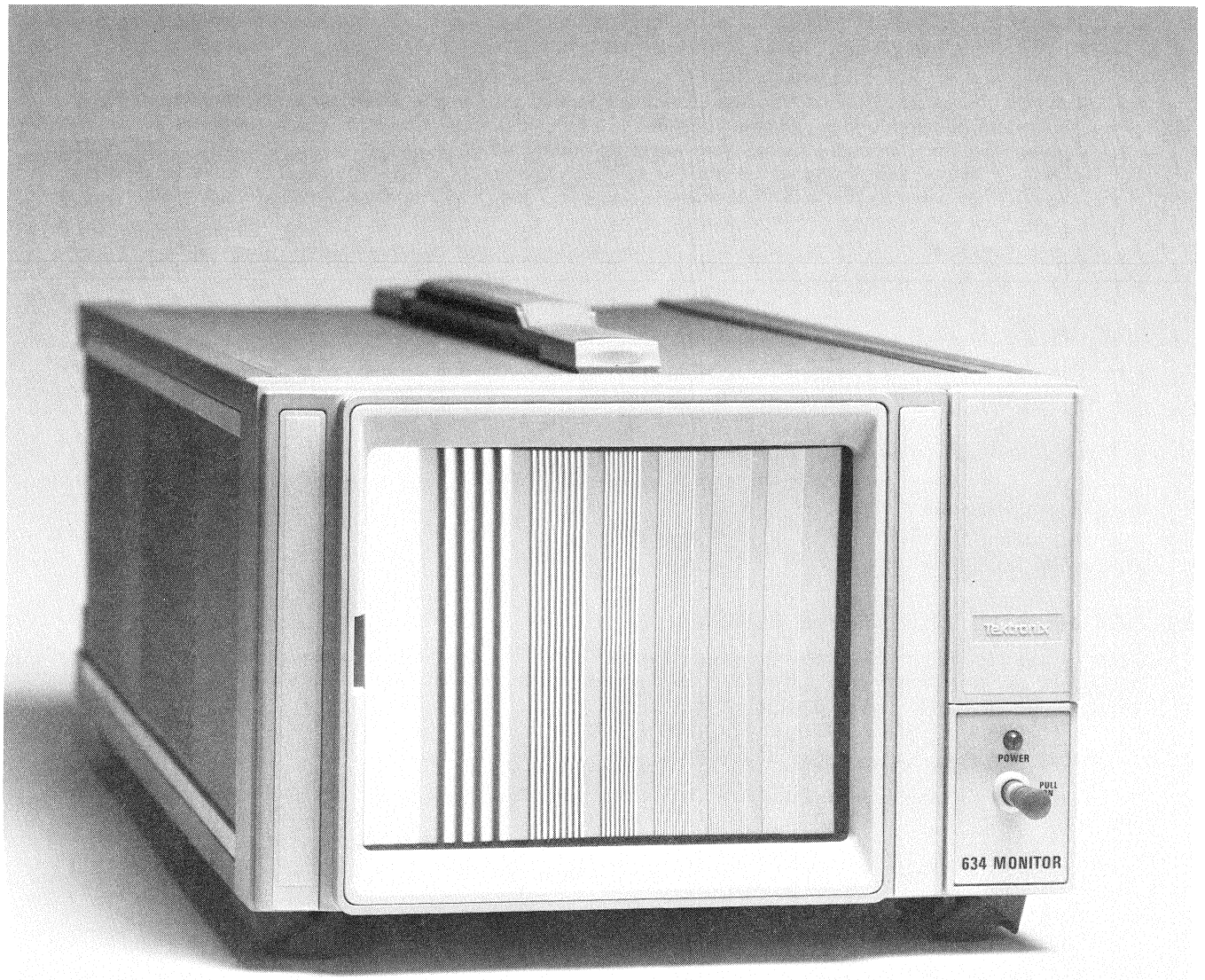
LIMIT INPUT SIGNAL VOLTAGE

To avoid electric-shock hazard and to protect the instrument, do not apply input signals of greater than 5 volts (dc + peak ac).

CAUTION

PREVENT IMAGE BURN-IN ON CRT PHOSPHOR

To avoid damaging the crt phosphor, do not allow a stationary bright image to remain on the screen any longer than necessary.



634 MONITOR (OPTION 23) FEATURES

The 634 Monitor utilizes magnetic deflection raster scan to provide a 9 x 12 video display area on the crt. The 634 is well suited for many display applications in ultrasonic detection systems, electron microscope systems, radiation and thermal scanning systems, speech therapy, mechanical pressure, volume and vibration analysis, and medical biophysical systems. The 634 may also be used to provide video displays of alpha-numeric and graphic information from measurement systems, computers, and other data-transmission systems. The rear panel VIDEO INPUT connectors provide a means to operate several 634 Monitors from a single video source.

The external physical dimensions of the 634 Monitor lends itself to easy rackmounting to adjacent equipment.

GENERAL INFORMATION

INTRODUCTION

The Operators Manual contains information necessary to effectively operate the 634 Monitor and is divided into three sections: Section 1 provides packaging for shipment information, specifications, and a list of standard accessories. Section 2 contains operating information. Information concerning available options for the 634 Monitor is located in section 3.

The Instruction Manual contains ten sections. Operating information is covered in the first two sections, servicing information is covered in the remaining eight sections. 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 schematic diagrams are defined on the first page of the Diagrams and Circuit Board Illustrations section. Abbreviations used in the manuals, except 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 DESCRIPTION

The 634 Monitor is a compact, solid-state instrument with excellent resolution, providing a video display of information input to the VIDEO INPUT connectors on the rear panel.

WARNING

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

Video signals connected to the VIDEO INPUT connector are amplified by the Input and Video Output Amplifiers to drive the crt control grid.

The Input Amplifier also supplies a synchronization signal to the Vertical and Horizontal Ramp Generators. The vertical and horizontal ramps are then geometrically shaped and amplified to drive the electromagnetic deflection yokes.

Signal samples from the Vertical Ramp Generator and Horizontal Yoke Driver provide retrace blanking to the crt cathode. Screen blanking can be achieved by supplying a zero input level to the rear-panel TTL BLANKING connector.

The Dynamic Focus circuit provides focus correction for the display when the crt beam is deflected from crt center. Thus, by varying the voltage to the crt focus element, the Dynamic Focus Circuit compensates for geometric defocusing.

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

SPECIFICATION

The electrical specifications listed in Table 1-1 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° (+32° and +122°F), and (3) the instrument must have been operating for at least 20 minutes.

TABLE 1-1

Electrical Characteristics

Characteristic	Performance Requirement
VIDEO INPUT SIGNAL	
Sync Pulse	Negative (negative black level).
Amplitude	0.35 V to 2 V peak-to-peak (max.).
Return Loss	46 dB to 5 MHz with internal 75 Ω termination and power on.
Maximum Nondestructive Input Voltage	±5 V peak.
Bandwidth	1 Hz to at least 10 MHz.
RASTER	
Sweep Rate	
Vertical	60 ramps/second, sync pull-in within 2%.
Horizontal	15,750 ramps/second, sync pull-in within 2%.
Linearity	
Display Area	
9 cm diameter circle centered within the 9 x 12 cm graticule area.	Within 0.5% of the height (0.045 cm or 0.018 inch).
9 x 12 cm graticule area excluding the centered 9 cm diameter circle.	Within 1% of the height (0.09 cm or 0.036 inches).
Linearity (Option 1 Only)	Also refer to Resolution (Option 1).
Display Area	
9 cm diameter circle centered within the 9 x 12 cm graticule area.	Within 1% of the height (0.09 cm or 0.036 inches).
9 x 12 cm graticule area excluding the centered 9 cm diameter circle.	Within 2% of the height (0.018 cm or 0.07 inches).

TABLE 1-1 (CONT.)

Electrical Characteristics

Characteristic	Performance Requirement
VIDEO AMPLIFIER	
DC Restoration	Referenced to back porch
CRT DISPLAY	
Acceleration Potential	15 kV, within 5%, 1% regulation.
Heater Voltage	6.2 V @ 103 mA, within 5 %.
Faceplate	Flat.
Quality Area	12 cm horizontally by 9 cm vertically.
Diagonal (Of Quality Area)	15 cm (5.91 inches).
Deflection Angle	56 grads (50.4°).
Phosphor	P45.
Brightness	At least 150 fl.
Resolution	1100 lines center area @ 30 fl.
Corner Defocus	650 lines at 30 fl. 900 lines at 30 fl on 9 cm circle.
Resolution (Option 1 Only)	650 lines at screen center. 550 lines on 9 cm circle. 300 lines on 9 x 12 cm corners. Also refer to Linearity (Option 1).
POWER SOURCE	
Power Consumption (120 V AC, 60 ~)	50 W, 0.5 A maximum.
Line Voltage Range	
110 V AC (Nominal)	90 to 110 V ac. 99 to 121 V ac. 108 to 132 V ac.
220 V AC (Nominal)	180 to 220 V ac. 198 to 242 V ac. 216 to 250 V ac.
Line Frequency Range	48 to 440 Hz.
Power Requirements From An External Source (Option 20 Only)	
DC Supplies	+9 V within 10%, 300 mA, 1 V max ripple. +23 V within 10%, 1 A, 6 V max ripple. -22 V within 10%, 700 mA, 3 V max ripple.

TABLE 1-1 (CONT.)

Electrical Characteristics

Characteristic	Performance Requirement
Power Requirements (cont.)	
Monitor Regulated Output Voltages	Within 0.2%.
Total Power Consumed	45 W.

TABLE 1-2

Environmental Characteristics

Characteristic	Information
NOTE *This instrument will meet the electrical characteristics given in the Performance Requirement column of Table 1-1 over the following environmental limits.*	
Temperature	
Operating	0° to +50°C.
Storage	-40° to +70°C.
Altitude	
Operating	To 4.6 km (15,000 feet).
Storage	To 15.2 km (50,000 feet).
Transportation	Qualified under National Safe Transit Committee Test Procedure 1A, Category II.

TABLE 1-3

Physical Characteristics

Characteristic	Information
Net Weight	
Standard	6.3 kg (13.8 lb).
Option 20	4.6 kg (10.1 lb).
Options 6, 23	7.2 kg (15.9 lb).
Option 28	7 kg (15.5 lb).
Overall Dimensions	
Standard	Refer to Figure 1-1.
Option 20 Only	Refer to Figure 1-2.
Detailed Dimensional Drawing	Refer to the detailed dimensional drawing in the foldout section.

@

STANDARD ACCESSORIES

1 ea	Operators Manual
1 ea	Instruction Manual
1 ea	Linearity Graticule (Standard)
1 ea	Smoke Gray Filter
1 ea	Linearity Graticule (Option 1 only)

PACKAGING FOR SHIPMENT

If this instrument is to be shipped for long distances by commercial transportation, packaging the instrument in the original manner is recommended for maximum protection. The carton and packaging material in which your instrument was shipped should be saved and used for this purpose.

Also, if this instrument is to be shipped to a Tektronix Service Center for service or repair, attach a tag to the instrument showing the following: Owner of the instrument (with address), 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.

If the original packaging is unfit for use or not available, package the instrument as follows:

1. Obtain a corrugated cardboard shipping carton having inside dimensions of no less than six inches more than the instrument dimensions; this will allow for cushioning. The carton should have a test strength of at least 275 lbs.

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.

5. Mark the address of the Tektronix Service Center and your return address on the carton in one or more prominent locations.

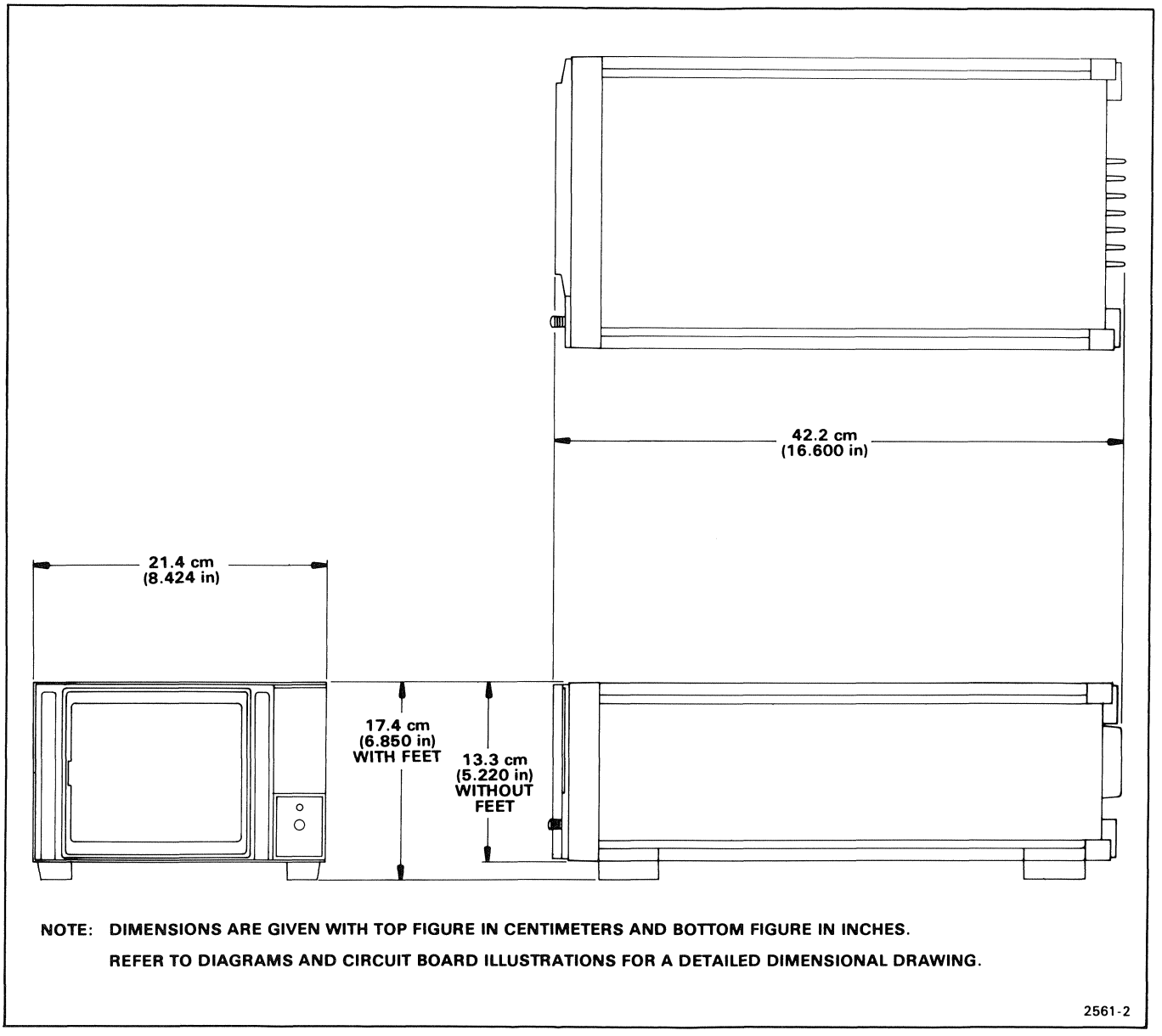


Figure 1-1. Dimensional drawing (Standard instrument package).

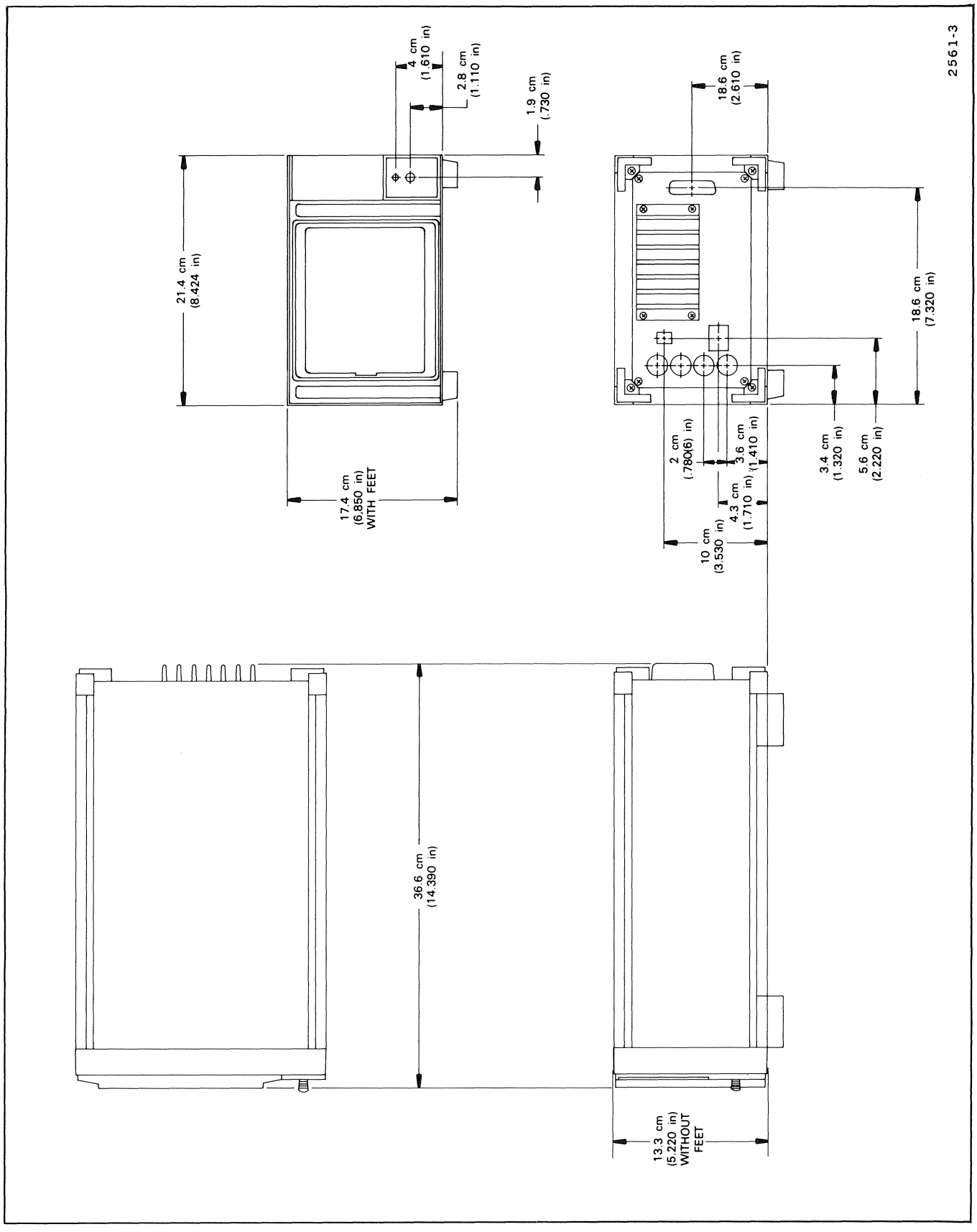


Figure 1-2. Dimensional drawing (Option 20 only).

OPERATING INSTRUCTIONS

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 above operating limits, allow the chassis temperature to return to within the operating limits before applying power. Allowing the Monitor to operate at an ambient temperature substantially higher than that specified may result in poor reliability as well as inaccurate performance.

When the 634 is mounted in a rack with other equipment, it is important that the ambient temperature surrounding the Monitor does not exceed +50° C (+122° F). Additional clearance for convection, or forced ventilation methods (fan), may be needed to maintain ambient temperatures below +50° C (+122° F). Reliability and performance of the 634 will be affected if the ventilation holes in the protective panels are obstructed, or if the 634 is operated at an ambient temperature higher than +50° C (+122° F). Other environments and mounting configurations may require additional cooling measures.

CONTROLS AND CONNECTORS

Controls and connectors necessary for operation of the 634 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 are shown and described in Figure 2-1. Brief descriptions of the standard rear-panel controls and connectors are given in Figure 2-2. The Option 20 rear panel is illustrated in Figure 2-3.

INPUT SIGNAL REQUIREMENTS

The 634 Monitor requires a negative sync-tip video input signal for proper operation. The input signal amplitude range should not exceed 0.35 to 2 volts peak-to-peak for normal operation, or a maximum of 5 volts peak.

OPERATORS CHECKOUT PROCEDURE

The following procedure is provided to aid in obtaining a display on the 634 Monitor and may be used as a check of basic instrument operation. The procedure 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 this procedure. Therefore, a minimum amount of test equipment is required. If performing the Operators Checkout 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 Operators Checkout Procedure. 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. Sync Pulse and Test Signal Generator

   Description: Negative-synchronized video signal generator.

   Type Used: TEKTRONIX 1470 NTSC Color Sync Test Signal Generator.

2. Cable

   Description: Coaxial; length, 42 inches; connectors, BNC male-to-male; impedance, 75 ohms.

   Type Used: Tektronix Part 012-0074-00.

PRELIMINARY SETUP

1. Connect the 634 Monitor power cord to a suitable power source.

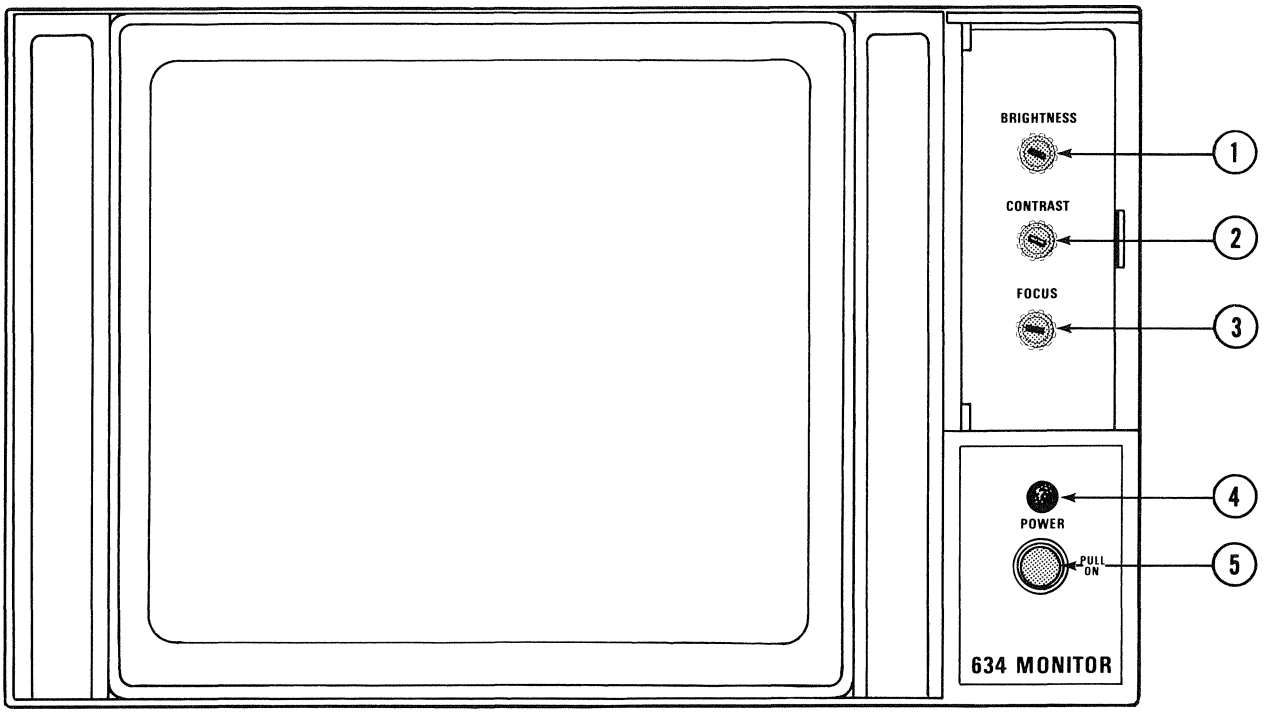
NOTE

Check the line voltage information indicated on the rear panel. If the source voltage is not within this range, refer qualified service personnel to the servicing information sections of the 634 Instruction Manual.

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

BRIGHTNESS ..... Fully counterclockwise
FOCUS ..... Midrange
CONTRAST ..... Midrange
POWER ..... Out (PULL ON)

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



(1) **BRIGHTNESS**—Provides adjustment of brightness (black and white) level.

(2) **CONTRAST**—Provides adjustment of contrast (white) level.

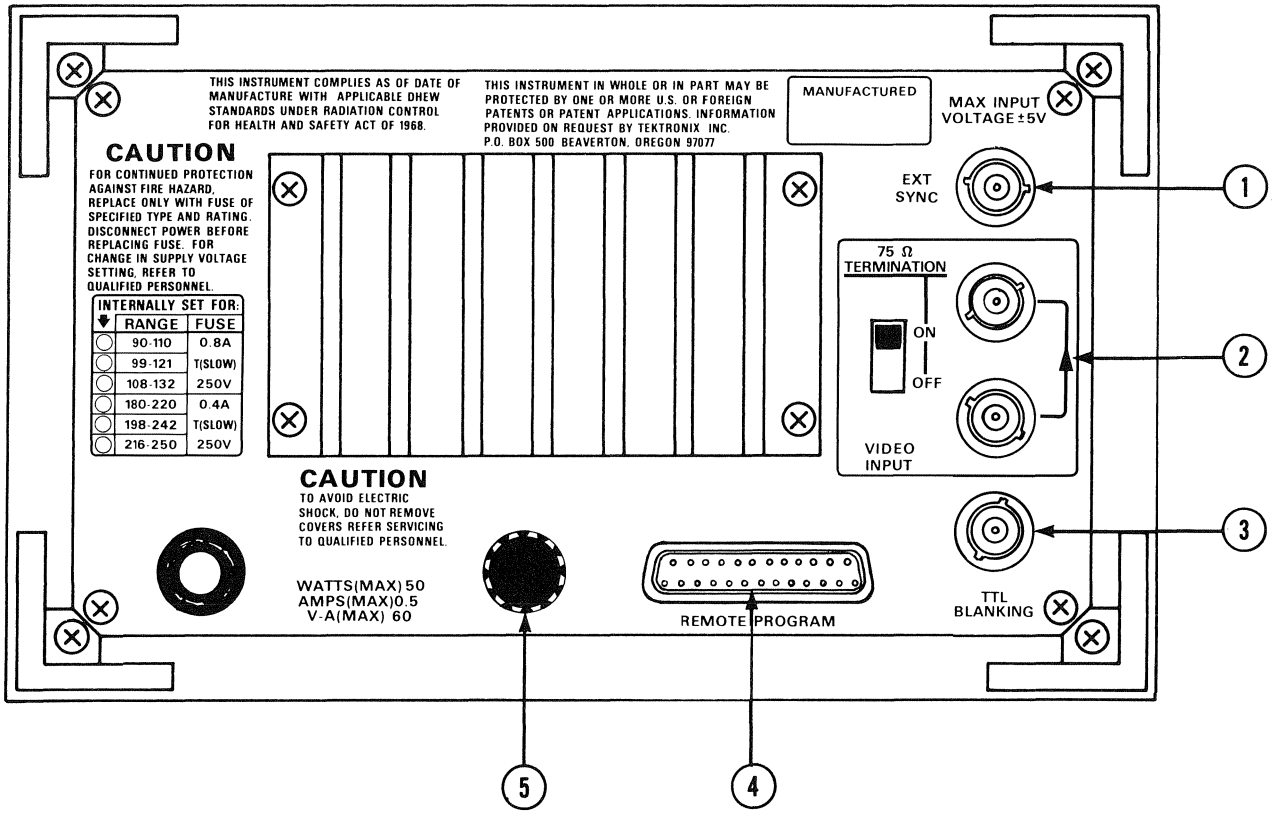
(3) **FOCUS**—Provides adjustment to obtain a well-defined display.

(4) **POWER (Indicator)**—Illuminates when instrument is on.

(5) **PULL ON**— Controls power to the Monitor. Instrument is on when the knob is out.

2561-4

Figure 2-1. Front-panel controls and indicators.



(1) **EXT SYNC (Option 11 only)**—Provides a means to connect external signals for synchronizing the Monitor.

(2) **VIDEO INPUT**—Provides a means to connect a video signal to the Monitor. A video signal connected to either of the two BNC connectors will be properly terminated when the 75 Ω TERMINATION switch is in the ON position. Several Monitors can be operated from a single video source by connecting them in series (utilizing the unused connector) and setting the 75 Ω TERMINATION switch to the OFF position.

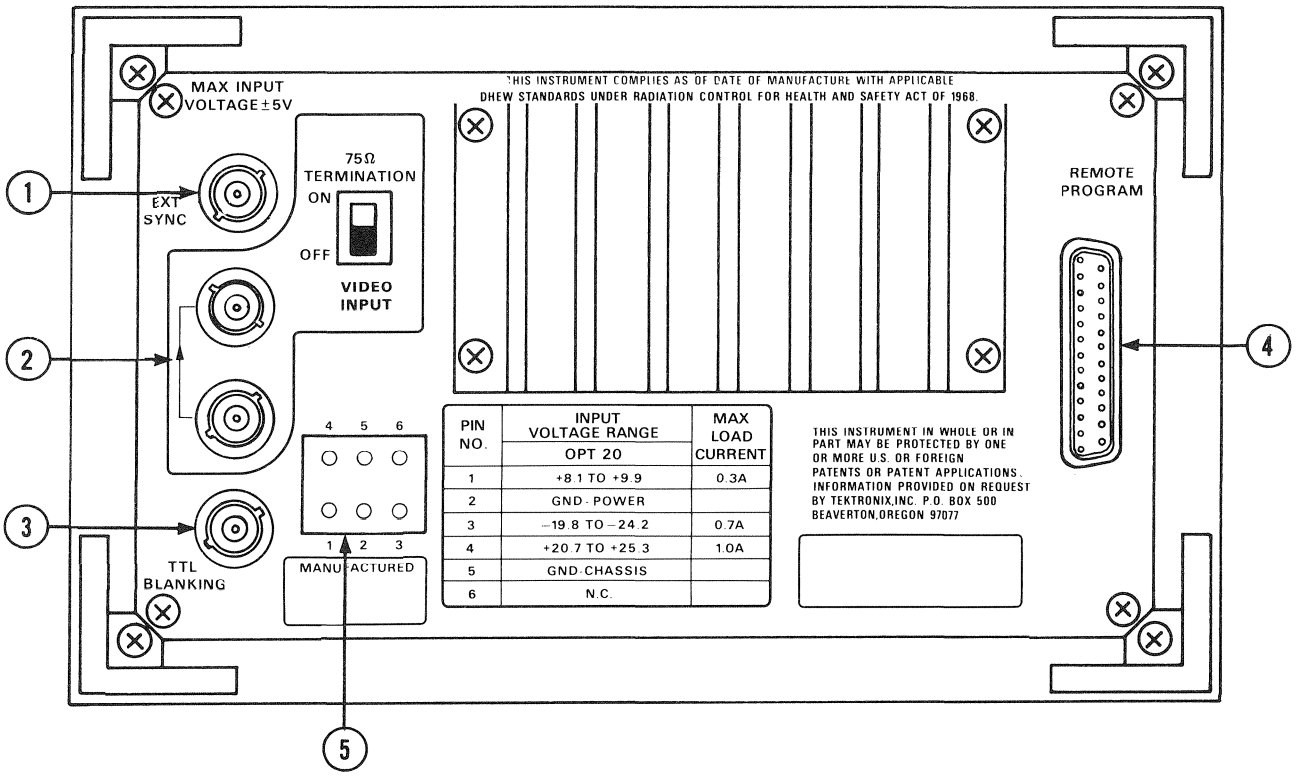
(3) **TTL BLANKING**—Provides a means to connect an external TTL zero level for screen blanking.

(4) **REMOTE PROGRAM (Option 16 only)**—Multi-pin connector provides for remote control of the BRIGHTNESS, CONTRAST, and FOCUS controls; a video reverse switch (Option 13 only), and remote inputs for the video, external sync (Option 11 only), and TTL Blanking signals.

(5) **LINE FUSE**—120 V, 0.8 A slow blow, or 240 V, 0.4 A slow blow (use 3AG 250 V fuse).

2561-5

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



(1) — **EXT SYNC (Option 11 only)**—Provides a means to connect external signals for synchronizing the Monitor.

(2) — **VIDEO INPUT**—Provides a means to connect a video signal to the Monitor. A video signal connected to either of the two BNC connectors will be properly terminated when the 75 Ω TERMINATION switch is in the ON position. Several Monitors can be operated from a single video source by connecting them in series (utilizing the unused connector) and setting the 75 Ω TERMINATION switch to the OFF position.

(3) — **TTL BLANKING**—Provides a means to connect an external TTL zero level for screen blanking.

(4) — **REMOTE PROGRAM (Option 16 only)**—Multi-pin connector provides for remote control of the BRIGHTNESS, CONTRAST, and FOCUS controls; a video reverse switch (Option 13 only), and remote inputs for the video, external sync (Option 11 only), and TTL Blanking signals.

(5) — **EXTERNAL-POWER INPUT CONNECTOR**—Provides a means to connect power to the Monitor from an external source. Pin 1, +9 V dc; pin 2, supply common; pin 3, -22 V dc; pin 4, +23 V dc; and pin 5, protective grounding.

2561-36

Figure 2-3. Option 20 rear-panel controls and connectors.

DISPLAY FUNCTIONS

1. Perform the above Preliminary Set Up procedure.

2. Notice a raster will appear on the screen, increasing in brightness as you slowly turn the BRIGHTNESS control clockwise.

CAUTION

A high brightness level combined with a stationary image may damage the crt phosphor. Therefore, set the BRIGHTNESS control to the minimum necessary for good visibility.

3. Connect the 1470 signal generator to the lower VIDEO INPUT connector on the rear panel and set the 75 Ω TERMINATION switch to ON. Set the 1470 for window signal output.

4. Adjust the FOCUS and CONTRAST controls for a sharp, well-defined display.

5. Set the rear-panel 75 Ω TERMINATION switch to OFF.

6. Notice that the raster background level has increased.

7. Set the 75 Ω TERMINATION switch to ON.

8. Disconnect the 1470 signal generator.

This completes the Operators Checkout Procedure for the 634 Monitor.

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. Refer to Table 3-1 for location of option information. For further information on options, see your Tektronix Catalog or contact your Tektronix Field Office.

OPTION 1

Replaces the standard crt with a reduced resolution crt.

OPTION 6

Listed as Professional Medical Equipment by Underwriters Laboratories, Inc. Modifications include warnings required for medical equipment, a hospital grade card and plug cap, an internal line fuse, a carrying handle, protection panels, and feet. (Cannot be ordered with Option 20.)

OPTION 9

Certified as a recognized component, Professional Medical Equipment, by Underwriters Laboratories, Inc.

OPTION 11

Additional BNC connector on rear panel allows input of external sync signal (internally switchable).

OPTION 13

Reverse video signal (from positive to negative picture) with switch on front-panel board, or 0 V TTL level input on a remote line from the front-panel board.

OPTION 16

Multi-pin connector on rear panel provides for remote control of the BRIGHTNESS, CONTRAST, and FOCUS controls; a video-reverse switch (Option 13 only), and remote inputs for the video, external sync (Option 11 only), and TTL unblanking signals.

OPTION 17

The front-panel CONTRAST, BRIGHTNESS, and FOCUS controls are repositioned to provide access from the top of the instrument. Not available with Options 6, 23, or 28.

OPTION 20

Deletes power transformer and regulators. Requires external dc supply (+ and -18 to 24 V and +8 to 10 V unregulated).

OPTION 23

Includes handles, feet, and protective covers (not available with Option 20).

OPTION 28

Provides protective covers only (not available with Options 6 or 20).

OPTION 74

Uses P4 phosphor in the crt.

TABLE 3-1
Option Information Locator

Instrument Option	Manual Section	Location Of Information
Option 1 (Reduced Resolution CRT)	1 General Information	Specification Table 1-1 contains the reduced resolution linearity specifications.
	3 Instrument Options	Instrument Options Includes a brief description of the optional reduced resolution CRT.
Option 6 (Listed as Professional Medical Equipment by Underwriter Laboratories, Inc.)	1 General Information	Specification Table 1-3 contains physical characteristics of the optional UL listing.
	3 Instrument Options	Instrument Options All information is contained in this section.
Option 9 (Certified as a recognized component, Professional Medical Equipment, by Underwriters Laboratories, Inc.)	3 Instrument Options	Instrument Options All information is contained in this section.
Option 11 (External sync input connector)	2 Operating Instructions	Controls and Connectors Figure 2-2 depicts and describes Ext Sync input connector.
	3 Instrument Options	Instrument Options Includes a brief description of the optional External Sync BNC connector.
Option 13 (Reverse video signal)	3 Instrument Options	Instrument Options All information is contained in this section.
Option 16 (Multi-pin connector on rear panel, for remote control)	2 Operating Instructions	Controls and Connectors Figure 2-2 depicts and describes the multi-pin connector.
	3 Instrument Options	Instrument Options Includes a brief description of the optional multi-pin connector.
Option 17 (Front-panel CONTRAST, BRIGHTNESS, and FOCUS controls repositioned to provide access from top of instrument)	3 Instrument Options	Instrument Options All information is contained in this section.
Option 20 (Deletes power transformer and regulators)	1 General Information	Specification Table 1-1, 1-3, and Figure 1-2 contains Electrical and Physical characteristics of the Option 20 Monitor.
	3 Instrument Options	Instrument Options Includes a brief description of the Option 20 Monitor.

TABLE 3-1 (CONT.)
Option Information Locator

Instrument Option	Manual Section	Location Of Information
Option 23 (Includes handles, feet, and protective covers)	1 General Information	Specification Table 1-3 contains the weight of the Option 23 Monitor.
	3 Instrument Options	Instrument Options Includes a brief description of the Option 13 Monitor.
Option 28 (Provides protective covers only)	1 General Information	Specification Table 1-3 contains the weight of the Option 28 Monitor.
	3 Instrument Options	Includes a brief description of the Option 28 Monitor.
Option 74 (P4 Phosphor)	3 Instrument Options	Instrument Options All information is contained in this section.

MANUAL CHANGE INFORMATION

At Tektronix, we continually strive to keep up with latest electronic developments by adding circuit and component improvements to our instruments as soon as they are developed and tested.

Sometimes, due to printing and shipping requirements, we can't get these changes immediately into printed manuals. Hence, your manual may contain new change information on following pages.

A single change may affect several sections. Since the change information sheets are carried in the manual until all changes are permanently entered, some duplication may occur. If no such change pages appear following this page, your manual is correct as printed.

SERVICE NOTE

Because of the universal parts procurement problem, some electrical parts in your instrument may be different from those described in the Replaceable Electrical Parts List. The parts used will in no way alter or compromise the performance or reliability of this instrument. They are installed when necessary to ensure prompt delivery to the customer. Order replacement parts from the Replaceable Electrical Parts List.

CALIBRATION TEST EQUIPMENT REPLACEMENT

Calibration Test Equipment Chart

This chart compares TM 500 product performance to that of older Tektronix equipment. Only those characteristics where significant specification differences occur, are listed. In some cases the new instrument may not be a total functional replacement. Additional support instrumentation may be needed or a change in calibration procedure may be necessary.

Comparison of Main Characteristics

DM 501 replaces 7D13		
PG 501 replaces 107	PG 501 - Risetime less than 3.5 ns into 50 Ω.	107 - Risetime less than 3.0 ns into 50 Ω.
108	PG 501 - 5 V output pulse; 3.5 ns Risetime	108 - 10 V output pulse 1 ns Risetime
PG 502 replaces 107		
108	PG 502 - 5 V output	108 - 10 V output
111	PG 502 - Risetime less than 1 ns; 10 ns Pretrigger pulse delay	111 - Risetime 0.5 ns; 30 to 250 ns Pretrigger pulse delay
PG 508 replaces 114	Performance of replacement equipment is the same or better than equipment being replaced.	
115		
2101		
PG 506 replaces 106	PG 506 - Positive-going trigger output signal at least 1 V; High Amplitude output, 60 V.	106 - Positive and Negative-going trigger output signal, 50 ns and 1 V; High Amplitude output, 100 V.
067-0502-01	PG 506 - Does not have chopped feature.	0502-01 - Comparator output can be alternately chopped to a reference voltage.
SG 503 replaces 190, 190A, 190B	SG 503 - Amplitude range 5 mV to 5.5 V p-p.	190B - Amplitude range 40 mV to 10 V p-p.
191		
067-0532-01	SG 503 - Frequency range 250 kHz to 250 MHz.	0532-01 - Frequency range 65 MHz to 500 MHz.
SG 504 replaces 067-0532-01	SG 504 - Frequency range 245 MHz to 1050 MHz.	0532-01 - Frequency range 65 MHz to 500 MHz.
067-0650-00		
TG 501 replaces 180, 180A	TG 501 - Trigger output-slaved to marker output from 5 sec through 100 ns. One time-mark can be generated at a time.	180A - Trigger pulses 1, 10, 100 Hz; 1, 10, and 100 kHz. Multiple time-marks can be generated simultaneously.
181		181 - Multiple time-marks
184	TG 501 - Trigger output-slaved to market output from 5 sec through 100 ns. One time-mark can be generated at a time.	184 - Separate trigger pulses of 1 and 0.1 sec; 10, 1, and 0.1 ms; 10 and 1 μs.
2901	TG 501 - Trigger output-slaved to marker output from 5 sec through 100 ns. One time-mark can be generated at a time.	2901 - Separate trigger pulses, from 5 sec to 0.1 μs. Multiple time-marks can be generated simultaneously.

NOTE: All TM 500 generator outputs are short-proof. All TM 500 plug-in instruments require TM 500-Series Power Module.

REV B, JUN 1978

TEKTRONIX®
committed to technical excellence

MANUAL CHANGE INFORMATION

PRODUCT 620, 634

CHANGE REFERENCE C4/179

DATE 1-9-79

CHANGE:	DESCRIPTION

620 Operators Manual 070-2651-00

634 Operators Manual 070-2560-00

634 Instruction Manual 070-2561-00

TEXT ADDITIONS

SECTION 1, GENERAL INFORMATION

ADD: The following text to page 1-1.

EXTERIOR CLEANING

Loose dust accumulated on the outside of the instrument can be removed with a soft cloth or small brush. The brush is particularly useful for dislodging dirt on and around the front-panel controls. Dirt which remains can be removed with a soft cloth dampened in a mild detergent and water solution. Abrasive cleaners should not be used.