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TEKTRONIX®

607 MONITOR

WITH OPTIONS

INSTRUCTION MANUAL

Tektronix, Inc.
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WARNING

THE REMAINING PORTION OF THIS TABLE OF CONTENTS LISTS THE SERVICING INSTRUCTIONS. THESE SERVICING INSTRUCTIONS ARE FOR USE BY QUALIFIED PERSONNEL ONLY. TO AVOID ELECTRICAL SHOCK, DO NOT PERFORM ANY SERVICING OTHER THAN THAT CALLED OUT IN THE OPERATING INSTRUCTIONS UNLESS QUALIFIED TO DO SO.

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LIST OF ILLUSTRATIONS

PETER CHRISTIE
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The illustrations in Section 9 are located near their associated diagrams on the foldout pages.

LIST OF TABLES

OPERATOR SAFETY SUMMARY

This manual contains safety information which the user must follow to ensure safe operation of the 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 in the operating sections of this manual and which must be applied during all phases of operation.

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 the operating sections of this manual, and are repeated here for emphasis:

WARNING

Do Not Remove Instrument Covers

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.

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 607 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.

SERVICE SAFETY SUMMARY

The following are safety precautions which appear in the servicing information sections of this manual, and are repeated here for emphasis:

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 connected directly to a patient, interconnecting this monitor to other equipment can result in the application of excessive current to a patient. It is extremely important that the interconnection is made in accordance with NFPA 76B-T, Tentative Standard for the Safe Use of Electricity in Patient Care Facilities, section 3038, "Signal Transmission Between Appliances".

Ground the Instrument

The instrument is intended to be operated from a single-phase, earth-referenced power source having one current-carrying conductor (the Neutral Conductor) near earth potential. Operation from power sources where both current-carrying conductors are live with respect to earth (such as phase-to-phase on a three-wire system) is not recommended, since only the Line Conductor has over-current (fuse) protection within the instrument.

This instrument has a three-wire power cord with a polarized two-pole, three-terminal plug for connection to the power source and safety-earth. The safety-earth terminal of the plug is directly connected to the instrument frame. For electric-shock protection, insert this plug only in a mating outlet with a safety-earth contact. Do not defeat the grounding connection. Any interruption of the grounding connection can create an electric-shock hazard. Before making external connections to this instrument, always ground the instrument first by connecting the power-cord plug to a proper mating power outlet.

Disconnect Instrument Power

Disconnect the monitor from the power source, to avoid electric shock, before removing the cabinet panels, replacing components, soldering, or changing the X Atten switch settings.

CRT Handling

Use care when handling a crt. Breakage of the crt causes a high-velocity scattering of glass fragments (implosion). Protective clothing and safety glasses should be worn. Avoid striking the crt on any object which might cause it to crack or implode. When storing a crt, place it in a protective carton or set it face down in a protected location on a smooth surface with a soft mat under the faceplate.

CAUTION

Apply Proper Line Voltage

To prevent damage to the instrument, always check the line-voltage information recorded on the rear panel before applying power to the instrument.

Damage to the instrument may result from incorrect placement of the line-voltage selector plug.

Use Proper Cleaning Agents

Avoid the use of chemical cleaning agents which might damage the plastics used in this instrument. Use isopropyl alcohol, total denatured ethyl alcohol or TP35. Before using any other solvents, consult your Tekronix Service Center.

Avoid Excessive Moisture

Make sure circuit boards and components are dry before applying power to prevent damage from arcing.

Avoid CRT Phosphor Damage

Do not allow a high-intensity spot to remain stationary on the crt. The crt phosphor could be permanently damaged.

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FEATURES

The 607 Storage Monitor provides a bright variable-persistence X-Y display of analog data on a 7.2 x 9 centimeter (2.8 x 3.5 inch) viewing area. The 607 is well suited for many display applications in ultrasonic detection, electron microscope, radiation and thermal scanning systems, speech therapy, mechanical pressure, volume, and vibration analysis, and medical and biophysical systems. The 607 may also be used to provide stored displays of alpha-numeric and graphic information from measurement systems, computers and other data-transmission systems.

All display axes (vertical, horizontal and intensity) can be operated differentially as well as from a single-signal source. A Remote Program connector provides access to some operate-mode functions from a remote station. The storage crt allows a display to be stored in excess of 5 minutes (longer display times are possible in the Save mode).

GENERAL INFORMATION

INTRODUCTION

The Operators Manual contains information necessary to effectively operate the 607 Storage Monitor and is divided into three sections: Section 1 provides packaging for shipment information, specifications, and a list of standard and recommended accessories. Section 2 contains operating information. Information concerning available options for the 607 Storage Monitor is 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.

PACKAGING FOR SHIPMENT

If this instrument is to be shipped for long distances by commercial transportation, it is recommended that the instrument be packaged in the original manner 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 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.

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

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.

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, (2) the instrument must be operating in an ambient temperature between 0° and +50° C, 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	Nominally set at 1 V within 2%, for 8 div of deflection. Internally adjustable from 0.5 V or less to at least 2.5 V full scale. An internal 5:1 attenuator extends the deflection factor range to at least 12.5 V full scale.
Horizontal	Nominally set at 1 V within 2%, for 8 div of deflection. Internally adjustable from 0.5 V or less to at least 2.5 V full scale. An internal 5:1 attenuator extends the deflection factor range to at least 12.5 V full scale.
Attenuators	Deflection factor reduced five times, within 3%, with 5:1 attenuation.
Polarity (Differential Inputs)	Positive signal applied to + input deflects beam up or to the right; negative signal deflects beam down or to the left. Positive signal applied to – input deflects beam down or to the left; negative signal deflects beam up or to the right.
Settling Time	Spot must reach new writing position within 1 spot diameter within 1 μs from any on-screen position.
Bandwidth (With 80% Full-Screen Reference Signal)	Dc to at least 3 MHz.
Rise Time	116 ns or less.
Common Mode Rejection	
Dc to 500 kHz	
1X Attenuation	At least 100:1 for signals of +3 V or –3 V peak or less.
5X Attenuation	At least 40:1 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 must be set for the same deflection factor (V/div).
Position Stability	0.1 div or less per hour after 20 minute warm-up.
Input Resistance and Capacitance (All Inputs)	1 MΩ, within 1%, paralleled by 47 pF or less.
Maximum Nondestructive Input Voltage (Fault Condition Only)	±100 V (dc + peak ac).

[1] **Refer qualified service personnel to the servicing information sections of the 607 Instruction Manual.**

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TABLE 1-2 (CONT.)
Electrical Characteristics

Characteristic	Performance Requirement
Z-AXIS AMPLIFIER	
Useful Input Voltage	Adjustable from +1 V or less to at least +5 V for full intensity when INTENSITY control is set to midrange. 0 V input cuts off visible display.
Useful Frequency Range	Dc to 5 MHz at –3 dB point.
Rise Time	70 ns or less.
Common Mode Rejection	
Dc to 100 kHz	At least 100:1 with input signals to 5 V peak-to-peak at any setting of Z-axis gain.
Input Resistance and Capacitance (Both Inputs)	1 MΩ within 1%, paralleled by 47 pF or less.
Maximum Nondestructive Input Voltage (Fault Condition Only)	±100 V (dc + peak ac). Crt beam positioned off screen.
REMOTE PROGRAM Connector	
Remote Inputs	+0.52 V or less provides active low. Open input or at least +2.5 V is high logic level.
Erase Interval Output	Active low logic is +0.4 V or less. High logic level is at least +2.5 V.
CRT DISPLAY	
Graticule	8 X 10 div (0.9 cm/div).
Geometry (Within Graticule Area)	Bowing or tilt 0.1 div or less.
Orthogonality (Within Graticule Area)	90° within 0.7°.
Halftone Luminance (Within 6 X 8 Div Quality Area)	At least 200 fL.
Stored Dot Writing Time	A stationary dot written in 500 ns or less can be viewed for at least 15 seconds. With a black background, a stationary dot written in 1 μs or less can be viewed for at least 3 minutes.
Stored Linear Writing Speed (Within 6 X 8 Div Quality Area)	At least 0.8 div/μs, viewable for 1 minute.
Halftone Resolution (Within 6 X 8 Div Quality Area)	At least 18 dots/div.
Erase Time	Approximately 0.5 second.
Acceleration Potential	12 kV.

TABLE 1-2 (CONT.)
Electrical Characteristics

Characteristic	Performance Requirement
POWER SOURCE	
Line Voltage Range	
120 V AC (Nominal)	
Low	90 to 110 V ac.
Medium	99 to 121 V ac.
High	108 to 132 V ac.
220 V AC (Nominal)	
Low	180 to 220 V ac.
Medium	198 to 242 V ac.
High	216 to 250 V ac.
Line Frequency Range	48 to 440 Hz.
Maximum Power Consumption (120 V AC, 60 Hz)	53 W, 0.62 A.
Fuse Data	
120 V AC (Nominal)	0.7 A, 3 AG, slow-blowing type.
220 V AC (Nominal)	0.4 A, 3 AG, slow-blowing type.
High Voltage Supply	2 A, 3 AG, fast-blowing type.
OPTION 4 HORIZONTAL SWEEP	
Sweep Rate	
Range	0.1 s/div to 1 μs/div, in decade steps.
Accuracy Over Center 8 Divisions	Within 3% with VARIABLE fully clockwise.
Linearity of Any 2 Division Portion Within Center 8 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.
Trigger Sensitivity	At least 0.5 div vertical deflection from dc to 2 MHz.

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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	Description
Net Weight	
Cabinet and Rackmount	17.5 lbs (7.9 kg).
Overall Dimensions	See Figure 1-1, Dimensional Drawing.

STANDARD ACCESSORIES

1 each . . . . . .Operators Manual
1 each . . . . . .Instruction Manual
1 each . . . . . Graticule, 8 X 10 Div
1 each . . . . . .Connector
1 each . . . . . Connector Cover

For more detailed information, refer to the tabbed Accessories page in the back of the 607 Instruction Manual.

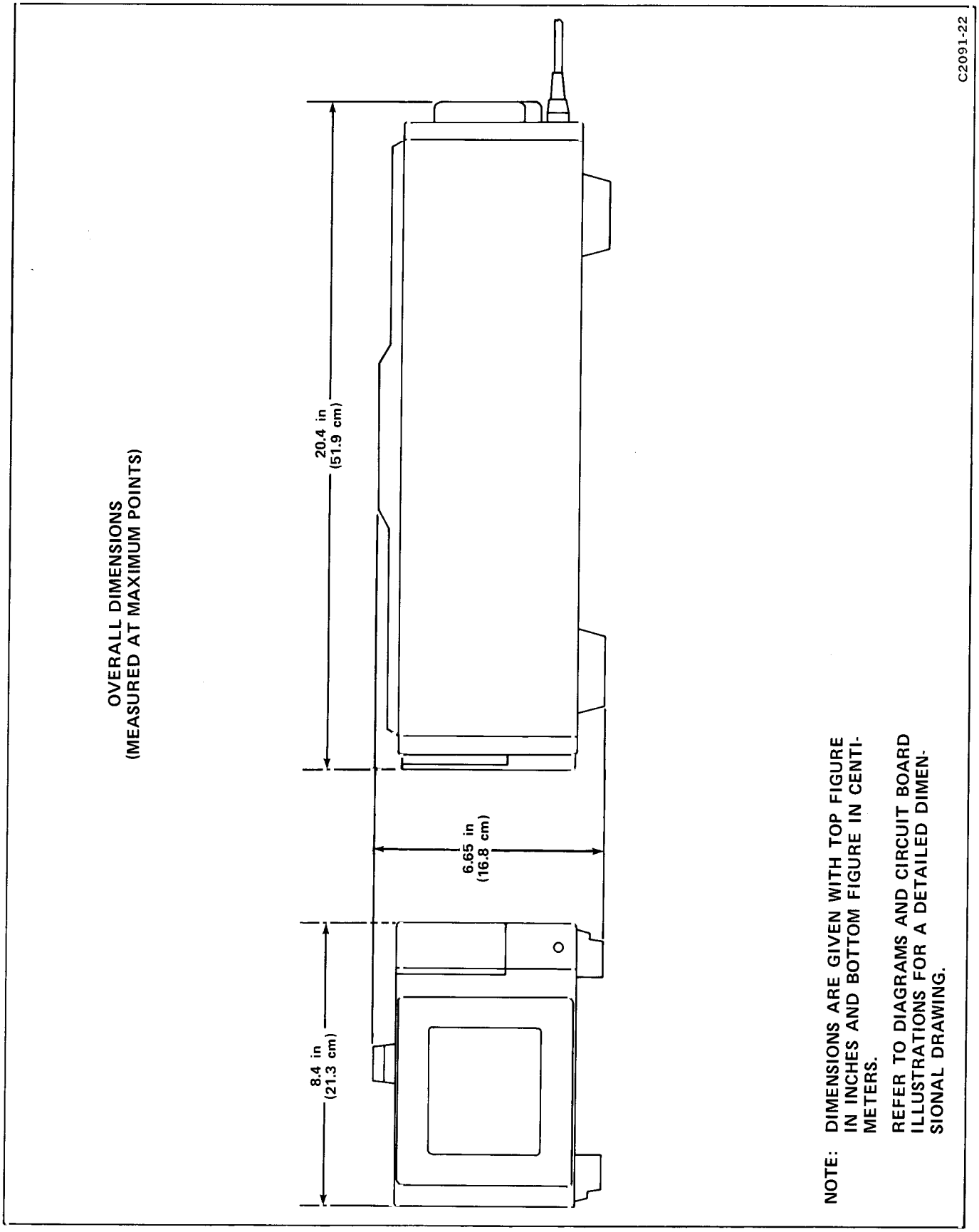
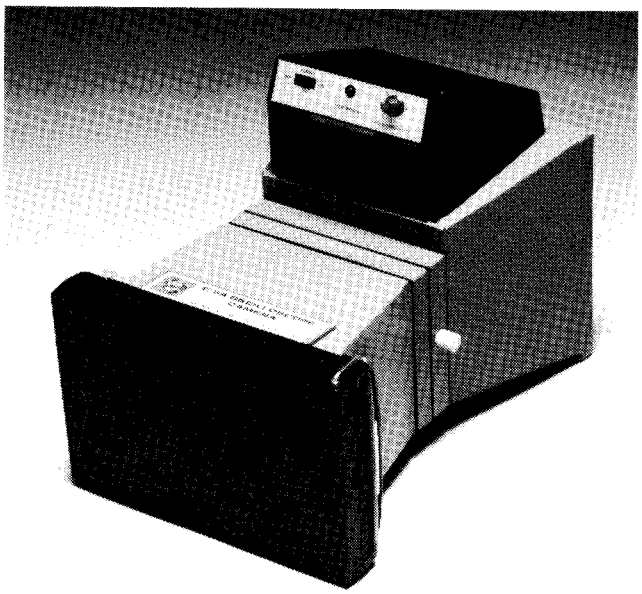


Figure 1-1. Dimensional drawing.

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



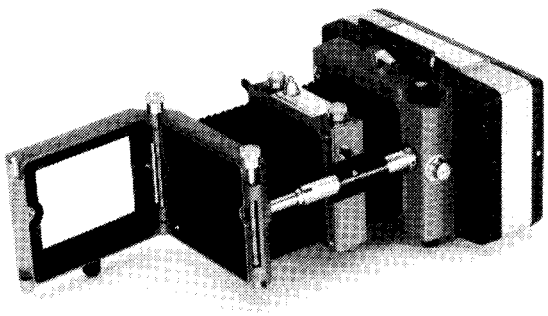
C-5A: The C-5A is a low-cost general-purpose camera with a Polaroid Pack-Film Back, pulsed graticule illumination, and a fixed f/16 lens. Magnification may be set at 0.67 or 0.85.

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

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OPERATING INSTRUCTIONS

CONTROLS AND CONNECTORS

Controls and connectors necessary for X-Y operation of the 607 Storage 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. A brief description of the front-panel controls is given in Figure 2-1 and the rear-panel controls and connectors in Figure 2-2.

NOTE

Internal switches are provided for selecting X and Y input signal attenuation and internal sweep operation (Option 4). The proper operation of these switches is described for qualified service personnel in the servicing information sections of the 607 Instruction Manual.

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.

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 in an instrument rack, may require additional cooling measures. Operating the instrument at an ambient temperature substantially higher than that specified may result in poor reliability and substandard performance.

FUNCTIONAL CHECK

The following procedures are provided to aid in obtaining a display and may be used as a check of basic instrument operation. The first procedure applies for an instrument without the Option 4 internal sweep. The procedures can be used for incoming inspection to verify proper operation, and can 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 procedures reveals improper performance or instrument malfunction, first check the operation of associated equipment; then refer the instrument to qualified service personnel for repair or adjustment.

Test Equipment Required

The following test equipment was used to perform 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

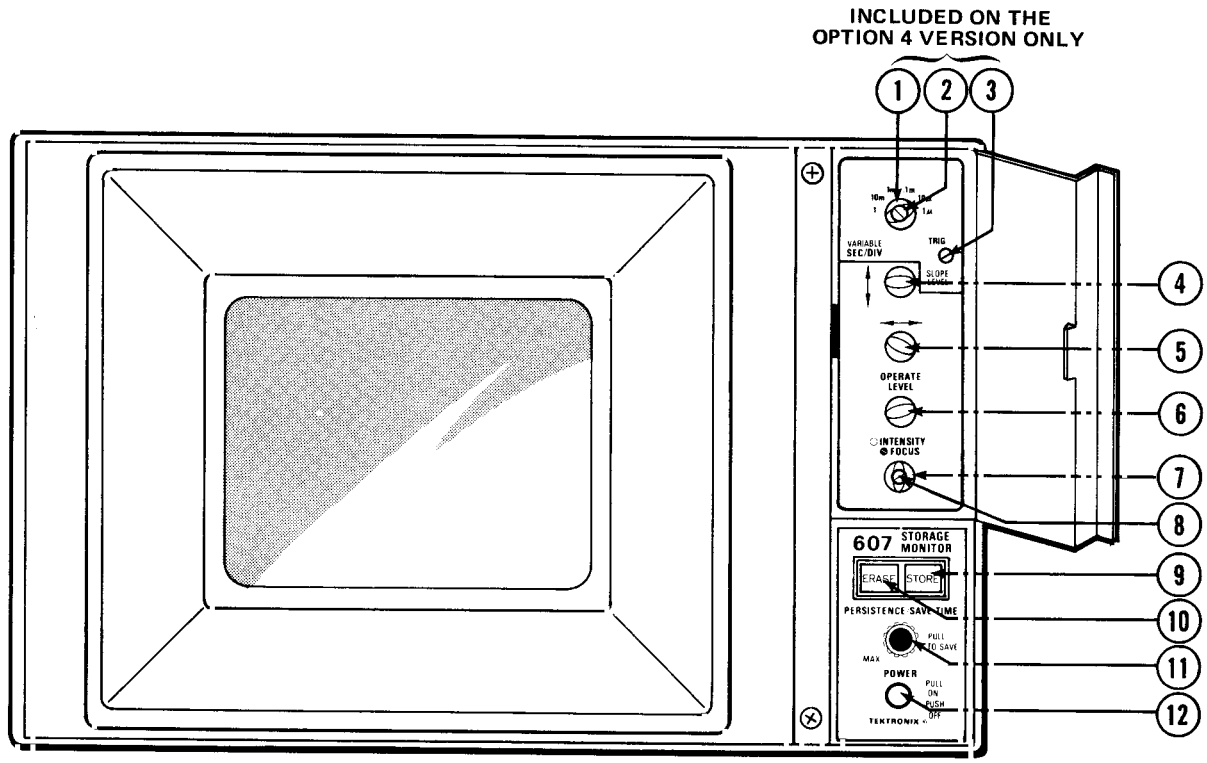
   Description: Frequency range, 1 hertz to 50 kilohertz; output amplitude, 1 volt peak-to-peak into 50 ohms; waveform output, sine wave.

   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).



(1) **SEC/DIV Switch (Option 4 only)**—Selects from six calibrated sweep rates from 0.1 second/division to 1 microsecond/division in decade steps. (VARIABLE control must be fully clockwise for indicated sweep rate.)

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

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

(4) **Vertical (↕) Position Control**—Moves writing beam or display up or down.

(5) **Horizontal (↔) Position Control**—Moves writing beam or display to the right or left.

(6) **OPERATE LEVEL Control**—Varies the writing speed and contrast of a stored display.

(7) **INTENSITY Control**—Varies the brightness of a non-stored display.

(8) **FOCUS Control**—Screwdriver adjustment concentric with the INTENSITY control that provides a well-defined display.

(9) **STORE Push Button**—Selects storage operation when pushed in and non-storage operation when in the out position.

(10) **ERASE Push Button**—Erases the stored display when pushed in.

(11) **PERSISTENCE/SAVE TIME Control**—Varies the persistence of the crt screen from a fraction of a second with the knob pushed in and turned fully clockwise to maximum store time in the fully counterclockwise (MAX) position (maximum store time depends on the setting of the OPERATE LEVEL control). With the knob pulled out, the monitor is in the save mode which extends the store time beyond that available with the knob pushed in. In the save mode (knob pulled out), the display controls are disabled to prevent accidentally erasing or changing the stored display. To view the stored display, the knob must be pushed in or turned clockwise.

(12) **POWER Switch**—Turns instrument power on when pulled out and off when pushed in.

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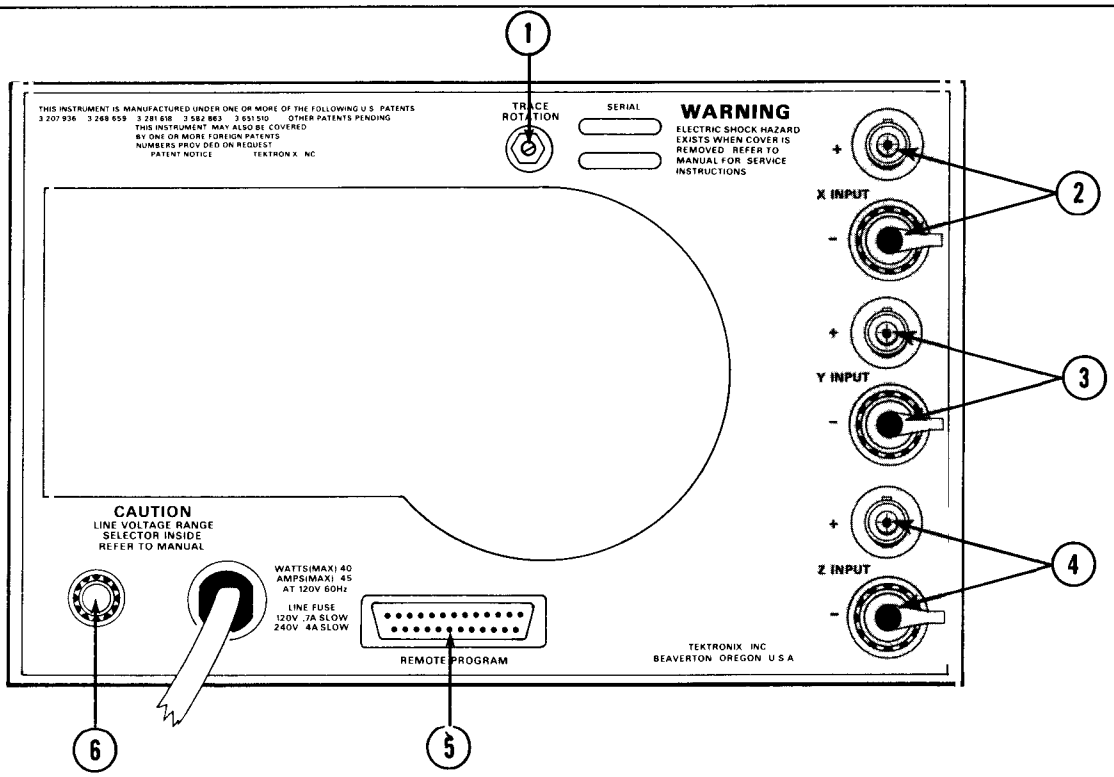
Figure 2-1. Location and function of front-panel controls.



(1) **TRACE ROTATION Control**—Screwdriver adjustment that aligns the trace with the crt horizontal axis.

(2) **X INPUT Connectors**—
+: BNC connector that deflects the beam to the right with a positive signal applied and to the left with a negative signal applied.

—: BNC connector that deflects the beam to the left with a positive signal applied and to the right with a negative signal applied.

(3) **Y INPUT Connectors**—
+: BNC connector that deflects the beam up with a positive signal applied and down with a negative signal applied.

—: BNC connector that deflects the beam down with a positive signal applied and up with a negative signal applied.

(4) **Z INPUT Connectors**—
+: BNC connector that provides a linear function to increase display brightness with a positive signal applied and decrease display brightness with a negative signal applied.

—: BNC connector that provides a linear function to decrease display brightness with a positive signal applied and increase display brightness with a negative signal applied.

(5) **REMOTE PROGRAM Connector**—Twenty-five pin connector that provides remote inputs and outputs. See Detailed Operating Information for additional details.

(6) **Fuse Holder (Located inside the instrument for Option 6 version*)**—Contains the line-voltage fuse to protect the instrument from excessive line-voltage surges.

***Refer qualified service personnel to the servicing information sections of the 607 Instruction Manual for further information.**

2090-5

Figure 2-2. Location and function of rear-panel controls and connectors.

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. Connect the 607 power cord to a suitable power source.

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 607 Instruction Manual.

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

SEC/DIV (Option 4 only)	.10 μ
Vertical and Horizontal Position	.Midrange
OPERATE LEVEL	.Fully clockwise
INTENSITY	.Fully counterclockwise
STORE	.Non store (button out)
PERSISTENCE/ SAVE TIME	.Midrange and knob pushed in
POWER	.On (button out)

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

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

NOTE

Refer qualified service personnel to the servicing information sections of the 607 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. Slowly turn the INTENSITY control clockwise until a spot appears on the crt.

3. Turn the INTENSITY control further clockwise and notice that the displayed spot intensity increases.

CAUTION

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.

4. Adjust the FOCUS control for a sharp, well-defined spot.

5. 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 connect 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.

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10. Disconnect the signal from the —X INPUT connector and connect 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 connect 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 connect 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 connect 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.

28. Replace the grounding caps on the — (inverting) INPUT connectors.

STORAGE FUNCTIONS

1. Perform the Preliminary Set Up procedure.

2. Press the STORE button and notice that the crt floods momentarily.

3. Set the INTENSITY control for a visible spot on the crt.

NOTE

If the crt blooms around the displayed spot, reduce the INTENSITY control setting.

4. Slowly move the displayed spot with the vertical Position control and notice that the spot leaves a visible trail on the crt.

5. Turn the PERSISTENCE/SAVE TIME control clockwise and repeat step 4. Notice that the trail persists for a shorter time and the background brightens as the PERSISTENCE/SAVE TIME control is turned clockwise.

6. Set the PERSISTENCE/SAVE TIME control to the fully counterclockwise detent (MAX) position.

7. Move the displayed spot with the vertical Position control to obtain a stored trace. If necessary, increase the INTENSITY control setting.

8. Turn the OPERATE LEVEL control fully counterclockwise and notice that the trace intensity decreases (or disappears entirely depending on the INTENSITY control setting).

9. Move the displayed spot with either Position control to again obtain a stored trace.

10. Press and release the ERASE button and notice that the crt floods, then erases, the trace.

11. Move the displayed spot with either Position control to again obtain a stored trace.

12. Pull the PERSISTENCE/SAVE TIME knob out to the PULL TO SAVE position and notice that the trace disappears.

13. Turn the PERSISTENCE/SAVE TIME control clockwise and notice that the trace reappears.

14. Turn the Position and INTENSITY controls and notice that they have no affect on the display.

15. Turn the PERSISTENCE/SAVE TIME control fully counterclockwise to the detent (MAX) position and notice that the trace disappears.

16. Press the PERSISTENCE/SAVE TIME knob in and notice that the trace reappears.

17. Turn the PERSISTENCE/SAVE TIME control fully clockwise and notice that the crt brightens and the trace disappears.

This completes the Functional Check procedure for the standard 607 (without Option 4).

Instruments With Internal Sweep (Option 4)

NOTE

The following procedure applies to the Option 4 version of the 607 that has been properly set for internal sweep operation. Refer qualified service personnel to the servicing information sections of the 607 Instruction Manual to determine if the internal sweep has been connected.

DISPLAY FUNCTIONS

1. Perform the Preliminary Set Up procedure.

2. Slowly turn the INTENSITY control clockwise until a horizontal trace appears on the crt.

3. Turn the INTENSITY control further clockwise and notice that the displayed trace intensity increases.

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

5. 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 display.

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

7. Disconnect the signal from the +Y INPUT and connect 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 connect 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.

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

16. Disconnect the signal from the +Z INPUT connector and connect 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.

20. Replace the grounding caps on the – (inverting) INPUT connectors.

STORAGE FUNCTIONS

1. Perform the Preliminary Set Up procedure.

2. Press the STORE button and notice that the crt floods momentarily.

3. Set the INTENSITY control for a bright trace on the crt.

NOTE

If the crt blooms around the displayed trace, reduce the INTENSITY control setting.

4. Slowly move the displayed trace with the vertical Position control and notice that the trace leaves a visible trail on the crt.

5. Turn the PERSISTENCE/SAVE TIME control clockwise and repeat step 4. Notice that the trail persists for a shorter time and the background brightens as the PERSISTENCE/SAVE TIME control is turned clockwise.

6. Set the PERSISTENCE/SAVE TIME control to the fully counterclockwise detent (MAX) position.

7. Move the displayed trace with the vertical Position control to obtain a display of stored lines. If necessary, decrease the INTENSITY control setting.

8. Turn the OPERATE LEVEL control fully counterclockwise and notice that the trace intensity decreases (or disappears entirely depending on the INTENSITY control setting).

9. Move the displayed trace with the vertical Position control to again obtain a display of stored lines.

10. Press and release the ERASE button and notice that the crt floods, then erases, the stored lines.

11. Move the displayed trace with the vertical Position control to again obtain a display of stored lines.

12. Pull the PERSISTENCE/SAVE TIME knob out to the PULL TO SAVE position and notice that the display disappears.

13. Turn the PERSISTENCE/SAVE TIME control clockwise and notice that the display reappears.

14. Turn the Position and INTENSITY controls and notice that they have no affect on the display.

15. Turn the PERSISTENCE/SAVE TIME control fully counterclockwise to the detent (MAX) position and notice that the display disappears.

16. Press the PERSISTENCE/SAVE TIME knob in and notice that the display reappears.

17. Turn the PERSISTENCE/SAVE TIME control fully clockwise and notice that the crt brightens and the display disappears.

This completes the Functional Check procedure for the 607 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 607 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.

WARNING

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 607 Instruction Manual.

The best transient response 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 hazard, 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 —Z INPUT connectors, the intensity of the display is controlled only by the front-panel INTENSITY control. To control the 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

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.

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) Amplifier 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.

Remote Program Connector

The REMOTE PROGRAM connector, located on the rear panel, provides direct connections to the + inputs of the Horizontal (X), Vertical (Y), and the Z-Axis amplifiers from a remote location. Also, erase, non-store and save-storage operation can be controlled from a remote location; however, the front-panel controls of the instrument override the remote inputs. All inputs and outputs are TTL compatible. See Figure 2-3 for additional details.

NOTE

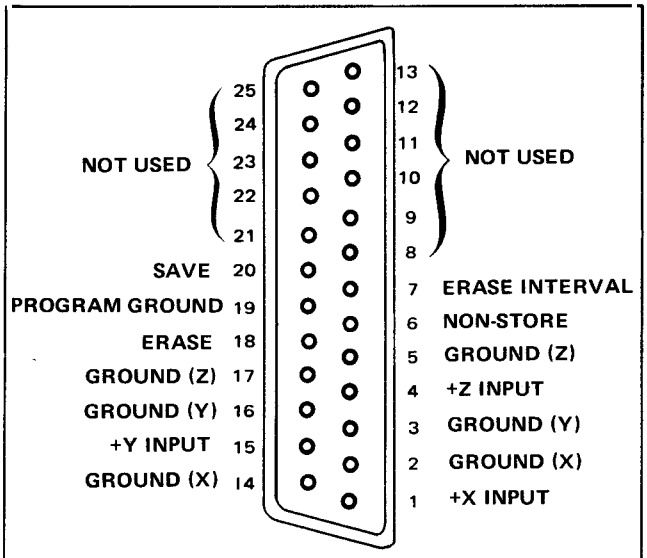
Normal remote input requires a logical 0 level of +0.48 volt or less. This level should be satisfied by the TTL output levels, providing the loading rules of the TTL output device are observed.

If low logic levels (i.e., between +0.48 and +0.8 volt) are to be applied to the 607 REMOTE PROGRAM connector inputs, internal circuit modifications may be required. Refer qualified service personnel to the servicing information sections of the 607 Instruction Manual for instructions.

REMOTE ERASE. Stored display will be erased when a remote contact is closed to ground, or logical 0 (TTL) is applied.

REMOTE NON-STORE. Grounding the remote contact or applying a logical 0 (TTL) allows the storage crt to operate in the non-store mode.

REMOTE SAVE. Grounding the remote contact or applying a logical 0 (TTL) places the 607 in the save mode. The front-panel PERSISTENCE/SAVE TIME control sets the save time.



AS SEEN FROM THE REAR PANEL

THE SWITCHING REQUIREMENTS (VOLTAGE LEVELS, LOADING, DRIVE, ETC.) OF REMOTE-CONTROLLED FUNCTIONS CAN BE SATISFIED BY A TTL CIRCUIT.

TTL-COMPATIBLE LOGIC LEVELS:

	VOLTS	CURRENT
LOGICAL 1 =	⩽ +5 V ⩾ +2.4 V	OPEN CIRCUIT
LOGICAL 0 =	⩾ 0 V ⩾ +0.52 V	1.6 mA

2090-3

Figure 2-3. REMOTE PROGRAM connector data.

ERASE INTERVAL. During the erase interval, a negative-going pulse, logical 0 (TTL), is present at this contact. This can be used to notify associated equipment that information stored on the 607 crt is being erased.

Care of Storage Screen

The following precautions will prolong the useful storage life of the crt used in this instrument:

1. Use the minimum beam intensity required to produce a clear, well-defined display. Excessive beam intensity may permanently damage the crt, particularly if a bright spot is allowed to remain stationary on the display area.

2. Avoid repeated use of the same area of the crt. If a particular display is being stored repeatedly, change the vertical position occasionally to use other portions of the display area.

3. Do not leave a stored display on the crt when it is no longer needed.

4. Operate the instrument in the non-store mode unless storage is required.

Storage Operation

The storage crt allows a display to be retained for a selectable period of time. When the STORE button is out, the instrument operates as a conventional monitor. When the STORE button is in, the instrument operates in the storage mode. Two modes of storage are available: Variable persistence where the persistence of the crt is electrically controlled by the PERSISTENCE/SAVE TIME control; and the conventional storage mode, which allows longer retention of the displayed information. When the PULL TO SAVE switch is pulled out, the length of time the stored image can be retained is greatly extended, A lockout function prevents accidental erasure of the stored display in the save mode.

A stored display is erased by pressing the ERASE button. In the save mode, the erase function is disabled.

NOTE

Crt image contrast and resolution can be improved slightly, at the sacrifice of some background uniformity, by a slight modification to the storage circuit. Refer qualified service personnel to the servicing information sections of the 607 Instruction Manual for the procedure to improve image contrast and resolution.

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 sweep rates between the calibrated settings of the SEC/DIV switch, extending the slowest sweep rate to at least 1 second/division.

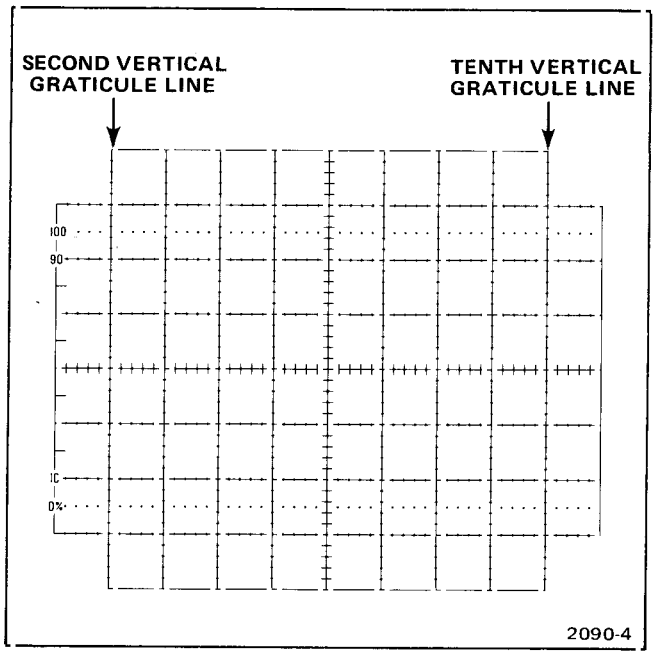


Figure 2-4. Measurement lines on the 607 graticule.

When making time measurements using the graticule, the area between the second and tenth vertical lines provides the most linear measurement. (See Fig. 2-4.) 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 graticule line. Then set the SEC/DIV switch so that the end of the display measurement section falls between the second and tenth vertical graticule lines.

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INSTALLATION

OPERATING POWER INFORMATION

This instrument can be operated from either a 120-volt or 220-volt nominal line-voltage source at 48 to 440 hertz. In addition, three regulating ranges are provided for each nominal line-voltage source.

CAUTION

To prevent damage to the instrument, always check the line-voltage information recorded on the rear panel before applying power to the instrument.

Power Cord Information

WARNING

The instrument is intended to be operated from a single-phase, earth-referenced power source having one current-carrying conductor (the Neutral Conductor) near earth potential. Operation from power sources where both current-carrying conductors are live with respect to earth (such as phase-to-phase on a three-wire system) is not recommended, since only the Line Conductor has over-current (fuse) protection within the instrument.

This instrument has a three-wire power cord with a polarized two-pole, three-terminal plug for connection to the power source and safety-earth. The safety-earth terminal of the plug is directly connected to the instrument frame. For electric-shock protection, insert this plug only in a mating outlet with a safety-earth contact. Do not defeat the grounding connection. Any interruption of the grounding connection can create an electric-shock hazard. Before making external connections to this instrument, always ground the instrument first by connecting the power-cord plug to a proper mating power outlet.

TABLE 3-1

Power Cord Conductor Identification

Conductor	Color	Alternate Color
Ungrounded (Line)	Brown	Black
Grounded (Neutral)	Blue	White
Grounding (Earthing)	Green-Yellow	Green-Yellow

The power-cord plug required depends upon the ac input voltage, and the country in which the instrument is to be used. Refer to the standards listed in Table 3-2 for the recommended power-cord plug configuration for your specific requirements.

TABLE 3-2

Location of Power-Cord Plug Configuration Information

Nominal Line-Voltage	Reference Standards
120 V AC	[1] ANSI C73.11
	[2] NEMA 5-15-P (Hospital Grade)
220 V AC	ANSI C73.20
	[3] AS C112
	[4] BS 1363
	[5] CEE 7, sheets IV, VI, and VII
	NEMA 6-15-P

[1] **ANSI—American National Standards Institute**
[2] **NEMA—National Electrical Manufacturer's Association**
[3] **AS—Standards Association of Australia**
[4] **BS—British Standards Institution**
[5] **CEE—International Commission on Rules for the Approval of Electrical Equipment**

For medical-dental applications, use NEMA 5-15-P (Hospital-Grade) plug for 120-volt operation, or NEMA 6-15-P plug for 220-volt operation.

Line-Voltage and Regulating-Range Selection

CAUTION

Damage to the instrument may result from incorrect placement of the line-voltage selector plug.

To select the correct nominal line voltage and regulating range, proceed as follows:

1. Disconnect the instrument from the power source.

2. Remove the bottom cabinet panel from the instrument, (refer to section 5, Cabinet Panel Removal), to gain access to the Low-Voltage Power Supply board.

3. Insert the proper line-voltage selector plug (brown plug for 120-volt nominal operation or red plug for 220-volt nominal operation) on the Line-Voltage Selector pins labeled for the desired nominal line-voltage range. Refer to Figure 3-1 for location and additional information.

4. Remove the line fuse from the fuse holder located on the rear panel for the standard instrument, or inside the instrument for the Option 6 version (see Fig. 3-1), and replace it with one having the correct rating.

NOTE

An alternate line fuse is supplied from the factory and clipped to the Low-Voltage Power Supply board (see Fig. 3-1).

5. Change the nominal line-voltage information recorded on the 607 rear panel. Use a non-abrasive eraser to remove previous data, and mark on the new data with a pencil.

6. Replace the bottom cabinet panel and apply power to the instrument.

INSTALLATION IN PATIENT-CARE FACILITIES

WARNING

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.

WARNING

Although this monitor is not to be connected directly to a patient, interconnecting this monitor to other equipment can result in the application of excessive current to a patient. It is extremely important that the interconnection is made in accordance with NFPA 76B-T, Tentative Standard for the Safe Use of Electricity in Patient Care Facilities, section 3038, "Signal Transmission Between Appliances".

Among the situations involving the above-mentioned patient hazard is one in which two or more pieces of interconnected equipment are grounded at locations remote from one another. The standard mentioned in the preceding Warning describes both this hazard and appropriate corrective measures.

INPUT ATTENUATION SELECTION

X and Y Input Attenuation

The Horizontal (X) and Vertical (Y) Amplifiers include a selectable 1:1 and 5:1 step attenuator in both the + (non-inverting) and the − (inverting) input circuits. These attenuators are set in the 1X position when shipped from the factory. When set in the 5X position, these attenuators extend the deflection factor range of the appropriate amplifier to at least 12.5 volts, for full-screen signal deflection. Refer to the Internal Control and Selector Locations pullout page in section 9, Diagrams and Circuit Board Illustrations, for position settings and location of the attenuator switches.

WARNING

The finned transistor heat sinks on the Horizontal (X) Amplifier are elevated to a maximum of +80 volts. To avoid a potential shock hazard, always turn the instrument power off before changing the X Atten switch settings.

Z-Axis Input Attenuation

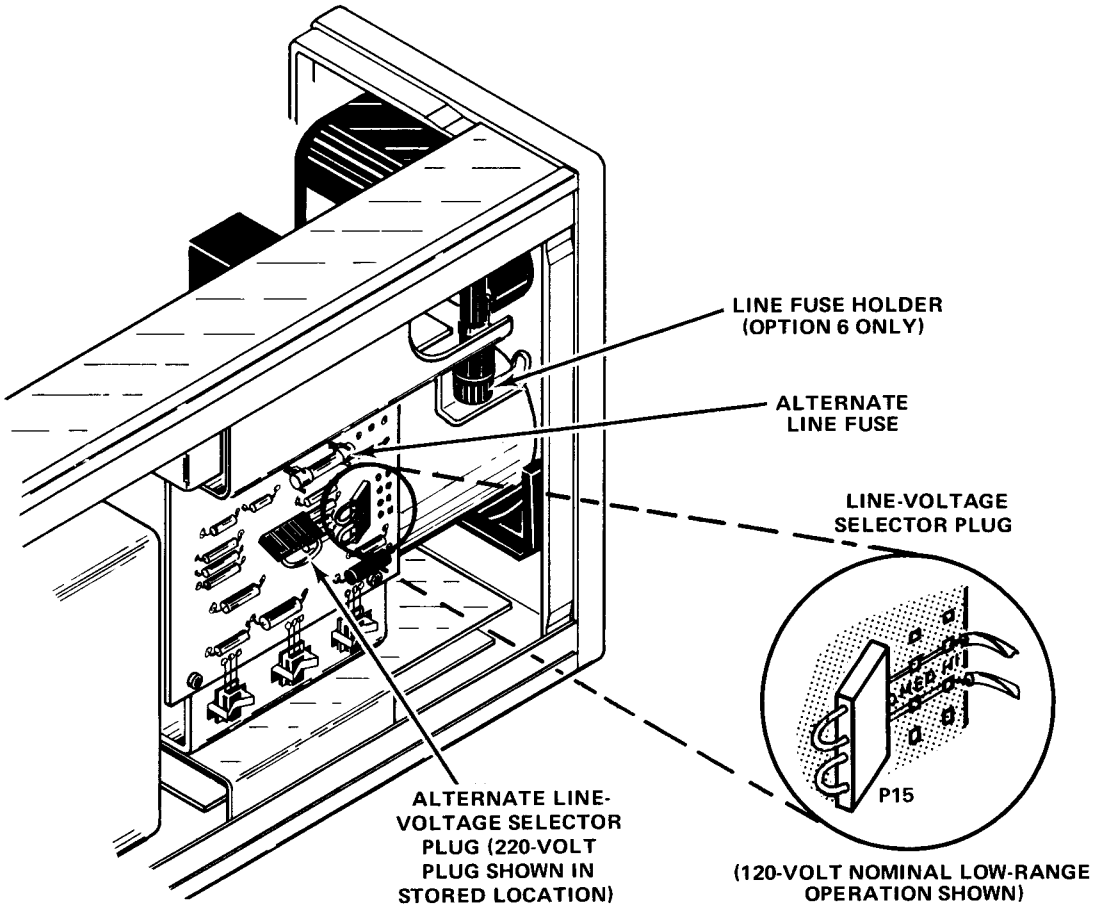
The Z-Axis Amplifier is shipped from the factory with 1X input attenuation and 1 megohm input impedance. However, the attenuation and input impedance can be modified to suit a specific application. Posts on the Z-Axis Amplifier board allow components to be changed without damage to the circuit board. Figure 3-2 illustrates the method used to modify input attenuation and input impedance of the Z-axis input. The same method applies to both the +Z and −Z inputs. Refer to the Internal Control and Selector Locations pullout page in section 9, Diagrams and Circuit Board Illustrations for the location of the Z-axis attenuation components. Refer to your Tketronix Field Office or representative for additional information.

IMAGE CONTRAST AND RESOLUTION

When in the store mode, a uniformity ramp signal from the Variable-Persistence Pulse Generator improves the crt storage area background uniformity at the sacrifice of some image contrast and resolution. A slight improvement in image contrast and resolution can be obtained with some loss of background uniformity by removing jumper wire W988 on the Storage board (see the Internal Control and Selector Locations pullout page in section 9, Diagrams and Circuit Board Illustrations).

REMOTE PROGRAM INPUTS

REMOTE PROGRAM connector input logic level requirements are discussed in section 2, Operating Instructions. However, if low logic levels (i.e., between +0.48 and +0.8 volt) are to be applied to the REMOTE PROGRAM connector inputs, it may be necessary to replace current-limiting resistors R802, R852, R860, and R912 (located on the Storage board) with jumpers. Although this modification allows the use of logic levels outside the normal limits, the current surge protection provided by these resistors is not available. See the Internal Control and Selector Locations pullout page in section 9, Diagrams and Circuit Board Illustrations, for the jumper locations.



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Regulating Ranges

Line-Voltage Selector Position	Regulating Range	
	120 Volts (Nominal)	220 Volts (Nominal)
LO	90 V ac to 110 V ac	180 V ac to 220 V ac
MED	99 V ac to 121 V ac	188 V ac to 242 V ac
HI	108 V ac to 132 V ac	216 V ac to 250 V ac
Line Fuse Data	0.7 A slow-blow	0.4 A slow-blow

2091-35

Figure 3-1. Location of Line-Voltage Selector plugs, regulating-range pins, and line fuses.

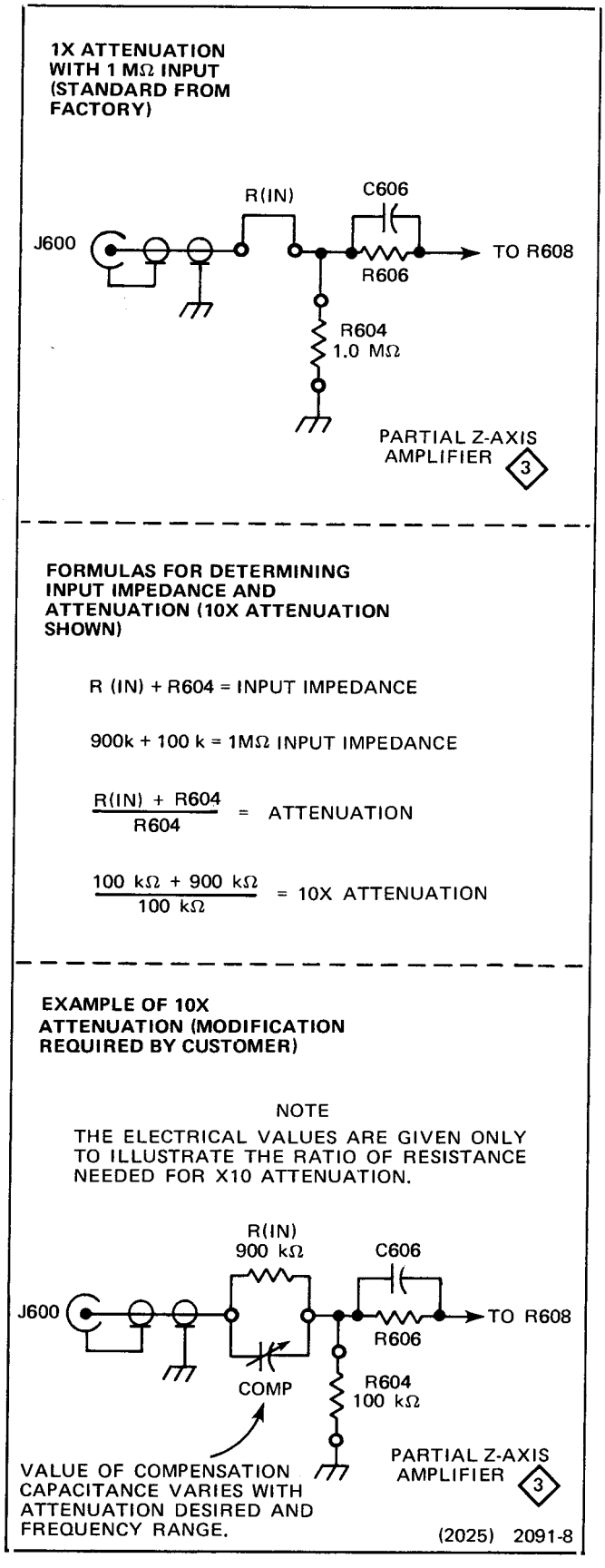

Figure 3-2. Typical method for modifying Z-axis input impedance and attenuation.

CONNECTING THE INTERNAL SWEEP (OPTION 4)

Internal switches are provided to internally connect the optional sweep generator circuit to the Horizontal (X) Amplifier. Remove the left and right side panels (see Cabinet Panel Removal procedures in section 5, Maintenance) to gain access to the switches. Refer to the Internal Control and Selector Locations pullout page in section 9, Diagrams and Circuit Board Illustrations, for the locations of the appropriate switches. Proceed as follows:

1. Set S220 (Int Swp) located on the Deflection Amplifier board to the Y-T (up) position.

2. Set S735 (Int Blank) located on the Z-Axis Amplifier board to the Y-T (right) position.

3. Set S1109 (Trig Mode) located on the Sweep board to the Auto (rear) position.

4. Replace the left and right side panels.

RACKMOUNTING INFORMATION

The 607 can be operated in a standard 19-inch instrument rack with front and rear holes that conform to universal hole spacing. Kits are available to convert the 607 from the cabinet to a rackmounted configuration, and vice versa. Detailed rackmounting instructions are included in the kits. The following is a brief description of each conversion kit available. Consult your Tektronix Field Office or representative for additional information.

Cabinet to Rackmount Conversion

TEKTRONIX PART 040-0600-00. Mounts two 607 Storage Monitors side-by-side in a standard 19-inch wide rack. The kit comes equipped with a slide-out assembly and includes the securing hardware. Complete rackmounting instructions are included with each kit.

TEKTRONIX PART 040-0601-00. Mounts one 607 Storage Monitor in a standard 19-inch wide rack. The kit is equipped with a slide-out assembly, securing hardware, and a blank front panel to cover the second instrument opening in the rack. Complete rackmounting instructions are included with each kit.

TEKTRONIX PART 040-0624-00. Converts one TM 503 Power Module and one 607 Storage Monitor to mount side-by-side in a standard 19-inch wide instrument rack. The kit includes a slide-out assembly and securing hardware. Complete rackmounting instructions are included with each kit.

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TEKTRONIX PART 016-0337-00. Converts one 607 Storage Monitor and one 602 Monitor or one 528 Waveform Monitor to rackmount side-by-side in a standard 19-inch rack. The kit includes a slide-out assembly, securing hardware, and blank panel for mounting only one instrument in the rack. Complete rackmounting instructions are included in the kit.

Rackmount to Cabinet Conversion

TEKTRONIX PART 040-0602-00. Converts one 607 Storage Monitor from a rackmount configuration to a cabinet configuration. Complete instructions are included with each kit.

Instrument Dimensions

Figure 1-1 shows the major dimensions of the 607. A detailed dimensional drawing is shown on the Detailed Dimensional Drawing pullout page in section 9, Diagrams and Circuit Board Illustrations.

Slide-Out Tracks Information

The slide-out tracks provided in the conversion kits permit this instrument to be extended out of the rack for maintenance without removing it from the rack. Be sure the power cord and signal cables are long enough to allow operation in the extended position. Refer to the instructions in the appropriate rackmount kit for additional information.

Removing or Installing the Instrument

After initial installation and adjustment of the slide-out tracks, the instrument can be removed or installed by following the instructions given in Figure 3-3 (see next page). No further adjustments are required under normal conditions.

Slide-Out Track Lubrication

The special finish on the sliding surfaces of the tracks provides permanent lubrication. However, if the tracks require additional lubrication, a thin coat of paraffin can be rubbed onto the sliding surfaces.

Ventilation Requirements

When the 607 Storage Monitor is mounted in a rack with other equipment, it is important that the temperature surrounding the monitor does not exceed +50° C. Additional clearance or forced ventilation methods (fan) may need to be employed to maintain the ambient temperature below +50° C. Reliability and performance will be adversely affected if the monitor is operated at an ambient temperature higher than +50° C.

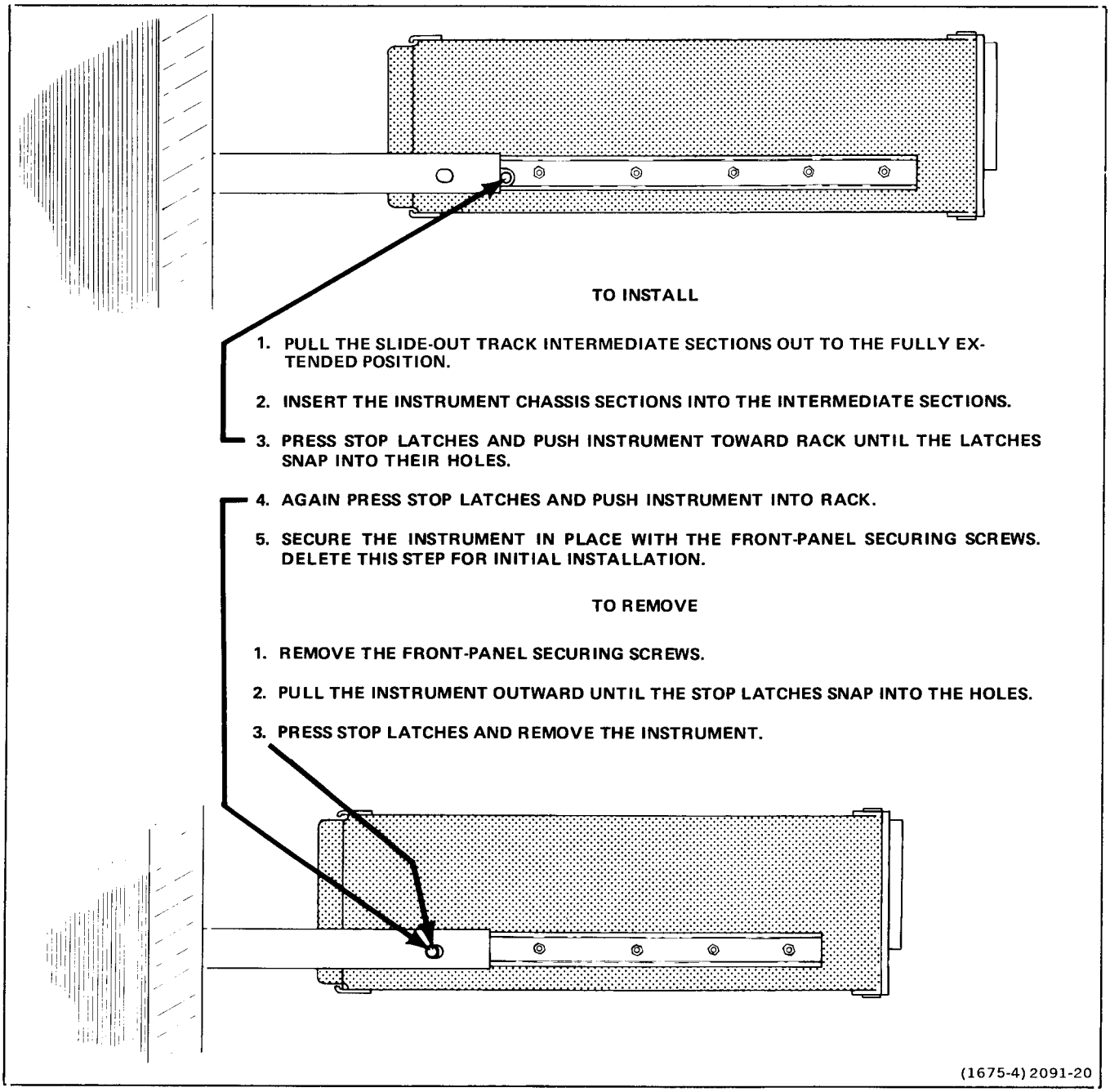

Figure 3-3. Installing and removing a rackmounted instrument.

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THEORY OF OPERATION

This section of the manual contains a brief block-diagram description and a detailed circuit description of the 607 Storage Monitor. An overall block diagram and schematic diagrams of each major circuit are provided on pullout pages in section 9, Diagrams and Circuit Board Illustrations. Refer to these diagrams throughout the following discussion to aid in understanding the circuit operation.

BLOCK DIAGRAM DESCRIPTION

Vertical and horizontal signals to be displayed on the crt are applied to the Horizontal (X) and Vertical (Y) Amplifiers through the appropriate + (noninverting) and − (inverting) input connectors. Input signals can be either single-ended or differential. The Horizontal (X) and Vertical (Y) Amplifiers process the input signals and provide push-pull outputs to drive the deflection plates of the crt. Both amplifiers contain position, gain, and step attenuation controls.

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 −Z (inverting) INPUT connectors may be either single-ended or differential.

The Storage Control circuit includes the Erase-Pulse Generator for erasing stored information and a Variable-Persistence Pulse Generator for varying the crt phosphor persistence. Also provided are erase, save, and non-store input and erase interval output gate stages which allow remote operation through the REMOTE PROGRAM connector.

The Storage Output circuit consists of the Storage Mesh Amplifier stage and the regulators for the collimation and flood-gun anode and cathode electrodes. These stages provide the voltage levels necessary to operate the crt storage elements.

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

The optional Sweep circuit produces a positive-going sawtooth voltage, which is amplified by the Horizontal (X) Amplifier, to provide horizontal sweep deflection. 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 which unblanks the crt to permit display presentation.

DETAILED CIRCUIT OPERATION

Complete schematic diagrams are provided in section 9, Diagrams and Circuit Board Illustrations. The number inside the diamond after a heading in the following discussion refers to the schematic diagram for that circuit. The schematic diagrams contain shaded borders around the major circuits to conveniently locate the circuits and components mentioned in the following discussion.

VERTICAL (Y) AMPLIFIER ◇1

The Vertical (Y) Amplifier provides a push-pull output suitable to drive the crt deflection plates. Input signals can be applied either single-ended or differentially.

Input

Signals can be applied to either J400 (+Y INPUT) or J500 (−Y INPUT) as single-ended inputs, or to both connectors as a differential input. Also, a signal can be applied via pin 15 of J20 (rear-panel REMOTE PROGRAM connector) to the +Y input. Internal attenuator switches S400 (+Y Atten) and S500 (−Y Atten) allow a choice of either 1X or 5X attenuation of the input signal before it is applied to the gate(s) of FET (field-effect transistor) Q410. The input 5X attenuators are frequency-compensated voltage dividers.

Preamplifier

The Preamplifier employs a dual FET to provide a high input impedance. This stage consists of two identical feedback amplifiers, Q410A-Q420 and Q410B-Q520, which can be operated as either a paraphase amplifier (with single-ended input) or as a differential amplifier. A push-pull signal is produced at the collectors of Q420 and Q520. The FET gates are diode-clamped on negative-going overdrive signals to protect the field-effect transistors from excessive input voltages. Variable resistor R415 (Y Gain) provides an adjustable amplification factor to allow a crt full-scale

deflection range of at least 0.5 volt to 2.5 volts. This control is normally set to a nominal 1 volt for 8 divisions of deflection.

Output Amplifier

The Output Amplifier consists of two identical non-inverting operational amplifiers connected in a differential configuration. Transistors Q432 and Q532 provide bias current for input transistors Q430 and Q530. Transistors Q430 and Q530 amplify the push-pull signal from the Preamplifier stage. The amplified signal is fed to emitter followers Q460 and Q560, which drive Q464 and Q564.

The bases of Q460 and Q560 are diode limited to ensure quick overdrive recovery. The output signal at the collectors of Q464 and Q564 causes a change in the current through feedback resistors R450 and R550 that just balances the current through R442 due to the input signal. Thus the current in Q430 and Q530 is held nearly constant.

Display vertical positioning is accomplished by R440, which provides a shift in constant-current source transistors Q432 and Q532 to change the quiescent output voltage. Capacitor C446 (Y HF Comp) provides frequency compensation. Custom bandpass limiting can be provided by connecting a selected capacitor between the bases of Q430 and Q530.

HORIZONTAL (X) AMPLIFIER ◇2

The Horizontal (X) Amplifier provides a push-pull output suitable to drive the crt deflection plates. Input signals can be applied either single-ended or differentially.

Input

Input signals can be applied to either J200 (+X INPUT) or J300 (−X INPUT) as single-ended inputs, or to both connectors as a differential input. Also, a signal can be applied via pin 1 of J20 (rear-panel REMOTE PROGRAM connector) to the +X input. Internal attenuator switches S200 (+X Atten) and S300 (−X Atten) allow a choice of either 1X or 5X attenuation of the input signal before it is applied to the gate(s) of field-effect transistor Q210. The input 5X attenuators are frequency-compensated voltage dividers.

Preamplifier

The Preamplifier employs a dual FET to provide a high input impedance. This stage consists of two identical feedback amplifiers, Q210A-Q220 and Q210B-Q320, which can be operated as either a paraphase amplifier (with single-ended input) or as a differential amplifier. A push-pull signal is produced at the collectors of Q220 and Q320. The FET gates are diode-clamped on negative-going overdrive signals to protect the field-effect transistors from excessive input voltages.

Variable resistor R215 (X Gain), provides an adjustable amplification factor to allow a crt full-scale deflection range of at least 0.5 volt to 2.5 volts. This adjustment is normally set to a nominal 1 volt for 8 divisions of deflection.

Output Amplifier

The Output Amplifier consists of two identical non-inverting operational amplifiers connected in a differential configuration. Transistors Q232 and Q332 provide bias current for input transistors Q230 and Q330. Transistors Q230 and Q330 amplify the push-pull signal from the Preamplifier stage. The amplified signal is fed to emitter followers Q260 and Q360 which drive Q264 and Q364. The bases of Q260 and Q360 are diode limited to ensure quick overdrive recovery. The output signal at the collectors of Q264 and Q364 causes a change in the current in feedback resistors R250 and R350 that just balances the current in R242 due to the input signal. Thus, the current in Q230 and Q330 is held nearly constant.

Display horizontal positioning is accomplished by R240, which causes a shift in constant-current source transistors Q232 and Q332 to change the quiescent output voltage. Capacitor C246 (X HF Comp) provides frequency compensation. Custom bandpass limiting can be provided by connecting a selected capacitor between the bases of Q230 and Q330. Switch S220 (Int Swp), in the Option 4 version, permits connecting the Preamplifier to the Output Amplifier (X-Y position) for external sweep operation or disconnecting the Preamplifier and connecting the Sweep Generator output to the Output Amplifier input for internal sweep operation.

Z-AXIS AMPLIFIER ◇3

Input

Signals can be applied to either J600 (+Z INPUT) or J650 (−Z INPUT) as single-ended inputs, or to both connectors as a differential input. Also, a signal can be applied via pin 4 of J20 (rear-panel REMOTE PROGRAM connector) to the +Z input. A provision is made on each input line to permit installation of attenuating resistors.

Preamplifier

The Z-Axis Preamplifier employs a dual FET, Q610, to provide a high input impedance. The stage consists of two identical feedback amplifiers, Q610A-Q620-Q630 and Q610B-Q670-Q680, which can be operated as either a paraphase amplifier (with a single-ended input) or as a differential amplifier. A single-ended output is produced at the collector of Q680 which is in phase with the signal applied to the +Z INPUT connector, and opposite in phase to the signal applied to the −Z INPUT connector. Additional bias current for the stage is supplied by Q640. The FET gates are diode-clamped on negative-going overdrive signals to protect the field-effect transistors from excessive input

voltages. Potentiometer R615 (Z Gain) provides an adjustable amplification factor to provide a maximum allowable crt grid drive when a signal of at least +1 volt to +5 volts is applied to either the +Z or −Z INPUT connector, and R175A (INTENSITY) is set to about midrange. Under this condition, a zero-volt input cuts off the intensity to below the visible level.

Output Amplifier

The Output Amplifier is a non-inverting operational amplifier consisting of Q690, Q710, Q720, and Q724. The feedback resistor is R734 while C734 (Z HF Comp) provides a means of adjusting the amplifier response. Transistors Q720 and Q724 are connected as a collector-coupled complementary amplifier to provide a fast, linear output signal while consuming minimum quiescent power. The quiescent output level can be set by potentiometer R175A (INTENSITY). The output is applied to the crt control-grid circuit.

To prevent writing over information being saved in the stored mode, Q700 disables the Z-Axis Amplifier when the save mode is enabled.

HIGH VOLTAGE ④

High-Voltage Regulator

HIGH-VOLTAGE PRIMARY. A repetitive, sinusoidal signal is produced by a regenerative feedback oscillator in the primary of T120 and induced into the secondary. Current drive for the primary winding is furnished by Q130 and Q132. The conduction of Q130 and Q132 is controlled by the output voltage of U110.

HIGH-VOLTAGE REGULATION. Regulation is accomplished by comparing a sample of the −1500 volts with a sample of the regulated +15 volts from potentiometer R100 (HV Adj) and divider network R104A-R104B to the positive input (pin 3) of U110. If the output level of the Cathode Supply goes above the nominal −1.5 kilovolts (i.e., goes more negative), the positive input (pin 3) of U110 goes negative from its quiescent +1.2 volts. The output of U110 then goes less positive to reduce the conduction of Q130 and Q132. This reduces the peak-to-peak sinusoidal signal amplitude, resulting in a reduced voltage across the secondary of T120. Conversely, if the output drops below −1.5 kilovolts (i.e., goes more positive), Q130 and Q132 will conduct harder (i.e., have a larger sinusoidal signal amplitude). Transistor Q120 protects the High-Voltage Power Supply, in the event the output is shorted, by limiting the maximum current drawn by high-voltage oscillator Q130 and Q132.

High-Voltage Outputs

The secondary winding of T120 provides the negative and positive accelerating potentials for the crt, the bias voltage for the control grid, the +80-volt and +170-volt supply voltages used elsewhere in the 607, and the crt writing-gun filament voltage.

Positive accelerating voltage for the crt anode is supplied by voltage tripler U120. The applied voltage to the input of the tripler from the T120 secondary winding is about +3.5 kilovolts peak. The output voltage of the tripler is about +10.5 kilovolts at the crt anode. The negative accelerating voltage for the crt cathode is also obtained from the T120 secondary winding. Diode CR150 rectifies the transformer output and supplies the −1.5 kilovolts to the crt cathode. Crt writing-gun filament voltage is provided by a winding on the secondary of T120 which is elevated to −1.5 kilovolts.

Control-Grid DC Restorer

The Control-Grid DC Restorer couples the dc and low-frequency components of the Z-Axis Amplifier output signal to the crt control grid. This allows the Z-Axis Amplifier to control the crt beam intensity. The potential difference between the Z-Axis Amplifier output level and the crt control grid (about −1600 volts) prohibits direct coupling.

The Control-Grid DC Restorer is actually a cathode-referenced bias supply for the crt control grid. Quiescently, its output voltage is more negative than the crt cathode by an amount determined by the Z-Axis Amplifier output level and the setting of R192 (Cutoff). (The cutoff voltage at the crt control grid is typically about 100 volts more negative than the crt cathode level.)

NOTE

A simplified diagram of the Control-Grid DC Restorer is shown in Figure 4-1. The voltages given on this diagram are idealized levels and will not necessarily be the same as those found in the actual instrument.

The Control-Grid DC Restorer is divided into two sections in this description for ease of explanation. The first section can be considered a Modulator at low-voltage potentials and the remaining section as a Demodulator at high-voltage potentials.

MODULATOR. When the secondary-winding output of T120 (pin 11) swings positive, C186 charges through R150 and C150 to a voltage level determined by the setting of R192 (Cutoff). At this voltage level (approximately 110 volts), CR186 conducts, preventing any additional increase in positive voltage across C186. When the secondary-winding output swings negative, CR186 turns off. Then CR148 conducts and clamps the negative excursion at C186

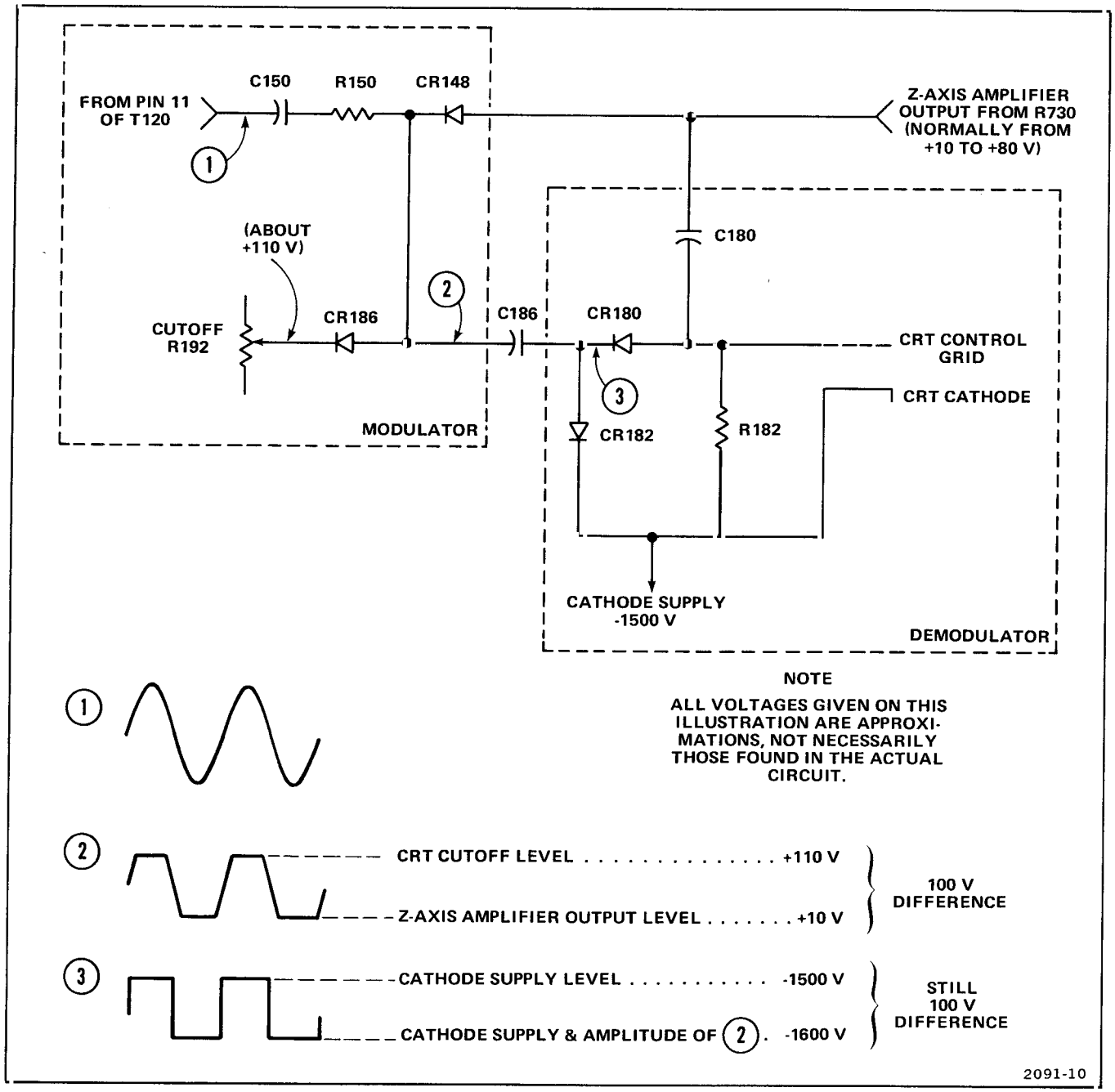

Figure 4-1. Simplified diagram of DC Restorer circuit.

to the voltage level of the Z-Axis Amplifier output. The result is a square-wave output from the Modulator, with the amplitude determined by the difference between the Z-Axis Amplifier output level and the setting of R192 (Cutoff). (See waveform 2 on Fig. 4-1.) This square wave is coupled through C186 to the Demodulator.

DEMODULATOR. The Demodulator rectifies the signal from the Modulator and references it to the crt cathode supply level. The positive swing of waveform 3 (see Fig. 4-1) is limited by CR182 to the Cathode Supply level while the negative excursion is coupled through CR180 to C180. Quiescently, C180 will charge to about −1500 volts through R182. After repetitive cycles from C186, C180 will charge to the negative level of waveform 3. Capacitor C180 holds the voltage constant at the crt control grid, and also provides a path for the ac portions of the Z-Axis Amplifier output signal to be coupled to the crt control grid.

The remainder of the components not shown in the simplified diagram provide protection for the active components and the Z-Axis Amplifier in the event of a high-voltage arc or other malfunction.

CRT Control Circuits

In addition to the INTENSITY control discussed previously, a front-panel FOCUS control and internal Astig adjustment have been incorporated for obtaining an optimum crt display. Potentiometer R175B (FOCUS) provides the correct voltage for the second anode in the crt. Proper voltage for the third anode is obtained by adjusting potentiometer R170 (Astig). In order to obtain optimum spot size and shape, both R175B (FOCUS) and R170 (Astig) are adjusted to provide the proper electrostatic lens configuration in the crt.

Potentiometer R165 (Geom) varies the positive level on the horizontal deflection plate shields to control the overall geometry of the display. Potentiometer R145 (TRACE ROTATION) permits adjustment of the dc current through beam-rotation coil L145 to align the display horizontally.

Potentiometer R173 (Y-Axis Align) varies the dc current through beam rotation coil L172 to align the crt vertical (Y) axis. Beam-rotation coil L172 is located between the vertical and horizontal deflection plates to allow rotation of the vertical (Y) axis only.

STORAGE CONTROL AND OUTPUT ◈5◈6

Storage Cathode-Ray Tube

The cathode-ray tube (crt) is a standard transmission halftone storage tube. The collector mesh is a coarse mesh that accelerates electrons toward the target area. The target (storage mesh) is a fine mesh with a highly insulative dielectric layer deposited on it. Storage occurs in the dielectric layer. The flood guns cover the entire storage target with a continuous stream of low-velocity electrons that are prevented from reaching the phosphor screen unless a display has been written on the storage mesh.

Erase-Pulse Generator

The Erase-Pulse Generator consists of three timing circuits. The timing circuit outputs are summed together to form the composite erase pulse that appears on the storage mesh (see Fig. 4-2). T1, (the 50-millisecond, approximately 120-volt pulse) is derived from monostable multivibrator U820. T2, which if formed by RC network R838, C840, and switching transistor Q835, returns the storage mesh to the 0-volt level for approximately 10 milliseconds at the end of T1. T3, which is determined by U850 and is initiated at the start of T1, maintains control over the storage mesh after T1 and T2 have passed and sets the storage mesh preparation level for the remainder of the erase cycle. The T1, T2, and T3 signals control diode gates CR950, CR952, CR954, CR956, CR960, and CR962 which in turn supply the control currents to the summing point at the base of Q1060 in the Storage Mesh Amplifier stage.

The output of U810B is used to trigger U820 to initiate an erase cycle. If S870 (ERASE) is held depressed longer than one erase cycle, the erase cycle will repeat, thereby generating multiple erase cycles to clear the crt of such problems as residual images.

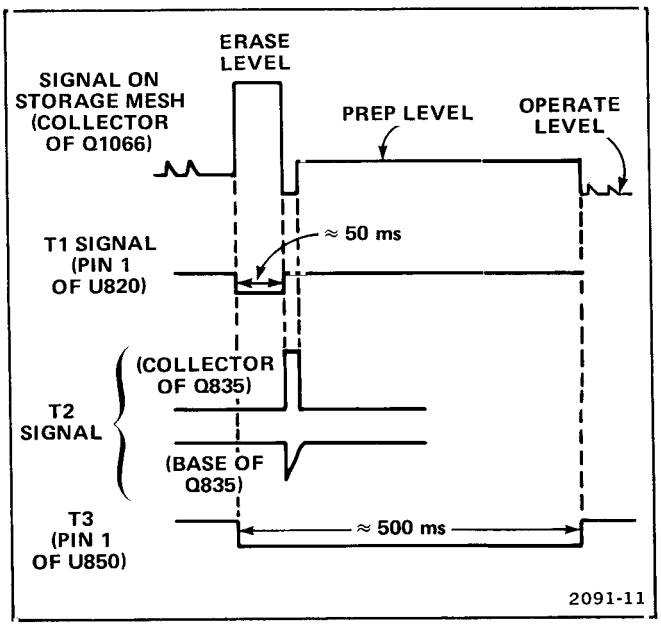

Figure 4-2. Idealized waveform ladder showing the outputs of the Erase Pulse Generator.

When an erase cycle is initiated, pin 1 of U850 goes low and causes C890 to discharge through CR890. When pin 1 of U850 returns positive (at the end of the erase cycle), and if S870 (ERASE) is still depressed, C890 momentarily pulls pin 6 of U810B positive, then recharges negative because of the current in R870. As U810B pin 6 swings to its low level, the output of U810B pin 4 goes high again and triggers U820. This cycle will repeat as long as S870 (ERASE) is held depressed. Multiple erase cycles cannot be obtained when using the remote erase feature.

Pin 6 of U850 drives Erase Interval Output Gate U810A to generate an Erase Interval Out signal at pin 7 of J20 (REMOTE PROGRAM). The output from U850 is also used as a lockout signal for U820 and U895 during the erase cycle.

Transistor Q810, along with C810 and R810, form a circuit to initiate an erase cycle whenever the 607 storage mode is changed from store to non-store.

Variable-Persistence Pulse Generator

Transistors Q872 and Q876 are connected as a relaxation oscillator that generates sharp positive pulses (see Fig. 4-3) at a 100-hertz rate. The timing components for the relaxation oscillator are R875 and C886. The sharp positive pulses from the emitter of Q876 are used to trigger monostable multivibrator U895. The on time of U895 is controlled by C895, R892, R894, and potentiometer R895 (PERSISTENCE/SAVE TIME). The output of U895 controls diode gates CR973 and CR975, which subtract current from the summing point at the base of Q1060 in the Storage Mesh Amplifier, thus modulating the storage mesh. The amount of current to be subtracted is set by potentiometer R975 (Pulse Ht).

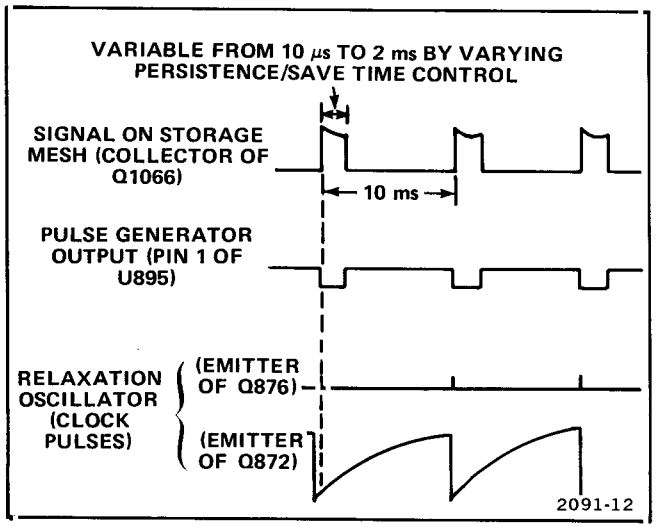

Figure 4-3. Idealized waveform ladder showing the output and internal clock pulses of the Variable-Persistence Pulse Generator.

Turning R895 (PERSISTENCE/SAVE TIME) fully counterclockwise (maximum persistence position) closes S895A and grounds the output of the relaxation oscillator through R882, thereby preventing U895 from being triggered.

Pulling the PERSISTENCE/SAVE TIME knob out to the save mode causes the output of Save Input Gate U810D to bias CR984 on and CR975 off. Thus, the output of U895 is fed to the flood-gun cathode through CR986. With the output of U895 modulating the flood-gun cathode current instead of the storage mesh, the stored image can now be observed without complete loss of the save feature by adjusting potentiometer R895 (PERSISTENCE/SAVE TIME). The maximum average flood-gun cathode current corresponds to the fully clockwise position (minimum persistence) of potentiometer R895 (PERSISTENCE/SAVE TIME). When potentiometer R895 (PERSISTENCE/SAVE TIME) is fully counterclockwise, U895 is not triggered and the flood-gun cathode current is zero, which results in maximum save time. During the time U895 is not triggered (PERSISTENCE/SAVE TIME control fully counterclockwise), the flood-gun cathode is positive with respect to the flood-gun anode level (i.e., approximately +35 volts) and no flood-gun cathode current flows (Q996 is turned off).

Store/Non-Store Input Gate

The Store/Non-Store Input Gate consists of U810C which initiates an erase cycle each time the storage mode is changed from store to non-store or vice versa.

When the non-store mode is selected, either remotely through pin 6 of J20 (REMOTE PROGRAM) or by releasing S910 (STORE) to the out position, pin 10 of U810C goes high and turns on Q810 in the Erase Pulse Generator. Consequently, pin 6 of U810B goes low and triggers U820 which initiates an erase cycle. After a short time, due to the delay introduced by C904, pin 4 of U820 is then pulled high through CR812 to disable U820 and prevent any additional erase pulses during the erase cycle. The high at pin 10 of U810C also turns on Q990 in the Flood-Gun Cathode Regulator. Transistor Q996 is turned on coincidently with Q990 for about 50 milliseconds by the erase pulse from pin 6 of U820 through R1000 and CR1000. Thus, cathode current flows and the crt phosphor is flooded with electrons for 50 milliseconds. After 50 milliseconds, Q990 turns Q996 off and R998 holds the flood-gun cathode positive with respect to the flood-gun anode which stops the flow of cathode current.

When the store mode is selected by pushing S910 (STORE), pin 10 of U810C goes low and pulls pin 6 of U810B low through CR814 and C814, thereby initiating an erase cycle. Capacitor C814 then charges through R806 which allows pin 6 of U810B to return high and enable the Erase Pulse Generator to generate another erase cycle.

Save Input Gate

The Save Input Gate, composed of U810D, disables the Z-Axis Amplifier and the Erase Pulse Generator, and switches the output of the Variable-Persistence Pulse Generator from the Storage Mesh Amplifier to the Flood-Gun Cathode Regulator.

When the save mode is selected, either remotely through pin 20 of J20 (REMOTE PROGRAM) or by pulling out the PERSISTENCE/SAVE TIME knob to close S895B, pin 13 of U810D goes high. Consequently, pin 4 of U820 goes high to disable the Erase Pulse Generator while Q700 in the Z-Axis Amplifier is biased on to disable the Z-Axis Output Amplifier. The high at pin 13 of U810D also biases CR984 on and CR975 off, which feeds the Variable-Persistence Pulse Generator output through CR986 to the base of Q990 in the Flood-Gun Cathode. Thus, the Variable-Persistence Pulse Generator output now modulates the flood-gun cathode current instead of the storage mesh as described in the Variable-Persistence Pulse Generator discussion.

Input-Output Gate Protection

Resistors R802, R852, R860 and R912, and diodes CR801, CR802, CR852, CR853, CR860, CR861, CR910, and CR912 provide limited protection against accidental line transients as an additional voltage drop is introduced.

Storage Element Supplies

The storage-element supply provides operating and control voltages for the storage and flood-gun crt elements.

FLOOD-GUN CATHODE REGULATOR. Transistors Q990 and Q996 form a clamped switching circuit. When Q996 is on, the flood-gun cathode is held at +15 volts and cathode current flows. With Q996 off, R998 holds the flood-gun cathode positive with respect to the flood-gun anode, and no cathode current flows.

FLOOD-GUN ANODE REGULATOR. Transistor Q1010 forms a shunt regulator with the output voltage set by R1014 and R1012 to about +35 volts. During an erase cycle, the flood-gun anode voltage is raised by the added current drawn by R1018. Normally, the additional R1018 current is supplied by pin 1 of U850. However, when the output (pin 1) of U850 goes low for the duration of the erase cycle, CR1018 turns off, CR1016 turns on, and the additional current is then supplied from the summing point (base of Q1010).

COLLIMATION ELECTRODE REGULATORS. Transistor Q1036 with R1034, R1032, and R1030 forms a shunt regulator. Potentiometer R1030 (CE 1) sets the output voltage to collimation electrode 1. When the 607 is changed from store to non-store mode, Q1026 is momentarily turned on. Consequently, the additional current from the base of Q1036 is switched to ground through R1026 which raises the voltage at collimation electrode 1.

Transistor Q1050 with R1052, R1054, and R1055 form a shunt regulator. Potentiometer R1054 (CE 2) sets the output voltage to collimation electrode 2. Zener diode VR1040 supplies a regulated +135 volts to potentiometer R1042 (CE 3) which sets the output voltage to collimation electrode 3.

STORAGE MESH AMPLIFIER. Transistors Q1060 and Q1066 form an operational amplifier that is used as a current-to-voltage conversion amplifier to control the storage mesh. The output dc level of the amplifier is set by R970 (OPERATE LEVEL) and R965 (Op Level). In addition to the input signals that modulate the supply during the erase cycle and variable persistence modes of operation, an additional input in the form of a modified ramp is made to the summing point (base of Q1060). The modified ramp provides more consistent storage performance and is supplied from relaxation oscillator Q872 and Q876.

LOW VOLTAGE ⑦

Power Input

Power is applied to the primary of transformer T15 through fuse F10, thermal cutout S10, power switch S12, and line-voltage selector plug P15 (or P17). The line-voltage selector plug allows changing the primary-winding taps of T15 to fit different line-voltage requirements.

Low-Voltage Rectifiers and Unregulated Outputs

The full-wave bridge rectifiers and associated filter components in the secondaries of T15 provide filtered dc voltages. The unregulated +20-volt output goes to the high-voltage transformer, where it is fuse protected.

Low-Voltage Regulators

+15-VOLT SUPPLY. The +15-Volt Supply, besides providing power to circuitry throughout the instrument, provides a reference-voltage source to establish operating levels for the feedback regulators in the −30-Volt and the +5-Volt Supply. The regulator for the +15-Volt Supply is a feedback amplifier system that operates between ground and the unregulated +20-volts. Current to the load is delivered by series-pass transistor Q30 and the supply voltage is established by the drop across R38, R40, and R42, which is compared to the voltage drops across VR50 and the emitter-base junction of Q50. Any variation in output voltage due to ripple is amplified by Q50 and Q32. The current change through the load is applied to the base of Q30 which maintains a constant output. The output of the supply is set to exactly +15 volts by potentiometer R40 (+15 V). During initial turn on, CR30 biases Q30 on. Sufficient voltage is then developed across shunt resistor R34 to start the High-Voltage Power Supply.

Transistor Q32 protects the supply in the event of a current overload. The overload will cause the voltage across R36 to become high enough to overcome the voltage drops across CR40, CR41 and the base-collector junction of Q32. At this time, Q32 becomes saturated and turns off Q30, thereby current-limiting the supply.

–30-VOLT SUPPLY. The regulator for the –30-Volt Supply consists of series-pass transistor Q70 and error amplifier Q80. This is a feedback amplifier system similar to that just described for the +15-Volt Supply, except that the regulator is located in the return side of the supply instead of the output.

The center of resistive divider network R86 and R88 is set by error amplifier Q80 to be zero volts with respect to ground during normal operation. Any variation in output from the –30-Volt Supply is coupled to the error amplifier, which changes the bias of the series-pass transistor. This change in bias, and the resulting change in conduction of the regulator, alters the voltage at the –30-Volt Supply return, which maintains the –30-Volt Supply at the proper level.

Transistor Q76 protects the –30-volt series regulator Q70 if excess current is demanded from this supply. All current from this supply must flow through R72. When excess current is demanded, the voltage drop across R72 increases enough to forward bias CR74. The resulting current through this diode takes control away from Q80, and will turn on Q76 while turning off Q70, thus limiting the supply current to a safe level.

+5-VOLT SUPPLY. The regulator for the +5-Volt Supply consists of series-pass transistor Q60 and error amplifier Q64. Operation of this feedback amplifier system is similar to that described for the +15-Volt Supply. Current limiting, in the event of an overload, is provided by R56.

SWEEP (OPTION 4) ◈8◈

Trigger and Sweep Generator

The Trigger and Sweep Generator produces a positive-going sawtooth voltage that is amplified by the Horizontal (X) Amplifier to provide sweep deflection in the crt. Six sweep rates are provided in decade steps from 0.1 second through 1 microsecond/division. A negative-going gate is produced at the same time the sawtooth is being produced to unblank the crt.

The Trigger and Sweep Generator is composed of Tektronix-manufactured integrated circuit U1130 and its associated discrete circuit components. Integrated circuit U1130 contains the trigger generator, the sweep-gating circuit, and an operational amplifier to form the basis of a Miller integrator. Power is applied to pins 7 and 12 to establish the operating levels within the device. An internal reference Zener diode provides 6.4 volts between pins 8 and 9 for operation of external controls; pin 8 provides a level of two diode junctions above the negative level at pin 12.

The timing components are selected by S1130 (SEC/DIV) which permits one of six nominal sweep rates to be chosen. Potentiometer R1145 (VARIABLE) adjusts the timing current to provide a continuously variable sweep rate.

Pins 10, 11, 13, and 14 are associated with the Trigger Generator portion of U1130. The triggering signal is applied to a field-effect transistor (FET) input at pin 13. Potentiometer R1118 (TRIG SLOPE/LEVEL) at pin 14 controls the internal comparators that determine the level and slope at which the internal Schmitt multivibrator switches states, initiating a sweep trigger. Differentiating capacitor C1112 at pin 11 determines the trigger-pulse width.

For normal triggered operation, –8.2 volts is applied to pin 10 to hold the bright-baseline auto circuit inactive. In this mode, when the triggering signal is lost, a sweep cannot be produced. When internal switch S1109 (Trig Mode) is set to Auto, the –8.2 volts is disconnected to permit a free-running sweep, or bright baseline, to be produced. Pin 10 moves positive as C1110 charges, and this positive potential then acts as the triggering signal. A new sweep will be initiated immediately following the sweep hold-off time. However, with S1109 (Trig Mode) in the Auto position, any incoming triggering signal will discharge C1110. If the signal is occurring at a rate greater than about 20 hertz, C1110 will be held below the auto-trigger level to permit a triggered sweep to be produced.

Pins 1 through 6 and pin 16 are associated with the Sweep Generator portion of U1130. Upon receipt of a trigger from the Trigger Generator, the sweep gate turns on. While the gate is on, CR1130 is turned off by a high logic level at pin 2, allowing the current through external R_t components R1130 and R1146 to be switched to timing capacitors C1130 and C1138. Pin 5 is the operational amplifier null point, thus the nearly constant timing current charges the capacitors linearly, producing a linear, negative-going sawtooth voltage at pin 4. When the sawtooth reaches a level determined by R1115 (Swp Length), the sweep terminates. At this point, the sweep gate turns off, turning on CR1130 and quickly discharging the timing capacitors. A short-duration trigger-lockout period, (to allow the sweep generator to reset and stabilize), is provided by C1124 and C1125 at pin 3.

Sawtooth Amplifier

Operational amplifier system Q1160 and Q1164 provides amplification of the sweep sawtooth to a suitable amplitude to meet the sensitivity requirements of the Horizontal (X) Amplifier. Potentiometer R1165 (Swp Cal) permits calibrating the sweep to the crt graticule. The base of Q1160 is the null point, R1150 is the R_{in} element, and R1155 is the feedback element. A positive-going sawtooth is produced at the emitter of Q1164.

Unblanking-Gate Output Amplifier

The negative-going gate produced at pin 16 of U1130 is amplified by Q1175 and Q1178. The negative-going gate produced at the collector of Q1178 is applied to R735 in the Z-Axis Amplifier circuit to turn on the crt during the sweep.

MAINTENANCE

This section of the manual contains information for performing preventive maintenance, troubleshooting, and corrective maintenance for the 607 Storage Monitor.

PREVENTIVE MAINTENANCE

Preventive maintenance, when performed on a regular basis, can prevent instrument breakdown and may improve the reliability of the instrument. The severity of the environment to which the instrument is subjected will determine the frequency of maintenance. A convenient time to perform preventive maintenance is preceding electrical adjustment of the instrument.

CABINET PANEL REMOVAL

WARNING

Disconnect power to the instrument before removing the cabinet panels to avoid electric-shock hazard.

The cabinet panels are held in place by slotted fasteners. To remove the panels, turn each fastener counterclockwise a quarter turn with a large screwdriver. Lift the panels away. Always operate the instrument with the panels in place to protect the interior from dust.

CLEANING

The 607 Storage Monitor should be cleaned as often as operating conditions require. Accumulation of dirt in the instrument can cause overheating and component breakdown. Dirt on components acts as an insulating blanket and prevents efficient heat dissipation. It also provides an electrical conduction path which may result in instrument failure. The cabinet panels provide protection against dust in the interior of the instrument.

CAUTION

Avoid the use of chemical cleaning agents which might damage the plastics used in this instrument. Use isopropyl alcohol, total denatured ethyl alcohol or TP35. Before using any other solvents, consult your Tektronix Service Center.

Exterior

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.

CRT

Clean the crt faceplate protector with a soft, lint-free cloth dampened with denatured alcohol.

Interior

Clean the interior by blowing away the accumulated dust with dry, low-velocity air (approximately 5 lb/in^2). Remove any dirt which remains with a soft brush or a cloth dampened with a mild detergent and water solution. A cotton-tipped applicator is useful for cleaning in narrow spaces or for cleaning more delicate circuit components.

CAUTION

Make sure circuit boards and components are dry before applying power to prevent damage from arcing.

The high-voltage circuits should receive special attention. Excessive dirt in this area may cause high-voltage arcing and result in improper instrument operation.

VISUAL INSPECTION

The 607 Storage Monitor should be inspected occasionally for such defects as broken connections, improperly seated semiconductors, damaged or improperly installed circuit boards, and heat-damaged parts. The corrective procedure for most visible defects is obvious; however, particular care must be taken if heat-damaged parts are found. Overheating usually indicates other trouble in the instrument; therefore, it is important that the cause of overheating be corrected to prevent recurrence of the damage.

SEMICONDUCTOR CHECKS

Periodic checks of semiconductors are not recommended. The best check of semiconductor performance is actual operation in the instrument. More details on semiconductors are given under Troubleshooting.

PERIODIC ELECTRICAL ADJUSTMENT

To ensure accurate measurements, check the electrical adjustment of this instrument after each 1000 hours of operation, or every 6 months if used infrequently. In addition, replacement of components may necessitate adjustment of the affected circuits. Complete adjustment instructions are given in section 6, Performance Check and Adjustment.

TROUBLESHOOTING

The following information is provided to facilitate troubleshooting of the 607 Storage Monitor. Information contained in other sections of this manual should be used in conjunction with the following data to aid in locating a defective component. An understanding of the circuit operation is helpful in locating troubles. See section 4, Theory of Operation, for this information.

TROUBLESHOOTING AIDS

Diagrams

Complete schematic diagrams are given on the foldout pages in section 9, Diagrams and Circuit Board Illustrations. The component number and electrical value of each component in this instrument is shown on these diagrams (see the first page of the Diagrams and Circuit Board Illustrations section for definitions of the reference designators and symbols used to identify components in this instrument).

Pertinent voltages and numbered waveform test points are shown on the schematic diagrams. The typical waveforms obtained at the numbered test points are located to the left of the schematic diagram to which they refer. The portions of the circuits mounted on circuit boards are enclosed with heavy solid black lines.

To help locate the major circuits and the components contained in those major circuits, each schematic diagram is divided into functional blocks as indicated by wide shaded lines. These functional blocks are described in detail in section 4, Theory of Operation.

Circuit Board Illustrations

To aid in locating circuit boards, a circuit board location illustration appears on the back of the foldout page facing the schematic diagrams. In addition, illustrations of the circuit boards are included along with the physical location of the components and waveform test points that appear on the schematic diagram. Each circuit board illustration is arranged in a grid with an index for rapid location of components.

Adjustment and Test Point Locations

To aid in locating test points and adjustable components referenced in the Performance Check and Adjustment procedures, an Adjustment and Test Point Locations pullout page is provided in section 9, Diagrams and Circuit Board Illustrations.

Component Color Coding

The instrument contains brown composition resistors, some metal-film resistors and some wire-wound resistors. The resistance values of wire-wound resistors are usually printed on the component body. The resistance values of composition resistors and metal-film resistors are color coded on the components using the EIA color code (some metal-film resistors may have the value printed on the body). The color code is read starting with the stripe nearest the end of the resistor. Composition resistors have four stripes, which consist of two significant figures, a multiplier, and a tolerance value. Metal-film resistors have five stripes consisting of three significant figures, a multiplier, and a tolerance value.

The values of common disc capacitors and small electrolytics are marked on the side of the component body. The white ceramic and epoxy-coated tantalum capacitors used in the instrument are color coded using a modified EIA code.

The cathode end of glass-encased diodes is indicated by a stripe, a series of stripes, or a dot. The cathode and anode ends of metal-encased diodes can be identified by the diode symbol marked on the body.

Cam-Switch Contact Identification

Cam switches shown on the diagrams are drawn to indicate the position of the contact in the complete switch assembly counting from the front, or knob end of the switch, towards the rear. The contact closure chart on the diagrams indicates when each contact is closed.

Semiconductor Lead Configurations

Figure 5-1 shows the lead configurations of the semiconductors.

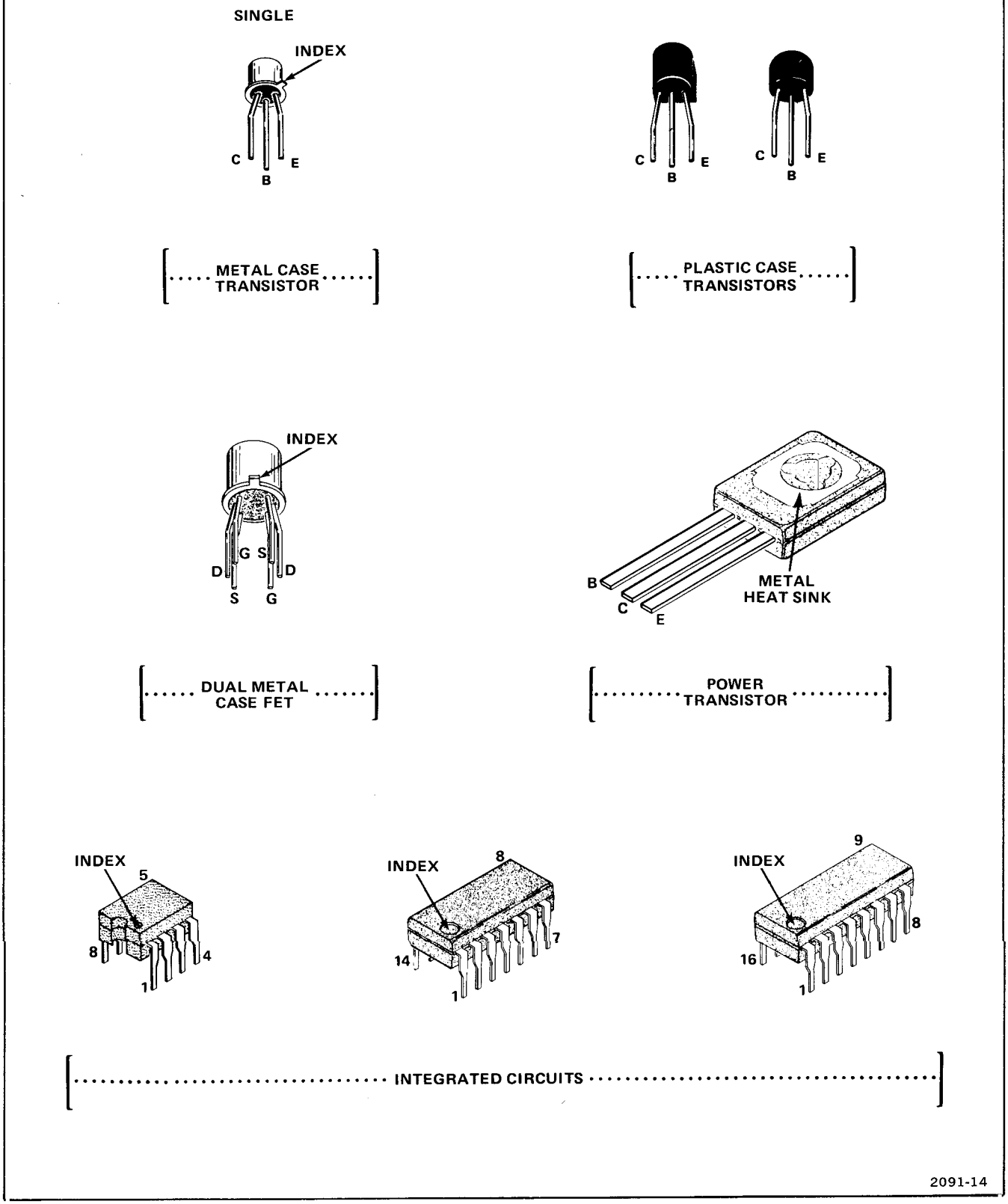

Figure 5-1. Semiconductor lead configurations.

Multi-Connector Holders

The multi-connector holders are keyed with two triangles, one on the holder and one on the circuit board. When a connection is made perpendicular to a circuit board surface, the orientation of the triangle and slot numbers on the connector holder is determined by the direction of the nomenclature marking (see Fig. 5-2).

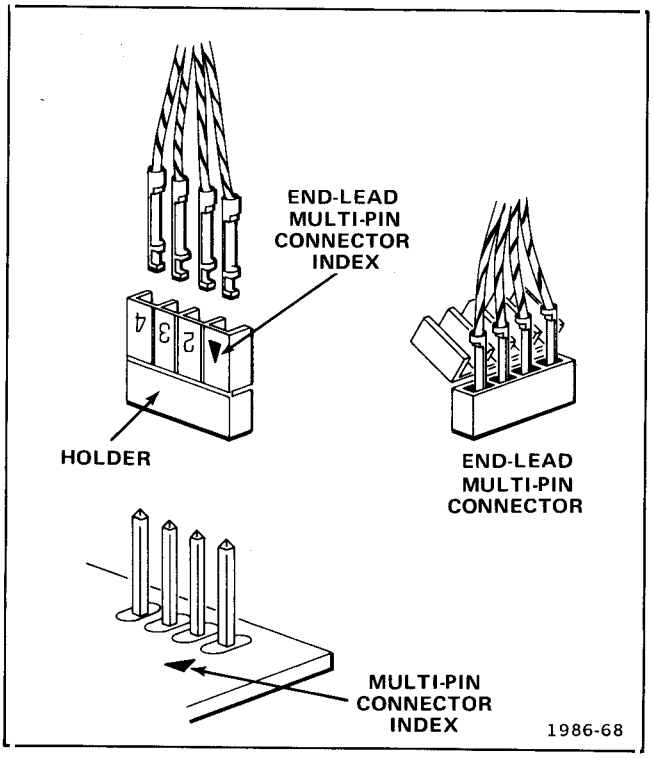

Figure 5-2. Orientation of multi-connector holders.

Troubleshooting Equipment

The following equipment is useful for troubleshooting the 607 Storage Monitor:

Semiconductor Tester

Description: Dynamic-type tester.

Purpose: To test the semiconductors used in this instrument.

Recommended type: TEKTRONIX Type 576 Transistor Curve Tracer or equivalent.

Multimeter

Description: Input impedance, 10 megohms. Voltage range 0 to 300 volts, ac and dc. Resistance range, 0 to 50 megohms. Accuracy, within 3%. Test probes must be insulated to prevent accidental shorting.

Multimeter (Cont.)

Purpose: To check voltages and for general troubleshooting.

Test Oscilloscope

Description: Frequency response, dc to at least 2 megahertz (to 10 megahertz for troubleshooting the Z-Axis Amplifier). Deflection factor, 1 millivolt/division to 5 volts/division. A 10X, 10-megohm voltage probe should be used to reduce circuit loading for voltage measurements.

Purpose: To check operating waveforms.

TROUBLESHOOTING TECHNIQUES

This troubleshooting procedure is arranged in an order that checks the simple trouble possibilities before proceeding with extensive troubleshooting. The first few checks ensure proper connection, operation, and adjustment. If the trouble is not located by these checks, the remaining steps aid in locating the defective component. When the defective component is located, it should be replaced by performing the procedure given under Component Replacement in this section.

1. Check Control Settings

Incorrect control settings can imitate a trouble that does not exist. If there is any question about the correct function or operation of any control, refer to section 2, Operating Instructions.

2. Check Associated Equipment

Before proceeding with troubleshooting, check that the equipment used with this instrument is operating correctly. Also, check that the input signals are properly connected and that the interconnecting cables are not defective. Check the line-voltage source.

3. Visual Check

Visually check that portion of the instrument in which the trouble is located. Many troubles can be found by visible indications, such as unsoldered connections, broken wires, damaged circuit boards and damaged components.

4. Check Instrument Adjustment

Check the electrical adjustment of this instrument, or of the affected circuit if the trouble appears in one circuit. The apparent trouble may only be a result of misadjustment. Complete adjustment instructions are given in section 6, Performance Check and Adjustment.

TABLE 5-1
Power Supply Output Voltage

Power Supply	Test Point	Output Voltage Range	Typical Ripple (Peak-to-Peak)
+5 V	TP +5 V	+4.75 V to +5.25 V	5 mV or less
+15 V (Adjustable)	TP +15 V	+14.92 V to +15.08 V	5 mV or less
−30 V	TP −30 V	−29.10 V to −30.90 V	5 mV or less
+80 V	TP +80 V	+75 V to +90 V	0.5 V or less
+170 V	TP +170 V	+160 V to +190 V	1 V or less
−1500 V (Adjustable)	Pin 2 of crt socket	−1470 V to −1530 V	

5. Isolate Trouble to a Circuit

To isolate trouble to a particular circuit, note the trouble symptom. The symptom often identifies the circuit in which the trouble is located. When trouble symptoms appear in more than one circuit, check the affected circuits by taking voltage and waveform readings.

Incorrect operation of all circuits often indicates trouble in the power supplies. Check first for the correct output voltage of the individual supplies. A defective component elsewhere in the instrument can appear as a power supply trouble and may also affect the operation of other circuits. Table 5-1 lists the output voltage range and typical ripple of the power supplies in the 607. These voltages are measured between the power-supply test points and ground (see Adjustment and Test Point Locations pullout page in section 9, Diagrams and Circuit Board Illustrations, for test point locations). If the power-supply voltage and ripple is within the listed range, the supply can be assumed to be working correctly. If outside the range, the supply may be misadjusted or operating incorrectly. Use the procedure given in section 6, Performance Check and Adjustment, to adjust the power supplies.

The Troubleshooting Chart pullout page in section 9, Diagrams and Circuit Board Illustrations, provides a guide for locating a defective circuit. Start at the top left of the Troubleshooting Chart and perform the checks given across the top of the chart until the indicated results are not found. Then proceed to further checks, or the circuit in which the trouble is suspected, as listed underneath the step. The shaded blocks on the Troubleshooting Chart indicate circuit(s) that may cause a malfunction. The circuit(s) listed in shaded blocks are discussed in detail in section 4, Theory of Operation. After the defective circuit has been located, proceed with steps 6 and 7 to locate the defective component(s).

6. Check Voltages and Waveforms

Often the defective component can be located by checking for the correct voltages and waveforms in the circuit. Typical voltages and waveforms are given in section 9, Diagrams and Circuit Board Illustrations.

NOTE

Voltages and waveforms given in section 9, Diagrams and Circuit Board Illustrations, are not absolute and may vary slightly between different 607 Storage Monitors. To obtain operating conditions similar to those used to take these readings, see the appropriate schematic diagram.

7. Check Individual Components

The following procedures describe methods of checking individual components. Components which are soldered in place are best checked by first disconnecting one end. This isolates the measurement from the effects of surrounding circuitry.

WARNING

Disconnect the monitor from the power source before removing or replacing components to avoid electric shock.

TRANSISTORS. A good check of transistor operation is actual performance under operating conditions. A transistor can most effectively be checked by substituting a new component for it (or one which has been checked previously). However, be sure that circuit conditions are not such that a replacement transistor might also be damaged. If substitute transistors are not available, use a dynamic tester. Static-type testers are not recommended, since they do not check operation under simulated operating conditions.

INTEGRATED CIRCUITS. Integrated circuits (IC's) can be checked with a voltmeter, test oscilloscope, or by direct substitution. A good understanding of the circuit operation is essential to troubleshooting circuits using IC's. In addition, operating waveforms, logic levels, and other operating information for the IC's are given in the section 4, Theory of Operation. Be careful when checking voltages and waveforms around the integrated circuits so that adjacent leads

are not shorted together. A convenient means of clipping a test probe to in-line multi-pin integrated circuits is with an integrated-circuit test clip. This device also doubles as an integrated-circuit extraction tool.

DIODES. A diode can be checked for an open or shorted condition by measuring the resistance between terminals with an ohmmeter scale having a low internal source current, such as the R X 1K scale. The resistance should be very high in one direction and very low when the meter leads are reversed.

RESISTORS. Check the resistors with an ohmmeter. Resistor tolerance is given in section 7, Replaceable Electrical Parts. Normally, resistors do not need to be replaced unless the measured value varies widely from the specified value.

INDUCTORS. Check for open inductors by checking continuity with an ohmmeter. Shorted or partially shorted inductors can usually be found by checking the waveform response when high-frequency signals are passed through the circuit. Partial shorting often reduces high-frequency response.

CAPACITORS. A leaky or shorted capacitor can best be detected by checking resistance with an ohmmeter on the highest scale. Do not exceed the voltage rating of the capacitor. The resistance reading should be high after initial charge of the capacitor. An open capacitor can best be detected with a capacitance meter or by checking if the capacitor passes ac signals.

8. Repair and Readjust the Circuit

If any defective parts are located, follow the replacement procedures given under Component Replacement in this section. Check the performance of any circuit that has been repaired or that has had any electrical components replaced. Readjustment of the circuit may be necessary.

CORRECTIVE MAINTENANCE

Corrective maintenance consists of component replacement and instrument repair. Special techniques required to replace components in this instrument are given here.

OBTAINING REPLACEMENT PARTS

Standard Parts

All electrical and mechanical part replacements can be obtained through your local Tektronix Field Office or representative. However, many of the standard electronic components can be obtained locally in less time than is required to order them from Tektronix, Inc. Before ordering or purchasing replacement parts, check the parts list for value, tolerance, rating, and description.

NOTE

When selecting replacement parts, remember that the physical size and shape of a component may affect its performance in the instrument. All replacement parts should be direct replacements unless it is known that a different component will not adversely affect instrument performance.

Special Parts

Some components in this instrument are manufactured or selected by Tektronix, Inc., to meet specific performance requirements, or are manufactured for Tektronix, Inc. in accordance with our specifications. Most of the mechanical parts used in this instrument have been manufactured by Tektronix, Inc. Order all special parts directly from your local Tektronix Field Office or representative.

Ordering Parts

When ordering replacement parts from Tekronix, Inc., include the following information:

1. Instrument type.
2. Instrument serial number.
3. A description of the part (if electrical, include the circuit number).
4. Tektronix part number.

SOLDERING TECHNIQUES

WARNING

Disconnect the monitor from the power source before soldering to avoid electric shock.

The reliability and accuracy of this instrument can be maintained only if proper soldering techniques are used when repairing or replacing parts. General soldering techniques which apply to maintenance of any precision electronic equipment should be used when working on this instrument. Use only 60/40 rosin-core, electronic-grade solder. The choice of soldering iron is determined by the repair to be made. When soldering on circuit boards or small wiring, use only a 15-watt, pencil-type, soldering iron. A higher wattage-rating soldering iron can cause the etched circuit wiring to separate from the board base material and melt the insulation from small wiring. Always keep the soldering iron tip properly tinned to ensure the best heat transfer to the solder joint. Apply only enough heat to remove the component or to make a good solder joint. To protect heat-sensitive components, hold the component lead with a pair of long-nose pliers between the component body and the solder joint. Use a solder-removing wick to remove excess solder from connections or to clean circuit board pads.

The following technique should be used to replace components on any of the circuit boards. Most components can be replaced without removing the boards from the instrument.

1. Touch the soldering iron to the lead at the solder connection. Never place the iron directly on the board, as this may damage the board.

2. Melt a small amount of solder onto the component lead connection. This replaces the flux, which may have been removed during cleaning, and facilitates removal of the component.

3. Grip the component lead with a pair of long-nose pliers. When the solder begins to flow, gently pull the component lead from the board.

NOTE

Some components are difficult to remove from the circuit board due to a bend placed in each lead during machine insertion of the component. The purpose of the bent leads is to hold the component in position during a flow-soldering manufacturing process which solders all components at once. To make removal of machine inserted components easier, straighten the leads of the component on the back of the circuit board using a small screwdriver or pliers while heating the soldered connection.

4. Bend the leads of the replacement component to fit the holes in the circuit board. If the component is replaced while the board is mounted in the instrument, cut the leads so they will just protrude through the board. Insert the leads into the holes in the board so that the component is firmly seated against the board, or as originally positioned.

5. Touch the iron to the connection and apply enough solder to make a firm solder joint.

6. Cut off any excess lead protruding through the board (if not clipped in step 4).

7. Clean the area around the solder connection with a flux-removing solvent. Be careful not to remove information printed on the circuit board.

COMPONENT REMOVAL AND REPLACEMENT

WARNING

Disconnect the monitor from the power source before replacing components to avoid electric shock.

The exploded-view drawings associated with the Replaceable Mechanical Parts list in section 10 may be helpful in the removal or disassembly of individual components or subassemblies.

Circuit Boards

If a circuit board is damaged beyond repair, the entire assembly, including all soldered-on components, can be replaced. Part numbers are given in section 7, Replaceable Electrical Parts, for the completely wired boards.

All the boards in this instrument are mounted on the chassis. Removal and replacement procedures for the Z-Axis Amplifier, and High- and Low-Voltage Power Supply boards are included here. The remaining boards are easily removed and replaced by first removing the securing screws and then the interconnecting wires. Replacement is accomplished in the reverse order of removal.

Z-AXIS AMPLIFIER BOARD—A2. Remove and replace the Z-Axis Amplifier board as follows (see Fig. 5-3):

1. Remove the 2 securing screws to loosen the Z-Axis Amplifier board.

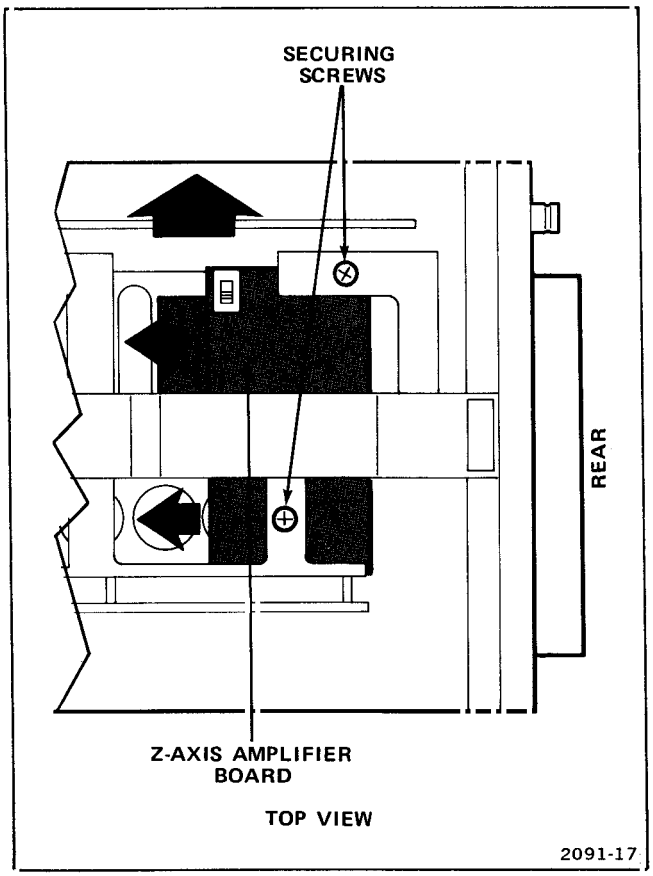

Figure 5-3. A2—Z-Axis Amplifier board removal and replacement.

2. Slide the board sideways toward the front of the instrument.

3. Unsolder the attaching wires from the left and top edge of the board (see Soldering Techniques in this section).

4. Lift the top of the board up through the slot in the chassis assembly and slide the board out of the instrument.

5. Unsolder the remaining wires to free the board.

6. Replace the Z-Axis Amplifier board in the reverse order of removal.

HIGH-VOLTAGE POWER SUPPLY BOARD—A3. Remove and replace the High-Voltage Power Supply board as follows (see Fig. 5-4):

1. Disconnect the crt anode lead at the anode plug.

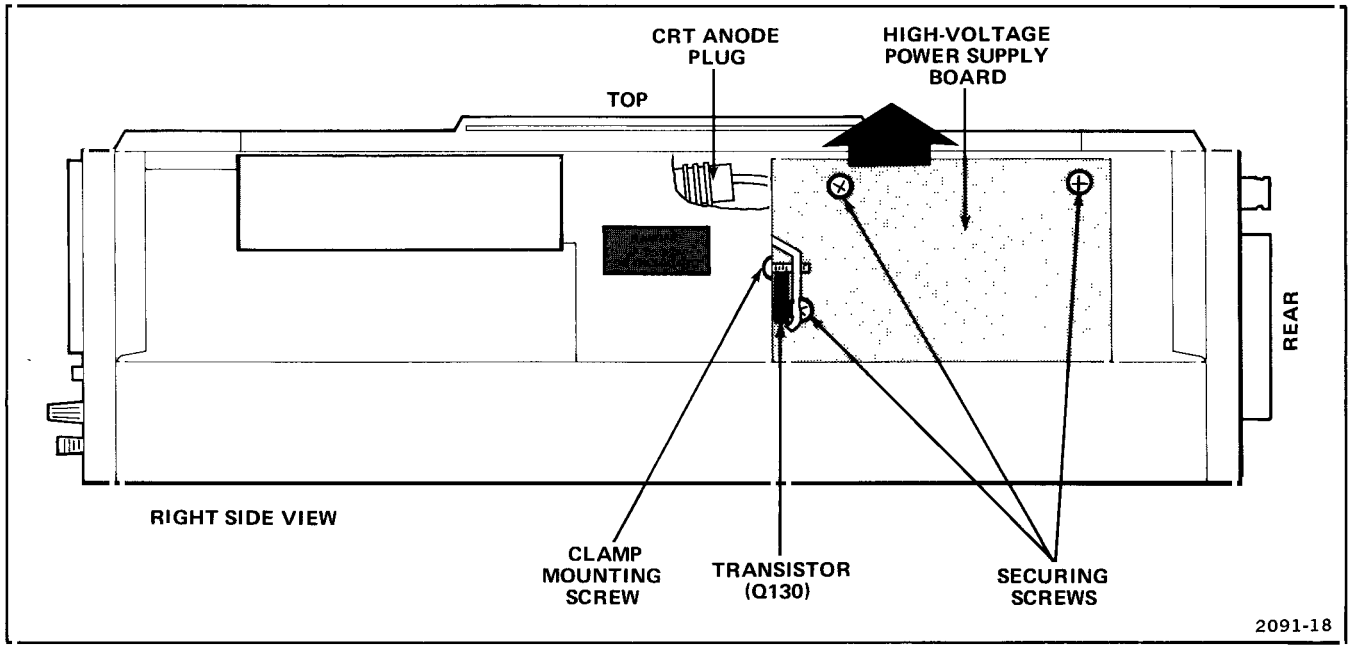

Figure 5-4. A3—High-Voltage Power Supply board removal and replacement.

WARNING

Momentarily ground the jack (crt) end of the anode plug to the chassis to dissipate any stored charge.

2. Remove the chassis-mounted clamp (on the left side of the board) that holds transistor Q130 against the heat sink.

3. Remove the 3 securing screws that hold the board to the chassis.

4. Gently lift the board up and over the chassis rail.

5. Unsolder all attached wires to free the board (see Soldering Techniques in this section).

6. Replace the High-Voltage Power Supply board in the reverse order of removal. Refer to Semiconductors in this section for instructions on replacing the transistor (Q130) heat sink.

LOW-VOLTAGE POWER SUPPLY BOARD—A5. Remove and replace the Low-Voltage Power Supply board as follows (see Fig. 5-5):

1. Reach around behind the power transistors (Q30, Q60, and Q70) and release the clips that hold the transistor cases to the heat sinks.

2. Unsolder the wires from the board (see Soldering Techniques in this section).

3. Remove the 2 securing screws to free the board from the instrument.

4. Replace the Low-Voltage Power Supply board in the reverse order of removal. Refer to Semiconductors for instructions on replacing the transistor (Q30, Q60, and Q70) heat sinks.

Semiconductors

Semiconductors should not be replaced unless actually defective. If removed from their sockets during routine maintenance, return them to their original sockets. Unnecessary replacement of semiconductors may affect the adjustment of the instrument. When semiconductors are replaced, check the operation of circuits which may be affected.

CAUTION

The POWER switch must be turned off before removing or replacing semiconductors to prevent damage to the instrument.

Replacement semiconductors should be of the original type or a direct replacement. Lead configurations of the semiconductors used in this instrument are shown in Figure 5-1.

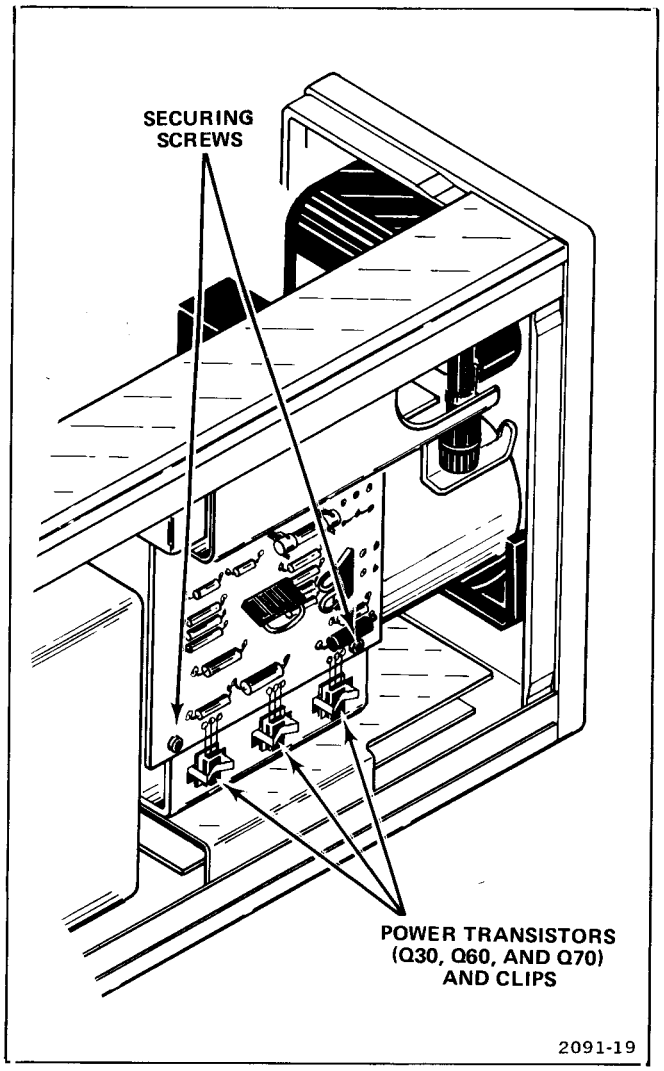

Figure 5-5. A5—Low-Voltage Power Supply board removal and replacement.

Some plastic case transistors have lead configurations which do not agree with those shown. If a replacement transistor is made by a different manufacturer than the original, check the manufacturer's basing diagram for correct basing. All transistor sockets are wired for the standard basing as used for metal-cased transistors. When removing soldered-in transistors, use a solder-removing wick to remove the solder from the holes in the circuit board. Transistors which have heat radiators or are mounted on the chassis use silicone grease to increase heat transfer. Replace the silicone grease on both sides of the insulator plate and on the metal tab, if the transistor has one, when replacing these transistors.

WARNING

Handle silicone grease with care. Avoid getting silicone grease in the eyes. Wash hands thoroughly after use.

To replace one of the power transistors mounted on the chassis adjacent to the Low-Voltage Power Supply board, first unsolder the leads. Then, remove the push-on clip that clamps the transistor to the chassis. Remove the defective transistor.

To replace the transistor mounted on the chassis adjacent to the High-Voltage Power Supply board, first unsolder the leads. Then remove the chassis clamp to remove the defective transistor.

An extracting tool should be used to remove the 8-pin integrated circuits to prevent damage to the pins. This tool is available from Tektronix, Inc.; order Tektronix Part 003-0619-00. If an extracting tool is not available, use care to avoid damaging the pins. Pull slowly and evenly on both ends of the IC. Try to avoid having one end disengage from the socket before the other.

Cathode-Ray Tube Removal

Remove the cathode-ray tube (crt) as follows (see Fig. 5-6):

WARNING

Use care when handling a crt. Breakage of the crt causes a high velocity scattering of glass fragments (implosion). Protective clothing and safety glasses should be worn. Avoid striking the crt on any object which might cause it to crack or implode. When storing a crt, place it in a protective carton or set it face down in a protected location on a smooth surface with a soft mat under the faceplate.

1. Remove the bezel assembly and snap-in implosion shield with graticule by removing the 2 bezel securing screws on the front of the instrument.

2. Remove the left and right cabinet panels (see Cabinet Panel Removal in this section).

3. Disconnect the 4 leads from the crt X and Y deflection plate pins.

NOTE

The red and black leads entering the crt shield from the Deflection Amplifier board and the rear-panel TRACE ROTATION control are connected to the display-rotation coil inside the shield. They will not hamper crt removal and need not be unsoldered.

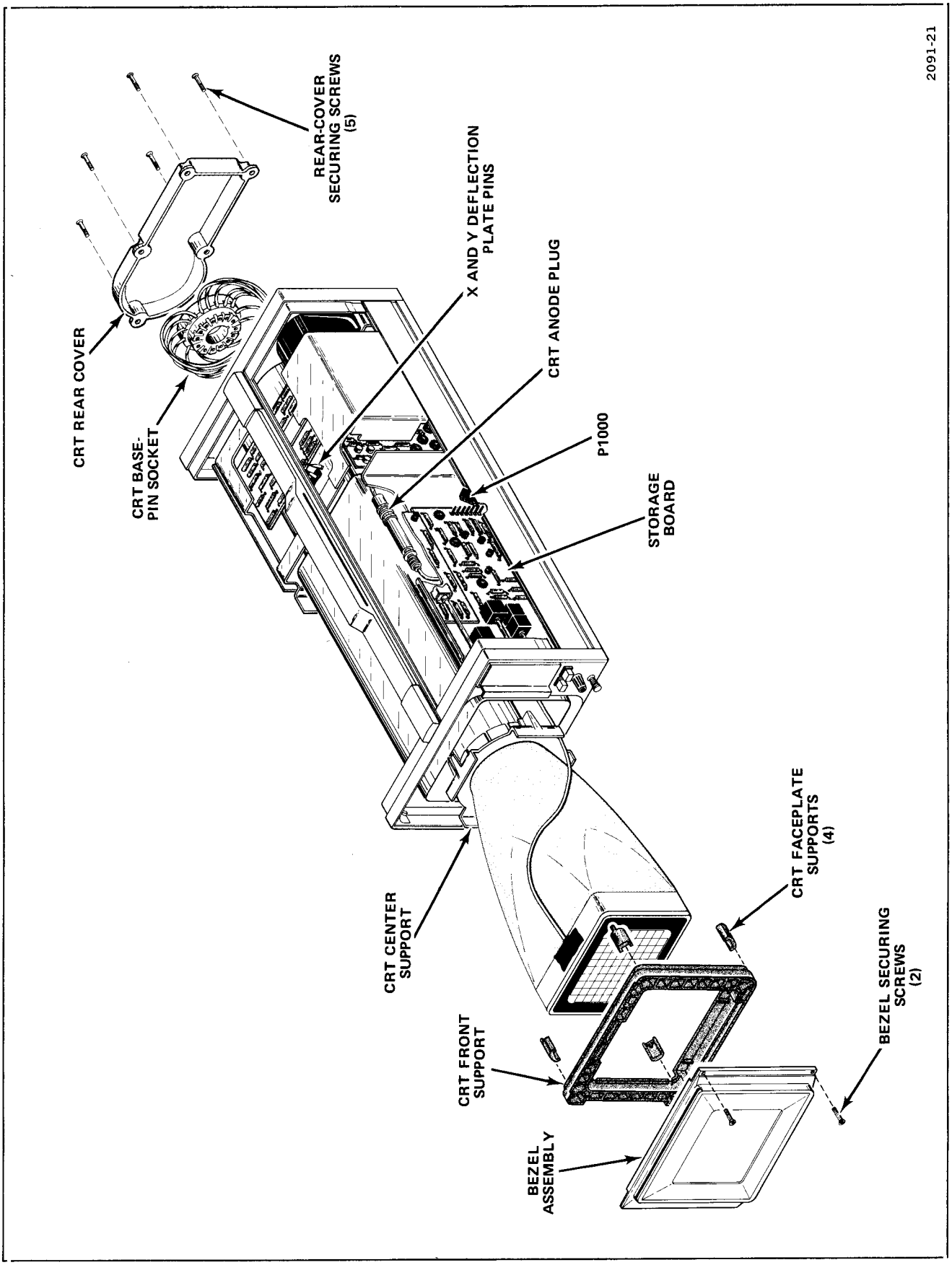

Figure 5-6. Cathode ray tube (crt) removal and replacement.

4. Disconnect plug P1000 from the Storage board and the anode lead from the crt anode plug.

5. Remove the 5 crt rear-cover securing screws and remove the cover.

6. Remove the crt base-pin socket.

7. With one hand on the front of the instrument, gently push on the crt base to slide the crt forward. The crt front support will slide out with the crt.

8. Remove the crt front support and gently pull the crt out from the front of the instrument while guiding plug P1000 and the crt anode plug through the holes in the crt shield.

NOTE

Be careful not to loose the soft plastic crt faceplate supports if they should become detached during crt removal.

9. Slide the crt center support toward the rear of the crt to remove it.

Cathode-Ray Tube Replacement

Replace the cathode-ray tube (crt) as follows (see Fig. 5-6):

1. Slide the crt center support to the bottom of the shield with the 4 legs facing the back of the instrument.

2. Press the crt front support into the front-panel recess.

3. Insert the 4 soft plastic crt faceplate supports into the corners of the crt front support.

4. Insert the neck of the crt part way into the shield.

5. Feed plug P1000 and the crt anode plug through the appropriate holes in the shield.

6. Fully insert the crt through the crt center support and into the shield. Make sure the 4 soft plastic crt faceplate supports are properly positioned in the corners of the crt front support.

7. Connect plug P1000 to the Storage board and the crt anode plug to the mating jack.

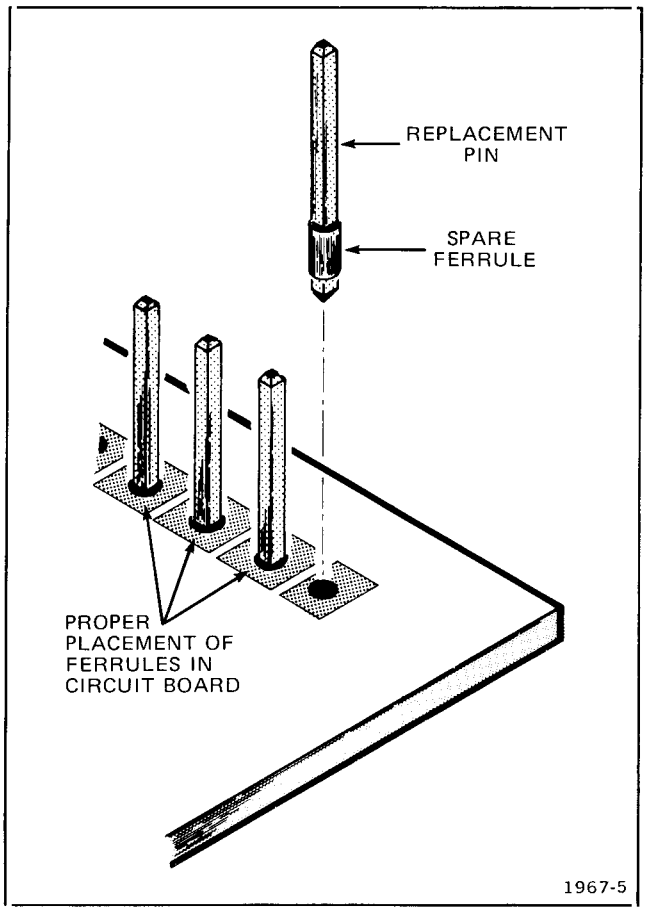

Figure 5-7. Exploded view of circuit board pin and ferrule.

8. Mount and fasten the bezel and implosion shield to the front panel with the 2 bezel securing screws.

9. Place the crt base-pin socket onto the crt base pins and replace the crt rear cover.

10. Connect the 4 leads to the proper crt X and Y deflection pins.

NOTE

The replacement crt will require that the monitor be readjusted. Refer to section 6, Performance Check and Adjustment.

Power Transformer Replacement

Replace the power transformer only with a direct replacement Tektronix transformer. After the transformer has been replaced, check the power supply output voltages and the instrument performance as outlined in section 6, Performance Check and Adjustment.

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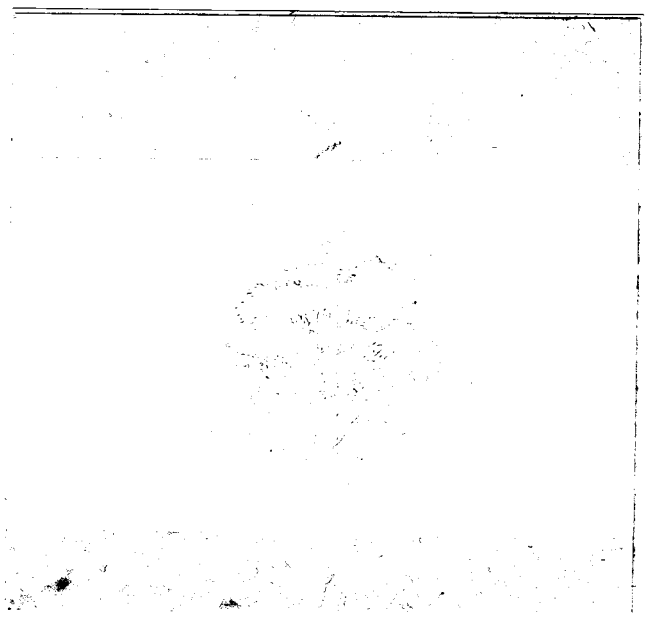
Interconnecting Circuit-Board Pins

A circuit-board pin replacement kit, including necessary tools, instructions, and replacement pins with attached spare ferrules, is available from Tektronix, Inc. Order Tektronix Part 040-0542-00.

To replace a damaged pin on a circuit board, first disconnect any pin connectors. Then unsolder (see Soldering Techniques) the damaged pin and pull it from the board with a pair of pliers, leaving the ferrule (see Fig. 5-7) in the hole if possible. If the ferrule remains in the circuit board, remove the spare ferrule from the replacement pin and press the new pin into the hole in the circuit board. If the ferrule is removed with the damaged pin, clean out the hole using a solder-removing wick and a scribe. Then press the replacement pin, with attached spare ferrule, into the hole. Position the replacement pin in the same manner as the original pin. Solder the pin to the circuit board on each side of the board. If the original pin was bent at an angle to mate with a connector, carefully bend the new pin to the same angle. Replace the pin connector.



PETER CHRISTIE
VK5EM

PERFORMANCE CHECK AND ADJUSTMENT

This section contains information necessary to perform a complete instrument performance check and adjustment. Limits given in the procedure are adjustment guides and should not be interpreted as performance requirements unless preceded by a check mark (√). Where possible, instrument performance is checked before an adjustment is made.

PRELIMINARY INFORMATION

Adjustment Interval

To maintain accuracy, check the performance of the 607 every 1000 hours of operation, or every 6 months if used infrequently. Before complete adjustment, thoroughly clean and inspect this instrument as outlined in section 5, Maintenance.

Tektronix Field Service

Tektronix Field Service Centers and the Factory Service Center provide instrument repair and adjustment services. Contact your Tektronix Field Office or representative for further information.

Using This Procedure

This Performance Check and Adjustment procedure can be used either for complete adjustment or as a check of instrument performance. Completion of each step in the procedure ensures that the instrument is correctly adjusted and operating within specified limits. Refer to the following discussion for instructions on a complete or partial check and adjustment.

INDEX. An index precedes the procedure to aid in locating Performance Check and Adjustment steps.

PERFORMANCE CHECK. Instrument performance can be checked by performing the complete Performance Check and Adjustment procedure and omitting only the ADJUST parts of the steps. A check mark (√) preceding a CHECK indicates that the limit given is a performance requirement specified under Specification in section 1, General Information.

ADJUSTMENT. Completion of each step in the Performance Check and Adjustment procedure ensures that the instrument is correctly adjusted and performing within specified limits. Where possible, instrument performance is checked before an adjustment is made. For best overall performance when performing the complete adjustment procedure, make each adjustment to the exact setting indicated.

PARTIAL PROCEDURES. The following procedure is written to completely check and adjust the instrument to the Specification in section 1, General Information. If the applications for which the instrument is used do not require the full available performance, the procedure and the required equipment list can be shortened accordingly.

A partial performance check and adjustment may be desirable after replacing components, or to touch up the adjustment of a portion of the instrument. To check or adjust only part of the instrument, refer to the Equipment Required list which precedes that portion of the procedure to be performed. To avoid unnecessary adjustment of other parts, adjust only if the tolerance given in each CHECK step is not met.

TEST EQUIPMENT REQUIRED

The test equipment listed in Table 6-1 is required for a complete performance check and adjustment of this instrument. The specifications given in Table 6-1 for test equipment are the minimum required to meet the Specifications in section 1. Detailed operating instructions for test equipment are omitted in this procedure. Refer to the test equipment instruction manual if more information is needed.

Test Equipment Alternatives

The test equipment listed in the Examples of Applicable Test Equipment column, Table 6-1, is required to check and adjust this instrument. The Performance Check and Adjustment procedure is based on the first item of equipment given as an example. If other equipment is substituted, control settings or setups may need to be altered. If the exact item of equipment given as an example is not available, refer to the Minimum Specifications column to determine if other equipment may be substituted. Then check the Purpose column. If you determine that your measurement requirements will not be affected, the item and corresponding step(s) can be deleted.

TABLE 6-1
Test Equipment

Description	Minimum Specifications	Purpose	Examples of Applicable Test Equipment
Test Oscilloscope	Bandwidth, dc to at least 8 MHz; deflection factor, 0.2 to 5 V/div within 2%, sweep rate, 0.5 ms to 20 μs/div.	Adjust storage levels, and pulse height, vertical, horizontal and Z-axis gain and compensation. Check phase difference, horizontal, vertical and Z-axis bandwidth.	TEKTRONIX 5403/D40 Oscilloscope with 5A48 Dual Trace Amplifier and 5B42 Delaying Time Base plug-ins.
Ramp Generators (2)	Ramp duration, 10 μs to 5 ms within 3%; ramp amplitude, +1 to +3 V into 50 Ω. Gate output amplitude, at least 0.3 V open circuit.	Adjust trace rotation, Y-axis alignment, geometry; vertical, horizontal and Z-axis gain and compensation. Check dot writing time, stored linear writing speed, horizontal, vertical, and Z-axis bandwidth.	TEKTRONIX RG 501 Ramp Generators (operate in TM 500-series power module).
Square-Wave Generator	Frequency, 1 kHz, 10 kHz, and 100 kHz; risetime, 50 ns or less; amplitude, 5 V into 50 Ω.	Adjust vertical, horizontal, and Z-axis gain and compensation.	TEKTRONIX PG 506 Calibration Generator (operates in TM 500-series power module).
Sine-Wave Generator	Frequency, 350 kHz to at least 5 MHz; reference frequency, 50 kHz; amplitude, 0.5 to 5 V within 3% into 50 Ω.	Check horizontal, vertical, and Z-axis bandwidth; horizontal and vertical phase difference, and Option 4 sweep generator trigger slope/level.	TEKTRONIX SG 503 Leveled Sine-Wave Generator (operates in TM 500-series power module).
Time-Mark Generator (Required for Option 4 only)	Marker output, 1 μs to 0.1 s; accuracy, within 1%.	Check Option 4 sweep timing.	TEKTRONIX TG 501 Time-Mark Generator (operates in TM 500-series power module).
Pulse Generator	Negative-going pulse. Pulse period, 1 ms; pulse duration, 0.5 and 1 μs; accuracy, within 5%; amplitude, 0.5 to at least 5 V into 50 Ω; rise time, 50 ns or less.	Check dot writing time.	TEKTRONIX PG 501 Pulse Generator (operates in TM 500-series power module).
Precision DC Voltmeter	Measurement range, −30 to +180 V; measurement accuracy, within 0.1%.	Adjust +15 V supply and crt bias. Check low-voltage supplies.	TEKTRONIX DM 502 Digital Multi-Meter (operates in TM 500-series power module).
DC Voltmeter	Measurement range, −1470 to −1530 V; measurement accuracy, within 3%.	Adjust −1500 V supply.	Triplett Model 630 NA.
10X Probe	Compatible with test oscilloscope used.	Adjust Z-axis gain, compensation and bandwidth, storage levels and pulse height.	TEKTRONIX P6065A 10X Probe.
5X Attenuator	Impedance, 50 Ω within 2%; connectors, BNC.	Adjust horizontal, vertical, and Z-axis gain and compensation. Check dot writing time.	Tektronix part 011-0060-02.
50-Ohm Termination	Impedance, 50 Ω within 2%; connectors, BNC.	Adjust Option 4 sweep timing. Check dot writing time.	Tektronix part 011-0049-01.

TABLE 6-1 (CONT.)
Test Equipment

Description	Minimum Specifications	Purpose	Examples of Applicable Test Equipment
BNC T Connector		Adjust horizontal, vertical, and Z-axis gain and compensation; horizontal and vertical phase difference.	Tekronix part 103-0030-00.
50-Ohm BNC Cables (4)	Impedance, 50 Ω; length, 42 inches, connectors, BNC.	Provide signal interconnections.	Tektronix part 012-0057-01.
Screwdriver	3-inch shaft, 3/32-inch bit.	Perform internal adjustments.	Xcelite R-3323.

INDEX TO PERFORMANCE CHECK AND ADJUSTMENT PROCEDURE

√Performance Requirement check; see introductory information.

PRELIMINARY PROCEDURE

NOTE

The performance of this instrument can be checked at any ambient temperature from 0° to +50° C unless otherwise stated. Adjustments must be performed at an ambient temperature from +20° to +30° C for specified accuracies.

1. Check that the internal Line Voltage Selector has been set for the correct input line voltage (see section 3, Installation).

2. Check that the crt has an 8 X 10 division scribed graticule (standard accessory) over the display area.

3. Remove the cabinet panels (see section 5, Maintenance) to gain access to the internal controls and test points.

4. Connect the instrument to the line-voltage source.

5. Apply power and allow at least 20 minutes warm-up time.

6. Set the controls as follows.

NOTE

Refer to the Internal Control and Selector Locations pullout page in section 9, Diagrams and Circuit Board Locations, for the locations of the internal switches.

INTERNAL

Int Swp (Option 4 only). . . . . .X-Y (down position)

Int Blank (Option 4 only) . . . . . .X-Y (right position)

WARNING

The black finned transistor heat sinks on the Horizontal (X) Amplifier are elevated to a maximum of +80 volts. To avoid electric shock, always turn the instrument power off before changing the settings of the X Atten switches.

X and Y Atten (all) . . . . . .1X (up position)

FRONT PANEL

PERSISTENCE/ SAVE TIME. . . . . .Fully counterclockwise (detent) and knob pushed in

STORE . . . . . .Non-store (button out)

INTENSITY. . . . . .Fully counterclockwise

FOCUS . . . . . .Midrange

Horizontal and Vertical Position . . .Midrange

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

A. POWER SUPPLIES

Equipment Required

1. Precision dc voltmeter (low-voltage supply)
2. Dc voltmeter (high-voltage supply)

BEFORE YOU BEGIN, see TEST POINT AND ADJUSTMENT LOCATIONS in the Diagrams and Circuit Board Illustrations section.

NOTE

Perform the Preliminary Procedure before making the following checks and adjustments.

A1. CHECK POWER SUPPLY OUTPUT VOLTAGE

a. Connect the precision dc voltmeter between the appropriate voltage test points and ground.

b. CHECK–Voltmeter for the output voltage range listed in Table 6-2:

TABLE 6-2
Power Supply Output Voltage

Supply	Test Point	Output Voltage Range
+5 V	TP +5 V	+4.75 V to +5.25 V
+15 V	TP +15 V	+14.92 V to +15.08 V (Adjusted for +15.000 V in step A2)
–30 V	TP –30 V	–29.10 V to –30.90 V
+80 V	TP +80 V	+75 V to +90 V
+170 V	TP +170 V	+160 V to +190 V
–1500 V	Pin 2 of crt socket	–1470 V to –1530 V (Adjusted for –1500 V in step A3)

A2. ADJUST +15-VOLT SUPPLY (R40)

a. Connect the precision dc voltmeter between test point TP +15 V and ground.

b. ADJUST–R40 (+15 V) for a voltmeter reading of exactly +15.000 volts.

c. INTERACTION–Any change in the +15-volt supply beyond the limits in Table 6-2 may affect the operation of all circuits in the instrument.

A3. ADJUST –1500-VOLT SUPPLY (R100)

WARNING

Turn off instrument power when connecting and disconnecting the dc voltmeter. Potentially dangerous electrical shock hazards exist at several points on the High-Voltage Power Supply board and the crt socket.

a. Connect the dc voltmeter (set for at least –1500 volts full scale) between pin 2 of the crt socket and ground. (Remove protective cap over crt socket.)

b. CHECK–Voltmeter for reading from –1470 volts to –1530 volts.

c. ADJUST–R100 (HV) for exactly –1500 volts.

d. Turn off the instrument power and disconnect the voltmeter. (Replace protective cap over crt socket.)

B. CRT CIRCUIT

Equipment Required

1. Precision dc voltmeter
2. Ramp generator
3. 50-ohm cables (2)

BEFORE YOU BEGIN, see TEST POINT AND ADJUSTMENT LOCATIONS in the Diagrams and Circuit Board Illustrations section.

NOTE

Perform the Preliminary Procedure before making the following checks and adjustments.

CAUTION

Do not allow a high-intensity spot to remain stationary on the crt. The crt phosphor could be permanently damaged.

B1. ADJUST CRT BIAS (R192)

a. Set the Position and INTENSITY controls for a visible dot on the crt.

b. Connect the precision dc voltmeter between test point TP 720 (Z-Axis Amplifier board) and ground.

c. Set the INTENSITY control for a voltmeter reading of +10 volts. Disconnect the voltmeter.

d. ADJUST–R192 (Cutoff) until the displayed dot just disappears.

e. Set the INTENSITY control for a visible dot.

B2. ADJUST ASTIGMATISM (R170)

a. Set FOCUS control fully clockwise.

b. ADJUST–R170 (Astig) for a round dot.

c. Set the FOCUS control for optimum dot definition.

NOTE

For critical applications, slight readjustment of R170, Astig, may improve dot definition.

B3. ADJUST TRACE ROTATION (R145)

a. Apply a 1-volt positive-going, 5 millisecond duration ramp signal from the ramp generator to the + X INPUT connector.

b. Set the ramp generator amplitude for a 10-division horizontal trace on the crt.

c. Position the trace to the graticule horizontal center line.

d. ADJUST–R145 (TRACE ROTATION) to align the trace with the graticule horizontal center line.

√ B4. ADJUST Y-AXIS ALIGNMENT (R173)

a. Disconnect the ramp generator from the + X INPUT connector and connect it to the + Y INPUT connector.

b. Set the ramp generator amplitude for an 8-division vertical trace on the crt.

c. Position the trace to the graticule vertical center line.

d. ADJUST–R173 (Y-Axis Align) to align the trace with the graticule vertical center line.

√ B5. ADJUST GEOMETRY (R165)

a. Position the trace to the left edge of the graticule, then to the right edge.

√Performance Requirement check; see introductory information.

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√ b. CHECK–Trace for 0.1 division or less of bowing at the left and right edge of the graticule.

c. ADJUST–R165 (Geom) for minimum trace bowing at the left and right edge of the graticule.

d. Disconnect the ramp generator from the + Y INPUT connector and connect it to the + X INPUT connector.

e. Position the trace to the top of the graticule, then to the bottom.

√ f. CHECK–Trace for 0.1 division or less of bowing at the top and bottom of the graticule.

g. If necessary, readjust R165 (Geom) for minimum trace bowing at the top and bottom of the graticule. Then reconnect the ramp generator to the + Y INPUT connector and repeat this procedure until optimum geometry is achieved.

h. Disconnect the ramp generator.

√Performance Requirement check; see introductory information.

C. VERTICAL (Y) AND HORIZONTAL (X) AMPLIFIERS

Equipment Required

1. Test oscilloscope
2. Ramp generator
3. Square-wave generator
4. Sine-wave generator
5. 50-ohm cables (2)
6. BNC T connector
7. 5X attenuator (optional, depending on test equipment used)

BEFORE YOU BEGIN, see TEST POINT AND ADJUSTMENT LOCATIONS in the Diagrams and Circuit Board Illustrations section.

NOTE

Perform the Preliminary Procedure before making the following checks and adjustments.

√ C1. ADJUST VERTICAL (Y) AXIS GAIN AND COMPENSATION (R415, C400, AND C500)

NOTE

The Y gain is normally set to provide full-screen deflection, depending upon the input signal amplitude. The following procedure adjusts the Y gain so that 1 volt provides 8 divisions of deflection. If the gain adjustment is changed, the + and – attenuator compensation should be readjusted to optimize square-wave response.

WARNING

The black finned transistor heat sinks on the Horizontal (X) Amplifier are elevated to a maximum of +80 volts. To avoid electric shock, always turn the instrument power OFF before changing the settings of the X Atten switches.

a. Check that S200 (+ X Atten), S300 (– X Atten), S400 (+ Y Atten), and S500 (– Y Atten) are in the 1X (up) position.

b. Apply a positive-going, 5 millisecond ramp at approximately 2 volts amplitude from the ramp generator to the rear-panel + X INPUT connector.

c. Connect the square-wave generator through a T connector to the rear-panel + Y INPUT connector.

d. Trigger the ramp generator from the square-wave generator.

NOTE

Be sure to replace grounding caps on all unused X, Y, and Z INPUT connectors.

e. Connect the test oscilloscope vertical input to the T connector at the output of the square-wave generator.

f. Set the square-wave generator for a 1-kilohertz, 1-volt output as indicated on the test oscilloscope.

g. ADJUST–R415 (Y Gain) for an 8-division square-wave display on the 607 as shown in Figure 6-1.

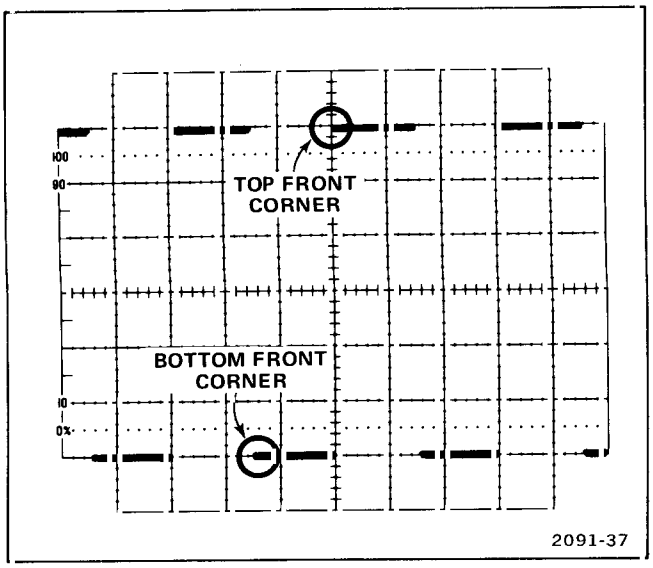

Figure 6-1. Typical display for adjusting vertical compensation.

√Performance Requirement check; see introductory information.

h. Set S400 (+ Y Atten) and S500 (– Y Atten) to the 5X (down) position.

i. Set the square-wave generator amplitude for a 6 division display on the 607.

j. ADJUST—C400 (+ Y Atten Comp) for an optimum square top front corner on the 607 display (see Fig. 6-1). For best accuracy, position the display corner of interest to graticule center.

k. Disconnect the square-wave signal from the + Y INPUT connector and connect it to the – Y INPUT connector.

l. ADJUST—C500 (– Y Atten Comp) for an optimum square bottom front corner on the 607 display (see Fig. 6-1). For best accuracy, position the display corner of interest to graticule center.

m. Set S400 (+ Y Atten) and S500 (– Y Atten) to the 1X (up) position.

n. Set the square-wave generator for a 100-kilohertz, 0.7 volt output as indicated on the test oscilloscope.

o. Set the ramp generator for a 50-microsecond duration ramp output.

p. Disconnect the square-wave signal from the – Y INPUT connector and connect it to the + Y INPUT connector.

q. ADJUST—C446 (Y HF Comp) for an optimum square front corner on the 607 display (see Fig. 6-1). For best accuracy, position the display corner of interest to graticule center.

√ C2. ADJUST HORIZONTAL (X) GAIN AND COMPENSATION (R215, C200, AND C300)

NOTE

The X gain is normally set to provide 8 divisions of deflection, depending upon the input signal amplitude. The following procedure adjusts the X gain so that 1 volt provides 8 divisions of deflection. If the gain adjustment is changed, the + X and – X attenuator compensation should be readjusted to optimize square-wave response.

a. Disconnect the ramp signal from the + X INPUT connector and connect it to the + Y INPUT connector.

b. Disconnect the square-wave signal from the + Y INPUT connector and connect it to the + X INPUT connector.

NOTE

Be sure to replace grounding caps on unused rear-panel X, Y, and Z INPUT connectors.

c. Set the square-wave generator for a 1-kilohertz, 1-volt output as indicated on the test oscilloscope.

d. Set the ramp generator for a positive-going, 5-millisecond ramp signal at approximately 2 volts amplitude.

e. ADJUST—R215 (X Gain) for an 8-division display on the 607 as shown in Figure 6-2.

f. Set S200 (+ Y Atten) and S300 (– Y Atten) to the 5X (down) position.

g. Set the square-wave generator amplitude for an 8 division horizontal display on the 607.

h. ADJUST—C200 (+ X Atten Comp) for an optimum square right bottom corner on the 607 display (see Fig. 6-2). For best accuracy, position the display corner of interest to graticule center.

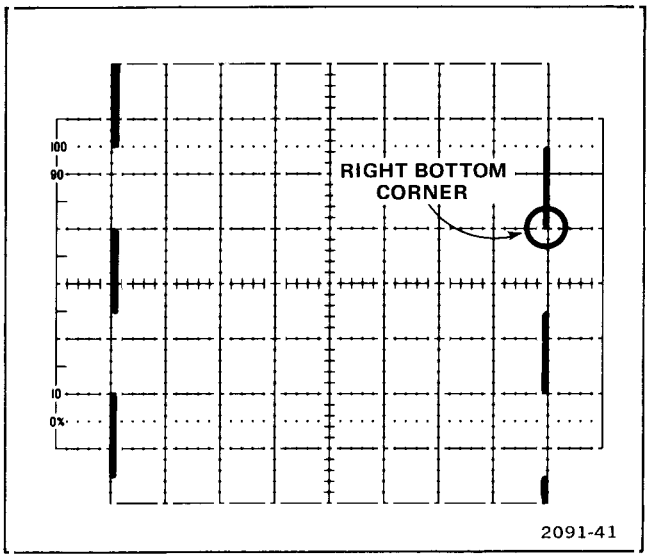

Figure 6-2. Typical display for adjusting horizontal compensation.

√Performance Requirement check; see introductory information.

i. Disconnect the square-wave signal from the + X INPUT connector and connect it to the – X INPUT connector.

j. ADJUST–C300 (– X Atten Comp) for an optimum square right bottom corner on the 607 display (see Fig. 6-2). For best accuracy, position the display corner of interest to graticule center.

k. Set S200 (+ X Atten) and S300 (– X Atten) to the 1X (up) position.

l. Set the square-wave generator for a 100-kilohertz, 0.7-volt output as indicated on the test oscilloscope.

m. Set the ramp generator for a 50-microsecond duration ramp output.

n. Disconnect the square-wave signal from the – X INPUT connector and connect it to the + X INPUT connector.

o. ADJUST–C246 (X HF Comp) for an optimum square right bottom corner on the 607 display (see Fig. 6-2). For best accuracy, position the display corner of interest to graticule center.

√ C3. CHECK HORIZONTAL AND VERTICAL BANDWIDTH

a. Disconnect the square-wave generator and test oscilloscope from the + X INPUT connector.

b. Set the sine-wave generator for a 50-kilohertz output at approximately 1-volt amplitude.

c. Connect the sine-wave generator to the + X INPUT connector.

d. Set the sine-wave generator amplitude and 607 Position controls for a centered 8-division display.

e. Slowly increase the sine-wave generator frequency until the display amplitude is 5.66 divisions.

√ f. CHECK–That the sine-wave generator frequency is at least 3 megahertz.

g. Disconnect the ramp and sine-wave generators from the + Y INPUT and + X INPUT connectors.

h. Connect the ramp generator to the + X INPUT connector and the sine-wave generator to the + Y INPUT connector.

i. Set the sine-wave generator for a 50-kilohertz output.

j. Set the sine-wave generator amplitude and 607 Position controls for a centered 6.4 division display.

k. Slowly increase the sine-wave generator frequency until the display amplitude is 4.5 divisions.

√ l. CHECK–That the sine-wave generator frequency is at least 3 megahertz.

√ C4. CHECK HORIZONTAL AND VERTICAL PHASE DIFFERENCE

a. Disconnect the ramp generator from the + X INPUT connector and connect the sine-wave generator through the T connector to both the + Y INPUT and + X INPUT connectors.

b. Set the sine-wave generator frequency for 50 kilohertz.

c. Set the sine-wave generator amplitude and the 607 Position controls for an 8-division diagonal display as shown in Figure 6-3.

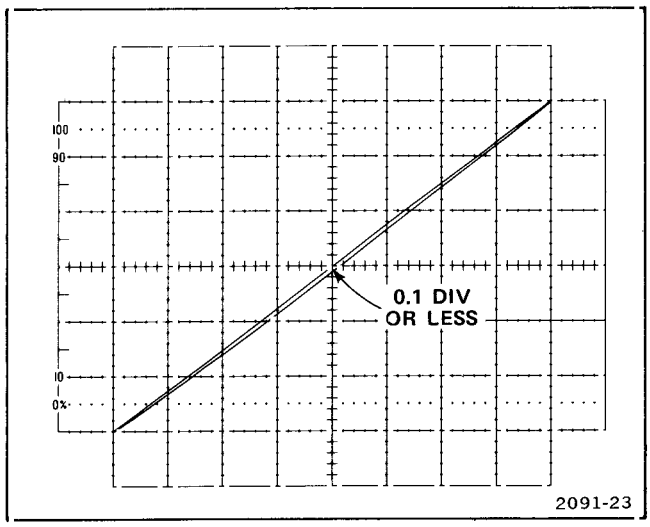

Figure 6-3. Typical horizontal and vertical phase difference display.

√Performance Requirement check; see introductory information.

d. Set the sine-wave generator frequency for 500 kilohertz.

√ e. CHECK–That the diameter of the displayed ellipse measured vertically at the center of the graticule is 0.1 division or less (see Fig. 6-3). If necessary, adjust C470 (Phasing) to reduce phase shift.

f. INTERACTION–C470 (Phasing) affects the vertical amplifier frequency compensation. If adjustment was necessary in part (e), repeat the Vertical (Y) Gain and Compensation procedures in step C1.

NOTE

It may be necessary to make a slight compromise between the Y HF compensation adjustment in step C1 and the phasing adjustment in part (e).

√**Performance Requirement check; see introductory information.**

D. Z-AXIS AMPLIFIER

Equipment Required

1. Test oscilloscope
2. Ramp generator
3. Square-wave generator
4. Sine-wave generator
5. BNC T connector
6. 10X probe
7. 50-ohm cables (2)
8. 50-ohm termination (optional, depending on test equipment used)

BEFORE YOU BEGIN, see TEST POINT AND ADJUSTMENT LOCATIONS in the Diagrams and Circuit Board Illustrations section.

NOTE

Perform the Preliminary Procedure before making the following checks and adjustments.

√ D1. ADJUST Z-AXIS GAIN AND COMPENSATION (R615 AND C734)

a. Apply a 1 volt positive-going, 200-microsecond (20 microseconds/division) ramp signal from the ramp generator to the + X INPUT connector.

b. Apply a negative-going, 50-kilohertz square wave from the square-wave generator through the T connector to the + Z INPUT connector.

c. Trigger the ramp generator from the square wave generator.

d. Connect the test oscilloscope to the T connector at the output of the square-wave generator.

e. Set the square-wave generator amplitude for 1 volt peak-to-peak as indicated on the test oscilloscope.

f. Set the 607 INTENSITY control to the fully clockwise position.

g. ADJUST–R615 (Z Gain) for bright line segments that are completely blanked between each segment.

NOTE

The preceding procedure sets the Z-Axis Amplifier gain for a full intensity range of +1 volt. This procedure can be repeated for any input voltage up to +5 volts to provide the desired Z-axis sensitivity.

h. Reduce the display intensity and disconnect the square-wave generator from the + Z INPUT connector.

i. Set the test oscilloscope deflection factor for 5 volts/division and sweep rate for 1 microsecond/division.

j. Connect the 10X probe from the test oscilloscope vertical input to test point TP720.

k. Set the 607 INTENSITY control for a 10-volt dc level at test point TP720 as indicated on the test oscilloscope.

l. Apply a positive-going, symmetrical, 100-kilohertz square wave from the square-wave generator to the + Z INPUT connector.

m. Set the square-wave generator amplitude for a 4-division display on the test oscilloscope.

n. ADJUST–C734 (Z HF Comp) for an optimum square front corner on the test oscilloscope display.

√Performance Requirement check; see introductory information.

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√ D2. CHECK Z AXIS BANDWIDTH

a. Disconnect the square-wave generator from the + Z INPUT connector.

b. Set the 607 INTENSITY control for a +30-volt dc level at test point TP720 as indicated on the test oscilloscope.

c. Apply a 50-kilohertz sine wave from the sine-wave generator (if necessary, through the 50-ohm termination) to the + Z INPUT connector.

d. Set the sine-wave generator amplitude for an 8-division free-running display on the test oscilloscope.

e. Slowly increase the sine-wave generator frequency until the test oscilloscope display amplitude is 5.66 divisions.

√ f. CHECK—That the sine-wave generator frequency is at least 5 megahertz.

g. Disconnect the test equipment.

√Performance Requirement check; see introductory information.

E. STORAGE CIRCUIT

Equipment Required

1. Test oscilloscope
2. Pulse generator
3. Ramp generator (2)
4. 10X probe
5. 50-ohm termination
6. 5X attenuator

BEFORE YOU BEGIN, see TEST POINT AND ADJUSTMENT LOCATIONS in the Diagrams and Circuit Board Illustrations section.

NOTE

Perform the Preliminary Procedure before making the following checks and adjustments.

E1. ADJUST COLLIMATION (R1030, R1054, AND R1042)

a. Set the INTENSITY control fully counterclockwise and check that there is no display.

b. Push the STORE button.

c. Turn the OPERATE LEVEL control fully clockwise.

d. Set R835 (Prep Level) fully counterclockwise and R965 (Op Level) fully clockwise.

e. ADJUST–R1030 (CE1), R1054 (CE2), and R1042 (CE3) alternately until the brightened storage area does not have any shadowed corners or scallops.

E2. ADJUST STORAGE LEVELS (R835 AND R965)

a. Set R965 (Op Level) fully counterclockwise.

b. ADJUST–R965 (Op Level) clockwise in small increments while pushing and releasing the ERASE button after each increment until the display area just reaches a uniformly bright condition. (Further adjustment will make the display area brighter but will degrade performance).

c. Push and release the ERASE button.

d. ADJUST–R835 (Prep Level) clockwise in small increments, while pushing and releasing the ERASE button after each increment, until the display area brightness just begins to decrease.

e. ADJUST–R965 (Op Level) counterclockwise in small increments, while pushing and releasing the ERASE button after each increment, until a slight glow remains on the display area.

E3. ADJUST PULSE HEIGHT (R975)

a. Connect the 10X probe from the test oscilloscope vertical input to test point TP1066.

b. Turn the PERSISTENCE/SAVE TIME control clockwise until a waveform is displayed on the test oscilloscope.

c. Push and hold the ERASE button in.

d. Note the dc (prepare) level of the test oscilloscope display and release the ERASE button.

e. ADJUST–R975 (Pulse Ht) until the top of the waveform is 1 volt above the dc (prepare) level noted in part (d).

√ E4. CHECK STORED DOT WRITING TIME

NOTE

For the 607 Option 4, disconnect the internal sweep by setting S220 (Int Swp) and S735 (Int Blank) to the X-Y position. See Connecting the Internal Sweep (Option 4) in section 3, Installation, for additional information.

a. Push in the PERSISTENCE/SAVE TIME control and turn it fully counterclockwise.

b. Push and release the ERASE button.

c. Turn the OPERATE LEVEL control until the crt background glow just disappears.

d. Set the INTENSITY control for a bright stored dot displayed on the crt.

e. Position the displayed dot to the lower left corner of the graticule with the vertical and horizontal Position controls.

f. Set the INTENSITY control fully counterclockwise.

g. Apply a 1-second duration automatically-triggered, positive-going ramp from a ramp generator to the + Y INPUT connector.

h. Apply the gate output signal from the ramp generator through the 5X attenuator to the + Z INPUT connector.

i. Apply a 50-millisecond duration automatically-triggered, positive-going ramp from a second ramp generator to the + X INPUT connector.

j. Turn the INTENSITY control clockwise until a display appears.

k. Set both ramp generator output amplitudes for a 6 X 8 division display.

l. Alternately push the ERASE button and turn the INTENSITY control counterclockwise, in small increments, until the display just disappears.

m. Apply a minimum-amplitude, negative-going, 1-microsecond duration, 1-millisecond period pulse from the pulse generator through a 50-ohm termination to the – Z INPUT connector.

n. Connect the 10X probe from the test oscilloscope vertical input to test point TP720 and set the sweep rate for 1 microsecond/division.

o. Slowly increase the pulse generator output amplitude for a 30-volt peak-to-peak display on the test oscilloscope.

p. Set the ramp generator (connected to the + Y INPUT connector) for normal triggering.

q. Push the ERASE button and check for no display.

r. Turn the ramp generator (connected to the + Y INPUT connector) triggering level from one extreme to the other until a 6 X 8 division dot display appears on the crt.

√ s. CHECK–That the 6 X 8 division dot display remains for at least 3 minutes.

t. Set the pulse generator for a 0.5-microsecond duration pulse output.

u. Push and release the ERASE button.

v. Set the OPERATE LEVEL control fully clockwise.

w. Turn the ramp generator (connected to the + Y INPUT connector) triggering level from one extreme to the other until a 6 X 8 division dot display appears on the crt.

√ x. CHECK–That the 6 X 8 division display remains for at least 15 seconds.

√ E5. CHECK STORED LINEAR WRITING SPEED

a. Remove the pulse generator from the – Z INPUT connector and replace the grounding cap.

√**Performance Requirement check; see introductory information.**

b. Remove the 5X attenuator from the gate output of the ramp generator connected to the + Y INPUT connector and apply the gate output directly to the + Z INPUT connector.

c. Set the ramp generator connected to the + Y INPUT connector for approximately a 300-microsecond duration, automatically triggered, ramp output.

d. Set the ramp generator connected to the + X INPUT connector for a 10-microsecond duration ramp output.

e. Set the ramp amplitude of both ramp generators for a 6 X 8 division stored display (push and release the ERASE button after each amplitude change).

f. Connect the 10X probe from the test oscilloscope vertical input to test point TP720 and set the test oscilloscope sweep rate for 0.1 millisecond/division.

g. Turn the 607 INTENSITY control for a +60-volt dc level displayed on the test oscilloscope.

h. Set the ramp generator connected to the + Y INPUT connector for normal triggering.

i. Push and release the ERASE button.

j. Turn the triggering level on the ramp generator connected to the + Y INPUT connector from one extreme to the other until a 6 X 8 division display of stored lines appears on the 607 crt.

√ k. CHECK—That the stored lines are visible without any gaps or breaks for at least 1 minute.

l. Disconnect the test equipment.

F. SWEEP GENERATOR (OPTION 4)

Equipment Required

1. Sine-wave generator
2. Time-mark generator
3. 50-ohm cable
4. 50-ohm termination

BEFORE YOU BEGIN, see TEST POINT AND ADJUSTMENT LOCATIONS in the Diagrams and Circuit Board Illustrations section.

NOTE

Perform the Preliminary Procedure before making the following checks and adjustments.

F1. ADJUST SWEEP LENGTH (R1115)

a. Set the Option 4 controls as follows:

Int Swp (Deflection Amplifier board)	Y-T (up position)
Int Blank (Z-Axis Amplifier board)	Y-T (right position)
Trig Mode (Sweep board)	Auto (rear position)
SEC/DIV	1 μ
VARIABLE	Fully clockwise (calibrated)

b. Set INTENSITY control for a barely visible trace.

c. ADJUST–R1115 (Swp Length) for a sweep length of approximately 10.5 divisions.

√ F2. CHECK TRIGGER SLOPE/LEVEL

a. Apply a 2-megahertz sine-wave signal from the sine-wave generator to the + Y INPUT connector.

b. Set the sine-wave generator amplitude for a 0.5 division display.

√ c. CHECK–That a stable display can be obtained by turning the TRIG SLOPE/LEVEL control.

√ d. CHECK–For a free-running display when the TRIG SLOPE/LEVEL control is set fully clockwise and fully counterclockwise.

e. Set S1109 (Trig Mode) to Norm.

√ f. CHECK–That a stable display can be obtained by turning the TRIG SLOPE/LEVEL control.

√ g. CHECK–For no display when the TRIG SLOPE/LEVEL control is set fully clockwise and fully counterclockwise.

h. Set S1109 (Trig Mode) to Auto.

i. Disconnect the sine-wave generator.

√ F3. ADJUST SWEEP TIMING (R1165)

a. Set the SEC/DIV switch to 1 m.

b. Apply 1-millisecond markers from the time-mark generator through the 50-ohm termination to the + Y INPUT connector.

c. Set the time-mark generator amplitude (or attach attenuators) for a 2- to 6-division display.

d. Position the first time marker to the left edge of the graticule and check for 1 time marker per graticule division.

√ e. CHECK–That the distance between the second and tenth time marker is 8 divisions within 0.24 division (3%).

√Performance Requirement check; see introductory information.

f. ADJUST–R1165 (Swp Cal) so that the second and tenth markers are exactly 8 divisions apart.

√ g. CHECK–Remaining SEC/DIV switch positions with time markers that correspond to each switch position. The distance between the second and tenth time marker at each SEC/DIV switch position should be 8 divisions within 0.24 division (3%).

√ F4. CHECK VARIABLE TIME/DIVISION

a. Set the time-mark generator for 0.1 millisecond markers.

b. Set the SEC/DIV switch to 0.1 m and check for 1 time marker per division.

c. Set the front-panel VARIABLE adjustment fully counterclockwise.

d. Set the SEC/DIV switch to 10 μ.

√ e. CHECK–For at least 1 time marker per graticule division.

f. Disconnect all test equipment.

NOTE

For X-Y operation, return the Int Swp and Int Blank switches on the Deflection and Z-Axis Amplifier boards to the X-Y position.

This completes the Performance Check and Adjustment Procedure.

√Performance Requirement check; see introductory information.

REPLACEABLE ELECTRICAL PARTS

PARTS ORDERING INFORMATION

Replacement parts are available from or through your local Tektronix, Inc. Field Office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available, and to give you the benefit of the latest circuit improvements developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and modification number if applicable.

If a part you have ordered has been replaced with a new or improved part, your local Tektronix, Inc. Field Office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

SPECIAL NOTES AND SYMBOLS

X000	Part first added at this serial number
00X	Part removed after this serial number

ITEM NAME

In the Parts List, an Item Name is separated from the description by a colon (:). Because of space limitations, an Item Name may sometimes appear as incomplete. For further Item Name identification, the U.S. Federal Cataloging Handbook H6-1 can be utilized where possible.

ABBREVIATIONS

ACTR	ACTUATOR	PLSTC	PLASTIC
ASSY	ASSEMBLY	QTZ	QUARTZ
CAP	CAPACITOR	RECP	RECEPTACLE
CER	CERAMIC	RES	RESISTOR
CKT	CIRCUIT	RF	RADIO FREQUENCY
COMP	COMPOSITION	SEL	SELECTED
CONN	CONNECTOR	SEMICOND	SEMICONDUCTOR
ELCTLT	ELECTROLYTIC	SENS	SENSITIVE
ELEC	ELECTRICAL	VAR	VARIABLE
INCAND	INCANDESCENT	WW	WIREWOUND
LED	LIGHT EMITTING DIODE	XFMR	TRANSFORMER
NONWIR	NON WIREWOUND	XTAL	CRYSTAL

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
00853	SANGAMO ELECTRIC CO., S. CAROLINA DIV.	P O BOX 128	PICKENS, SC 29671
01121	ALLEN-BRADLEY COMPANY	1201 2ND STREET SOUTH	MILWAUKEE, WI 53204
01295	TEXAS INSTRUMENTS, INC., SEMICONDUCTOR GROUP	P O BOX 5012, 13500 N CENTRAL EXPRESSWAY	DALLAS, TX 75222
03888	KDI PYROFILM CORPORATION	60 S JEFFERSON ROAD	WHIPPANY, NJ 07981
04222	AVX CERAMICS, DIVISION OF AVX CORP.	P O BOX 867, 19TH AVE. SOUTH	MURTLE BEACH, SC 29577
04713	MOTOROLA, INC., SEMICONDUCTOR PROD. DIV.	5005 E MCDOWELL RD,PO BOX 20923	PHOENIX, AZ 85036
05091	TRI-ORDINATE CORPORATION	343 SNYDER AVENUE	BERKELEY HEIGHTS, NJ 07922
05397	UNION CARBIDE CORPORATION, MATERIALS SYSTEMS DIVISION	11901 MADISON AVENUE	CLEVELAND, OH 44101
07263	FAIRCHILD SEMICONDUCTOR, A DIV. OF FAIRCHILD CAMERA AND INSTRUMENT CORP.	464 ELLIS STREET	MOUNTAIN VIEW, CA 94042
07910	TELEDYNE SEMICONDUCTOR	12515 CHADRON AVE.	HAWTHORNE, CA 90250
10389	CHICAGO SWITCH, INC.	2035 WABANSIA AVE.	CHICAGO, IL 60647
11237	CTS KEENE, INC.	3230 RIVERSIDE AVE.	PASO ROBLES, CA 93446
12697	CLAROSTAT MFG. CO., INC.	LOWER WASHINGTON STREET	DOVER, NH 03820
12969	UNITRODE CORPORATION	580 PLEASANT STREET	WATERTOWN, MA 02172
14936	GENERAL INSTRUMENT CORP., SEMICONDUCTOR PRODUCTS GROUP	P.O. BOX 600,600 W. JOHN ST.	HICKSVILLE, NY 11802
15818	TELEDYNE SEMICONDUCTOR	1300 TERRA BELLA AVE.	MOUNTAIN VIEW, CA 94043
27014	NATIONAL SEMICONDUCTOR CORP.	2900 SEMICONDUCTOR DR.	SANTA CLARA, CA 95051
52306	HIGH VOLTAGE DEVICES, INC.	7485 AVENUE 304	VISALIA, CA 93277
53944	ELT INC., GLOW LITE DIVISION	BOX 698	PAULS VALLEY, OK 73075
56289	SPRAGUE ELECTRIC CO.		NORTH ADAMS, MA 01247
71400	BUSSMAN MFG., DIVISION OF MCGRAW-EDISON CO.	2536 W. UNIVERSITY ST.	ST. LOUIS, MO 63107
71468	ITT CANNON ELECTRIC	666 E. DYER RD.	SANTA ANA, CA 92702
72982	ERIE TECHNOLOGICAL PRODUCTS, INC.	644 W. 12TH ST.	ERIE, PA 16512
73138	BECKMAN INSTRUMENTS, INC., HELIPOT DIV.	2500 HARBOR BLVD.	FULLERTON, CA 92634
73803	TEXAS INSTRUMENTS, INC., METALLURGICAL MATERIALS DIV.	34 FOREST STREET	ATTLEBORO, MA 02703
74970	JOHNSON, E. F., CO.	299 10TH AVE. S. W.	WASECA, MN 56093
75042	TRW ELECTRONIC COMPONENTS, IRC FIXED RESISTORS, PHILADELPHIA DIVISION	401 N. BROAD ST.	PHILADELPHIA, PA 19108
76493	BELL INDUSTRIES, INC., MILLER, J. W., DIV.	19070 REYES AVE., P O BOX 5825	COMPTON, CA 90224
79727	C-W INDUSTRIES	550 DAVISVILLE RD.,P O BOX 96	WARMINISTER, PA 18974
80009	TEKTRONIX, INC.	P O BOX 500	BEAVERTON, OR 97077
80031	ELECTRA-MIDLAND CORP., MEPCO DIV.	22 COLUMBIA ROAD	MORRISTOWN, NJ 07960
81483	INTERNATIONAL RECTIFIER CORP.	9220 SUNSET BLVD.	LOS ANGELES, CA 90069
82389	SWITCHCRAFT, INC.	5555 N. ELSTON AVE.	CHICAGO, IL 60630
83003	VARO, INC.	P O BOX 411, 2203 WALNUT STREET	GARLAND, TX 75040
90201	MALLORY CAPACITOR CO., DIV. OF P. R. MALLORY AND CO., INC.	3029 E WASHINGTON STREET P O BOX 372	INDIANAPOLIS, IN 46206
91637	DALE ELECTRONICS, INC.	P. O. BOX 609	COLUMBUS, NE 68601
91929	HONEYWELL, INC., MICRO SWITCH DIV.	CHICAGO & SPRING STS.	FREEPORT, IL 61032

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A1	670-3125-02			CKT BOARD ASSY:POWER SUPPLY	80009	670-3125-02
A2	670-4515-00			CKT BOARD ASSY:HIGH VOLTAGE	80009	670-4515-00
A2[1]	670-4515-01			CKT BOARD ASSY:HIGH VOLTAGE	80009	670-4515-01
A3	670-3178-02			CKT BOARD ASSY:DEFLECTION	80009	670-3178-02
A4	670-3182-01			CKT BOARD ASSY:Z AXIS	80009	670-3182-01
A5	670-4516-00			CKT BOARD ASSY:STORAGE	80009	670-4516-00
A5[1]	670-4516-01			CKT BOARD ASSY:STORAGE	80009	670-4516-01
A6[1]	670-5175-00			CKT BOARD ASSY:MULTIPLIER	80009	670-5175-00
C18	290-0702-00			CAP.,FXD,ELCTLT:2000UF,+100-0%,50V	56289	68D10715
C20	290-0571-00			CAP.,FXD,ELCTLT:5000UF,+100-0%,25V	90201	PFP20-36043
C21	290-0571-00			CAP.,FXD,ELCTLT:5000UF,+100-0%,25V	90201	PFP20-36043
C36	290-0559-00			CAP.,FXD,ELCTLT:22UF,20%,35V	90201	TDC226M035WLG
C40	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C46	281-0525-00			CAP.,FXD,CER DI:470PF,+/-94PF,500V	04222	7001-1364
C58	281-0543-00			CAP.,FXD,CER DI:270PF,10%,500V	72982	301055X5P271K
C60	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C62	290-0535-00			CAP.,FXD,ELCTLT:33UF,20%,10V	56289	196D336X0010KA1
C78	281-0524-00	B010100	B010299	CAP.,FXD,CER DI:150PF,+/-30PF,500V	04222	7001-1381
C78	281-0546-00	B010300		CAP.,FXD,CER DI:330PF,10%,500V	04222	7001-1380
C88	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C90	290-0528-00			CAP.,FXD,ELCTLT:15UF,20%,50V	90201	TDC156M050WLC
C104	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8121-N088Z5U104M
C106	283-0021-00			CAP.,FXD,CER DI:0.001UF,20%,5000V	72982	848-556-Y5S-102M
C112	290-0527-00			CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C114	283-0142-00			CAP.,FXD,CER DI:0.0027UF,5%,200V	72982	875-551B272J
C117	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
C118	283-0010-00			CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	273C20
C126	290-0536-00			CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
C128	290-0536-00			CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
C132	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C141[1]	283-0300-00			CAP.,FXD,CER DI:0.001UF,+80-20%,10,000V	72982	3910BW509C142K
C143[1]	283-0300-00			CAP.,FXD,CER DI:0.001UF,+80-20%,10,000V	72982	3910BW509C142K
C148	283-0105-00			CAP.,FXD,CER DI:0.01UF,+80-20%,2000V	56289	41C316
C149	283-0105-00			CAP.,FXD,CER DI:0.01UF,+80-20%,2000V	56289	41C316
C150	281-0512-00			CAP.,FXD,CER DI:27PF,+/-2.7PF,500V	72982	308-000C0G0270K
C154	283-0057-00			CAP.,FXD,CER DI:0.1UF,+80-20%,200V	56289	274C10
C156	283-0057-00			CAP.,FXD,CER DI:0.1UF,+80-20%,200V	56289	274C10
C158	290-0164-00			CAP.,FXD,ELCTLT:1UF,+50-10%,150V	56289	30D105F150BA2
C160	290-0164-00			CAP.,FXD,ELCTLT:1UF,+50-10%,150V	56289	30D105F150BA2
C164	283-0057-00			CAP.,FXD,CER DI:0.1UF,+80-20%,200V	56289	274C10
C165	283-0178-00	XB01012?		CAP.,FXD,CER DI:0.1UF,+80-20%,100V	72982	8131N145 E 104Z
C170	283-0178-00			CAP.,FXD,CER DI:0.1UF,+80-20%,100V	72982	8131N145 E 104Z
C180	283-0105-00			CAP.,FXD,CER DI:0.01UF,+80-20%,2000V	56289	41C316
C186	283-0021-00			CAP.,FXD,CER DI:0.001UF,20%,5000V	72982	848-556-Y5S-102M
C188	290-0164-00			CAP.,FXD,ELCTLT:1UF,+50-10%,150V	56289	30D105F150BA2
C200	281-0203-00	B010100	B020179	CAP.,VAR,PLSTC:2-10PF,100V	80031	C010EA/10E
C200	281-0153-00	B020180		CAP.,VAR,AIR DI:1.7-10PF,250V	74970	187-0106-005
C202	281-0510-00			CAP.,FXD,CER DI:22PF,+/-4.4PF,500V	72982	301-000C0G0220M
C206	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C212	281-0544-00			CAP.,FXD,CER DI:5.6PF,10%,500V	72982	301-000C0H0569D
C218	281-0518-00			CAP.,FXD,CER DI:47PF,+/-9.4PF,500V	72982	301-000U2J0470M
C246	281-0203-00	B010100	B020179	CAP.,VAR,PLSTC:2-10PF,100V	80031	C010EA/10E
C246	281-0153-00	B020180		CAP.,VAR,AIR DI:1.7-10PF,250V	74970	187-0106-005

PETER CHRISTIE VK5EM

[1]Option 8 only

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
C250	281-0661-00			CAP.,FXD,CER DI:0.8PF,+/-0.1PF,500V	72982	301-000C0K0808B
C256	281-0628-00			CAP.,FXD,CER DI:15PF,5%,500V	72982	301-000C0G0150J
C300	281-0203-00	B010100	B020179	CAP.,VAR,PLSTC:2-10PF,100V	80031	C010EA/10E
C300	281-0153-00	B020180		CAP.,VAR,AIR DI:1.7-10PF,250V	74970	187-0106-005
C302	281-0510-00			CAP.,FXD,CER DI:22PF,+/-4.4PF,500V	72982	301-000C0G0220M
C306	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C312	281-0544-00			CAP.,FXD,CER DI:5.6PF,10%,500V	72982	301-000C0H0569D
C320	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C326	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C350	281-0661-00			CAP.,FXD,CER DI:0.8PF,+/-0.1PF,500V	72982	301-000C0K0808B
C380	290-0572-00			CAP.,FXD,ELCTLT:0.1UF,20%,50V	56289	196D104X0050HA1
C382	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C384	290-0572-00			CAP.,FXD,ELCTLT:0.1UF,20%,50V	56289	196D104X0050HA1
C400	281-0203-00	B010100	B020179	CAP.,VAR,PLSTC:2-10PF,100V	80031	C010EA/10E
C400	281-0153-00	B020180		CAP.,VAR,AIR DI:1.7-10PF,250V	74970	187-0106-005
C402	281-0510-00			CAP.,FXD,CER DI:22PF,+/-4.4PF,500V	72982	301-000C0G0220M
C406	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C412	281-0544-00			CAP.,FXD,CER DI:5.6PF,10%,500V	72982	301-000C0H0569D
C418	281-0518-00			CAP.,FXD,CER DI:47PF,+/-9.4PF,500V	72982	301-000U2J0470M
C442	281-0526-00	B010100	B010499X	CAP.,FXD,CER DI:1.5PF,+/-0.5PF,500V	72982	301-000S2K0159D
C446	281-0203-00	B010100	B020179	CAP.,VAR,PLSTC:2-10PF,100V	80031	C010EA/10E
C446	281-0153-00	B020180		CAP.,VAR,AIR DI:1.7-10PF,250V	74970	187-0106-005
C450	281-0534-00			CAP.,FXD,CER DI:3.3PF,+/-0.25PF,500V	72982	301-000C0J0339C
C456	283-0663-00			CAP.,FXD,MICA D:16.8PF,+/-0.5PF,500V	00853	D155C16.8D0
C470	281-0203-00	B010100	B020179	CAP.,VAR,PLSTC:2-10PF,100V	80031	C010EA/10E
C470	281-0153-00	B020179		CAP.,VAR,AIR DI:1.7-10PF,250V	74970	187-0106-005
C500	281-0203-00	B010100	B020180	CAP.,VAR,PLSTC:2-10PF,100V	80031	C010EA/10E
C500	281-0153-00	B020180		CAP.,VAR,AIR DI:1.7-10PF,250V	74970	187-0106-005
C502	281-0510-00			CAP.,FXD,CER DI:22PF,+/-4.4PF,500V	72982	301-000C0G0220M
C506	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C512	281-0544-00			CAP.,FXD,CER DI:5.6PF,10%,500V	72982	301-000C0H0569D
C520	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C526	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C550	281-0534-00			CAP.,FXD,CER DI:3.3PF,+/-0.25PF,500V	72982	301-000C0J0339C
C606	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C612	281-0508-00			CAP.,FXD,CER DI:12PF,+/-0.6PF,500V	72982	301-000C0G0120J
C614	281-0549-00			CAP.,FXD,CER DI:68PF,10%,500V	72982	301-000U2J0680K
C642	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C656	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C662	281-0508-00			CAP.,FXD,CER DI:12PF,+/-0.6PF,500V	72982	301-000C0G0120J
C670	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C690	281-0534-00			CAP.,FXD,CER DI:3.3PF,+/-0.25PF,500V	72982	301-000C0J0339C
C692	281-0526-00			CAP.,FXD,CER DI:1.5PF,+/-0.5PF,500V	72982	301-000S2K0159D
C716	281-0629-00			CAP.,FXD,CER DI:33PF,5%,600V	72982	308-000C0G0330J
C718	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C724	283-0057-00			CAP.,FXD,CER DI:0.1UF,+80-20%,200V	56289	274C10
C734	281-0064-00			CAP.,VAR,PLSTC:0.25-1.5PF,600V	72982	530-002
C740	283-0057-00			CAP.,FXD,CER DI:0.1UF,+80-20%,200V	56289	274C10
C810	290-0572-00			CAP.,FXD,ELCTLT:0.1UF,20%,50V	56289	196D104X0050HA1
C812	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
C814	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C816	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C820	290-0536-00			CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
C840	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C848	290-0529-00			CAP.,FXD,ELCTLT:47UF,20%,20V	05397	T368C476M020AZ
C886	285-0686-00			CAP.,FXD,PLSTC:0.068UF,10%,100V	56289	410P68391
C890	290-0535-00			CAP.,FXD,ELCTLT:33UF,20%,10V	56289	196D336X0010KA1
C895	285-0686-00			CAP.,FXD,PLSTC:0.068UF,10%,100V	56289	410P68391
C904	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C1062	281-0627-00			CAP.,FXD,CER DI:1PF,+/-0.25PF,500V	72982	301-000C0K0109C
CR15	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	80009	152-0066-00
CR16	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	80009	152-0066-00
CR17	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	80009	152-0066-00
CR18	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	80009	152-0066-00
CR20	152-0556-00			SEMICOND DEVICE:BRIDGE,50V,2.5A	04713	SDA10271K
CR25	152-0107-00			SEMICOND DEVICE:SILICON,400V,400MA	80009	152-0107-00
CR27	152-0107-00			SEMICOND DEVICE:SILICON,400V,400MA	80009	152-0107-00
CR29	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	80009	152-0066-00
CR30	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR32	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	80009	152-0066-00
CR36	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	80009	152-0066-00
CR40	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR41	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR48	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR74	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR80	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR90	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	80009	152-0066-00
CR106	152-0333-00			SEMICOND DEVICE:SILICON,55V,200MA	80009	152-0333-00
CR107	152-0333-00			SEMICOND DEVICE:SILICON,55V,200MA	80009	152-0333-00
CR120	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR141[1]	152-0409-00			SEMICOND DEVICE:SILICON,12,000V,5MA	83003	VG12X
CR143[1]	152-0409-00			SEMICOND DEVICE:SILICON,12,000V,5MA	83003	VG12X
CR148	152-0242-00			SEMICOND DEVICE:SILICON,225V,200MA	12969	NDP341
CR150	152-0409-00			SEMICOND DEVICE:SILICON,12,000V,5MA	83003	VG12X
CR154	152-0586-00			SEMICOND DEVICE:SILICON,600V,500MA	14936	RGP10J
CR158	152-0586-00			SEMICOND DEVICE:SILICON,600V,500MA	14936	RGP10J
CR164	152-0586-00			SEMICOND DEVICE:SILICON,600V,500MA	14936	RGP10J
CR180	152-0242-00			SEMICOND DEVICE:SILICON,225V,200MA	12969	NDP341
CR182	152-0242-00			SEMICOND DEVICE:SILICON,225V,200MA	12969	NDP341
CR186	152-0242-00			SEMICOND DEVICE:SILICON,225V,200MA	12969	NDP341
CR208	152-0246-00			SEMICOND DEVICE:SILICON,400PIV,200MA	07910	CD12676
CR220	152-0141-02	XB010500		SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR254	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR255	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR256	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR257	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR270	152-0061-00			SEMICOND DEVICE:SILICON,175V,100MA	80009	152-0061-00
CR272	152-0061-00			SEMICOND DEVICE:SILICON,175V,100MA	80009	152-0061-00
CR308	152-0246-00			SEMICOND DEVICE:SILICON,400PIV,200MA	07910	CD12676
CR320	152-0141-02	XB010500		SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR408	152-0246-00			SEMICOND DEVICE:SILICON,400PIV,200MA	07910	CD12676
CR420	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR454	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR455	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR456	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152

[1]Option 8 only

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
CR457	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR508	152-0246-00			SEMICOND DEVICE:SILICON,400PIV,200MA	07910	CD12676
CR520	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR608	152-0246-00			SEMICOND DEVICE:SILICON,400PIV,200MA	07910	CD12676
CR620	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR642	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR658	152-0246-00			SEMICOND DEVICE:SILICON,400PIV,200MA	07910	CD12676
CR670	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR698	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR699	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR730	152-0574-00			SEMICOND DEVICE:SILICON,120V,0.15A	80009	152-0574-00
CR801	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR802	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR812	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR814	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR852	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR853	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR856	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR857	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR860	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR861	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR874	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR888	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR890	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR902	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR910	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR912	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR950	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR952	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR954	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR956	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR960	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR962	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR972	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR973	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR975	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR982	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR984	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR986	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR996	152-0107-00			SEMICOND DEVICE:SILICON,400V,400MA	80009	152-0107-00
CR998	152-0107-00			SEMICOND DEVICE:SILICON,400V,400MA	80009	152-0107-00
CR1000	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR1016	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR1018	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
DS182	150-0111-00			LAMP,GLOW:NEON,1.2MA	53944	A1B-3
DS183	150-0111-00			LAMP,GLOW:NEON,1.2MA	53944	A1B-3
F10	159-0040-00			FUSE,CARTRIDGE:3AG,0.7A,SLOW-BLOW	71400	MDL 7/10
F120	159-0021-00			FUSE,CARTRIDGE:3AG,2A,250V,FAST-BLOW	71400	AGC 2
J20	131-0569-00			CONNECTOR,RCPT,:25 PIN,FEMALE	71468	DB25S
J200	131-0955-00			CONNECTOR,RCPT,:BNC,FEMALE,W/HARDWARE	05091	31-279
J300	131-0955-00			CONNECTOR,RCPT,:BNC,FEMALE,W/HARDWARE	05091	31-279
J400	131-0955-00			CONNECTOR,RCPT,:BNC,FEMALE,W/HARDWARE	05091	31-279

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
J500	131-0955-00			CONNECTOR,RCPT,:BNC,FEMALE,W/HARDWARE	05091	31-279
J600	131-0955-00			CONNECTOR,RCPT,:BNC,FEMALE,W/HARDWARE	05091	31-279
J650	131-0955-00			CONNECTOR,RCPT,:BNC,FEMALE,W/HARDWARE	05091	31-279
L145	108-0792-00			COIL,TUBE DEFLE:TRACE ROTATION	80009	108-0792-00
L154	108-0324-00			COIL,RF:10MH	76493	70F102A1
L158	108-0324-00			COIL,RF:10MH	76493	70F102A1
L172	108-0714-00			COIL,TUBE DEFLE:Y AXIS ALIGNMENT	80009	108-0714-00
Q30	151-0405-00			TRANSISTOR:SILICON,NPN,SEL FROM MJE800	80009	151-0405-00
Q32	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q50	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
Q60	151-0405-00			TRANSISTOR:SILICON,NPN,SEL FROM MJE800	80009	151-0405-00
Q64	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
Q70	151-0405-00			TRANSISTOR:SILICON,NPN,SEL FROM MJE800	80009	151-0405-00
Q76	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
Q80	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
Q120	151-0302-00			TRANSISTOR:SILICON,NPN	04713	2N2222A
Q130	151-0349-00			TRANSISTOR:SILICON,NPN,SEL FROM MJE2801	80009	151-0349-00
Q132	151-0103-00			TRANSISTOR:SILICON,NPN	04713	2N2219A
Q210A,B	151-1054-00			TRANSISTOR:SILICON,JFE,N-CHANNEL,DUAL	80009	151-1054-00
Q220	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q230	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q232	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q260	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q264	151-0279-00			TRANSISTOR:SILICON,NPN	80009	151-0279-00
Q320	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q330	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q332	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q360	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q364	151-0279-00			TRANSISTOR:SILICON,NPN	80009	151-0279-00
Q410A,B	151-1054-00			TRANSISTOR:SILICON,JFE,N-CHANNEL,DUAL	80009	151-1054-00
Q420	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q430	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q432	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q460	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q464	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
Q520	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q530	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q532	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q560	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q564	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
Q610A,B	151-1054-00			TRANSISTOR:SILICON,JFE,N-CHANNEL,DUAL	80009	151-1054-00
Q620	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q630	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q640	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q670	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q680	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q690	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
Q700	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
Q710	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
Q720	151-0279-00			TRANSISTOR:SILICON,NPN	80009	151-0279-00
Q724	151-0270-00			TRANSISTOR:SILICON,PNP	80009	151-0270-00
Q810	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
Q835	151-0126-00			TRANSISTOR:SILICON,NPN	15818	2N2484
Q872	151-0188-00			TRANSISTOR:SILICON,PNP	01295	2N3906
Q876	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
Q990	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
Q996	151-0292-00			TRANSISTOR:SILICON,NPN	80009	151-0292-00
Q1010	151-0292-00			TRANSISTOR:SILICON,NPN	80009	151-0292-00
Q1026	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
Q1036	151-0292-00			TRANSISTOR:SILICON,NPN	80009	151-0292-00
Q1050[1]	151-0292-00			TRANSISTOR:SILICON,NPN	80009	151-0292-00
Q1060	151-0216-00			TRANSISTOR:SILICON,PNP	04713	MPS6523
Q1066	151-0292-00			TRANSISTOR:SILICON,NPN	80009	151-0292-00
R25	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
R27	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
R30	315-0333-00			RES.,FXD,CMPSN:33K OHM,5%,0.25W	01121	CB3335
R31	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
R34	308-0568-00			RES.,FXD,WW:35 OHM,5%,5W	91637	RS5-K35R00J
R36	308-0702-00			RES.,FXD,WW:0.33 OHM,5%,2W	75042	BWH-R3300J
R38	321-0250-00			RES.,FXD,FILM:3.92K OHM,1%,0.125W	91637	MFF1816G39200F
R40	311-1564-00			RES.,VAR,NONWIR:500 OHM,20%,0.50W	73138	91A R500
R42	321-0242-00			RES.,FXD,FILM:3.24K OHM,1%,0.125W	91637	MFF1816G32400F
R44	315-0334-00			RES.,FXD,CMPSN:330K OHM,5%,0.25W	01121	CB3345
R46	315-0561-00			RES.,FXD,CMPSN:560 OHM,5%,0.25W	01121	CB5615
R48	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R50	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R54	315-0822-00			RES.,FXD,CMPSN:8.2K OHM,5%,0.25W	01121	CB8225
R56	305-0620-00			RES.,FXD,CMPSN:62 OHM,5%,2W	01121	HB6205
R58	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R60	321-0254-00			RES.,FXD,FILM:4.32K OHM,1%,0.125W	91637	MFF1816G43200F
R62	321-0335-00			RES.,FXD,FILM:30.1K OHM,1%,0.125W	91637	MFF1816G30101F
R64	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R70	308-0218-00			RES.,FXD,WW:150 OHM,5%,3W	91637	RS2B-B150R0J
R72	308-0764-00			RES.,FXD,WW:2.7 OHM,5%,2W	75042	BWF-2R700J
R74	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R76	315-0823-00			RES.,FXD,CMPSN:82K OHM,5%,0.25W	01121	CB8235
R78	315-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
R80	315-0334-00			RES.,FXD,CMPSN:330K OHM,5%,0.25W	01121	CB3345
R82	315-0183-00			RES.,FXD,CMPSN:18K OHM,5%,0.25W	01121	CB1835
R84	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R86	321-0306-00			RES.,FXD,FILM:15K OHM,1%,0.125W	91637	MFF1816G15001F
R88	321-0335-00			RES.,FXD,FILM:30.1K OHM,1%,0.125W	91637	MFF1816G30101F
R100	311-1555-00			RES.,VAR,NONWIR:100K OHM,20%,0.5W	73138	91A R100K
R102	321-0473-00			RES.,FXD,FILM:825K OHM,1%,0.125W	91637	MFF1816G82502F
R104A-D	307-0290-06			RES.,FXD,FILM:HIGH VOLTAGE DIV	80009	3070-0290-06
R106	315-0123-00			RES.,FXD,CMPSN:12K OHM,5%,0.25W	01121	CB1235
R108	321-0360-00			RES.,FXD,FILM:54.9K OHM,1%,0.125W	91637	MFF1816G54901F
R110	321-0258-00			RES.,FXD,FILM:4.75K OHM,1%,0.125W	91637	MFF1816G47500F
R112	315-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
R114	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
R116	315-0563-00			RES.,FXD,CMPSN:56K OHM,5%,0.25W	01121	CB5635
R118	315-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
R120	315-0101-00	B010100	B010299	RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R120	315-0271-00	B010300		RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715

[1]Not included in Option 8.

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R124	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
R126	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R128	308-0459-00			RES.,FXD,WW:1.1 OHM,5%,3W	91637	RS2B-D1R100J
R130	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
R132	315-0391-00			RES.,FXD,CMPSN:390 OHM,5%,0.25W	01121	CB3915
R141[1]	301-0335-00			RES.,FXD,CMPSN:3.3M OHM,5%,0.50W	01121	EB3355
R143[1]	301-0335-00			RES.,FXD,CMPSN:3.3M OHM,5%,0.50W	01121	EB3355
R145	311-1332-00			RES.,VAR,NONWIR:5K OHM,10%,2W	12697	389-CM40936
R148	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R150	315-0564-00			RES.,FXD,CMPSN:560K OHM,5%,0.25W	01121	CB5645
R151[2]	315-0154-00	B010100	B010279X	RES.,FXD,CMPSN:150K OHM,5%,0.25W	01121	CB1545
R158	315-0180-00			RES.,FXD,CMPSN:18 OHM,5%,0.25W	01121	CB1805
R162	315-0622-00			RES.,FXD,CMPSN:6.2K OHM,5%,0.25W	01121	CB6225
R164	315-0163-00			RES.,FXD,CMPSN:16K OHM,5%,0.25W	01121	CB1635
R165	311-1555-00			RES.,VAR,NONWIR:100K OHM,20%,0.5W	73138	91A R100K
R170	311-1556-00			RES.,VAR,NONWIR:50K OHM,20%,0.50W	73138	91A R50K
R172	315-0122-00			RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	01121	CB1225
R173	311-1561-00			RES.,VAR,NONWIR:2.5K OHM,20%,0.50W	73138	91A R2500
R174	315-0122-00			RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	01121	CB1225
R175A,B	311-1687-00			RES.,VAR,NONWIR:2K OHM X 5M OHM,20%,0.5W	01121	12M359
R180	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R182	315-0106-00			RES.,FXD,CMPSN:10M OHM,5%,0.25W	01121	CB1065
R184	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R186	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R188	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
R190	321-0373-00			RES.,FXD,FILM:75K OHM, 1%,0.125W	91637	MFF1816G75001F
R192	311-1555-00			RES.,VAR,NONWIR:100K OHM,20%,0.5W	73138	91A R100K
R194	321-0373-00			RES.,FXD,FILM:75K OHM, 1%,0.125W	91637	MFF1816G75001F
R200	321-0891-00			RES.,FXD,FILM:800K OHM,1%,0.125W	91637	MFF1816G80002F
R202	321-0423-00			RES.,FXD,FILM:249K OHM,1%,0.125W	91637	MFF1816G24902F
R204	322-0481-00			RES.,FXD,FILM:1M OHM,1%,0.25W	75042	CEBT0-1004F
R206	321-0385-00			RES.,FXD,FILM:100K OHM,1%,0.125W	91637	MFF1816G10002F
R208	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R210	315-0822-00			RES.,FXD,CMPSN:8.2K OHM,5%,0.25W	01121	CB8225
R212	321-0207-00			RES.,FXD,FILM:1.4K OHM,1%,0.125W	91637	MFF1816G14000F
R215	311-1561-00			RES.,VAR,NONWIR:2.5K OHM,20%,0.50W	73138	91A R2500
R216	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R218	321-0126-00			RES.,FXD,FILM:200 OHM,1%,0.125W	91637	MFF1816G200R0F
R220	315-0751-00			RES.,FXD,CMPSN:750 OHM,5%,0.25W	01121	CB7515
R222	315-0752-00			RES.,FXD,CMPSN:7.5K OHM,5%,0.25W	01121	CB7525
R226	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
R228	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R230	315-0822-00			RES.,FXD,CMPSN:8.2K OHM,5%,0.25W	01121	CB8225
R232	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R234	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R238	315-0392-00			RES.,FXD,CMPSN:3.9K OHM,5%,0.25W	01121	CB3925
R240	311-1311-00			RES.,VAR,NONWIR:1K OHM,20%,1W	01121	10M655
R242	321-0289-00			RES.,FXD,FILM:10K OHM,1%,0.125W	91637	MFF1816G10001F
R246	315-0182-00			RES.,FXD,CMPSN:1.8K OHM,5%,0.25W	01121	CB1825
R250	321-0385-00			RES.,FXD,FILM:100K OHM,1%,0.125W	91637	MFF1816G10002F
R254	315-0752-00			RES.,FXD,CMPSN:7.5K OHM,5%,0.25W	01121	CB7525
R256	315-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
R260	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035

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[1]Option 8 only.

[2]Above S/N B010280 replaced by a dummy resistor.

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R262	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R264	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R266	308-0349-00			RES.,FXD,WW:3.6K OHM,1%,3W	91637	RS2B-B36000F
R268	315-0240-00			RES.,FXD,CMPSN:24 OHM,5%,0.25W	01121	CB2405
R270	323-0154-00			RES.,FXD,FILM:392 OHM,1%,0.50W	75042	CECT0-3920F
R272	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R300	321-0891-00			RES.,FXD,FILM:800K OHM,1%,0.125W	91637	MFF1816G80002F
R302	321-0423-00			RES.,FXD,FILM:249K OHM,1%,0.125W	91637	MFF1816G24902F
R304	322-0481-00			RES.,FXD,FILM:1M OHM,1%,0.25W	75042	CEBT0-1004F
R306	321-0385-00			RES.,FXD,FILM:100K OHM,1%,0.125W	91637	MFF1816G10002F
R308	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R310	315-0822-00			RES.,FXD,CMPSN:8.2K OHM,5%,0.25W	01121	CB8225
R312	321-0207-00			RES.,FXD,FILM:1.4K OHM,1%,0.125W	91637	MFF1816G14000F
R322	315-0752-00			RES.,FXD,CMPSN:7.5K OHM,5%,0.25W	01121	CB7525
R326	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
R328	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R330	315-0822-00			RES.,FXD,CMPSN:8.2K OHM,5%,0.25W	01121	CB8225
R332	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R334	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R350	321-0385-00			RES.,FXD,FILM:100K OHM,1%,0.125W	91637	MFF1816G10002F
R360	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R362	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R364	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R366	308-0349-00			RES.,FXD,WW:3.6K OHM,1%,3W	91637	RS2B-B36000F
R368	315-0240-00			RES.,FXD,CMPSN:24 OHM,5%,0.25W	01121	CB2405
R380	315-0183-00			RES.,FXD,CMPSN:18K OHM,5%,0.25W	01121	CB1835
R382	315-0392-00			RES.,FXD,CMPSN:3.9K OHM,5%,0.25W	01121	CB3925
R400	321-0891-00			RES.,FXD,FILM:800K OHM,1%,0.125W	91637	MFF1816G80002F
R402	321-0423-00			RES.,FXD,FILM:249K OHM,1%,0.125W	91637	MFF1816G24902F
R404	322-0481-00		PETER CHRISTIE VK5EM	RES.,FXD,FILM:1M OHM,1%,0.25W	75042	CEBT0-1004F
R406	321-0385-00			RES.,FXD,FILM:100K OHM,1%,0.125W	91637	MFF1816G10002F
R408	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R410	315-0822-00			RES.,FXD,CMPSN:8.2K OHM,5%,0.25W	01121	CB8225
R412	321-0207-00			RES.,FXD,FILM:1.4K OHM,1%,0.125W	91637	MFF1816G14000F
R415	311-1561-00			RES.,VAR,NONWIR:2.5K OHM,20%,0.50W	73138	91A R2500
R416	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R418	321-0126-00			RES.,FXD,FILM:200 OHM,1%,0.125W	91637	MFF1816G200R0F
R420	315-0751-00			RES.,FXD,CMPSN:750 OHM,5%,0.25W	01121	CB7515
R422	315-0752-00			RES.,FXD,CMPSN:7.5K OHM,5%,0.25W	01121	CB7525
R426	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
R428	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R430	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
R432	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R434	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R438	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R440	311-1311-00			RES.,VAR,NONWIR:1K OHM,20%,1W	01121	10M655
R442	321-0311-00			RES.,FXD,FILM:16.9K OHM,1%,0.125W	91637	MFF1816G16901F
R446	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
R450	321-0354-00			RES.,FXD,FILM:47.5K OHM,1%,0.125W	91637	MFF1816G47501F
R454	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
R456	315-0391-00			RES.,FXD,CMPSN:390 OHM,5%,0.25W	01121	CB3915
R460	315-0912-00			RES.,FXD,CMPSN:9.1K OHM,5%,0.25W	01121	CB9125
R464	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R466	321-0247-00			RES.,FXD,FILM:3.65K OHM,1%,0.125W	91637	MFF1816G36500F
R468	315-0430-00			RES.,FXD,CMPSN:43 OHM,5%,0.25W	01121	CB4305
R470	321-0196-00			RES.,FXD,FILM:1.07K OHM,1%,0.125W	91637	MFF1816G10700F
R500	321-0891-00			RES.,FXD,FILM:800K OHM,1%,0.125W	91637	MFF1816G80002F
R502	321-0423-00			RES.,FXD,FILM:249K OHM,1%,0.125W	91637	MFF1816G24902F
R504	322-0481-00			RES.,FXD,FILM:1M OHM,1%,0.25W	75042	CEBT0-1004F
R506	321-0385-00			RES.,FXD,FILM:100K OHM,1%,0.125W	91637	MFF1816G10002F
R508	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R510	315-0822-00			RES.,FXD,CMPSN:8.2K OHM,5%,0.25W	01121	CB8225
R512	321-0207-00			RES.,FXD,FILM:1.4K OHM,1%,0.125W	91637	MFF1816G14000F
R522	315-0752-00			RES.,FXD,CMPSN:7.5K OHM,5%,0.25W	01121	CB7525
R526	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
R528	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R530	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
R532	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R534	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R550	321-0354-00			RES.,FXD,FILM:47.5K OHM,1%,0.125W	91637	MFF1816G47501F
R560	315-0912-00			RES.,FXD,CMPSN:9.1K OHM,5%,0.25W	01121	CB9125
R564	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
R566	321-0247-00			RES.,FXD,FILM:3.65K OHM,1%,0.125W	91637	MFF1816G36500F
R568	315-0430-00			RES.,FXD,CMPSN:43 OHM,5%,0.25W	01121	CB4305
R604	322-0481-00			RES.,FXD,FILM:1M OHM,1%,0.25W	75042	CEBT0-1004F
R606	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
R608	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R610	315-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	01121	CB6825
R612	321-0210-00			RES.,FXD,FILM:1.5K OHM,1%,0.125W	91637	MFF1816G15000F
R614	321-0142-00			RES.,FXD,FILM:294 OHM,1%,0.125W	91637	MFF1816G294R0F
R615	311-1561-00			RES.,VAR,NONWIR:2.5K OHM,20%,0.50W	73138	91A R2500
R620	315-0751-00			RES.,FXD,CMPSN:750 OHM,5%,0.25W	01121	CB7515
R622	315-0183-00			RES.,FXD,CMPSN:18K OHM,5%,0.25W	01121	CB1835
R630	321-0198-00			RES.,FXD,FILM:1.13K OHM,1%,0.125W	91637	MFF1816G11300F
R632	321-0193-00			RES.,FXD,FILM:1K OHM,1%,0.125W	91637	MFF1816G10000F
R636	321-0158-00			RES.,FXD,FILM:432 OHM,1%,0.125W	91637	MFF1816G432R0F
R640	321-0127-00			RES.,FXD,FILM:205 OHM,1%,0.125W	91637	MFF1816G205R0F
R642	321-0208-00			RES.,FXD,FILM:1.43K OHM,1%,0.125W	91637	MFF1816G14300F
R644	321-0321-00			RES.,FXD,FILM:21.5K OHM,1%,0.125W	91637	MFF1816G21501F
R654	322-0481-00			RES.,FXD,FILM:1M OHM,1%,0.25W	75042	CEBT0-1004F
R656	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
R658	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R660	315-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	01121	CB6825
R662	321-0210-00			RES.,FXD,FILM:1.5K OHM,1%,0.125W	91637	MFF1816G15000F
R672	315-0183-00			RES.,FXD,CMPSN:18K OHM,5%,0.25W	01121	CB1835
R680	321-0198-00			RES.,FXD,FILM:1.13K OHM,1%,0.125W	91637	MFF1816G11300F
R682	321-0193-00			RES.,FXD,FILM:1K OHM,1%,0.125W	91637	MFF1816G10000F
R690	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R692	321-0254-00			RES.,FXD,FILM:4.32K OHM,1%,0.125W	91637	MFF1816G43200F
R698	315-0392-00			RES.,FXD,CMPSN:3.9K OHM,5%,0.25W	01121	CB3925
R710	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R712	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
R716	315-0181-00			RES.,FXD,CMPSN:180 OHM,5%,0.25W	01121	CB1815
R724	301-0561-00			RES.,FXD,CMPSN:560 OHM,5%,0.50W	01121	EB5615
R726	315-0562-00			RES.,FXD,CMPSN:5.6K OHM,5%,0.25W	01121	CB5625
R728	315-0303-00			RES.,FXD,CMPSN:30K OHM,5%,0.25W	01121	CB3035

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Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R730	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
R734	322-0613-00			RES.,FXD,FILM:20.4K OHM,1%,0.25W	75042	CEBT0-2042F
R735	321-0253-00			RES.,FXD,FILM:4.22K OHM,1%,0.125W	91637	MFF1816G42200F
R750	301-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.50W	01121	EB8215
R802	315-0181-00			RES.,FXD,CMPSN:180 OHM,5%,0.25W	01121	CB1815
R806	315-0133-00			RES.,FXD,CMPSN:13K OHM,5%,0.25W	01121	CB1335
R808	315-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
R810	315-0154-00			RES.,FXD,CMPSN:150K OHM,5%,0.25W	01121	CB1545
R812	315-0473-00			RES.,FXD,CMPSN:47K OHM,5%,0.25W	01121	CB4735
R814	315-0333-00			RES.,FXD,CMPSN:33K OHM,5%,0.25W	01121	CB3335
R816	315-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
R820	315-0752-00			RES.,FXD,CMPSN:7.5K OHM,5%,0.25W	01121	CB7525
R822	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R824	315-0753-00			RES.,FXD,CMPSN:75K OHM,5%,0.25W	01121	CB7535
R828	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R830	315-0123-00			RES.,FXD,CMPSN:12K OHM,5%,0.25W	01121	CB1235
R834	321-0458-00			RES.,FXD,FILM:576K OHM,1%,0.125W	91637	MFF1816G57602F
R835	311-1557-00			RES.,VAR,NONWIR:25K OHM,20%,0.50W	73138	91A R25K
R838	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
R840	315-0154-00			RES.,FXD,CMPSN:150K OHM,5%,0.25W	01121	CB1545
R844	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R846	315-0391-00			RES.,FXD,CMPSN:390 OHM,5%,0.25W	01121	CB3915
R848	315-0163-00			RES.,FXD,CMPSN:16K OHM,5%,0.25W	01121	CB1635
R852	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R853	315-0222-00			RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	01121	CB2225
R856	315-0183-00			RES.,FXD,CMPSN:18K OHM,5%,0.25W	01121	CB1835
R860	315-0181-00			RES.,FXD,CMPSN:180 OHM,5%,0.25W	01121	CB1815
R862	315-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
R864	315-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
R866	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R870	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
R872	315-0364-00			RES.,FXD,CMPSN:360K OHM,5%,0.25W	01121	CB3645
R874	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
R875	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
R878	315-0562-00			RES.,FXD,CMPSN:5.6K OHM,5%,0.25W	01121	CB5625
R880	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	01121	CB1215
R882	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
R886	315-0125-00			RES.,FXD,CMPSN:1.2M OHM,5%,0.25W	01121	CB1255
R888	315-0106-00			RES.,FXD,CMPSN:10M OHM,5%,0.25W	01121	CB1065
R890	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R892	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R894	315-0114-00			RES.,FXD,CMPSN:110K OHM,5%,0.25W	01121	CB1145
R895[1]	311-1688-00			RES.,VAR,NONWIR:50K OHM,20%,1W	01121	12M792
R896	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R897	315-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
R898	315-0473-00			RES.,FXD,CMPSN:47K OHM,5%,0.25W	01121	CB4735
R902	315-0272-00			RES.,FXD,CMPSN:2.7K OHM,5%,0.25W	01121	CB2725
R906	315-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
R908	315-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
R912	315-0181-00			RES.,FXD,CMPSN:180 OHM,5%,0.25W	01121	CB1815
R950	321-0393-00			RES.,FXD,FILM:121K OHM,1%,0.125W	91637	MFF1816G12102F
R960	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R962	315-0753-00			RES.,FXD,CMPSN:75K OHM,5%,0.25W	01121	CB7535

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[1]Furnished as a unit with S895A,B.

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R965	311-1555-00			RES.,VAR,NONWIR:100K OHM,20%,0.5W	73138	91A R100K
R966	321-0466-00			RES.,FXD,FILM:698K OHM,1%,0.125W	91637	MFF1816G69802F
R968	315-0106-00			RES.,FXD,CMPSN:10M OHM,5%,0.25W	01121	CB1065
R970	311-1710-00			RES.,VAR,NONWIR:20K OHM,20%,1W	01121	13M215
R972	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R973	315-0753-00			RES.,FXD,CMPSN:75K OHM,5%,0.25W	01121	CB7535
R975	311-1550-00			RES.,VAR,NONWIR:2M OHM,20%,0.50W	73138	91A R2MEG
R976	315-0335-00			RES.,FXD,CMPSN:3.3M OHM,5%,0.25W	01121	CB3355
R982	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R984	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
R986	315-0822-00			RES.,FXD,CMPSN:8.2K OHM,5%,0.25W	01121	CB8225
R990	315-0272-00			RES.,FXD,CMPSN:2.7K OHM,5%,0.25W	01121	CB2725
R992	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
R994	308-0503-00			RES.,FXD,WW:6.8 OHM,5%,2.50W	91637	RS2B-D6R800J
R996	315-0272-00			RES.,FXD,CMPSN:2.7K OHM,5%,0.25W	01121	CB2725
R998	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
R1000	315-0182-00			RES.,FXD,CMPSN:1.8K OHM,5%,0.25W	01121	CB1825
R1010	303-0303-00			RES.,FXD,CMPSN:30K OHM,5%,1W	01121	GB3035
R1012	315-0563-00			RES.,FXD,CMPSN:56K OHM,5%,0.25W	01121	CB5635
R1014	315-0513-00			RES.,FXD,CMPSN:51K OHM,5%,0.25W	01121	CB5135
R1016	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R1018	315-0123-00			RES.,FXD,CMPSN:12K OHM,5%,0.25W	01121	CB1235
R1026	315-0163-00			RES.,FXD,CMPSN:16K OHM,5%,0.25W	01121	CB1635
R1030	311-1556-00			RES.,VAR,NONWIR:50K OHM,20%,0.50W	73138	91A R50K
R1032	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
R1034	315-0223-00			RES.,FXD,CMPSN:22K OHM,5%,0.25W	01121	CB2235
R1036	305-0243-00			RES.,FXD,CMPSN:24K OHM,5%,2W	01121	HB2435
R1040	315-0223-00			RES.,FXD,CMPSN:22K OHM,5%,0.25W	01121	CB2235
R1041[1]	301-0363-00			RES.,FXD,CMPSN:36K OHM,5%,0.50W	01121	EB3635
R1042	311-1556-00			RES.,VAR,NONWIR:50K OHM,20%,0.50W	73138	91A R50K
R1043	315-0433-00			RES.,FXD,CMPSN:43K OHM,0.25W	01121	CB4335
R1044[1]	315-0563-00			RES.,FXD,CMPSN:56 OHM,5%,0.25W	01121	CB5635
R1046[2]	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1050[2]	301-0333-00			RES.,FXD,CMPSN:33K OHM,5%,0.50W	01121	EB3335
R1052[2]	315-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
R1054[2]	311-1556-00			RES.,VAR,NONWIR:50K OHM,20%,0.50W	73138	91A R50K
R1055[2]	315-0683-00			RES.,FXD,CMPSN:68K OHM,5%,0.25W	01121	CB6835
R1060	321-0423-00			RES.,FXD,FILM:249K OHM,1%,0.125W	91637	MFF1816G24902F
R1062	321-0481-00			RES.,FXD,FILM:1M OHM,1%,0.125W	91637	MFF1816G10003F
R1064	315-0683-00			RES.,FXD,CMPSN:68K OHM,5%,0.25W	01121	CB6835
R1066	303-0563-00			RES.,FXD,CMPSN:56K OHM,5%,1W	01121	GB5635
R1068	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
S10	260-0413-00			SW,THERMOSTATIC:10A,240V	73803	200700L63-253
S12	260-1222-00			SWITCH,PUSH-PUL:10A,250VAC	91929	2DM301
S895A,B[3]	311-1688-00			RES.,VAR,NONWIR:50K OHM,20%,1W	01121	12M792
S200	260-0723-00	B010100	B010499	SWITCH,SLIDE:DPDT,0.5A,125VAC	79727	GF126-0028
S200	260-1811-00	B010500		SWITCH,SLIDE:DPDT,0.5A,125VAC DC	82389	C56206L2
S300	260-0723-00	B010100	B010499	SWITCH,SLIDE:DPDT,0.5A,125VAC	79727	GF126-0028
S300	260-1811-00	B010500		SWITCH,SLIDE:DPDT,0.5A,125VAC DC	82389	C56206L2
S400	260-0723-00	B010100	B010499	SWITCH,SLIDE:DPDT,0.5A,125VAC	79727	GF126-0028
S400	260-1811-00	B010500		SWITCH,SLIDE:DPDT,0.5A,125VAC DC	82389	C56206L2
S500	260-0723-00	B010100	B010499	SWITCH,SLIDE:DPDT,0.5A,125VAC	79727	GF126-0028
S500	260-1811-00	B010500		SWITCH,SLIDE:DPDT,0.5A,125VAC DC	82389	C56206L2

[1]Option 8 only.
[2]Not included in Option 8.
[3]Furnished as a unit with R985.

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
S870	260-1308-00			SWITCH,PUSH:MOMENTARY	80009	260-1308-00
S910	260-1211-00			SWITCH,PUSH:DPDT,PUSH-PUSH	80009	260-1211-00
T15	120-0925-00			XFMR,PWR,STPDN:	80009	120-0925-00
T120	120-0926-00			XFMR,PWR,SDN/SU:	80009	120-0926-00
U110	156-0067-00			MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER	80009	156-0067-00
U120[1]	152-0660-00			SEMICOND DVC,DI:HV MULTR,SI,7KV,IN,105KV OUT	52306	CMX286
U810	156-0057-00			MICROCIRCUIT,DI:QUAD 2-INPUT NAND GATE	07263	7401PC
U820	156-0072-00			MICROCIRCUIT,DI:MONOSTABLE MV,TTL	27014	DM74121N
U850	156-0072-00			MICROCIRCUIT,DI:MONOSTABLE MV,TTL	27014	DM74121N
U895	156-0072-00			MICROCIRCUIT,DI:MONOSTABLE MV,TTL	27014	DM74121N
V100[2]	154-0697-11			ELECTRON TUBE:CRT	80009	154-0697-11
V100[3]	154-0771-00			ELECTRON TUBE:CRT	80009	154-0771-00
V100	154-0771-01			ELECTRON TUBE:CRT	80009	154-0771-01
VR50	152-0166-00			SEMICOND DEVICE:ZENER,0.4W,6.2V,5%	81483	69-9035
VR130	152-0243-00			SEMICOND DEVICE:ZENER,0.4W,15V,5%	81483	1N965B
VR166	152-0268-00			SEMICOND DEVICE:ZENER,0.4W,56V,5%	04713	1N979B
VR270	152-0149-00			SEMICOND DEVICE:ZENER,0.4W,10V,5%	04713	1N961B
VR670	152-0149-00			SEMICOND DEVICE:ZENER,0.4W,10V,5%	04713	1N961B
VR690	152-0227-00			SEMICOND DEVICE:ZENER,0.4W,6.2V,5%	80009	152-0227-00
VR915	152-0166-00			SEMICOND DEVICE:ZENER,0.4W,6.2V,5%	81483	69-9035
VR1010[2,4]	152-0428-00			SEMICOND DEVICE:ZENER,0.4W,120V,5%	04713	1N987B
VR1042[4]	152-0286-00			SEMICOND DEVICE:ZENER,0.4W,75V,5%	04713	1N982B
VR1043[2]	152-0286-00			SEMICOND DEVICE:ZENER,0.4W,75V,5%	04713	1N982B

[1]Not included in Option 8.
[2]Option 8 only.
[3]Option 1 only.
[4]Standard only.

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
				OPTION 4		
A6	670-2278-00			CKT BOARD ASSY:SWEEP	80009	670-2278-00
C1105	281-0503-00			CAP.,FXD,CER DI:8PF,+/-0.5PF,500V	72982	301-000C0H0809D
C1110	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C1112	281-0629-00			CAP.,FXD,CER DI:33PF,5%,600V	72982	308-000C0G0330J
C1114	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	72982	855-558-Z5V0203Z
C1124	283-0041-00			CAP.,FXD,CER DI:0.0033UF,5%,500V	72982	841-541B332J
C1125	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C1130[1]	285-0754-02			CAP.,FXD,PLASTIC:0.001UF,3%,400V	80009	285-0754-02
C1134[1]	285-0753-01			CAP.,FXD,PLASTIC:0.01UF,3%,100V	80009	285-0753-01
C1138[1]	285-0895-00			CAP.,FXD,PLASTIC:1.0UF,3%,25V	80009	285-0895-00
C1160	281-0604-00			CAP.,FXD,CER DI:2.2PF,+/-0.25PF,500V	72982	301-000C0J0229C
C1162	290-0572-00			CAP.,FXD,ELCTLT:0.1UF,20%,50V	56289	196D104X0050HA1
C1176	281-0549-00			CAP.,FXD,CER DI:68PF,10%,500V	72982	301-000U2J0680K
C1190	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C1194	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C1195	290-0572-00			CAP.,FXD,ELCTLT:0.1UF,20%,50V	56289	196D104X0050HA1
CR1130	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR1175	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
Q1160	151-0342-00			TRANSISTOR:SILICON,PNP	80009	151-0342-00
Q1164	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q1175	151-0342-00			TRANSISTOR:SILICON,PNP	80009	151-0342-00
Q1178	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
R1105	315-0363-00			RES.,FXD,CMPSN:36K OHM,5%,0.25W	01121	CB3635
R1106	315-0223-00			RES.,FXD,CMPSN:22K OHM,5%,0.25W	01121	CB2235
R1110	316-0332-00			RES.,FXD,CMPSN:3.3K OHM,10%,0.25W	01121	CB3321
R1115	311-0607-00			RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	82P-59-4-103K
R1118	311-0949-00			RES.,VAR,NONWIR:2K OHM,10%,0.50W	01121	WA1G040S202UA
R1120	316-0333-00			RES.,FXD,CMPSN:33K OHM,10%,0.25W	01121	CB3331
R1122	316-0122-00			RES.,FXD,CMPSN:1.2K OHM,10%.0.25W	01121	CB1221
R1124	315-0223-00			RES.,FXD,CMPSN:22K OHM,5%,0.25W	01121	CB2235
R1130	321-0356-00			RES.,FXD,FILM:49.9K OHM,1%,0.125W	91637	MFF1816G49901F
R1134	321-0452-00			RES.,FXD,FILM:499K OHM,1%,0.125W	91637	MFF1816G49902F
R1138	307-0381-00			RES.,FXD,FILM:4.99M OHM,1%,0.50W	03888	FL12-499734
R1145	311-0443-00			RES.,VAR,NONWIR:2500 OHM,20%,0.75W	11237	300SF-41330
R1146	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
R1150	321-0327-00			RES.,FXD,FILM:24.9K OHM,1%,0.125W	91637	MFF1816G24901F
R1152	321-0311-00			RES.,FXD,FILM:16.9K OHM,1%,0.125W	91637	MFF1816G16901F
R1155	321-0369-00			RES.,FXD,FILM:68.1K OHM,1%,0.125W	91637	MFF1816G68101F
R1156	315-0822-00			RES.,FXD,CMPSN:8.2K OHM,5%,0.25W	01121	CB8225
R1158	316-0222-00			RES.,FXD,CMPSN:2.2K OHM,10%,0.25W	01121	CB2221
R1160	316-0333-00			RES.,FXD,CMPSN:33K OHM,10%,0.25W	01121	CB3331
R1162	316-0101-00			RES.,FXD,CMPSN:100 OHM,10%,0.25W	01121	CB1011
R1165	311-0635-00			RES.,VAR,NONWIR:1K OHM,10%,0.50W	73138	82-32-0
R1167	321-0230-00			RES.,FXD,FILM:2.43K OHM,1%,0.125W	91637	MFF1816G24300F
R1171	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
R1173	316-0102-00			RES.,FXD,CMPSN:1K OHM,10%,0.25W	01121	CB1021
R1175	316-0102-00			RES.,FXD,CMPSN:1K OHM,10%,0.25W	01121	CB1021
R1176	316-0471-00			RES.,FXD,CMPSN:470 OHM,10%,0.25W	01121	CB4711

[1]Available as a matched set, part number 295-0159-00. The letter suffix and the tolerance should be the same for all of the capacitors in the assembly.

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R1178	315-0133-00			RES.,FXD,CMPSN:13K OHM,5%,0.25W	01121	CB1335
R1190	301-0241-00			RES.,FXD,CMPSN:240 OHM,5%,0.50W	01121	EB2415
R1194	303-0821-00			RES.,FXD,CMPSN:820 OHM,5%,1W	01121	GB8215
S220	260-0723-00	B010100	B010499	SWITCH,SLIDE:DPDT,0.5A,125VAC	79727	GF126-0028
S220	260-1811-00	B010500		SWITCH,SLIDE:DPDT,0.5A,125VAC DC	82389	C56206L2
S735	260-0723-00	B010100	B010499	SWITCH,SLIDE:DPDT,0.5A,125VAC	79727	GF126-0028
S735	260-1811-00	B010500		SWITCH,SLIDE:DPDT,0.5A,125VAC DC	82389	C56206L2
S1109	260-0960-01			SWITCH,SLIDE:0.5A,120VDC,CKT CD MT	10389	23-021-043
S1130	105-0389-00			ACTR ASSY,CAM S:	80009	105-0389-00
U1130	155-0055-00			MICROCIRCUIT,LI:MONOLITHIC,TRIG AND SWEEP	80009	155-0055-00
VR1162	152-0166-00			SEMICOND DEVICE:ZENER,0.4W,6.2V,5%	81483	69-9035
VR1190	152-0217-00			SEMICOND DEVICE:ZENER,0.4W,8.2V,5%	80009	152-0217-00
VR1194	152-0217-00			SEMICOND DEVICE:ZENER,0.4W,8.2V,5%	80009	152-0217-00

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 8-1 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.

OPTION 1

Includes an internal, unlighted, 8 X 10 division (0.9 cm/div) graticule.

OPTION 3

Deletes the carrying handle and feet.

OPTION 4

Includes an internal X-axis sweep with rates from 1 second/division to 1 microsecond/division. Instrument is internally selectable for X-Y or Y-T modes of operation.

OPTION 6

The standard 607 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.

OPTION 7

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

TABLE 8-1
Option Information Locator

Instrument Option	Manual Section	Location of Information
Option 1 (Crt with internal graticule)	7 Replaceable Electrical Parts	Provides the replacement part number for the crt with an internal graticule.
	8 Instrument Options	Option 1 The introduction includes a description of the Option 1 instrument.
Option 3 (Deletes carrying handle and feet)	8 Instrument Options	Option 3 The introduction includes a description of the Option 3 instrument.
	10 Replaceable Mechanical Parts	Provides a footnote deleting the carrying handle and feet for the Option 3 instrument.
Option 4 (Provides internal horizontal sweep circuit)	1 Specification	Electrical Table 1-2 includes electrical characteristics for the Option 4 instrument.
	2 Operating Instructions	Controls and Connectors Describes the function of the Option 4 front-panel controls.
		Functional Check Provides functional check procedure for the Option 4 instrument.
		Option 4 Sweep Information Discusses the use of the graticule, controls, and the internal sweep generator for making accurate time measurements.
	3 Installation	Connecting the Internal Sweep (Option 4) Provides a procedure for using the internal switches to connect the internal sweep generator.
	4 Theory of Operation	Detailed Circuit Operation Discusses the operation of the internal sweep circuit.
	6 Performance Check and Adjustment	Sweep Generator (Option 4) Contains procedures for checking and adjusting the Option 4 instrument.

TABLE 8-1 (CONT.)
Option Information Locator

Instrument Option	Manual Section	Location of Information
Option 4 (cont.)	7 Replaceable Electrical Parts	Provides an electrical parts list for the Option 4 instrument.
	8 Instrument Options	Option 4 The introduction includes a description of the Option 4 instrument.
	9 Diagrams and Circuit Board Illustrations	Provides block diagram, component, adjustment, test point, internal control and selector locations, troubleshooting chart, and schematic diagram for the Option 4 instrument.
	10 Replaceable Mechanical Parts	Provides a mechanical parts list and an exploded-view drawing for the Option 4 instrument.
Option 6 (Meets Underwriter's Laboratory 544 Medical and Dental Equipment requirements)	3 Installation	Line-Voltage and Regulating Range Selection Figure 3-1 shows the location of the line fuse for the Option 6 instrument.
	7 Replaceable Electrical Parts	Provides an electrical parts list with replacement parts footnoted for the Option 6 instrument.
	8 Instrument Options	Option 6 The introduction includes a description of the Option 6 instrument.
	10 Replaceable Mechanical Parts	Provides a mechanical parts list with replacement parts footnoted for the Option 6 instrument.
Option 7 (Deletes all protective cabinet panels, feet, and carrying handle)	8 Instrument Options	Option 7 The introduction includes a description of the Option 7 instrument.
	10 Replaceable Mechanical Parts	Provides a footnote deleting all the protective cabinet panels, feet, and carrying handle.

DIAGRAMS AND CIRCUIT BOARD ILLUSTRATIONS

Symbols and Reference Designators

Electrical components shown on the diagrams are in the following units unless noted otherwise:

Capacitors = Values one or greater are in picofarads (pF).
Values less than one are in microfarads (μF).
Resistors = Ohms (Ω).

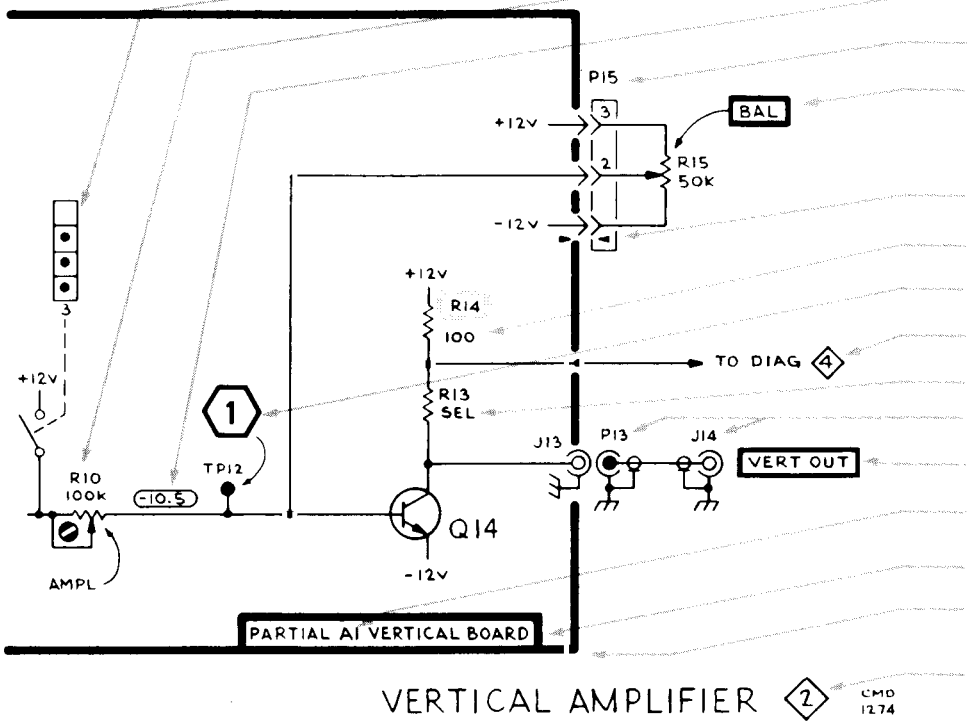
Symbols used on the diagrams are based on ANSI Standard Y32.2-1975.

Logic symbology is based on ANSI Y32.14-1973 in terms of positive logic. Logic symbols depict the logic function performed and may differ from the manufacturer's data.

The following prefix letters are used as reference designators to identify components or assemblies on the diagrams.

A	Assembly, separable or repairable (circuit board, etc.)	H	Heat dissipating device (heat sink, heat radiator, etc.)	RT	Thermistor
AT	Attenuator, fixed or variable	HR	Heater	S	Switch
B	Motor	HY	Hybrid circuit	T	Transformer
BT	Battery	J	Connector, stationary portion	TC	Thermocouple
C	Capacitor, fixed or variable	K	Relay	TP	Test point
CB	Circuit breaker	L	Inductor, fixed or variable	U	Assembly, inseparable or non-repairable (integrated circuit, etc.)
CR	Diode, signal or rectifier	LR	Inductor/resistor combination	V	Electron tube
DL	Delay line	M	Meter	VR	Voltage regulator (zener diode, etc.)
DS	Indicating device (lamp)	P	Connector, movable portion	Y	Crystal
E	Spark Gap	Q	Transistor or silicon-controlled rectifier	Z	Phase shifter
F	Fuse				
FL	Filter	R	Resistor, fixed or variable		

The following special symbols are used on the diagrams:



VERTICAL AMPLIFIER 2 CMD 1274

Cam Switch Closure Chart

Internal Screwdriver Adjustment

Test Voltage

Plug to E.C. Board

Panel Adjustment

Plug Index

Modified Component—See Parts Li

Refer to Waveform

Refer to Diagram Number

SEL Value Selected at Factory

Coaxial Connector

Panel Connector

Assembly Number

Board Name

Etched Circuit Board Outlined in Black

Schematic Name and Number

@

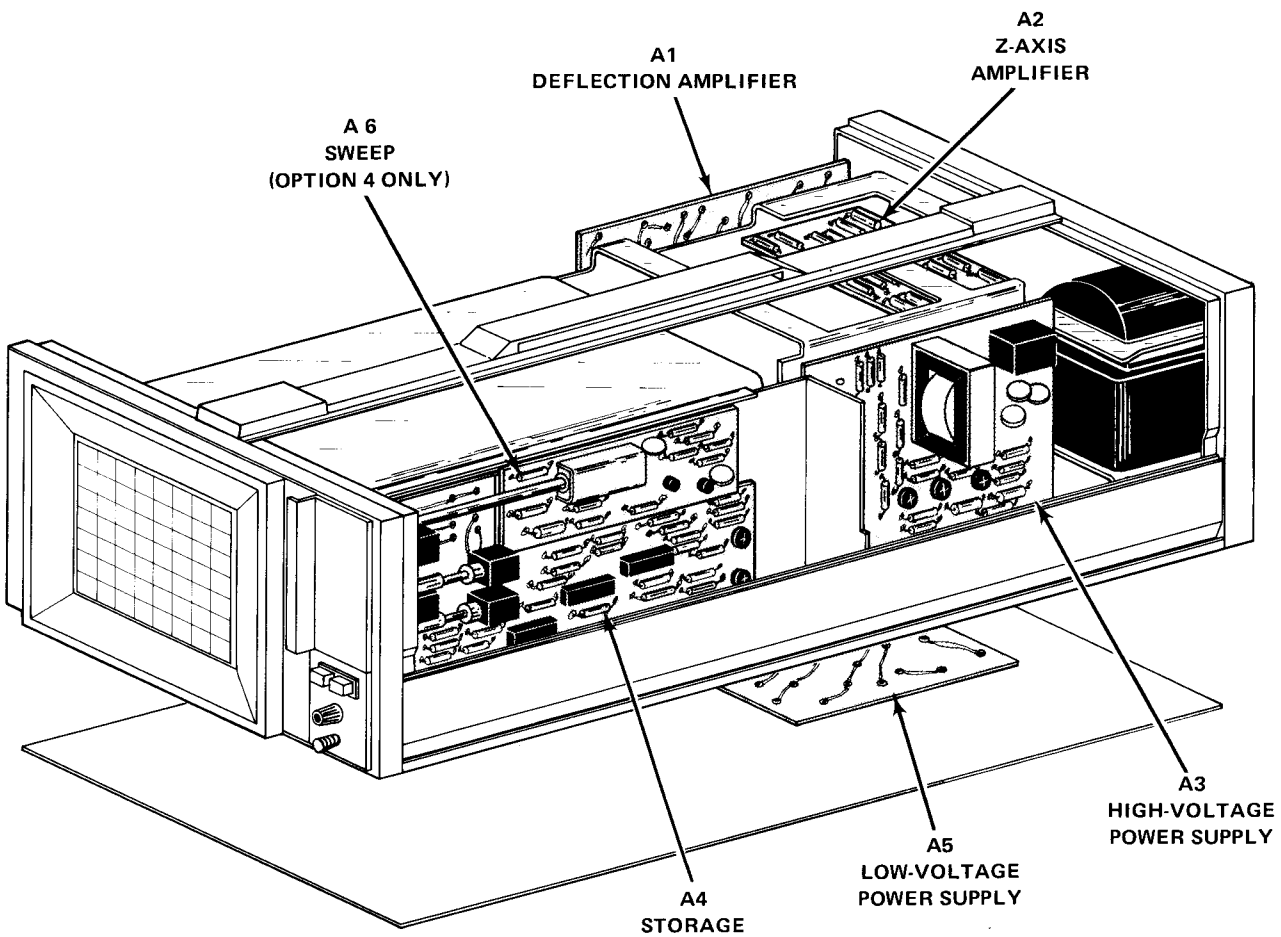
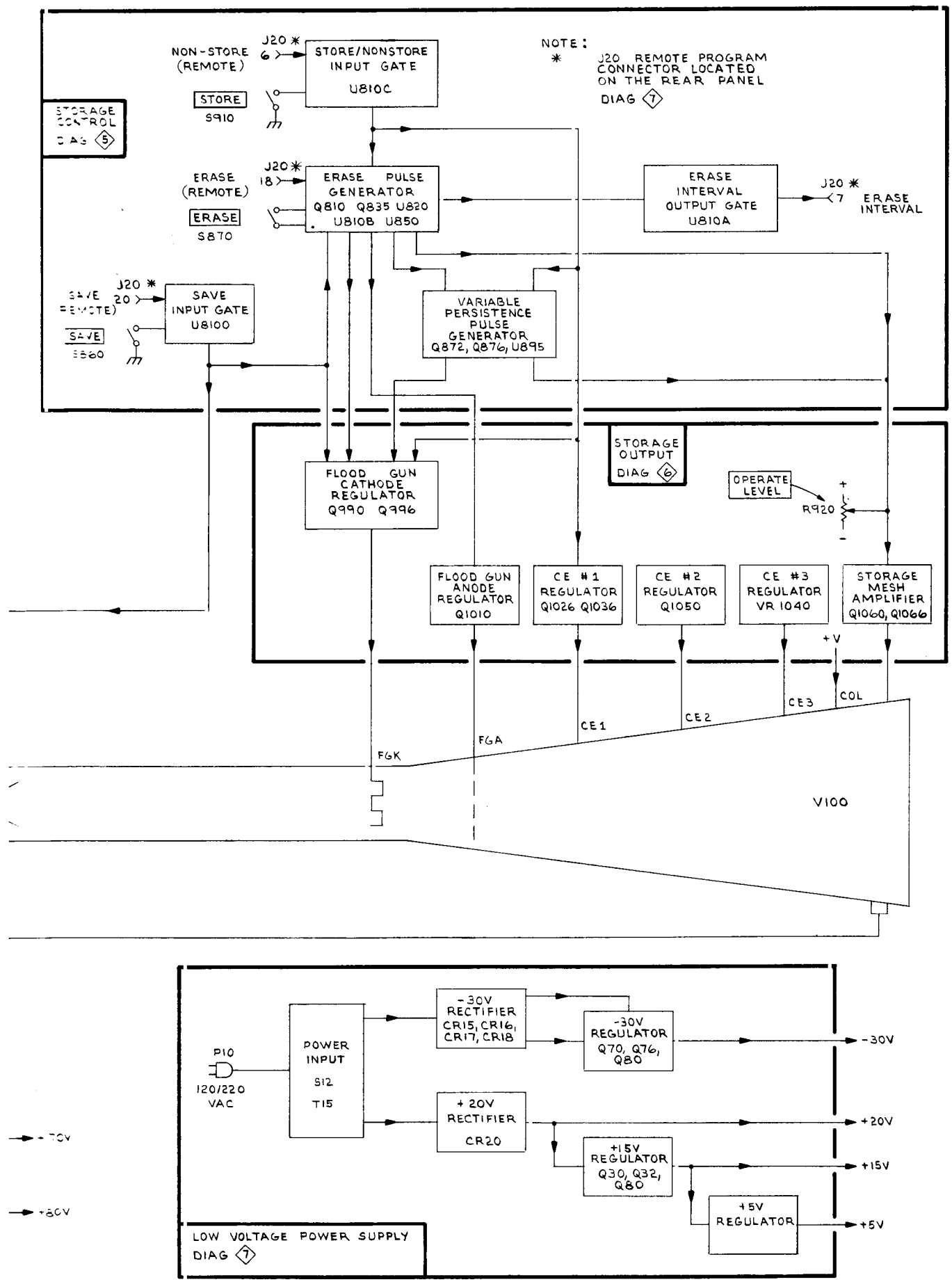


Figure 9-1. Circuit board locations.



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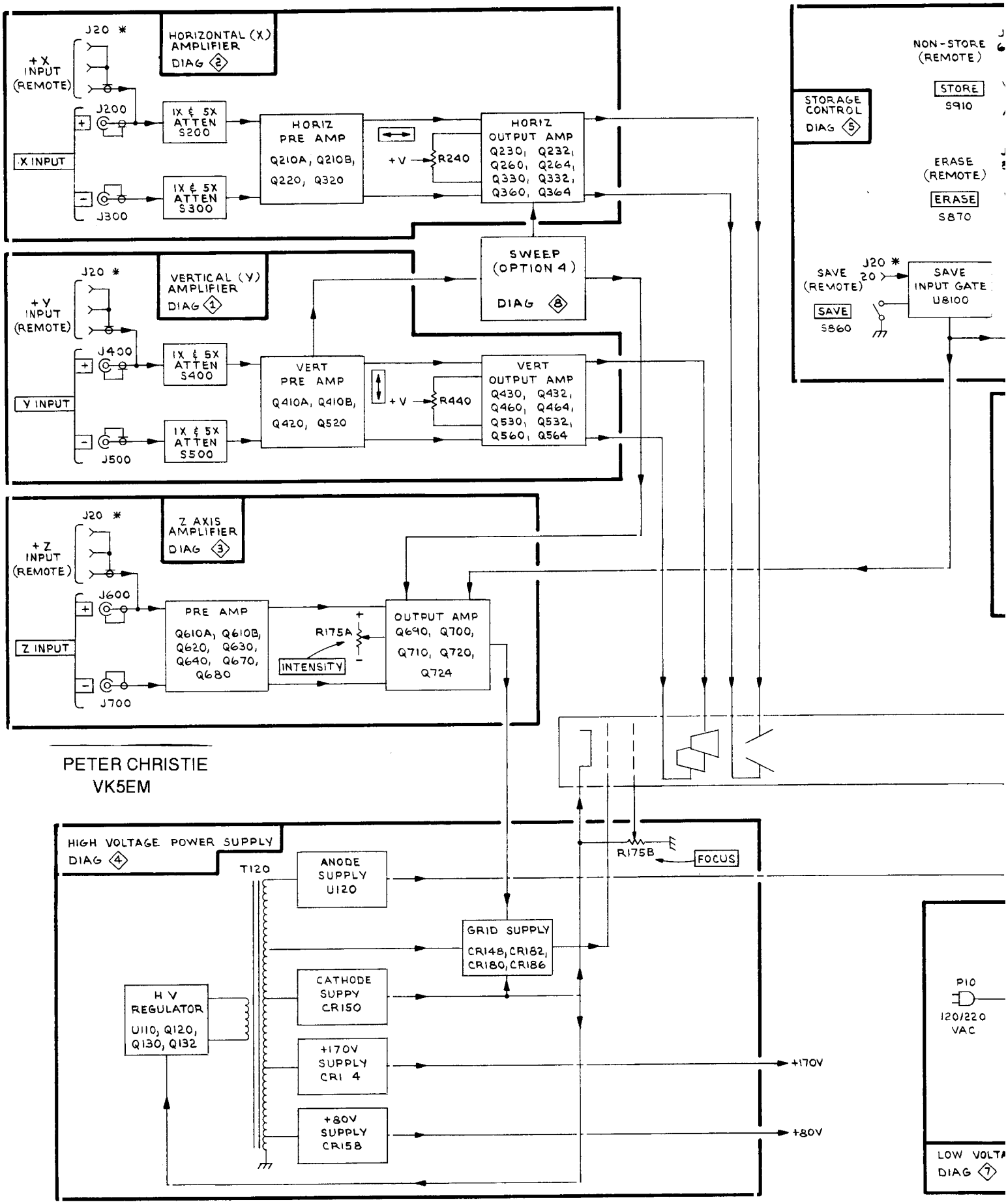
BLOCK DIAGRAM



PETER CHRISTIE
VK5EM

55% W-76-6 VAC

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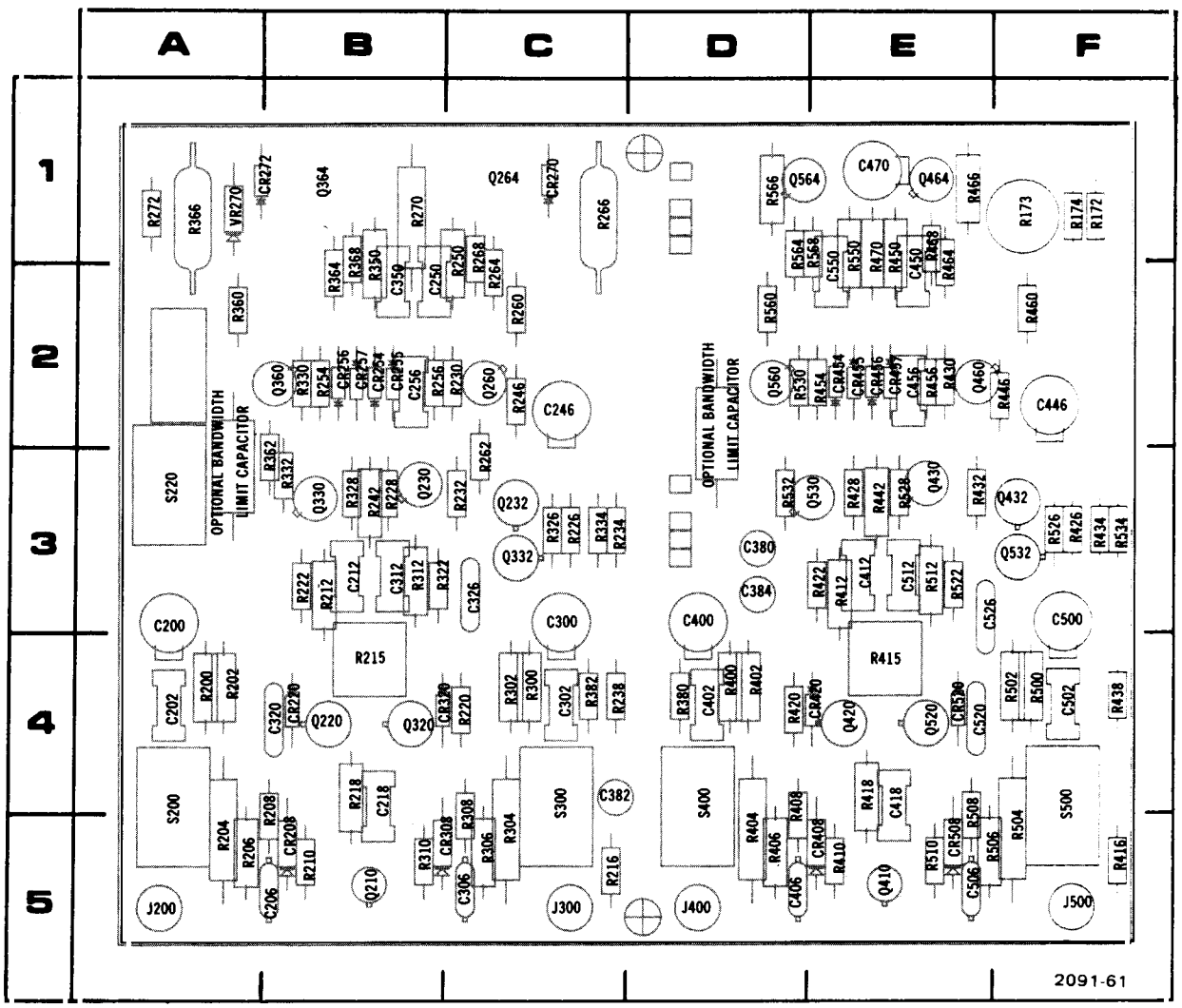


Figure 9-2A. A1—Vertical Amplifier (option 8) component locations.

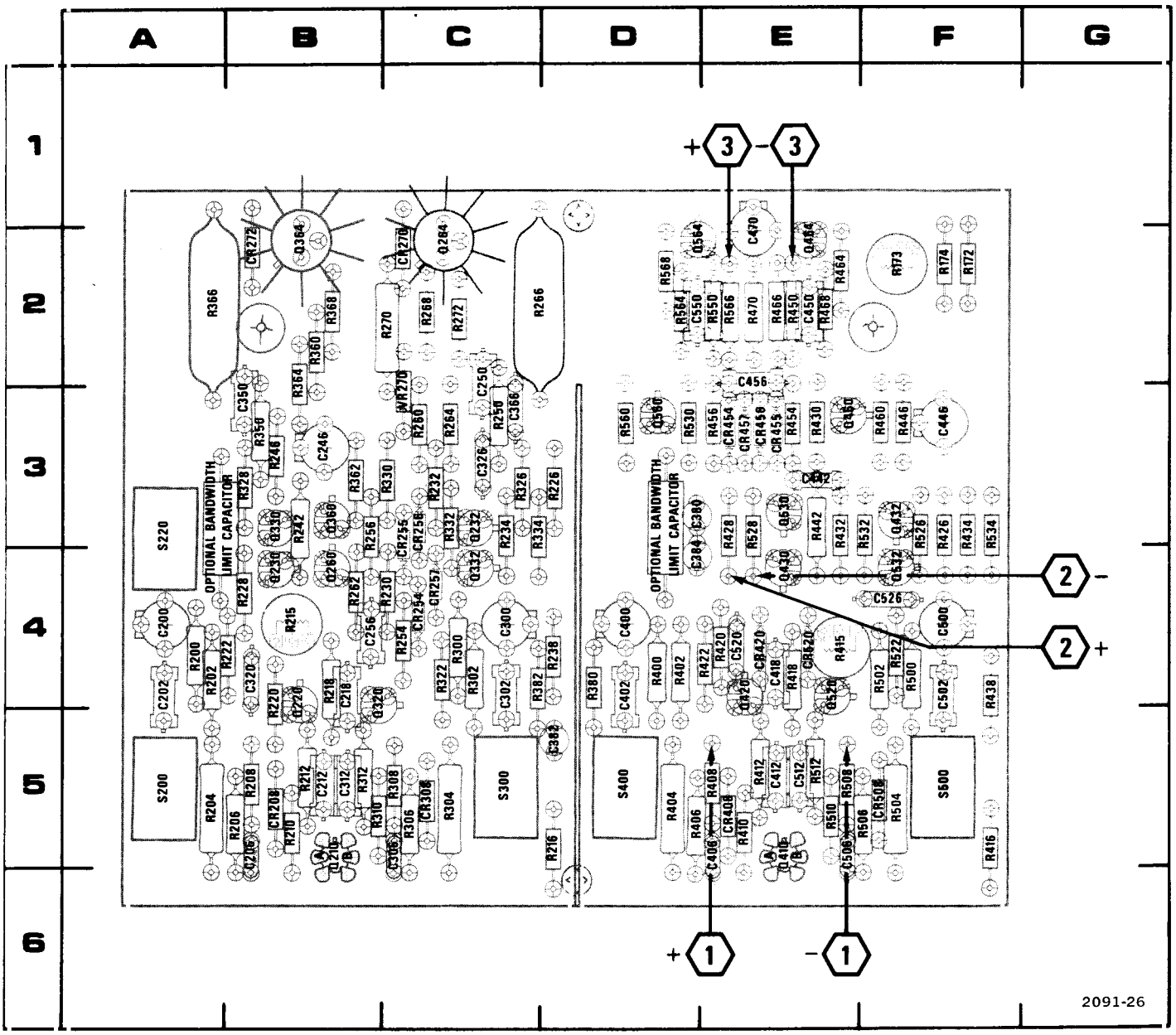
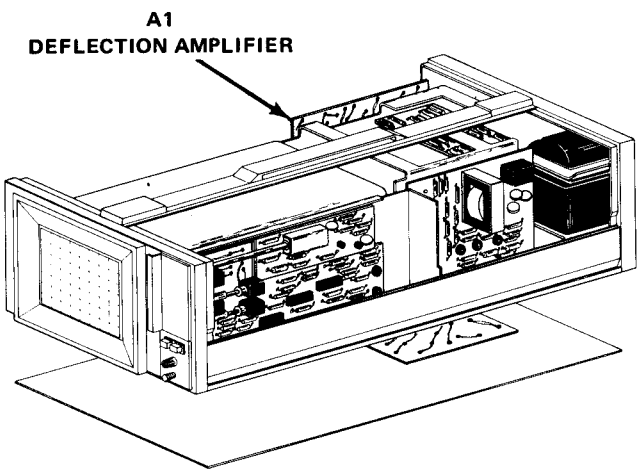


Figure 9-2. A1—Vertical Amplifier component and waveform test point locations.



CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD
C200	4A	C506	5E	Q330	3B	R226	3D	R350	3B	R460	3F
C202	4A	C512	5E	Q332	4C	R228	4B	R360	2B	R464	2E
C206	5B	C520	4E	Q360	3B	R230	4C	R362	3B	R466	2E
C212	5B	C526	4F	Q364	2B	R232	3C	R364	2B	R468	2E
C218	4B	C550	2D	Q410	5E	R234	3C	R366	2A	R470	2E
C246	3B			Q420	4E	R238	4D	R368	2B	R500	4F
C250	2C	CR208	5B	Q430	4E	R242	3B	R380	4D	R502	4F
C256	4B	CR254	4C	Q432	3F	R246	3B	R382	4C	R504	5F
C300	4C	CR255	3C	Q460	3E	R250	3C	R400	4D	R506	5F
C302	4C	CR256	3C	Q464	2E	R254	4C	R402	4D	R508	5E
C306	5C	CR257	4C	Q520	4E	R256	3B	R404	5D	R510	5E
C312	5B	CR270	2C	Q530	3E	R260	3C	R406	5D	R512	5E
C320	4B	CR272	2B	Q532	4F	R262	4B	R408	5E	R522	4F
C326	3C	CR308	5C	Q560	3D	R264	3C	R410	5E	R526	3F
C350	3B	CR408	5E	Q564	2D	R266	2C	R412	5E	R528	3E
C366	3C	CR420	4E			R268	2C	R415	4E	R530	3D
C380	3D	CR454	3E	R172	2F	R270	2C	R416	5F	R532	3F
C382	5D	CR455	3E	R173	2F	R272	2C	R418	4E	R534	3F
C384	3D	CR456	3E	R174	2F	R300	4C	R420	4E	R550	2E
C400	4D	CR457	3E	R200	4A	R302	4C	R422	4E	R560	3D
C402	4D	CR508	5F	R202	4A	R304	5C	R426	3F	R564	2D
C406	5E	CR520	4E	R204	5A	R306	5C	R428	3E	R566	2E
C412	5W	K220	3A	R206	5B	R308	5C	R430	3E	R568	2D
C418	4E			R208	5B	R310	5B	R432	3E		
C442	3E	Q210	5B	R210	5B	R312	5B	R434	3F	S200	5A
C446	3F	Q220	4B	R212	5B	R322	4C	R438	4F	S220	3A
C450	2E	Q230	4B	R215	4B	R326	3C	R442	3E	S300	5C
C456	2E	Q232	3C	R216	5D	R328	3B	R446	3F	S400	5D
C470	2E	Q260	4B	R218	4B	R330	3C	R450	2E	S500	5F
C500	4F	Q264	2C	R220	4B	R332	3C	R454	3E		
C502	4F	Q320	4B	R222	4B	R334	3C	R456	3E	VR270	3C

INDEX FOR FIG.9-2

CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD
C200	3A	C512	3E	Q320	4B	R226	3C	R360	2A	R466	1E
C202	4A	C520	4E	Q330	3B	R228	3B	R362	3B	R468	1E
C206	5B	C526	3E	Q332	3C	R230	2C	R364	2B	R470	1E
C212	3B	C550	2E	Q360	2B	R232	3C	R366	1A	R500	4F
C218	4B			Q364	1B	R234	3C	R368	2B	R502	4F
C246	2C	CR208	5B	Q410	5E	R238	4C	R380	4D	R504	5F
C250	2B	CR220	4B	Q420	4E	R242	3B	R382	4C	R506	5F
C256	2B	CR254	2B	Q430	3E	R246	2C	R400	4D	R508	5E
C300	3C	CR255	2B	Q432	3F	R250	2C	R402	4D	R510	5E
C302	4C	CR256	2B	Q460	2E	R254	2B	R404	5D	R512	3E
C306	5C	CR257	2B	Q464	1E	R256	2B	R406	5D	R522	3E
C312	3B	CR270	1C	Q520	4E	R260	2C	R408	4D	R526	3F
C320	4B	CR272	1B	Q530	3E	R262	3C	R410	5D	R528	3E
C326	3C	CR308	5C	Q532	3F	R264	2C	R412	3E	R530	2D
C350	2B	CR320	4C	Q560	2D	R266	1C	R415	4E	R532	3D
C366		CR408	5E	Q564	1D	R268	1C	R416	5F	R534	3F
C380	3D	CR420	4E			R270	1B	R418	4E	R550	1E
C382	4C	CR454	2E	R172	1F	R272	1A	R420	4D	R560	2D
C384	3D	CR455	2E	R173	1F	R300	4C	R422	3E	R564	1D
C400	3D	CR456	2E	R174	1F	R302	4C	R426	3F	R566	1D
C402	4D	CR457	2E	R200	4B	R304	5C	R428	3E	R568	1E
C406	5D	CR508	5E	R202	4B	R306	5C	R430	2E		
C412	3E	CR520	4E	R204	5A	R308	4C	R432	3E	S200	4A
C418	4E			R206	5B	R310	5B	R434	3F	S220	3A
C442				R208	4B	R312	3B	R438	4F	S300	4C
C446	2F			R210	5B	R322	3B	R442	3E	S400	4D
C450	2E	Q210	5B	R212	3B	R326	3C	R446	2F	S500	4F
C456	2E	Q220	4B	R215	4B	R328	3B	R450	1E		
C470	1E	Q230	3B	R216	5C	R330	2B	R454	2E	VR270	1A
C500	3F	Q232	3C	R218	4B	R332	3B	R456	2E		
C502	4F	Q260	2C	R220	4C	R334	3C	R460	2F		
C506	5E	Q264	1C	R222	3B	R350	2B	R464	2E		

INDEX FOR FIG. 9-2A.

VOLTAGE AND WAVEFORM CONDITIONS

NOTE

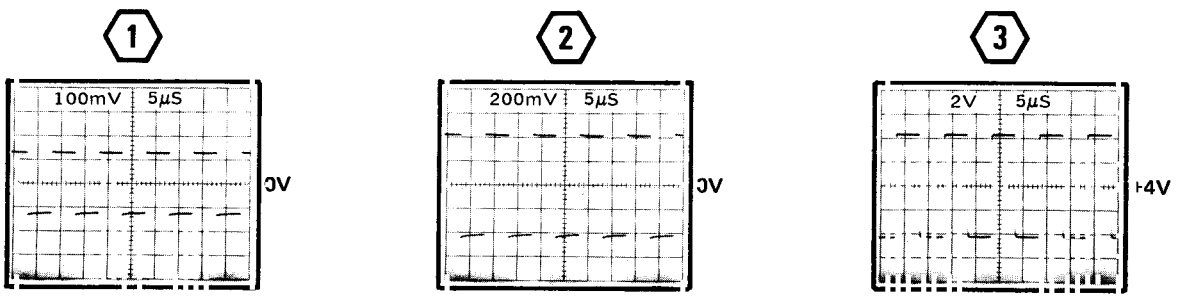
The test equipment used to obtain the voltages and waveforms is listed in Table 6-1, Test Equipment.

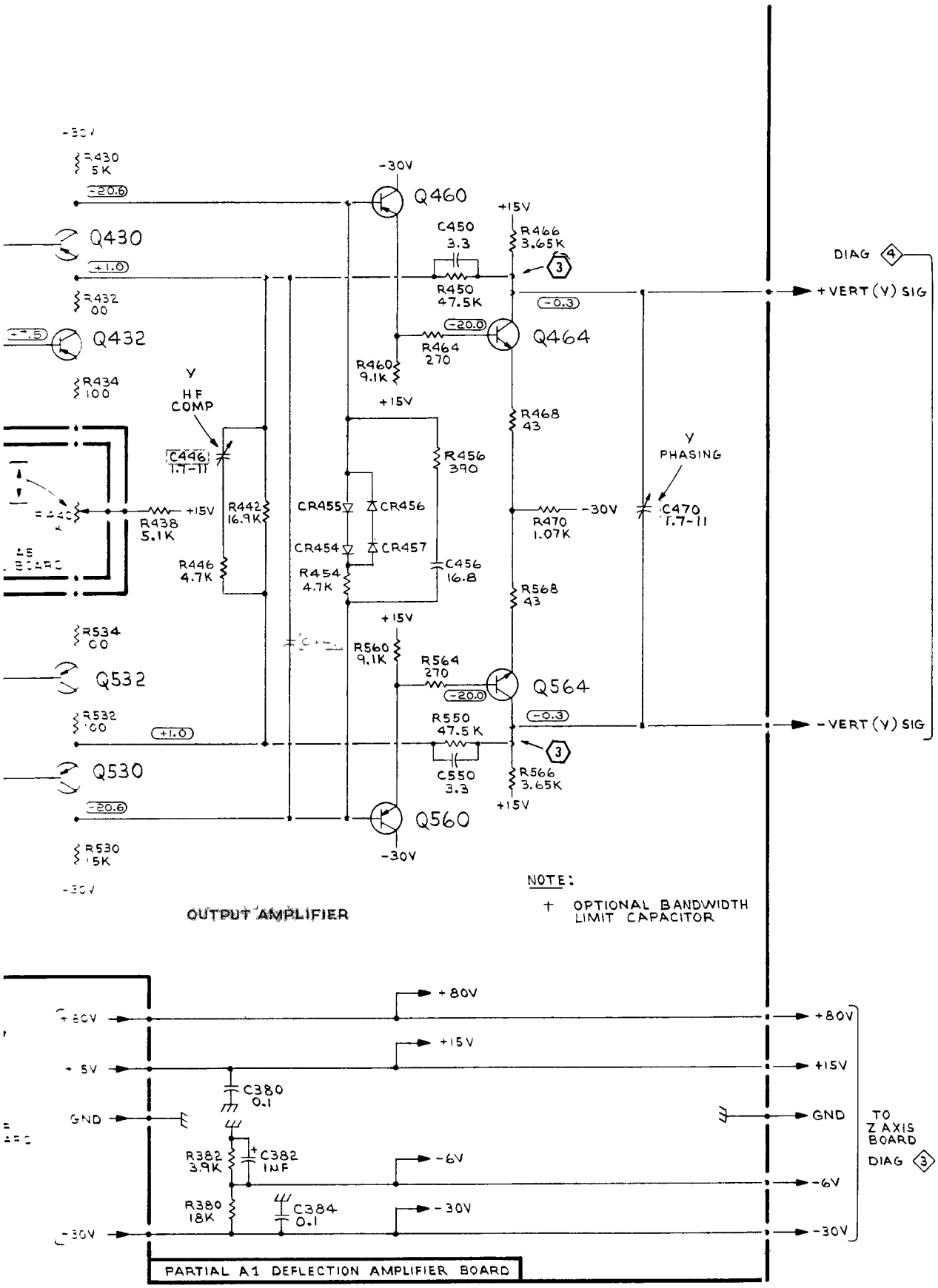
VOLTAGE CONDITIONS

The dc voltages indicated on the schematic diagram were obtained with no test signal input using a digital multimeter. The INTENSIT and Position controls were set for a barely visible dot at near center screen with the internal sweep generator disconnected (Option 4 version only).

WAVEFORM CONDITIONS

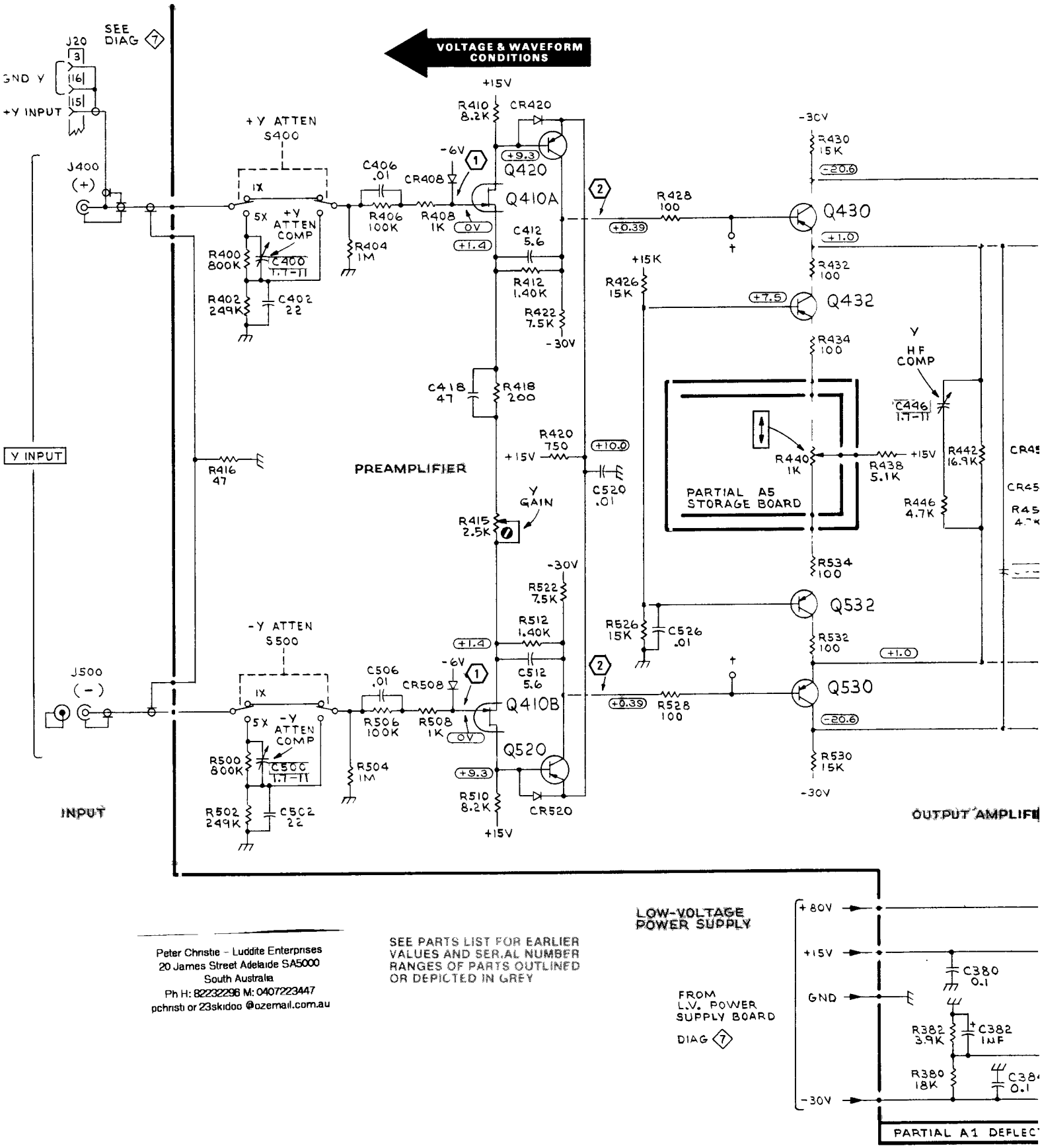
The following waveforms were monitored with a test oscilloscope and a 10X probe. A negative-going 100 kHz, 0.5 V, square wave was applied to the appropriate input connector with the vertical Position control centered, Y Atten switches at 1X, internal sweep generator disconnected (Option 4 version only), and the unused input connector grounded (grounding cap installed). The test points shown on the component and waveform test point location illustration with a + or — sign opposite the test point number indicates the input connector to which the test signal was applied.





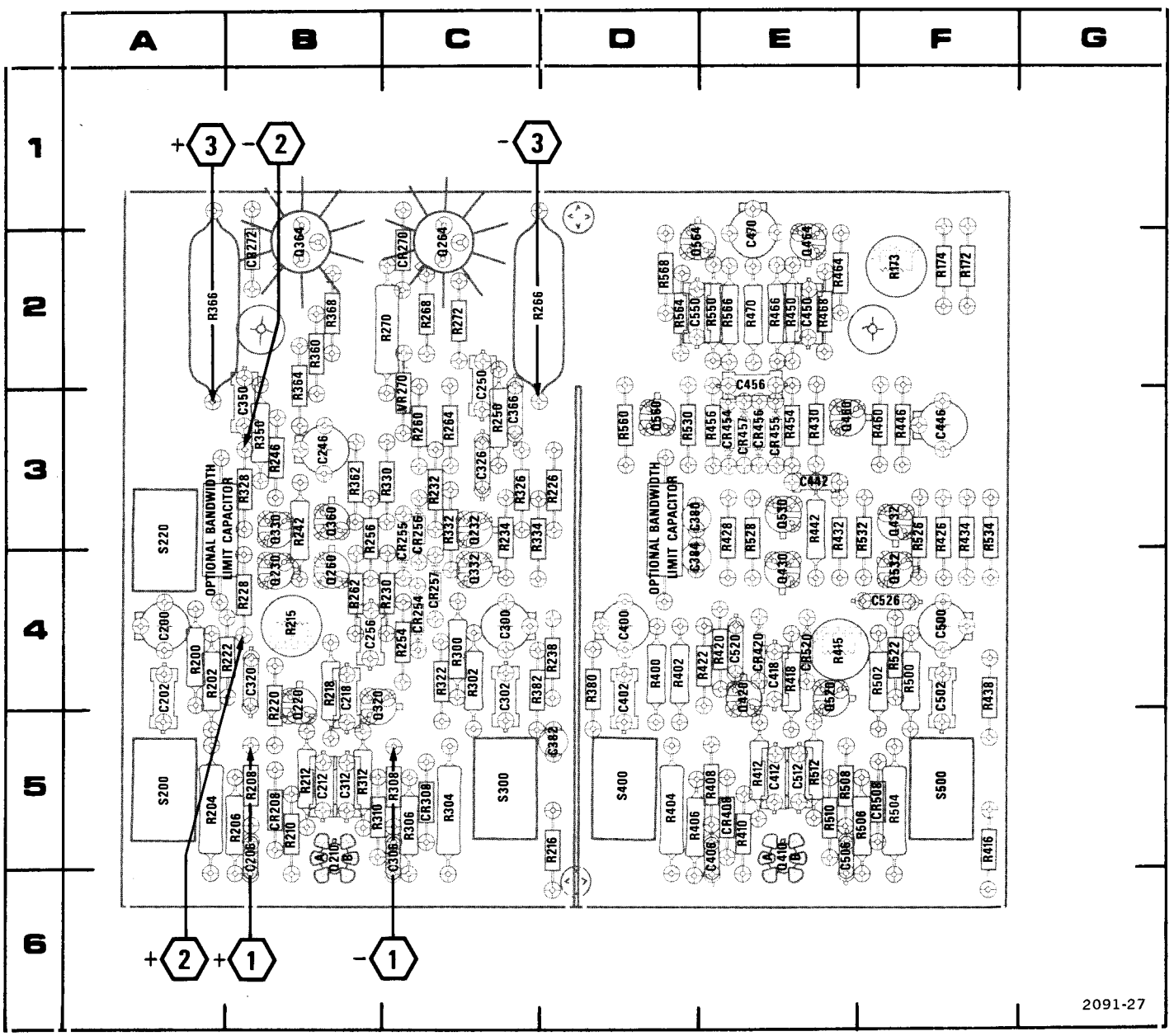
SEE PARTS LIST FOR SEMICONDUCTOR TYPES.

VERTICAL (Y) AMPLIFIER 1



Peter Christie - Luddite Enterprises
20 James Street Adelaide SA5000
South Australia
Ph H: 82232296 M: 0407223447
pchristi or 23skidoo @ozemail.com.au

SEE PARTS LIST FOR EARLIER VALUES AND SER.AL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY

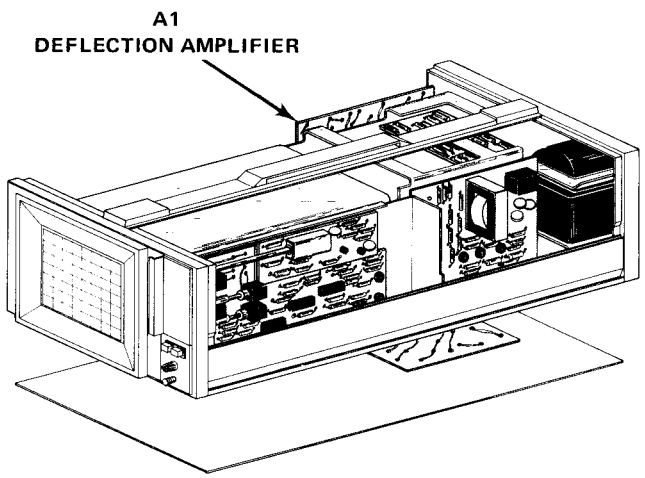


ASSEMBLY A1

Figure 9-3. A1—Horizontal Amplifier component and waveform test point locations.

CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD
C200	4A	C506	5E	Q330	3B	R226	3D	R350	3B	R460	3F
C202	4A	C512	5E	Q332	4C	R228	4B	R360	2B	R464	2E
C206	5B	C520	4E	Q360	3B	R230	4C	R362	3B	R466	2E
C212	5B	C526	4F	Q364	2B	R232	3C	R364	2B	R468	2E
C218	4B	C550	2D	Q410	5E	R234	3C	R366	2A	R470	2E
C246	3B			Q420	4E	R238	4D	R368	2B	R500	4F
C250	2C	CR208	5B	Q430	4E	R242	3B	R380	4D	R502	4F
C256	4B	CR254	4C	Q432	3F	R246	3B	R382	4C	R504	5F
C300	4C	CR255	3C	Q460	3E	R250	3C	R400	4D	R506	5F
C302	4C	CR256	3C	Q464	2E	R254	4C	R402	4D	R508	5E
C306	5C	CR257	4C	Q520	4E	R256	3B	R404	5D	R510	5E
C312	5B	CR270	2C	Q530	3E	R260	3C	R406	5D	R512	5E
C320	4B	CR272	2B	Q532	4F	R262	4B	R408	5E	R522	4F
C326	3C	CR308	5C	Q560	3D	R264	3C	R410	5E	R526	3F
C350	3B	CR408	5E	Q564	2D	R266	2C	R412	5E	R528	3E
C366	3C	CR420	4E			R268	2C	R415	4E	R530	3D
C380	3D	CR454	3E	R172	2F	R270	2C	R416	5F	R532	3F
C382	5D	CR455	3E	R173	2F	R272	2C	R418	4E	R534	3F
C384	3D	CR456	3E	R174	2F	R300	4C	R420	4E	R550	2E
C400	4D	CR457	3E	R200	4A	R302	4C	R422	4E	R560	3D
C402	4D	CR508	5F	R202	4A	R304	5C	R426	3F	R564	2D
C406	5E	CR520	4E	R204	5A	R306	5C	R428	3E	R566	2E
C412	5W	K220	3A	R206	5B	R308	5C	R430	3E	R568	2D
C418	4E			R208	5B	R310	5B	R432	3E		
C442	3E	Q210	5B	R210	5B	R312	5B	R434	3F	S200	5A
C446	3F	Q220	4B	R212	5B	R322	4C	R438	4F	S220	3A
C450	2E	Q230	4B	R215	4B	R326	3C	R442	3E	S300	5C
C456	2E	Q232	3C	R216	5D	R328	3B	R446	3F	S400	5D
C470	2E	Q260	4B	R218	4B	R330	3C	R450	2E	S500	5F
C500	4F	Q264	2C	R220	4B	R332	3C	R454	3E		
C502	4F	Q320	4B	R222	4B	R334	3C	R456	3E	VR270	3C

INDEX FOR FIG. 9-3



VOLTAGE AND WAVEFORM CONDITIONS

NOTE

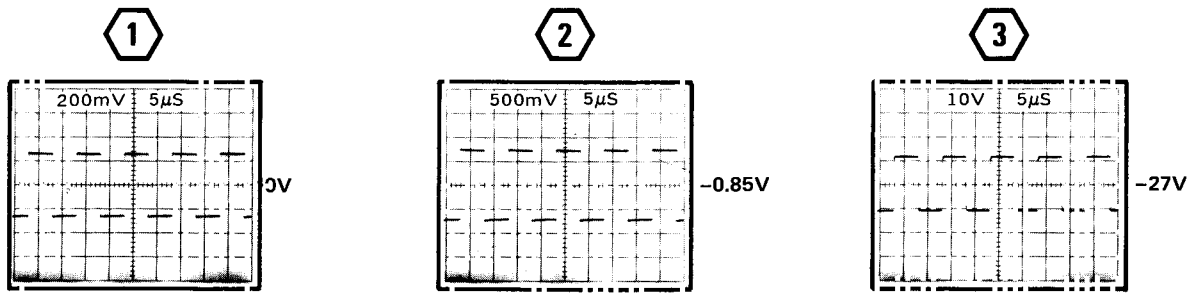
The test equipment used to obtain the voltages and waveforms is listed in Table 6-1, Test Equipment.

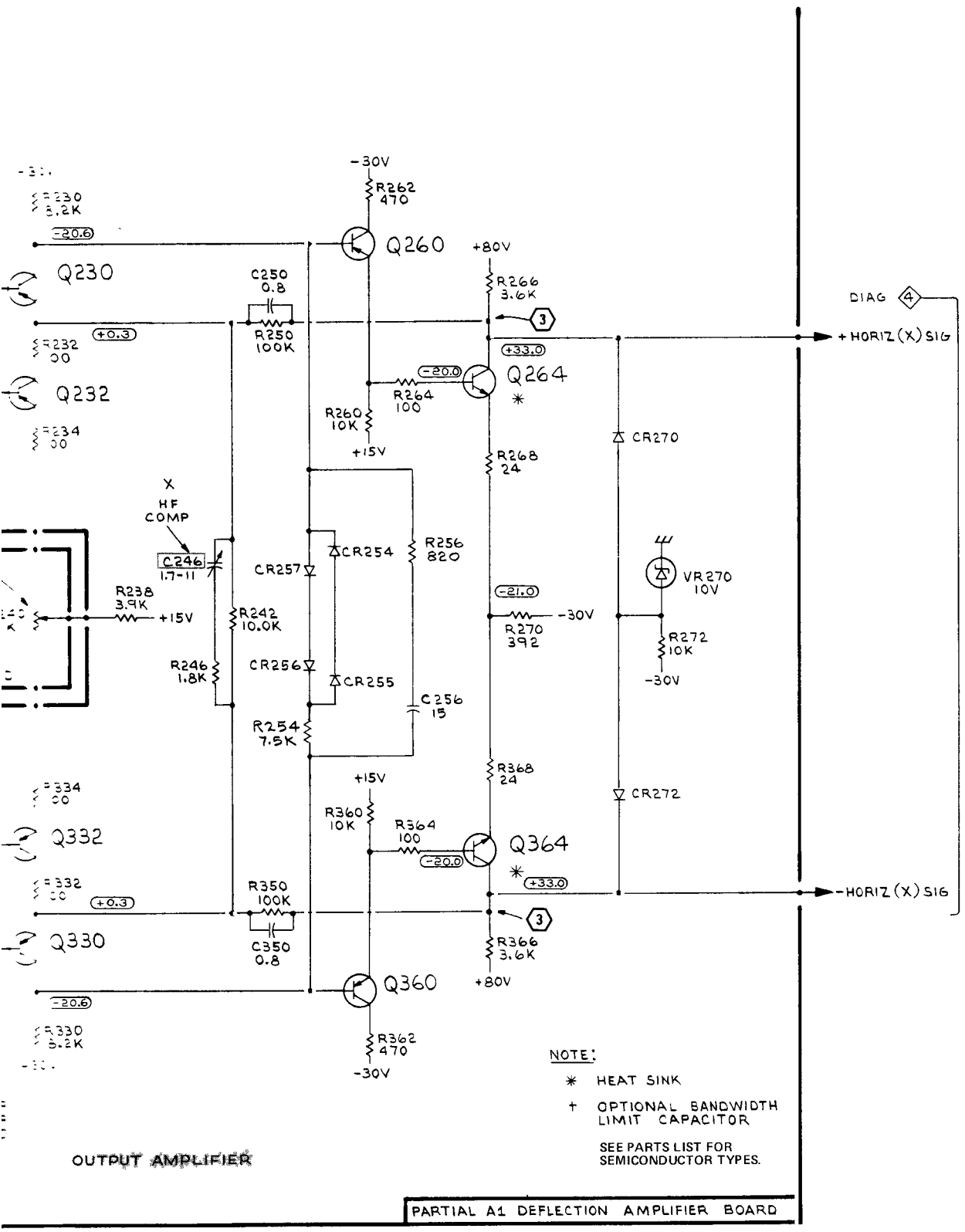
VOLTAGE CONDITIONS

The dc voltages indicated on the schematic diagram were obtained with no test signal input using a digital multimeter. The INTENSITY and Position controls were set for a barely visible dot at near center screen with the internal sweep generator disconnected (Option 4 version only).

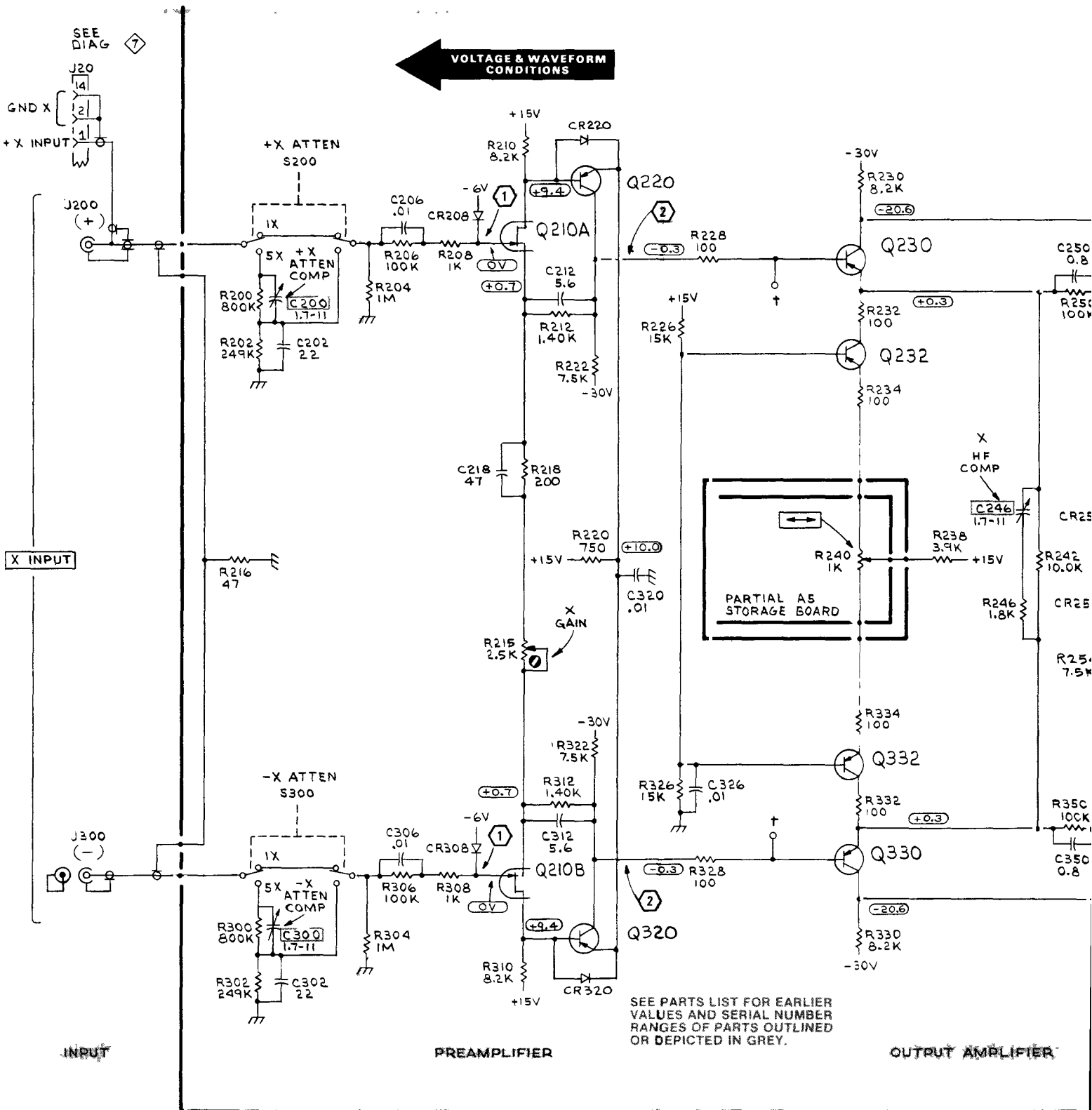
WAVEFORM CONDITIONS

The following waveforms were monitored with a test oscilloscope and a 10X probe. A negative-going 100 kHz, 0.5 V, square wave was applied to the appropriate input connector with the vertical Position control centered, X Atten switches at 1X, internal sweep generator disconnected (Option 4 version only), and the unused input connector grounded (grounding cap installed). The X Gain was adjusted to 1 V for 8 divisions of deflection. The test points shown on the component and waveform test point location illustration with a + or — sign opposite the test point number indicates the input connector to which the test signal was applied.





HORIZONTAL (X) AMPLIFIER ②



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VK5EM

2091-46
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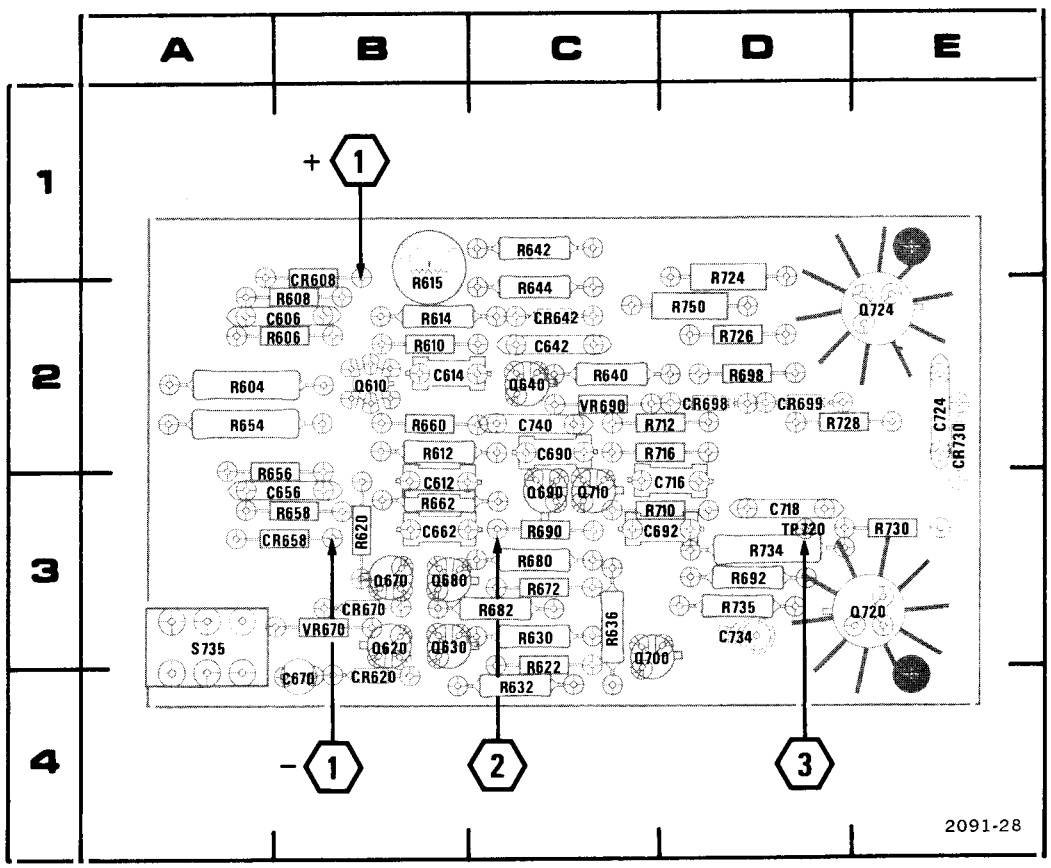
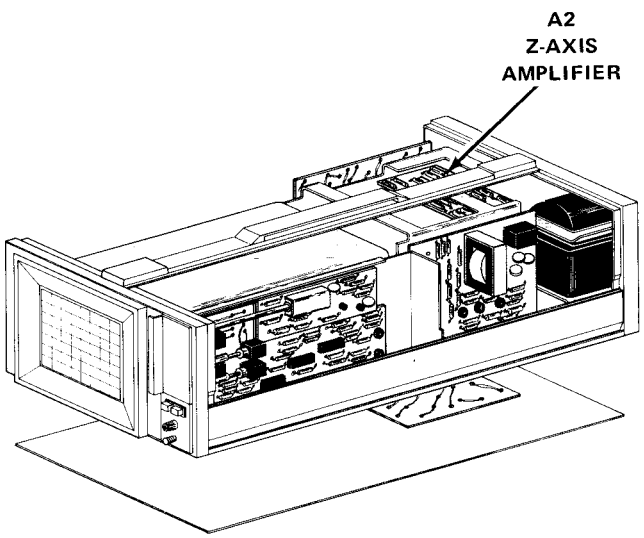


Figure 9-4. A2–Z-Axis Amplifier component and waveform test point locations.

CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD
C606	2B	CR620	4B	Q710	3C	R640	2C	R716	2D
C612	3B	CR642	2C	Q720	3E	R642	2C	R724	2D
C614	2B	CR658	3B	Q724	2E	R644	2C	R726	2D
C642	2C	CR670	3B			R654	2A	R728	2D
C656	3B	CR698	2D	R604	2A	R656	3B	R730	3E
C662	3B	CR699	2D	R606	2B	R658	3B	R734	3D
C670	4B	CR730	2E	R608	2B	R660	2B	R735	3D
C690	2C			R610	2B	R662	3B	R750	2D
C692	3D	Q610	2B	R612	2B	R672	3C		
C716	3D	Q620	3B	R614	2B	R680	3C	S735	3A
C718	3D	Q630	3B	R615	1B	R682	3C		
C724	2E	Q640	2C	R620	3B	R690	3C	TP720	3D
C734	3D	Q670	3B	R622	4C	R692	3D		
C740	2C	Q680	3B	R630	3C	R698	2D	VR670	3B
		Q690	3C	R632	4C	R710	3D	VR690	2C
CR608	1B	Q700	3C	R636	3C	R712	2D		

INDEX FOR FIG.9-4

@


A2
Z-AXIS
AMPLIFIER

VOLTAGE AND WAVEFORM CONDITIONS

NOTE

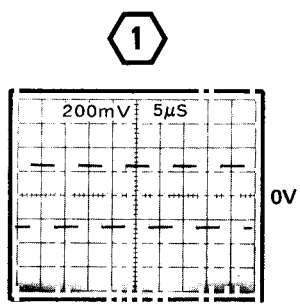
The test equipment used to obtain the voltages and waveforms is listed in Table 6-1, Test Equipment.

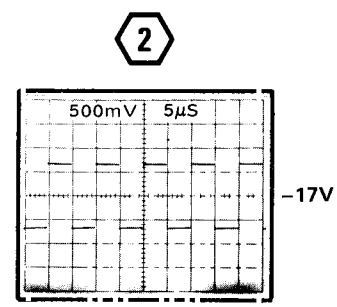
VOLTAGE CONDITIONS

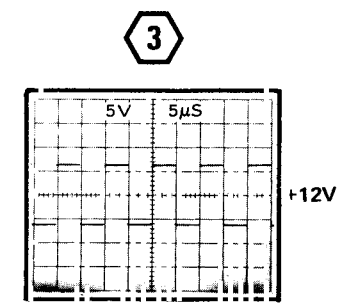
The dc voltages indicated on the schematic diagram were obtained with no test signal input using a digital multimeter. The INTENSITY and Position controls were set for a barely visible dot at near center screen with the internal sweep generator disconnected (Option 4 version only).

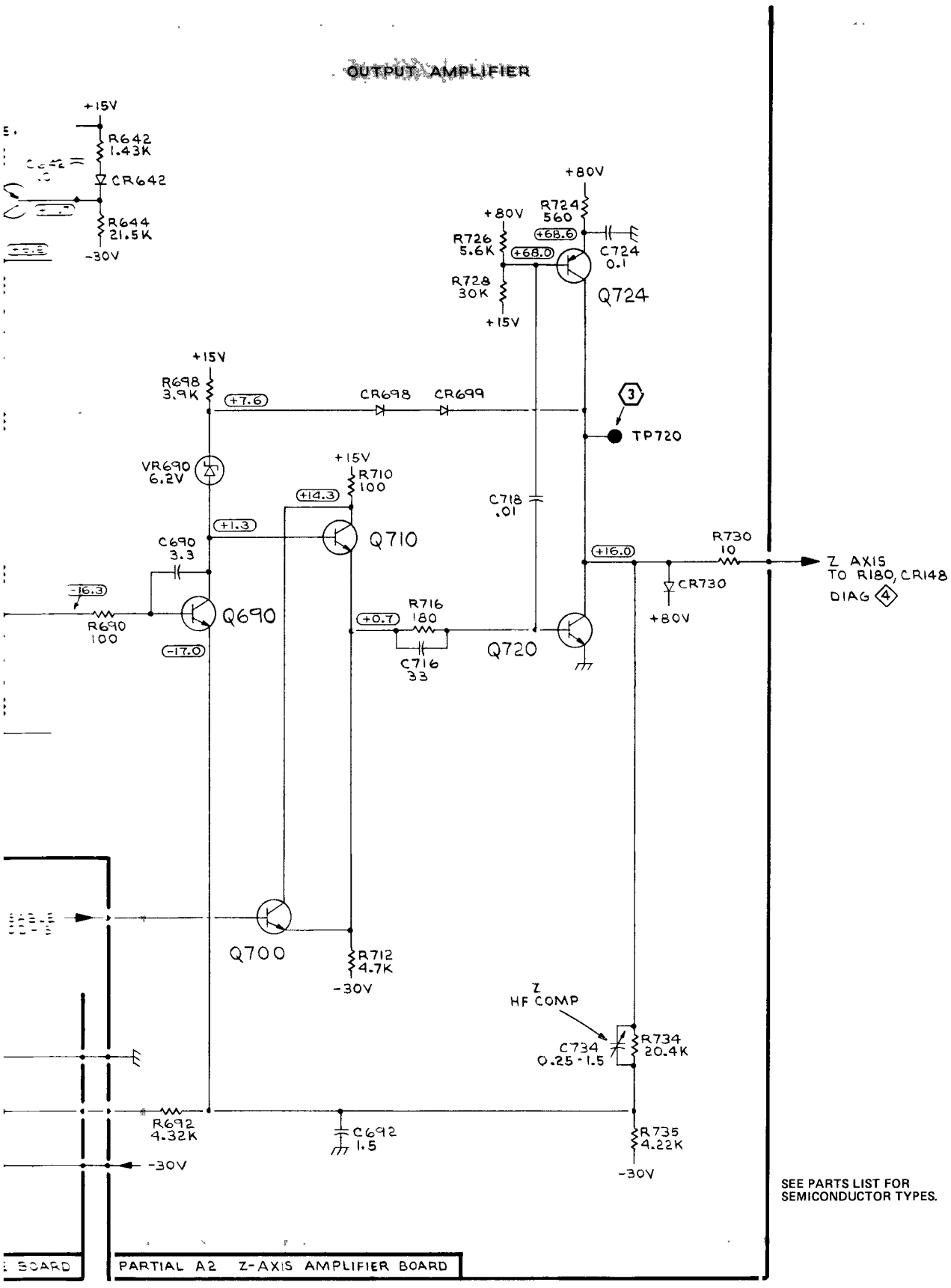
WAVEFORM CONDITIONS

The following waveforms were monitored with a test oscilloscope and a 10X probe. A negative-going 100 kHz, 0.5 V, square wave was applied to the appropriate input connector with the vertical and horizontal Position control fully clockwise, internal sweep generator disconnected (Option 4 version only), and the unused input connector grounded (grounding cap installed). The INTENSITY control was set for +40 V dc at test point 3 with the test signal applied to the +Z INPUT and +10 V dc at test point 3 with the test signal applied to the −Z INPUT.



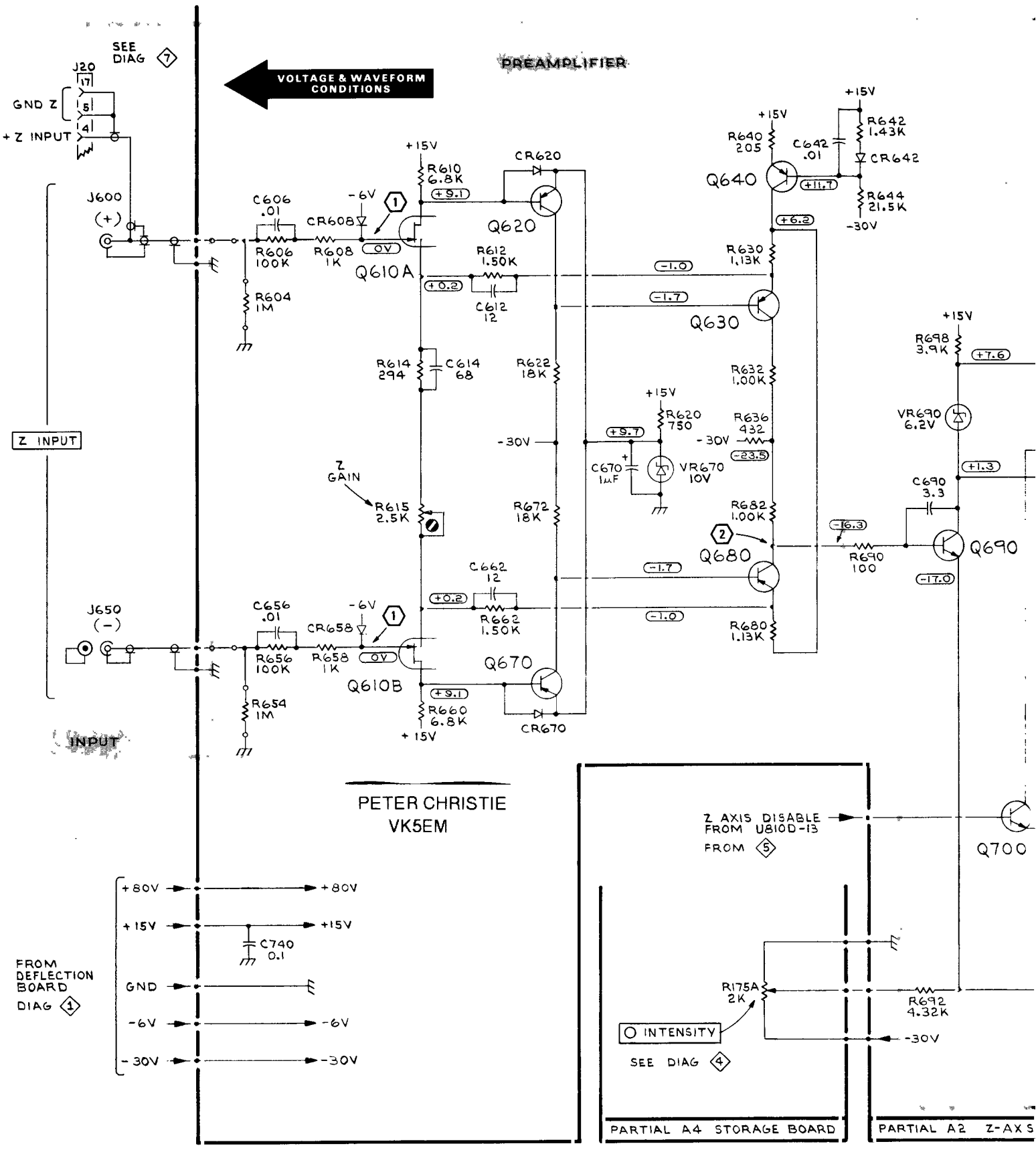






LIC
B6

Z AXIS AMPLIFIER 3


PREAMPLIFIER
VOLTAGE & WAVEFORM CONDITIONS
SEE DIAG 7
J20
GND Z
+ Z INPUT
J600 (+)
J650 (-)
Z INPUT
INPUT
R606 100K
R604 1M
R656 100K
R654 1M
C606 .01
C656 .01
CR608
CR658
R608 1K
R658 1K
-6V
Q610A
Q610B
R610 6.8K
R660 6.8K
+15V
CR620
CR670
Q620
Q670
R612 1.50K
R662 1.50K
C612 12
C662 12
R614 294
C614 68
R622 18K
R672 18K
Z GAIN
R615 2.5K
-30V
R620 750
C670 1μF
VR670 10V
R640 205
C642 .01
R642 1.43K
CR642
R644 21.5K
Q640
R630 1.13K
R632 1.00K
R636 432
Q630
R680 1.13K
R682 1.00K
Q680
R698 3.9K
VR690 6.2V
C690 3.3
R690 100
Q690
Q700
PETER CHRISTIE
VK5EM
FROM DEFLECTION BOARD DIAG 1
+80V
+15V
GND
-6V
-30V
C740 0.1
Z AXIS DISABLE FROM U810D-13
FROM 5
R175A 2K
R692 4.32K
INTENSITY
SEE DIAG 4
PARTIAL A4 STORAGE BOARD
PARTIAL A2 Z-AXIS

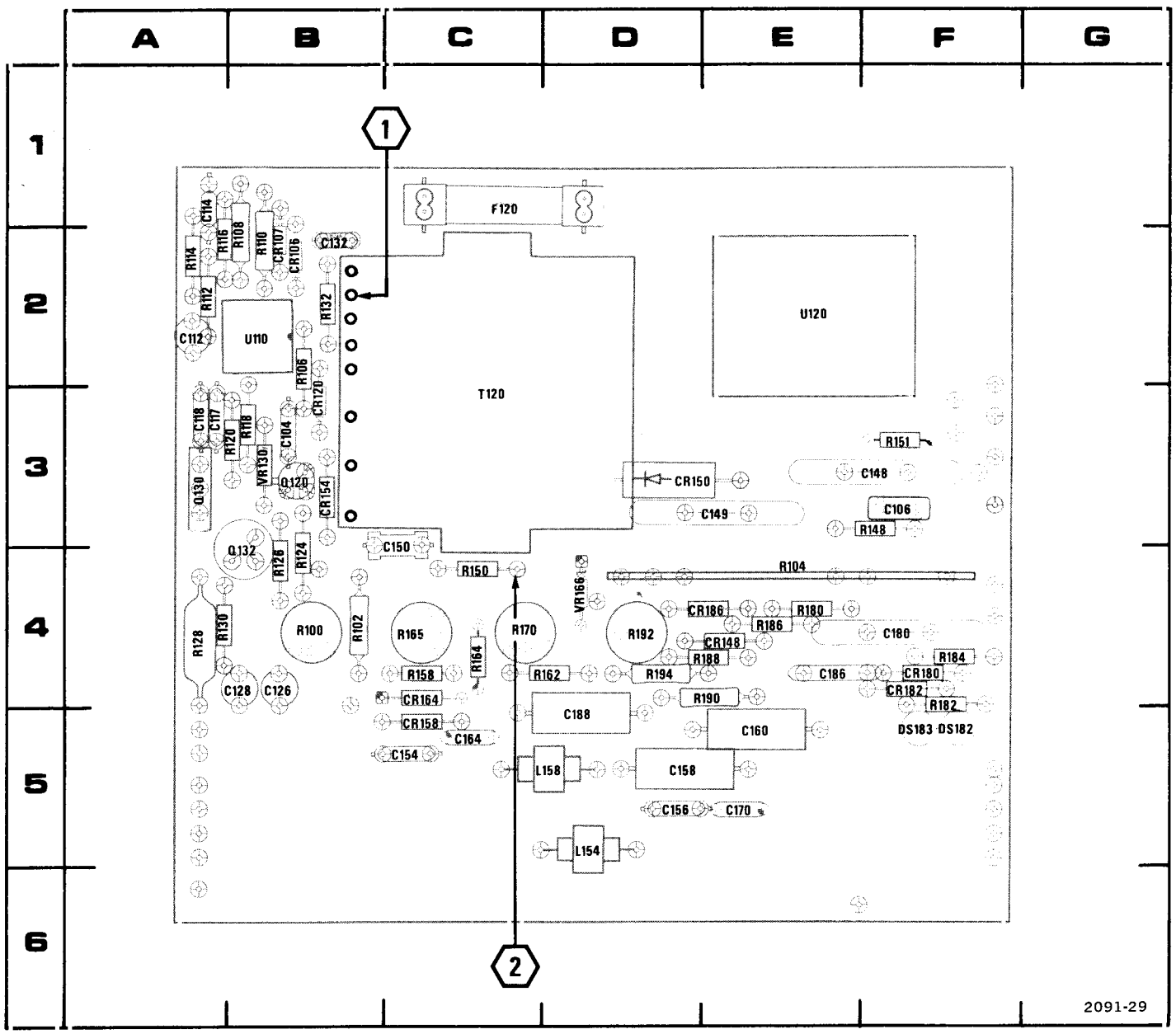
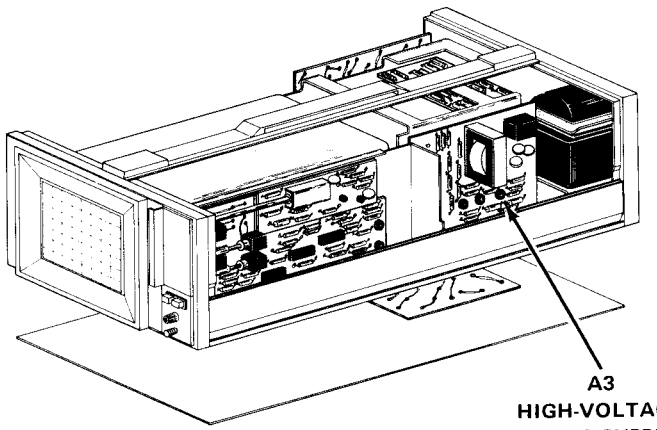


Figure 9-5. A3—High-Voltage Power Supply component and waveform test point locations.

CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD
C104	3B	C158	5D	CR164	4C	Q130	3A	R124	4B	R182	4F
C106	3F	C160	5E	CR180	4F	Q132	4B	R126	4B	R184	4F
C112	2A	C164	5C	CR182	4F			R128	4A	R186	4E
C114	1A	C170	5E	CR186	4E	R100	4B	R130	4A	R188	4E
C117	3A	C180	4F			R102	4B	R132	2B	R190	4E
C118	3A	C186	4E	DS182	5F	R104	4E	R148	3F	R192	4D
C126	4B	C188	5D	DS183	5F	R106	2B	R150	4C	R194	4D
C128	4B					R108	2B	R151	3F	U110	2B
C132	2B	CR106	2B	F120	1C	R110	2B	R158	4C	U120	2E
C148	3F	CR107	2B			R112	2A	R162	4D		
C149	3E	CR120	3B	L154	5D	R114	2A	R164	4C	T120	3C
C150	3C	CR148	4E	L158	5D	R116	2A	R165	4C		
C154	5C	CR150	3D			R118	3B	R170	4C	VR130	3B
C156	5D	CR154	3B	Q120	3B	R120	3B	R180	4E	VR166	4D
		CR158	5C								

INDEX FOR FIG. 9-5



VOLTAGE AND WAVEFORM CONDITIONS

NOTE

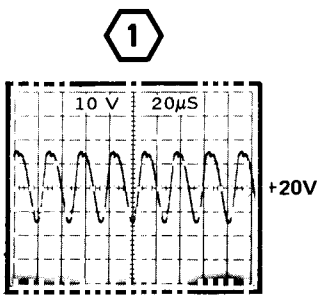
The test equipment used to obtain the voltages and waveforms is listed in Table 6-1, Test Equipment.

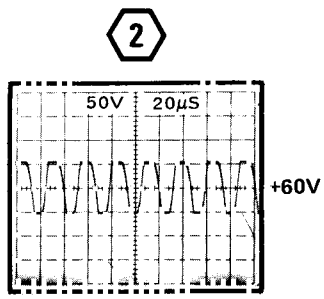
VOLTAGE CONDITIONS

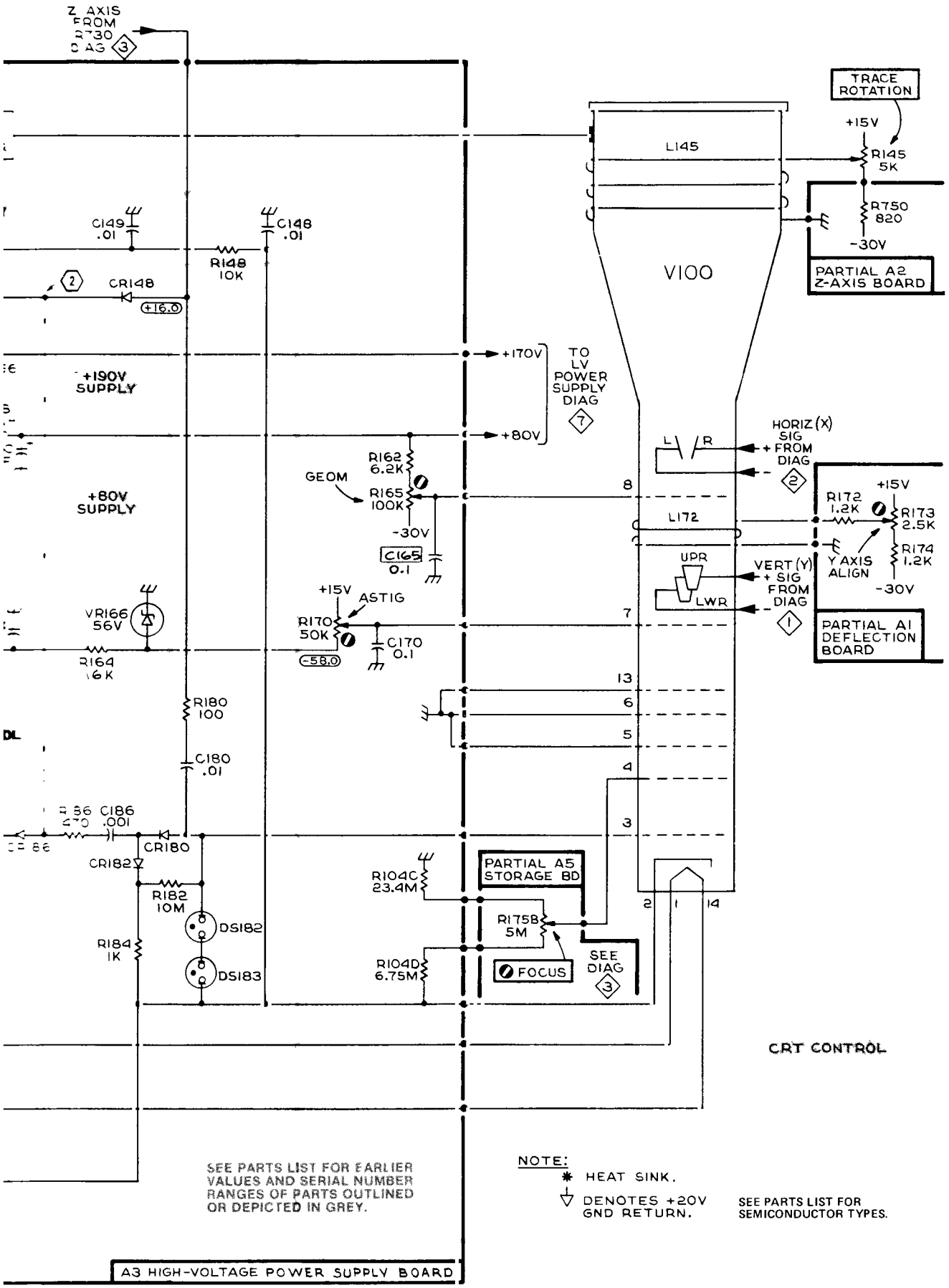
The dc voltages indicated on the schematic diagram were obtained with no test signal input using a digital multimeter. The INTENSITY and Position controls were set for a barely visible dot at near center screen with the internal sweep generator disconnected (Option 4 version only).

WAVEFORM CONDITIONS

The following waveforms were monitored by a test oscilloscope and a 10X probe with no test signal applied, internal sweep generator disconnected (Option 4 version only), and INTENSITY control fully counterclockwise.







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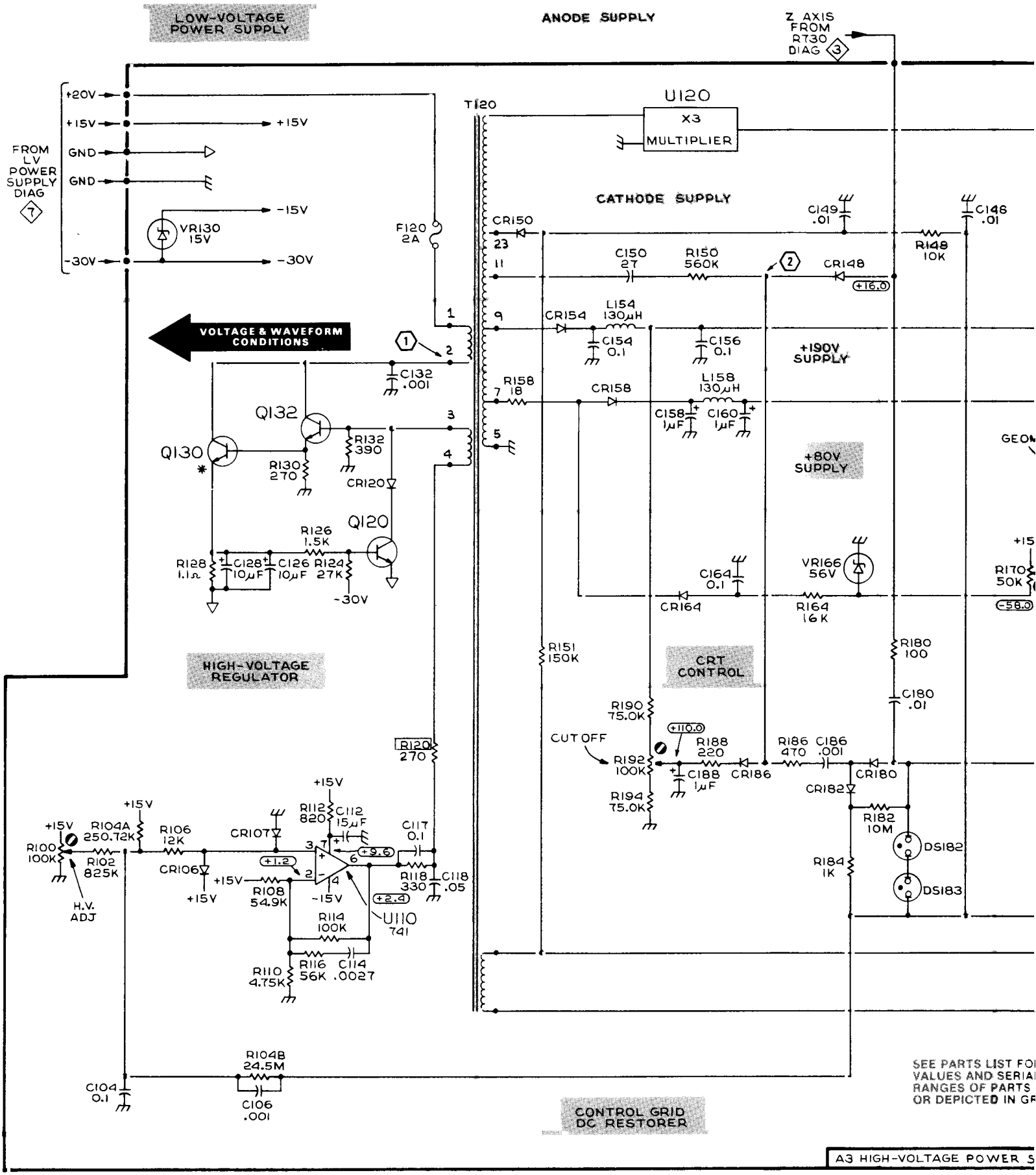
HIGH-VOLTAGE POWER SUPPLY ◇4


LOW-VOLTAGE POWER SUPPLY
ANODE SUPPLY
Z AXIS FROM R730 DIAG 3
FROM LV POWER SUPPLY DIAG 7
+20V
+15V
GND
GND
-15V
-30V
VR130 15V
F120 2A
T120
U120
X3 MULTIPLIER
CATHODE SUPPLY
CR150
C149 .01
C148 .01
R148 10K
C150 27
R150 560K
CR148
+16.0
L154 130µH
CR154
C154 0.1
C156 0.1
+190V SUPPLY
VOLTAGE & WAVEFORM CONDITIONS
C132 .001
R158 18
CR158
L158 130µH
C158 1µF
C160 1µF
Q132
Q130
R132 390
R130 270
CR120
Q120
R126 1.5K
R128 1.1Ω
C128 10µF
C126 10µF
R124 27K
-30V
+80V SUPPLY
C164 0.1
VR166 56V
CR164
R164 16K
R170 50K
-58.0
HIGH-VOLTAGE REGULATOR
R151 150K
CRT CONTROL
R180 100
C180 .01
R190 75.0K
+110.0
CUT OFF
R188 220
R186 470
C186 .001
R192 100K
C188 1µF
CR186
CR180
CR182
R194 75.0K
R182 10M
DS182
DS183
R184 1K
R120 270
+15V
R112 820
C112 15µF
C117 0.1
R104A 250.72K
R106 12K
R100 100K
R102 825K
H.V. ADJ
CR107
CR106
+1.2
+9.6
+2.4
R108 54.9K
R118 330
C118 .05
-15V
U110 741
R114 100K
R116 56K
C114 .0027
R110 4.75K
R104B 24.5M
C104 0.1
C106 .001
CONTROL GRID DC RESTORER
SEE PARTS LIST FOR VALUES AND SERIAL RANGES OF PARTS OR DEPICTED IN GR
A3 HIGH-VOLTAGE POWER S

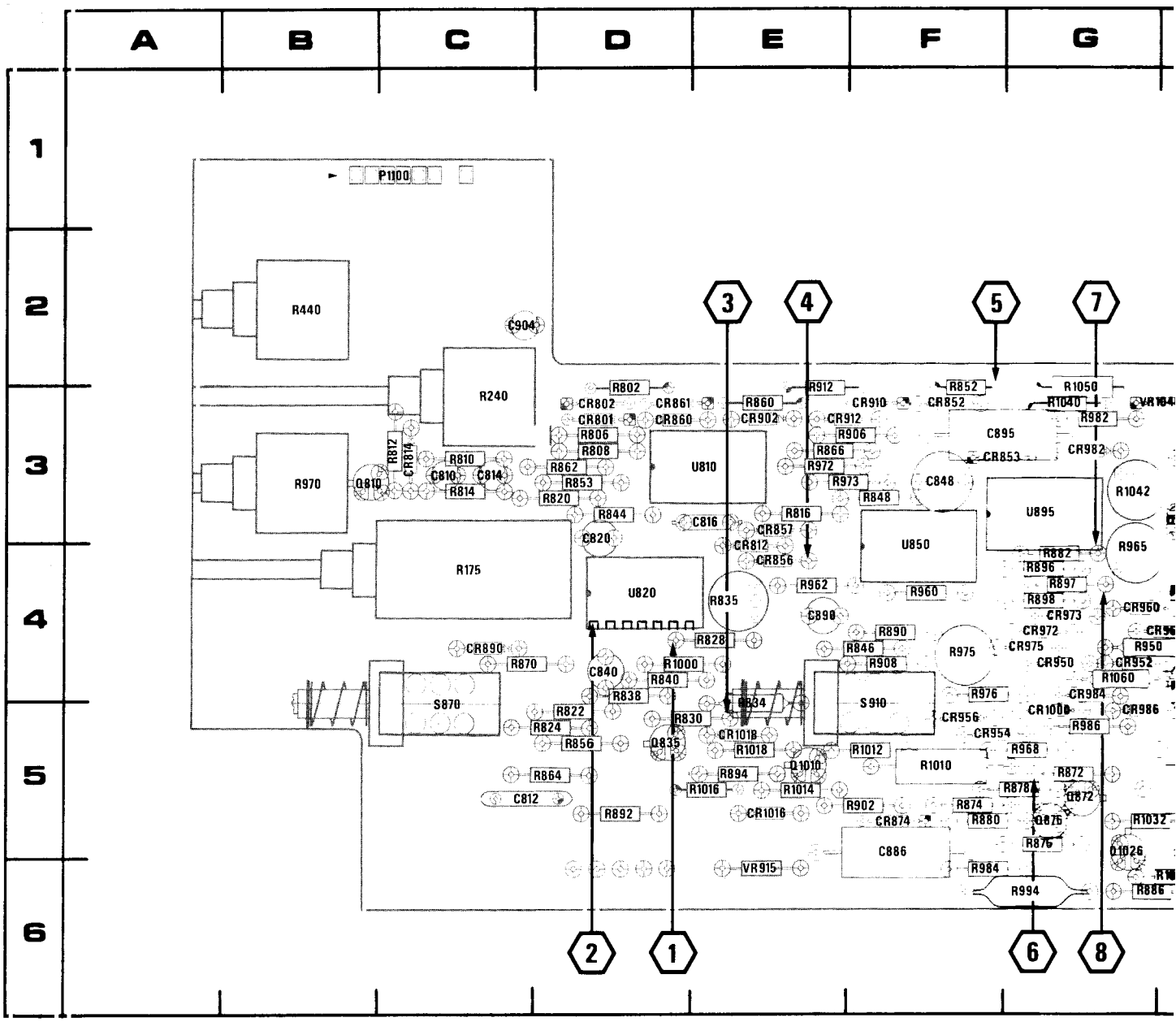
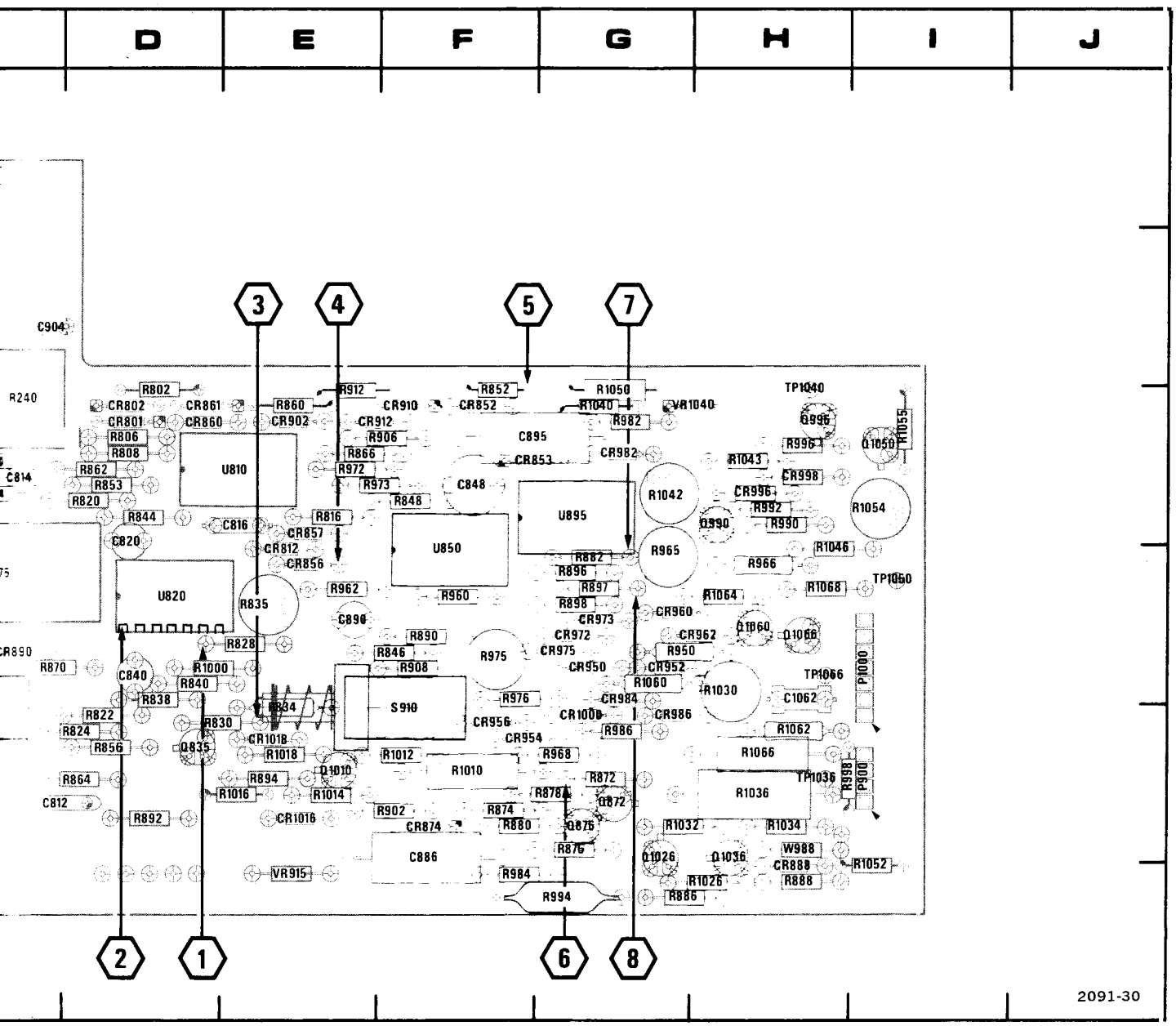


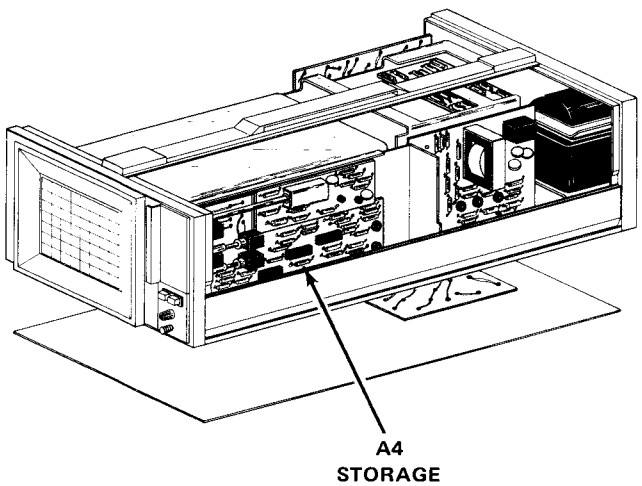
Figure 9-6. A4—Storage Control component and waveform test point locations.

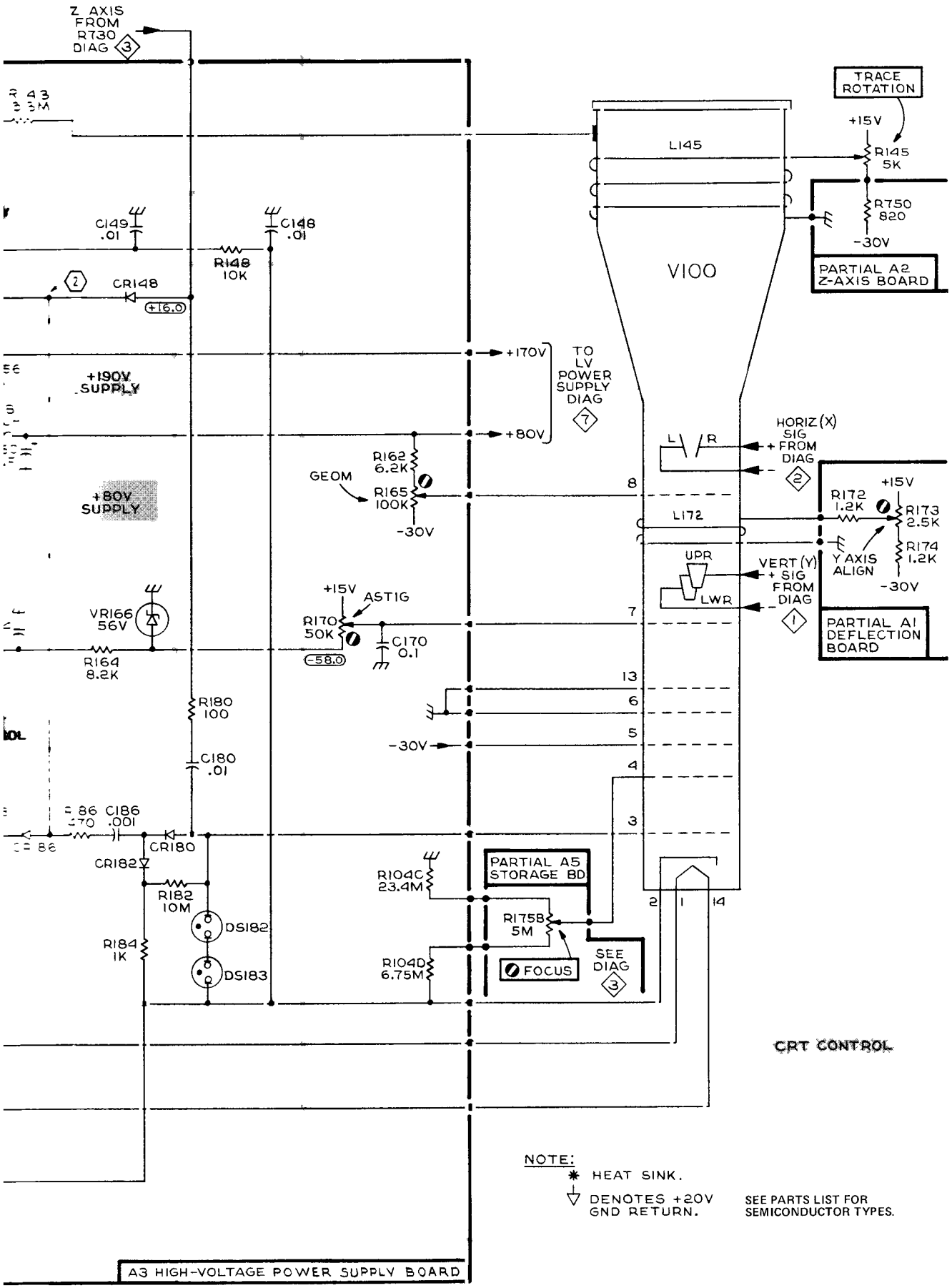


component and waveform test point locations.

CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD
C810	3C	CR954	5F	Q1066	4H	R866	3E	R976	4F	R1066	5H
C812	5C	CR956	5F			R870	4C	R982	3G	R1068	4H
C814	3C	CR960	4G	R175	4C	R872	5G	R984	6F		
C816	3E	CR962	4H	R240	3C	R874	5F	R986	5G	S870	5C
C820	3D	CR972	4G	R440	2B	R875	5G	R990	3H	S910	5F
C840	4D	CR973	4G	R802	3D	R878	5G	R992	3H		
C848	3F	CR975	4G	R806	3D	R880	5F	R994	6G	TP1036	5H
C886	5F	CR982	3G	R808	3D	R882	4G	R996	3H	TP1040	2H
C890	4E	CR984	4G	R810	3C	R886	6G	R1000	4D	TP1050	4I
C895	3F	CR986	5G	R812	3C	R888	6H	R1010	5F	TP1066	4H
C904	2C	CR996	3H	R814	3C	R890	4F	R1012	5F		
C1062	4H	CR998	3H	R816	3E	R892	5D	R1014	5E	U810	3E
CR801	3D	CR1000	5G	R820	3D	R894	5E	R1016	5E	U820	4D
CR802	3D	CR1016	5E	R822	5D	R896	4G	R1018	5E	U850	5F
CR812	4E	CR1018	5E	R824	5D	R897	4G	R1026	6H	U895	3G
CR814	3C			R828	4E	R898	4G	R1030	4H		
CR852	3F	P900	5I	R830	5D	R902	5F	R1032	5G	W988	5H
CR853	3F	P1000	4I	R834	5E	R906	3E	R1034	5H		
CR856	4E			R835	4E	R908	4F	R1036	5H	VR915	6E
CR857	3E	Q810	3B	R838	4D	R912	3E	R1040	3G	VR1040	3H
CR860	3D	Q835	5D	R840	4D	R950	4G	R1042	3G		
CR861	3D	Q872	5G	R844	3D	R960	4F	R1043	3H		
CR874	5F	Q876	5G	R846	4F	R962	4E	R1046	4H		
CR888	5H	Q990	3H	R848	3F	R965	4G	R1050	3G		
CR890	4C	Q996	3H	R852	3F	R966	4H	R1052	6I		
CR902	3E	Q1010	5E	R853	3D	R968	5G	R1054	3I		
CR910	3F	Q1026	5G	R856	5D	R970	3B	R1055	3I		
CR912	3E	Q1036	5H	R860	3E	R972	3E	R1060	4G		
CR950	4G	Q1050	3I	R862	3D	R973	3E	R1062	5H		
CR952	4G	Q1060	4H	R864	5D	R975	4F	R1064	4H		

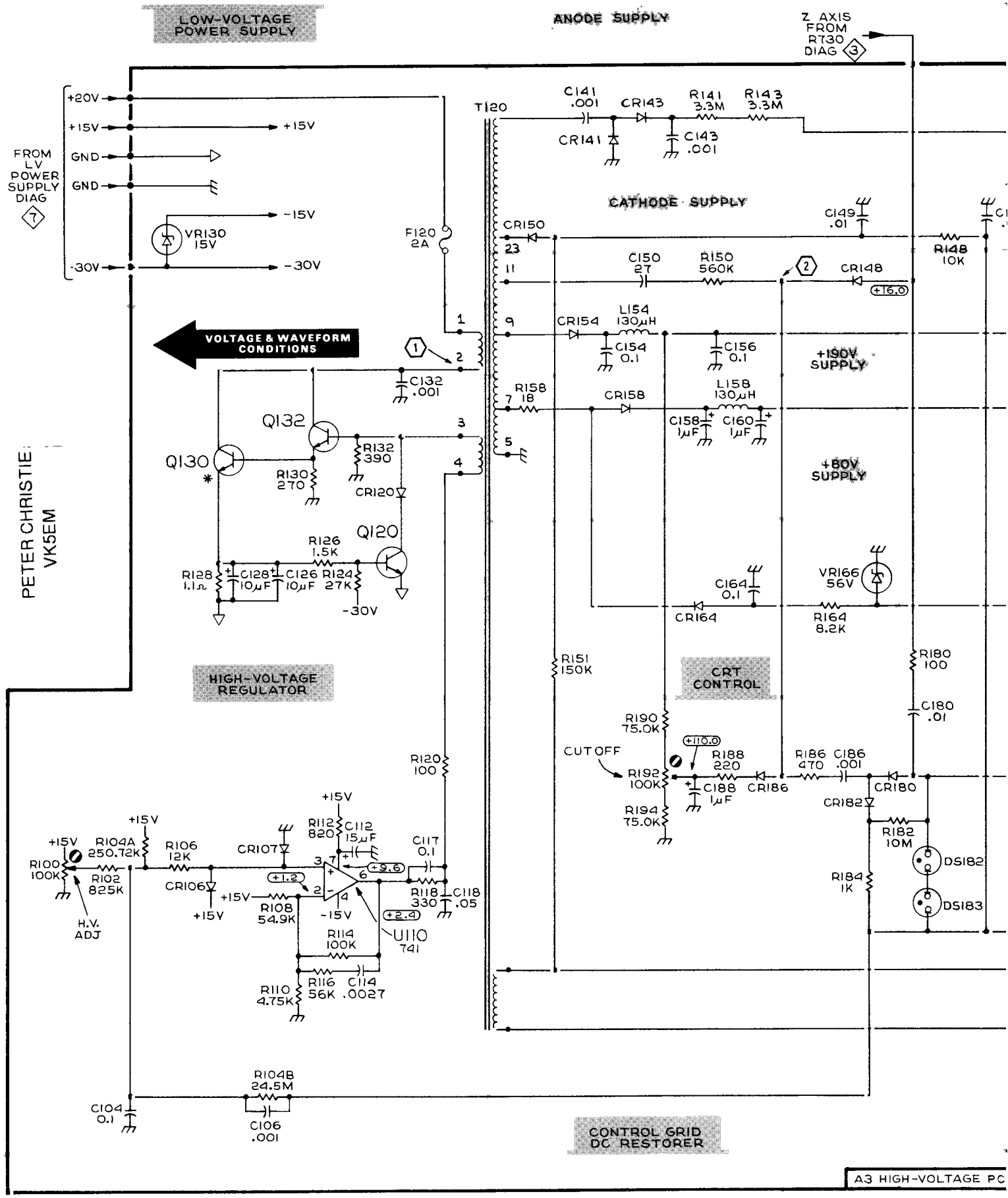
INDEX FOR FIG.9-6





(OPTION 8)

HIGH-VOLTAGE POWER SUPPLY 4



PETER CHRISTIE VK5EM

VOLTAGE AND WAVEFORM CONDITIONS

NOTE

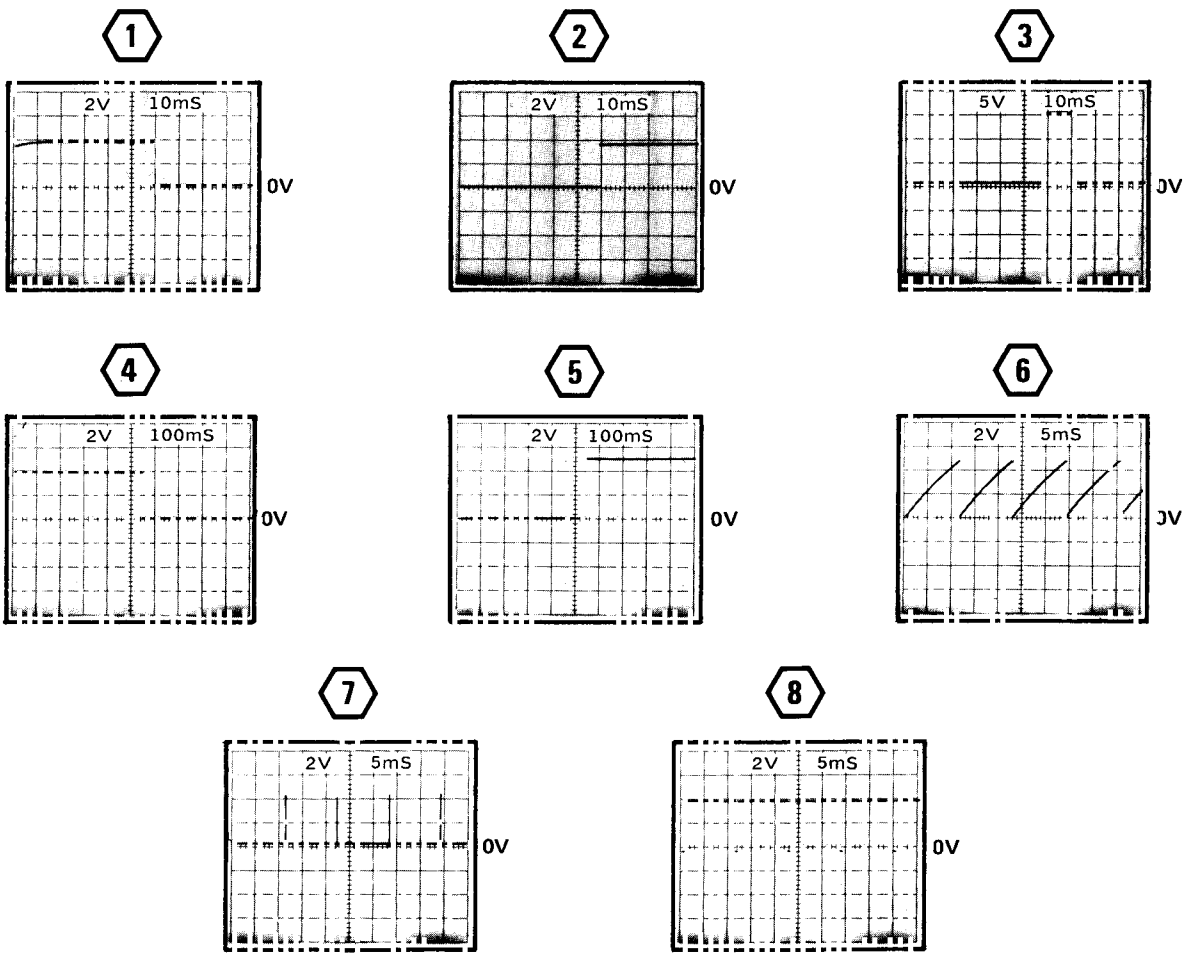
The test equipment used to obtain the voltages and waveforms is listed in Table 6-1, Test Equipment.

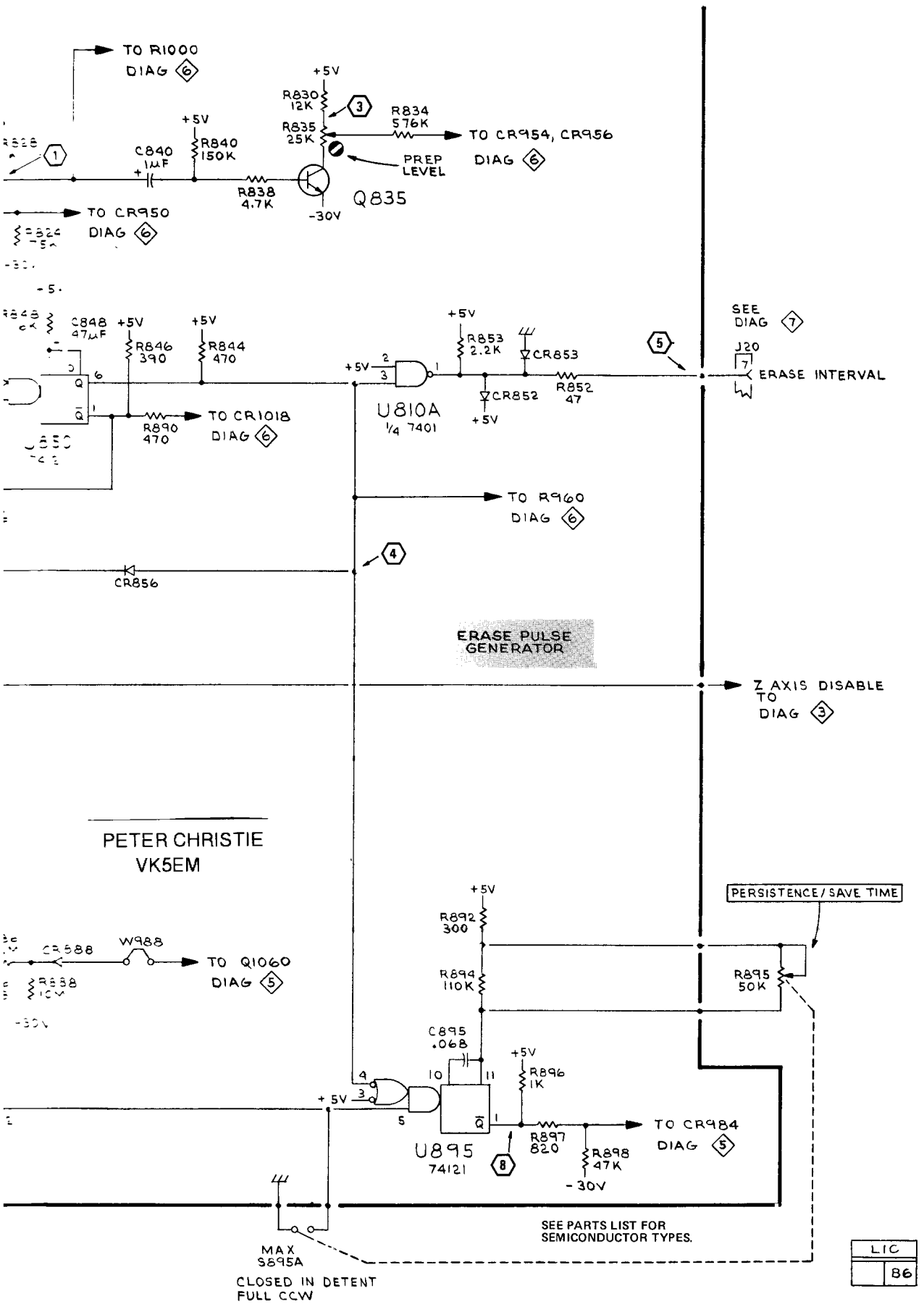
VOLTAGE CONDITIONS

The dc voltages indicated on the schematic diagram were obtained with no test signal input using a digital multimeter. The INTENSITY and Position controls were set for a barely visible dot at near center screen with the internal sweep generator disconnected (Option 4 version only). The store button and the PERSISTENCE/SAVE TIME knob were pushed in.

WAVEFORM CONDITIONS

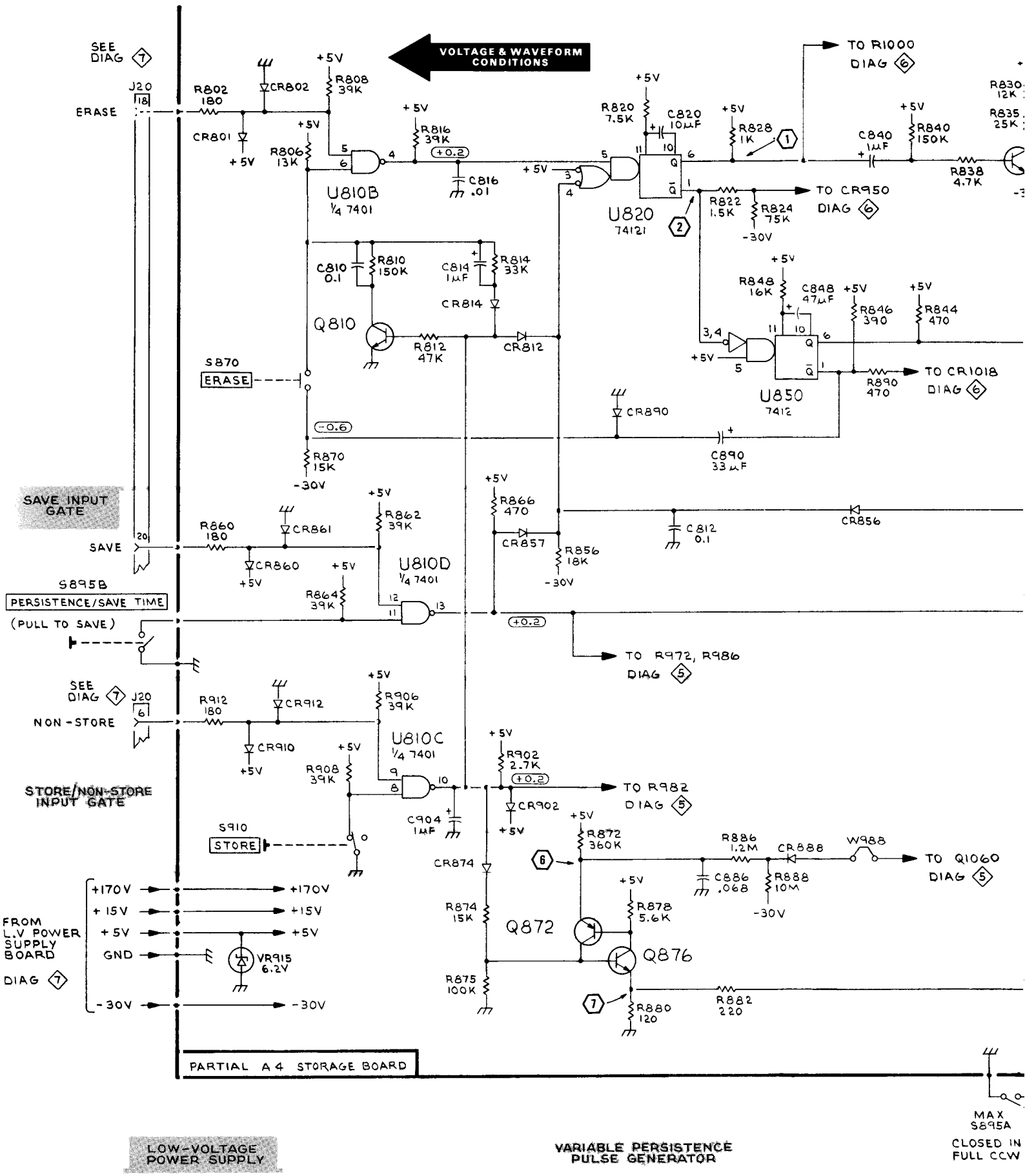
The following waveforms were monitored by a test oscilloscope and a 10X probe with no test signal applied. The STORE button was pushed in, INTENSITY control fully counterclockwise, and PERSISTENCE/SAVE TIME control pushed in and set to midrange. Waveforms at test points 1 through 5 were obtained when the ERASE button was pushed in; waveforms at test points 6 through 8 with the ERASE button out. The test oscilloscope sweep was triggered from test point 1.





STORAGE CONTROL 5

STORAGE CONTROL 5


VOLTAGE & WAVEFORM CONDITIONS
SEE DIAG 7
ERASE
J20 18
R802 180
CR802
+5V
R808 39K
CR801
R806 13K
U810B 1/4 7401
R816 39K
+0.2
C816 .01
R820 7.5K
C820 10µF
R828 1K
TO R1000 DIAG 6
R840 150K
C840 1µF
R838 4.7K
U820 74121
R822 1.5K
R824 75K
-30V
TO CR950 DIAG 6
C810 0.1
R810 150K
C814 1µF
R814 33K
CR814
Q810
R812 47K
CR812
R848 16K
C848 47µF
R846 390
R844 470
U850 7412
R890 470
TO CR1018 DIAG 6
S870 ERASE
-0.6
R870 15K
CR890
C890 33µF
SAVE INPUT GATE
SAVE
R860 180
CR861
CR860
R862 39K
U810D 1/4 7401
R866 470
CR857
R856 18K
C812 0.1
CR856
S895B PERSISTENCE/SAVE TIME (PULL TO SAVE)
R864 39K
TO R972, R986 DIAG 5
SEE DIAG 7
J20 6
NON-STORE
R912 180
CR912
CR910
R906 39K
U810C 1/4 7401
R908 39K
R902 2.7K
TO R982 DIAG 5
CR902
C904 1µF
STORE/NON-STORE INPUT GATE
S910 STORE
CR874
R872 360K
R886 1.2M
CR888
W988
TO Q1060 DIAG 5
C886 .068
R888 10M
R874 15K
Q872
R878 5.6K
Q876
R875 100K
R880 120
R882 220
FROM L.V POWER SUPPLY BOARD DIAG 7
+170V
+15V
+5V
GND
-30V
VR915 6.2V
PARTIAL A4 STORAGE BOARD
MAX S895A CLOSED IN FULL CCW
LOW-VOLTAGE POWER SUPPLY
VARIABLE PERSISTENCE PULSE GENERATOR

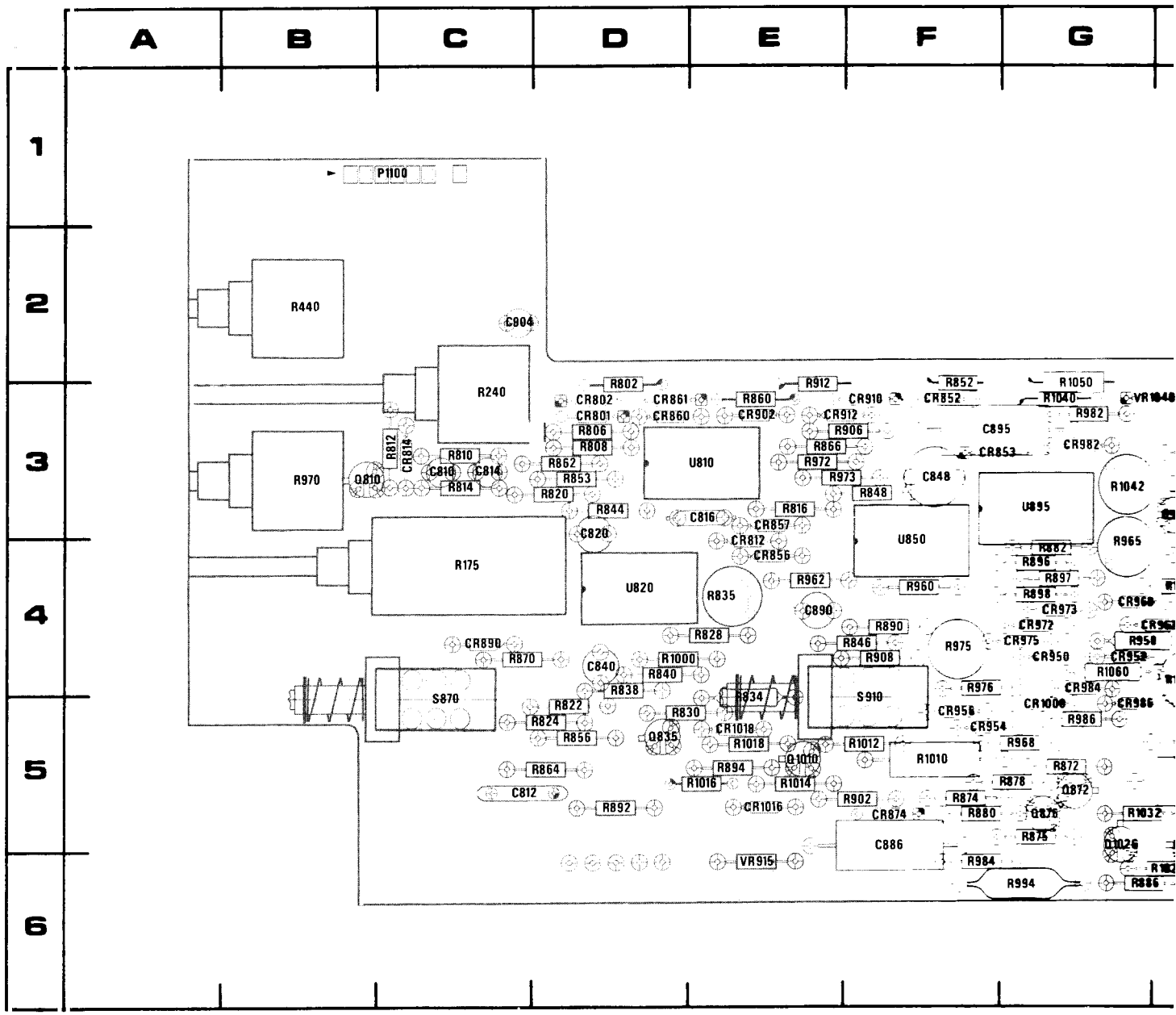
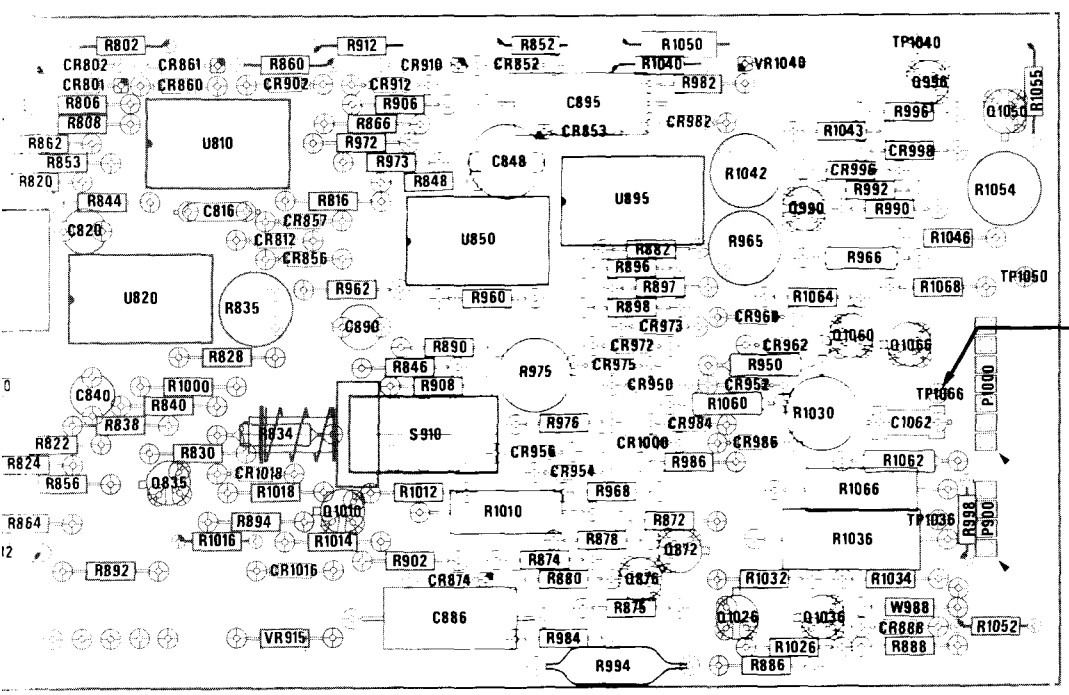


Figure 9-7. A4—Storage Output component and waveform test point locations.

@



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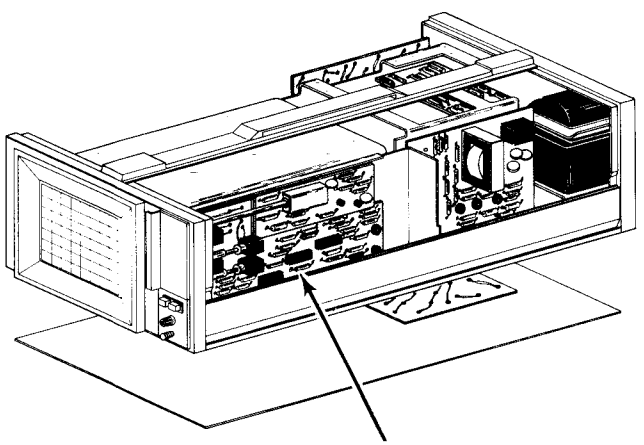
onent and waveform test point locations.

CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD
C810	3C	CR954	5F	Q1066	4H	R866	3E	R976	4F	R1066	5H
C812	5C	CR956	5F			R870	4C	R982	3G	R1068	4H
C814	3C	CR960	4G	R175	4C	R872	5G	R984	6F		
C816	3E	CR962	4H	R240	3C	R874	5F	R986	5G	S870	5C
C820	3D	CR972	4G	R440	2B	R875	5G	R990	3H	S910	5F
C840	4D	CR973	4G	R802	3D	R878	5G	R992	3H		
C848	3F	CR975	4G	R806	3D	R880	5F	R994	6G	TP1036	5H
C886	5F	CR982	3G	R808	3D	R882	4G	R996	3H	TP1040	2H
C890	4E	CR984	4G	R810	3C	R886	6G	R1000	4D	TP1050	4I
C895	3F	CR986	5G	R812	3C	R888	6H	R1010	5F	TP1066	4H
C904	2C	CR996	3H	R814	3C	R890	4F	R1012	5F		
C1062	4H	CR998	3H	R816	3E	R892	5D	R1014	5E	U810	3E
CR801	3D	CR1000	5G	R820	3D	R894	5E	R1016	5E	U820	4D
CR802	3D	CR1016	5E	R822	5D	R896	4G	R1018	5E	U850	5F
CR812	4E	CR1018	5E	R824	5D	R897	4G	R1026	6H	U895	3G
CR814	3C			R828	4E	R898	4G	R1030	4H		
CR852	3F	P900	5I	R830	5D	R902	5F	R1032	5G	W988	5H
CR853	3F	P1000	4I	R834	5E	R906	3E	R1034	5H		
CR856	4E			R835	4E	R908	4F	R1036	5H	VR915	6E
CR857	3E	Q810	3B	R838	4D	R912	3E	R1040	3G	VR1040	3H
CR860	3D	Q835	5D	R840	4D	R950	4G	R1042	3G		
CR861	3D	Q872	5G	R844	3D	R960	4F	R1043	3H		
CR874	5F	Q876	5G	R846	4F	R962	4E	R1046	4H		
CR888	5H	Q990	3H	R848	3F	R965	4G	R1050	3G		
CR890	4C	Q996	3H	R852	3F	R966	4H	R1052	6I		
CR902	3E	Q1010	5E	R853	3D	R968	5G	R1054	3I		
CR910	3F	Q1026	5G	R856	5D	R970	3B	R1055	3I		
CR912	3E	Q1036	5H	R860	3E	R972	3E	R1060	4G		
CR950	4G	Q1050	3I	R862	3D	R973	3E	R1062	5H		
CR952	4G	Q1060	4H	R864	5D	R975	4F	R1064	4H		

INDEX FOR FIG. 9-7



VOLTAGE AND WAVEFORM CONDITIONS

NOTE

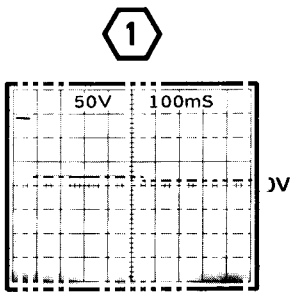
The test equipment used to obtain the voltages and waveforms is listed in Table 6-1, Test Equipment.

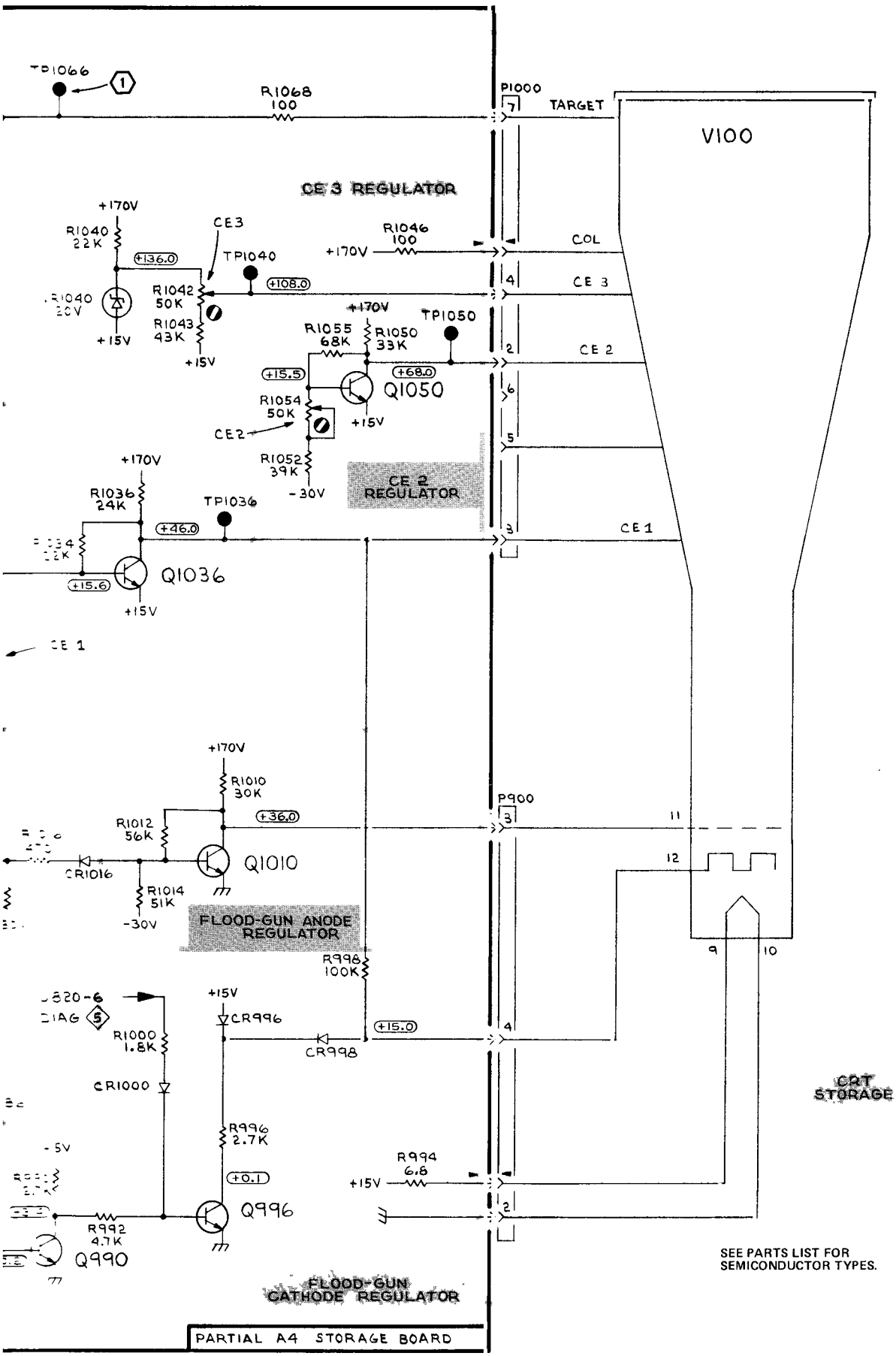
VOLTAGE CONDITIONS

The dc voltages indicated on the schematic diagram were obtained with no test signal input using a digital multimeter. The INTENSITY and Position controls were set for a barely visible dot at near center screen with the internal sweep generator disconnected (Option 4 version only). The STORE button was pushed in, OPERATE LEVEL control fully clockwise, and PERSISTENCE/SAVE TIME control pushed in and set fully counterclockwise (MAX).

WAVEFORM CONDITIONS

The following waveforms were monitored by a test oscilloscope and a 10X probe with no test signal applied. The STORE button was pushed, INTENSITY control fully counterclockwise, and PERSISTENCE/SAVE TIME control pushed in and set to midrange. Waveform was obtained when the ERASE button was pushed in. The test oscilloscope sweep was triggered from test point 1 shown on the Storage Control schematic (diagram 5).

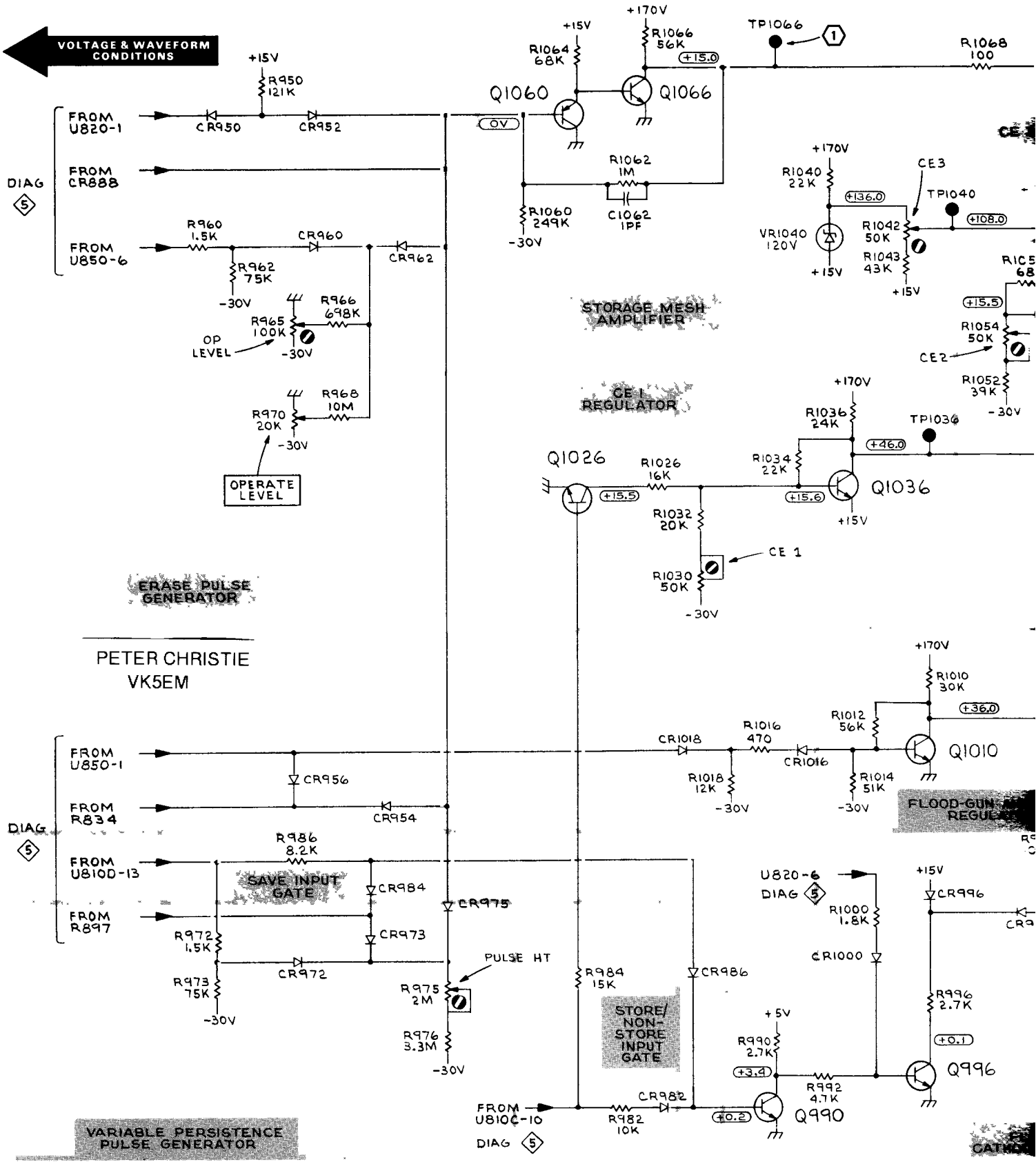




SEE PARTS LIST FOR SEMICONDUCTOR TYPES.

LIC	
B6	B6

STORAGE OUTPUT 6


VOLTAGE & WAVEFORM CONDITIONS
+15V
R950 121K
FROM U820-1
CR950
CR952
DIAG 5
FROM CR888
FROM U850-6
R960 1.5K
CR960
CR962
R962 75K
-30V
R966 698K
R965 100K
OP LEVEL
-30V
R968 10M
R970 20K
-30V
OPERATE LEVEL
ERASE PULSE GENERATOR
PETER CHRISTIE
VK5EM
FROM U850-1
CR956
FROM R834
CR954
DIAG 5
FROM U810D-13
R986 8.2K
SAVE INPUT GATE
CR984
CR975
FROM R897
R972 1.5K
CR973
CR972
R973 75K
-30V
PULSE HT
R975 2M
R976 3.3M
-30V
VARIABLE PERSISTENCE PULSE GENERATOR
+15V
R1064 68K
+170V
R1066 56K
+15.0
Q1060
Q1066
0V
R1062 1M
C1062 1PF
R1060 249K
-30V
TP1066
1
R1068 100
+170V
R1040 22K
+136.0
CE3
TP1040
+108.0
VR1040 120V
+15V
R1042 50K
R1043 43K
+15V
STORAGE MESH AMPLIFIER
+15.5
R1054 50K
CE2
R1052 39K
-30V
CE 1 REGULATOR
+170V
R1036 24K
TP1036
+46.0
Q1026
R1026 16K
+15.5
R1034 22K
+15.6
Q1036
+15V
R1032 20K
CE 1
R1030 50K
-30V
+170V
R1010 30K
+36.0
R1012 56K
CR1018
R1016 470
CR1016
Q1010
R1018 12K
-30V
R1014 51K
-30V
FLOOD-GUN REGUL
U820-6
DIAG 5
+15V
CR996
R1000 1.8K
CR1000
R996 2.7K
+0.1
Q996
+5V
R990 2.7K
+3.4
R992 4.7K
Q990
STORE/ NON-STORE INPUT GATE
R984 15K
CR986
CR982
FROM U810C-10
DIAG 5
R982 10K
+0.2
PARTIAL A4 ST

@

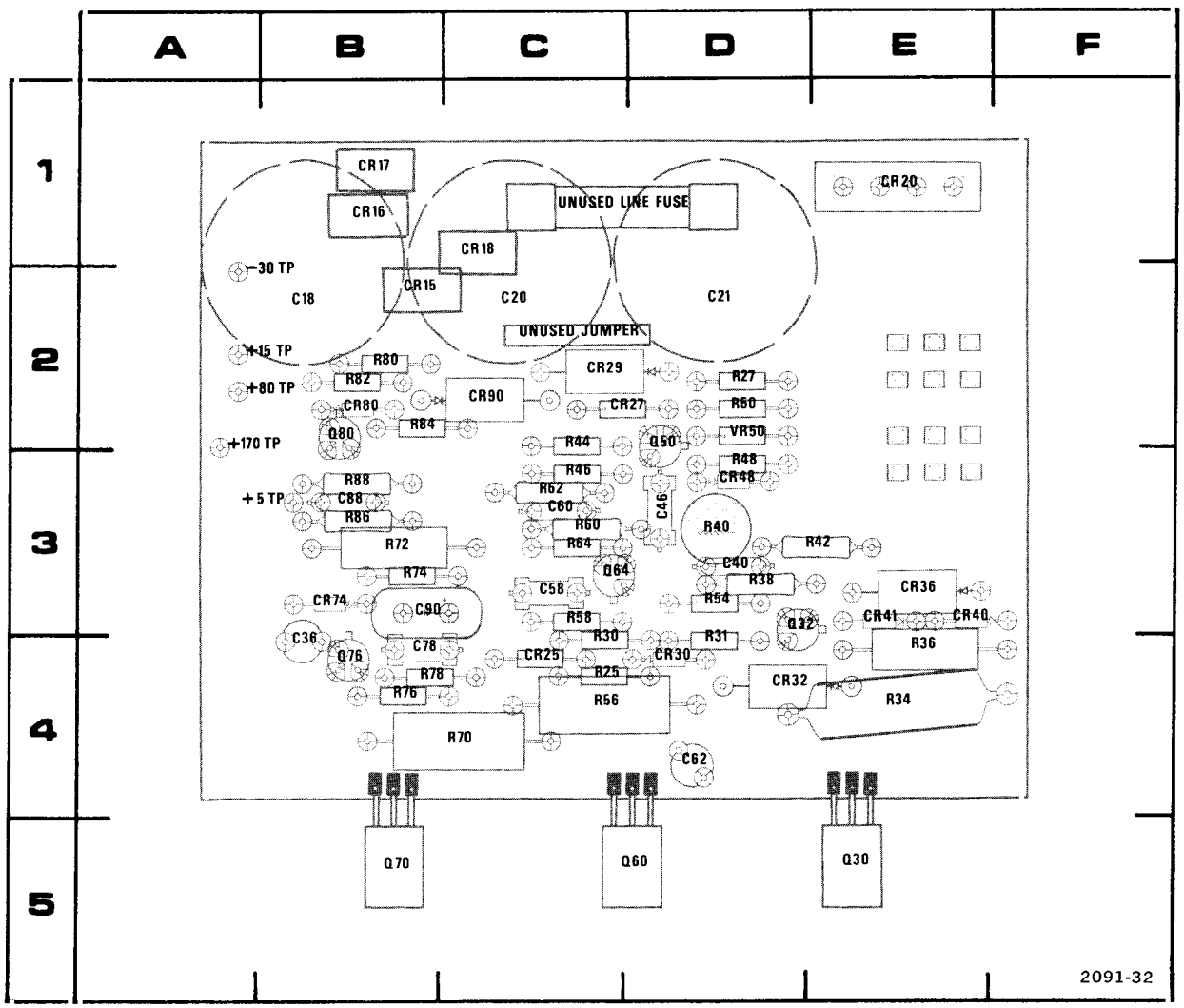
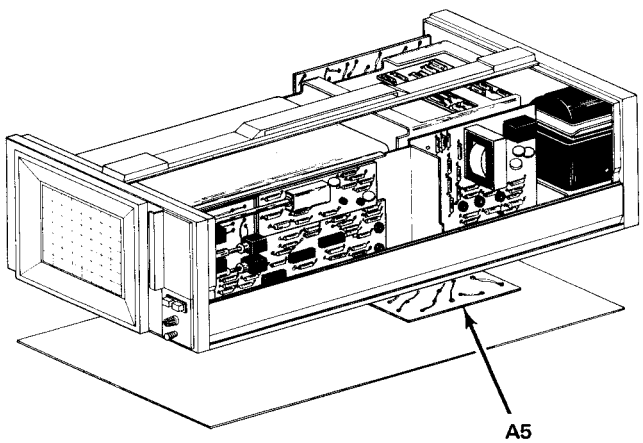
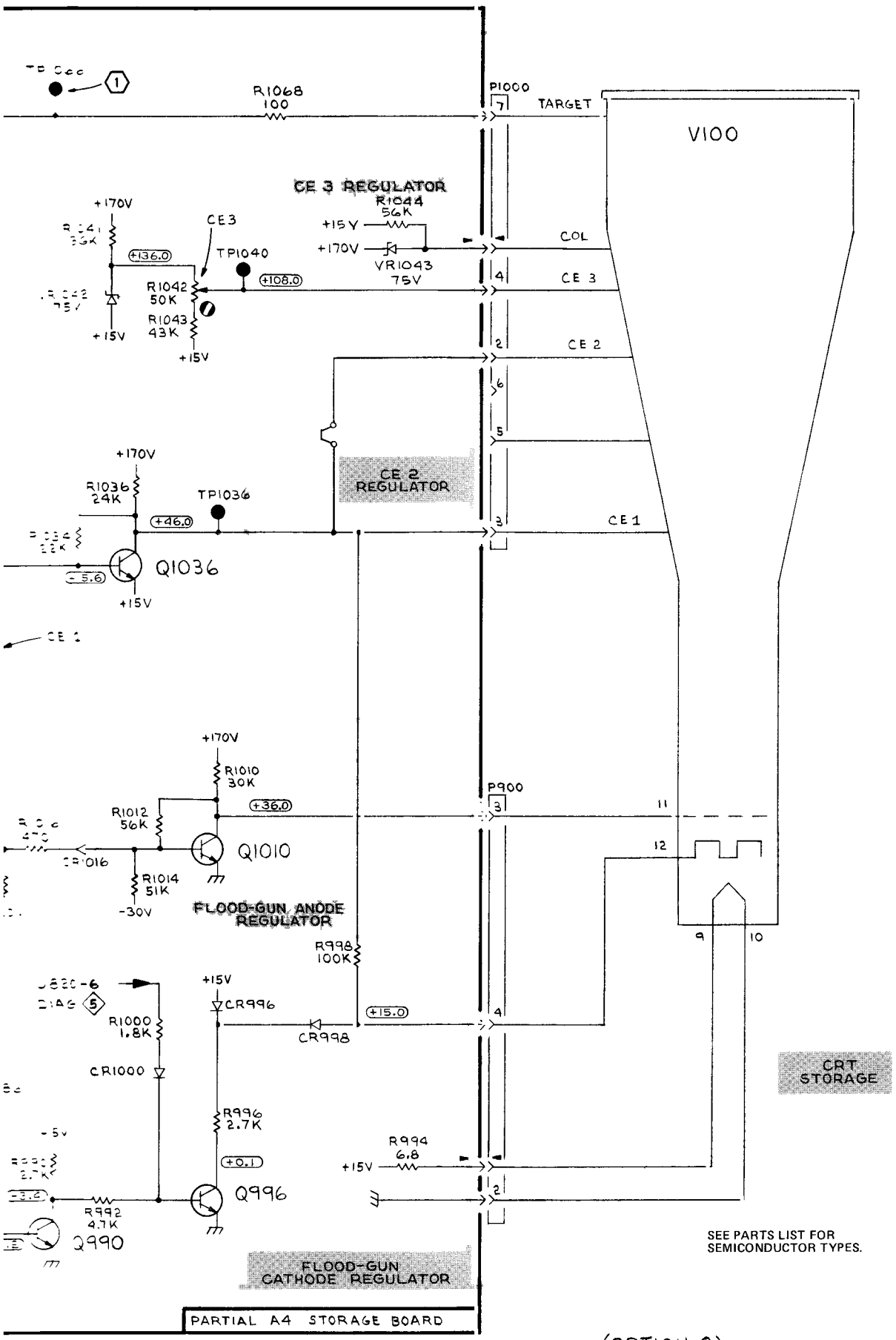


Figure 9-8. A5—Low-Voltage Power Supply component locations.

CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD
C18	2B	CR15	2B	CR41	3E	Q76	4B	R80	2B
C20	1C	CR16	1B	CR48	3D	Q80	2B	R82	2B
C21	2D	CR17	1B	CR74	3B			R84	2B
C36	4B	CR18	1C	CR80	2B	R25	4C	R86	3B
C40	3D	CR20	1E	CR90	2C	R27	2D	R88	3B
C46	3D	CR25	4C			R30	4C		
C53	3C	CR27	2C	Q30	5E	R31	4D	VR50	2D
C60	3C	CR29	2C	Q32	3D	R34	4E		
C62	4D	CR30	4D	Q50	2D	R36	4E		
C78	4B	CR32	4D	Q60	5D	R74	3B		
C88	3B	CR36	3E	Q64	3C	R76	4B		
C90	3B	CR40	3E	Q70	5B	R78	4B		

INDEX FOR FIG.9-8


A5
LOW-VOLTAGE
POWER SUPPLY



SEE PARTS LIST FOR SEMICONDUCTOR TYPES.

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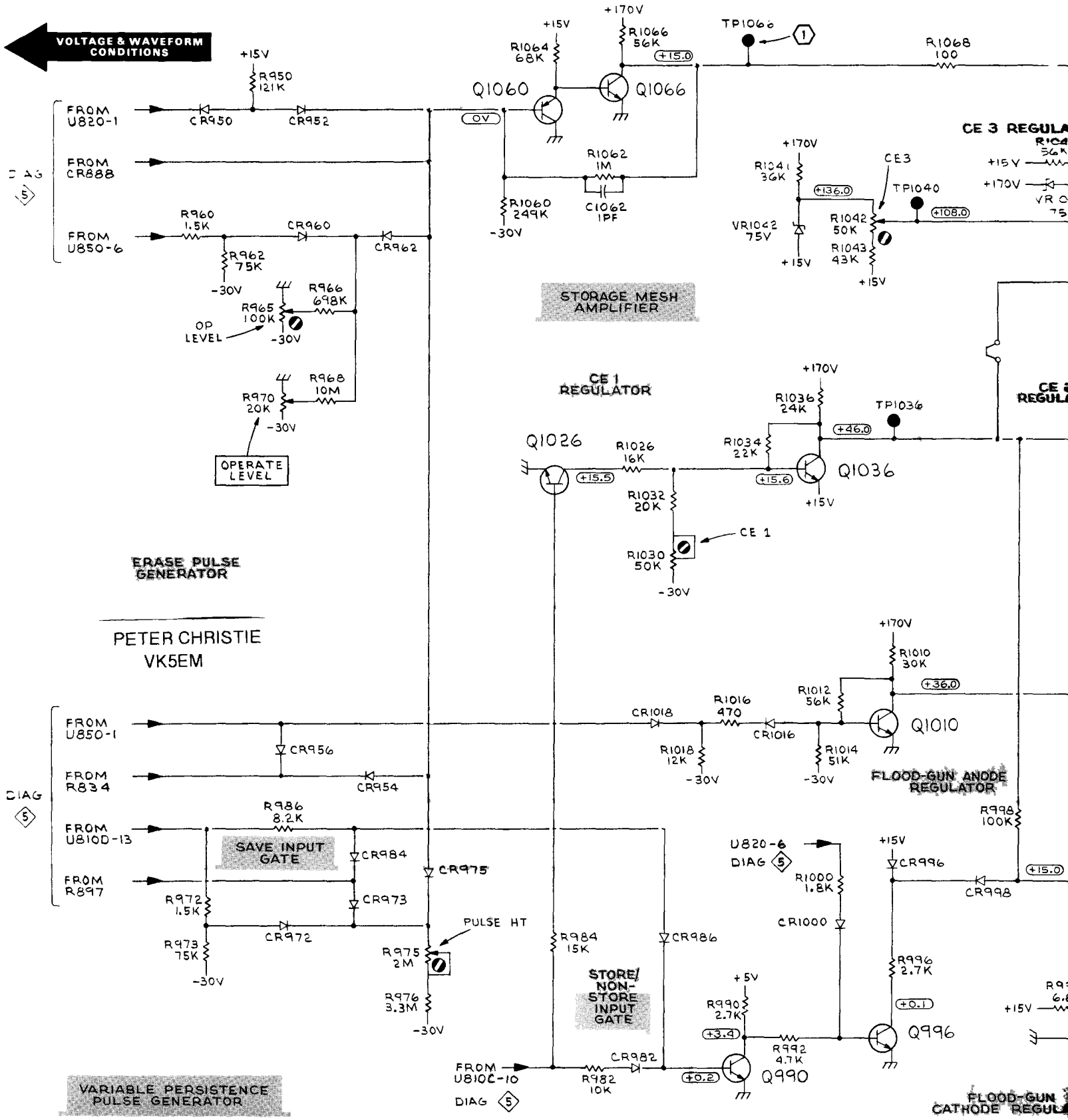
(OPTION 8)

STORAGE OUTPUT ⑥

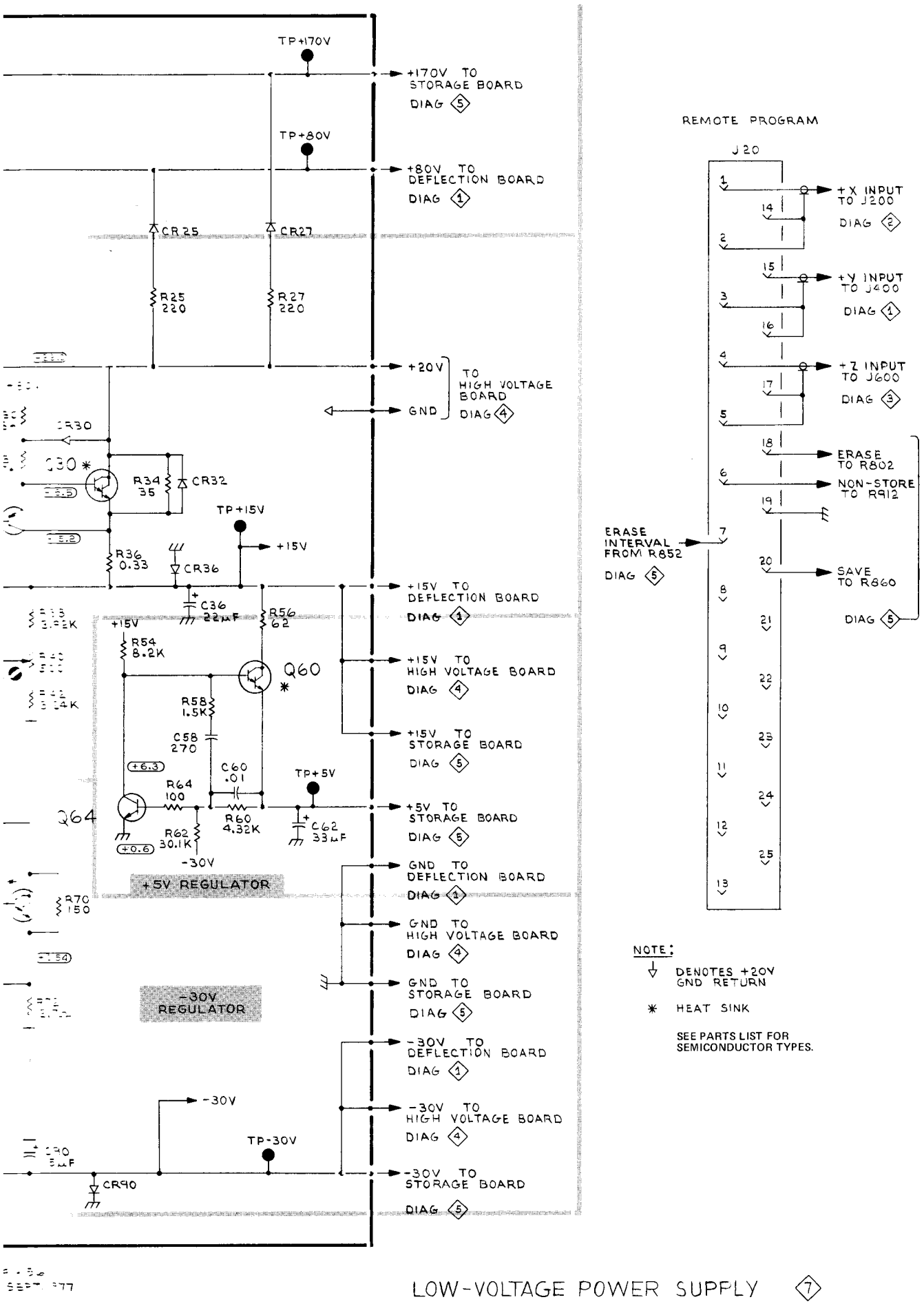

VOLTAGE & WAVEFORM CONDITIONS
+15V
R950 121K
FROM U820-1
CR950
CR952
FROM CR888
FROM U850-6
R960 1.5K
CR960
CR962
R962 75K
-30V
R966 698K
R965 100K
OP LEVEL
-30V
R968 10M
R970 20K
-30V
OPERATE LEVEL
+170V
R1064 68K
R1066 56K
+15.0
TP1066
1
R1068 100
Q1060
Q1066
0V
R1062 1M
C1062 1PF
R1060 249K
-30V
STORAGE MESH AMPLIFIER
+170V
R1041 3GK
+136.0
CE3
TP1040
+108.0
R1042 50K
R1043 43K
VR1042 75V
+15V
+15V
CE 3 REGULA
R1C4 56K
+15V
+170V
VR C 75
CE 1 REGULATOR
+170V
R1036 24K
TP1036
+46.0
Q1026
R1026 16K
+15.5
R1034 22K
+15.6
Q1036
+15V
R1032 20K
CE 1
R1030 50K
-30V
ERASE PULSE GENERATOR
PETER CHRISTIE
VK5EM
+170V
R1010 30K
+36.0
R1012 56K
R1016 470
CR1018
CR1016
Q1010
R1018 12K
-30V
R1014 51K
-30V
FLOOD-GUN ANODE REGULATOR
FROM U850-1
CR956
FROM R834
CR954
DIAG 5
R986 8.2K
FROM U810D-13
SAVE INPUT GATE
CR984
CR975
FROM R897
R972 1.5K
CR973
CR972
R973 75K
-30V
PULSE HT
R975 2M
R976 3.3M
-30V
R984 15K
CR986
STORE/ NON-STORE INPUT GATE
R998 100K
U820-6 DIAG 5
+15V
CR996
R1000 1.8K
CR1000
+15.0
CR998
+5V
R990 2.7K
+3.4
R992 4.7K
R996 2.7K
+0.1
Q996
Q990
+0.2
CR982
R982 10K
FROM U810C-10
DIAG 5
VARIABLE PERSISTENCE PULSE GENERATOR
FLOOD-GUN CATHODE REGUL
PARTIAL A4 STORAGE BO

VOLTAGE CONDITIONS

NOTE

The test equipment used to obtain the voltages is listed in Table 6-1, Test Equipment.

The dc voltages indicated on the schematic diagram were obtained with no test signal input using a digital multimeter. The INTENSITY and Position controls were set for a barely visible dot at near center screen with the internal sweep generator disconnected (Option 4 version only).



REMOTE PROGRAM

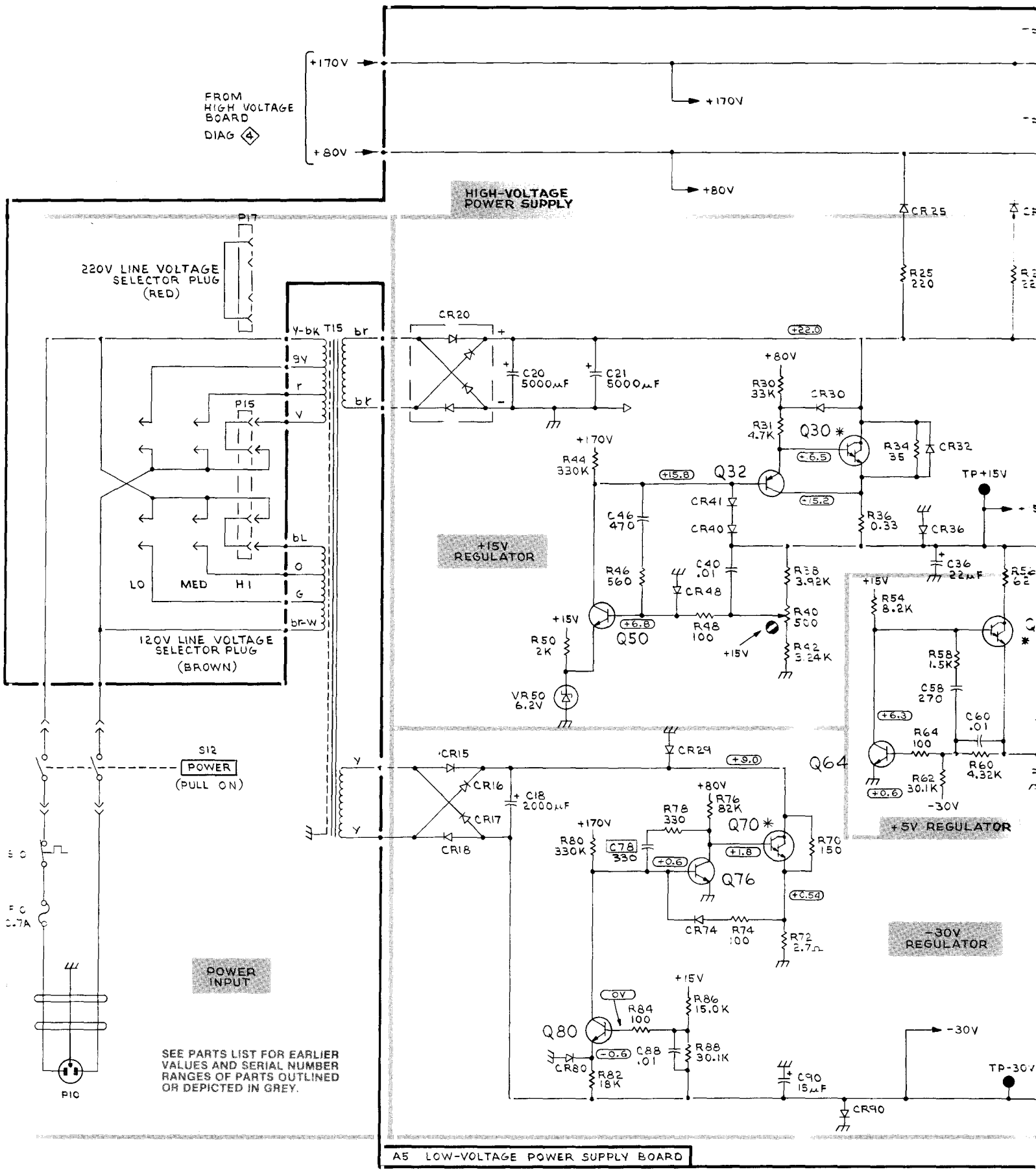
NOTE:

▽ DENOTES +20V GND RETURN

* HEAT SINK

SEE PARTS LIST FOR SEMICONDUCTOR TYPES.

LOW-VOLTAGE POWER SUPPLY ⑦



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REV.A, SEPT.1977

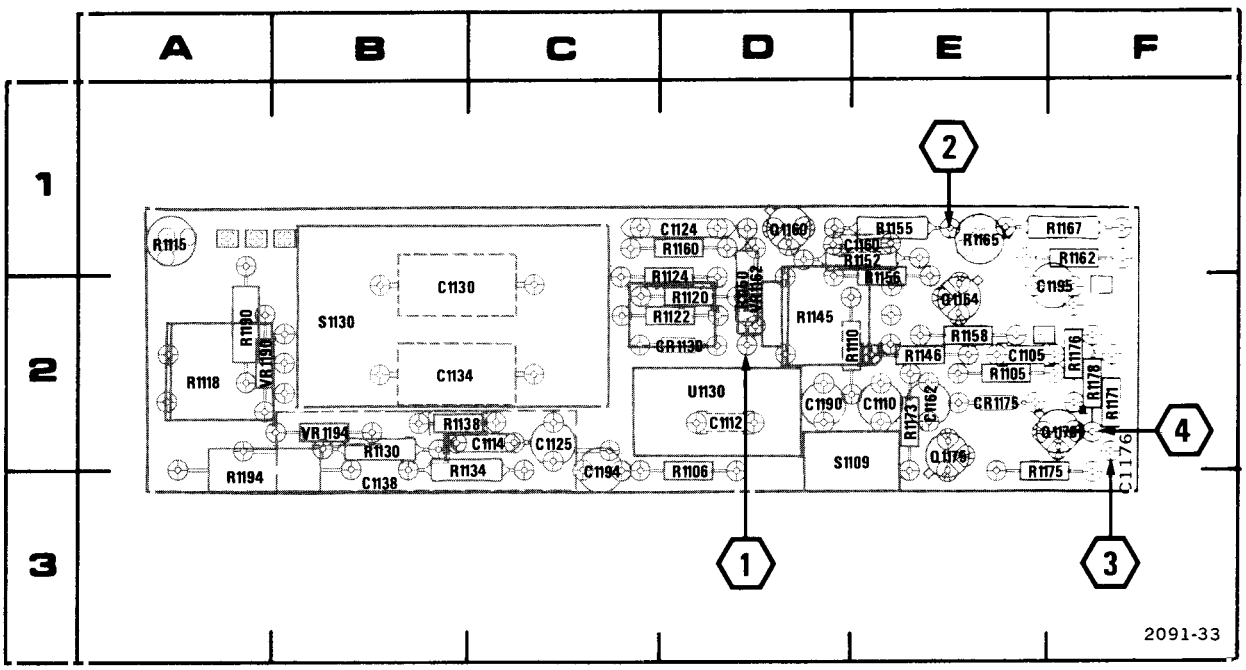

Figure 9-9. A6—Sweep (Option 4) component and waveform test point locations.

CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD	CKT NO	GRID COORD
C1105	2E	CR1175	2E	R1134	2C	R1178	2F
C1110	2E			R1138	2C	R1190	2A
C1112	2D	Q1160	1D	R1145	2D	R1194	3A
C1114	2C	Q1164	2E	R1146	2E		
C1124	1D	Q1175	2E	R1150	2D	S1109	2D
C1125	2C	Q1178	2F	R1152	1E	S1130	2B
C1130	2B			R1155	1E		
C1134	2B	R1105	2E	R1156	2E	U1130	2D
C1138	3B	R1106	3D	R1158	2E		
C1160	1E	R1110	2E	R1160	1D	VR1162	2D
C1162	2E	R1115	1A	R1162	1F	VR1190	2A
C1190	2D	R1118	2A	R1165	1E	VR1194	2B
C1194	3C	R1120	2D	R1167	1F		
C1176	3F	R1122	2D	R1171	2F		
		R1124	2D	R1173	2E		
CR1130	2D	R1130	2B	R1175	3F		
				R1176	2F		

INDEX FOR FIG.9-9

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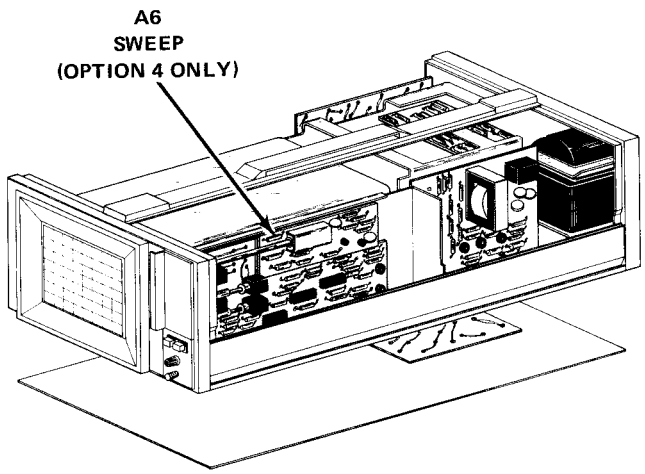
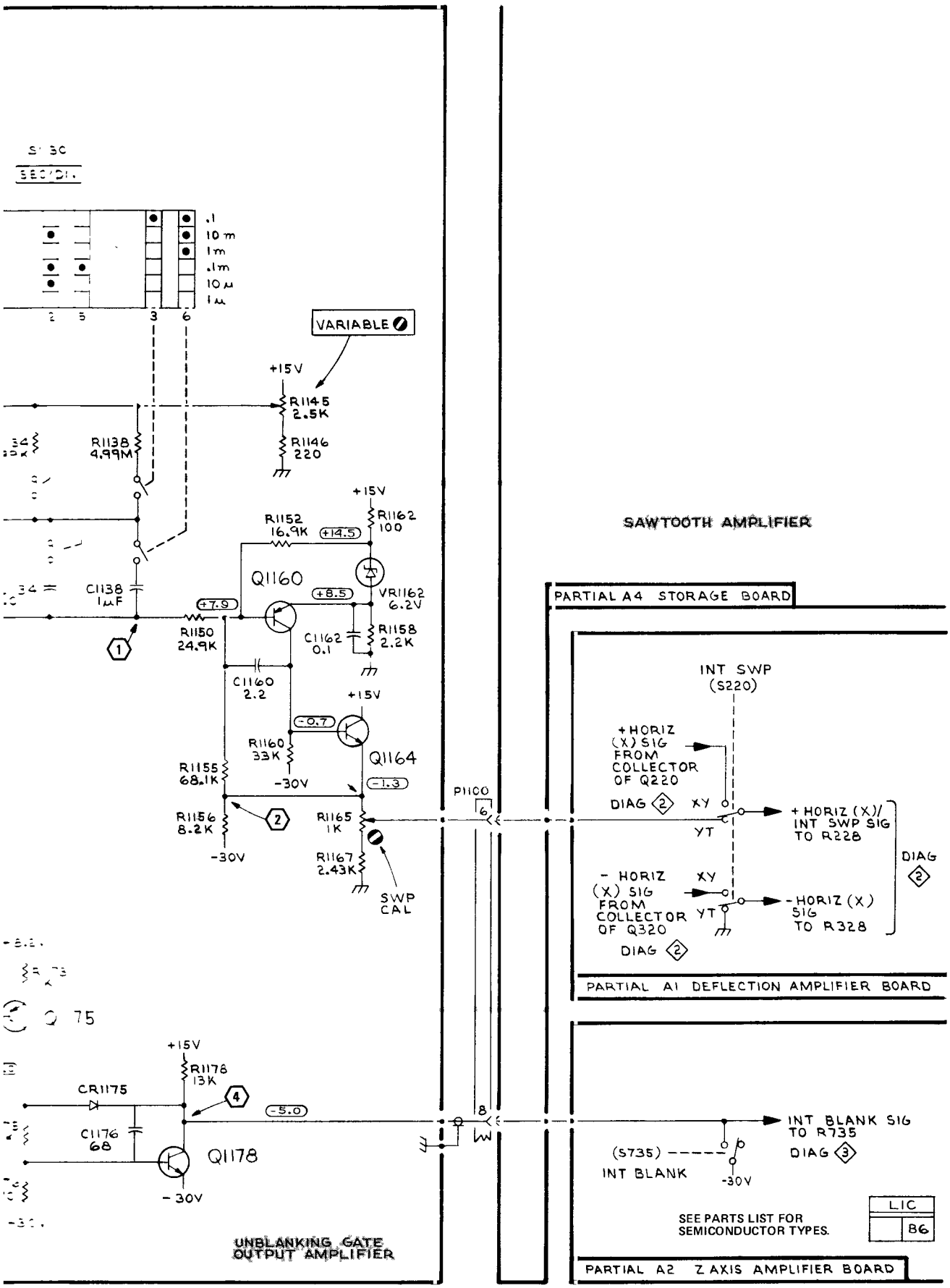
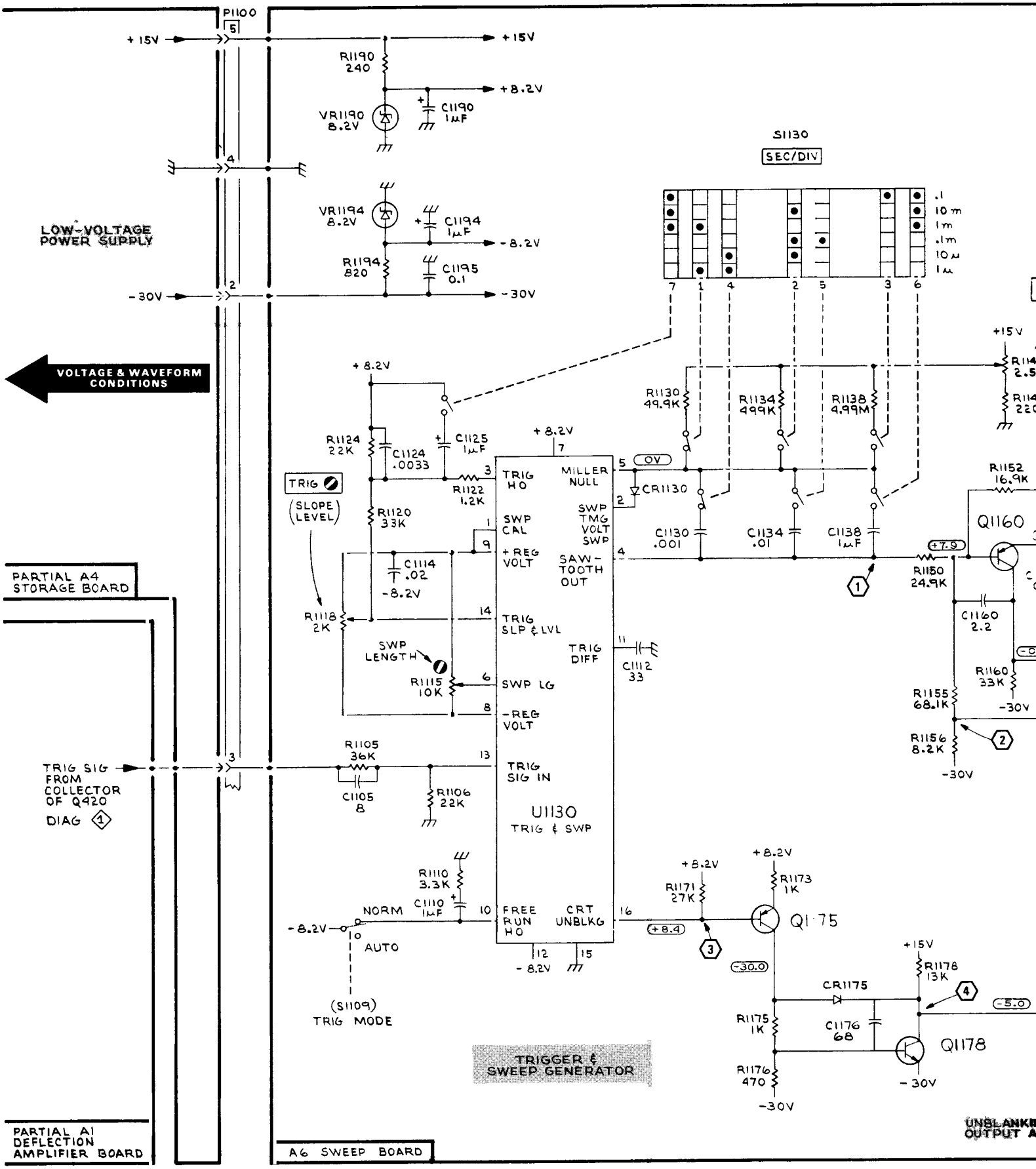

A6
SWEEP
(OPTION 4 ONLY)



SWEEP (OPTION 4) ◈8


P1100
+15V
-30V
LOW-VOLTAGE POWER SUPPLY
R1190 240
VR1190 8.2V
C1190 1μF
+8.2V
VR1194 8.2V
C1194 1μF
-8.2V
R1194 820
C1195 0.1
VOLTAGE & WAVEFORM CONDITIONS
S1130
SEC/DIV
.1
10 m
1 m
.1 m
10 μ
1 μ
R1124 22K
C1124 .0033
C1125 1μF
R1122 1.2K
R1120 33K
TRIG
(SLOPE LEVEL)
C1114 .02
R1118 2K
SWP LENGTH
R1115 10K
R1105 36K
C1105 8
R1106 22K
TRIG SIG FROM COLLECTOR OF Q920
DIAG 1
PARTIAL A4 STORAGE BOARD
PARTIAL A1 DEFLECTION AMPLIFIER BOARD
U1130
TRIG & SWP
TRIG HO
SWP CAL
+REG VOLT
TRIG SLP & LVL
SWP LG
-REG VOLT
TRIG SIG IN
MILLER NULL
SWP TMG VOLT SWP
SAW-TOOTH OUT
TRIG DIFF
FREE RUN HO
CRT UNBLKG
C1112 33
R1110 3.3K
C1110 1μF
NORM
AUTO
(S1109) TRIG MODE
R1130 49.9K
R1134 499K
R1138 4.99M
CR1130
C1130 .001
C1134 .01
C1138 1μF
OV
R1152 16.9K
Q1160
R1150 24.9K
C1160 2.2
R1160 33K
R1155 68.1K
R1156 8.2K
R1171 27K
R1173 1K
Q1175
R1178 13K
CR1175
R1175 1K
C1176 68
Q1178
R1176 470
TRIGGER & SWEEP GENERATOR
A6 SWEEP BOARD
UNBLANKI
OUTPUT A

VOLTAGE AND WAVEFORM CONDITIONS

NOTE

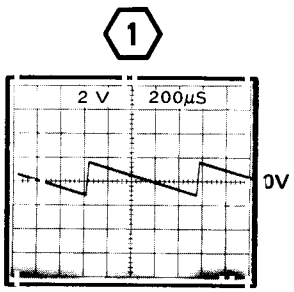
The test equipment used to obtain the voltages and waveforms is listed in Table 6-1, Test Equipment.

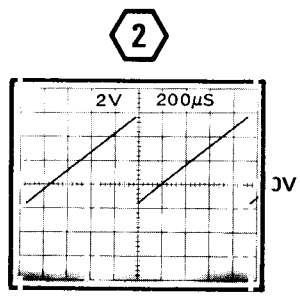
VOLTAGE CONDITIONS

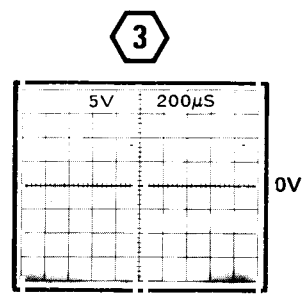
The dc voltages indicated on the schematic diagram were obtained with no test signal input using a digital multimeter. The INTENSITY and Position controls were set for a barely visible trace at near center screen with the internal sweep generator connected. The internal Trig Mode switch (S1109) was set to the Normal position.

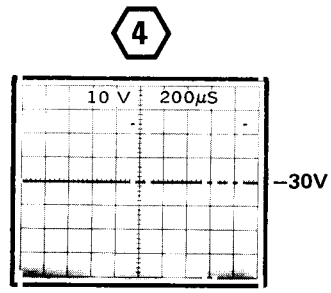
WAVEFORM CONDITIONS

The following waveforms were monitored by a test oscilloscope and a 10X probe with no test signal applied and the internal sweep generator connected. The internal Trig Mode switch (S1109) was set to the Auto position, SEC/DIV switch to .1 m, and VARIABLE control fully clockwise (calibrated).









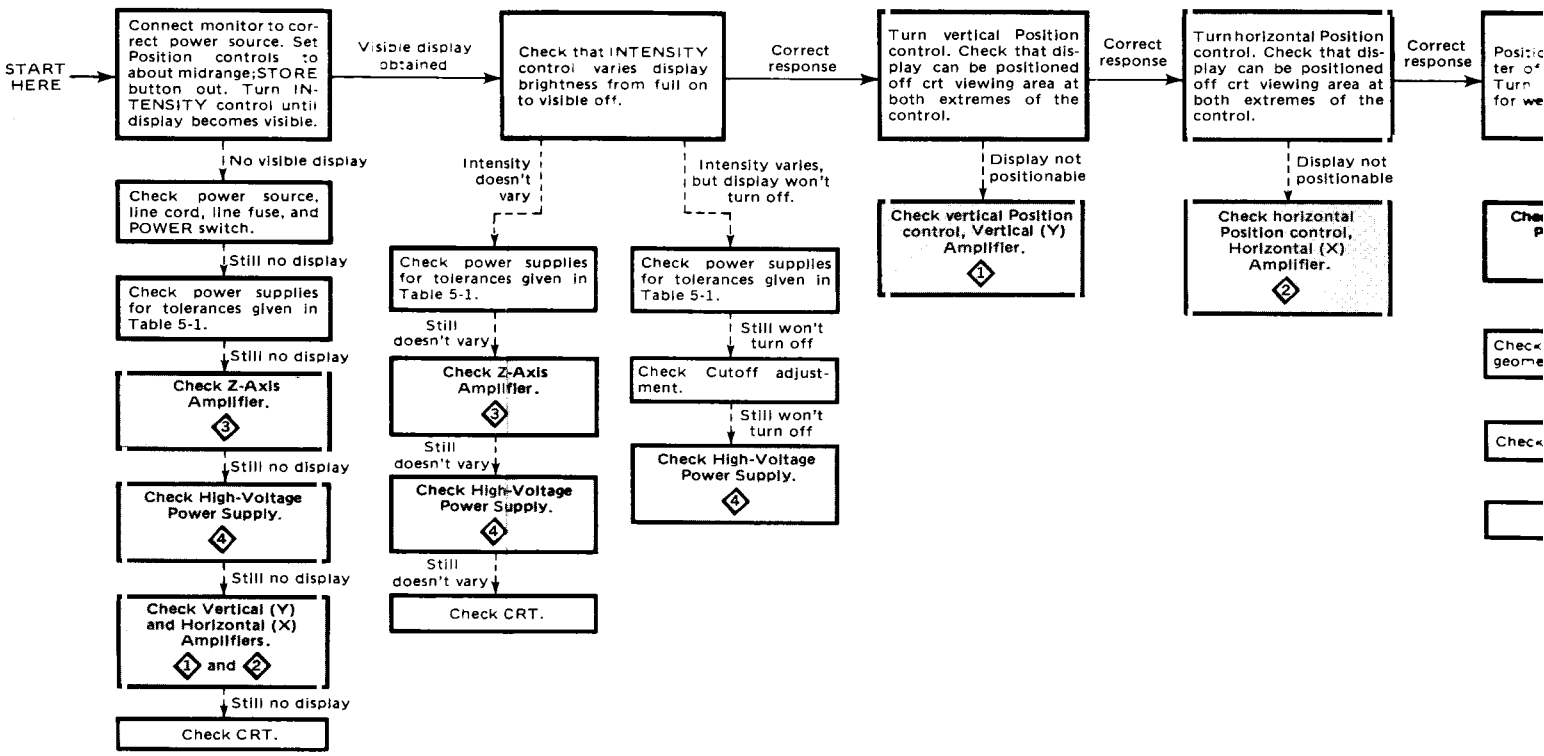
TROUBLESHOOTING CHART INSTRUCTIONS:

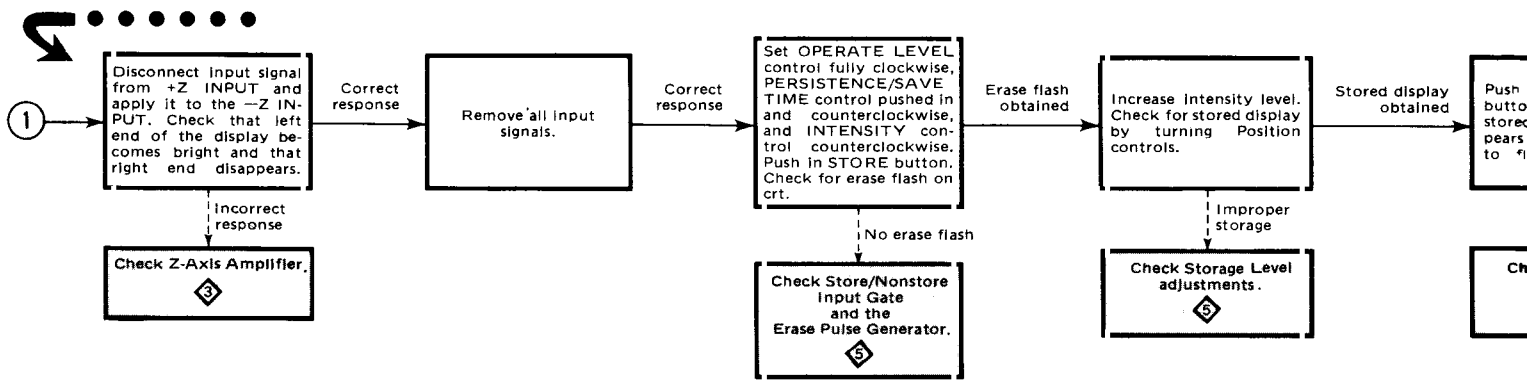
1. Beginning at the top left block of the chart proceed to the right until the Monitor does not perform as indicated.

2. Then follow the dashed line as the symptom indicates. Each shaded block indicates a circuit or a stage which may be the cause of the malfunction. Refer to section 4, Theory of Operation, for a detailed discussion.

NOTE

For instruments equipped with the Option 4 Sweep circuit, disconnect the sweep (by reversing the procedure given in section 3, Installation) before beginning this procedure.





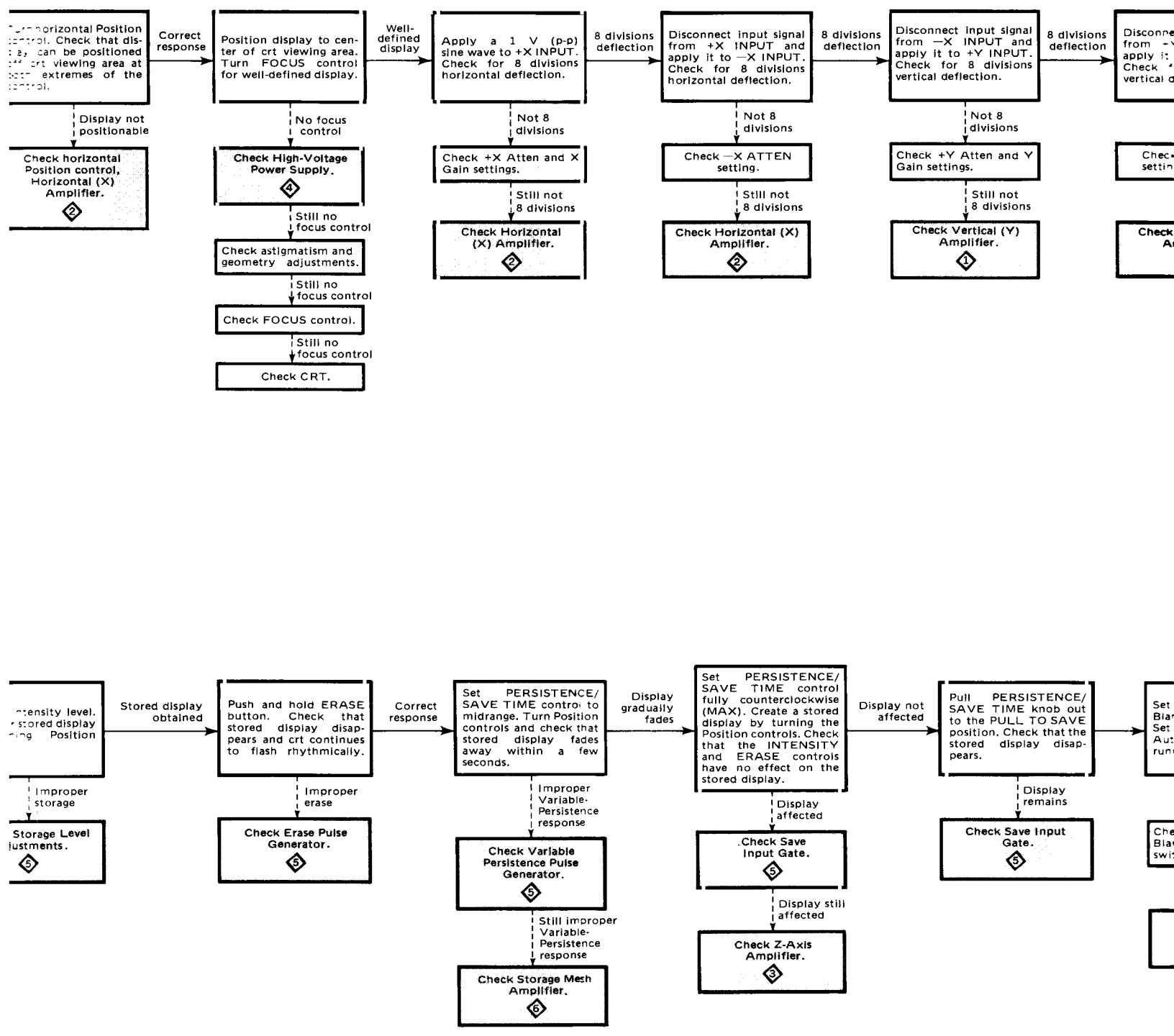


Figure 9-10. Troubleshooting char

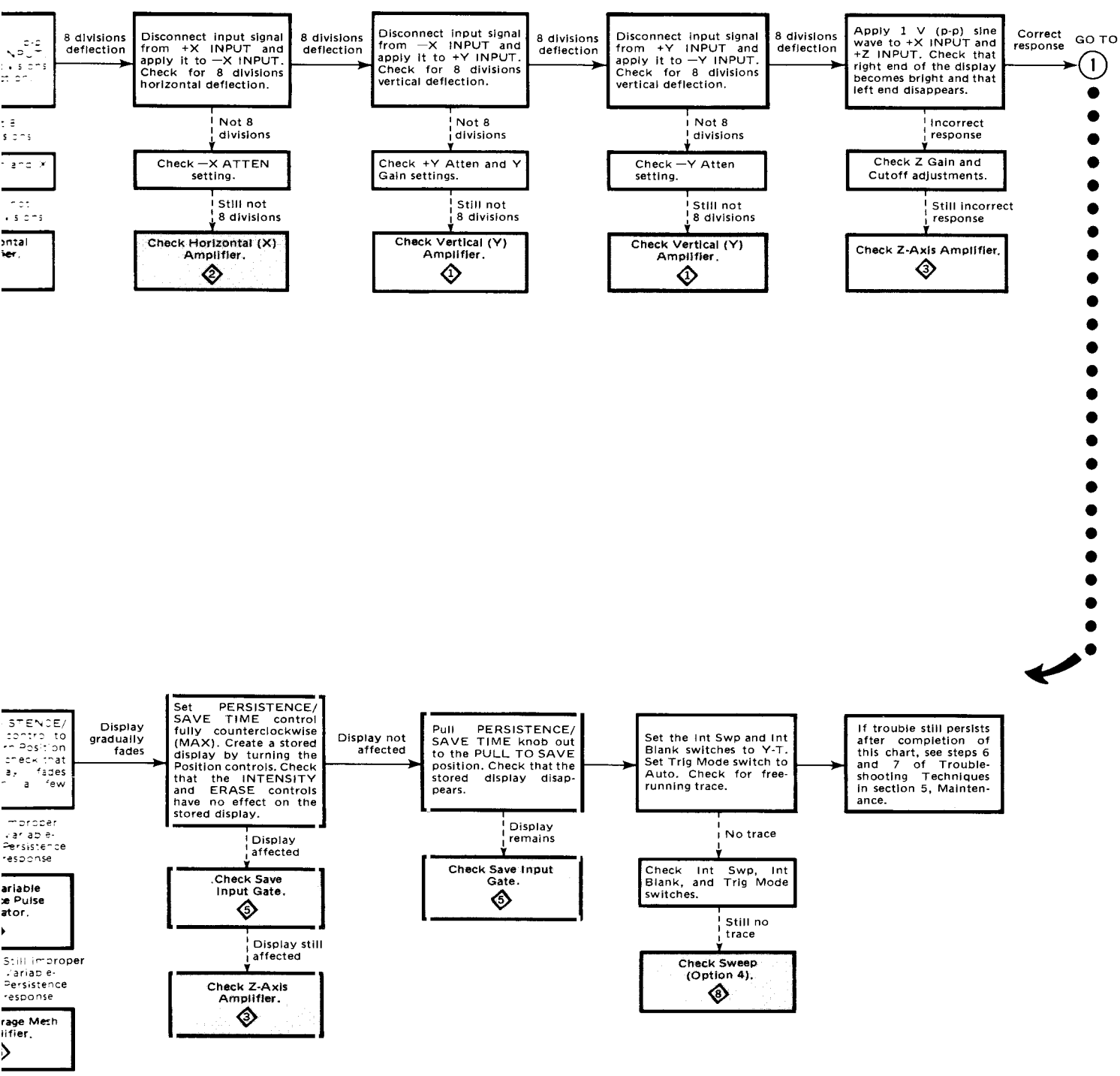


Figure 9-10. Troubleshooting chart.

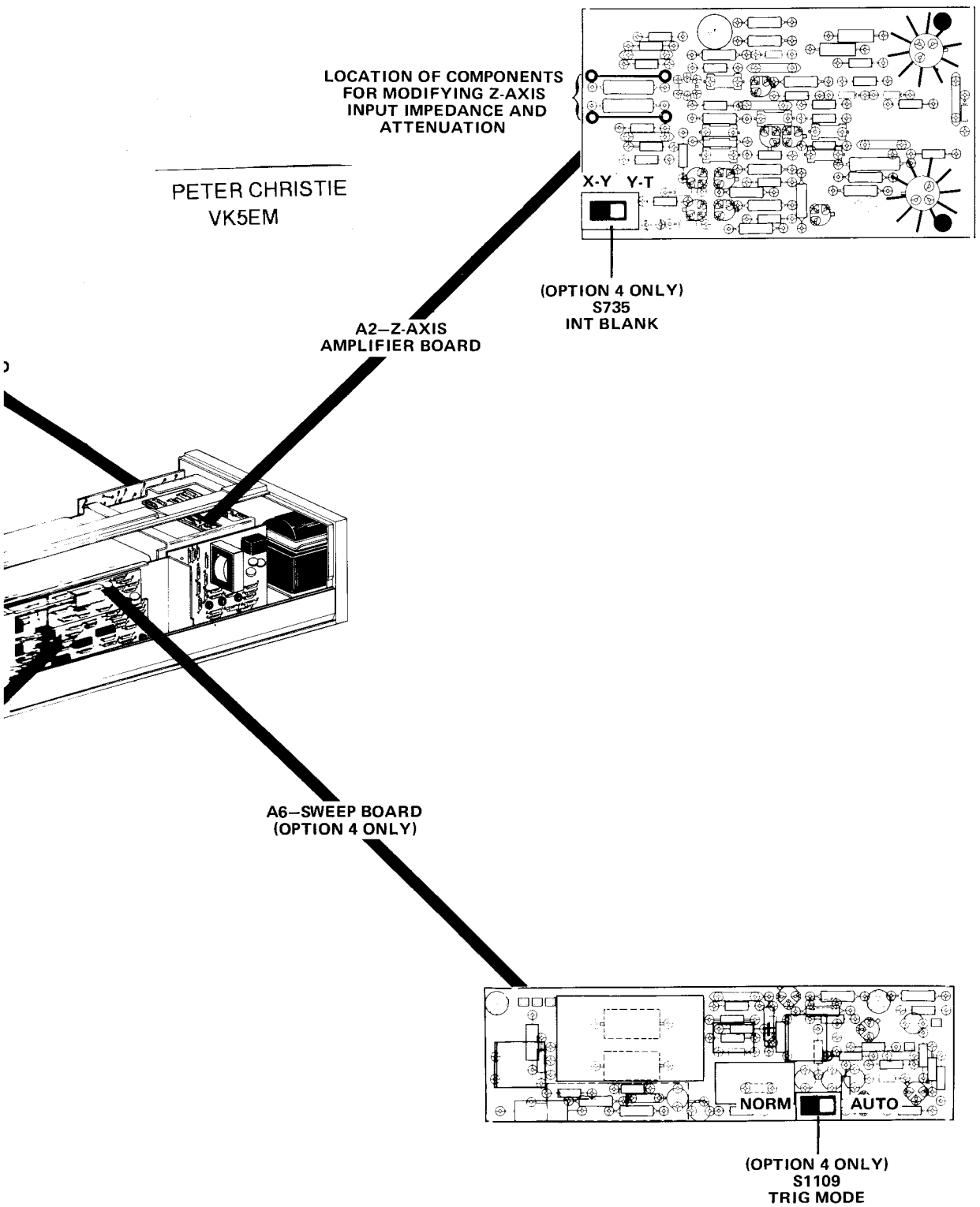


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Figure 9-11. Internal control and selector locations.

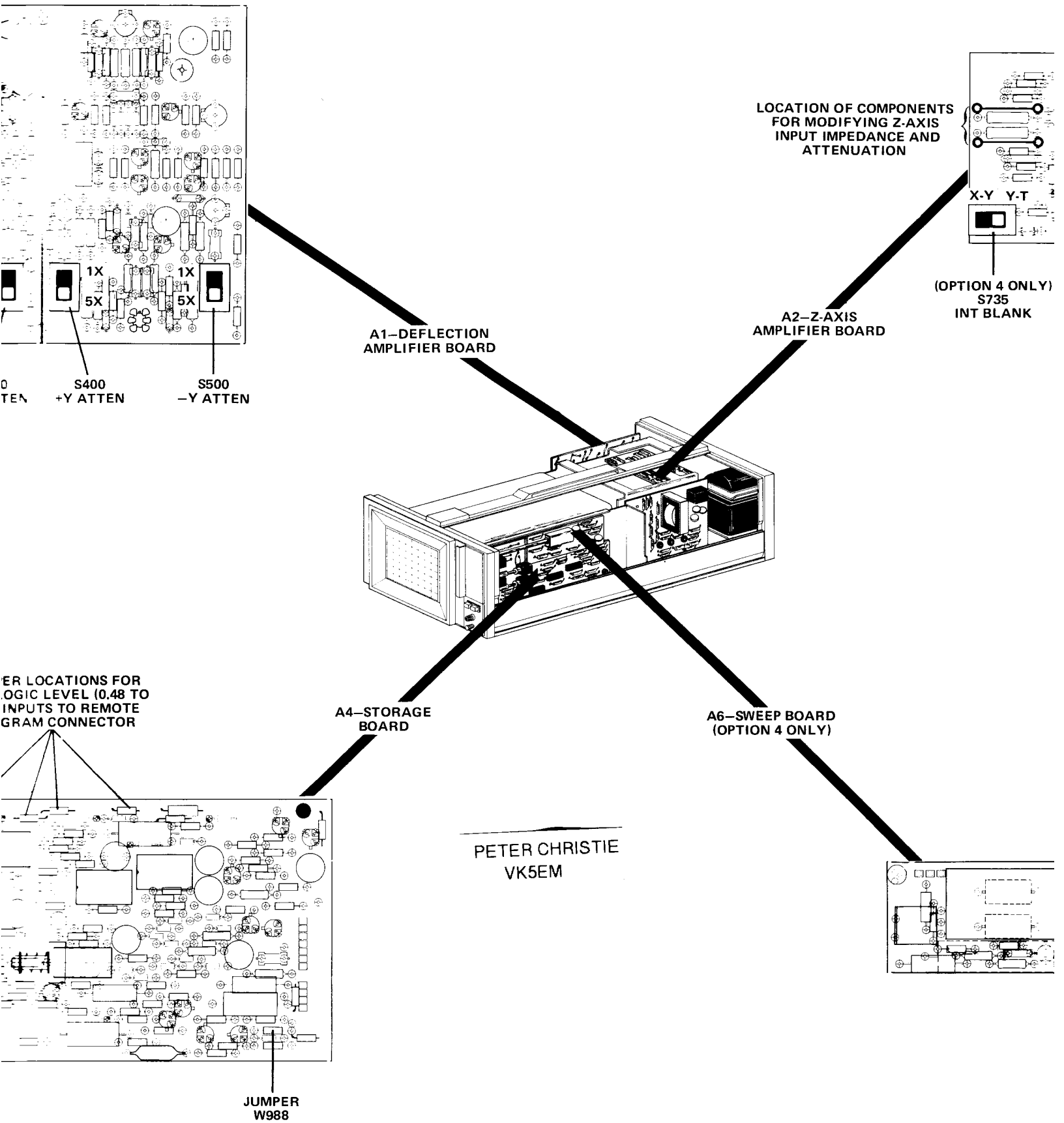
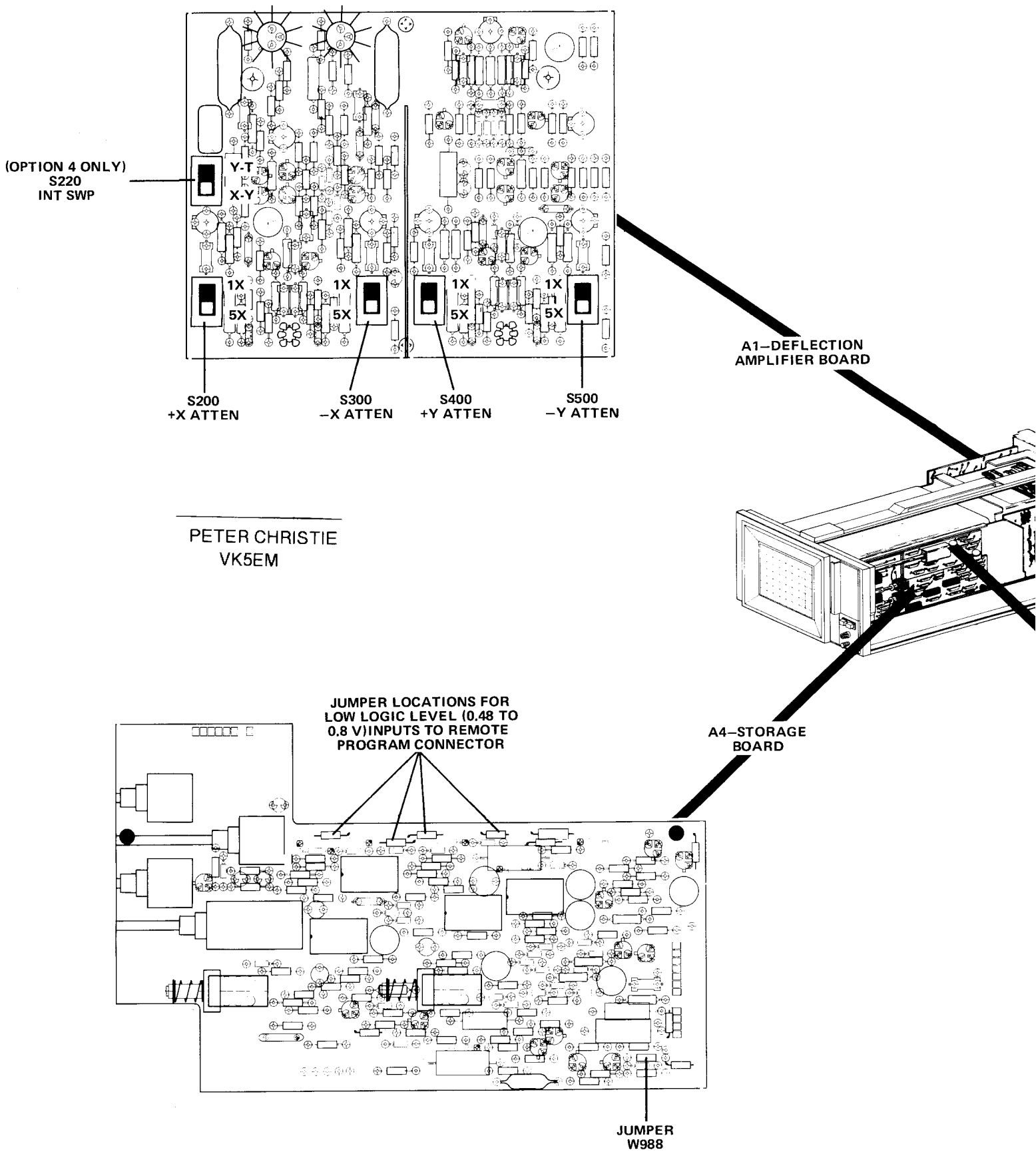


Figure 9-11. Internal contr


(OPTION 4 ONLY)
S220
INT SWP
Y-T
X-Y
1X
5X
S200
+X ATTEN
S300
–X ATTEN
S400
+Y ATTEN
S500
–Y ATTEN
A1–DEFLECTION
AMPLIFIER BOARD
PETER CHRISTIE
VK5EM
JUMPER LOCATIONS FOR
LOW LOGIC LEVEL (0.48 TO
0.8 V)INPUTS TO REMOTE
PROGRAM CONNECTOR
A4–STORAGE
BOARD
JUMPER
W988

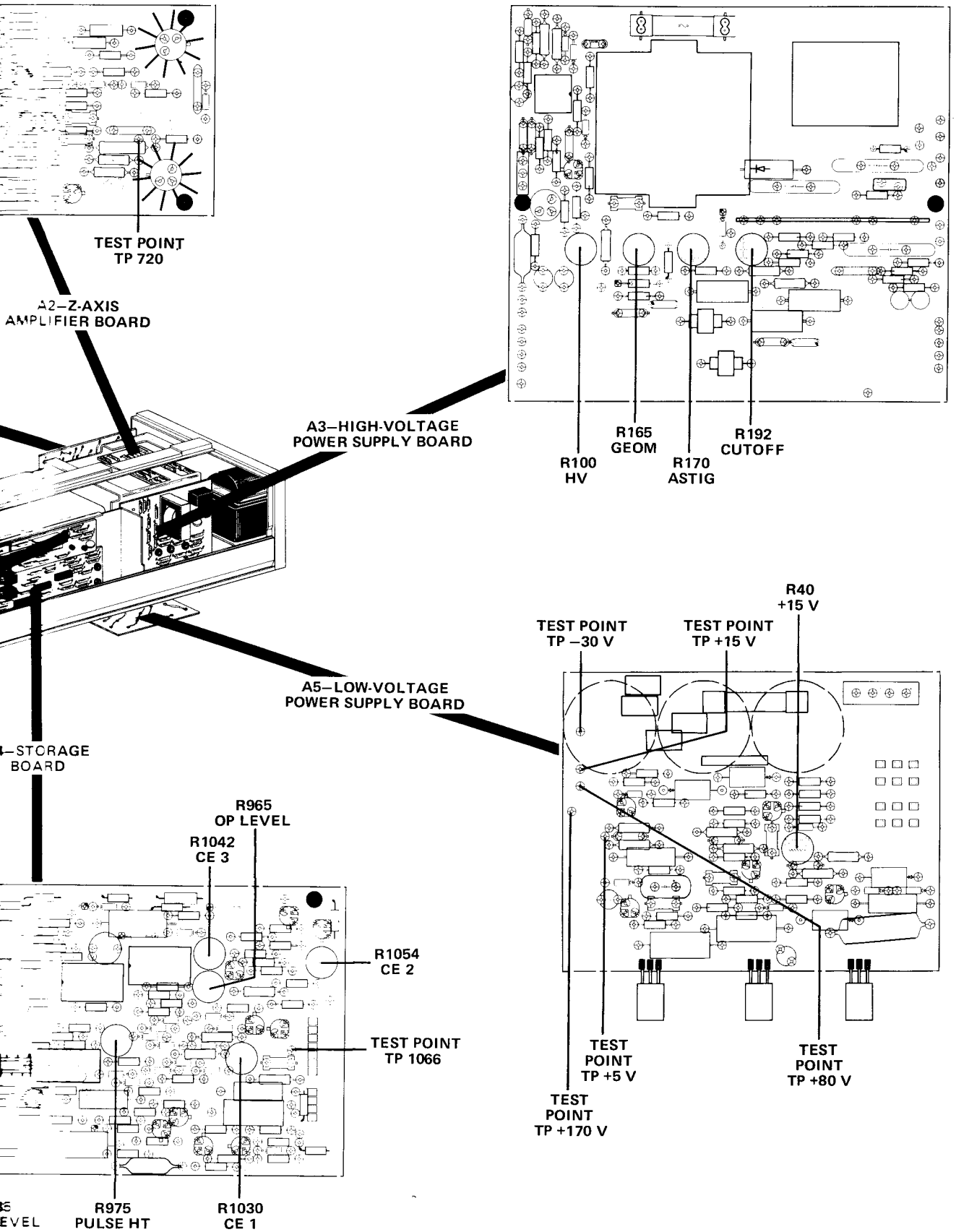


Figure 9-12. Test point and adjustment locations.

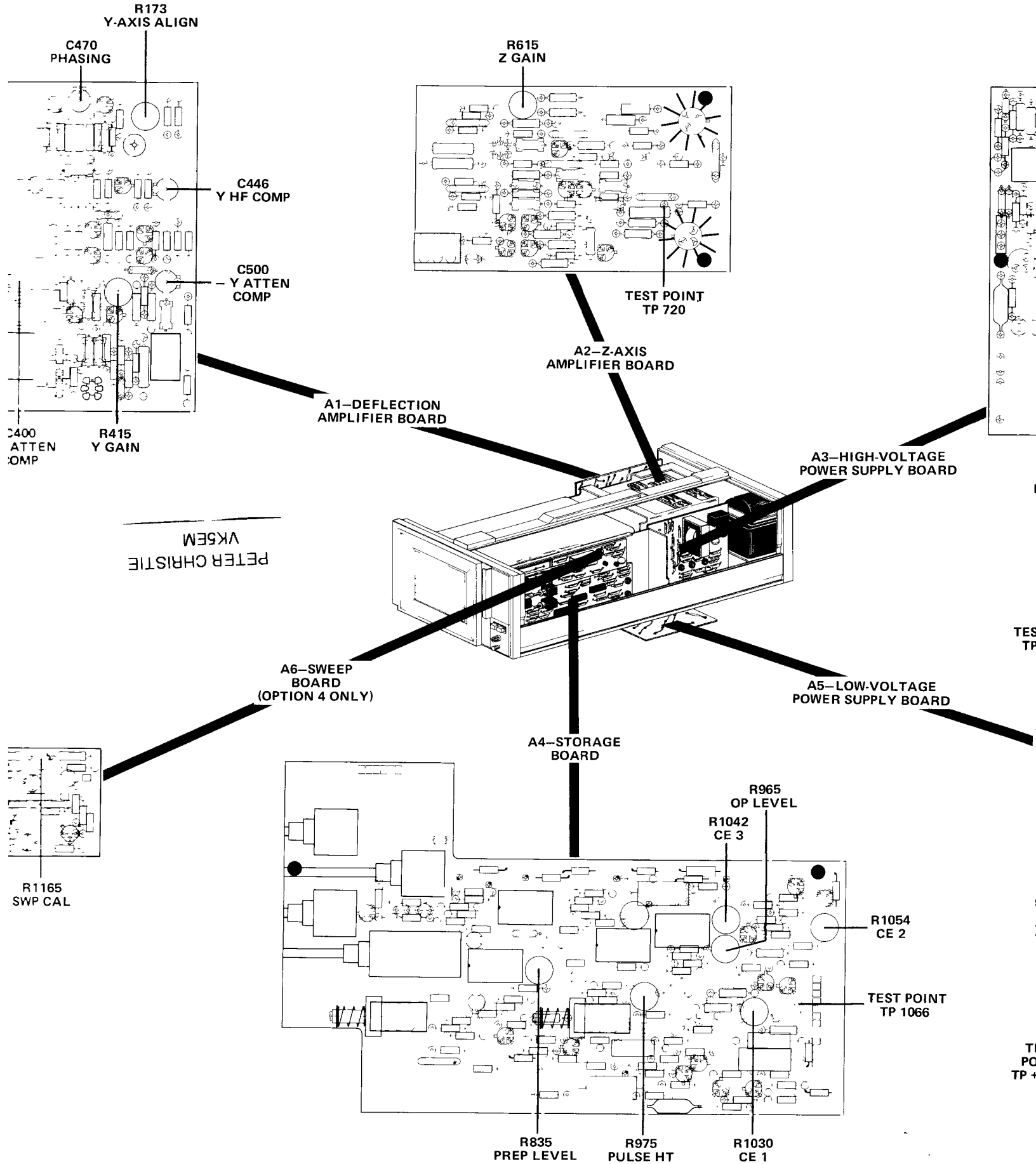
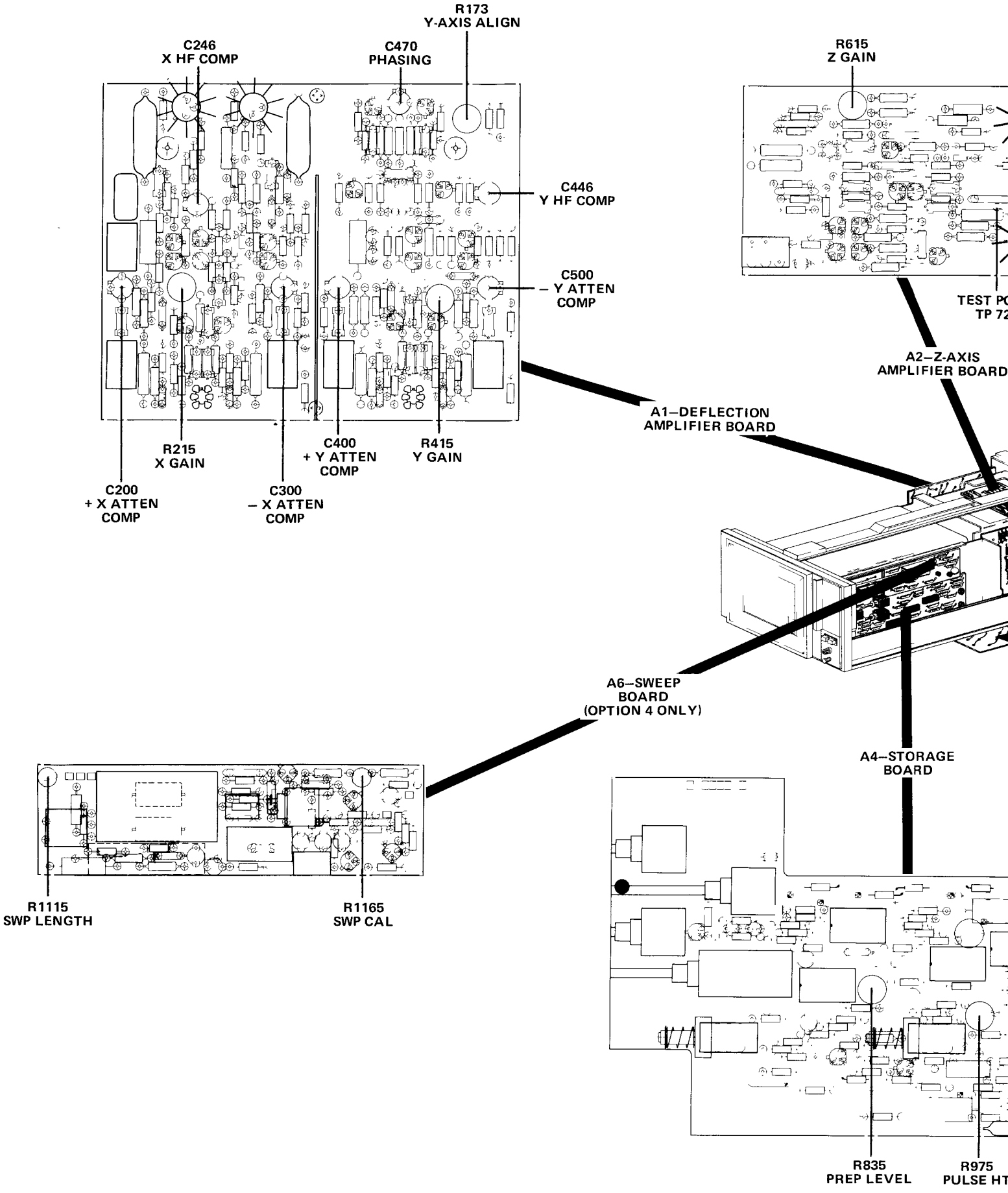
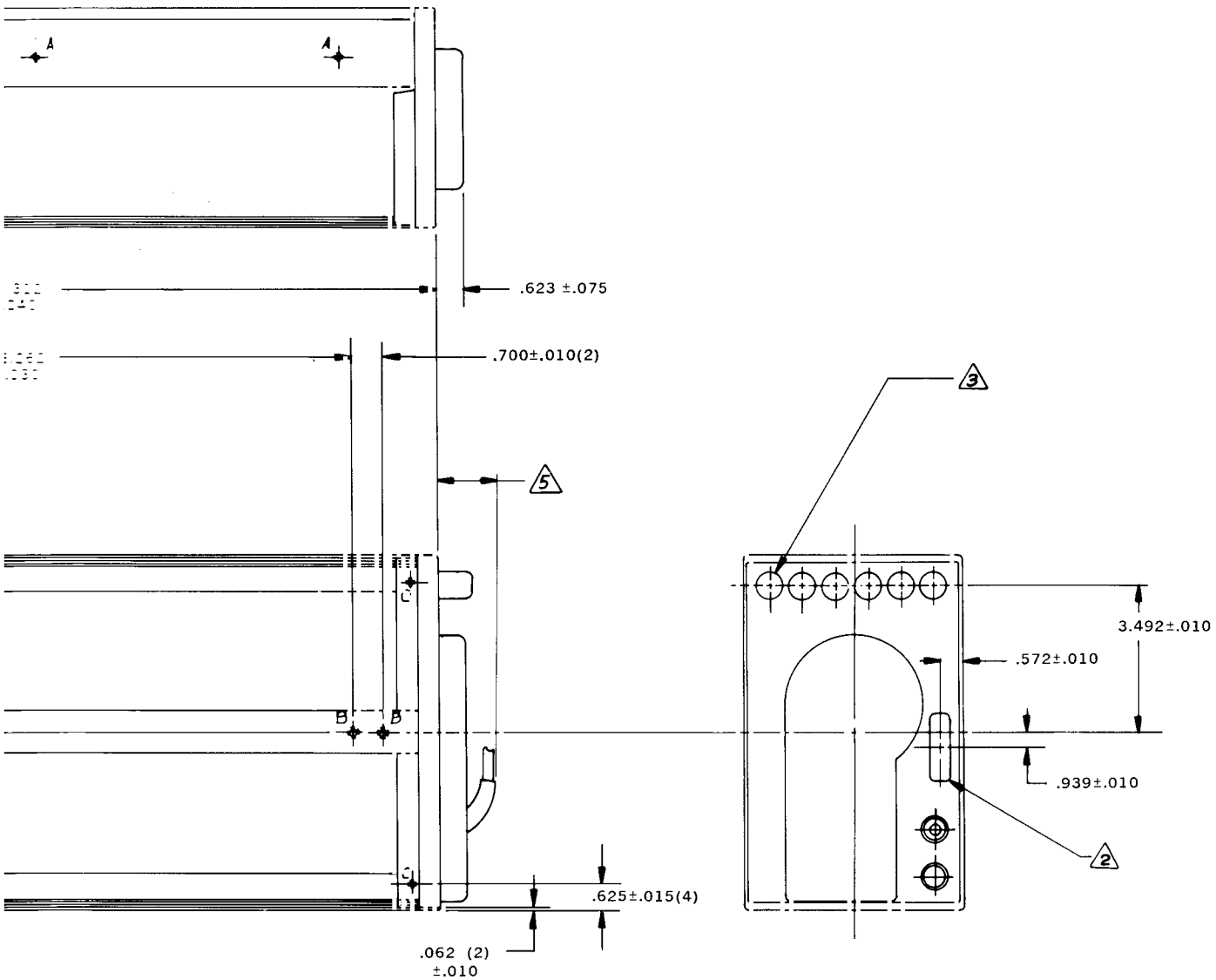


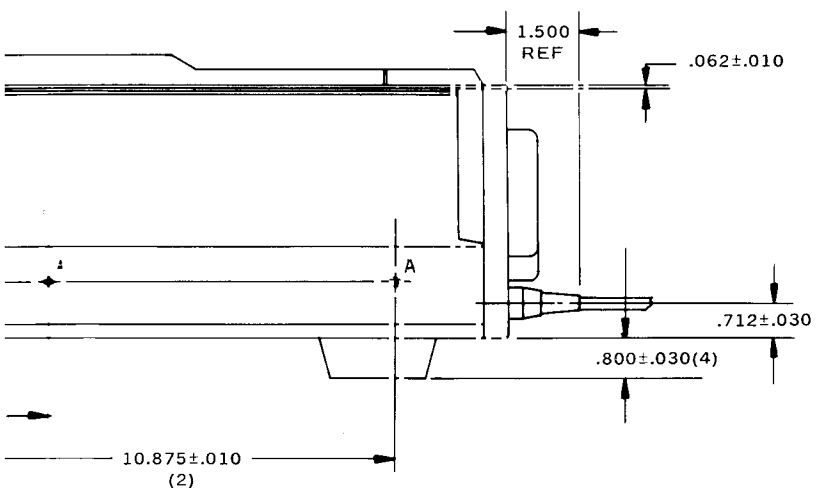
Figure 9-12. Test point


R173
Y-AXIS ALIGN
C246
X HF COMP
C470
PHASING
R615
Z GAIN
C446
Y HF COMP
C500
– Y ATTEN
COMP
TEST PC
TP 72
A2–Z-AXIS
AMPLIFIER BOARD
A1–DEFLECTION
AMPLIFIER BOARD
R215
X GAIN
C400
+ Y ATTEN
COMP
R415
Y GAIN
C200
+ X ATTEN
COMP
C300
– X ATTEN
COMP
A6–SWEEP
BOARD
(OPTION 4 ONLY)
A4–STORAGE
BOARD
R1115
SWP LENGTH
R1165
SWP CAL
R835
PREP LEVEL
R975
PULSE HT

English To Metric Conversion

Inches	Centimeters	Inches	Centimeters
0.003	0.008	0.600	1.524
0.005	0.013	0.623	1.582
0.008	0.020	0.625	1.588
0.010	0.025		
0.015	0.038	0.665	1.689
		0.700	1.778
0.016	0.041	0.706	1.793
0.020	0.051	0.712	1.809
0.023	0.058	0.787	1.999
0.028	0.071	0.800	2.032
0.030	0.076	.900	2.286
		1.020	2.591
0.035	0.089	1.161	2.949
0.040	0.102	1.350	3.429
0.062	0.158	1.500	3.810
0.075	0.191		
0.080	0.203	1.548	3.932
		2.407	6.116
0.093	0.236	3.187	8.087
0.125	0.318	3.492	8.870
0.140	0.356	3.625	9.208
0.197	0.500		
0.320	0.813	4.188	10.638
		5.062	12.858
0.339	0.861	5.125	13.018
0.394	1.001	5.224	13.269
0.480	1.219	5.578	14.168
0.486	1.234		
0.531	1.349	8.325	21.273
		10.875	27.623
0.550	1.397	16.262	41.306
0.572	1.453	18.312	46.513





5 MIN DIMENSION FOR BEND IN POWER CORD 603, 604, 605, 606, 607 0.900 1.250

3. BNC CONNECTORS & CAPS .625 MAX DIA BY .900 HIGH

2. CONNECTOR, MATES WITH CINCH OR CANNON DB-25P PLUG & DB-51226-1A COVER

1. HOLES A. 8-32 UNC-2B THD
B. 10-32 UNF-2BTHD
C. 6-32 UNC-2B THD

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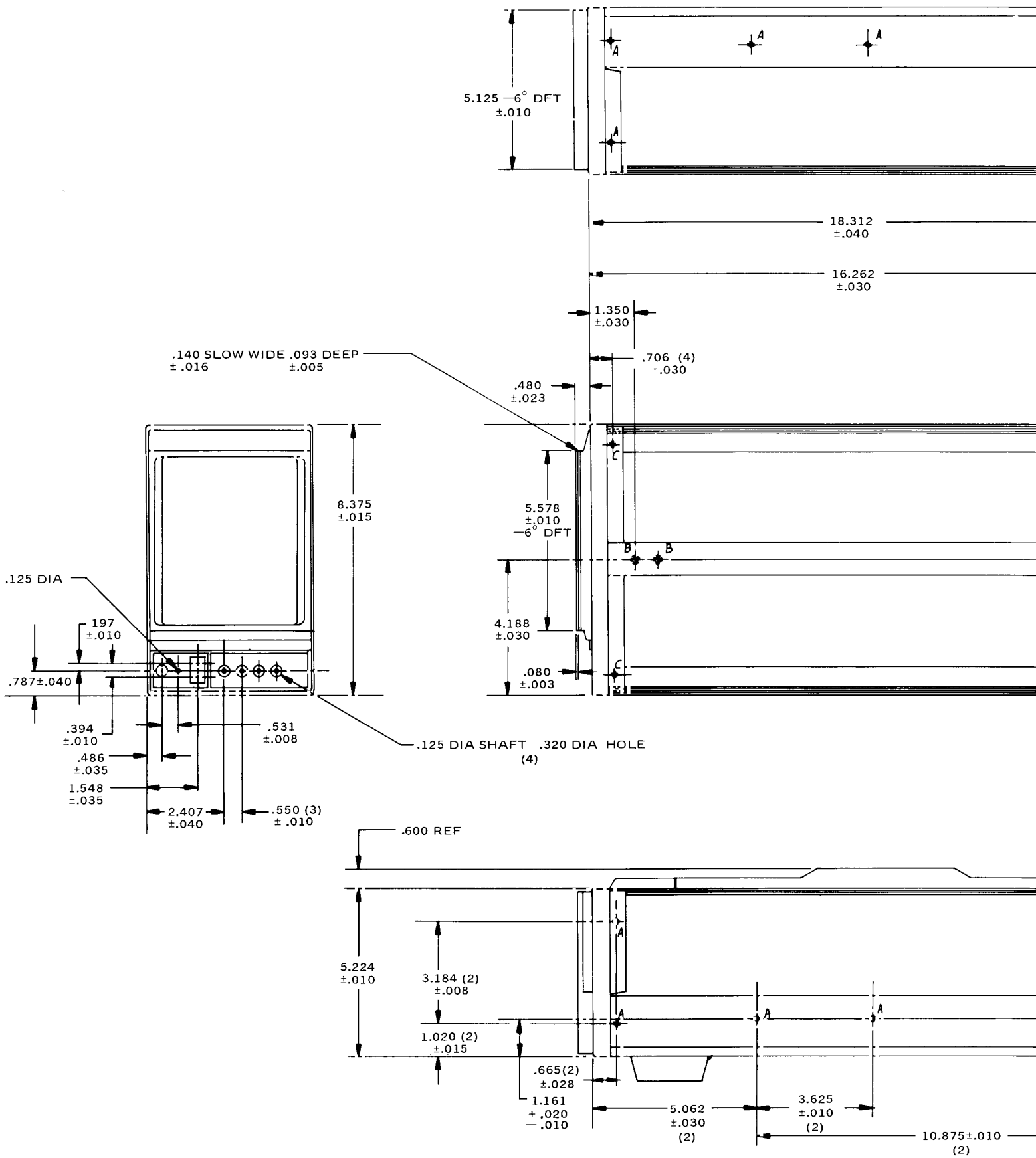
Figure 9-13. Detailed dimensional drawing.


5.125 —6° DFT
±.010
18.312
±.040
16.262
±.030
1.350
±.030
.706 (4)
±.030
.480
±.023
.140 SLOW WIDE .093 DEEP
±.016 ±.005
8.375
±.015
5.578
±.010
—6° DFT
4.188
±.030
.080
±.003
.125 DIA
.197
±.010
.787±.040
.394
±.010
.531
±.008
.486
±.035
1.548
±.035
2.407
±.040
.550 (3)
± .010
.125 DIA SHAFT .320 DIA HOLE
(4)
.600 REF
5.224
±.010
3.184 (2)
±.008
1.020 (2)
±.015
.665(2)
±.028
1.161
+ .020
— .010
5.062
±.030
(2)
3.625
±.010
(2)
10.875±.010
(2)

PETER CHRISTIE
VK5EM

REPLACEABLE MECHANICAL PARTS

PARTS ORDERING INFORMATION

Replacement parts are available from or through your local Tektronix, Inc. Field Office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available, and to give you the benefit of the latest circuit improvements developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and modification number if applicable.

If a part you have ordered has been replaced with a new or improved part, your local Tektronix, Inc. Field Office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

SPECIAL NOTES AND SYMBOLS

X000	Part first added at this serial number
00X	Part removed after this serial number

FIGURE AND INDEX NUMBERS

Items in this section are referenced by figure and index numbers to the illustrations.

INDENTATION SYSTEM

This mechanical parts list is indented to indicate item relationships. Following is an example of the indentation system used in the description column.

1 2 3 4 5 Name & Description

Assembly and/or Component
Attaching parts for Assembly and/or Component
\- - - * - - -
Detail Part of Assembly and/or Component
Attaching parts for Detail Part
\- - - * - - -
Parts of Detail Part
Attaching parts for Parts of Detail Part
\- - - * - - -

Attaching Parts always appear in the same indentation as the item it mounts, while the detail parts are indented to the right. Indented items are part of, and included with, the next higher indentation. The separation symbol - - - * - - - indicates the end of attaching parts.

Attaching parts must be purchased separately, unless otherwise specified.

ITEM NAME

In the Parts List, an Item Name is separated from the description by a colon (:). Because of space limitations, an Item Name may sometimes appear as incomplete. For further Item Name identification, the U.S. Federal Cataloging Handbook H6-1 can be utilized where possible.

ABBREVIATIONS

"	INCH
#	NUMBER SIZE
ACTR	ACTUATOR
ADPTR	ADAPTER
ALIGN	ALIGNMENT
AL	ALUMINUM
ASSEM	ASSEMBLED
ASSY	ASSEMBLY
ATTEN	ATTENUATOR
AWG	AMERICAN WIRE GAGE
BD	BOARD
BRKT	BRACKET
BRS	BRASS
BRZ	BRONZE
BSHG	BUSHING
CAB	CABINET
CAP	CAPACITOR
CER	CERAMIC
CHAS	CHASSIS
CKT	CIRCUIT
COMP	COMPOSITION
CONN	CONNECTOR
COV	COVER
CPLG	COUPLING
CRT	CATHODE RAY TUBE
DEG	DEGREE
DWR	DRAWER
ELCTRN	ELECTRON
ELEC	ELECTRICAL
ELCTLT	ELECTROLYTIC
ELEM	ELEMENT
EPL	ELECTRICAL PARTS LIST
EQPT	EQUIPMENT
EXT	EXTERNAL
FIL	FILLISTER HEAD
FLEX	FLEXIBLE
FLH	FLAT HEAD
FLTR	FILTER
FR	FRAME or FRONT
FSTNR	FASTENER
FT	FOOT
FXD	FIXED
GSKT	GASKET
HDL	HANDLE
HEX	HEXAGON
HEX HD	HEXAGONAL HEAD
HEX SOC	HEXAGONAL SOCKET
HLCPS	HELICAL COMPRESSION
HLEXT	HELICAL EXTENSION
HV	HIGH VOLTAGE
IC	INTEGRATED CIRCUIT
ID	INSIDE DIAMETER
IDENT	IDENTIFICATION
IMPLR	IMPELLER
IN	INCH
INCAND	INCANDESCENT
INSUL	INSULATOR
INTL	INTERNAL
LPHLDR	LAMPHOLDER
MACH	MACHINE
MECH	MECHANICAL
MTG	MOUNTING
NIP	NIPPLE
NON WIRE	NOT WIRE WOUND
OBD	ORDER BY DESCRIPTION
OD	OUTSIDE DIAMETER
OVH	OVAL HEAD
PH BRZ	PHOSPHOR BRONZE
PL	PLAIN or PLATE
PLSTC	PLASTIC
PN	PART NUMBER
PNH	PAN HEAD
PWR	POWER
RCPT	RECEPTACLE
RES	RESISTOR
RGD	RIGID
RLF	RELIEF
RTNR	RETAINER
SCH	SOCKET HEAD
SCOPE	OSCILLOSCOPE
SCR	SCREW
SE	SINGLE END
SECT	SECTION
SEMICOND	SEMICONDUCTOR
SHLD	SHIELD
SHLDR	SHOULDERED
SKT	SOCKET
SL	SLIDE
SLFLKG	SELF-LOCKING
SLVG	SLEEVING
SPR	SPRING
SQ	SQUARE
SST	STAINLESS STEEL
STL	STEEL
SW	SWITCH
T	TUBE
TERM	TERMINAL
THD	THREAD
THK	THICK
TNSN	TENSION
TPG	TAPPING
TRH	TRUSS HEAD
V	VOLTAGE
VAR	VARIABLE
W/	WITH
WSHR	WASHER
XFMR	TRANSFORMER
XSTR	TRANSISTOR

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
00779	AMP, INC.	P O BOX 3608	HARRISBURG, PA 17105
01009	ALDEN PRODUCTS COMPANY	117 N MAIN STREET	BROCKTON, MA 02403
01295	TEXAS INSTRUMENTS, INC., SEMICONDUCTOR GROUP	P O BOX 5012, 13500 N CENTRAL EXPRESSWAY	DALLAS, TX 75222
05820	WAKEFIELD ENGINEERING, INC.	AUDUBON ROAD	WAKEFIELD, MA 01880
08261	SPECTRA-STRIP CORP.	7100 LAMPSON AVE.	GARDEN GROVE, CA 92642
09133	KIERULFF ELECTRONICS, INC.	2585 COMMERCE WAY	LOS ANGELES, CA 90040
12327	FREEWAY CORPORATION	9301 ALLEN DRIVE	CLEVELAND, OH 44125
12360	ALBANY PRODUCTS CO., DIV. OF PNEUMO DYNAMICS CORPORATION	145 WOODWARD AVENUE	SOUTH NORWALK, CT 06586
22526	BERG ELECTRONICS, INC.	YOUK EXPRESSWAY	NEW CUMBERLAND, PA 17070
28520	HEYMAN MFG. CO.	147 N. MICHIGAN AVE.	KENILWORTH, NJ 07033
55210	GETTIG ENG. AND MFG. COMPANY	PO BOX 85, OFF ROUTE 45	SPRING MILLS, PA 16875
70485	ATLANTIC INDIA RUBBER WORKS, INC.	571 W. POLK ST.	CHICAGO, IL 60607
71159	BRISTOL SOCKET SCREW, DIV. OF AMERICAN CHAIN AND CABLE CO., INC.	P O BOX 2244, 40 BRISTOL ST.	WATERBURY, CT 06720
71468	ITT CANNON ELECTRIC	666 E. DYER RD.	SANTA ANA, CA 92702
71590	CENTRALAB ELECTRONICS, DIV. OF GLOBE-UNION, INC.	P O BOX 858	FORT DODGE, IA 50501
71785	TRW, CINCH CONNECTORS	1501 MORSE AVENUE	ELK GROVE VILLAGE, IL 60007
73743	FISCHER SPECIAL MFG. CO.	446 MORGAN ST.	CINCINNATI, OH 45206
73803	TEXAS INSTRUMENTS, INC., METALLURGICAL MATERIALS DIV.	34 FOREST STREET	ATTLEBORO, MA 02703
74445	HOLO-KROME CO.	31 BROOK ST. WEST	HARTFORD, CT 06110
75915	LITTELFUSE, INC.	800 E. NORTHWEST HWY	DES PLAINES, IL 60016
77820	BENDIX CORP., THE, ELECTRICAL COMPONENTS DIVISION	SHERMAN AVE.	SIDNEY, NY 13838
78189	ILLINOIS TOOL WORKS, INC. SHAKEPROOF DIVISION	ST. CHARLES ROAD	ELGIN, IL 60120
78471	TILLEY MFG. CO.	900 INDUSTRIAL RD.	SAN CARLOS, CA 94070
79136	WALDES, KOHINOOR, INC.	47-16 AUSTEL PLACE	LONG ISLAND CITY, NY 11101
79807	WROUGHT WASHER MFG. CO.	2100 S. O BAY ST.	MILWAUKEE, WI 53207
80009	TEKTRONIX, INC.	P O BOX 500	BEAVERTON, OR 97077
83385	CENTRAL SCREW CO.	2530 CRESCENT DR.	BROADVIEW, IL 60153
83907	ACCURATE RUBBER PRODUCTS CO.	123 N. RACINE	CHICAGO, IL 60607
86928	SEASTROM MFG. COMPANY, INC.	701 SONORA AVENUE	GLENDALE, CA 91201
95937	FEDERAL TELEVISION DIV., CARDWELL CONDENSER CORPORATION	80 E MONTAUK HIGHWAY	LINDENHURST, NY 11757
95987	WECKESSER CO., INC.	4444 WEST IRVING PARK RD.	CHICAGO, IL 60641
96904	NATVAR CORP.	211 RANDOLPH AVE.	WOODBRIDGE, NJ 07095

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-1	390-0270-00[1]			1		COVER,MONITOR:LEFT	80009	390-0270-00
	390-0543-00[2]			1		CAB.SIDE,MON:	80009	390-0543-00
	214-0812-00			2		. FASTENER,PAWL:	80009	214-0812-00
-2	386-0226-00			2		. . PL,LATCH LKG:FOR 0.080 INCH THICKNESS	80009	386-0226-00
-3	386-0227-00			2		. . PL,LATCH INDEX:	80009	386-0227-00
-4	214-0603-01			2		. . PIN,SECURING:0.27 INCH LONG	80009	214-0603-01
-5	214-0604-00			2		. . WASH.,SPG TNSN:0.26 ID X 0.47 INCH OD	80009	214-0604-00
-6	390-0244-00[1]			1		COVER,MONITOR:RIGHT	80009	390-0244-00
	390-0543-00[2]			1		CAB.SIDE,MON:	80009	390-0543-00
	214-0812-00			2		. FASTENER,PAWL:	80009	214-0812-00
-7	386-0226-00			2		. . PL,LATCH LKG:FOR 0.080 INCH THICKNESS	80009	386-0226-00
-8	386-0227-00			2		. . PL,LATCH INDEX:	80009	386-0227-00
-9	214-0603-01			2		. . PIN,SECURING:0.27 INCH LONG	80009	214-0603-01
-10	214-0604-00			2		. . WASH.,SPG TNSN:0.26 ID X 0.47 INCH OD	80009	214-0604-00
-11	348-0275-00[3]			1		FLIPSTAND,CAB.:	80009	348-0275-00
-12	390-0280-00[1,3]			1		COVER,SCOPE:BOTTOM	80009	390-0280-00
	390-0523-00[2]			1		COVER,SCOPE:BOTTOM	80009	390-0523-00
	214-0812-00			4		. FASTENER,PAWL:	80009	214-0812-00
-13	386-0226-00			4		. . PL,LATCH LKG:FOR 0.080 INCH THICKNESS	80009	386-0226-00
-14	386-0227-00			4		. . PL,LATCH INDEX:	80009	386-0227-00
-15	214-0603-01			4		. . PIN,SECURING:0.27 INCH LONG	80009	214-0603-01
-16	214-0604-00			4		. . WASH.,SPG TNSN:0.26 ID X 0.47 INCH OD	80009	214-0604-00
-17	348-0074-00			2		. SPT PIVOT,FLIP:RIGHT FRONT AND LEFT REAR	80009	348-0074-00
						(ATTACHING PARTS FOR EACH)		
-18	211-0532-00			2		. SCREW,MACHINE:6-32 X 0.75 INCH,FILH STL	83385	OBD
-19	210-0457-00			2		. NUT,PLAIN,EXT W:6-32 X 0.312 INCH,STL	83385	OBD
						- - - * - - -		
-20	348-0207-00			2		. FOOT,CABINET:RIGHT FRONT AND LEFT REAR	80009	348-0207-00
-21	348-0073-00			2		. SPT PIVOT,FLIP:LEFT FRONT AND RIGHT REAR	80009	348-0073-00
						(ATTACHING PARTS FOR EACH)		
-22	211-0532-00			2		. SCREW,MACHINE:6-32 X 0.75 INCH,FILH STL	83385	OBD
-23	210-0457-00			2		. NUT,PLAIN,EXT W:6-32 X 0.312 INCH,STL	83385	OBD
						- - - * - - -		
-24	348-0208-00			2		. FOOT,CABINET:LEFT FRONT AND RIGHT REAR	80009	348-0208-00
	390-0281-00[4]			1		COVER,SCOPE:BOTTOM	80009	390-0281-00
	214-0812-00			4		. FASTENER,PAWL:	80009	214-0812-00
	386-0226-00			4		. . PL,LATCH LKG:FOR 0.080 INCH THICKNESS	80009	386-0226-00
	386-0227-00			4		. . PL,LATCH INDEX:	80009	386-0227-00
	214-0603-01			4		. . PIN,SECURING:0.27 INCH LONG	80009	214-0603-01
	214-0604-00			4		. . WASH.,SPG TNSN:0.26 ID X 0.47 INCH OD	80009	214-0604-00
-25	200-0728-00[3]			2		COV,HANDLE END:	80009	200-0728-00
-26	367-0116-00[3]			1		HANDLE,CARRYING:	80009	367-0116-00
						(ATTACHING PARTS)		
-27	212-0597-00[3]			4		SCREW,MACHINE:10-32 X 0.50 INCH,STL	83385	OBD
-28	386-1624-00[3]			2		PL,RET.,HANDLE:	80009	386-1624-00
-29	386-1283-00[3]			2		PLATE,HDL MTG:PLASTIC	80009	386-1283-00
						- - - * - - -		
-30	200-1661-00[1]			1		RTNR,CRT SCALE:	80009	200-1661-00
	200-1661-02[2]			1		RTNR,CRT SCALE:605 OPT 06	80009	200-1661-02
						(ATTACHING PARTS)		
-31	211-0188-00			2		SCREW,MACHINE:4-40 X 0.30 INCH,SST	80009	211-0188-00
						- - - * - - -		
-32	337-1674-06			1		SHLD,ELCTRN TUB:CRT	80009	337-1674-06
-33	386-2340-00			4		SUPPORT,CRT:FRONT	80009	386-2340-00
-34	386-2899-00			1		SUPPORT,CRT:FRONT	80009	386-2899-00
-35	384-1270-00			1		EXTENSION SHAFT:	80009	384-1270-00
-36	385-0033-00			1		INS,STANDOFF:0.625 INCH LONG,NYLON	80009	385-0033-00
						(ATTACHING PARTS)		
-37	211-0538-00			1		SCREW,MACHINE:6-32 X 0.312"100 DEG,FLH STL	83385	OBD
						- - - * - - -		
-38	376-0127-00			1		COUPLER,SHAFT:PLASTIC	80009	376-0127-00
-39	358-0216-00			1		BUSHING,PLASTIC:0.257 ID X 0.412 INCH OD	80009	358-0216-00
-40	366-1023-01			1		KNOB:GRAY	80009	366-1023-01

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[1]Remove for Option 6.
[2]Option 6 only.
[3]Remove for Option 3 and 7.
[4]Option 3 only.

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-	213-0246-00			1		. SETSCREW:5-40 X 0.093 INCH L,HEX SOC	71159	OBD
-41	----- -----			1		RESISTOR,VAR:(SEE R895 EPL)		
						(ATTACHING PARTS)		
-42	210-0583-00			1		NUT,PLAIN,HEX.:0.25-32 X 0.312 INCH,BRS	73743	2X20224-402
-43	210-0940-00			1		WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL	79807	OBD
-44	210-0046-00			1		WASHER,LOCK:INTL,0.26 ID X 0.40" OD,STL	78189	1214-05-00-0541C
						- - - * - - -		
-45	426-0681-00			2		FR,PUSH BUTTON:GRAY PLASTIC	80009	426-0681-00
-46	333-1876-01			1		PANEL,FRONT:	80009	333-1876-01
-47	200-1282-00[1]			1		DOOR,ACCESS:	80009	200-1282-00
-48	333-1875-00[1]			1		PANEL,FRONT:	80009	333-1875-00
-49	386-2067-00			1		SUBPANEL,FRONT:	80009	386-2067-00
						(ATTACHING PARTS)		
-50	210-0406-00			3		NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
-51	210-0054-00			3		WASHER,LOCK:SPLIT,0.118 ID X 0.212"OD STL	83385	OBD
						- - - * - - -		
-52	200-1308-00[2]	B010100	B010499	1		COVER,CRT,REAR:	80009	200-1308-00
	200-1308-01[3]	B010500		1		COVER,CRT,REAR:	80009	200-1308-01
	200-1308-01[4]			1		COVER,CRT,REAR:	80009	200-1308-01
						(ATTACHING PARTS)		
-53	211-0097-00			5		SCREW,MACHINE:4-40 X 0.312 INCH,PNH STL	83385	OBD
						- - - * - - -		
-54	358-0515-00[2]	B010100	B010499	1		BSHG,STRAIN RLF:TOP	80009	358-0515-00
-55	358-0516-00[2]	B010100	B010499	1		BSHG,STRAIN RLF:BOTTOM	80009	358-0516-00
	358-0529-00[3]	B010500		1		BSHG,STRAIN RLF:FOR 0.3-0.36 OD CABLE,STR	28520	SR-63P-4
	358-0529-00[4]			1		BSHG,STRAIN RLF:FOR 0.3-0.36 OD CABLE,STR	28520	SR-63P-4
-56	200-1646-00[2]	B010100	B010499	1		CABLE NIP,PWR:1.500 X 0.625 ID W/FLANGE	80009	200-1646-00
-57	214-2038-00[2]	B010100	B010499	1		IND,LINE V:	80009	214-2038-00
	334-2551-00[4]			1		MARKER,IDENT:MKD WARNING POWER PLUG	80009	334-2551-00
-58	161-0033-12[2]	B010100	B010499	1		CABLE ASSY,PWR:	80009	161-0033-12
	161-0017-10[2]	B010500		1		CABLE ASSY,PWR:	80009	161-0017-10
	161-0106-00			1		CABLE ASSY,PWR,:3,18 AWG,115V,70.0 L	80009	161-0106-00
-59	346-0045-00			3		STRAP,CONN COV:PLASTIC	80009	346-0045-00
-60	200-0991-00			3		COV,ELEC CONN:BNC ,W/CTR GND	77820	2096-5
-61	----- -----			6		CONN,RCPT,:(SEE J200,300,400,500,600,650 EPL)		
-62	210-0255-00			6		TERMINAL,LUG:0.391" ID INT TOOTH	80009	210-0255-00
-63	342-0117-00			12		INSULATOR,BSHG:	80009	342-0117-00
-64	----- -----			1		RESISTOR,VAR:(SEE R145 EPL)		
						(ATTACHING PARTS)		
-65	210-0583-00			1		NUT,PLAIN,HEX.:0.25-32 X 0.312 INCH,BRS	73743	2X20224-402
-66	210-0940-00			1		WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL	79807	OBD
-67	210-0046-00			1		WASHER,LOCK:INTL,0.26 ID X 0.40" OD,STL	78189	1214-05-00-0541C
						- - - * - - -		
-68	----- -----			1		TRANSFORMER:(SEE T15 EPL)		
-69	343-0267-00			2		BRACKET,XFMR:	80009	343-0267-00
						(ATTACHING PARTS)		
-70	212-0100-00			4		SCREW,MACHINE:8-32 X 0.625 INCH,HEX.HD,STL	83385	OBD
-71	210-0804-00			4		WASHER,FLAT:0.17 ID X 0.375 INCH OD,STL	12327	OBD
-72	210-0458-00			4		NUT,PLAIN,EXT W:8-32 X 0.344 INCH,STL	83385	OBD
						- - - * - - -		
-73	333-1829-00[2]			1		PANEL,REAR:	80009	333-1829-00
	333-1829-01[4]			1		PANEL,REAR:605 OPT 6	80009	333-1829-01
-74	352-0076-00			1		FUSEHOLDER:W/HARDWARE	75915	342012
-75	210-0873-00			1		WASHER,NONMETAL:0.5 ID X 0.688 INCH OD,NPRN	70485	OBD
-76	----- -----			1		CONTACT,ELEC:(SEE J20 EPL)		
						(ATTACHING PARTS)		
-77	211-0101-00			2		SCREW,MACHINE:4-40 X 0.25" 100 DEG,FLH STL	83385	OBD
-78	210-0406-00			2		NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
-79	210-0004-00			2		WASHER,LOCK:INTL,0.12 ID X 0.26"OD,STL	78189	1204-00-00-0541C
						- - - * - - -		
-80	210-0201-00	B010100	B010299	1		TERMINAL,LUG:SE #4	78189	2104-04-00-2520N

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VK5EM

[1]Remove for Option 4.
[2]Remove for Option 6.
[3]607 only.
[4]Option 6 only.

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-	210-0202-00	B010300		1		TERMINAL,LUG:SE #6	78189	2104-06-00-2520N
						(ATTACHING PARTS)		
-81	210-0586-00	B010100	B010299	1		NUT,PLAIN,EXT W:4-40 X 0.25 INCH,STL	78189	OBD
	210-0457-00	B010300		1		NUT,PLAIN,EXT W:6-32 X 0.312 INCH,STL	83385	OBD
						- - - * - - -		
-82	426-1111-00[1]	B010100	B010299	1		FRAME ASSY,MON:	80009	426-1111-00
	426-1111-01[1]	B010300	B010499	1		FRAME ASSY,MON:605	80009	426-1111-01
	426-1301-00[2]	B010500		1		FRAME,MONITOR:	80009	426-1301-00
	426-1301-00[3]			1		FRAME,MONITOR:	80009	426-1301-00

[1]Remove for Option 6.
[2]607 only.
[3]Option 6 only.

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
2-1	366-1432-00			3		KNOB:GRAY,W/SPRING	80009	366-1432-00
-2	366-1369-00			1		KNOB:GRAY	80009	366-1369-00
	213-0153-00			1		. SETSCREW:5-40 X 0.125 INCH,HEX SOC STL	74445	OBD
-3	366-1257-84			1		PUSH BUTTON:GRAY--ERASE	80009	366-1257-84
-4	366-1257-85			1		PUSH BUTTON:GRAY--STORE	80009	366-1257-85
-5	384-1121-00			1		EXTENSION SHAFT:1.41 INCH LONG	80009	384-1121-00
-6	384-1099-00			1		EXTENSION SHAFT:PUSH BUTTON,1.54 INCH LONG	80009	384-1099-00
-7	384-1061-00			1		EXTENSION SHAFT:3.981 INCH LONG	80009	384-1061-00
-8	----- -----			1		CKT BOARD ASSY:STORAGE(SEE A5 EPL)		
						(ATTACHING PARTS)		
-9	211-0008-00			6		SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL	83385	OBD
						- - - * - - -		
	----- -----			-		. CKT BOARD ASSEMBLY INCLUDES:		
-10	131-1635-00			1		. CONTACT,ELEC:GND	80009	131-1635-00
-11	----- -----			2		. RESISTOR,VAR:(SEE R240 AND R440 EPL)		
-12	----- -----			1		. RESISTOR,VAR:(SEE R970 EPL)		
-13	----- -----			1		. RESISTOR,VAR:(SEE R175 EPL)		
-14	----- -----			1		. SWITCH,PUSH:(SEE S870 EPL)		
-15	----- -----			1		. SWITCH,PUSH:(SEE S910 EPL)		
-16	131-0566-00[1]			1		. LINK,TERM.CONNE:0.086 DIA X 2.375 INCH L	55210	L-2007-1
	131-0566-00[1]			2		. LINK,TERM.CONNE:0.086 DIA X 2.375 INCH L	55210	L-2007-1
-17	214-0579-00[2]			4		. TERM.,TEST PT:0.40 INCH LONG	80009	214-0579-00
	214-0579-00[1]			3		. TERM.,TEST PT:0.40 INCH LONG	80009	214-0579-00
-18	131-0608-00[2]			18		. CONTACT,ELEC:0.365 L X 0.25 PH BRZ GOLD PL	22526	47357
-19	136-0269-02			4		. SOCKET,PLUG-IN:14 CONTACT,LOW CLEARANCE	01295	C931402
	198-3043-00			1		. WIRE SET,ELEC:	80009	198-3043-00
	162-0009-00	XB020300		FT		. . INS SLV,ELEC:0.234 ID,VINYL,BLK,105 DEG	96904	TYPE 400SIZE3BLK
-20	175-0829-00			FT		. . WIRE,ELECTRICAL:6 WIRE RIBBON	08261	OBD
-21	175-0828-00			FT		. . WIRE,ELECTRICAL:5 WIRE RIBBON	08261	OBD
-22	175-0827-00[3]			FT		. . WIRE,ELECTRICAL:4 WIRE RIBBON	80009	175-0827-00
	342-0393-00[3]	XB010500		1		INSUL,CKT BD:STORAGE	80009	342-0393-00
-23	348-0051-00			1		GROMMET,RUBBER:0.938 INCH DIA	83907	1107
-24	343-0006-00			1		CLAMP,LOOP:0.50 INCH DIAMETER,PLSTC	95987	1-2-6B
						(ATTACHING PARTS)		
-25	211-0114-00			1		SCREW,MACHINE:4-40 X 0.438 INCH,FLH STL	83385	OBD
	210-0994-00			1		WASHER,FLAT:0.125 ID X 0.25" OD,STL	86928	5714-147-20N
-26	210-0863-00			1		WSHR,LOOP CLAMP:FOR 0.50" WIDE CLAMP,STL	95987	C191
						- - - * - - -		
-27	337-2006-00			1		SHLD,ELECTRICAL:HIGH VOLTAGE	80009	337-2006-00
						(ATTACHING PARTS)		
-28	211-0008-00			2		SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL	83385	OBD
						- - - * - - -		
	----- -----			-		. SHIELD INCLUDES:		
-29	342-0264-00			1		. INSULATOR,SHLD:HV	80009	342-0264-00
	342-0249-00			1		. INSULATOR,SHLD:3.82 X 1.87 IN,POLYEST FILM	80009	342-0249-00
-30	343-0521-00			1		CLAMP,XSTR:750 WIDE W(2)4-40 THD HOLE	80009	343-0521-00
						(ATTACHING PARTS)		
-31	211-0014-00			1		SCREW,MACHINE:4-40 X 0.50 INCH,PNH STL	83385	OBD
						- - - * - - -		
-32	342-0082-00			1		INSULATOR,PLATE:0.52 SQ X 0.015 INCH THK,AL	80009	342-0082-00
-33	384-0539-00			1		ROD,SPACER:0.375 X 0.750 INCH	80009	384-0539-00
						(ATTACHING PARTS)		
-34	211-0231-00			1		SCREW,MACHINE:4-40 X 1.0 PNH,SST,PSVT,POZ	83385	OBD
-35	210-1001-00			1		WASHER,FLAT:0.119 ID X 0.375" OD,BRS	12360	OBD
-36	210-0586-00			1		NUT,PLAIN,EXT W:4-40 X 0.25 INCH,STL	78189	OBD
-37	210-0958-00			1		WASHER,FLAT:0.115 ID X 0.469 INCH OD,STL	78471	OBD
						- - - * - - -		
-38	334-2360-00			1		MARKER,IDENT:WARNING	80009	334-2360-00
	334-2363-00			1		MARKER INDENT:WARNING,DANGER,HV	80009	334-2363-00
-39	343-0213-00[4]			1		CLAMP,LOOP:PRESS MT,PLASTIC	80009	343-0213-00
	334-3275-00[4]			1		MARKER,IDENT:MARKED UL APPROVED OPT 9		
-40	441-1224-00			1		CHAS,ELEC EQPT:STORAGE	80009	441-1224-00

[1]Option 8 only.
[2]Standard only.
[3]Option 6 only.
[4]Option 9 only.

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
2-	441-1224-00[1]	B010100	B010499	1		CHAS,ELEC EQPT:STORAGE	80009	441-1224-00
	441-1413-00[1]	B010500		1		CHAS,DSPL UNIT:	80009	441-1413-00
						(ATTACHING PARTS)		
-41	211-0538-00			2		SCREW,MACHINE:6-32 X 0.312"100 DEG,FLH STL	83385	OBD
-42	210-0457-00			2		NUT,PLAIN,EXT W:6-32 X 0.312 INCH,STL	83385	OBD
-43	211-0008-00			2		SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL	83385	OBD
						- - - * - - -		
-44	----- -----			1		CKT BOARD ASSY:HIGH VOLTAGE(SEE A2 EPL)		
						(ATTACHING PARTS)		
-45	211-0008-00			2		SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL	83385	OBD
						- - - * - - -		
	----- -----			-		. CKT BOARD ASSY INCLUDES:		
	131-0566-00	B010280		1		. LINK,TERM.CONNE:0.086 DIA X 2.375 INCH L	55210	L-2007-1
-46	344-0154-00			2		. CLIP,ELECTRICAL:FOR 0.25 INCH DIA FUSE	80009	344-0154-00
-47	136-0514-00			1		. SOCKET,PLUG IN:MICROCIRCUIT,8 CONTACT	73803	C9308-02
-48	175-0830-00			FT		. WIRE,ELECTRICAL:7 WIRE RIBBON	08261	OBD
	342-0412-00[2]	XB010500		1		INSUL,CKT BD:HIGH VOLTAGE	80009	342-0412-00
-49	----- -----			1		CKT BOARD ASSY:Z AXIS(SEE A4 EPL)		
						(ATTACHING PARTS)		
-50	211-0008-00			2		SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL	83385	OBD
						- - - * - - -		
	----- -----			-		. CKT BOARD ASSY INCLUDES:		
-51	131-0566-00[3]			1		. LINK,TERM.CONNE:0.086 DIA X 2.375 INCH L	55210	L-2007-1
-52	351-0280-00			2		. GUIDE-POST,LOCK:0.620 INCH LONG	80009	351-0280-00
-53	136-0252-04			6		. SOCKET,PIN TERM:0.188 INCH LONG	22526	75060
-54	214-0579-00			9		. TERM.,TEST PT:0.40 INCH LONG	80009	214-0579-00
-55	214-1291-00			2		. HEAT SINK,ELEC:XSTR,0.72 OD X 0.375"H	05820	207-AB
-56	200-1075-00			1		COVER,ELEC CONN:PLASTIC	00779	1-480435-0
-57	----- -----			1		SWITCH PP:(SEE S12 EPL)		
-58	----- -----			1		SWITCH,THRMSTIC:(SEE S10 EPL)		
						(ATTACHING PARTS)		
-59	210-0586-00			2		NUT,PLAIN,EXT W:4-40 X 0.25 INCH,STL	78189	OBD
-60	334-2359-00			1		MARKER,IDENT:WARNING	80009	334-2359-00
	334-2360-00			1		MARKER,IDENT:WARNING	80009	334-2360-00
-61	343-0088-00			1		CLAMP,LOOP:0.062 INCH DIA	80009	343-0088-00
-62	351-0087-00			1		GUIDE,CKT CARD:4.75 INCH LONG,PLASTIC	80009	351-0087-00
-63	210-0201-00			1		TERMINAL,LUG:SE #4	78189	2104-04-00-2520N
						(ATTACHING PARTS)		
-64	211-0008-00			1		SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL	83385	OBD
-65	210-0586-00			1		NUT,PLAIN,EXT W:4-40 X 0.25 INCH,STL	78189	OBD
						- - - * - - -		
-66	441-1223-00[4]	B010100	B010499	1		CHAS,ELEC EQPT:HIGH VOLTAGE	80009	441-1223-00
	441-1327-00[5]	B010500		1		CHAS,ELEC EQPT:HIGH VOLTAGE	80009	441-1327-00
	441-1327-00[1]			1		CHAS,ELEC EQPT:HIGH VOLTAGE	80009	441-1327-00
						(ATTACHING PARTS)		
-67	211-0538-00			3		SCREW,MACHINE:6-32 X 0.312"100 DEG,FLH STL	83385	OBD
-68	210-0457-00			3		NUT,PLAIN,EXT W:6-32 X 0.312 INCH,STL	83385	OBD
-69	211-0025-00			1		SCREW,MACHINE:4-40 X 0.375 100 DEG,FLH STL	83385	OBD
	211-0114-00			1		SCREW,MACHINE:4-40 X 0.438 INCH,FLH STL	83385	OBD
-70	210-0586-00			2		NUT,PLAIN,EXT W:4-40 X 0.25 INCH,STL	78189	OBD
						- - - * - - -		
	----- -----			-		. CHASSIS INCLUDES:		
-71	342-0248-00			1		. INSULATOR,SHLD:3.23 X 2.23 IN,POLYEST FILM	80009	342-0248-00
-72	344-0131-00			2		. CLIP,SPG TENS:CIRCUIT CARD MOUNTING	80009	344-0131-00
						(ATTACHING PARTS FOR EACH)		
-73	210-0659-01			1		. EYELET,METALLIC:0.121 OD X 0.156 INCH LONG	80009	210-0659-01
						- - - * - - -		
-74	----- -----			1		CKT BOARD ASSY:POWER SUPPLY(SEE A1 EPL)		
						(ATTACHING PARTS)		
-75	211-0008-00			2		SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL	83385	OBD
						- - - * - - -		

[1]Option 6 and 9 only.
[2]Option 6 only.
[3]Remove for Option 4.
[4]Remove for Option 6.
[5]607 only.

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
2-	----- -----			-		. CKT BOARD ASSY INCLUDES:		
-76	131-0608-00			14		. CONTACT,ELEC:0.365 L X 0.25 PH BRZ GOLD PL	22526	47357
-77	214-0579-00			5		. TERM.,TEST PT:0.40 INCH LONG	80009	214-0579-00
-78	344-0154-00			2		. CLIP,ELECTRICAL:FOR 0.25 INCH DIA FUSE	80009	344-0154-00
-79	131-1895-00			1		. LINK,TERM. CONN:8,22 AWG,1.5 L	80009	131-1895-00
-80	131-1896-00			1		. LINK,TERM. CONN:8,22 AWG,1.5 L	80009	131-1896-00
-81	344-0236-00			3		CLIP,SPR TNSN:	80009	344-0236-00
-82	342-0082-00			3		INSULATOR,PLATE:0.52 SQ X 0.015 INCH THK,AL	80009	342-0082-00
-83	407-1498-00			1		BRACKET,ANGLE:	80009	407-1498-00
						(ATTACHING PARTS)		
-84	211-0008-00			2		SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL	83385	OBD
						- - - * - - -		
-85	----- -----			1		CKT BOARD ASSY:DEFLECTION(SEE A3 EPL)		
						(ATTACHING PARTS)		
-86	211-0008-00			2		SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL	83385	OBD
						- - - * - - -		
	----- -----			-		. CKT BOARD ASSY INCLUDES:		
-87	----- -----			4		. SWITCH,SLIDE:(SEE S200,S300,S400 AND S500 EPL)		
-88	131-0566-00[1]			2		. LINK,TERM.CONNE:0.086 DIA X 2.375 INCH L	55210	L-2007-1
-89	337-1995-00			1		. SHLD,ELECTRICAL:DEFLECTION CIRCUIT CARD	80009	337-1995-00
-90	136-0252-04			12		. SOCKET,PIN TERM:0.188 INCH LONG	22526	75060
-91	214-1291-00			1		. HEAT SINK,ELEC:XSTR,0.72 OD X 0.375"H	05820	207-AB
-92	175-0827-00			FT		. WIRE,ELECTRICAL:4 WIRE RIBBON	80009	175-0827-00
	342-0394-00[2]	XB0101500		1		INSUL,CKT BD:DEFLECTION 607 OPT 06	80009	342-0394-00
	334-2361-00			1		MARKER,IDENT:WARNING UP TO 80V ON THIS BOARD	80009	334-2361-00
	348-0233-00[2]			1		GROMMET,PLASTIC:GRAY,OVAL SHAPE,0.927 ID	80009	348-0233-00
-93	441-1222-00			1		CHAS,ELEC EQUIP:DEFLECTION	80009	441-1222-00
						(ATTACHING PARTS)		
-94	211-0538-00			2		SCREW,MACHINE:6-32 X 0.312"100 DEG,FLH STL	83385	OBD
-95	210-0457-00			2		NUT,PLAIN,EXT W:6-32 X 0.312 INCH,STL	83385	OBD
-96	211-0025-00			1		SCREW,MACHINE:4-40 X 0.375 100 DEG,FLH STL	83385	OBD
-97	211-0116-00			1		SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	OBD
-98	210-0586-00			2		NUT,PLAIN,EXT W:4-40 X 0.25 INCH,STL	78189	OBD
						- - - * - - -		
	----- -----			-		. CHASSIS ASSY INCLUDES:		
-99	344-0133-00			2		. CLIP,SPR,TNSN:CIRCUIT CARD MOUNTING	80009	344-0133-00
						(ATTACHING PARTS)		
-100	210-0659-01			1		. EYELET,METALLIC:0.121 OD X 0.156 INCH LONG	80009	210-0659-01
						- - - * - - -		
-101	386-2876-00			1		SUPPORT,CRT:CENTER	80009	386-2876-00
-102	----- -----			1		COIL,TUBE DEFL:(SEE L145 EPL)		
-103	334-1379-00			1		LABEL:CRT,ADHESIVE BACK	80009	334-1379-00
	334-1951-00			1		MARKER,IDENT:CRT WARNING	80009	334-1951-00
-104	348-0253-00			1		GROMMET,PLASTIC:1.24 X 0.739 X 0.108" OA	80009	348-0253-00
-105	343-0298-00			1		CLAMP,LOOP:PLASTIC,W/ADHESIVE BACK	95937	HPC25
-106	348-0064-00	B010100	B020299	1		GROMMET,PLASTIC:0.625 INCH DIA	80009	348-0064-00
	348-0518-00	B020300		1		GROMMET,PLASTIC:BLACK,ROUND,0.5 ID	28520	SB-625-8
	252-0570-00[2]	XB010500		FT		PLASTIC SHEET:	80009	252-0570-00
-107	337-2081-00			1		SHIELD,CRT:FRONT	80009	337-2081-00
-108	200-0616-01			1		COV,ELECTRON TU:	80009	200-0616-01
-109	136-0596-00	B010100	B020299	1		SOCKET,PLUG-IN:CRT,WIRED	80009	136-0596-00
	136-0596-01	B020300		1		SKT,PL-IN ELEK:W/SLEEVE	80009	136-0596-01
	136-0596-02[2]	XB0102080		1		SOCKET,PLUG-IN:ELCTRON TUBE,14 CONT,W/LEADS	80009	136-0596-02
	136-0301-01			1		. SOCKET,PLUG-IN:	80009	136-0301-01
-110	407-1128-00			1		BRKT,CRT SHIELD:REAR	80009	407-1128-00
						(ATTACHING PARTS)		
-111	211-0507-00			2		SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL	83385	OBD
-112	211-0589-00			1		SCREW,MACHINE:6-32 X 0.312 INCH,PNH BRS	83385	OBD
-113	220-0419-00			3		NUT,PLAIN,SQ:6-32 X 0.312 INCH,STL	83385	OBD
						- - - * - - -		
-114	348-0145-00			1		GROMMET,PLASTIC:U-SHP,1.0 X 0.42 INCH	80009	348-0145-00
-115	386-2246-00			1		SUPPORT,CRT:REAR	80009	386-2246-00

[1]Remove for Option 4.
[2]Option 6 only.

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
2-116	343-0217-00			1		CLAMP,COIL:Y-AXIS	80009	343-0217-00
						(ATTACHING PARTS)		
-117	211-0147-00			2		SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL	83385	OBD
						- - - * - - -		
-118	----- -----			1		COIL,TUBE DEFL:(SEE L172 EPL)		
-119	348-0004-00	B010100	B020299	1		GROMMET,RUBBER:0.281 ID X 0.563 INCH OD	70485	763
	348-0517-00	B020300		1		GROMMET,PLASTIC:BLACK,ROUND,0.25 ID	28520	SB-375-4
-120	337-1986-00			1		SHLD,ELCTRN TUB:REAR	80009	337-1986-00
	334-2361-00			1		MARKER,IDENT:WARNING UP TO 80V ON THIS BOARD	80009	334-2361-00
-121	179-2163-00			1		WIRING HARNESS,:POWER	80009	179-2163-00
-122	200-1075-00			3		. COVER,ELEC CONN:PLASTIC	00779	1-480435-0
-123	131-0861-00			3		. CONTACT,ELEC:QUICK DISCONNECT	00779	42617-2
-124	195-0165-00			1		LEAD SET,ELEC:CRT DEFLECTION	80009	195-0165-00
	131-1538-00			4		. CONTACT,ELEC:CRIMP-ON,22-26 AWG WIRE	22526	75369-002
-125	175-0825-00			FT		WIRE,ELECTRICAL:2 WIRE RIBBON	08261	OBD
-126	175-0828-00			FT		WIRE,ELECTRICAL:5 WIRE RIBBON	08261	OBD
	672-0654-00[1]			1		CKT BOARD ASSY:HV/MULTIPLIER	80009	672-0654-00
						(ATTACHING PARTS)		
	211-0008-00			1		SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL	83385	OBD
-127	211-0014-00			1		SCREW,MACHINE:4-40 X 0.50 INCH,PNH STL	83385	OBD
						- - - * - - -		
-128	166-0025-00			1		SPACER,SLEEVE:0.25 L X 0.125 ID,AL	71590	P07608-51
-129	----- -----			1		CKT BOARD ASSY:MULTIPLIER(SEE A6 EPL)		
-130	131-0773-00			1		. LEAD,ELECTRICAL:18.0 INCH LONG	01009	8111LFD
-131	----- -----			1		CKT BOARD ASSY:HIGH VOLTAGE(SEE A2 EPL)		
-132	344-0154-00			2		. CLIP,ELECTRICAL:FOR 0.25 INCH DIA FUSE	80009	344-0154-00
-133	386-1895-00			1		. SUPPORT,CKT BD:	80009	386-1895-00
-134	136-0514-00			1		. SOCKET,PLUG IN:MICROCIRCUIT,8 CONTACT	73803	C9308-02
-135	175-0830-00			FT		. . WIRE,ELECTRICAL:7 WIRE RIBBON	08261	OBD

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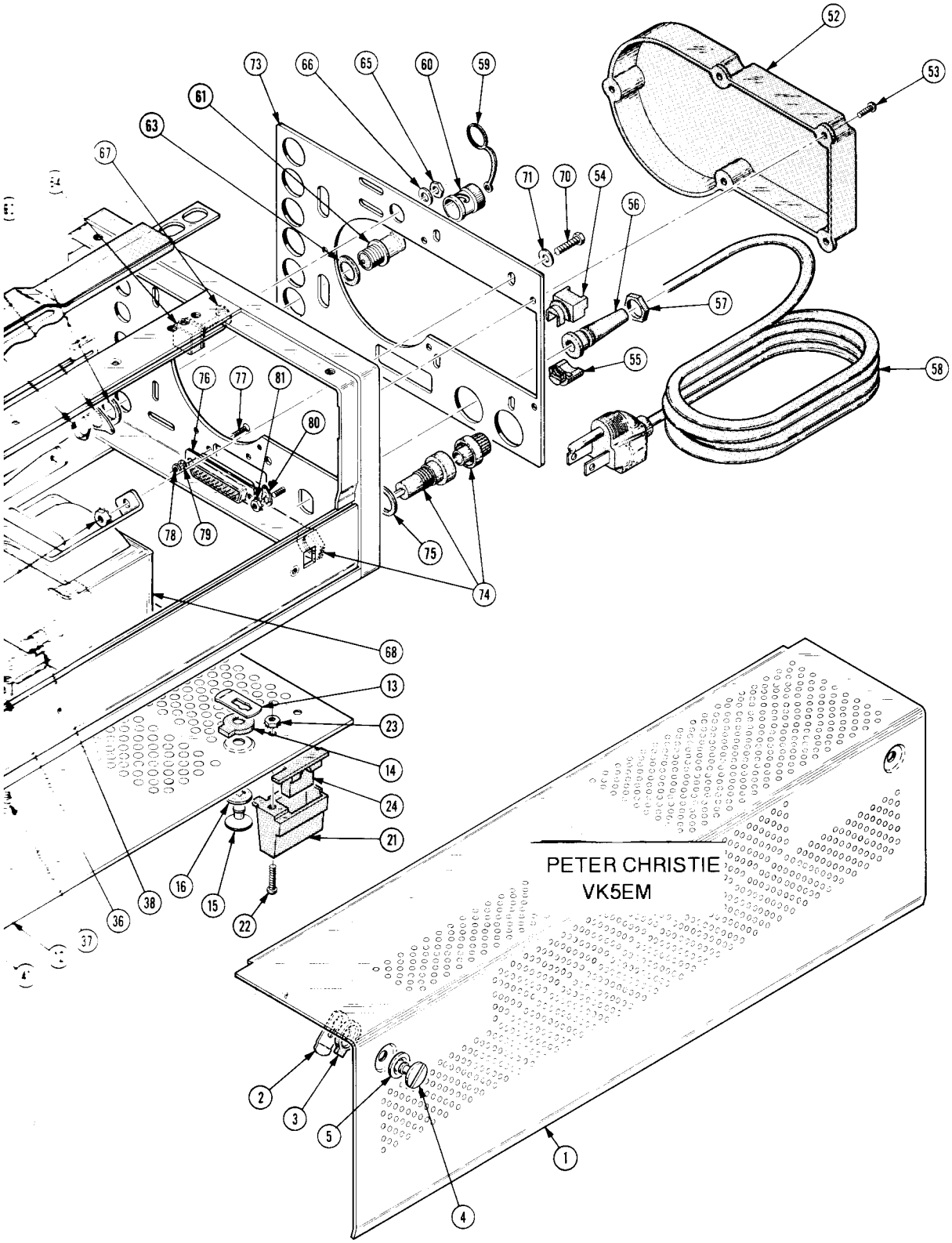
[1]Option 8 only.

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5 Name & Description	Mfr Code	Mfr Part Number
-1	366-1369-00			1	KNOB:GRAY	80009	366-1369-00
	213-0153-00			2	. SETSCREW:5-40 X 0.125 INCH,HEX SOC STL	74445	OBD
-2	333-2001-00			1	PANEL,FRONT:SWP OPTION 4	80009	333-2001-00
-3	----- -----			1	CKT BOARD ASSY:SWEEP(SEE A6 EPL)		
					(ATTACHING PARTS)		
	211-0008-00			4	SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL	83385	OBD
					- - - * - - -		
	----- -----			-	. CKT BOARD ASSY:INCLUDES:		
-4	384-1156-00			1	. EXTENSION SHAFT:2.20 INCH LONG	80009	384-1156-00
-5	376-0051-00			1	. CPLG,SHAFT,FLEX:FOR 0.125 INCH DIA SHAFTS	80009	376-0051-00
	213-0022-00			1	. . SETSCREW:4-40 X 0.188 INCH,HEX SOC STL	74445	OBD
-6	----- -----			1	. RESISTOR,VAR:(SEE R918 EPL)		
					(ATTACHING PARTS)		
-7	210-0583-00			1	. NUT,PLAIN,HEX.:0.25-32 X 0.312 INCH,BRS	73743	2X20224-402
	210-0590-00			1	. NUT,PLAIN,HEX.:0.375 X 0.438 INCH,STL	73743	2X28269-402
					- - - * - - -		
-8	386-2351-00			1	. PLATE,RES MTG:	80009	386-2351-00
-9	384-0284-00			1	. EXTENSION SHAFT:5.688 INCH LONG	80009	384-0284-00
-10	376-0051-00			1	. CPLG,SHAFT,FLEX:FOR 0.125 INCH DIA SHAFTS	80009	376-0051-00
	213-0048-00			4	. . SETSCREW:4-40 X 0.125 INCH,HEX SOC STL	74445	OBD
-11	----- -----			1	. RESISTOR,VAR:(SEE R945 EPL)		
					(ATTACHING PARTS)		
-12	210-0583-00			1	. NUT,PLAIN,HEX.:0.25-32 X 0.312 INCH,BRS	73743	2X20224-402
	210-0590-00			1	. NUT,PLAIN,HEX.:0.375 X 0.438 INCH,STL	73743	2X28269-402
					- - - * - - -		
-13	387-0794-00			1	. PLATE,CMPNT MTG:VAR RESISTOR	80009	387-0794-00
	----- -----			1	. DRUM ASSY,CAM SW:(SEE S1130 EPL)		
					(ATTACHING PARTS)		
-14	211-0116-00			4	. SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	OBD
					- - - * - - -		
	----- -----			-	. . DRUM ASSEMBLY INCLUDES:		
-15	200-1441-00			1	. . COVER,CAM SW.:7 ELEMENTS	80009	200-1441-00
-16	210-0406-00			2	. . NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
-17	214-1704-01			2	. . SPRING,FLAT:CAM SW DETENT,0.008 INCH THK	80009	214-1704-01
-18	214-1127-00			2	. . ROLLER,DETENT:0.125 DIA X 0.125 INCH L	80009	214-1127-00
-19	401-0155-00			1	. . BEARING,CAM SW:FRONT	80009	401-0155-00
					(ATTACHING PARTS)		
-20	354-0219-00			1	. . RING,RETAINING:FOR 0.25 INCH SHAFT	79136	5103-25-MD-R
					- - - * - - -		
-21	105-0388-00			1	. . DRUM,CAM SWITCH:	80009	105-0388-00
-22	210-0406-00			2	. . NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
-23	401-0156-00			1	. . BEARING,CAM SW:REAR	80009	401-0156-00
-24	136-0260-01			1	. SOCKET,PLUG-IN:16 CONTACT,RECT SHAPE	71785	133-51-02-075
-25	----- -----			1	. SWITCH,SLIDE:(SEE S1109 EPL)		
-26	131-0707-00			6	. CONTACT ELEC:0.48" L,22-26 AWG WIRE	22526	47439
-27	352-0166-05			1	. CONN BODY,PL,EL:8 WIRE GREEN	80009	352-0166-05
-28	175-0828-00			FT	. WIRE,ELECTRICAL:5 WIRE RIBBON	08261	OBD
-29	343-0298-00			1	CLAMP,LOOP:PLASTIC,W/ADHESIVE BACK	95937	HPC25
-30	179-1739-00			1	WIRING HARNESS:COAX	80009	179-1739-00


PETER CHRISTIE
VK5EM

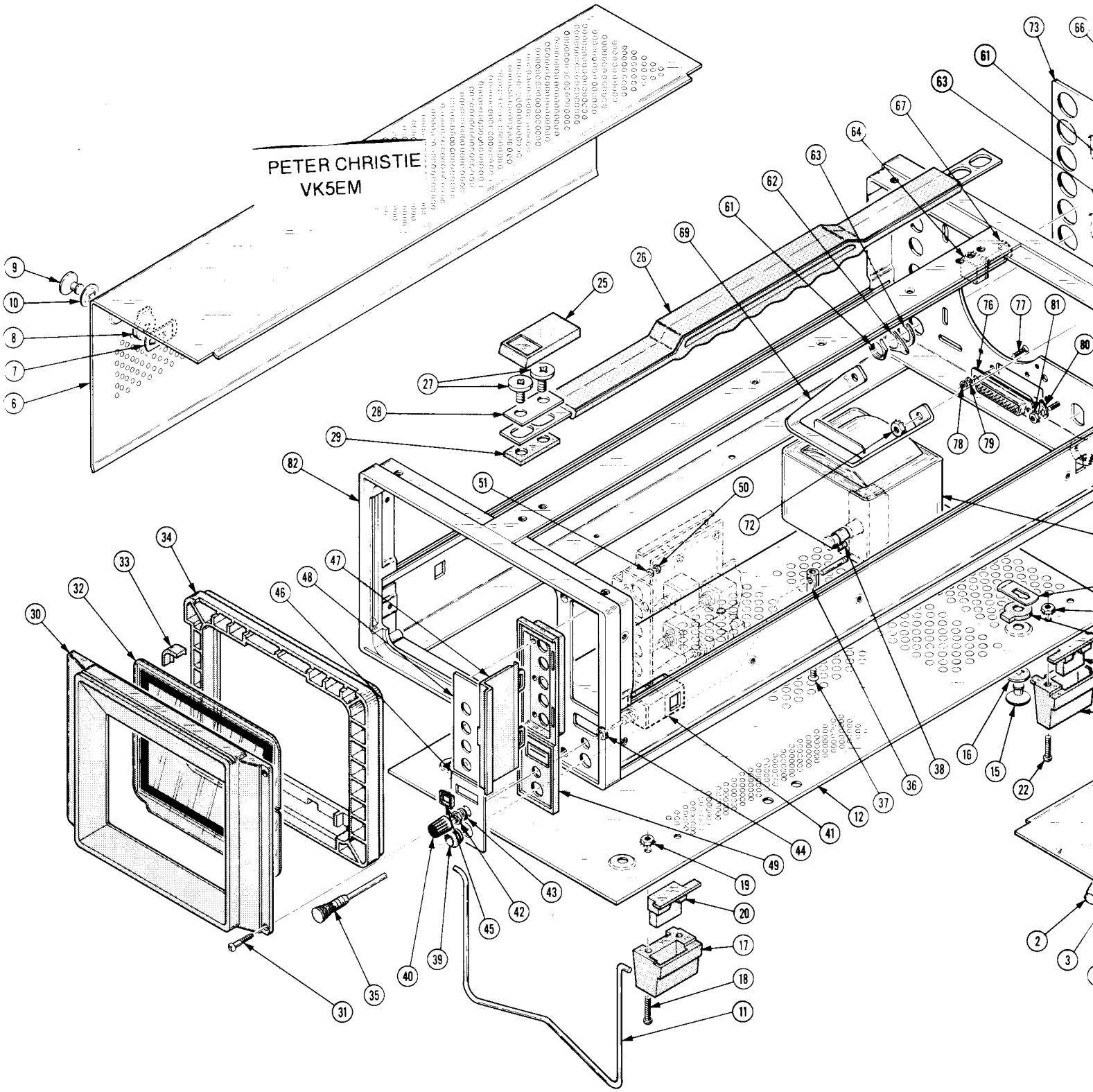
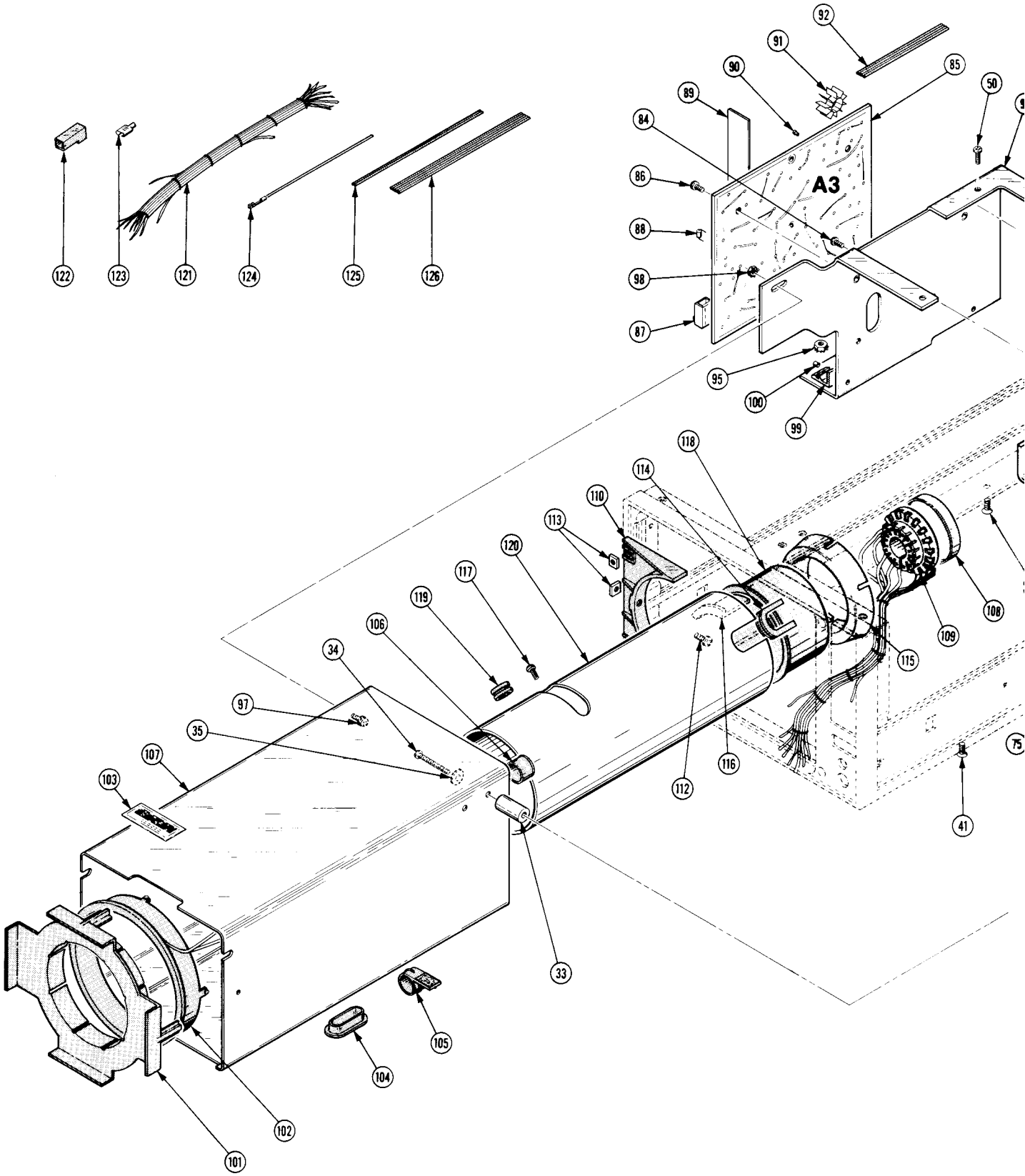
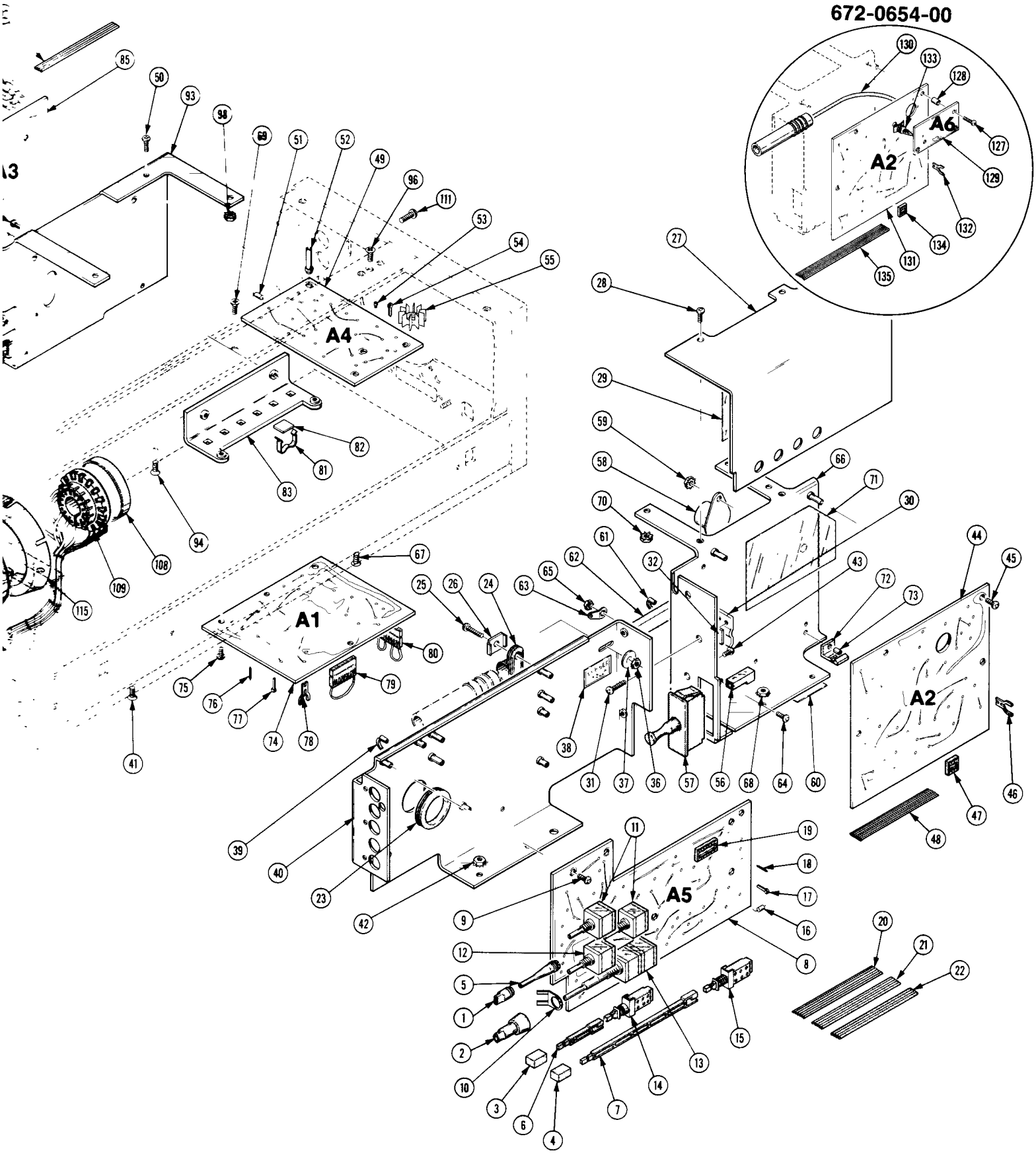

PETER CHRISTIE
VK5EM

FIG. 2 CRT & CIRCUIT BOARDS





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STANDARD ACCESSORIES

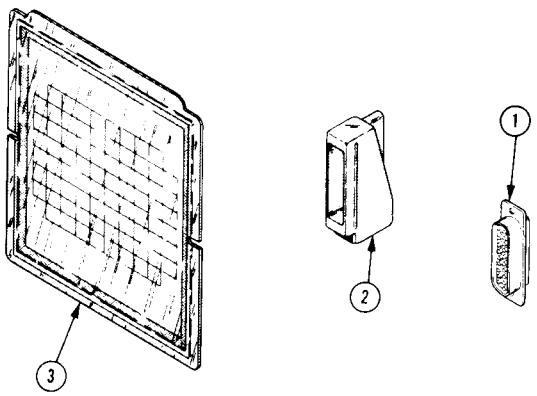
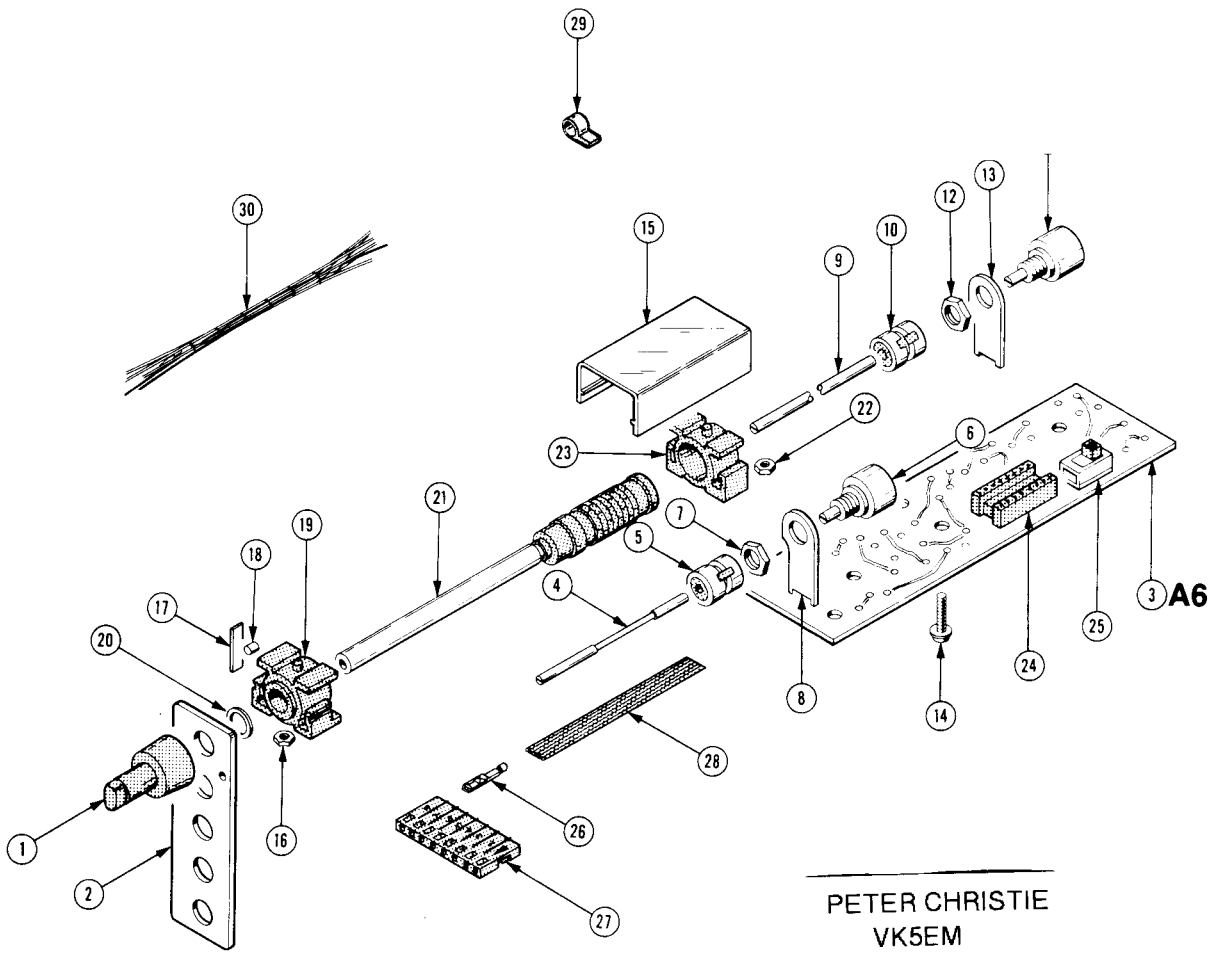


FIG. 3 ACCESSORIES

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty 1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
3-	070-2090-00			1	MANUAL,TECH:OPERATORS	80009	070-2090-00
	070-2091-00			1	MANUAL,TECH:INSTRUCTION	80009	070-2091-00
-1	131-0570-00			1	CONNECTOR,RCPT:25 PIN,MALE	71468	DB25P
-2	200-0821-00			1	COV,ELEC CONN:25 PIN	09133	DB-51213-1
-3	331-0391-00			1	SCALE,CRT:	80009	331-0391-00

Option 4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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.
111	PG 501 - Risetime less than 3.5 ns; 8 ns Pretrigger pulse delay.	111 - Risetime 0.5 ns; 30 to 250 ns Pretrigger Pulse delay.
114	PG 501 - ±5 V output.	114 - ±10 V output. Short proof output.
115	PG 501 - Does not have Paired, Burst, Gated, or Delayed pulse mode; ±5 V dc Offset. Has ±5 V output.	115 - Paired, Burst, Gated, and Delayed pulse mode; ±10 V output. Short-proof output.
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.
114	PG 502 - ±5 V output	114 - ±10 V output. Short proof output.
115	PG 502 - Does not have Paired, Burst, Gated, Delayed & Undelayed pulse mode; Has ±5 V output.	115 - Paired, Burst, Gated, Delayed & Undelayed pulse mode; ±10 V output. Short-proof output.
2101	PG 502 - Does not have Paired or Delayed pulse. Has ±5 V output.	2101 - Paired and Delayed pulse; 10 V output.
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	SG 503 - Frequency range 250 kHz to 250 MHz.	191 - Frequency range 350 kHz to 100 MHz.
067-0532-01	SG 503 - Frequency range 250 kHz to 250 MHz.	0532-01 - Frequency range 65 MHz to 500 MHz.
TG 501 replaces 180, 180A	TG 501 - Marker outputs, 5 sec to 1 ns. Sinewave available at 5, 2, and 1 ns. Trigger output - slaved to marker output from 5 sec through 100 ns. One time-mark can be generated at a time.	180A - Marker outputs, 5 sec to 1 μs. Sinewave available at 20, 10, and 2 ns. Trigger pulses 1, 10, 100 Hz; 1, 10, and 100 kHz. Multiple time-marks can be generated simultaneously.
181	TG 501 - Marker outputs, 5 sec to 1 ns. Sinewave available at 5, 2, and 1 ns.	181 - Marker outputs, 1, 10, 100, 1000, and 10,000 μs, plus 10 ns sinewave.
184	TG 501 - Marker outputs, 5 sec to 1 ns. Sinewave available at 5, 2, and 1 ns. Trigger output - slaved to marker output from 5 sec through 100 ns. One time-mark can be generated at a time.	184 - Marker outputs, 5 sec to 2 ns. Sinewave available at 50, 20, 10, 5, and 2 ns. Separate trigger pulses of 1 and .1 sec; 10, 1, and .1 ms; 10 and 1 μs. Marker amplifier provides positive or negative time marks of 25 V min. Marker intervals of 1 and .1 sec; 10, 1, and .1 ms; 10 and 1 μs.
2901	TG 501 - Marker outputs, 5 sec to 1 ns. Sinewave available at 5, 2, and 1 ns. Trigger output - slaved to marker output from 5 sec through 100 ns. One time-mark can be generated at a time.	2901 - Marker outputs, 5 sec to 0.1 μs. Sinewave available to 50, 10, and 5 ns. 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.

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MANUAL CHANGE INFORMATION

PRODUCT 607 MONITOR
070-2091-00

CHANGE REFERENCE C5/877
DATE 8-12-77

CHANGE:	DESCRIPTION

Pilot Changes #11 and #13

ELECTRICAL PARTS LIST AND SCHEMATIC CHANGES

CHANGE TO: (EFF SN B010500)

S200	260-1811-00	SWITCH,SLIDE:DPDT,0.5A,125VAC
S300	260-1811-00	SWITCH,SLIDE:DPDT,0.5A,125VAC
S400	260-1811-00	SWITCH,SLIDE:DPDT,0.5A,125VAC
S500	260-1811-00	SWITCH,SLIDE:DPDT,0.5A,125VAC
S220	260-1811-00	SWITCH,SLIDE:DPDT,0.5A,125VAC
S735	260-1811-00	SWITCH,SLIDE,DPDT,0.5A,125VAC

REMOVE: (EFF SN B010280)

R151	315-0154-00	RES.,FXD,CMPSN:150K OHM,5%,0.25W

ADD:

W151	131-0566-00	BUS,CONDUCTOR,DUMMY RESISTOR

R151 is replaced by W151 located on the HIGH-VOLTAGE POWER SUPPLY BOARD and shown on diagram 4 HIGH VOLTAGE POWER SUPPLY.

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