



WARNING

THE FOLLOWING SERVICING INSTRUCTIONS ARE FOR USE BY QUALIFIED PERSONNEL ONLY. TO AVOID PERSONAL INJURY, DO NOT PERFORM ANY SERVICING OTHER THAN THAT CONTAINED IN OPERATING INSTRUCTIONS UNLESS YOU ARE QUALIFIED TO DO SO.

**PLEASE CHECK FOR CHANGE INFORMATION
AT THE REAR OF THIS MANUAL.**

7603/R7603 OSCILLOSCOPE

SERVICE

INSTRUCTION MANUAL


Tektronix, Inc.
P.O. Box 500
Beaverton, Oregon 97077
070-1429-00,
Product Group 42

Serial Number _____

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INSTRUMENT SERIAL NUMBERS

Each instrument has a serial number on a panel insert, tag,
or stamped on the chassis. The first number or letter
designates the country of manufacture. The last five digits
of the serial number are assigned sequentially and are
unique to each instrument. Those manufactured in the
United States have six unique digits. The country of
manufacture is identified as follows:

| | |
|---------|---|
| B000000 | Tektronix, Inc., Beaverton, Oregon, USA |
| 100000 | Tektronix Guernsey, Ltd., Channel Islands |
| 200000 | Tektronix United Kingdom, Ltd., London |
| 300000 | Sony/Tektronix, Japan |
| 700000 | Tektronix Holland, NV, Heerenveen, The Netherlands |

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SAFETY SUMMARY

The general safety information contained in this summary is for servicing personnel. Specific warnings and cautions will be found throughout the manual where they apply, but may not appear in this summary.

TERMS

IN THIS MANUAL

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

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

AS MARKED ON EQUIPMENT

CAUTION indicates a personal injury hazard not immediately accessible as one reads the marking, or a hazard to property including the equipment itself.

DANGER indicates a personal injury hazard immediately accessible as one reads the marking.

SYMBOLS

IN THIS MANUAL



Static-Sensitive Devices



This symbol indicates where applicable cautionary or other information is to be found.

AS MARKED ON EQUIPMENT



DANGER—High voltage.



Protective ground (earth) terminal.



ATTENTION—refer to manual.

WARNINGS

POWER SOURCE

This product is intended to operate from a power source that will not apply more than 250 volts rms between the supply conductors or between either supply conductor and ground. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

USE THE PROPER POWER CORD

Use only the power cord and connector specified for your product. Use only a power cord that is in good condition.

GROUNDING THE PRODUCT

This product is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before making connections to the product input or output terminals. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

DANGER ARISING FROM LOSS OF GROUND

Upon loss of the protective-ground connection, all accessible conductive parts (including knobs and controls that may appear to be insulating), can render an electric shock.

USE THE PROPER FUSE

To avoid hazard, use only the fuse specified in the parts list for your product, and which is identical in type, voltage rating, and current rating.

DO NOT OPERATE IN EXPLOSIVE ATMOSPHERES

To avoid explosion, do not operate this product in an atmosphere of explosive gases unless it has been specifically certified for such operation.

DO NOT SERVICE ALONE

Do not perform internal service or adjustment of this product unless another person capable of rendering first aid and resuscitation is present.

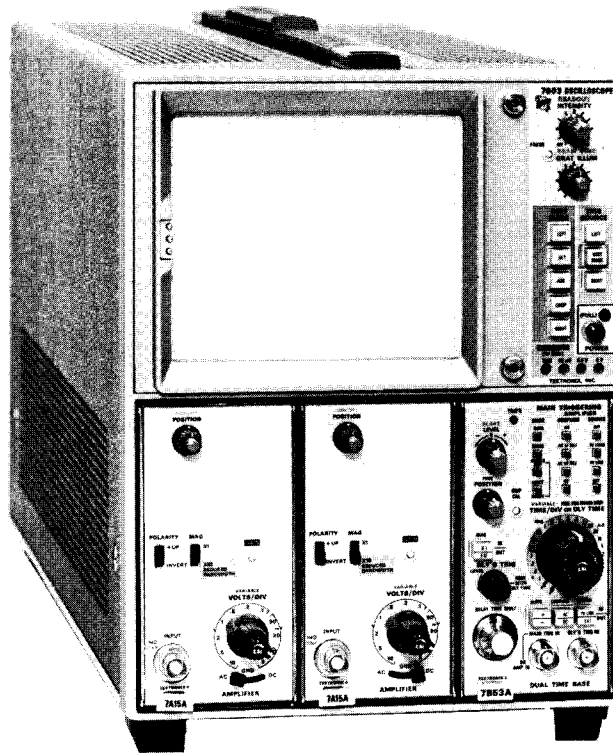
USE CARE WHEN SERVICING WITH POWER ON

Dangerous voltages exist at several points in this product. To avoid personal injury, do not touch exposed connections and components while power is on.

Disconnect power before removing protective panels, soldering, or replacing components.

SILICONE GREASE HANDLING

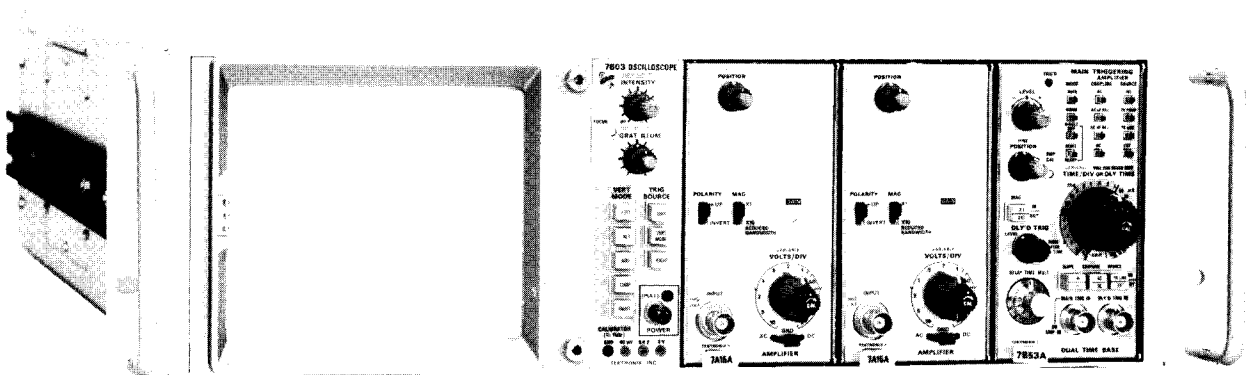
Handle silicone grease with care. Avoid getting the silicone grease in your eyes. Wash hands thoroughly after using silicone grease.



7603 Features

The TEKTRONIX 7603 Oscilloscope is a solid state, light weight instrument designed for general-purpose measuring applications. This instrument has three plug-in compartments that accept TEKTRONIX 7-series plug-in units to form a complete measurement system. The two plug-in compartments on the left are connected to the vertical deflection system. The right plug-in compartment is connected to the horizontal deflection system. Electronic switching between the vertical plug-in compartments allows a multi-trace vertical display. The flexibility of this plug-in feature and the variety of plug-in units available allow this system to be used for many measurement applications. In addition, the instrument contains a readout system to provide a CRT display of alphanumeric information from the plug-in units. Data such as deflection factor, sweep rate, etc. can be encoded and displayed on the CRT.

This instrument features a large-screen, 8 X 10 division display; each division equals 1.22 centimeters. The CRT provides small spot size and fast writing speed. Regulated DC power supplies assure that performance is not affected by variations in line voltage and frequency, or by changes in the load due to the varying power requirements of the plug-in units. Maximum power consumption is about 170 watts (60 hertz, 115-volt line).



OPERATING INSTRUCTIONS

General

To effectively use the 7603, the operation and capabilities of the instrument must be known. This section describes the operation of the front- and rear-panel controls and connectors and gives simplified and general operating information.

PRELIMINARY INFORMATION

Operating Voltage

WARNING

This instrument is designed for operation from a power source with its neutral at or near earth (ground) potential with a separate safety-earth conductor. It is not intended for operation from two phases of a multi-phase system, or across the legs of a single-phase, three-wire system.

The 7603 can be operated from either a 110-volt or a 220-volt nominal line-voltage source. In addition, three operating ranges can be selected within each nominal line voltage source. The voltage-selector jumper on the Rectifier board (see Fig. 1-1) allows selection of the operating voltage. To convert the instrument from one regulating range to another, first disconnect the instrument from the power source. Then, slide out the power unit as described in the Maintenance section. Remove the voltage-selector jumper and re-install it on the set of pins which represent the desired regulating range. Select a range which is centered about the average line voltage to which the instrument is to be connected (see Table 1-1).

TABLE 1-1
Regulating Range and Fuse Data

| Pins Selected | Regulating Range | |
|---------------|-------------------|-------------------|
| | 110-volts nominal | 220-volts nominal |
| LOW | 90 to 110 volts | 180 to 220 volts |
| MED | 99 to 121 volts | 198 to 242 volts |
| HI | 108 to 132 volts | 218 to 262 volts |
| Line Fuse | 3.2 A slow-blow | 1.6 A slow-blow |

To convert from 110-volts to 220-volts nominal line voltage, or vice versa, remove the voltage-selector jumper and replace it with the spare jumper (stored on pins adjacent to voltage selector area). The jumpers are color-

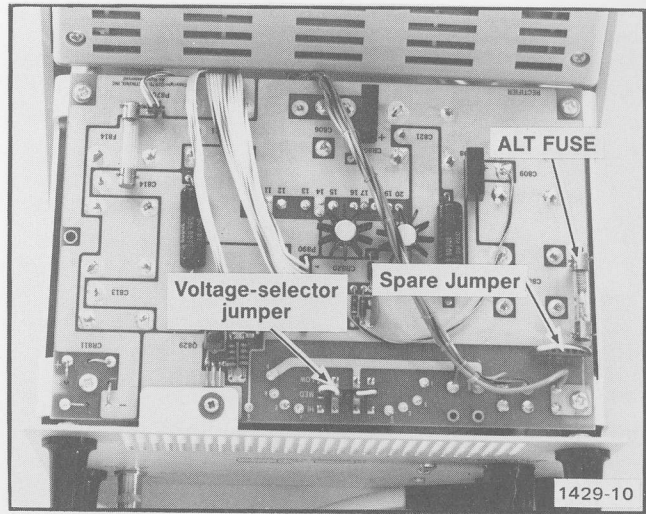


Fig. 1-1. Locations of voltage-selector jumper, spare jumper, and ALT FUSE in power unit (7603 shown).

coded to indicate the nominal voltage for which they are intended; brown for 110-volt nominal operation and red for 220-volt nominal operation. Change the line fuse to provide protection for the selected nominal line voltage. Use the fuse located in the ALT FUSE holder on the Rectifier board (see Fig. 1-1) or see Table 1-1 for value. Also, change the line-cord plug to match the power-source receptacle or use a suitable adapter.

Power Cord Conductor Identification

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

The 7603 is designed to be used with a three-wire AC power system. If a three- to two-wire adapter is used to connect this instrument to a two-wire AC power system, be sure to connect the ground lead of the adapter to earth (ground). Failure to complete the ground system may allow the chassis of this instrument to be elevated above ground potential and pose a shock hazard.

Operating Temperature

The 7603 can be operated where the ambient air temperature is between 0°C and +50°C. This instrument

can be stored in ambient temperatures between -55°C and $+75^{\circ}\text{C}$. After storage at temperatures beyond the operating limits, allow the chassis temperature to come within the operating limits before power is applied.

The 7603 is cooled by convection air flow through the instrument. Components which require the most cooling are mounted externally on a heat radiator at the rear. Adequate clearance must be provided on all sides to allow heat to be dissipated from the instrument. Do not block or restrict the air flow through the holes in the cabinet or the heat radiator on the rear. Maintain the clearance provided by the feet on the bottom and allow about two inches clearance on the top, sides, and rear (more if possible).

The R7603 is cooled by air drawn in through the air filter on the rear panel and blown out through the holes on the right side. Adequate clearance must be provided at these locations. Allow at least one and one-half inches clearance behind the air filter and at least one inch on the right side.

A thermal cutout in this instrument provides thermal protection and interrupts the power to the instrument if the internal temperature exceeds a safe operating level. Power is automatically restored when the temperature returns to a safe level. Operation in confined areas or in close proximity to heat-producing instruments may cause the thermal cutout to open more frequently.

Operating Position

A bale-type stand is mounted on the bottom of this instrument. This stand permits the 7603 to be tilted up about 10° for more convenient viewing.

Rackmounting

Instructions and dimensional drawings for rackmounting the R7603 are located in Section 6 of the service manual.

DISPLAY DEFINITIONS

General

The following definitions describe the types of displays which can be obtained with a 7603 Oscilloscope system with real-time amplifiers, time-base units, or combinations of these. Use of special purpose plug-in units may result in different types of displays, which are defined in the instruction manuals for these special units. The following terminology will be used throughout this manual.

Alternate Mode

A time-sharing method of displaying two or more signals with a single cathode-ray tube beam. Channel switching is sequential and occurs at the end of each sweep.

Chopped Mode

A time-sharing method of displaying two or more signals with a single cathode-ray tube beam. Channel switching is sequential and occurs at a rate determined by an internal clock generator (chopping rate).

NOTE

See Simplified Operating Instructions in this section for set-up information to obtain each of the following displays.

Single Trace

A display of a single plot produced by one vertical signal and one sweep.

Dual Trace

A display of two plots produced by two vertical signals and one sweep.

Delayed Sweep — Single Trace

A display of a single plot produced by one vertical signal and a delayed sweep. Two sweeps are used to produce this display; the sweeps are operating with a delaying/delayed relationship where one sweep (identified as the delaying sweep) delays the start of the second sweep (identified as the delayed sweep).

Delayed Sweep — Dual Trace

A display of two plots produced by combining two vertical signals and a delayed sweep. Two sweeps are used to produce this display; the sweeps are operating with a delaying/delayed relationship. Each vertical signal is displayed against the delayed sweep.

X-Y

A plot of two variables, neither of which represents time. X refers to the horizontal axis and Y refers to the vertical axis.

PLUG-IN UNITS

CONTROLS AND CONNECTORS

General

The 7603 is designed to accept up to three TEKTRONIX 7-series plug-in units. This plug-in feature allows a variety of display combinations and also allows selection of bandwidth, sensitivity, display mode, etc. to meet the measurement requirements. In addition, it allows the oscilloscope system to be expanded to meet future measurement requirements. The overall capabilities of the resultant system are in large part determined by the characteristics of the plug-in selected. For complete information on plug-ins available for use with this instrument, see the current Tektronix, Inc. catalog.

Plug-In Installation

To install a plug-in unit into one of the plug-in compartments, align the slots in the top and bottom of the plug-in with the associated guide rails in the plug-in compartment. Push the plug-in unit firmly into the plug-in compartment until it locks into place. To remove a plug-in, pull the release latch on the plug-in unit to disengage it and pull the unit out of the plug-in compartment. Plug-in units can be removed or installed without turning off the instrument power.

It is not necessary that all of the plug-in compartments be filled to operate the instrument; the only plug-in units needed are those required for the measurement to be made. However, at environmental extremes, excess radiation may be radiated into or out of this instrument through the open plug-in compartments. Blank plug-in panels are available from Tektronix, Inc. to cover the unused compartment; order TEKTRONIX Part No. 016-0155-00.

When the 7603 is calibrated in accordance with the calibration procedure given in this instruction manual, the vertical and horizontal gain are standardized. This allows calibrated plug-in units to be changed from one plug-in compartment to another without recalibration. However, the basic calibration of the individual plug-in units should be checked when they are installed in this system to verify their measurement accuracy. See the operating instructions section of the plug-in unit instruction manual for verification procedure.

Special purpose plug-in units may have specific restrictions regarding the plug-in compartments in which they can be installed. This information will be given in the instruction manual for these plug-in units.

NOTE

Later production of rackmount oscilloscopes are provided with support posts between the individual plug-in compartments. A post or posts must be removed if a multiwidth plug-in is to be installed. To remove a post, unfasten the screws that secure it at the top and bottom of the plug-in housing.

The major controls for operation of the 7603 are located on the front panel of the instrument. Figs. 1-2 and 1-3 provide a brief description of each control and connector. More detailed operating information is given under General Operating Information.

OPERATING CHECKOUT

General

The following Operating Checkout provides a means of verifying instrument operation and basic calibration without removing the covers or making internal adjustments. Since it demonstrates the use of all controls and connectors, it can also be used to provide basic training on the operation of this instrument. If re-calibration of the 7603 appears to be necessary, see the Calibration procedure in Section 3 of this manual. If re-calibration of a plug-in unit is indicated, see the instruction manual for the appropriate plug-in unit.

Set-Up Information

1. Set the front-panel controls as follows:

| | |
|-----------------|------------------|
| INTENSITY | Counterclockwise |
| FOCUS | Midrange |
| BEAM FINDER | Pressed in |
| GRATICULE ILLUM | As desired |
| VERT MODE | LEFT |
| TRIG SOURCE | VERT MODE |
| POWER | Pushed in |

2. Connect the 7603 to a power source which meets the voltage and frequency requirements of this instrument. The applied voltage should be near the center of the voltage range marked on the rear panel (see Operating Voltage in this section for information on converting this instrument from one operating voltage to another).

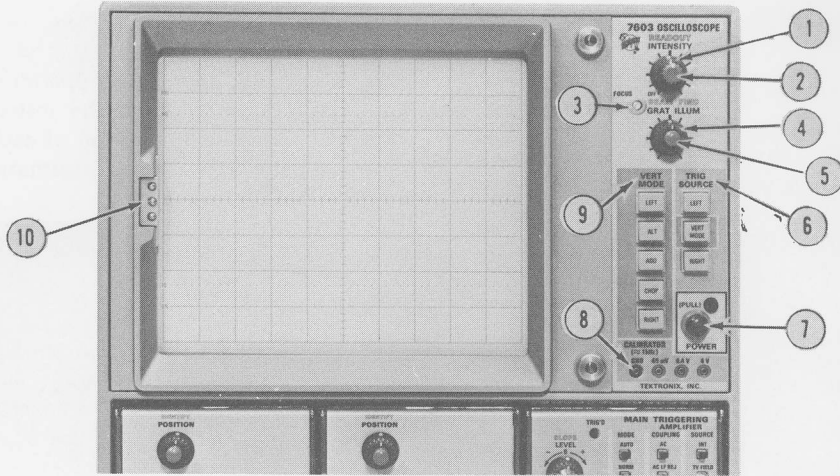
3. Install TEKTRONIX 7A-series amplifier units into both the left and right vertical plug-in compartments. Install a 7B-series time-base unit into the horizontal compartment.

4. Pull the POWER switch to turn the instrument on. Allow several minutes warmup before proceeding.

5. Set both vertical units for a deflection factor of two volts/division and center the vertical position controls. Set both vertical units for AC input coupling.

6. Set the time-base unit for a sweep rate of one millisecond/division in the auto, internal trigger mode.

FUNCTIONS OF CONTROLS AND CONNECTORS



Front Panel

- 1. INTENSITY—Controls brightness of the display. Control is inoperative when horizontal compartment is vacant.
- 2. READOUT—Turns on the readout display and controls the readout intensity.
- 3. FOCUS—Provides adjustment for optimum display definition.
- 4. GRATICULE ILLUM—Controls graticule illumination.
- 5. BEAM FINDER—When pressed, the scan is limited to within the graticule area.
- 6. TRIG SOURCE—Selects source of internal trigger signal for the time base plug-in in the horizontal compartment.

LEFT: The trigger signal is obtained from the plug-in unit in the left vertical compartment only.

VERT MODE: Trigger signal automatically follows the vertical display except in CHOP and ADD; then the trigger signal is the algebraic sum of the signals from the left and right vertical compartments.

RIGHT: The trigger signal is obtained from the plug-in unit in the right vertical compartment only.

7. POWER—

Switch: Controls power to the instrument.

Light: Indicates that the power switch is on and that the instrument is connected to a line voltage source.

8. CALIBRATOR—Calibrator output pin jacks (4 V, 0.4 V, 40 mV, ground). Positive-going pulse or DC voltage selected by changing internal jumper. Repetition rate is approximately one kilohertz.

9. VERT MODE—Selects vertical mode of operation.

LEFT: Signals from plug-in unit in left vertical compartment are displayed.

ALT: Signals from plug-in units in both the left and right vertical compartments are displayed (dual trace). Display switched between vertical plug-in units after each sweep.

ADD: Signals from plug-in units in both the left and right vertical compartments are algebraically added and the sum is displayed on the CRT.

CHOP: Signals from plug-in units in both the left and right vertical compartments are displayed (dual trace). The display is switched between vertical plug-in units at approximately one megahertz rate.

RIGHT: Signals from plug-in unit in right vertical compartment is displayed.

10. Camera Power (Not Labeled)—Three-pin connector on CRT bezel provides power output (+15 V). Receives remote single sweep reset signal from compatible camera systems, and a ground pin connection.

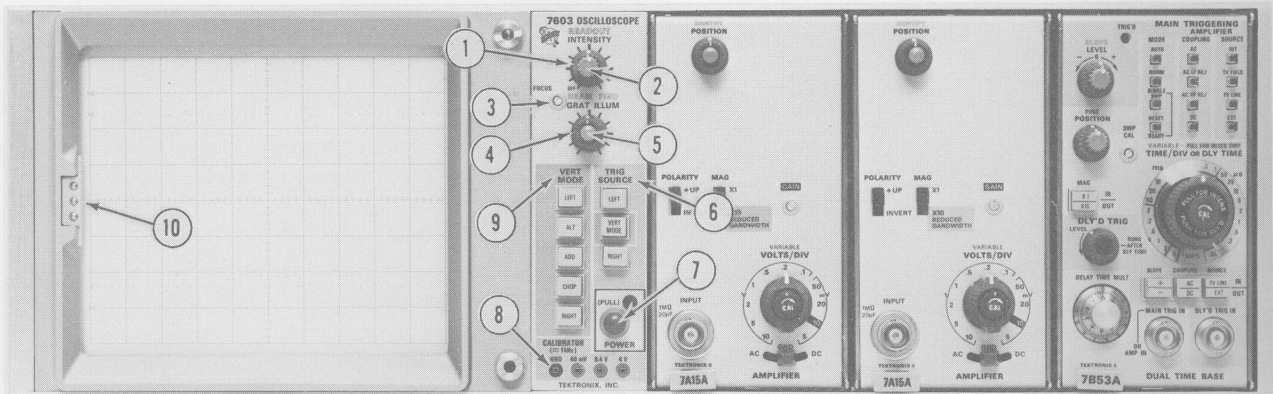
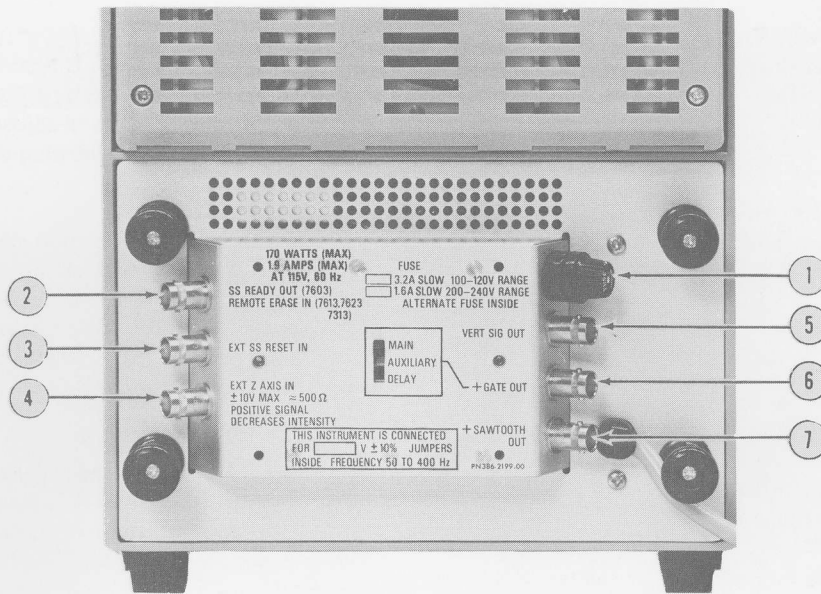


Fig. 1-2. Front-panel controls and connectors.



Rear Panel

1. FUSE—Line voltage fuse for instrument.
2. SS READY OUT—Provides an external single sweep ready indicator signal after the single sweep has been reset.
3. EXT S S RESET IN—Remote single sweep reset.
4. EXT Z AXIS IN—Input connector for intensity modulation of the CRT display.
5. VERT SIG OUT—Vertical signal selected by TRIG SOURCE switch (LEFT, RIGHT, ALT and ADD).
6. GATE OUT—Gate signal selected by gate selector switch (MAIN, AUXILIARY, and DELAY).
7. + SAWTOOTH OUT—Positive-going sawtooth from time-base unit.

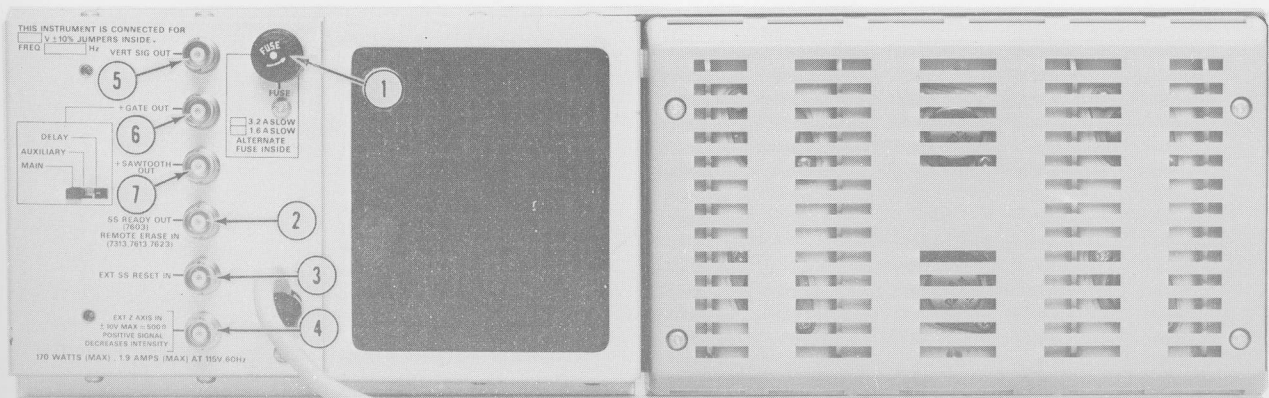


Fig. 1-3. Rear-panel controls and connectors.

7. Advance the INTENSITY control until the trace is at the desired viewing level (near midrange). Advance the READOUT until the readout display is at the desired viewing level.

8. Connect the 4 V calibrator pin-jack to the input of the left vertical unit with a BNC to pin-jack cable (supplied accessory).

Display Focus

9. Adjust the FOCUS control for a sharp, well-defined display over the entire trace length. If a properly focused display cannot be obtained with the FOCUS control, the internal Astigmatism adjustment must be re-set; see the Calibration section of this manual.

Trace Alignment

10. Disconnect the input signal and position the trace with the left vertical unit position control so it coincides with the center horizontal line of the graticule. If the trace is not parallel to the center horizontal line of the graticule, see Trace Rotation adjustment procedure in Calibration section.

Graticule Illumination

11. Rotate the GRAT ILLUM control throughout its range and notice that the illumination of the graticule lines increases as the control is turned clockwise (most obvious with tinted filter installed). Set the control so the graticule lines are illuminated as desired.

Vertical Deflection System

12. Connect the 4 V calibrator signal to the input connector of the left vertical unit with the BNC to pin-jack cable. Set both vertical units for a deflection factor of one volt/division. The display amplitude should be four divisions. Note the exact display amplitude for step 15.

13. Notice that the position control of only the left vertical unit has an effect on the position of the display. Position the display to the upper half of the graticule.

14. Press the RIGHT button of the VERT MODE switch. Remove the calibrator signal from the left vertical and connect it to the right vertical. The display amplitude should be four divisions within 0.12 division. Note the exact display amplitude for the next step.

15. A correct display in both steps 12 and 14 indicates that the 7603 Vertical Deflection System and the vertical

plug-in units are calibrated. If the displays noted previously are both outside the given tolerance in the same direction (i.e., high or low), the Vertical Gain or 4 Volts calibrator adjustment probably needs re-adjustment. Otherwise, check the calibration of the vertical plug-in units.

16. Notice that the position control of only the right vertical unit has an effect on the position of the display. Position the display to the lower half of the graticule. Set both vertical units for a deflection factor of two volts/division. Connect calibrator signal to both vertical units by using a dual input coupler.

17. Press the ALT button of the VERT MODE switch. Notice that two traces are displayed on the CRT. The top trace is produced by the left vertical unit and the bottom trace is produced by the right vertical unit. Set the sweep rate to 50 milliseconds/division. Notice that the display alternates between the left and right vertical units after each sweep. Turn the sweep rate switch throughout its range. Notice that the display alternates between vertical units at all sweep rates.

18. Press the CHOP button of the VERT MODE switch. Turn the sweep rate throughout its range. Notice that a dual-trace display is presented at all sweep rates, but unlike ALT both vertical units are displayed on each sweep in a time-sharing manner. Return the sweep rate to 0.5 millisecond/division.

19. Press the ADD button of the VERT MODE switch. The display should be four divisions in amplitude. Notice that the position control of either vertical unit moves the display. Return the VERT MODE switch to LEFT.

Triggering

20. Center the display on the CRT with the left vertical unit position control. Disconnect the input signal from the right vertical unit input connector. Sequentially press all of the VERT MODE switch buttons. Notice that a stable display is obtained in all positions of the VERT MODE switch (straight line in RIGHT position).

21. Press the LEFT button of the TRIG SOURCE switch. Again, sequentially press all of the VERT MODE buttons. Notice that the display is again stable in all positions, as in the previous step.

22. Press the RIGHT button of the TRIG SOURCE switch. Sequentially press all of the VERT MODE buttons and notice that a stable display cannot be obtained in any position. This is because there is no input signal connected

to the right vertical unit. Return the TRIG SOURCE switch to VERT MODE. Remove calibrator signal from left vertical unit and connect it to right vertical unit. Repeat steps 20 to 22. The trigger signal will come from right vertical. When the LEFT button is pressed of the TRIG SOURCE switch the display is not stable because there is no input signal connected to the left vertical. Return the TRIG SOURCE switch to VERT MODE.

Horizontal Deflection System

23. Position the start of the sweep to the left graticule line with the time-base unit position control.

24. Connect a 10X probe to the input of the right vertical unit. Set the right vertical unit for a deflection factor of 10 volts/division and set the VERT MODE switch to RIGHT. Set the time-base unit for a sweep rate of five milliseconds/division.

25. Connect the probe tip to a line-voltage source. The display should show three complete cycles over the 10 divisions within 0.3 division. A correct display indicates that the 7603 Horizontal Deflection System and the time-base plug-in unit are correctly calibrated. If the display is outside the given tolerance, either the 7603 or the time-base unit needs to be recalibrated. Refer to the Calibration section of this manual, and to the time-base unit manual for adjustment procedure.

NOTE

This step is based on an accurate 60-Hertz line frequency. For other line frequencies, this procedure will need to be changed accordingly.

26. Disconnect the probe from the line-voltage source and the right vertical unit and connect the probe to the left vertical unit. Set the VERT MODE switch to LEFT and set the time-base unit for a sweep rate of 0.5 millisecond/division.

Beam Finder

27. Set the deflection factor of the left vertical unit to 0.1 volt/division. Notice that a square-wave display is not visible, since the deflection exceeds the scan area of the CRT.

28. Press and hold the BEAM FINDER switch. Notice that the display is returned to the viewing area in compressed form. Increase the vertical and horizontal deflection factors until the display is reduced to about two divisions vertically and horizontally (when the horizontal unit is operated in the time-base mode, change only the

deflection factor of the vertical unit). Adjust the position controls of the displayed vertical unit and the time-base unit to center the compressed display about the center lines of the graticule. Release the BEAM FINDER switch. Notice that the display remains within the viewing area.

Z-Axis Input

29. If an external signal is available (five volts peak-to-peak minimum at two megahertz or less), the function of the EXT Z AXIS input can be demonstrated. Connect the external signal to both the input of the right vertical unit and the EXT Z AXIS connector with two BNC cables and a BNC T connector. Set the VERT MODE switch to RIGHT and set the vertical unit for a deflection factor of two volts/division. Set the time-base unit for a sweep rate which displays several cycles of the signal. Adjust the amplitude of the signal generator until intensity modulation is visible on the display. The positive peaks of the waveform should be blanked out and the negative peaks intensified. Notice that the setting of the INTENSITY control determines the amount of intensity modulation that is visible.

30. Disconnect the signal from the EXT Z AXIS connector, but leave it connected to the right vertical unit input. Check that peak-to-peak amplitude of the displayed signal is four divisions maximum.

31. This completes the Operating Checkout procedure for the 7603. Instrument operations not explained here, or operations which need further explanation are discussed under General Operating Information.

SIMPLIFIED OPERATING INSTRUCTIONS

The following information is provided to aid in quickly obtaining the correct setting for the 7603 controls to present a display. The operator should be familiar with the complete function and operation of this instrument as described elsewhere in this section before using this procedure. For detailed operating information for the plug-in units, see the instruction manuals for the applicable units.

Single-Trace Display

The following procedure will provide a display of a single-trace vertical unit against one time-base unit. For simplicity of explanation, the vertical unit is installed in the left vertical compartment. The right vertical compartment can be used if the procedure is changed accordingly.

1. Install a 7A-series vertical unit in the left vertical compartment.

Operating Instructions—7603/R7603 Service

2. Press the LEFT button of the VERT MODE switch.
3. Install a 7B-series time-base unit in the horizontal compartment.
4. Press the VERT MODE button of the TRIG SOURCE switch.
5. Connect the signal to the input connectors of the vertical units.
6. Set the vertical unit for AC input coupling and calibrated deflection factors.
7. Set the time-base unit for auto mode, internal triggering at a sweep rate of one millisecond/division.
8. Advance the INTENSITY control until a display is visible. (If no display is visible with INTENSITY at about midrange, press and hold the BEAM FINDER switch and adjust the vertical deflection factor until the display is reduced in size vertically; then center the compressed display with vertical and horizontal position controls; release the BEAM FINDER.) Adjust the FOCUS control for a well-defined display. Adjust Readout INTENSITY for the desired viewing level.
9. Set the vertical deflection factor and vertical position control for a display which remains within the graticule area vertically.
10. If necessary, set the time-base triggering controls for a stable display.
11. Adjust the time-base position control so the display begins at the left edge of the graticule. Set the time-base sweep rate to display the desired number of cycles.

Dual-Trace Display

The following procedure will provide a display of two single-trace vertical units against one time-base unit.

1. Install 7A-series vertical units in both vertical plug-in compartments.
2. Press the LEFT button of the VERT MODE switch.

3. Install a 7B-series time-base unit in the horizontal compartment.
4. Press the VERT MODE button of the TRIG SOURCE switch.
5. Connect the signal to the input connectors of the vertical units.
6. Set the vertical units for AC input coupling and calibrated deflection factors.
7. Set the time-base unit for auto mode, internal triggering at a sweep rate of one millisecond/division.
8. Advance the INTENSITY control until a display is visible. (If no display is visible with INTENSITY at midrange, press and hold BEAM FINDER switch and adjust vertical deflection factor until display is reduced in size vertically; then center compressed display with vertical and horizontal position controls; release the BEAM FINDER switch.) Set the FOCUS control for a well-defined display.
9. Set the left vertical unit deflection factor for a display about four divisions in amplitude. Adjust the left vertical position control to move this display to the top of the graticule area.
10. Press the RIGHT button of the VERT MODE switch.
11. Set the RIGHT vertical unit deflection factor for a display about four divisions in amplitude (if display cannot be located, use BEAM FINDER switch). Position this display to the bottom of the graticule area with the right vertical unit position control.
12. Press the ALT or CHOP button of the VERT MODE switch. A dual-trace display of the signal from the left vertical and right vertical plug-in units should be presented on the CRT. (For more information on choice of dual-trace mode, see Vertical Mode in this section.)
13. If necessary, adjust the time-base triggering controls for a stable display.
14. Adjust the time-base position control so the display begins at the left edge of the graticule. Set the time-base sweep rate for the desired horizontal display.

Delayed Sweep — Single Trace

The following procedure will provide a delayed sweep display of a single-trace vertical unit.

1. Follow the complete procedure given under Single-Trace Displays.
2. Be sure the time-base unit installed in the horizontal compartment is a dual time-base with delaying/delayed capabilities.
3. Follow the procedure given in the instruction manual for the dual time-base unit to obtain a delayed-sweep display.

Delayed Sweep — Dual Trace

The following procedure will provide a delayed-sweep display of two single-trace vertical units.

1. Follow the complete procedure given under Dual-Trace Display.
2. Be sure the time-base unit installed in the horizontal compartment is a dual time-base unit with delaying/delayed capabilities.
3. Follow the procedure given in the instruction manual for the dual time-base unit to obtain a delayed-sweep display.

X-Y Display

The following procedure will provide an X-Y display (one signal versus another rather than against time).

NOTE

Some 7B-series time-base units have provisions for amplifier operation in the X-Y mode; see X-Y operation in this section for details of operation in this manner.

1. Install 7A-series amplifier units in both the left vertical and the horizontal compartments.
2. Press the LEFT button of the VERT MODE switch.

3. Connect the X-signal to the amplifier unit in the horizontal compartment.

4. Connect the Y-signal to the amplifier unit in the left vertical compartment.

5. Set both amplifier units for AC input coupling and calibrated deflection factors.

6. Advance the INTENSITY control until a display is visible. (If no display is visible, press and hold BEAM FINDER switch and adjust the deflection factors of both amplifier units until display is reduced in size both vertically and horizontally; then center compressed display with the position controls; release the BEAM FINDER switch.) Adjust the FOCUS control for a well-defined display.

GENERAL OPERATING INFORMATION

Intensity Control

The setting of the INTENSITY control may affect the correct focus of the display. Slight re-adjustment of the FOCUS control may be necessary, when the intensity level is changed. To protect the CRT phosphor; do not turn the INTENSITY control higher than necessary to provide a satisfactory display. The light filters reduce the observed light output from the CRT. When using these filters, avoid advancing the INTENSITY control to a setting that may burn the phosphor. When the highest intensity display is desired, remove the filters and use only the clear faceplate protector (permanently installed behind bezel). Apparent trace intensity can also be improved in such cases by reducing the ambient light level or using a viewing hood. Also, be careful that the INTENSITY control is not set too high when changing the time-base unit sweep rate from a fast to a slow sweep rate, or when changing to the X-Y mode of operation. The instrument incorporates protection circuitry which automatically reduces the display intensity to a lower level when the time-base unit is set to a slow sweep rate. This reduces the danger of damaging the CRT phosphor at these slower sweep rates.

Display Focus

The FOCUS control allows adjustment for best definition of the CRT display. The Readout intensity should be turned on, when adjusting the Focus control. Slight re-adjustment of this control may be necessary as the display conditions change. If a properly focused display cannot be obtained with the FOCUS control, the internal Astigmatism adjustment must be re-set; see the Calibration section of this manual.

Graticule

The graticule of the 7603 is marked on the inside of the faceplate of the CRT, providing accurate, no-parallax measurements. The graticule is divided into eight vertical and ten horizontal divisions. Each division is 1.22 centimeters square. In addition, each major division is divided into five minor divisions. The vertical gain and horizontal timing of the plug-in units are calibrated to the graticule so accurate measurements can be made from the CRT. The illumination of the graticule lines can be varied with the GRATICULE ILLUM control.

NOTE

Two types of crt graticules have been used in some Tektronix oscilloscopes. One graticule has 0% and 100% risetime reference points that are separated by 6 vertical graticule divisions. The other graticule has the 0% and 100% risetime reference points separated by 5 vertical divisions. In your manual, illustrations of the crt face or risetime measurement instructions may not correspond with the graticule markings on your oscilloscope.

Fig. 1-4 shows the graticule of the 7603 and defines the various measurement lines. The terminology defined here will be used in all discussions involving graticule measurements. Notice the 0%, 10%, 90% and 100% markings on the left side of the graticule. These markings are provided to facilitate risetime measurements.

Light Filter

The tinted filter provided with the 7603 minimizes light reflections from the face of the CRT to improve contrast when viewing the display under high ambient light conditions. This filter should be removed for waveform photographs or when viewing high writing rate displays. To remove the filter, loosen the two screws on the right side of

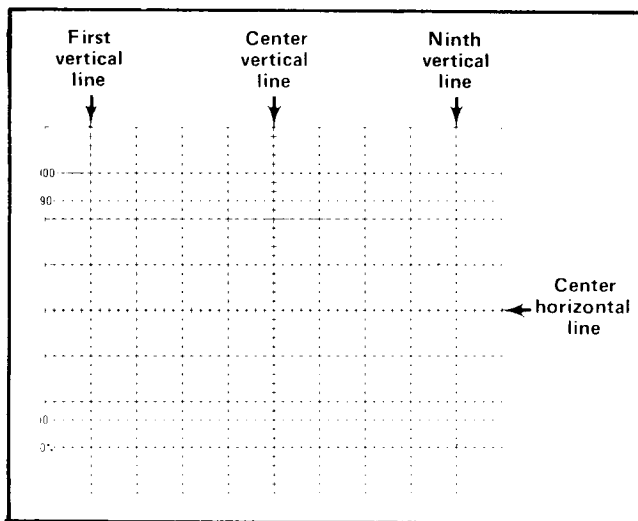


Fig. 1-4. Definition of measurement lines on 7603 graticule.

the bezel and remove the bezel. Remove the tinted filter; leave the clear plastic faceplate protector installed and replace the bezel. The faceplate protector should be left in place at all times to protect the CRT faceplate from scratches.

An optional mesh filter is available for use with the 7603. This filter provides shielding against radiated EMI (electro-magnetic interference) from the face of the CRT. It also serves as a light filter to make the trace more visible under high ambient light conditions. The mesh filter fits in place of the plastic CRT mask and the tinted filter.

Beam Finder

The BEAM FINDER switch provides a means of locating a display which overscans the viewing area either vertically or horizontally. When the BEAM FINDER switch is pressed and held, the display is compressed within the graticule area. Release the BEAM FINDER switch to return to a normal display. To locate and reposition an overscanned display, use the following procedure:

1. Press and hold the BEAM FINDER switch.

2. Increase the vertical and horizontal deflection factors until the vertical deflection is reduced to about two divisions and the horizontal deflection is reduced to about four divisions (the horizontal deflection needs to be reduced only when in the X-Y mode of operation).

3. Adjust the vertical and horizontal position controls to center the display about the vertical and horizontal center lines of the graticule.

4. Release the BEAM FINDER switch; the display should remain within the viewing area.

Readout Modes

The characters of the readout display are written by the CRT beam on a time-share basis with signal waveforms. The Readout system operates in a free running mode to randomly interrupt the waveform display to present the readout characters. The readout system can also operate in a GATE TRIG'D mode. No readout signal is produced until after the sweep has occurred. In this mode the sweep must run to have the readout displayed.

Display Photography

A permanent record of the CRT display can be obtained with an oscilloscope camera system. The instruction manuals for the TEKTRONIX Oscilloscope Cameras include complete instructions for obtaining waveform photographs. The following specific information applies to the 7603.

The CRT bezel of the 7603 provides integral mounting for a TEKTRONIX Oscilloscope Camera. The three pins located on the left side of the CRT bezel connect power to compatible camera systems. It also receives control signals from TEKTRONIX automatic cameras to allow camera-controlled single-shot photography (see camera manual for further information).

Vertical Mode

Left and Right Mode. When the LEFT or RIGHT button of the VERT MODE switch is pressed, only the signal from the plug-in unit in the selected compartment is displayed.

Alternate Mode. The ALT position of the VERT MODE switch produces a display which alternates between the plug-in units in the left vertical and right vertical compartments with each sweep of the CRT. Although the ALT mode can be used at all sweep rates, the CHOP mode provides a more satisfactory display at sweep rates below about 20 milliseconds/division. At these slower sweep rates, alternate-mode switching becomes visually perceptible.

NOTE

This instrument will not operate in the ALT mode if the horizontal plug-in unit is not operated in the time-base mode.

The TRIG SOURCE switch allows selection of the triggering for an alternate display. When this switch is set to the VERT MODE position, each sweep is triggered by the signal being displayed on the CRT. This provides a stable display of two unrelated signals, but does not indicate the time relationship between the signals. In either the LEFT or RIGHT positions of the TRIG SOURCE switch, the two signals are displayed showing true time relationship. However, if the signals are not time-related, the display from the plug-in unit which is not providing a trigger signal will appear unstable on the CRT.

Chopped Mode. The CHOP position of the VERT MODE switch produces a display which is electronically switched between channels at a one-megahertz rate. In general, the CHOP mode provides the best display at sweep rates lower than about 20 milliseconds/division, or whenever dual-trace single-shot phenomena are to be displayed. At faster sweep rates, the chopped switching becomes apparent and may interfere with the display.

Correct internal triggering for the CHOP mode can be obtained in any of the three positions of the TRIG SOURCE switch. When the TRIG SOURCE switch is set to VERT MODE, the internal trigger signals from the vertical

plug-in units are algebraically added and the time-base unit is triggered from the resultant signal. Use of the LEFT or RIGHT trigger-source positions triggers the time-base unit on the internal trigger signal from the selected vertical unit only. This allows two time-related signals to be displayed showing true time relationship. However, if the signals are not time-related, the display from the channel which is not providing the trigger signal will appear unstable. The CHOP mode can be used to compare two single-shot, transient, or random signals which occur within the time interval determined by the time-base unit (ten times selected sweep rate). To provide correct triggering, the display which provides the trigger signal must precede the second display in time. Since the signals show true time relationship, time-difference measurements can be made from the display.

Algebraic Addition. The ADD position of the VERT MODE switch can be used to display the sum or difference of two signals, for common-mode rejection to remove an undesired signal, or for DC offset (applying a DC voltage to one channel to offset the DC component of a signal on the other channel). The common-mode rejection ratio between the vertical plug-in compartments of the 7603 is greater than 20:1 at 50 megahertz. The rejection ratio increases to 100:1 at DC.

The overall deflection factor on the CRT in the ADD mode is the resultant of the algebraic addition of the signals from the two vertical plug-in units. It is difficult to determine the voltage amplitude of the resultant display unless the amplitude of the signal applied to one of the plug-in units is known. This is particularly true when the vertical units are set to different deflection factors, since it is not obvious which portion of the display is a result of the signal applied to either plug-in unit. Also, the polarity and repetition rate of the applied signals enters into the calculation.

The following general precautions should be observed to provide the best display when using the ADD mode:

1. Do not exceed the input voltage rating of the plug-in units.
2. Do not apply large signals to the plug-in inputs. A good rule to follow is not to apply a signal which exceeds an equivalent of about eight times the vertical deflection factors. For example, with a vertical deflection factor of 0.5 volt/division, the voltage applied to that plug-in unit should not exceed 4 volts. Larger voltages may result in a distorted display.
3. To ensure the greatest dynamic range in the ADD mode, set the position controls of the plug-in units to a

setting which would result in a mid-screen display if viewed in the LEFT or RIGHT positions of the VERT MODE switch.

4. For similar response from each channel, set the plug-in units for the same input coupling.

Trigger Source

The TRIG SOURCE switch allows selection of the internal trigger signal for the time-base unit. For most applications, this switch can be set to the VERT MODE position. This position is the most convenient, since the internal trigger signal is automatically switched as the VERT MODE switch is changed, or as the display is electronically switched between the left vertical and right vertical plug-in units in the ALT position of the VERT MODE switch. It also provides a usable trigger signal in the ADD or CHOP positions of the VERT MODE switch, since the internal trigger signal in these modes is the algebraic sum of the signals applied to the vertical plug-in units. Therefore, the VERT MODE position ensures that the time-base unit receives a trigger signal regardless of the VERT MODE switch setting, without the need to change the trigger source selection.

If correct triggering for the desired display is not obtained in the VERT MODE position, the LEFT or RIGHT positions can be used to obtain the trigger signal from either the left vertical or right vertical plug-in unit. The internal trigger signal is obtained from the selected vertical compartment, whether the plug-in unit in that compartment is selected for display on the CRT or not. If the internal trigger signal is obtained from one of the vertical units, but the other vertical unit is selected for display, the internal trigger signal must be time-related to the displayed signal in order to obtain a triggered (stable) display.

X-Y Operation

In some applications, it is desirable to display one signal versus another (X-Y) rather than against time (internal sweep). The flexibility of the plug-in units available for use with the 7603 provides a means for applying an external signal to the horizontal deflection system for this type of display. Some of the 7B-series time-base units can be operated as amplifiers in addition to their normal use as time-base generators. This feature allows an external signal to provide the horizontal deflection on the CRT. For most of the time-base units with the amplifier function, the X (horizontal) signal can be connected either to an external input connector on the time-base unit or it can be routed to the time-base unit through the internal triggering system (see time-base instruction manual for details). If the latter method is used, the TRIG SOURCE switches must be set so that the X (horizontal) signal is obtained from one of the

vertical units and the Y (vertical) signal is obtained from the other vertical unit. The advantages of using the internal trigger system to provide the X signal are that the attenuator switch of the amplifier unit providing the horizontal signal determines the horizontal deflection factor to allow full-range operation and the plug-in units do not have to be moved between compartments when X-Y operation is desired.

Another method of obtaining an X-Y display is to install an amplifier plug-in unit in one of the horizontal plug-in compartments (check amplifier unit gain as given in the plug-in instruction manual to obtain calibrated horizontal deflection factors). This method provides the best X-Y display, particularly if two identical amplifier units are used, since both the X and Y input systems will have the same delay time, gain characteristics, input coupling, etc. For further information on obtaining X-Y displays, see the plug-in unit manuals. Also, the reference books listed under Applications provide information on X-Y measurements and interpreting the resultant lissajous displays.

Intensity Modulation

Intensity (Z-axis) modulation can be used to relate a third item of electrical phenomena to the vertical (Y-axis) and the horizontal (X-axis) coordinates without affecting the waveshape of the displayed signal. The Z-axis modulating signal applied to the CRT circuit changes the intensity of the displayed waveform to provide this type of display. "Gray scale" intensity modulation can be obtained by applying signals which do not completely blank the display. Large amplitude signals of the correct polarity will completely blank the display; the sharpest display is provided by signals with a fast rise and fall. The voltage amplitude required for visible trace modulation depends upon the setting of the INTENSITY control. A two-volt peak-to-peak signal will completely blank the display even at maximum intensity levels. Lower amplitude signals can be used to only change the trace brightness rather than completely blank the display. Negative-going modulating signals increase the display intensity and positive-going modulating signals decrease the display intensity. Useful input frequency range is DC to 10 megahertz (input voltage derating necessary above two megahertz). The maximum input voltage should be limited to 10 volts (DC plus peak AC).

Time markers applied to the EXT Z AXIS input connector provide a direct time reference on the display. With uncalibrated horizontal sweep or external horizontal mode operation, the time markers provide a means of reading time directly from the display. However, if the markers are not time-related to the displayed waveform, a single-sweep display should be used (for internal sweep only) to provide a stable display.

Raster Display

A raster-type display can be used to effectively increase the apparent sweep length. For this type of display, the trace is deflected both vertically and horizontally by sawtooth signals. This is accomplished in the 7603 by installing a 7B-series time-base unit in one of the vertical plug-in compartments. Normally, the time-base unit in the vertical compartment should be set to a slower sweep rate than the time-base unit in the horizontal compartment; the number of horizontal traces in the raster depends upon the ratio between the two sweep rates. Information can be displayed on the raster using several different methods. In the ADD position of the VERT MODE switch, the signal from an amplifier unit can be algebraically added to the vertical deflection. With this method, the vertical signal amplitude on the CRT should not exceed the distance between the horizontal lines of the raster. Another method of displaying information on the raster is to use the EXT Z AXIS input to provide intensity modulation of the display. This type of raster display could be used to provide a television-type display. Complete information on operation using the Z-axis feature is given under Intensity Modulation.

To provide a stable raster display, both time-base units must be correctly triggered. Internal triggering is not provided for the time-base units when they are in the vertical compartments; external triggering must be used. Also, blanking is not provided from the time-base units when they are installed in a vertical compartment. To blank out the retrace portion from the time-base unit in the vertical compartment, special connections must be made from this time-base unit to the blanking network of the 7603. If this mode of operation is desirable, contact your local TEKTRONIX Field Office or representative for specific information on obtaining blanking with the specific time-base unit being used in the vertical compartment.

Calibrator

General. The internal calibrator of the 7603 provides a convenient signal source for checking basic vertical gain and for adjusting probe compensation as described in the probe instruction manual. In addition, the calibrator can be used as a convenient signal source for application to external equipment.

Voltage. The calibrator provides accurate output voltage of 40 millivolts, 0.4 volt, and 4 volts at the three front-panel pin-jack connectors into high-impedance loads. Output resistance is approximately 50 ohms at the 40 mV and 0.4 V pin jacks and approximately 450 ohms at the 4 V pin jack.

Current. A 40-milliampere, one-kilohertz output current is provided when the optional current-loop accessory

(TEKTRONIX Part No. 012-0259-00) is connected between the 4 V pin-jack and ground. This output can be used to check and calibrate current-measuring probe systems.

Waveshape. The square-wave output signal of the calibrator can be used as a reference waveshape when checking or adjusting the compensation of passive, high-resistance probes. Since the square-wave output from the calibrator has a flat top, any distortion in the displayed waveform is due to the probe compensation. DC voltage output is also available by changing a jumper on the calibrator board; see Fig. 1-5.

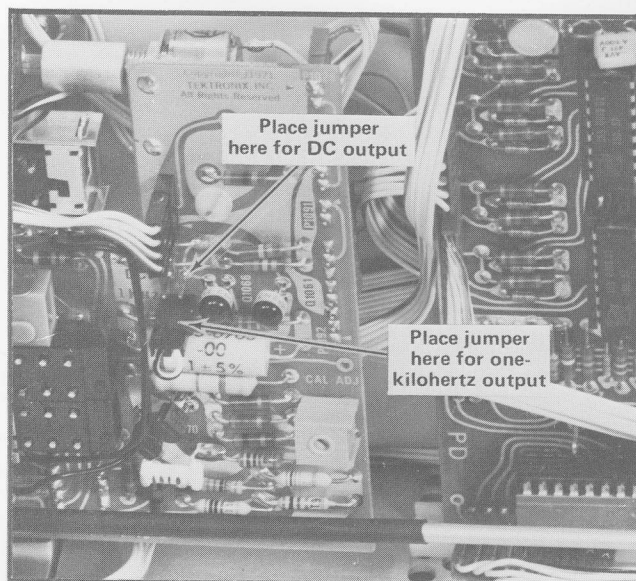


Fig. 1-5. Jumper locations for DC and one-kilohertz Calibrator operation (Calibrator board).

Signals Out

Vertical Signal. The VERT SIG OUT connector provides a sample of the vertical deflection signal. The source of the output signal is determined by the TRIG SOURCE switch. The source will follow the setting of the TRIG SOURCE switch. When the TRIG SOURCE is in the VERT MODE the output will follow the VERTICAL MODE switch except CHOP, then the signals are ADDED. The output signals are LEFT, ALT, ADD and RIGHT. The output signal into 50 ohms is about 25 millivolts/division of the vertical signal displayed on systems CRT. The output signal into 1 megohm is about 0.5 volts/division of the vertical signal displayed on the systems CRT.

+ **Gate.** The + gate connector provides a sweep gate signal that is generated by the time base plug-in unit. The

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gate selector switch provides three gates MAIN, AUXILIARY and DELAY. The duration of the gate pulse is determined by the respective sweep. Auxiliary and Delay gates can only be produced by dual sweep time base plug-in units. The amplitude of the gate signal is about 50 millivolts into 50 ohms or 10 volts into 1 megohm.

+ **Sawtooth.** The + sawtooth connector provides a positive going sample of the sawtooth from the time base unit in the horizontal compartment. The rate of rise of the sawtooth signal is about 50 millivolts/unit of time into 50 ohms or 1 volt/unit of time into 1 megohm. Unit of time is determined by the time/division switch of the horizontal plug-in unit.

Applications

The 7603 Oscilloscope and its associated plug-in units provide a very flexible measurement system. The capabilities of the overall system depend mainly upon the plug-in units that are chosen for use with this instrument. Specific applications for the individual plug-in units are described in the plug-in manuals. The overall system can also be used for many applications which are not described in detail either in this manual or in the manuals for the individual plug-in units. Contact your local TEKTRONIX Field Office or representative for assistance in making specific measurements with this instrument.

The following books describe oscilloscope measurement techniques which can be adapted for use with this instrument.

John D. Lenk, "Handbook of Oscilloscopes, Theory, and Application", Prentice-Hall Inc., Englewood Cliffs, New Jersey, 1968.

J. Czech, "Oscilloscope Measuring Techniques", Springer-Verlag, New York, 1965.

J. F. Golding, "Measuring Oscilloscopes", Transatlantic Arts, Inc., 1971.

Charles H. Roth Jr., "Use of the Oscilloscope", A Programmed text, Prentice-Hall Inc., Englewood Cliffs, New Jersey, 1970.

Repackaging for Shipment

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

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

Surround the instrument with polyethylene sheeting to protect the finish of the instrument. Obtain a carton of corrugated cardboard of the correct carton strength and having inside dimensions of no less than six inches more than the instrument dimensions. Cushion the instrument by tightly packing three inches of dunnage or urethane foam between carton and instrument, on all sides. Seal carton with shipping tape or industrial stapler.

The carton test strength for your instrument is 375 pounds.

SPECIFICATION

Information given in this manual applies to the R7603 Oscilloscope also, unless otherwise indicated. The R7603 is electrically identical to the 7603, but it is adapted for mounting in a standard 19-inch rack. Rackmounting instructions and a dimensional drawing for the R7603 are given in Section 6.

This instrument will meet the following electrical specifications after complete calibration as given in Section 5. The Operating Checkout procedure which is given in Section 1 provides a convenient method of checking instrument performance without making internal checks or adjustments. The following electrical characteristics apply over an ambient temperature range of 0°C to +50°C, except

as otherwise indicated. Warmup time for given accuracy is 20 minutes. Limits and tolerances given in the Supplemental Information column are provided for user information only, and should not be interpreted as Performance Requirements.

NOTE

Many of the measurement capabilities of this instrument are determined by the choice of plug-in units. The following characteristics apply to the 7603 Oscilloscope only. See the System Specification at the end of this section for specifications of the complete system.

VERTICAL DEFLECTION SYSTEM

| Characteristic | Performance Requirements | Supplemental Information |
|---|---|---|
| Deflection Factor | Compatible with all 7000-series plug-in units. | |
| Between Compartments | Within 1%. | |
| Low Frequency Linearity | 0.1 division or less compression or expansion of a center-screen 2 division signal when positioned anywhere vertically within the graticule area. | |
| Bandwidth | See system specifications for 7000-series instruments. | |
| 7603 Vertical Amplifier only (6 div Reference; 0°C to +50°C) | DC to at least 115 MHz. | |
| Step Response Risetime | See system specifications for 7000-series instruments. | |
| Isolation Between Vertical Compartments | At least 100:1 from DC to 100 MHz. | |
| Delay Line | | Permits viewing leading edge of trigger signal. |
| Chopped Mode | | |
| Repetition Rate | 1 MHz within 20%. | |
| Time Segment From Each Compartment | 0.4 to 0.6 μ s. | |

VERTICAL DEFLECTION SYSTEM (cont)

| Characteristic | Performance Requirements | Supplemental Information |
|---|--|-------------------------------|
| Difference In Delay Between Vertical Compartments | | 0.5 ns or less. |
| Vertical Display Modes | LEFT: Left vertical unit only. ALT: Dual trace, alternate between vertical units. ADD: Added algebraically. CHOP: Dual trace, chopped between vertical units. RIGHT: Right vertical unit only. | Selected by VERT MODE switch. |

TRIGGERING

| Characteristic | Performance Requirements | Supplemental Information |
|----------------|---|------------------------------------|
| Trigger Source | LEFT VERT: From left vertical only. VERT MODE: Determined by vertical mode. RIGHT VERT: From right vertical only. | Selected by TRIGGER SOURCE switch. |

HORIZONTAL DEFLECTION SYSTEM

| Characteristic | Performance Requirements | Supplemental Information |
|--|---|--------------------------|
| Fastest Calibrated Sweep Rate | 5 ns/div. | |
| Deflection Factor | Compatible with all 7000-series plug-in units. | |
| Low Frequency Linearity | 0.1 div or less compression or expansion of a center-screen 2 div signal when positioned anywhere horizontally within the graticule area. | |
| Phase Shift Between the Vertical and Horizontal Amplifiers | Less than 2° from DC to 35 kHz. | |
| Frequency Response Bandwidth (8 div Reference) | At least 2 MHz. | |

CALIBRATOR

| Characteristic | Performance Requirements | Supplemental Information |
|-------------------------|---|--|
| Waveshape | Positive-going squarewave or DC (DC voltage selected by internal jumper). | |
| Voltage Output Range | 40 mV, 0.4 V, and 4 V. | Into 1 M Ω load. |
| Voltage Output Accuracy | | |
| +15°C to +35°C | Within 1%. | |
| 0°C to +50°C | Within 2%. | |
| Current Output Accuracy | 40 mA. | |
| +15°C to +35°C | Within 2%. | With optional current loop accessory (012-0259-00) connected between 4 V pin jack and ground pin jack. |
| 0°C to +50°C | Within 3%. | |
| Repetition Rate | | Approximately 1 kHz. |
| Output Resistance | | |
| 40 mV and 0.4 V | | Approximately 50 Ω . |
| 4 V | | Approximately 450 Ω . |

EXTERNAL Z AXIS INPUT

| Characteristic | Performance Requirements | Supplemental Information |
|--|--|------------------------------|
| Sensitivity (Full Intensity Range) | 2 V peak to peak. | |
| Useful Input Voltage Versus Repetition Frequency | 2 V peak to peak, DC to 2 MHz; reducing to 0.4 V peak to peak at 10 MHz. | |
| Polarity of Operation | Positive-going signal decreases intensity. | |
| Maximum Input Voltage | | 10 V (DC to peak AC). |
| Input Resistance | | Approximately 500 Ω . |

OUTPUTS

| Characteristic | Performance Requirements | Supplemental Information |
|-----------------------------------|--------------------------|--------------------------|
| Camera Power (P1041 at CRT Bezel) | | |
| Pin 1 -- +15 V | | |
| Pin 3 -- single sweep reset | | |
| Pin 5 -- ground | | |

CHARACTER GENERATOR

| Characteristic | Performance Requirements | Supplemental Information |
|--------------------|--------------------------------|---|
| Character Size | Adjustable. | |
| Modes of Operation | Free-run independent of sweep. | Selected by internal READOUT mode switch. |
| | Triggered after sweep. | |

DISPLAY (CRT) and OPTIONS

| Characteristic | Performance Requirements | | | Supplemental Information | |
|-------------------------------------|---|---|------------------|--|-----------------|
| Cathode Ray Tube Type | T 7400. | | | | |
| Graticule | | | | | |
| | Type | Internal and illuminated. | | | |
| Area | 8 X 10 div. | | | | |
| | Standard | 1 div equals 1.22 cm. | | | |
| | Option 4 | 1 div equals 1 cm. | | | |
| | Option 6 | 1 div equals 1.22 cm (Spectrum Analyzer). | | | |
| | Phosphor | | | | |
| Standard | P31. | | | | |
| | Option 78 | P11 others on request. | | | |
| Beam Finder | | | | Limits display to within graticule area when BEAM FINDER switch is actuated. | |
| Photographic Writing Specifications | Phosphor | Standard | Option 4 | Polaroid ¹ film type 107 (3000 ASA). Without film fogging techniques. | |
| | C53 Camera (f1.9 Lens 1:0.85 Image-to-Object Ratio) | P31 | 100 div/ μ s | | 180 cm/ μ s |
| | | P11 | 140 div/ μ s | | 260 cm/ μ s |

¹Registered trademark Polaroid Corporation.

POWER SOURCE

| Characteristic | Performance Requirements | Supplemental Information |
|---|--------------------------|---|
| Line Voltage Ranges | | |
| 110 V nominal | 100 V \pm 10%. | |
| | 110 V \pm 10%. | |
| | 120 V \pm 10%. | |
| 220 V nominal | 200 V \pm 10%. | |
| | 220 V \pm 10%. | |
| | 240 V \pm 10%. | |
| Line Frequency | | 50 to 60 Hz (R7603 and 7603) (7603 B010100 to B368864, 50 to 400 Hz) R7603 and 7603 Option 5, 50 to 400 Hz. |
| Maximum Power Consumption (115 V AC; 60 Hz) | | 170 W, 1.9 A. |
| Fuse Data | | |
| 110 V line (F1000) | | See Electrical Parts List for fuse information. |
| 220 V line (F1000) | | |
| +130 V Supply (F855) | | |

SIGNALS OUT

| Characteristic | Performance Requirements | Supplemental Information |
|------------------------------|---|---|
| VERT SIG OUT | See systems specifications for 7000-series instruments. | |
| Vertical Signals | LEFT, RIGHT, ALT, and ADD. | Selected by TRIG SOURCE switch. |
| Gain | | |
| Into 50 Ω | | 25 mV/div. |
| Into 1 M Ω | | 0.5 V/div. |
| | | \pm 20% system CRT to VERT SIG OUT. |
| Risetime (Into 50 Ω) | | 5 ns or less. |
| Aberrations | | |
| Centering | | \pm 3 div system CRT to VERT SIG OUT. (1.5 V into 1 M Ω or 75 mV into 50 Ω .) |
| Output Resistance | | 950 Ω within 2%. |
| +GATE OUT | | |
| Gate Signals | MAIN, AUXILIARY, and DELAY. | Selected by Gate selector switch. |
| Output | | |
| Into 50 Ω | | 0.5 V within 10%. |
| Into 1 M Ω | | 10 V within 10%. |

SIGNALS OUT (cont)

| Characteristic | Performance Requirement | Supplemental Information |
|----------------------|-------------------------|--|
| Risetime (Into 50 Ω) | | 20 ns or less |
| Output Resistance | | 950 Ω within 2%. |
| +SAWTOOTH OUT | | |
| Output | | |
| Into 50 Ω | | 50 mV/unit time ² within 15%. |
| Into 1 MΩ | | 1 V/unit time ² within 10%. |
| Output Resistance | | 950 Ω within 2%. |

ENVIRONMENTAL

| Characteristic | Information |
|--|-----------------------|
| <i>NOTE</i> | |
| <i>This instrument will meet the electrical characteristics given in the Performance Requirement column of the Specifications over the following environmental limits.</i> | |
| Temperature Range | |
| Operating | 0°C to +50°C. |
| Non-operating | -55°C to +75°C. |
| Altitude | |
| Operating | 15,000 ft. |
| Non-operating | Test limit 50,000 ft. |
| Transportation (packaged instrument, without plug-in units) qualifies under National Safe Transit test procedure 1A, Category II. | |

PHYSICAL

| Characteristic | Information |
|----------------|--|
| Ventilation | Safe operating temperature maintained by convection cooling. (7603) ³ or forced air cooling (R7603). Automatic resetting thermal cutout protects instrument from overheating. |

PHYSICAL (cont)

| Characteristic | Information |
|---|---|
| Finish | Anodized aluminum front panel. Painted cabinet. |
| 7603 Overall Dimensions (measured at maximum points) | |
| Height | 11.4 in (28.9 cm). |
| Width | 8.7 in (22.1 cm). |
| Length | 24.0 in (60.9 cm). |
| Net Weight (instrument only) | 30 lb (13.6 kg). |
| R7603 Overall Dimensions (measured at maximum points) | |
| Height | 5.25 in (13.3 cm). |
| Width | 19.0 in 48.2 cm). |
| Length | 24.7 in (62.9 cm). |
| Net Weight (instrument only) | 30 lb (13.6 kg). |

STANDARD ACCESSORIES

Standard accessories supplied with the 7603 are given in the Mechanical Parts List illustrations. For optional accessories available for use with this instrument, see the Tektronix, Inc. catalog.

²Referenced to Time/Div setting.

³See Line Frequency specification.

7600-SERIES SYSTEM SPECIFICATIONS

| Amplifier Plug-In Unit | Vertical System | | | | | | | |
|------------------------|-----------------|--------------|----------------|----------------------|-----------------------|----------------------|--------------|----------------|
| | Probe | BW | T _r | Accuracy | | | SIG OUT | |
| | | | | EXT CAL 0 to 50°C | INT CAL 15 to 35°C | INT CAL 0 to 50°C | BW | T _r |
| 7A11 | Integral | 100 MHz | 3.5 ns | 2% | 3% | 4% | 60 MHz | 5.9 ns |
| 7A12 | None | 85 MHz | 4.2 ns | 2% | 3% | 4% | 55 MHz | 6.4 ns |
| | P6053 | | | 3% | 4% | 5% | 55 MHz | 6.4 ns |
| 7A13 | None | 80 MHz | 4.4 ns | 1.5% | 2.5% | 3.5% | 55 MHz | 6.4 ns |
| | P6055 | | | 1.5% | 2.5% | 3.5% | 45 MHz | 7.8 ns |
| 7A14 | P6021 | 50 MHz | 7.0 ns | 2% | 3% | 4% | 40 MHz | 8.8 ns |
| | P6022 | 85 MHz | 4.2 ns | 2% | 3% | 4% | 50 MHz | 7.0 ns |
| 7A15A | None | 65 MHz | 5.4 ns | 3% | 4% | 5% | 50 MHz | 7.0 ns |
| | P6053 | | | 3% | 4% | 5% | 50 MHz | 7.0 ns |
| 7A16 | None | 100 MHz | 3.5 ns | 2% | 3% | 4% | 60 MHz | 5.9 ns |
| | P6053 | | | 3% | 4% | 5% | 60 MHz | 5.9 ns |
| 7A17 | None | 100 MHz | 3.5 ns | | | | 15 MHz | 24 ns |
| 7A18 | None | 70 MHz | 5.0 ns | 2% | 3% | 4% | 50 MHz | 7.0 ns |
| | P6053 | | | 3% | 4% | 5% | 50 MHz | 7.0 ns |
| 7A19 | None or P6051 | 110 MHz | 3.2 ns | 2% | 3% | 4% | 65 MHz | 5.4 ns |
| | P6056/ P6057 | | | 3% | 4% | 5% | 65 MHz | 5.4 ns |
| 7A22 | None or Any | 1.0 MHz ±10% | 350 ns ±9% | 2% | 3% | 4% | 1.0 MHz ±10% | 350 ns ±9% |

The bandwidth of a vertical plug-in used in the horizontal compartment is 2 MHz except for the 7A22 which has a bandwidth of 850 kHz. The X-Y phase shift between 2 similar units is 2° at 35 kHz.

TIME BASE PLUG-INS

| Time Base | Performance Feature | Max Sweep Rate | Triggering Freq Range |
|-----------|--------------------------------|----------------|-----------------------|
| 7B50 | Delayed Sweep & Ext Amplifier | 5 ns/div | DC to 100 MHz |
| 7B51 | Delaying Sweep | 5 ns/div | DC to 100 MHz |
| 7B52 | Delayed & Mixed Sweeps | 5 ns/div | DC to 100 MHz |
| 7B53N | Delayed & Mixed Sweeps | 5 ns/div | DC to 100 MHz |
| 7B70 | Delayed Sweeps & Ext Amplifier | 2 ns/div | DC to 200 MHz |
| 7B71 | Delaying Sweep | 2 ns/div | DC to 200 MHz |
| 7B92 | Display Switching | 2 ns/div | DC to 250 MHz |

SPECIAL PURPOSE and SAMPLING PLUG-INS

| Plug-In | Performance Feature |
|---------|---|
| 7CT1N | Low Power Semiconductor Curve Tracer |
| 7D13 | Measures: Temperature, Voltage, Current, and Resistance |
| 7D14 | Directly Gated Counter to 525 MHz |
| 7L12 | 1 MHz to 1.8 GHz Spectrum Analyzer |
| 7M11 | High Quality Dual Delay Line |
| 7S11 | Accepts Plug-In Sampling Heads |
| 7S12 | TDR and Sampling Applications |
| 7T11 | Random or Sequential; Equivalent or Real-Time Sampling |

For more complete specifications on plug-in units for the 7600-Series Oscilloscope System, refer to the TEKTRONIX Catalog.



CALIBRATION

Calibration Interval

To assure instrument accuracy, check the calibration of the 7603 every 1000 hours of operation, or every six months if used infrequently. Before complete calibration, thoroughly clean and inspect this instrument as outlined in the Maintenance section.

TEKTRONIX Field Service

Tektronix, Inc. provides complete instrument repair and recalibration at local Field Service Centers and the Factory Service Center. Contact your local TEKTRONIX Field Office or representative for further information.

Using This Procedure

General. This section provides several features to facilitate calibration of the 7603. These are:

Index. An index is given preceding the calibration procedure to aid in locating a step.

Partial Procedure. A partial calibration is often desirable after replacing components, or to touch up the adjustment of a portion of the instrument between major recalibrations. To calibrate only part of the instrument, set the controls as given under Preliminary Control Settings and start with the nearest Equipment Required list preceding the desired portion. To prevent unnecessary recalibration of other parts of the instrument, re-adjust only if the tolerance given in the CHECK- part of the step is not met. If re-adjustment is necessary, also check the calibration of any steps listed in the INTERACTION- part of the step.

Complete Calibration Procedure. Completion of each step in the following calibration procedure insures that this instrument is both correctly adjusted and performing within all given tolerances.

IMPORTANT NOTE

All waveforms shown in this section were taken with a TEKTRONIX Oscilloscope Camera System, unless noted otherwise.

TEST EQUIPMENT REQUIRED

General

The test equipment and accessories, or its equivalent, given in the Test Equipment table is required for complete

calibration of the 7603. Specifications given for the test equipment are the minimum necessary for accurate calibration. Therefore, the specifications of any test equipment used must meet or exceed the listed specifications. All test equipment is assumed to be correctly calibrated and operating within the listed specification. Detailed operating instructions for the test equipment are not given in this procedure. Refer to the instruction manual for the test equipment if more information is needed.

Special Calibration Fixtures

Special TEKTRONIX calibration fixtures are used in this procedure only where they facilitate instrument calibration. These special calibration fixtures are available from Tektronix, Inc. Order by part number through your local TEKTRONIX Field Office or representative.

Calibration Equipment Alternatives

All of the listed test equipment is required to completely check and adjust this instrument. This Calibration procedure is based on the first item of equipment given as an example of applicable equipment. When other equipment is substituted, control settings or calibration setup may need to be altered slightly to meet the requirements of the substitute equipment. If the exact item of test equipment given as an example in the Test Equipment table is not available, first check the Specifications column carefully to see if any other equipment is available which might suffice. Then check the Usage column to see what this item of test equipment is used for. If used for a check or adjustment which is of little or no importance to your measurement requirements, the item and corresponding step(s) can be deleted.

The following procedure is written to completely check and adjust the 7603 to the limits given in Section 2 and to allow interchanging 7000-series plug-in units between 7000-series mainframes without the need to recalibrate the instruments each time. If the applications for which you will use the 7603 do not require the full available performance from the 7603/plug-in combination, this procedure and the required equipment list can be shortened accordingly. For example, the basic measurement capabilities of this instrument can be verified by checking vertical deflection accuracy, vertical square-wave response, and basic horizontal timing with 7000-series real-time plug-in units and an accurate square-wave signal. Also, if the 7603/plug-in combination is to be used as a fixed system without the need to interchange plug-in units, all tests can be made by substituting vertical plug-in units and applicable test signals for the 067-0587-01 mainframe standardizer calibration fixture.

TEST EQUIPMENT

| Description | Minimum Specifications | Usage | Examples of Applicable Test Equipment |
|--|---|---|--|
| 1. Precision DC voltmeter | Range, zero to 150 volts; accuracy, within 0.1%. | Calibrator output accuracy check and adjustment. Low-voltage power supply adjustment. | a. TEKTRONIX DM 501A Digital Multimeter. ¹ b. Fluke Model 825A Differential DC Voltmeter. |
| 2. DC voltmeter (vom) With Test Leads | Range, zero to 4000 volts; accuracy, checked to within 1% at -2960 volts. | High-voltage power supply check. Z-axis DC levels adjustment | Valhalla Model 4500 HV Multimeter Tektronix Part No. 003-0120-00 test leads |
| 3. Time-mark generator | Marker outputs, 10 nanoseconds to 0.1 second; marker accuracy, within 0.1%. Trigger output, one millisecond. | CRT geometry check and adjustment. Horizontal timing check and adjustment. | TEKTRONIX TG 501 Time-Mark Generator. ¹ |
| 4. High-frequency constant amplitude signal generator | Frequency, 65 to above 190 megahertz, reference frequency, 3 megahertz output amplitude variable from 0.5 volt to 5 volts; amplitude accuracy, within 1% of reference as output frequency changes. | Vertical bandwidth check. Vertical amplifier isolation check. | Wavetek 1002 Sweep/Signal Generator. |
| 5. Medium-frequency constant amplitude signal generator. | Frequency, 50 to 70 megahertz; reference frequency, 50 kilohertz; output amplitude, variable from five millivolts to five volts peak to peak into 50 ohms; amplitude accuracy, constant within 3% of reference as output frequency changes. | External Z-axis operation check. Vertical bandwidth check. Vertical amplifier isolation check. Horizontal bandwidth check. | a. TEKTRONIX SG 503 Signal Generator. ¹ b. General Radio 1215-C with 1263-C Amplitude Regulating Power Supply. |
| 6. Low-frequency signal generator | Frequency, 35 kilohertz; output amplitude, variable from 50 to 100 millivolts. | X-Y phase shift check. | a. TEKTRONIX FG 503 Signal Generator. ¹ b. General Radio 1310-B Oscillator. |
| 7. Test-oscilloscope system (dual-trace) | Bandwidth, DC to 50 megahertz; minimum deflection factor, 10 millivolts/division; accuracy, within 3% | Horizontal limit centering adjustment and + GATE OUT. | a. TEKTRONIX 7603 Oscilloscope with two 7A15A or 7A16A Amplifiers and 7B50A or 7B53A Time-Base plug-in units, and two P6053B Probes. b. TEKTRONIX 2335 Oscilloscope. |
| 8. Vertical plug-in unit (two identical units required), and a dual display vertical unit. | TEKTRONIX 7A-series 65 megahertz bandwidth required for complete procedure as written. | Used throughout procedure to provide vertical input to 7603 under calibration. Identical units required only for X-Y phase shift check. The 7A18A is used to check READOUT operation. | a. TEKTRONIX 7A15A and a 7A18A Amplifier (may be shared with the 7000-series test oscilloscope). b. Any 7A-series plug-in unit (tolerances in some steps may be limited if low-frequency units used). |

¹ Requires TM 500-Series Power Module.

TEST EQUIPMENT (cont)

| Description | Minimum Specifications | Usage | Examples of Applicable Test Equipment |
|--|---|--|--|
| 9. Time-base unit | a. TEKTRONIX dual-time-base with Aux Z-axis output. b. TEKTRONIX 7B-series | a. Used to check Aux Z-axis circuitry. b. Used throughout procedure to provide sweep. | a. TEKTRONIX 7B53A or 7B92A Time-Base. b. Any 7B-series plug-in unit. |
| 10. Mainframe standardizer calibration fixture | Produces gain-check and pluse-response waveforms. | Used throughout procedure to standardize instrument so plug-in units can be interchanged without complete recalibration. | a. TEKTRONIX Calibration Fixture 067-0587-02. b. Calibrated 7000-series plug-in units with suitable signal sources may be substituted if lower performance is acceptable. |
| 11. 10X passive probe | Compatible with 7B-series external trigger input. | Chopped mode operation check (adjustment procedure). | a. TEKTRONIX P6053B Probe (may be shared with test oscilloscope). |
| 12. T connector | Connectors, BNC. | External Z-axis operation check. | a. TEKTRONIX Part No. 103-0030-00. |
| 13. Termination | Impedance, 50 ohms; accuracy, $\pm 2\%$; connectors, BNC. | Horizontal timing check and adjustment. X-Y phase shift check. | a. TEKTRONIX Part No. 011-0049-01. |
| 14. Dual-input coupler | Connectors, BNC. | Added operation check. X-Y phase shift check. | a. TEKTRONIX Calibration Fixture 067-0525-02. |
| 15. Cable (two required). | Impedance, 50 ohms; type, RF-58/U; length, 18 and 42 inches; connectors, BNC. | Used throughout procedure for signal interconnection. | a. TEKTRONIX Part No. 012-0076-00 (18-inch). TEKTRONIX Part No. 012-0057-01 (42-inch). |
| 16. BNC to pin-jack cable | Adapts pin-jacks to BNC male connector. | Added operation check. Trigger source operation check. Astigmatism adjustment. | a. TEKTRONIX Part No. 175-1178-00 (one supplied as standard accessory). |
| 17. Screwdriver | Three-inch shaft, 3/32-inch bit. | Used throughout adjustment procedure to adjust variable resistors. | a. Xcelite R3323. |
| 18. Low-capacitance screwdriver | 1 1/2-inch shaft. | Used throughout adjustment procedure to adjust variable capacitors. | a. TEKTRONIX Part No. 003-0000-00. |

Setup Procedure

NOTE

This instrument should be adjusted at an ambient temperature of +25° C ±5° C for best overall accuracy.

1. Remove the sides and bottom covers from the 7603 or the top cover and side panel from the R7603.

2. Connect the instrument to a power source which meets the voltage and frequency requirements. The applied voltage should be near the center of the voltage range marked on the rear panel (see Section 1 for information on converting this instrument from one operating voltage to another).

NOTE

If correct line voltage is not available, use a variable autotransformer to provide the correct input voltage.

3. Set the controls as given under Preliminary Control Settings. Allow at least 20 minutes warmup before proceeding.

NOTE

Titles for external controls of this instrument are capitalized in this procedure (e.g., INTENSITY). Internal adjustments are initial capitalized only (e.g., CRT Grid Bias).

Preliminary Control Settings

Set the 7603 controls as follows:

| | |
|-----------------|---------------------------------|
| READOUT | ccw (in detent) |
| INTENSITY | Midrange |
| FOCUS | Adjust for well-defined display |
| BEAM FINDER | Out |
| GRATICULE ILLUM | As desired |
| VERT MODE | LEFT |
| TRIG SOURCE | VERT MODE |
| POWER | ON |

CALIBRATION PROCEDURE

7603 Serial No.

Calibration Date

Calibrated By

Introduction

The following procedure returns the 7603 to correct calibration. All limits and tolerances given in this procedure are calibration guides, and should not be interpreted as instrument specifications except as listed in Section 2.

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Power Supply

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- 2. Check Remaining Power-Supply Voltages Page 3-5
- 3. Check High-Voltage Power Supply Page 3-6

Display and Z-Axis

- 4A. Adjust CRT Grid Bias Page 3-6
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- 5. Adjust Auto Focus Compensation Page 3-7
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- 7. Adjust Y-Axis Alignment Page 3-8
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- 9. Check External Z-Axis Operation Page 3-8
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Vertical Deflection System

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- 13. Check Vertical Gain Page 3-9
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30. Check SINGLE SWEEP READY OUT Page 3-16

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33. Check +SAWTOOTH OUT Page 3-17

34. Check +GATE OUT Page 3-17

Readout Operation

35. Check READOUT SYSTEM Operation Page 3-17

36. Check READOUT Gate Triggered Operation Page 3-18

Control Settings

Set the controls as given under Preliminary Control Settings.

1. Adjust —50 Volt Power Supply

- a. Set the INTENSITY control fully counterclockwise.
- b. Connect the precision DC voltmeter between TP—50 (see Fig. 3-1A) and chassis ground.
- c. CHECK—Meter reading; —50 volts ± 0.1 volt.
- d. ADJUST— —50 volts adjustment R881 (see Fig. 3-1B) for a meter reading of exactly —50 volts.
- e. INTERACTION—Change in setting of R881 may affect operation of all circuits within the 7603.

2. Check Remaining Power-Supply Voltages

- a. CHECK—Table 3-1 lists the low-voltage power supplies in this instrument. Check each supply with the precision DC voltmeter for output voltage within the given tolerance (connect meter ground lead to chassis ground). Power supply test points are shown in Fig. 3-1A.
- b. Disconnect the precision DC voltmeter.

NOTE

Ripple and regulation of the individual power supplies can be checked using the procedure given under Troubleshooting Techniques in Section 5.

**TABLE 3-1
Power Supply Tolerance**

| Power Supply | Test Point | Output Voltage Tolerance |
|--------------|-------------|--------------------------|
| —50 Volt | Pin 8 P1171 | ± 0.2 volt |
| —15 Volt | Pin 1 P1171 | ± 0.15 volt |
| +5 Volt | Pin 2 P1171 | ± 0.1 volt |
| +15 Volt | Pin 3 P1171 | ± 0.15 volt |
| +50 Volt | Pin 4 P1171 | ± 0.5 volt |
| +130 Volt | Pin 6 P1171 | ± 5.2 volt |

POWER SUPPLY

Equipment Required

- 1. Precision DC voltmeter
- 2. DC voltmeter (VOM)
- 3. Three-inch screwdriver

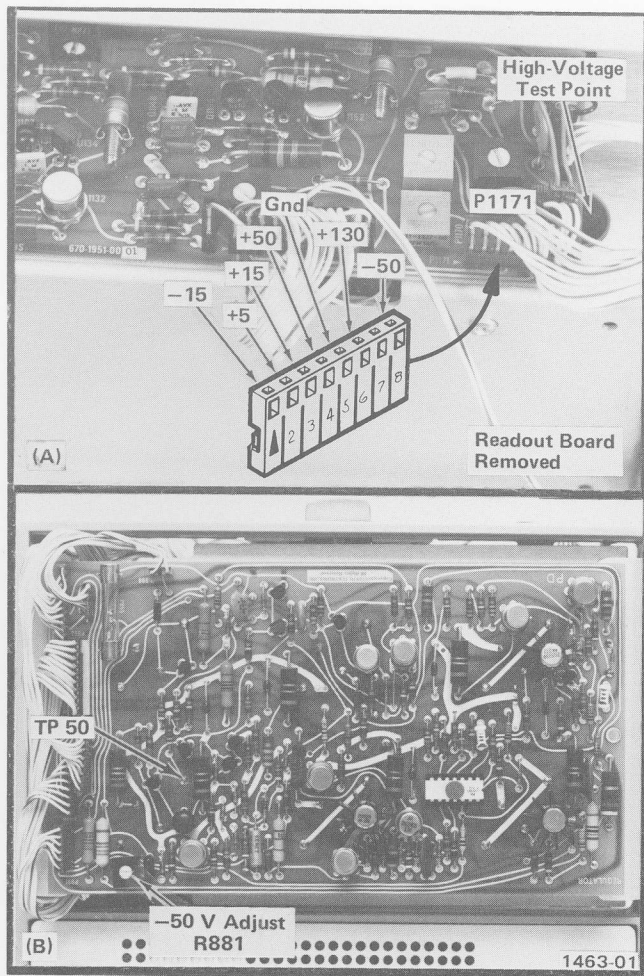


Fig. 3-1. (A) Location of power supply and high-voltage test points (right side of instrument); (B) Location of -50 V adjustment (Low Voltage Regulator board).

3. Check High-Voltage Power Supply

- a. Turn off instrument.
- b. Set the DC voltmeter (VOM) to measure at least 3000 volts. Then, connect it between the high-voltage test point (see Fig. 3-1A) and chassis ground.
- c. Turn on instrument. Check meter reading; -2975 volts \pm 89 volts (Option 4, -3475 volts \pm 104 volts).
- d. Turn off instrument. Disconnect the DC voltmeter.
- e. Turn on instrument.

DISPLAY AND Z-AXIS

Equipment Required

1. Mainframe standardizer calibration fixture
2. 7B53A plug-in unit
3. DC Voltmeter (VOM)
4. 7A15A plug-in unit

5. Time-mark generator
6. Medium-frequency generator
7. BNC to pin-jack cable
8. 18-inch 50-ohm BNC cable
9. 42-inch 50-ohm BNC cable
10. BNC T connector
11. Three-inch screwdriver
12. Low-capacitance screwdriver

Control Settings

Set the controls as given under Preliminary Control Settings.

4A. Adjust CRT Grid Bias

- a. Install the mainframe standardizer calibration fixture (or a vertical plug-in) in the left vertical compartment and depress the LEFT VERT MODE button. Set the fixture for Vert or Horiz +Step Resp, amplitude fully counterclockwise, and Position to midrange.
- b. Install the time-base plug-in in the horizontal compartment, and set it for 1 ms/division. Adjust triggering for a free-running sweep. If a 7B53A time-base plug-in is to be used, set it for Intensified Sweep.
- c. Adjust the fixture Position control to bring the trace on screen, then rotate both the INTENSITY and READ-OUT INTENSITY controls fully counterclockwise.
- d. Connect a 10X probe from the test-oscilloscope to the Z-Axis test point (see Fig. 3-2) and the probe ground lead to chassis ground.
- e. Set the test-oscilloscope to DC input and a display of 5 volts/division (including probe attenuation), position the trace to the center graticule line.
- f. ADJUST-INTENSITY control for a display amplitude 4 volts above the center graticule line.
- g. ADJUST-CRT Grid Bias adjustment R1261 (see Fig. 3-2) until the trace on the 7603 is just extinguished. Set INTENSITY for a viewable trace.

4B. Check Z-Axis DC Levels

- a. Set the test-oscilloscope for 10 V/division, DC input.
- b. Set the time base plug-in in the 7603 to 50 ms/division and the test-oscilloscope time base to 1 sec/div.

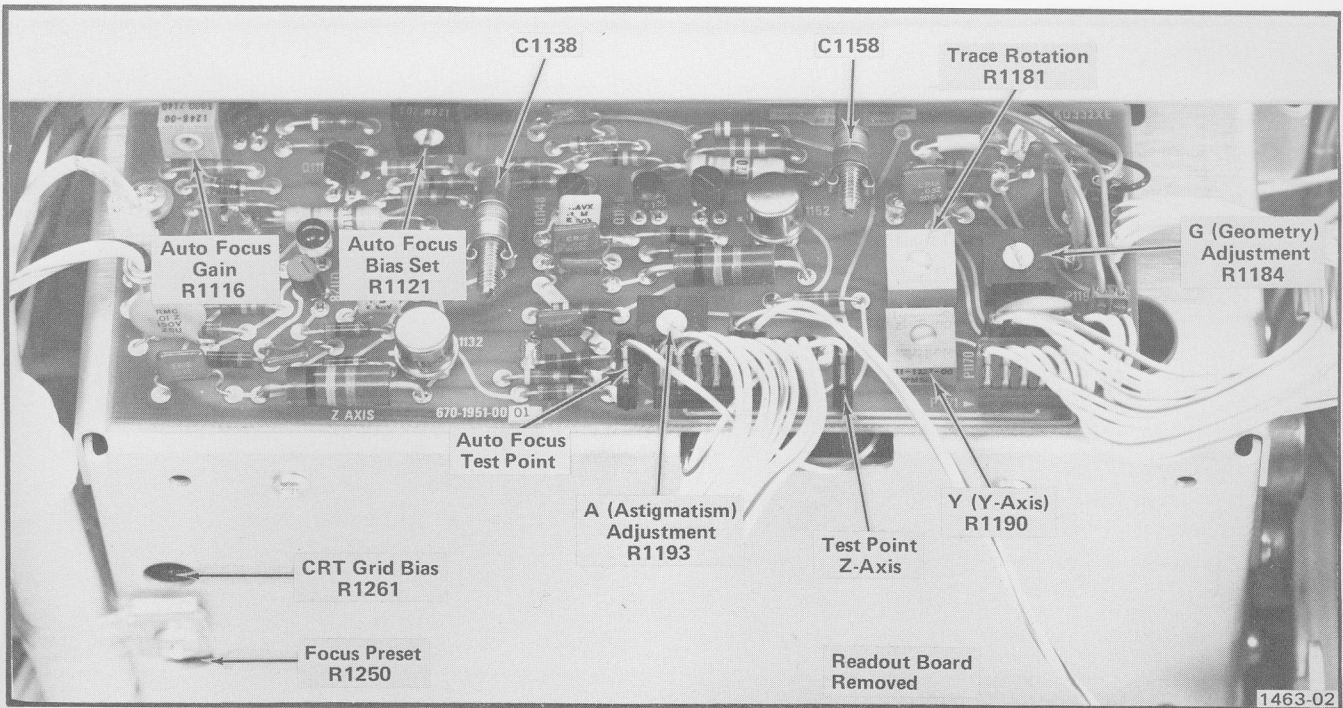


Fig. 3-2. Location of Display and Z Axis adjustments and test points.

c. Set the calibration fixture Position control to position the trace vertically off screen, and set the INTENSITY control fully clockwise.

d. CHECK—The test-oscilloscope display amplitude should be at least 58 volts, note this reading.

e. Set the 7603 time base plug-in to 0.1 second/division.

f. CHECK—Pulse amplitude deflection on the test-oscilloscope should decrease to between 25 volts to 35 volts less than the amplitude in step d.

g. Set the 7603 time-base plug-in to 0.2 ms/div and the test oscilloscope time-base plug-in to 0.5 ms/div.

h. Adjust the INTENSITY control for three divisions of vertical deflection on the test oscilloscope. Position the display so the positive leading edge of the waveform is displayed.

i. Adjust—C1158, for optimum square leading corner of the positive leading edge of the waveform (use a low capacitance screwdriver). See Fig. 3-2 for adjustment location.

j. Disconnect the probe.

5. Adjust Auto Focus Compensation

a. Connect the 10X probe to the Auto Focus Test Point. See Fig. 3-2 for adjustment location.

b. Adjust the INTENSITY control for three divisions of vertical deflection on the test oscilloscope. Position the display so the positive leading edge of the waveform is displayed (if three divisions of vertical deflection cannot be obtained, adjust R1116 and R1121 to midrange).

c. Adjust—C1138, for optimum square leading corner of the positive leading edge of the waveform (use a low capacitance screwdriver). See Fig. 3-2 for adjustment location.

d. Disconnect the probe.

e. Set the constant amplitude signal generator to 50 kHz reference frequency.

f. Connect the signal generator output to the Aux In connector of the Calibration Fixture. Set the Calibration Fixture for Vert of Horiz Aux In and the Position control to midrange.

g. Set the 7603 time-base unit to 20 μ s/div, Mag to X10, and adjust INTENSITY until the display is just visible.

h. Adjust the Calibration Fixture Amplitude and Position controls for a 3.2 division display, centered vertically.

i. Adjust the time-base unit position control until the lowest part of the display is on the center vertical graticule line.

j. Adjust the front-panel FOCUS control to midrange. Adjust the intensity of the display so it is just visible.

k. Adjust—Focus Preset, R1250, and Astigmatism, R1193, for optimum focus. See Fig. 3-2 for adjustment location.

l. Connect a 10X probe from the test oscilloscope to the Z-Axis Test Point. See Fig. 3-2 for location.

m. Set the test oscilloscope to dc input and a vertical deflection factor of 10V/div (measured at probe tip), and set the time-base unit to 0.1 ms/div.

n. Adjust the INTENSITY control for a 30 volt signal on the test oscilloscope.

o. Adjust—Auto Focus Bias Set, R1121, for optimum focus. See Fig. 3-2 for adjustment location.

p. Adjust the INTENSITY control for a 60 volt signal on the test oscilloscope.

q. Adjust—Auto Focus Gain, R1116, for optimum focus. See Fig. 3-2 for adjustment location.

r. Repeat parts k through q until optimum focus is achieved.

s. Disconnect all test equipment.

6. Adjust Trace Rotation

a. Set the INTENSITY control to midrange.

b. Move the trace to the center horizontal line with the mainframe standardizer Position control.

c. CHECK—Trace aligns with the center horizontal line within 0.1 division.

d. ADJUST—Trace Rotation adjustment R1181 (see Fig. 3-2) to align the trace with the center horizontal line.

7. Adjust Y-Axis Alignment

a. Inter-change the 7B53A and mainframe standardizer plug-in units.

b. Move the trace to the center vertical line with the mainframe standardizer Position control.

c. CHECK—Trace aligns with the center vertical line within 0.1 division.

d. ADJUST—Y-Axis adjustment R1190 (see Fig. 3-2) to align the trace with the center vertical line.

8. Adjust Geometry

a. Remove the mainframe standardizer and install the 7B53A in the horizontal compartment. Replace the mainframe standardizer in the left vertical compartment.

b. Set the VERT MODE switch to LEFT.

c. Connect the marker output of the time-mark generator to the Aux In connector of the calibration fixture with an 18-inch 50-ohm BNC cable.

d. Connect the trigger output of the time-mark generator to the external trigger input connector of the 7B53A with a 42-inch 50-ohm BNC cable.

e. Set the time-mark generator for one-millisecond markers and one-millisecond triggers.

f. Set the calibration fixture Test switch to Vert or Horiz Aux In and the Amplitude Step or Aux control fully clockwise.

g. Set the 7B53A for auto triggering from the external source at a sweep rate of 0.5 millisecond/division (magnifier off).

h. Set the 7B53A variable time/division control to obtain exactly one marker for each major graticule division.

i. Set the time-mark generator for both one- and 0.1-millisecond markers.

j. Position the baseline of the markers as far toward the bottom of the graticule as possible with the calibration fixture Position control.

k. CHECK—Vertical bowing and tilt of the marker display is less than 0.1 division (each 0.1-millisecond marker represents 0.1 division).

l. ADJUST—Geometry adjustment R1184 (see Fig. 3-2) for minimum bowing of time markers. Adjustment may have to be compromised to obtain less than 0.1 division bowing and tilt everywhere within the graticule area.

9A. Check External Z-Axis Operation

a. Install the 7A15A in the right vertical compartment.

b. Connect the output of the medium-frequency constant-amplitude signal generator to the 7A15A through the BNC cable, 50-ohm BNC termination, and the BNC T connector.

c. Set the 7A15A for a deflection factor of one volt/division.

d. Set the 7B53A for auto, internal triggering at a calibrated sweep rate of 10 microseconds/division.

e. Set the medium-frequency generator for a two-division display at its reference frequency (50 kilohertz).

f. Connect the output of the BNC T connector to the EXT Z-AXIS connector with the 42-inch 50-ohm BNC cable.

g. CHECK—Top portion of displayed waveform blanked out.

h. Disconnect cable from external Z-AXIS connector.

9B. AUX. Z-AXIS CHECK

a. Install a dual time-base unit into the A horizontal compartment.

b. Set the time-base as follows:

| | |
|------------------|-----------------------|
| Time/Div | 1 mS |
| Dly'd Time/Div | .1 mS |
| Delay Time Mult | 5.0 |
| Dly'd Trig level | Runs After Delay Time |

c. CHECK—For approximately 1 division of intensified trace in the middle of the screen.

10. Check Beam Finder

a. Set the 7A15A deflection factor to 20 millivolts/division. Notice that the display exceeds the viewing area.

b. Press the BEAM FINDER switch.

c. CHECK—Display compressed within graticule area.

d. Decrease the 7A15A vertical sensitivity until the compressed display is reduced in amplitude.

e. Release the BEAM FINDER switch.

f. CHECK—Display remains within graticule area.

g. Disconnect all equipment and remove the plug-in units.

VERTICAL DEFLECTION SYSTEM

Equipment Required

1. Mainframe standardizer calibration fixture.
2. 7B53A plug-in unit.
3. High-frequency generator.
4. 7A15A plug-in unit (two).
5. 10X probe.
6. BNC to pin-jack cable.
7. Dual-input coupler.
8. Three-inch screwdriver.
9. Low-capacitance screwdriver.

Control Settings

Set the controls given under Preliminary Control Settings.

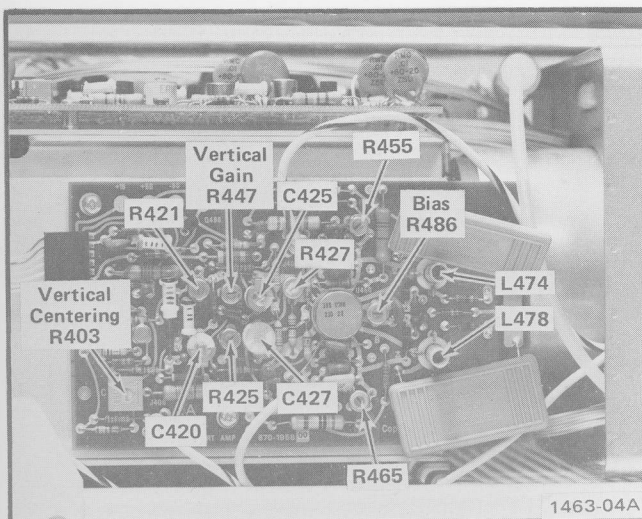


Fig. 3-3. Location of vertical system adjustments (Vertical Output board).

11. Adjust Bias Adjustment

a. Install the 7B53A in the horizontal compartment.

b. Set the 7B53A for auto, external triggering at a sweep rate of one millisecond/division.

c. Install the mainframe standardizer calibration fixture in the left vertical compartment. Set the calibration fixture Test switch to VERT or HORIZ Gain and the Rep Rate switch to 100 kHz.

d. ADJUST—Bias R486 for maximum gain. (See Fig. 3-3).

12. Adjust Vertical Centering

a. Set the calibration fixture Test switch to Triggering Gain.

b. The trace should be within 0.3 division of the graticule center line (within 0.5 division with readout).

c. ADJUST—Vertical Centering adjustment R403 (see Fig. 3-3) to position the trace to the center horizontal line.

13. Adjust Vertical Gain

a. Set the calibration fixture Test switch to Vert or Horiz Gain.

b. Position the display so the first and ninth traces are near the top and bottom lines of the graticule.

c. CHECK—Deflection between the second and eighth traces should be six divisions ± 0.06 division.

d. ADJUST—Vertical Gain adjustment R447 (see Fig. 3-3) for exactly six divisions of deflection between the second and eighth traces.

e. Remove the calibration fixture from the left vertical compartment and install it in the right vertical compartment.

f. Set the VERT MODE switch to RIGHT.

g. CHECK—Deflection between the second and eighth traces should be the same as part d $\pm 1\%$.

h. ADJUST—If necessary, re-adjust R447 for correct tolerance in both parts d and h.

14A. Check Vertical Linearity

a. Remove the mainframe standardizer calibration fixture. Install the 7A15A in the left vertical compartment and connect a 0.4 volt square wave signal from the CALIBRATOR out jacks. Set the VERT MODE switch to left.

b. Set the 7A15A Volts/Div switch to 0.2 volt/division. Adjust the position control to keep the display centered on the graticule and adjust the Variable Volts/Div control if needed for a two division display.

c. CHECK—Position the two divisions of display vertically and check for not more than 0.1 division of compression or expansion anywhere within the graticule area. Remove the 7A15A and install the mainframe standardizer calibration fixture.

14B. Adjust Thermal Compensation

- a. Set the calibration fixture Test switch to Vert or Horiz +Step Resp, Rep Rate switch to 10 kHz, and adjust the Amplitude control for a six-division display.
- b. Set the time-base unit sweep rate for 20 μ s/div.
- c. CHECK—For optimum square front corner and flat top on displayed pulse with aberrations not to exceed +0.03 or -0.03 division with total peak-to-peak aberrations not to exceed 0.03 division.
- d. ADJUST—Thermal compensation, R466, for optimum square front corner, with aberrations not to exceed \pm 0.03 division.
- e. Set the calibration fixture Rep Rate switch to 100 kHz, and set the time-base unit sweep rate for 2 μ s/div.
- f. ADJUST—Thermal compensation, R455, for optimum square front corner, with aberrations not to exceed \pm 0.03 division.
- g. Set the calibration fixture Rep Rate switch to 1 MHz, and set the time-base unit sweep rate for 1 μ s/div.
- h. CHECK—Repeat part c of this step.
- i. INTERACTION—Repeat part d through g until optimum adjustment is obtained.

14C. Adjust Thermal Compensation (SN B377000 and Up)

- a. Set the time base unit sweep rate for 0.2 ms/div.
- b. Set the calibration fixture Test switch to Vert or Horiz +Step Resp, Rep Rate switch to 1 kHz and adjust the Amplitude control for a six division display.
- c. CHECK—For optimum square front corner and flat top on displayed pulse with aberrations not to exceed +0.03 or -0.03 division with total peak-to-peak aberrations not to exceed 0.03 division.
- d. ADJUST—Thermal compensation, R465 and R466 for optimum square front corner with aberrations not to exceed \pm 0.03 division.
- e. Set the calibration fixture Rep Rate switch to 10 kHz and set the time base unit sweep rate for 20 μ s/div.
- f. ADJUST—Thermal compensation R455 and R468 for optimum square front corner with aberrations not to exceed \pm 0.03 division.
- g. Set the calibration fixture Rep Rate switch to 100 kHz and set the time base unit sweep rate for 2 μ s/div.
- h. ADJUST—Thermal compensation R456 and R458 for optimum square front corner with aberrations not to exceed \pm 0.03 division.
- i. Set the calibration fixture Rep Rate switch to 1 MHz and set the time base unit sweep rate for 1 μ s/div.
- j. CHECK—Repeat part c of this step.
- k. INTERACTION—Repeat part d through i until optimum adjustment is obtained.

15. Adjust Vertical High-Frequency Compensation

- a. Set the calibration fixture switch to Vert or Horiz +Step Resp, Rep Rate switch to 1 MHz, and adjust the Amplitude control for a six-division display.
- b. Set the 7B53A for a calibrated sweep rate of five nanoseconds/division (use X10 magnifier). Set the trigger source switch internal adjust trigger level control and position control for a stable display, centered on the graticule.
- c. CHECK—For optimum square corner and flat top on displayed pulse with aberrations not to exceed +0.1 or -0.1 division with total peak-to-peak aberrations not to exceed 0.18 division.
- d. ADJUST—High-frequency compensation as given in Table 3-2 for optimum square leading corner and flat top with minimum aberrations within limits given in part c. Location of adjustments is shown in Fig. 3-3. Use the low-capacitance screwdriver to adjust the variable capacitors. Repeat the complete adjustment procedure several times to obtain optimum adjustment.

**TABLE 3-2
High-Frequency Compensation**

| Adjustment | Primary Area Of Pulse Affected | Best Sweep Rate |
|---------------|--------------------------------|-------------------------|
| C420 and R421 | First 50 nanoseconds | 50 nanoseconds/division |
| R425 and C425 | First 20 nanoseconds | 20 nanoseconds/division |
| C427 and R427 | First 5 nanoseconds | 20 nanoseconds/division |

- e. Remove the calibration fixture from the left vertical compartment and install it in the right vertical compartment.
- f. Set the VERT MODE switch to RIGHT.
- g. CHECK—Optimum square leading corner and flat top on the displayed pulse with aberrations not to exceed +0.1 or -0.1 division, with total peak-to-peak aberrations not to exceed 0.1 division.
- h. ADJUST—If necessary, compromise the adjustment of C420, R421, R425, C425, C427, R427 for best response from both the left and right vertical compartments.
- i. To verify correct high-frequency compensation, perform the bandwidth check as given in next step.

16. Check Vertical Amplifier Bandwidth

- a. Connect the high-frequency constant-amplitude signal generator to the CW In connector of the mainframe standardizer calibration fixture.
- b. Set the Test switch of the calibration fixture to Vert or Horiz Freq Resp.

c. Set the 7B53A for a sweep rate of 0.2 microsecond/division.

d. Set the high-frequency generator for six divisions of deflection, centered on the graticule, at a reference frequency of 3 megahertz.

e. Without changing the output amplitude, increase the output frequency of the high-frequency generator until the display is reduced to 4.2 divisions (−3 dB point).

f. CHECK—Output frequency must be 115 megahertz or higher if using test fixture. If using amplifier, see systems specifications.

g. Remove the calibration fixture from the right vertical compartment and install it in the left vertical compartment (leave signal connected).

h. Set the VERT MODE switch to LEFT.

i. Repeat parts d through f. Actual frequency (right vertical), 115 megahertz or higher.

j. Disconnect all test equipment (leave plug-in units installed).

17. Check Vertical Amplifier Isolation

a. Remove the mainframe standardizer calibration fixture from the right vertical compartment and install the 7A15A in the left compartment.

b. Set the 7A15A for a deflection factor of 0.1 volt/division.

c. Connect the output of the high-frequency generator to the input of the 7A15A.

d. Set the high-frequency generator for eight divisions of deflection at 100 megahertz.

e. Set the VERT MODE switch to RIGHT.

f. CHECK—CRT display for not more than 0.1 division of 100 megahertz signal (channel isolation at least 100:1).

g. Remove the 7A15A from the left vertical compartment and install it in the right vertical compartment (leave signal connected).

h. Set the high-frequency generator for eight divisions of deflection at 100 megahertz.

i. Set the VERT MODE switch to LEFT.

j. CHECK—CRT display for not more than 0.1 division of 100 megahertz signal.

k. Disconnect all test equipment.

18. Check ADD Operation

a. Install the other 7A15A in the left vertical compartment.

b. Set both 7A15A units for a deflection factor of 0.2 volt/division.

c. Connect the 0.4 V Calibrator signal to the inputs of the 7A15A units with the BNC to pin-jack cable and dual-input coupler.

d. Set the 7B53A for auto, internal triggering at a sweep rate of 0.5 millisecond/division.

e. Center the display with the left 7A15A Position control and note the vertical deflection.

f. Set the VERT MODE switch to RIGHT.

g. Center the display with the right 7A15A Position control and note the vertical deflection.

h. Set the VERT MODE switch to ADD.

i. CHECK—CRT display; vertical deflection should approximately equal the algebraic sum of the deflection noted in parts e and g of this step.

j. Disconnect the BNC to pin-jack cable and dual-input coupler.

19. Check Alternate Operation

a. Set the VERT MODE switch to ALT.

b. Position the traces about two divisions apart.

c. Turn the 7B53A Time/Division switch throughout its range.

d. CHECK—Trace alternation between the left and right 7A15A units at all sweep rates. At faster sweep rates, alternation will not be apparent; instead display appears as two traces on the screen.

20. Check Vertical Chopped Mode Operation

- a. Connect the 10X probe to the external trigger input of the 7B53A.
- b. Connect the probe tip to TP67 (see Fig. 3-4).
- c. Position the trace several divisions above the center line with the Position control.
- d. Set the VERT MODE switch to CHOP.
- e. Set the 7B53A for auto, external triggering at a sweep rate of 0.2 microsecond/division.
- f. CHECK—CRT display for chopped waveform display with duration of the time segment from each channel, including the blanked portion, between two and three divisions. Also, check that the unblanked (visible) portion of the time segment from each channel consists of at least 75% of the duration of the total channel segment.
- g. Disconnect the probe and remove all plug-in units.

TRIGGERING SYSTEM

Equipment Required

1. Mainframe standardizer calibration fixture
2. 7B53A plug-in unit
3. 7A15A plug-in unit
4. BNC to pin-jack cable

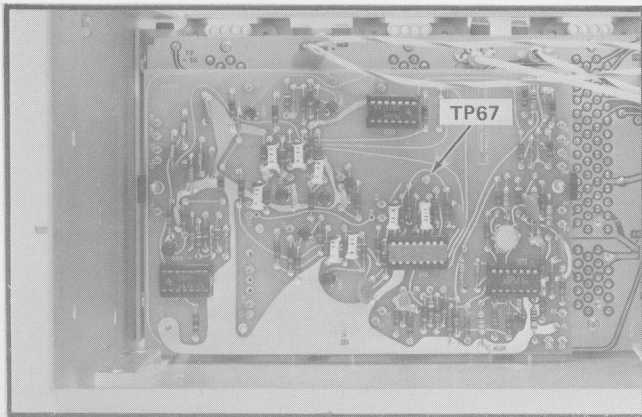


Fig. 3-4. Location of TP67 on Logic board (shown with power unit removed).

Control Settings

Set the controls as given under Preliminary Control Settings.

21. Check Trigger Source Operation

- a. Install the mainframe standardizer calibration fixture in the right vertical compartment and the 7A15A in the left vertical compartment.
- b. Install the 7B53A in the horizontal compartment.
- c. Set the 7B53A for auto, internal triggering at a sweep rate of 0.5 millisecond/division.
- d. Set the 7A15A for a deflection factor of 0.2 volt/division.
- e. Connect the 0.4 V Calibrator pin-jack to the input of the 7A15A with the BNC to pin-jack cable.
- f. Position the Calibrator waveform display in the upper half of the graticule area with the 7A15A Position control.
- g. Set the VERT MODE switch to RIGHT.
- h. Set the calibration fixture Test switch to Vert or Horiz +Step, Rep Rate switch to 100 kHz, and adjust the Amplitude control for a two-division display. Position the display in the lower half of the graticule area.
- i. Set the VERT MODE switch to ALT.
- j. CHECK—CRT display; both square-wave displays are stable.
- k. Set the TRIG SOURCE switch to LEFT.
- l. CHECK—CRT display; Calibrator display only is stable.
- m. Set the TRIG SOURCE switch to RIGHT.
- n. CHECK—CRT display; calibration fixture display only is stable.
- o. Disconnect the BNC to pin-jack cable and remove the plug-in units.

HORIZONTAL DEFLECTION SYSTEM

Equipment Required

1. 7B53A plug-in unit
2. 7A15A plug-in unit (two)
3. Mainframe standardizer calibration fixture
4. Test-oscilloscope system with two 10X probes
5. Time-mark generator
6. Low-frequency generator
7. Medium-frequency generator
8. Dual-input coupler
9. 42-inch 50-ohm BNC cable
10. 50-ohm BNC termination
11. Three-inch screwdriver
12. Low-capacitance screwdriver

Control Settings

Set the controls as given under Preliminary Control Settings.

22. Adjust Horizontal Amplifier Limit Centering

- a. Install the 7B53A in the horizontal compartment.
- b. Set the 7B53A for auto, internal triggering at a sweep rate of one millisecond/division with the magnifier on.
- c. Connect 10X probes to both inputs of the test oscilloscope. Connect the probe tips to the horizontal deflection plate connectors of the 7603 (be sure probes are compensated).
- d. Set both channels of the test oscilloscope for a vertical deflection factor of 1.0 volt/division (ten volts/division at probe tip) in the chop dual-trace mode with the input coupling set to ground.
- e. Position the ground-reference traces displayed on the test oscilloscope to the center horizontal line of the graticule. Do not change the test-oscilloscope position controls after establishing this ground reference.

f. Set the test oscilloscope for DC input coupling and set the triggering controls so the test oscilloscope is triggered from the signal on channel 1 only. Set the triggering controls for a stable display at a sweep rate of two milliseconds/division.

g. CHECK—The base line of both displayed waveforms should be at the same DC level within 0.2 division (see Fig. 3-5).

h. ADJUST—Limit Centering adjustment R535 (see Fig. 3-6) to match the DC levels of both waveforms.

- i. Disconnect all test equipment, and remove the 7B53A.

23. Adjust Horizontal Amplifier Centering

a. Install the calibration fixture in the horizontal compartment and set the Test Switch to Triggering Gain.

b. CHECK—Spot produced by calibration fixture should align with the vertical center of the graticule within 0.3 division (within 0.5 division with readout).

c. ADJUST—Horizontal Centering adjustment R525 (see Fig. 3-6) to position the spot to the vertical center line.

d. INTERACTION—If R525 is adjusted, re-check steps 22 and 23.

e. Remove the calibration fixture from the horizontal compartment.

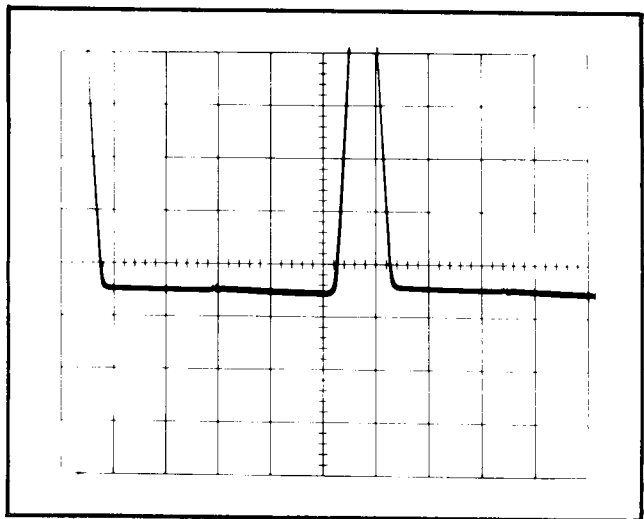


Fig. 3-5. Test oscilloscope waveforms when horizontal limit centering is properly adjusted.

24. Check/Adjust Horizontal Amplifier Gain and Low-Frequency Linearity

a. Install the 7A15A in the horizontal compartment and the 7B53A in the vertical compartment. Set the 7A15A Volts/Div switch to 0.2 volt/division. Connect a 0.4 volt square wave CALIBRATOR signal to the 7A15A; adjust the Position control to keep the display centered on the graticule and adjust the Variable Volts/Div control if needed for two division display.

b. Check—Position the two division display horizontally and check for not more than 0.1 division compression or expansion anywhere within the graticule area. Remove the 7A15A and install the mainframe standardizer calibration fixture. Set the Test switch on the calibration fixture to Vert or Horiz gain, and Rep Rate to 100 kHz.

c. Set the 7B53A for auto, external triggering at a sweep rate of one millisecond/division.

d. Position the display so the first and eleventh traces are near the far left and right vertical lines of the graticule.

e. CHECK—Deflection between the second and tenth traces is eight divisions ± 0.08 division.

f. ADJUST—Horizontal Gain adjustment R512 (see Fig. 3-6) for exactly eight divisions of deflection between the second and tenth traces.

g. CHECK—With gain set exactly, all nine vertical traces align with their respective graticule lines within 0.05 division.

h. INTERACTION—If R512 is adjusted, recheck steps 22 and 23.

i. Remove the calibration fixture and install the 7B53A in the horizontal compartment.

25. Adjust High-Frequency Timing

a. Install the 7A15A in the left vertical compartment.

b. Connect the time-mark generator to the input connector of the 7A15A with the 42-inch 50-ohm BNC cable and the 50-ohm BNC termination.

c. Set the time-mark generator for one-millisecond markers. Set the deflection factor of the 7A15A so the markers are at least two divisions in amplitude.

d. Set the 7B53A for auto, internal triggering at a sweep rate of one millisecond/division.

e. Position the first marker to the left vertical line of the graticule.

f. Set the 7B53A Swp Cal adjustment for one marker each major graticule division between the second and tenth lines.

g. Set the time-mark generator for 10-nanosecond markers.

h. Set the 7B53A for a sweep rate of 0.1 microsecond/division with the X10 magnifier on; set the deflection factor of the 7A15A as necessary so the markers are about two divisions in amplitude for the rest of step 25.

i. CHECK—CRT display for one marker each division over the center eight divisions.

j. ADJUST—For SN B030000-up—C588 for one marker each division (for SN below B030000, adjust C568 and C588 for one marker each division while maintaining approximately equal capacitances). Use low capacitance adjustment tool for all adjustments in this step.

k. Set the 7B53A for a sweep rate of 0.05 microsecond/division with X10 magnifier on.

l. ADJUST—For SN B030000-up—C566 and C586 for one marker each two divisions while maintaining approximately equal capacitances. (For SN below B030000, re-adjust C568 and C588 for best compromise between 5 nanosecond and 10 nanosecond timing.)

m. Repeat parts j, k, and l to achieve the best compromise for 5 nanosecond and 10 nanosecond timing over the center 8 horizontal divisions.

26. Check X-Y Phase Shift

a. Install the 7A15A plug-in units in the left vertical and horizontal compartments.

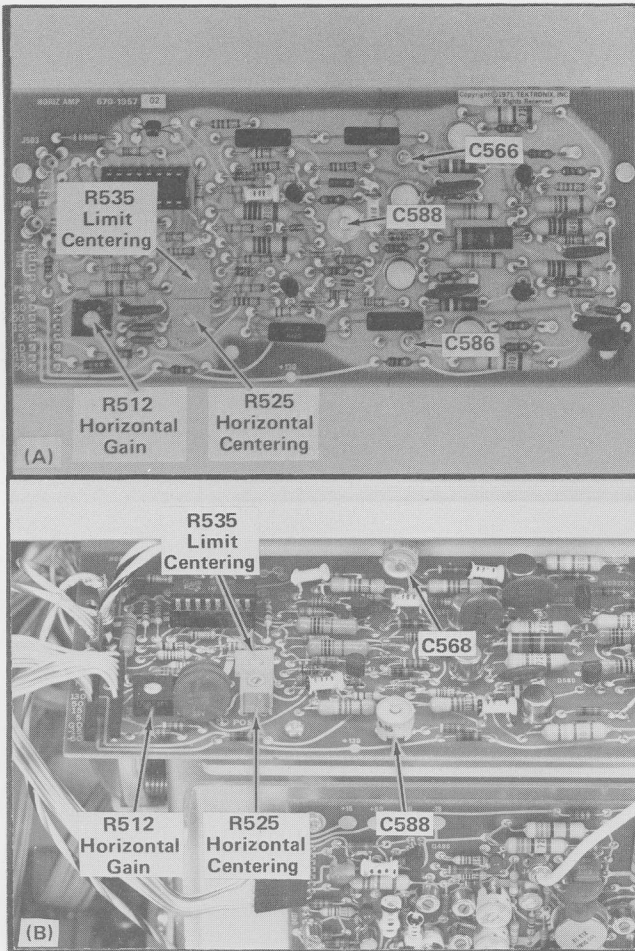


Fig. 3-6. Location of Horizontal adjustments (Horizontal Amplifier board). (A) SNB030000-up; (B) Below SNB030000.

b. Set both 7A15A units for a deflection factor of 10 millivolts/division with DC input coupling.

c. Connect the low-frequency signal generator to the inputs of both 7A15A plug-in units with the 42-inch 50-ohm BNC cable, 50-ohm BNC termination, and dual-input coupler.

d. Set the low-frequency generator for eight divisions of vertical and horizontal deflection at an output frequency of 35 kilohertz.

e. CHECK—CRT lissajous display for an opening at the center vertical line of 0.28 division or less (indicates 2° or less phase shift; see Fig. 3-7).

f. Disconnect all test equipment (leave plug-in units installed).

27. Check Horizontal Bandwidth

a. Install the 7B53A in the right vertical compartment.

b. Set the VERT MODE switch to RIGHT.

c. Set the 7B53A for auto triggering at a sweep rate of one millisecond/division (display will free run).

d. Connect the medium-frequency generator to the input of the 7A15A in the horizontal compartment with the 42-inch BNC and the 50-ohm BNC termination.

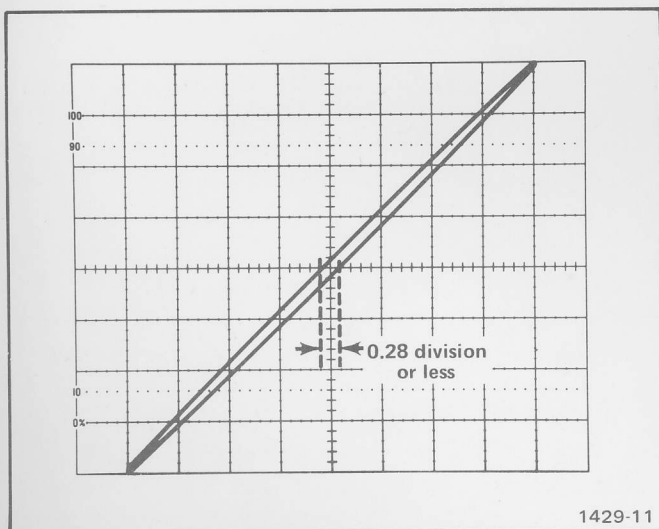


Fig. 3-7. Typical CRT display when checking X-Y phase shift.

e. Set the medium-frequency generator for 8 divisions of horizontal deflection at its reference frequency (50 kilohertz).

f. Without changing the output amplitude, increase the output frequency of the generator to two megahertz.

g. CHECK—For at least 5.6 division of signal amplitude.

h. Disconnect all test equipment and remove the plug-in units.

CALIBRATOR

Equipment Required

1. Precision DC voltmeter
2. 7A15A plug-in unit
3. 7B53A plug-in unit
4. BNC to pin-jack cable
5. Three-inch screwdriver

Control Settings

Set the controls as given under Preliminary Control Settings.

28. Adjust Calibrator Output Voltage

a. Change jumper P1066 (see Fig. 3-8) to the DC position.

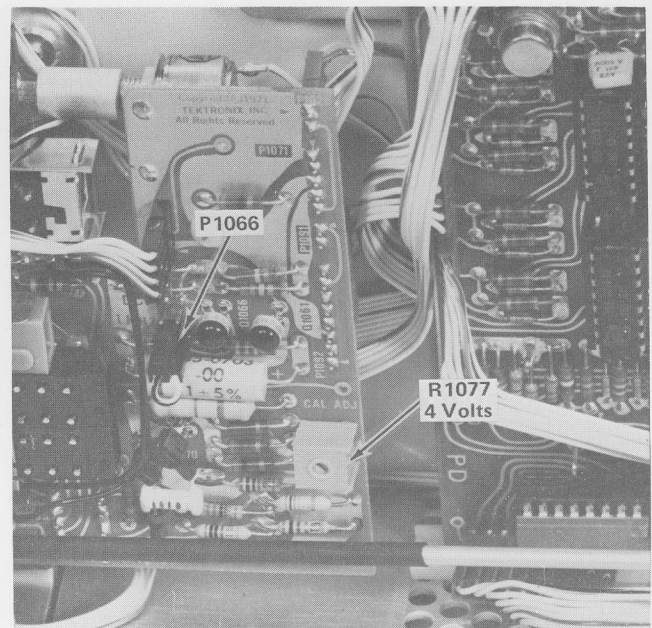


Fig. 3-8. Location of Calibrator adjustments (Calibrator board).

Calibration—7603/R7603 Service

b. Connect the precision DC voltmeter between the 4 V and GND pin-jacks.

c. CHECK—Meter reading; 4 volts ± 0.04 volt (within ± 0.08 volt if this measurement is made outside the $+15^{\circ}\text{C}$ to $+35^{\circ}\text{C}$ range).

d. ADJUST—4 Volts adjustment R1077 (see Fig. 3-8) for a meter reading of exactly 4 volts.

e. Connect the precision DC voltmeter between the 0.4 V Calibrator pin-jack and pin-jack ground.

f. CHECK—Meter reading; 0.4 volt ± 0.004 volt (within 0.008 volt if this measurement is made outside the $+15^{\circ}\text{C}$ to $+35^{\circ}\text{C}$ range).

g. Connect the precision DC voltmeter between the 40 mV Calibrator pin-jack and pin-jack ground.

h. CHECK—Meter reading; 40 millivolts ± 0.4 millivolt (within 0.8 millivolt if this measurement is made outside the $+15^{\circ}\text{C}$ to $+35^{\circ}\text{C}$ range).

i. Disconnect the precision DC voltmeter.

29. Check Calibrator Repetition Rate

a. Change jumper P1066 (see Fig. 3-8) to the 1 kHz position.

b. Install the 7A15A in the left vertical compartment and the 7B53A in the horizontal compartment.

c. Set the 7A15A for a deflection factor of one volt/division.

d. Set the 7B53A for auto, internal triggering at a sweep rate of 0.2 millisecond/division.

e. Connect the 4 V calibrator pin-jack to the input of the 7A15A with the BNC to pin-jack cable.

f. Position the start of the square wave to the left line of the graticule.

g. CHECK—CRT display for length of one complete cycle between 4.2 and 6.3 divisions (one kilohertz $\pm 20\%$).

SIGNALS IN AND OUT

Equipment Required

1. 7A15A (two)
2. 7B53A
3. DC Voltmeter
4. BNC to pin-jack cable
5. Test Oscilloscope

30. Check SS READY OUT

a. Connect a voltmeter to the SS READY OUT connector and connect the calibrator signal to the input of the 7A15A. Obtain a triggered display of 2 or more divisions.

b. Set the 7B53A to SINGLE Sweep at a sweep rate of 0.5 seconds/division.

c. CHECK—for 0 volt at SS READY OUT connector.

d. Press the 7B53A RESET button.

e. CHECK—for a +5 volt level at the SS READY OUT connector.

f. CHECK—that SS READY OUT returns to 0 volt after single sweep has been displayed and hold off has occurred.

31. Check EXT SS RESET IN

a. CHECK—that when the EXT SS RESET IN input is grounded that the time base single sweep function is reset.

32. Check VERT SIG OUT

a. Set the 7B53A to Auto and adjust the trigger level for stable display at 1 millisecond/division.

b. Connect a BNC cable to the VERT SIG OUT connector and to the 7A15A in the right vertical compartment. Set TRIG SOURCE switch to LEFT VERT.

c. Connect the 0.4 V CALIBRATOR signal to the input of 7A15A in the left vertical compartment. Set both vertical amplifiers for a deflection factor of 0.2 volts/division with each input set to DC and each Position control set so its trace is centered.

d. CHECK—that a 2 division signal is displayed by the left vertical amplifier.

e. Set VERT Mode switch to RIGHT and, check that a signal of about 5 divisions is displayed by the right vertical amplifier.

f. Interchange the connections to the vertical amplifiers. Set the TRIG SOURCE switch to right.

g. CHECK—that a 2 division signal is displayed by the right vertical amplifier.

h. Set the VERT MODE switch to LEFT and check that a signal of about 5 divisions is displayed.

i. Install a 50 Ω termination between the cable and the input of the right vertical amplifier.

j. Set the deflection factor of the left vertical to 100 mV/division. Check for a display of about 5 divisions.

k. Disconnect all cables.

33. Check +SAWTOOTH OUT

a. Connect the +SAWTOOTH OUT to the input of the left vertical amplifier. Set the deflection factor of the left vertical amplifier for 2 volts/division.

b. CHECK—for a sawtooth display of about 5 divisions in amplitude and greater than 10 cm in length.

34. Check +GATE OUT

a. Connect the +GATE OUT to the vertical input of the test-oscilloscope and set the deflection factor to 2 volts/division. Set the time/division switch to 1 ms/div. Place the GATE selector switch in the MAIN GATE position.

b. CHECK—that displayed signal is about 5 divisions in amplitude.

READOUT OPERATION

Equipment Required

1. 7A18A dual display vertical plug-in unit

35. Check READOUT Operation

NOTE

If the CRT has been replaced, the words identify may not be positioned horizontally as described in steps 37a, e, and f. Select a value for R519 which will provide a correct display.

a. Install the 7A18A in the left vertical compartment. Set the 7A18A to a dual trace mode. Push and hold the Identify buttons on the 7A18A. (Switch S2110 should be in the free run position.) Check that the word identify is within the top division and the bottom division of the graticule. Check that the words identify are positioned within the left third of the graticule. Check completeness of characters without over scanning (over scanning causes a bright dot where traces overlap).

b. ADJUST—Vertical Separation R2291 so the channel 1 characters are within top division, and the channel 2 characters are within bottom division.

c. ADJUST—Character height size R2273 as needed.

d. ADJUST—Character scan R2128 if characters are over scanned.

e. Remove the 7A18A from the left vertical and install it in the right vertical compartment. Push and hold the identify buttons on the 7A18A. Check that the words identify are positioned within the center third of the graticule.

f. Remove the 7A18A from the right vertical and install it in the horizontal compartment. Push and hold the identify buttons on the 7A18A. Check that the words identify are positioned within the right third of the graticule.

g. If the correct characters are displayed there is no need to adjust the Row Match adjustment R2183 or the Column Match adjustment R2214.

h. ADJUST—Row Match adjustment R2183 and Column Match adjustment R2214 for correct readout display.

READOUT GATE TRIG'D OPERATION

36. Check Readout Gate Trig'd Operation

- a. Set switch S2110 to Gate Trig'd position.

- b. Set sweep rate to 1 sec/division.

c. CHECK—that during the sweep that there is no readout information displayed, until after the sweep has been displayed. At fast sweep rates this is not noticeable.

This completes the calibration/checkout procedure for the 7603. Disconnect all test equipment and replace the side panels. If the instrument has been completely checked and adjusted to the tolerances given in this procedure, it will meet or exceed the specifications given in Section 1.

CIRCUIT DESCRIPTION

Introduction

This section of the manual contains a description of the circuitry used in the 7603 Oscilloscope. The description begins with a discussion of the instrument using the basic block diagram shown in Fig. 4-1. Then, each circuit is described in detail using detailed block diagrams to show the interconnections between the stages within each major circuit and the relationship of the external controls and connectors to the individual stages.

A complete block diagram is located in the Diagrams section at the back of this manual. This block diagram shows the overall relationship between all of the circuits. Complete schematics of each circuit are also given in the Diagrams section. Refer to these diagrams throughout the following circuit description for electrical values and relationship.

BLOCK DIAGRAM

The following discussion is provided to aid in understanding the overall concept of the 7603 before the individual circuits are discussed in detail. A basic block diagram of the 7603 is shown in Fig. 4-1. Only the basic interconnections between the individual blocks are shown on this diagram. Each block represents a major circuit within the instrument. The number on each block refers to the complete circuit diagram located at the rear of the manual.

Vertical signals to be displayed on the CRT are applied to the Vertical Interface circuit from both vertical plug-in compartments. The Vertical Interface circuit determines whether the signal from the left and/or right vertical unit is displayed. The selected vertical signal is then amplified by the Vertical Amplifier circuit to bring it to the level necessary to drive the vertical deflection plates of the CRT.

Horizontal signals for display on the CRT are connected to the Horizontal Amplifier circuit from the horizontal plug-in compartment. The Horizontal Amplifier circuit amplifies this signal to provide the horizontal deflection for the CRT.

The internal trigger signals from the vertical plug-in units are connected to the Trigger Selector circuit. This circuit selects the trigger signal which is connected to the horizontal plug-in unit. The Calibrator circuit produces a square-wave output signal with accurate amplitude which can be used to check the calibration of this instrument and the compensation of probes.

The Logic circuit develops control signals for use in other circuits within this instrument and the plug-in units. These output signals automatically determine the correct instrument operation in relation to the plug-ins installed and/or selected, plug-in control settings, and 7603 control settings. The CRT circuit produces the voltages and contains the controls necessary for operation of the cathode-ray tube. It also contains the Z-Axis Amplifier which provides the drive signal to control the intensity level of the CRT display.

The power necessary for the operation of this instrument is produced by the Low-Voltage Power Supply circuit. These voltages are connected to all circuits within the instrument.

CIRCUIT OPERATION

This section provides a detailed description of the electrical operation and relationship of the circuits in the 7603. The theory of operation for circuits unique to this instrument is described in detail in this discussion. Circuits which are commonly used in the electronics industry are not described in detail. If more information is desired on these commonly used circuits, refer to the following textbooks (also see books under Logic Fundamentals):

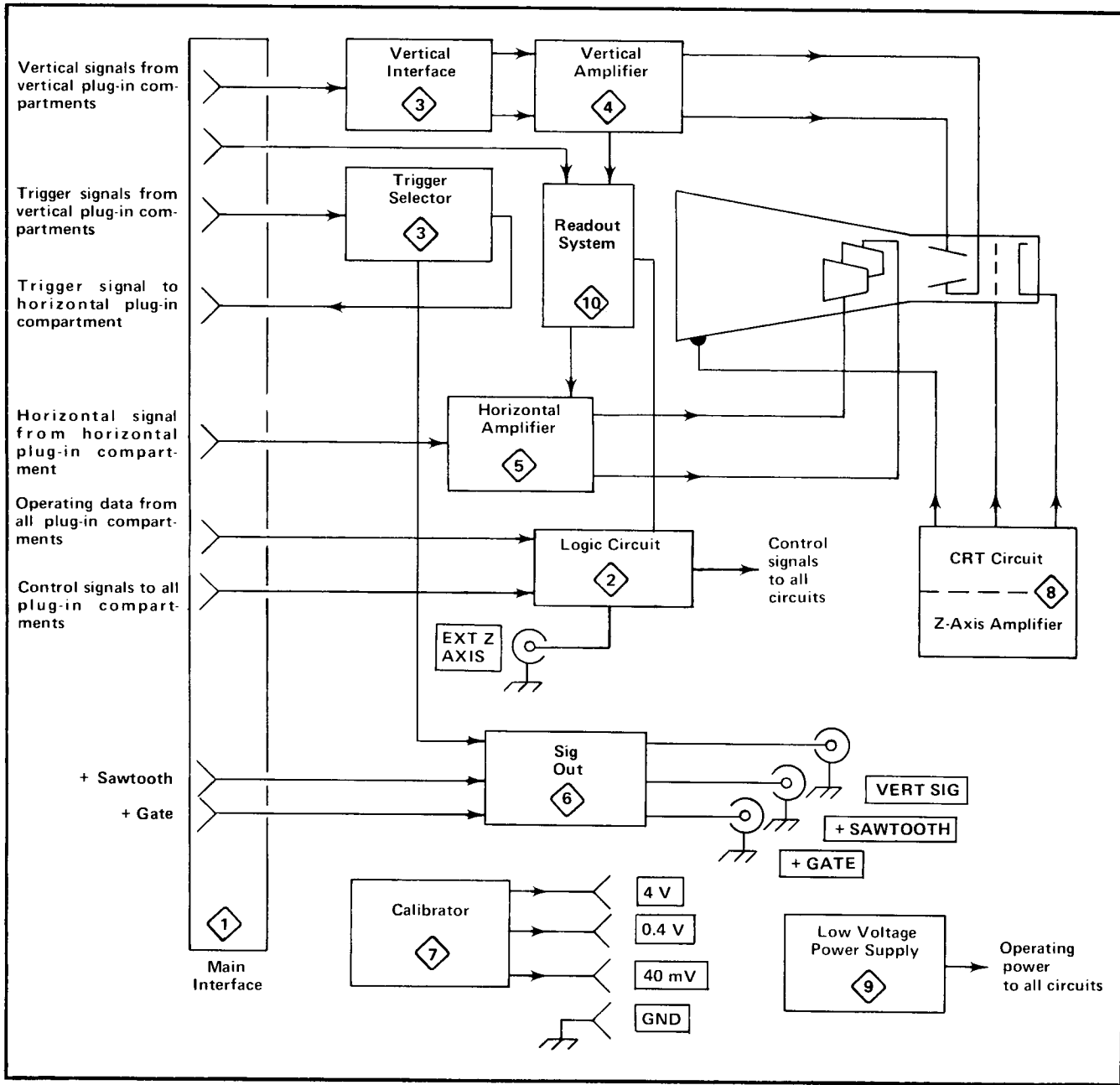


Fig. 4-1. Basic block diagram of 7603 Oscilloscope.

Phillip Cutler, "Semiconductor Circuit Analysis", McGraw-Hill, New York, 1964.

Lloyd P. Hunter (Ed.), "Handbook of Semiconductor Electronics", second edition, McGraw-Hill, New York, 1962.

Jacob Millman and Herbert Taub, "Pulse, Digital, and Switching Waveforms", McGraw-Hill, New York, 1965.

The following circuit analysis is written around the detailed block diagrams which are given for each major circuit. These detailed block diagrams give the names of the

individual stages within the major circuits and show how they are connected together to form the major circuit. The block diagrams also show the inputs and outputs for each circuit and the relationship of the external controls and connectors to the individual stages. The circuit diagrams from which the detailed block diagrams are derived are shown in the Diagrams section.

NOTE

All references to direction of current in this manual are in terms of conventional current; i.e., from plus to minus.

LOGIC FUNDAMENTALS

Digital logic techniques are used to perform many functions within this instrument. The function and operation of the logic circuits are described using logic symbology and terminology. This portion of the manual is provided to aid in the understanding of these symbols and terms. The following information is a basic introduction to logic concepts, not a comprehensive discussion of the subject. For further information on binary number systems and the associated Boolean Algebra concepts, the derivation of logic functions, a more detailed analysis of digital logic, etc., refer to the following textbooks:

Robert C. Baron and Albert T. Piccirilli, "Digital Logic and Computer Operation", McGraw-Hill, New York, 1967.

Thomas C. Bartee, "Digital Computer Fundamentals", McGraw-Hill, New York, 1966.

Yaohan Chu, "Digital Computer Design Fundamentals", McGraw-Hill, New York, 1962.

Joseph Millman and Herbert Taub, "Pulse, Digital, and Switching Waveforms", McGraw-Hill, New York, Chapters 9 – 11, 1965.

Symbols

The operation of circuits within the 7603 which use digital techniques is described using the graphic symbols set forth in military standard MIL-STD-806B. Table 4-1 provides a basic logic reference for the logic devices used within this instrument. Any deviations from the standard symbology, or devices not defined by this standard will be described in the circuit description for the applicable device.

TABLE 4-1
Basic Logic Reference

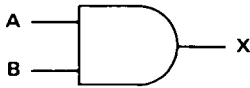

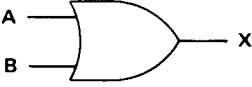
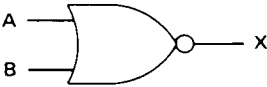
| Device | Symbol | Description | Input/Output Table | | | | | | | | | | | | | | | | | | |
|-----------|---|--|---|-------|--|--------|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|
| AND gate |  | A device with two or more inputs and one output. The output of the AND gate is HI if and only if all of the inputs are at the HI state. | <table border="1"> <thead> <tr> <th colspan="2">Input</th> <th>Output</th> </tr> <tr> <th>A</th> <th>B</th> <th>X</th> </tr> </thead> <tbody> <tr> <td>LO</td> <td>LO</td> <td>LO</td> </tr> <tr> <td>LO</td> <td>HI</td> <td>LO</td> </tr> <tr> <td>HI</td> <td>LO</td> <td>LO</td> </tr> <tr> <td>HI</td> <td>HI</td> <td>HI</td> </tr> </tbody> </table> | Input | | Output | A | B | X | LO | LO | LO | LO | HI | LO | HI | LO | LO | HI | HI | HI |
| Input | | Output | | | | | | | | | | | | | | | | | | | |
| A | B | X | | | | | | | | | | | | | | | | | | | |
| LO | LO | LO | | | | | | | | | | | | | | | | | | | |
| LO | HI | LO | | | | | | | | | | | | | | | | | | | |
| HI | LO | LO | | | | | | | | | | | | | | | | | | | |
| HI | HI | HI | | | | | | | | | | | | | | | | | | | |
| NAND gate |  | A device with two or more inputs and one output. The output of the NAND gate is LO if and only if all of the inputs are at the HI state. | <table border="1"> <thead> <tr> <th colspan="2">Input</th> <th>Output</th> </tr> <tr> <th>A</th> <th>B</th> <th>X</th> </tr> </thead> <tbody> <tr> <td>LO</td> <td>LO</td> <td>HI</td> </tr> <tr> <td>LO</td> <td>HI</td> <td>HI</td> </tr> <tr> <td>HI</td> <td>LO</td> <td>HI</td> </tr> <tr> <td>HI</td> <td>HI</td> <td>LO</td> </tr> </tbody> </table> | Input | | Output | A | B | X | LO | LO | HI | LO | HI | HI | HI | LO | HI | HI | HI | LO |
| Input | | Output | | | | | | | | | | | | | | | | | | | |
| A | B | X | | | | | | | | | | | | | | | | | | | |
| LO | LO | HI | | | | | | | | | | | | | | | | | | | |
| LO | HI | HI | | | | | | | | | | | | | | | | | | | |
| HI | LO | HI | | | | | | | | | | | | | | | | | | | |
| HI | HI | LO | | | | | | | | | | | | | | | | | | | |
| OR gate |  | A device with two or more inputs and one output. The output of the OR gate is HI if one or more of the inputs are at the HI state. | <table border="1"> <thead> <tr> <th colspan="2">Input</th> <th>Output</th> </tr> <tr> <th>A</th> <th>B</th> <th>X</th> </tr> </thead> <tbody> <tr> <td>LO</td> <td>LO</td> <td>LO</td> </tr> <tr> <td>LO</td> <td>HI</td> <td>HI</td> </tr> <tr> <td>HI</td> <td>LO</td> <td>HI</td> </tr> <tr> <td>HI</td> <td>HI</td> <td>HI</td> </tr> </tbody> </table> | Input | | Output | A | B | X | LO | LO | LO | LO | HI | HI | HI | LO | HI | HI | HI | HI |
| Input | | Output | | | | | | | | | | | | | | | | | | | |
| A | B | X | | | | | | | | | | | | | | | | | | | |
| LO | LO | LO | | | | | | | | | | | | | | | | | | | |
| LO | HI | HI | | | | | | | | | | | | | | | | | | | |
| HI | LO | HI | | | | | | | | | | | | | | | | | | | |
| HI | HI | HI | | | | | | | | | | | | | | | | | | | |
| NOR gate |  | A device with two or more inputs and one output. The output of the NOR gate is LO if one or more of the inputs are at the HI state. | <table border="1"> <thead> <tr> <th colspan="2">Input</th> <th>Output</th> </tr> <tr> <th>A</th> <th>B</th> <th>X</th> </tr> </thead> <tbody> <tr> <td>LO</td> <td>LO</td> <td>HI</td> </tr> <tr> <td>LO</td> <td>HI</td> <td>LO</td> </tr> <tr> <td>HI</td> <td>LO</td> <td>LO</td> </tr> <tr> <td>HI</td> <td>HI</td> <td>LO</td> </tr> </tbody> </table> | Input | | Output | A | B | X | LO | LO | HI | LO | HI | LO | HI | LO | LO | HI | HI | LO |
| Input | | Output | | | | | | | | | | | | | | | | | | | |
| A | B | X | | | | | | | | | | | | | | | | | | | |
| LO | LO | HI | | | | | | | | | | | | | | | | | | | |
| LO | HI | LO | | | | | | | | | | | | | | | | | | | |
| HI | LO | LO | | | | | | | | | | | | | | | | | | | |
| HI | HI | LO | | | | | | | | | | | | | | | | | | | |

TABLE 4-1 (cont)
Basic Logic Reference

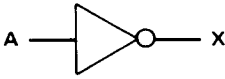

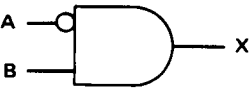
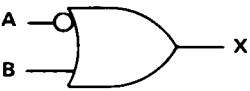

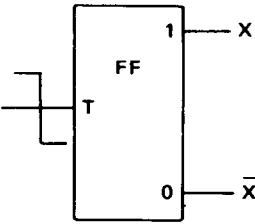
| Device | Symbol | Description | Input/Output Table | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|--------|--|--------|---|--------------------------------|-------------------------------|----|-----------|----|-----------|----|-----------|----|----|----|----|----|----|----|----|
| Inverter |  | A device with one input and one output. The output state is always opposite to the input state. | <table border="1"> <thead> <tr> <th colspan="2">Input</th> <th>Output</th> </tr> <tr> <th>A</th> <th></th> <th>X</th> </tr> </thead> <tbody> <tr> <td>LO</td> <td></td> <td>HI</td> </tr> <tr> <td>HI</td> <td></td> <td>LO</td> </tr> </tbody> </table> | Input | | Output | A | | X | LO | | HI | HI | | LO | | | | | | | | |
| Input | | Output | | | | | | | | | | | | | | | | | | | | | |
| A | | X | | | | | | | | | | | | | | | | | | | | | |
| LO | | HI | | | | | | | | | | | | | | | | | | | | | |
| HI | | LO | | | | | | | | | | | | | | | | | | | | | |
| LO-state indicator |  | A small circle at the input or output of a symbol indicates that the LO state is the significant state. Absence of the circle indicates that the HI state is the significant state. Two examples follow: | <table border="1"> <thead> <tr> <th colspan="2">Input</th> <th>Output</th> </tr> <tr> <th>A</th> <th>B</th> <th>X</th> </tr> </thead> <tbody> <tr> <td>LO</td> <td>LO</td> <td>LO</td> </tr> <tr> <td>LO</td> <td>HI</td> <td>HI</td> </tr> <tr> <td>HI</td> <td>LO</td> <td>LO</td> </tr> <tr> <td>HI</td> <td>HI</td> <td>LO</td> </tr> </tbody> </table> | Input | | Output | A | B | X | LO | LO | LO | LO | HI | HI | HI | LO | LO | HI | HI | LO | | |
| | Input | | | Output | | | | | | | | | | | | | | | | | | | |
| | A | B | | X | | | | | | | | | | | | | | | | | | | |
| LO | LO | LO | | | | | | | | | | | | | | | | | | | | | |
| LO | HI | HI | | | | | | | | | | | | | | | | | | | | | |
| HI | LO | LO | | | | | | | | | | | | | | | | | | | | | |
| HI | HI | LO | | | | | | | | | | | | | | | | | | | | | |
|  | AND gate with LO-state indicator at the A input. The output of this gate is HI if and only if the A input is LO and the B input is HI. | | | | | | | | | | | | | | | | | | | | | | |
|  | OR gate with LO-state indicator at the A input: The output of this gate is HI if either the A input is LO or the B input is HI. | | | | | | | | | | | | | | | | | | | | | | |
| Edge symbol |  | Normally superimposed on an input line to a logic symbol. Indicates that this input (usually the trigger input of a flip-flop) responds to the indicated transition of the applied signal. | | | | | | | | | | | | | | | | | | | | | |
| Triggered (toggle) Flip-Flop |  | A bistable device with one input and two outputs (either or both outputs may be used). When triggered, the outputs change from one stable state to the other stable state with each trigger. The outputs are complementary (i.e., when one output is HI the other is LO). The edge symbol on the trigger (T) input may be of either polarity depending on the device. | <table border="1"> <thead> <tr> <th colspan="2">Input</th> <th colspan="2">Output</th> </tr> <tr> <th>Condition before trigger pulse</th> <th>Condition after trigger pulse</th> <th>X</th> <th>\bar{X}</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>\bar{X}</td> <td>X</td> <td>\bar{X}</td> </tr> <tr> <td>LO</td> <td>HI</td> <td>HI</td> <td>LO</td> </tr> <tr> <td>HI</td> <td>LO</td> <td>LO</td> <td>HI</td> </tr> </tbody> </table> | Input | | Output | | Condition before trigger pulse | Condition after trigger pulse | X | \bar{X} | X | \bar{X} | X | \bar{X} | LO | HI | HI | LO | HI | LO | LO | HI |
| Input | | Output | | | | | | | | | | | | | | | | | | | | | |
| Condition before trigger pulse | Condition after trigger pulse | X | \bar{X} | | | | | | | | | | | | | | | | | | | | |
| X | \bar{X} | X | \bar{X} | | | | | | | | | | | | | | | | | | | | |
| LO | HI | HI | LO | | | | | | | | | | | | | | | | | | | | |
| HI | LO | LO | HI | | | | | | | | | | | | | | | | | | | | |

TABLE 4-1 (cont)
Basic Logic Reference

| Device | Symbol | Description | Input/Output Table | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--------|---|--|------------------------|-----------|--------|---|--------|-----------|----|-----------|----|----|-----------|-----------|----|----|----|----|------------------------|----|--------|--------|----|----|---------------|----|--------|--------|----|----|----|----|--------|--------|----|----|-----------|--|
| Set-Clear (J-K) Flip-Flop | | A bistable device with two inputs and two outputs (either or both outputs may be used). The outputs change state in response to the states at the inputs. The outputs are complementary (i.e., when one output is HI the other is LO). | <table border="1"> <thead> <tr> <th colspan="2">Input</th> <th colspan="2">Output</th> </tr> <tr> <th>A</th> <th>B</th> <th>X</th> <th>\bar{X}</th> </tr> </thead> <tbody> <tr> <td>LO</td> <td>LO</td> <td colspan="2">No change</td> </tr> <tr> <td>LO</td> <td>HI</td> <td>LO</td> <td>HI</td> </tr> <tr> <td>HI</td> <td>LO</td> <td>HI</td> <td>LO</td> </tr> <tr> <td>HI</td> <td>HI</td> <td colspan="2">Changes state</td> </tr> </tbody> </table> | Input | | Output | | A | B | X | \bar{X} | LO | LO | No change | | LO | HI | LO | HI | HI | LO | HI | LO | HI | HI | Changes state | | | | | | | | | | | | | |
| Input | | Output | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A | B | X | \bar{X} | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LO | LO | No change | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LO | HI | LO | HI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HI | LO | HI | LO | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HI | HI | Changes state | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D (data) Type Flip-Flop | | A bistable device with two inputs and two outputs (either or both outputs may be used). When triggered the state of the "1" output changes to the state at the data (D) input prior to the trigger. The outputs are complementary (i.e., when one output is HI the other is LO). The edge symbol on the trigger (T) input may be of either polarity, depending on the device. | <table border="1"> <thead> <tr> <th>Input</th> <th colspan="2">Output</th> </tr> <tr> <th>A</th> <th>X</th> <th>\bar{X}</th> </tr> </thead> <tbody> <tr> <td>LO</td> <td>LO</td> <td>HI</td> </tr> <tr> <td>HI</td> <td>HI</td> <td>LO</td> </tr> </tbody> </table> <p>Output conditions shown after trigger pulse</p> | Input | Output | | A | X | \bar{X} | LO | LO | HI | HI | HI | LO | | | | | | | | | | | | | | | | | | | | | | | | |
| Input | Output | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A | X | \bar{X} | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LO | LO | HI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HI | HI | LO | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Triggered Set-Clear (J-K) Flip-Flop | | A bistable device with three or more inputs and two outputs (either or both outputs may be used). When triggered, the outputs change state in response to the states at the inputs prior to the trigger. The outputs are complementary (i.e., when one output is HI the other is LO). The edge symbol on the trigger (T) input may be of either polarity depending on the device. | <table border="1"> <thead> <tr> <th colspan="2">Input</th> <th colspan="2">Output</th> </tr> <tr> <th>A</th> <th>B</th> <th>X</th> <th>\bar{X}</th> </tr> </thead> <tbody> <tr> <td>LO</td> <td>LO</td> <td colspan="2">No change</td> </tr> <tr> <td>LO</td> <td>HI</td> <td>LO</td> <td>HI</td> </tr> <tr> <td>HI</td> <td>LO</td> <td>HI</td> <td>LO</td> </tr> <tr> <td>HI</td> <td>HI</td> <td colspan="2">Changes state</td> </tr> </tbody> </table> <p>Output conditions shown after trigger pulse</p> | Input | | Output | | A | B | X | \bar{X} | LO | LO | No change | | LO | HI | LO | HI | HI | LO | HI | LO | HI | HI | Changes state | | | | | | | | | | | | | |
| Input | | Output | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A | B | X | \bar{X} | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LO | LO | No change | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LO | HI | LO | HI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HI | LO | HI | LO | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HI | HI | Changes state | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Flip-flop with direct inputs (may be applied to all triggered flip-flops) | | For devices with direct-set (S_D) or direct-clear (C_D) inputs, the indicated state at either of these inputs over-rides all other inputs (including trigger) to set the outputs to the states shown in the input/output table. | <table border="1"> <thead> <tr> <th colspan="4">Input</th> <th colspan="2">Output</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>X</th> <th>\bar{X}</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> <td>LO</td> <td>LO</td> <td colspan="2">No change¹</td> </tr> <tr> <td>Φ</td> <td>Φ</td> <td>LO</td> <td>HI</td> <td>LO</td> <td>HI</td> </tr> <tr> <td>Φ</td> <td>Φ</td> <td>HI</td> <td>LO</td> <td>HI</td> <td>LO</td> </tr> <tr> <td>Φ</td> <td>Φ</td> <td>HI</td> <td>HI</td> <td colspan="2">Undefined</td> </tr> </tbody> </table> <p>Φ = Has no effect in this case</p> <p>¹Output state determined by conditions at triggered inputs</p> | Input | | | | Output | | A | B | C | D | X | \bar{X} | 1 | 1 | LO | LO | No change ¹ | | Φ | Φ | LO | HI | LO | HI | Φ | Φ | HI | LO | HI | LO | Φ | Φ | HI | HI | Undefined | |
| Input | | | | Output | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A | B | C | D | X | \bar{X} | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 1 | LO | LO | No change ¹ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Φ | Φ | LO | HI | LO | HI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Φ | Φ | HI | LO | HI | LO | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Φ | Φ | HI | HI | Undefined | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

NOTE

Logic symbols used on the diagrams depict the logic function and may differ from the manufacturer's data.

Logic Polarity

All logic functions are described using the positive logic. Positive logic is a system of notation where the more positive of two levels (HI) is called the true or 1-state; the more negative level (LO) is called the false or 0-state. The HI-LO method of notation is used in this logic description. The specific voltages which constitute a HI or LO state vary between individual devices.

NOTE

The HI-LO logic notation can be conveniently converted to 1-0 notation by disregarding the first letter of each step. Thus:

HI = 1

LO = 0

Wherever possible, the input and output lines are named to indicate the functions that they perform when at the HI (true) state. For example, the line labeled, "Display B Command" means that the B Time-Base unit will be displayed when this line is HI or true. Likewise, the line labeled "X-Compensation Inhibit" means that the X-Compensation function is inhibited or disabled when this line is HI.

Input/Output Tables

Input/output (truth) tables are used in conjunction with the logic diagrams to show the input combinations which are of importance to a particular function, along with the resultant output conditions. This table may be given either for an individual device or for a complete logic stage. For examples of input/output tables for individual devices, see Table 4-1.

Non-Digital Devices

It should be noted that not all of the integrated circuit devices in this instrument are digital logic devices. The function of non-digital devices will be described individually using operating waveforms or other techniques to illustrate their function.

MAIN INTERFACE

Diagram 1 shows the plug-in interface and the interconnections between the plug-in compartments, circuit boards, etc. of this instrument.

LOGIC CIRCUIT

The Logic Circuit develops control signals for use in other circuits within this instrument and in the associated plug-in units. These output signals automatically determine the correct instrument operation in relation to the plug-in installed and/or selected, plug-in control settings, and the 7603 control settings. A schematic of this circuit is shown on diagram 2 at the rear of this manual.

Logic Block Diagram

A block diagram of the Logic Circuit is shown in Fig. 4-2. This diagram shows the source of the input control signals, the output signals produced by this circuit, and the basic interconnections between blocks. The interconnections shown are intended only to indicate inter-relationships between blocks and do not indicate a direct connection or that only a single connection is made between the given blocks. Details of the inter-relationship between stages within this circuit are given in the circuit description which follows.

The operation of each of these stages is discussed relating the input signals and/or levels to the output, with consideration given to the various modes of operation that may affect the stage. A logic diagram is also provided where applicable. These diagrams are not discussed in detail, but are provided to aid in relating the function performed by a given stage to standard logic techniques. It should be noted that these logic diagrams are not an exact representation of the circuit but are only a logic diagram of the function performed by the stage. An input/output table is given, where applicable, for use along with this circuit description and logic diagram. These input/output tables document the combination of input conditions which are of importance to perform the prescribed function of an individual stage.

Z-Axis Logic

The Z-Axis Logic stage produces an output current which sets the intensity of the display on the CRT. The level of this output current is determined by the setting of the front-panel INTENSITY control, an external signal from the rear panel EXT Z AXIS input connector, or signals from the plug-in compartments. The Vertical Chopped Blanking from U55 is applied to this stage to blank the CRT display during vertical trace switching. The Intensity Limit input from the horizontal plug-in compartment provides protection for the CRT phosphor at slow sweep rates.

The Z-Axis Logic stage consists of transistor 108, dual-transistor Q90 and integrated circuit U99, which is a five-transistor array. A simplified schematic of the Z-Axis

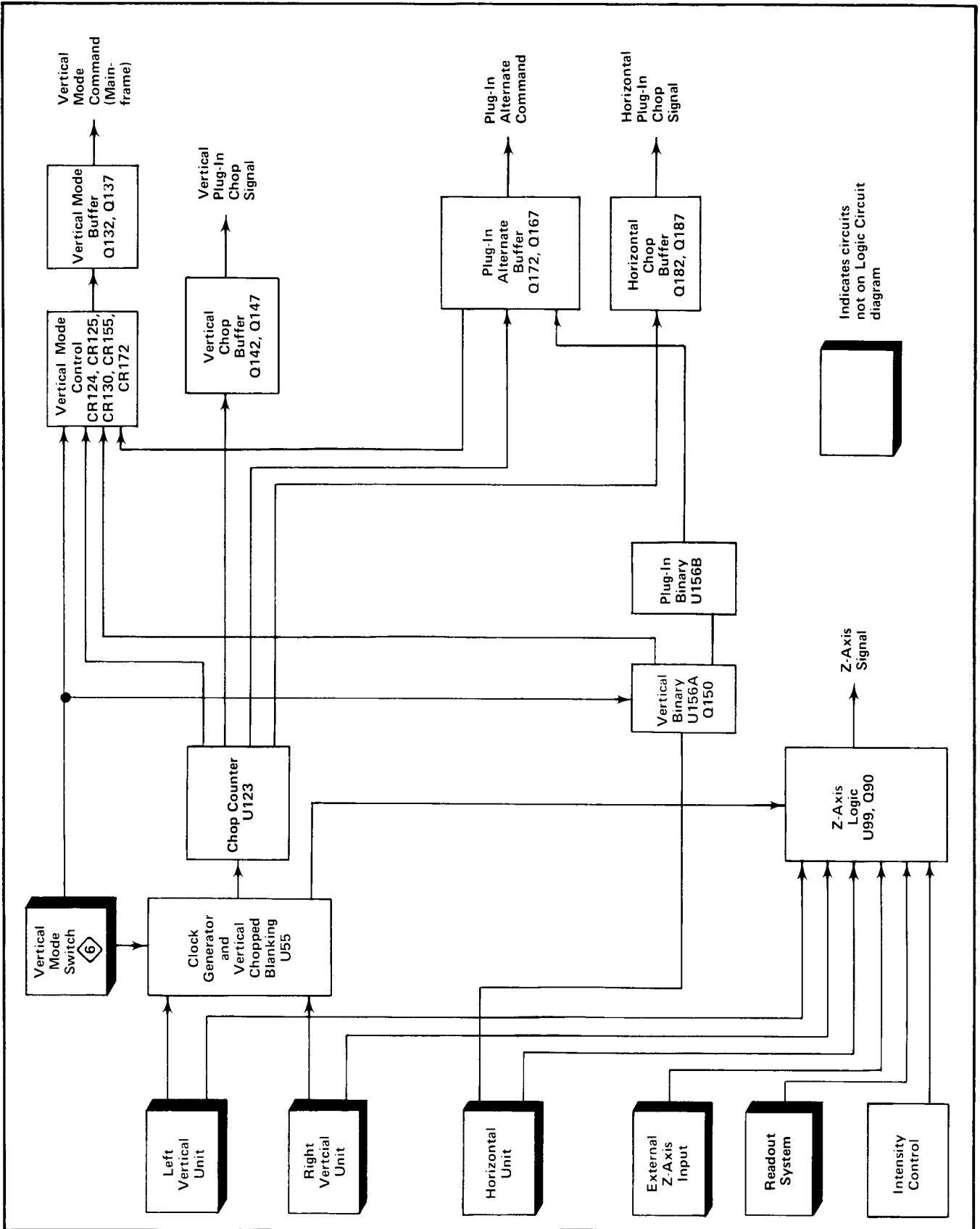


Fig. 4-2. Block diagram of Logic circuit.

Logic stage is shown in Fig. 4-3. Only the components essential to operation of this stage are shown in this simplified schematic.

Transistor U99C is connected in the common-base configuration to provide the output for this stage. The collector load for U99C is provided by the Z-Axis Amplifier in the CRT Circuit. Transistors U99D and U99E provide a current-limiting action for this stage. The collector current of U99D, represented by I_t , is the maximum amount of current that can flow in the circuit. The amount of this current is determined by the relationship between the Intensity Limit and Vertical Chopped Blanking. When both of these inputs are HI the collector current of U99D, I_t , is

maximum. This maximum level of I_t is determined by current I_1 in the base circuit of U99D established by networks R76-R77 and R62-R63 into R110 and the collector of U99E. During Vertical Chopped Blanking, the respective input level goes LO. This shunts the current I_1 from the base of U99D so the collector current of U99D, I_t , drops to minimum to blank the CRT display during vertical trace switching.

The Intensity Limit function limits the output current of this stage to protect the CRT phosphor whenever the time-base unit is set to a slow sweep rate. For conditions that do not require limiting, quiescent current is added to I_1 from the +15-volt supply through R76-R77. When the time-base unit is set to a sweep rate which requires intensity

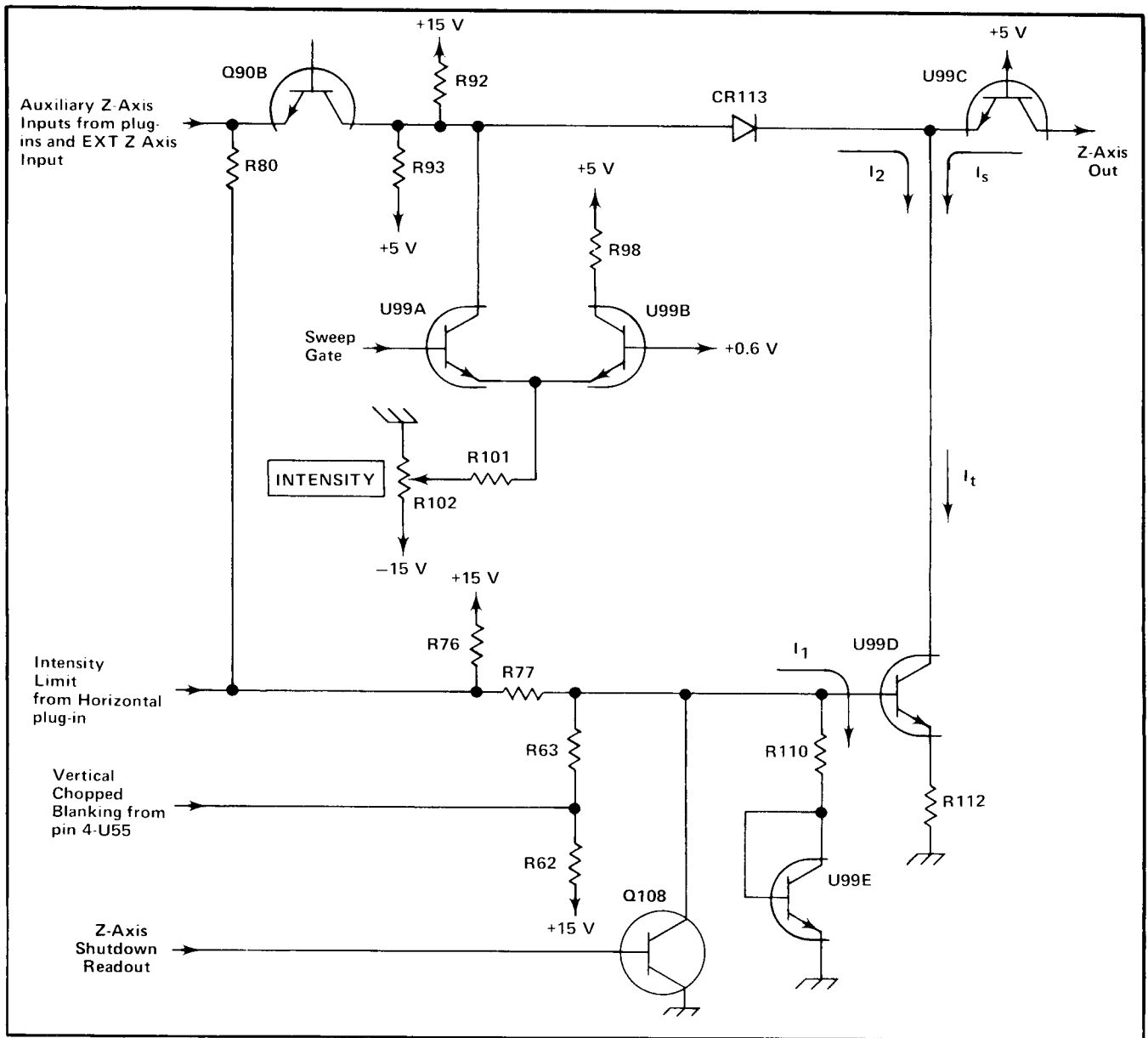


Fig. 4-3. Simplified schematic of Z-Axis Logic stage.

limiting, the Intensity Limit input goes to ground level in the plug-in unit. This reduces the level of I_1 at the base of U99D and therefore reduces I_t and the output current to reduce the intensity of the display. At the same time, the ground level from the Intensity Limit input is connected to the emitter of Q90B through R80. This connection limits the maximum level to which the INTENSITY control can be set to aid in obtaining intensity limiting at slow sweep rates.

The collector current of U99D is made up of two currents; I_s and I_2 is determined by divider R92 and R93. When the Sweep Gate level at the base of U99A is LO (no sweep in progress), I_2 is at its maximum level so that I_s is minimum to provide minimum intensity of the display ($I_s + I_2$ is always equal to I_t). During sweep time, the Sweep Gate level at the base of U99A as established by INTENSITY control R102 determines the output current. As the INTENSITY control is turned toward maximum, the level of I_2 decreases. This allows I_s to increase to produce a brighter display. The Auxiliary Z-Axis Inputs from the plug-in compartments and the intensity modulating signal from the EXT Z-AXIS input connector are connected to the emitter of Q90B. These signals modulate the level of I_2 to, in turn, modulate the intensity of the display.

When readout information is to be displayed on the CRT, the Z-Axis shutdown goes LO. This forward biases Q180, and it saturates, shunting I_1 , through Q108 to ground. This reduces the output current to zero during the readout time.

Clock Generator

One half of integrated circuit U55 along with the external components shown in Fig. 4-4A make up the Clock Generator stage. R1, Q1, Q2, and Q3 represent an equivalent circuit contained within U55A. This circuit along with discrete components C59, R56, R57, and R59 comprise a two-megahertz free-running oscillator to provide a timing signal (clock) for mainframe vertical and plug-in chopping.

The stage operates as follows: Assume that Q2 is conducting and Q1 is off. The collector current of Q2 produces a voltage drop across R1 which holds Q1 off. This negative level at the collector of Q2 is also connected to pin 14 through Q3 (see waveforms in Fig. 4-4B at time T_0). Since there is no current through Q1, C59 begins to charge towards -15 volts through R56-R57. The emitter of Q1 goes negative as C59 charges until it reaches a level about 0.6 volt more negative than the level at its base. Then, Q1 is forward biased and its emitter rapidly rises positive. Since

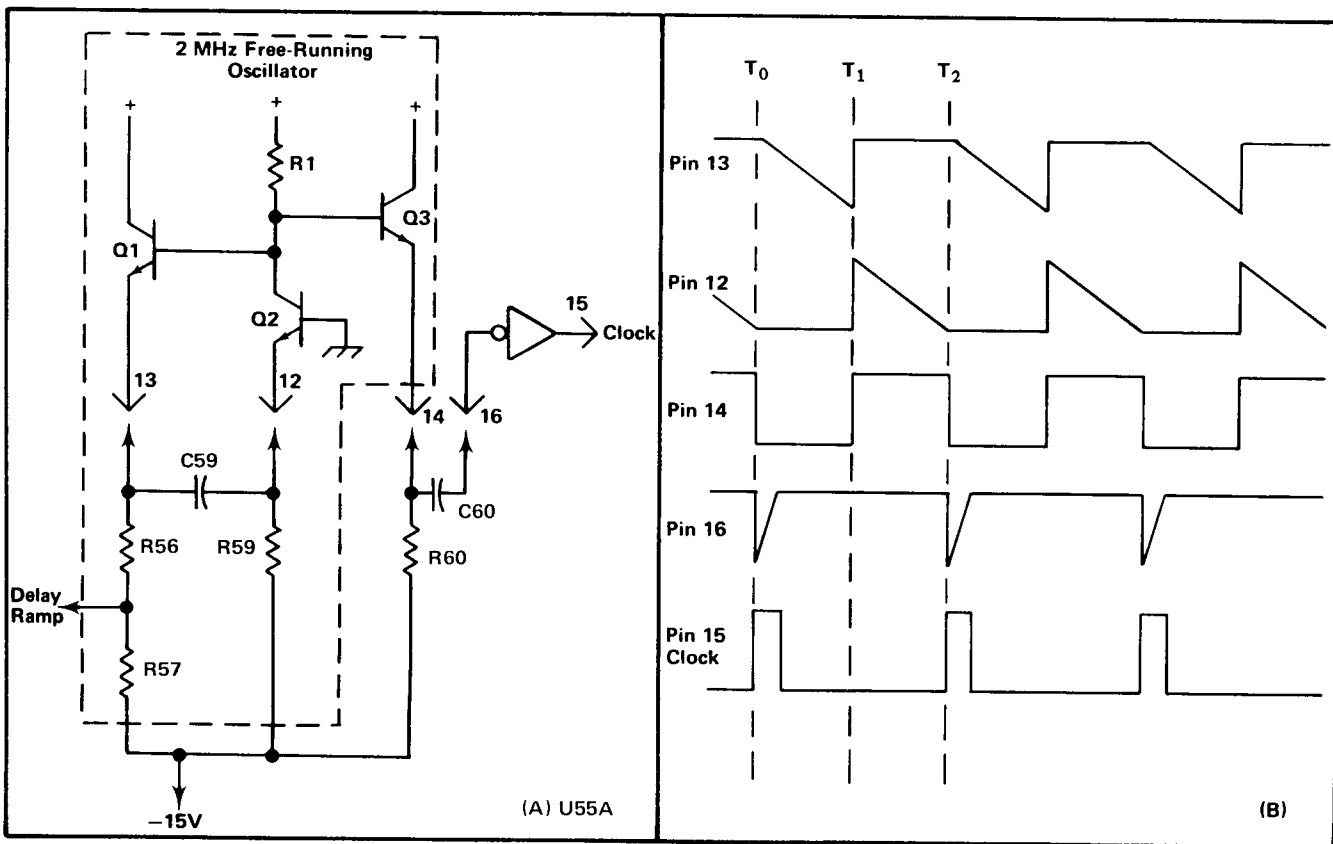


Fig. 4-4. (A) Diagram of Clock Generator stage. (B) Idealized waveforms from Clock Generator stage.

C59 cannot change its charge instantaneously, the sudden change in voltage at the emitter of Q1 pulls the emitter of Q2 positive also, to reverse-bias it. With Q2 reverse biased, its collector rises positive to produce a positive output level at pin 14 (see time T_1 on the waveforms).

Now, conditions are reversed. Since Q2 is reverse biased, there is no current through it. Therefore, C59 can begin to discharge through R59. The emitter level of Q2 follows the discharge of C59 until it reaches a level about 0.6 volt more negative than its base. Then Q2 is forward biased and its collector drops negative to reverse-bias Q1. The level at pin 14 drops negative also, to complete the cycle. Once again, C59 begins to charge through R56-R57 to start the second cycle.

Two outputs are provided from this oscillator. The Delay Ramp signal from the junction of R56-R57 is connected to the Vertical Chopped Blanking stage. This signal has the same waveshape as shown by the waveform at pin 13, with its slope determined by the divider ratio between R56-R57. A square-wave output is provided at pin 14. The frequency of this square wave is determined by the RC relationship between C59 and R1. The duty cycle is determined by the ratio of R56-R57 to R59.

The square wave at pin 14 is connected to pin 16 through C60. C60, along with the internal resistance of U55A, differentiates the square wave at pin 14 to produce a negative-going pulse coincident with the falling edge of the square wave (positive-going pulse coincident with rising edge has no effect on circuit operation). This negative going pulse is connected to pin 15 through an inverter-shaper which is also part of U55A. The output at pin 15 is a positive-going Clock pulse at a repetition rate of about two megahertz.

Vertical Chopped Blanking

The Vertical Chopped Blanking stage is made up of the remaining half of integrated circuit U55B, Fig. 4-5A. This stage determines if Vertical Chopped Blanking pulses are required, based upon the operating mode of the vertical system or the plug-in units (dual trace units only). Vertical Chopped Blanking pulses are produced if: (1) VERT MODE switch is set to CHOP; (2) dual-trace vertical unit is operating in the chopped mode and that unit is being displayed; (3) dual-trace vertical unit is operating in the chopped mode with the VERT MODE switch set to ADD. The repetition rate of the negative-going Vertical Chopped Blanking pulse output at pin 4 is always two megahertz as determined by the Clock Generator stage.

The Delay Ramp signal from the Clock Generator stage determines the repetition rate and pulse width of the Vertical Chopped Blanking pulses. The Delay Ramp applied to pin 10 starts to go negative from a level of about +1.1 volts coincident with the leading edge of the Clock pulse (see waveforms in Fig. 4-5B). This results in a HI quiescent condition for the Vertical Chopped Blanking pulse. The slope of the negative-going Delay Ramp is determined by the Clock Generator stage. As it reaches a level slightly negative from ground, the Vertical Chopped Blanking pulse output level changes to the LO state. This signal remains LO until the Delay Ramp goes HI again. Notice the delay between the leading edge of the Clock pulse generated by U55A and the leading edge of the Vertical Chopped Blanking pulses (see Fig. 4-5B). The amount of delay between the leading edges of these pulses is determined by the slope of the Delay Ramp applied to pin 10. This delay is necessary due to the delay line in the vertical deflection system. Otherwise, the trace blanking resulting from the Vertical Chopped Blanking pulse would not coincide with the switching between the displayed traces. The duty cycle of the square wave produced in the Clock Generator stage determines the pulse width of the Vertical Chopped Blanking pulses (see Clock Generator discussion for more information).

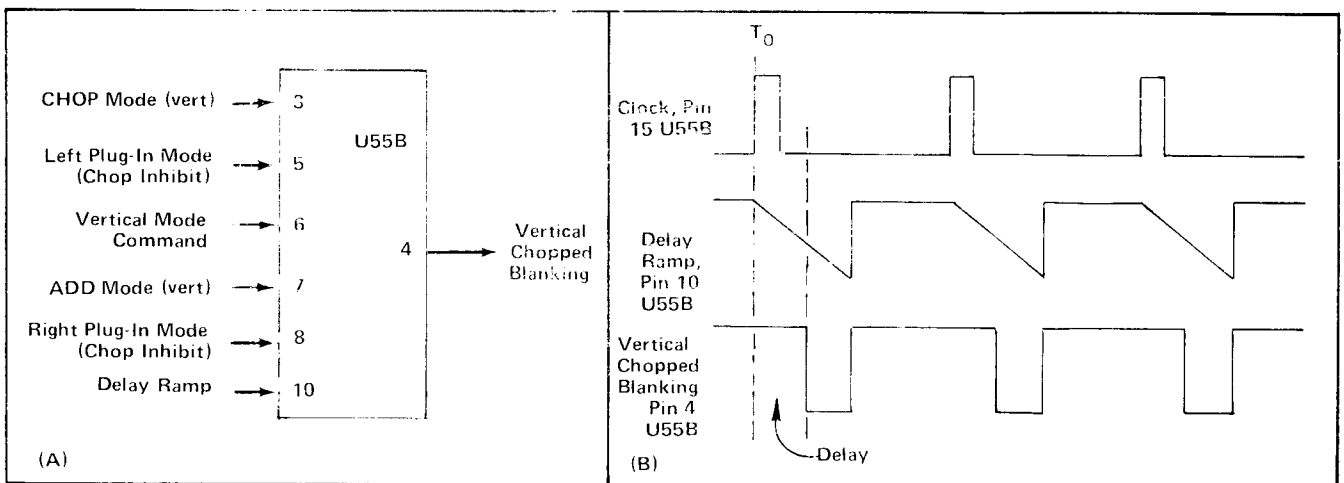


Fig. 4-5. (A) Input and output pins for Vertical Chopped Blanking stage, (B) Idealized waveforms for Vertical Chopped Blanking stage.

Whenever this instrument is turned on, the Vertical Chopped Blanking pulses are being produced at a two-megahertz rate. However, these pulses are available as an output at pin 4 only when the remaining inputs to U55B are at the correct levels. The following discussions give the operating conditions which produce Vertical Chopped Blanking pulses to blank the CRT during vertical trace switching. Fig. 4-5A identifies the functions of the pins of U55B.

1. CHOP VERTICAL MODE

When the VERT MODE switch is set to CHOP, Vertical Chopped Blanking pulses are available at pin 4 at all times. The input conditions necessary are:

PIN 3 HI—VERT MODE switch set to CHOP.

Pin 7 LO—VERT MODE switch set to any position except ADD.

Pin 10 LO—Delay Ramp more negative than about 0 volts.

2. LEFT VERTICAL UNIT SET FOR CHOPPED OPERATION

If the Left Vertical unit is set for chopped operation, the setting of the VERT MODE switch determines whether the Vertical Chopped Blanking pulses are available. If the VERT MODE switch is set to the CHOP position, conditions are as described in No. 1 above. Operation in the ADD position of the VERT MODE switch is given later. For the LEFT position of the VERT MODE switch, or when the left vertical unit is to be displayed in the ALT mode, Vertical Chopped Blanking pulses are available at all times (two-megahertz rate). The input conditions are:

Pin 3 LO—VERT MODE switch set to any position except CHOP.

Pin 5 LO—Left vertical unit set to chopped mode.

Pin 6 LO—Left vertical unit to be displayed (Vertical Mode Command LO).

Pin 7 LO—VERT MODE switch set to any position except ADD.

Pin 10 LO—Delay Ramp more negative than about 0 volts.

Notice that the Vertical Mode Command at pin 6 must be LO for output pulses to be available at pin 4. This means that when the VERT MODE switch is set to ALT, Vertical Chopped Blanking pulses are produced only during the time that the left vertical unit is to be displayed (unless right vertical unit is also set for chopped operation).

3. RIGHT VERTICAL UNIT SET FOR CHOPPED OPERATION

If the right vertical unit is set for chopped mode, operation is the same as described previously for the left vertical unit except that Vertical Chopped Blanking pulses are produced when the VERT MODE switch is set to RIGHT or when the Vertical Mode Command is HI in the ALT mode. The input conditions are:

Pin 3 LO—VERT MODE switch set to any position except CHOP.

Pin 6 HI—Right vertical unit to be displayed (Vertical Mode Command HI).

Pin 7 LO—VERT MODE switch set to any position except ADD.

Pin 8 LO—Right vertical unit set to chopped mode.

Pin 10 LO—Delay Ramp more negative than about 0 volts.

4. ADD VERTICAL MODE

When the VERT MODE switch is in the ADD position and either or both of the vertical units are operating in the chopped mode, Vertical Chopped Blanking pulses must be available to block out the transition between traces of the vertical units. The input conditions are:

Pin 3 LO—VERT MODE switch set to any position except CHOP.

Pin 5 LO—Left vertical unit set to chopped mode (can be HI if pin 8 is LO).

Pin 7 HI—VERT MODE switch set to ADD.

Pin 8 LO—Right vertical unit set to chopped mode (can be HI if pin 5 is LO).

Pin 10 LO—Delay Ramp more negative than about 0 volt.

Fig. 4-6A shows a logic diagram of the Vertical Chopped Blanking stage. Notice the comparator block on this diagram (one input connected to pin 10). The output of this comparator is determined by the relationship between the levels at its inputs. If pin 10 is more positive (HI) than the grounded input, the output is HI also; if it is more negative (LO), the output is LO. An input/output table for this stage is given in Fig. 4-6B.

Chop Counter

The Chop Counter stage produces the Mainframe Chop Signal and the Vertical Plug-In Chop Signal. The Clock

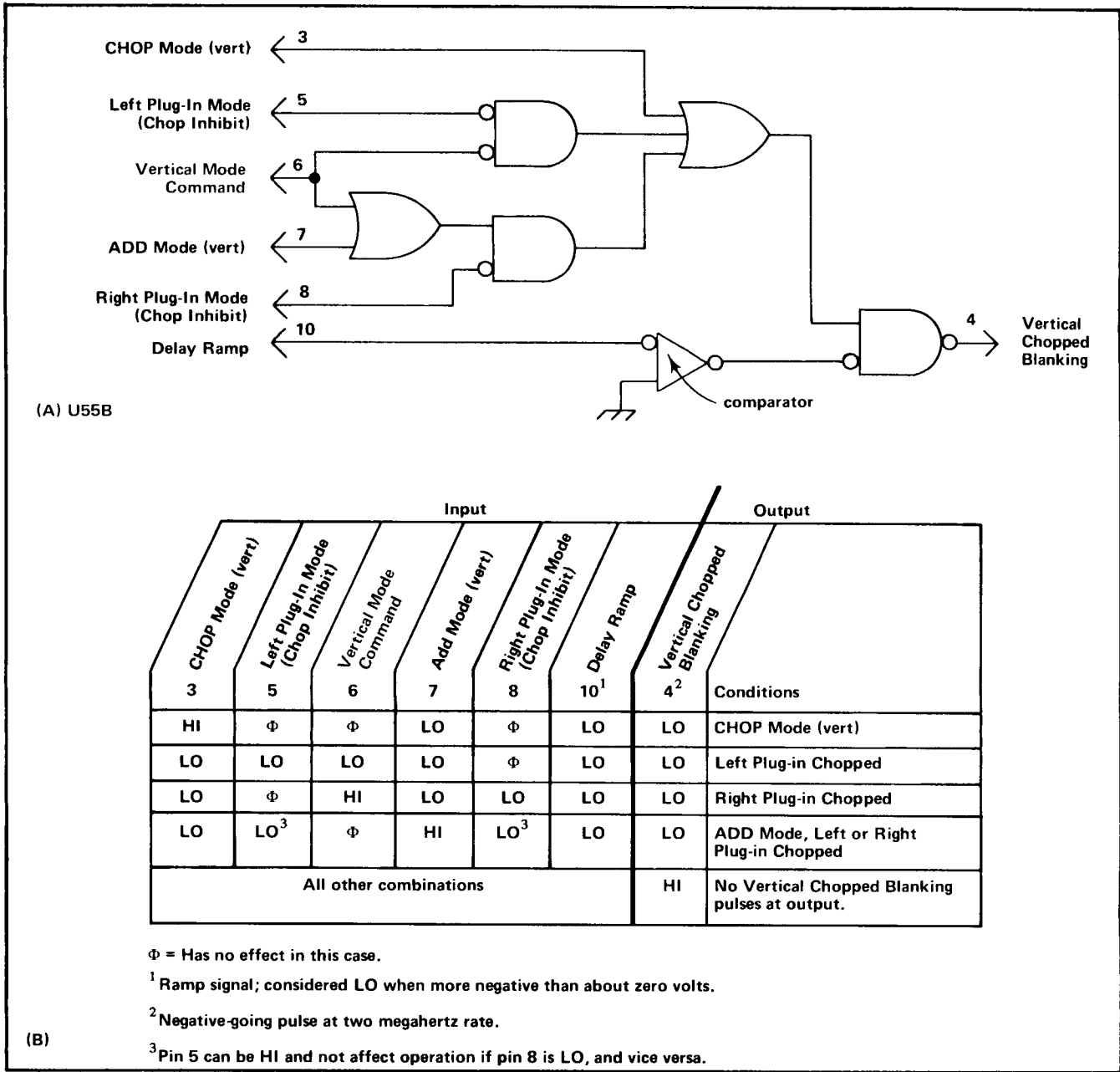


Fig. 4-6. (A) Logic diagram for Vertical Chopped Blanking stage, (B) Table of input/output combinations for Vertical Chopped Blanking stage.

pulse produced by the Clock Generator stage provides the timing signal for this stage. A logic diagram of the Chop Counter, identifying the inputs and outputs, is shown in Fig. 4-7.

The Chop Counter stage consists of integrated circuit U123, a dual D-type flip-flop with direct-set, direct-clear inputs (see Table 4-1 for operation of D-type flip-flop). As connected in this circuit, these D-type flip-flops operate as triggered (toggle) flip-flops.

The two-megahertz clock pulses from the Clock Generator stage are connected to the trigger (T) input of U123B. As connected, U123B changes output states with each positive-going Clock pulse, and the signal at its "1" output is a square wave which switches between the HI and LO levels at a one-megahertz rate. This signal is connected to the Vertical Mode Control stage to provide the Vertical Mainframe Chop Signal. It is also connected to the trigger input of U123A. U123A also changes output states with each positive-going pulse at its trigger input to produce a 500 kilohertz square wave at its "1" output. The output from U123A provides the Vertical Plug-In Chop Signal to

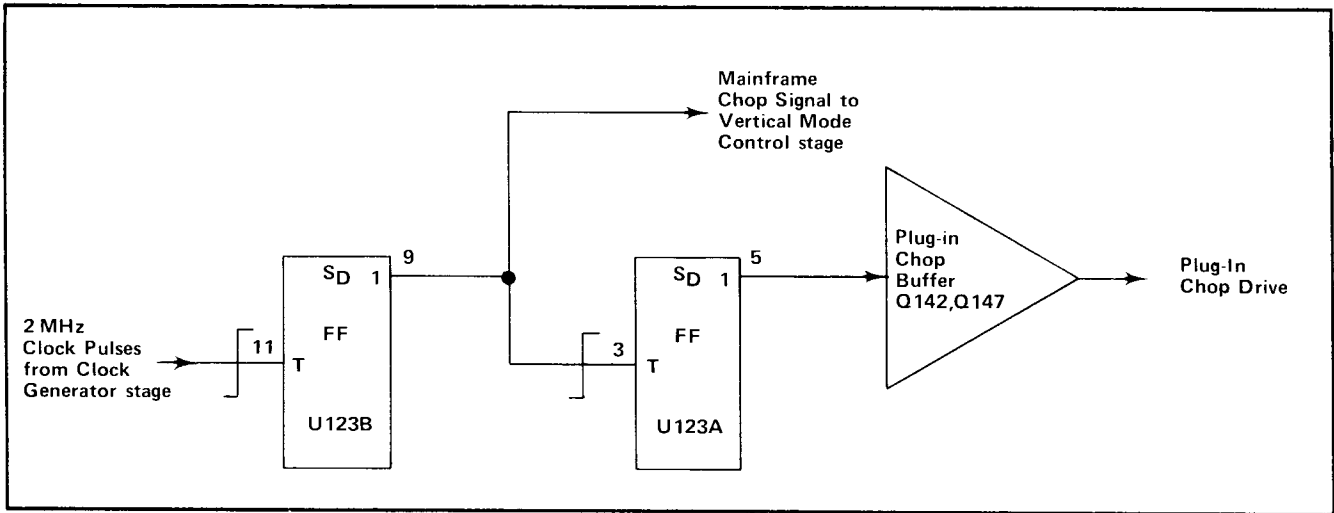


Fig. 4-7. Detailed logic diagram of Chop Counter stage.

the Plug-In Chop Buffer stage. Idealized waveforms showing the timing relationship between the input and output signals for this stage are shown in Fig. 4-8.

Vertical Mode Control

The Vertical Mode Control stage is made up of discrete components CR124-CR125, CR126, CR130-CR155, CR172, and buffer amplifier Q132-Q137. These components develop the Mainframe Vertical Mode Command which is connected to the Main Interface circuit (vertical plug-in compartments and trigger selection circuitry) and the Vertical Interface circuit to indicate which vertical unit is to be displayed. When this output level is HI, the right vertical unit is displayed and when it is LO, the left vertical unit is displayed.

The VERT MODE switch located on diagram 7 provides control levels for this stage. This switch provides a HI level on only one of four output lines to indicate the selected

vertical mode; the remaining lines are LO. The fifth mode, LEFT, is indicated when all four output lines are LO. Operation of this stage in all positions of the VERT MODE switch is as follows:

Right. When the VERT MODE switch is set to RIGHT, a HI level is connected to the Buffer Amplifier through R126 and CR126. The LO level at the anodes of diodes CR125 and CR130 holds them reverse biased. The resultant Vertical Mode Command output from the Vertical Mode Buffer Amplifier is a HI level to indicate that the right vertical unit is to be displayed.

Chop. In the CHOP position of the VERT MODE switch, a HI level is applied to the anodes of diodes CR124-CR125 through R125. Both diodes are forward biased so the Vertical Chop Signal from pin 9 of U123B can pass to the emitter of Q132. This signal switches between the HI and LO levels at a one-megahertz rate and it produces a corresponding Mainframe Vertical Mode Command output at the emitter of Q137. When this output is

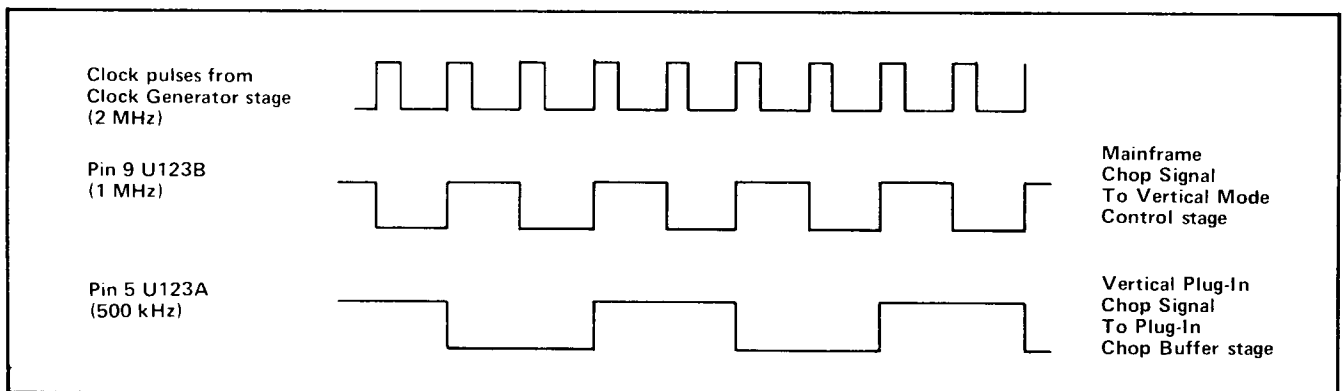


Fig. 4-8. Idealized input and output waveforms for Chop Counter stage.

HI, the right vertical unit is displayed and when it switches to LO, the left vertical unit is displayed.

Alt. In the ALT mode, the VERT MODE switch applies a HI level to the anodes of diodes CR130-CR155 through R130. These diodes are forward biased so the Display Right Command from pin 5 of U156A can pass to the emitter of Q132 to determine the Mainframe Vertical Mode Command level. The Display Right Command switches between its HI and LO levels at a rate determined by the Vertical Binary stage.

Add and Left. The control levels in the ADD and LEFT positions of the VERT MODE switch are not connected to this stage. However, since only the line corresponding to the selected vertical mode can be HI, the RIGHT, CHOP, and ALT lines must remain at their LO level when either LEFT or ADD are selected. Therefore, the emitter of Q132 remains LO to produce a LO Mainframe Vertical Mode Control output level. Final control of LEFT or ADD mode is made by the Vertical Interface circuit.

A logic diagram of the Vertical Mode Control stage is shown in Fig. 4-9. The discrete components which make up each logic function are identified. The gate connected to the input of the Vertical Mode Buffer Amplifier is a phantom-OR gate. A phantom-OR gate performs the OR logic function merely by interconnection of the three inputs.

Vertical Binary

The Vertical Binary stage consists of integrated circuit U156A and transistor Q150. U156A is a D-type flip-flop

with direct-set and direct-clear inputs (see Table 4-1 for operating details). The connection between the "0" output and the data (D) input enables this flip-flop to operate in the triggered mode. A logic diagram of the Vertical Binary stage is shown in Fig. 4-10.

The operation of the Vertical Binary stage is controlled by the level of the ALT Mode line from the VERT MODE switch. When this switch is set to ALT, a HI level is connected to the emitter of Q150 through R152. This HI level disables Q150 so its collector remains HI. As a result, Q150 has no effect upon operation of the Vertical Binary stage and the direct-clear input of U156A remains HI so it does not affect the operation of U156A. Therefore, U156A operates as a basic triggered flip-flop which changes output states with each positive-going Sweep Holdoff pulse at the trigger (T) input. The Sweep Holdoff pulse goes positive at the end of each sweep. The signal at the "1" output of U156A switches between the HI and LO level at one-half the rate of the Sweep Holdoff signal from the horizontal plug-in unit. Fig. 4-11 shows the time relationship between the input and output signals for this stage, and gives the resultant display with each signal combination.

For any other position, the emitter of Q150 is pulled LO by the ALT Mode command from the VERT MODE switch. This enables Q150, but it does not change output state unless the level at the "1" output of U156A is HI. Quiescently, the output of Q150 is LO. Therefore, when the positive-going Sweep Hold-off pulse is received at the end of the sweep, the "1" output of U156A goes HI. This activates Q150 and its output goes LO to provide a direct-clear reset to U156A. The "1" output of U156A is reset to its LO level, and Q150 is again disabled so its output returns to the HI level. The stage is now ready for

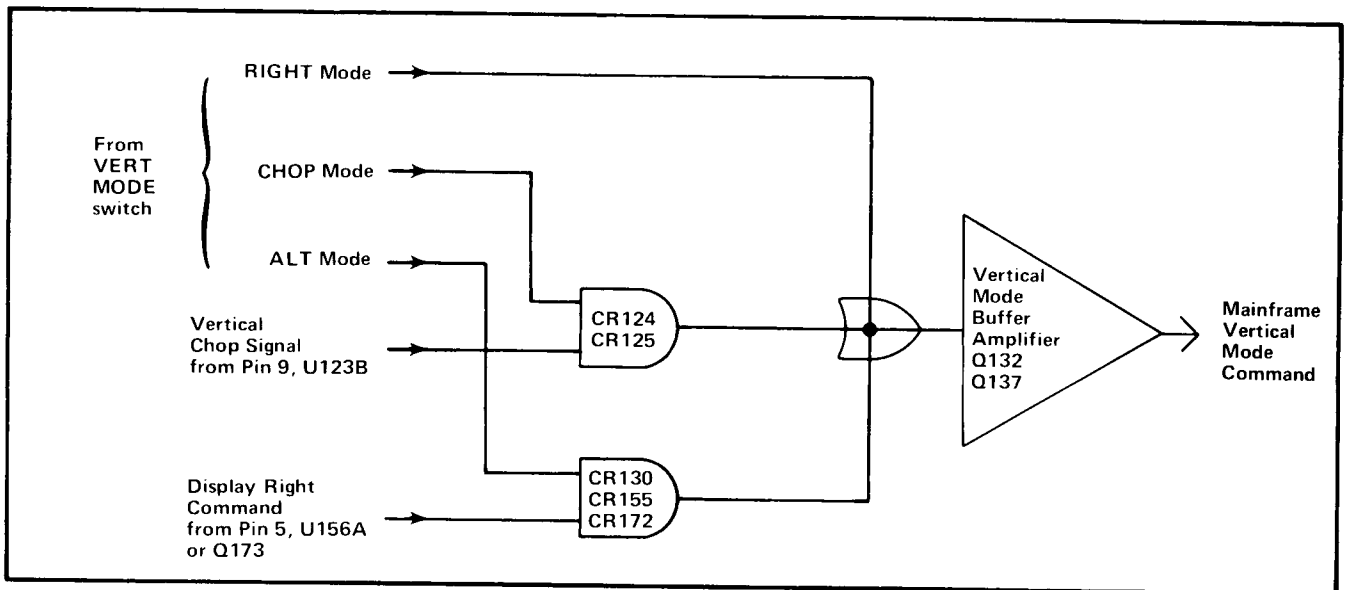


Fig. 4-9. Logic diagram of Vertical Mode Control and Vertical Mode Buffer Amplifier stages.

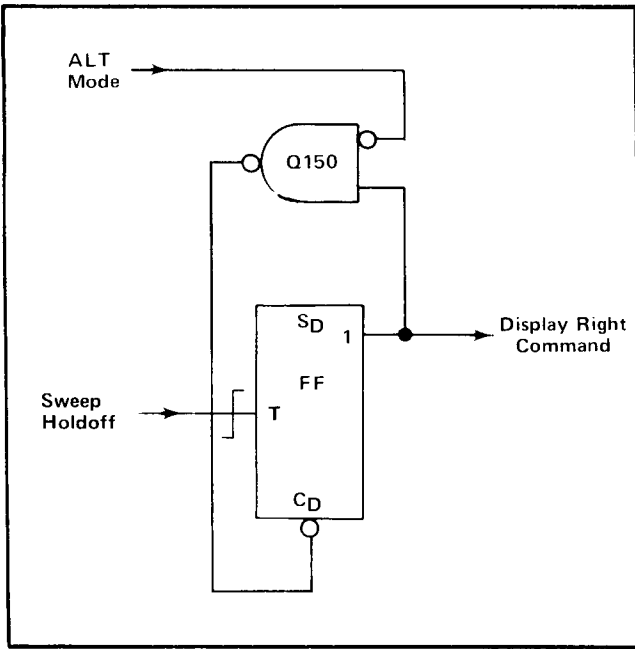


Fig. 4-10. Logic diagram of Vertical Binary stage.

the next positive-going Sweep Hold-off pulse. The action is the same with each pulse, so the signal at the output of this stage is at the same repetition rate as the Sweep Holdoff

input. Therefore, this stage is now operating as a divide-by-one counter rather than a divide-by-two counter as described previously. The output under this condition is used only by the Plug-In Binary stage.

Since the Vertical Binary stage can change output states only at the end of each sweep, there will be no Alternate Drive signal for either the mainframe or vertical plug-in units if a sweep is not being produced by the horizontal plug-in unit.

Plug-In Binary

The Plug-In Binary stage consists of U156B, which is connected as a triggered flip-flop with direct-set input. The trigger input for this stage is the Display Right Command from the Vertical Binary stage. When the VERT MODE switch is set to ALT, the repetition rate of the Display Channel 2 Command output of this stage is one-fourth of the Sweep Holdoff input (see waveforms in Fig. 4-11). For any position of the VERT MODE switch except ALT, the repetition rate of the output signal from this stage is one-half of the Sweep Holdoff input. A logic diagram of the Plug-In Binary stage is shown in Fig. 4-12.

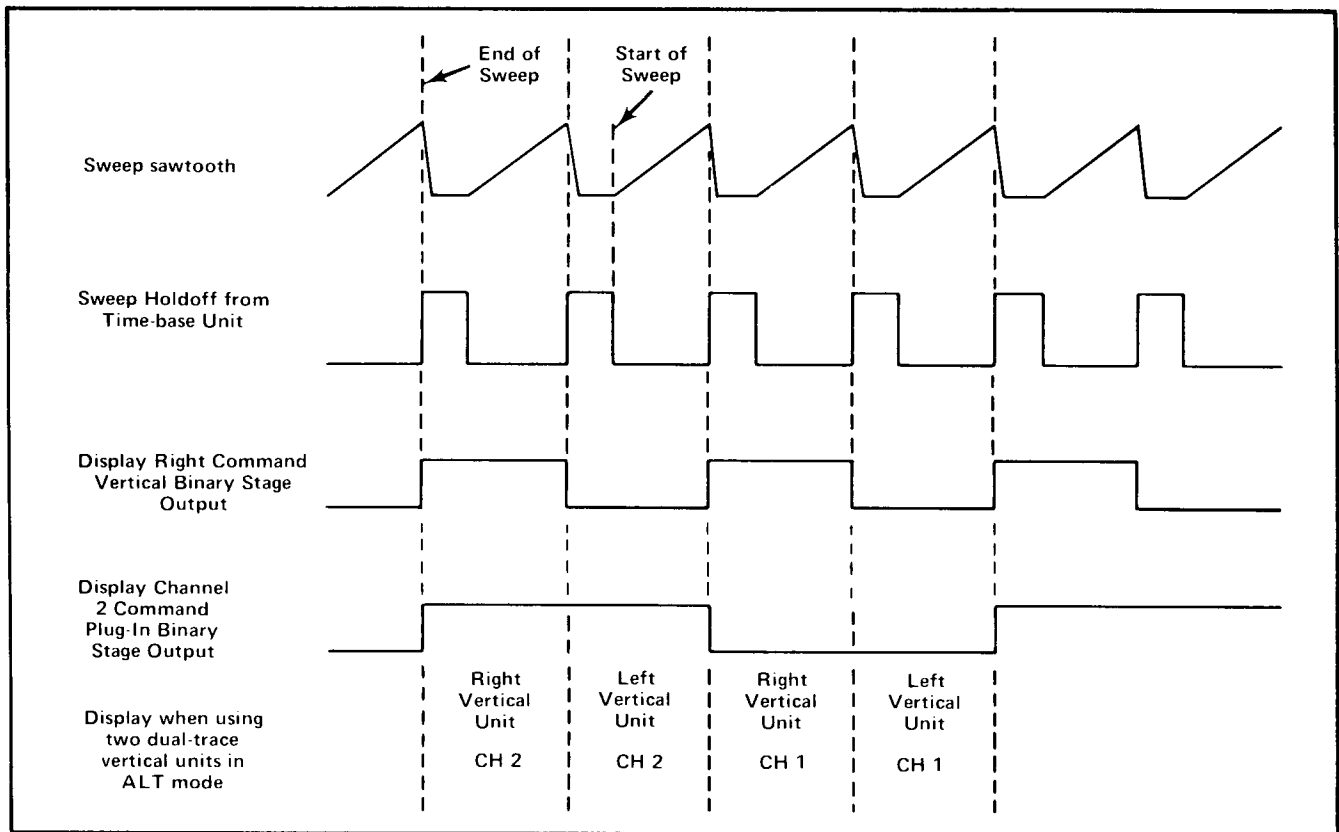


Fig. 4-11. Idealized waveforms showing relationship between input and output waveforms for Vertical Binary and Plug-In Binary stages when operating in ALT mode.

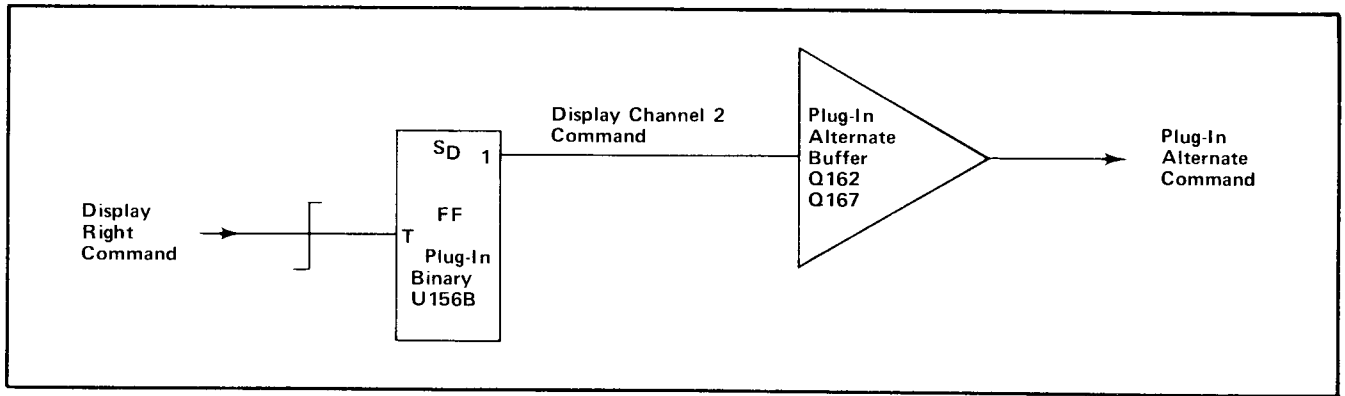


Fig. 4-12. Logic diagram of Plug-In Binary and Plug-In Alternate Buffer stages.

Output Buffers

The output switching commands from the Logic circuit are provided through buffer stages Q142-Q137, Q142-Q147, Q162-Q167, and Q182-Q187. Each of these stages includes a common-base input transistor to provide a low-impedance load for the associated driving stages. The output transistor is connected as an emitter-follower to provide isolation between the Logic circuit and other circuits within this instrument or the plug-in units.

TRIGGER SELECTOR

The Trigger source switch determines which vertical signal is connected to the time-base unit, and which vertical signal, that is provided at VERT SIG/OUT connector on the rear panel. Fig. 4-13 shows a detailed block diagram of the Trigger Selector circuit, along with a simplified diagram of all the circuitry involved in selection of the trigger source. A schematic of the Trigger Selector circuit is shown on diagram 3 at the rear of this manual. Also, see diagrams 6 and 7 for the signal selection circuitry not shown on diagram 3.

Trigger Mode and Add Signals

General. The circuitry shown on the left side of the simplified diagram in Fig. 4-13 determines the operation of the Trigger Channel Switch stage. TRIG SOURCE switch S1011 controls Trigger Channel Switch U324 through Q314. When the TRIG SOURCE switch is set to the VERT MODE position, the setting of the VERT MODE switch determines the trigger selection. In the LEFT or RIGHT positions, the trigger signal is obtained from the indicated vertical unit. The following discussions give detailed operation in each position of the TRIG SOURCE switch.

Vert Mode. In the VERT MODE position of the TRIG SOURCE switch, the setting of the VERT MODE switch determines the operation of the Trigger Channel Switch stage. In the LEFT position of the VERT MODE switch,

the base of Q314 is connected to ground through the ALT and RIGHT sections of S1021, CR1021 and CR1026, and S1011. This holds Q314 reverse biased to provide a LO level to pin 4 of U324 (see Fig. 4-14).

When the VERT MODE switch is set to ALT, +5 volts is applied to the base of Q314 through CR1021 and S1011. Q314 is forward biased and its emitter level is determined by the Mainframe Vertical Mode Command signal from the Logic circuit applied to its collector. This signal switches between the HI level (Right Vertical unit to be displayed) and the LO level (Left Vertical unit to be displayed) at the end of each sweep. When the Mainframe Vertical Mode Command is HI, it provides a positive collector voltage to Q314. Q314 is saturated due to CR1021, and its emitter level is very near the collector level. This provides a HI output level to the Trigger Channel Switch stage. As the Mainframe Vertical Mode Command goes LO, the collector supply for Q314 also goes negative. Q314 remains saturated and the output again follows the collector level to supply a LO output level to U324.

For ADD and CHOP vertical mode operation, +5 volts is connected to pin 14 of U324 through CR1023 or CR1024 and S1011. At the same time, the base of Q314 is held LO by the ground connection through the ALT and RIGHT section of S1021 so the level at pin 4 of U324 is LO also (produces an ADD mode in Trigger Channel Switch; see description of this circuit which follows). In the RIGHT position of the VERT MODE switch, +5 volts is connected to the base of Q314 through CR1026 and S1011 to forward-bias the transistor. The Mainframe Vertical Mode Command signal connected to the collector of Q314 is also HI in this mode, and a HI output level is produced at the emitter of Q314.

Left. When the LEFT trigger source is selected, the VERT MODE switch is disconnected from the trigger selector circuitry. Now the ground connection through the

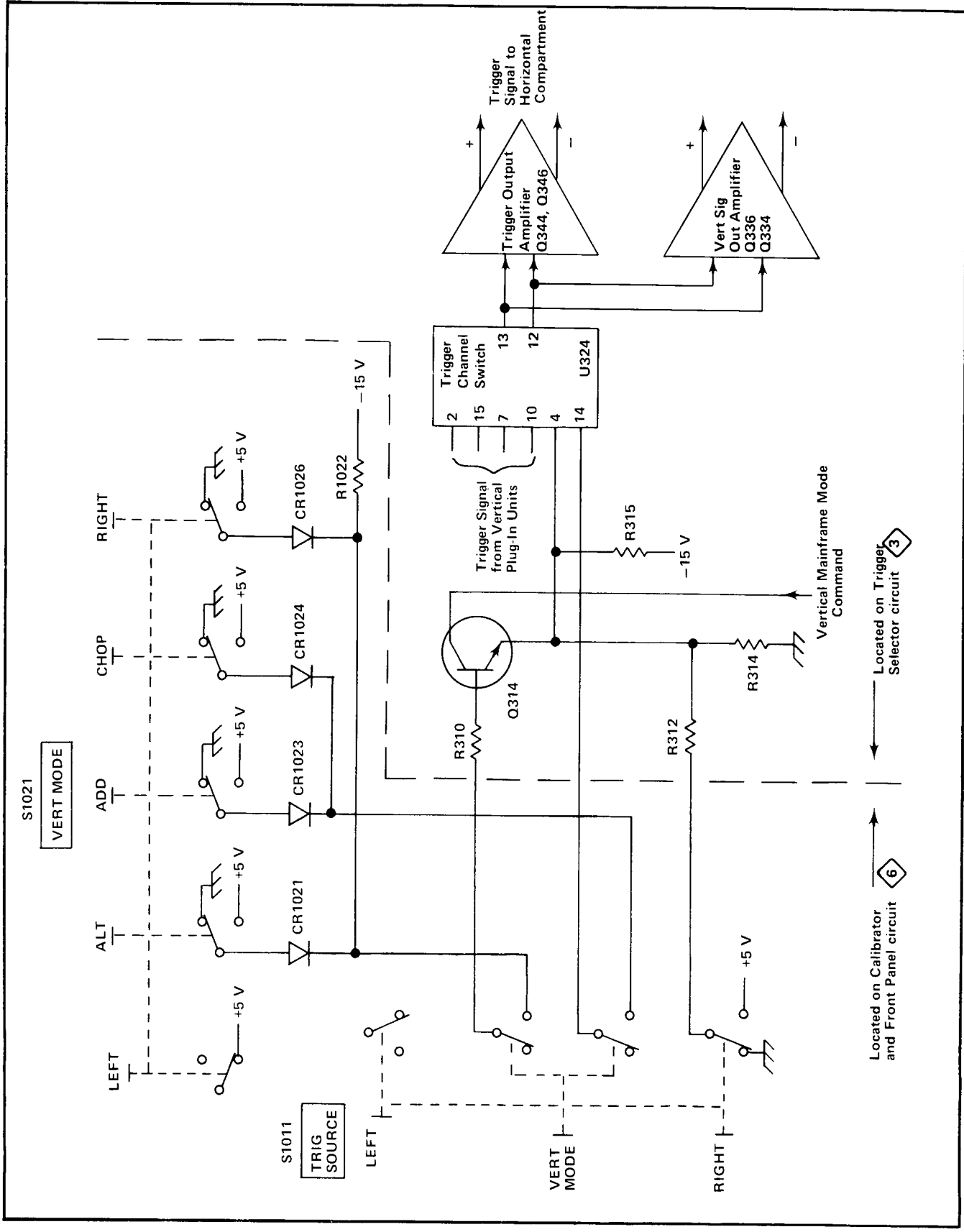


Fig. 4-13. Detailed block diagram of Trigger Selector circuit along with simplified diagram of trigger source selection circuitry.

| VERT MODE switch positions | | TRIG SOURCE switch positions | |
|----------------------------|-------|--|---------------------|
| | | LEFT | RIGHT |
| VERT MODE switch positions | LEFT | LO (Left Vertical) | ↑ |
| | ALT | Switches from LO to HI, and vice versa, at end of each sweep (both; follows display) | ↑ |
| | ADD | LO at pin 4 of U324. HI at pin 14 ¹ (both; added algebraically) | LO (Left Vertical) |
| | CHOP | | HI (Right Vertical) |
| | RIGHT | HI (Right Vertical) | ↓ |

¹ Pin 14 LO for all other conditions.

Fig. 4-14. Input levels at pin 4 of U324 (source of triggering is shown in parenthesis).

RIGHT section of S1011 establishes a LO output level at the emitter of Q314.

Right. In the RIGHT position of the TRIG SOURCE switch, +5 volts is connected to the emitter of Q314 through S1011 and R312. This produces a HI output level to the Trigger Channel Switch stage.

Trigger Channel Switch

The Trigger Channel Switch stage determines which input signal provides the trigger signal to the horizontal compartment as controlled by the Trigger Mode and ADD signals from the trigger selection circuitry. Refer to diagram 3 during the following discussion.

Resistors R317-R319 establish the input resistance and provide a load for the trigger signal from the right vertical plug-in unit. Resistors R307 and R308, provide the input resistance and load for the left vertical plug-in unit. R321-R323-R324 and R326-R327-R328 establish the operating level of the Trigger Channel Switch; R321-R323 and R326-R328 set the current gain for each channel. This stage is made up primarily of integrated circuit U324. An input/output table for U324 is shown in Fig. 4-15. U324 provides a high impedance differential input for the trigger signal from the left vertical unit at pins 2 and 15, and for

the trigger signal from the right vertical unit at pins 7 and 10. The output signal at pins 12 and 13 is a differential signal. The sum of the DC current at pins 12 and 13 is always equal to the sum of the DC currents at pins 1, 8, 9, and 16 in all modes. This provides a constant DC bias to the stages which follow as the TRIG SOURCE or the VERT MODE switches are changed.

When the level at pin 4 is LO (see Trigger Mode and ADD Signals discussion and Fig. 4-15), the trigger signal from the left vertical unit passes to the output, while the trigger signal from the right vertical unit is blocked. A HI level at pin 4 connects the trigger signal from the right vertical unit to the output and the trigger signal from the left vertical unit is blocked. For VERT MODE operation in the ALT position of the VERT MODE switch, the level at pin 4 switches between the LO and HI level at a rate determined by the Vertical Binary stage (see Logic circuit description). This action obtains the trigger signal from the left vertical unit when the left vertical unit is being displayed and from the right vertical unit when it is being displayed.

When the level at pin 4 is LO and the level at pin 14 is HI, the trigger signal from both the left and right vertical units passes to the output pins. This condition occurs only when the TRIG SOURCE switch is set to VERT MODE and the VERT MODE switch is set to either ADD or CHOP. Under this operating mode, the trigger output signal is the algebraic sum of the trigger input signals from the left and right vertical units to prevent triggering on the vertical chopping transition, or only on one signal of an added display.

Trigger Output Amplifier

The trigger output at pins 12 and 13 of U324 is connected to the bases of Q344-Q346 to provide the internal trigger signal for the horizontal unit (via the Main Interface circuit). The horizontal unit provides a 50-ohm differential load for this stage. If it is removed from its compartment, the collector load for Q344-Q346 changes and the voltage at their collectors increases. This stage prevents this change from affecting the vertical signal for the Output Signals board. CR341-CR349 clamp the collectors of Q344 and Q346 at about +0.6 volt to prevent these transistors from saturating under this no-load condition.

Vertical Signal Buffer

The trigger output signal at pin 12 and 13 of U324 is also connected to the emitter of a common-base amplifier Q336 and Q334. The output signal at the collector of Q336 and Q334 is connected to the signals out board.

diagram of the Vertical Interface circuit. A schematic of this circuit is shown on diagram 3 at the rear of this manual.

Vertical Channel Switch

The Vertical Channel Switch stage determines which input signal provides the vertical signal to the Delay-Line Driver stage as controlled by the Mainframe Vertical Mode Command from the Logic circuit. Resistors R200-R202 and R204-R206 establish the input resistance of this stage and provide a load for the left and right vertical units. Resistors R209-R211-R212 and R216-R218-R219 establish the operating levels for this stage. R209-R212 and R216-R219 set the current gain for each channel. C208-R208 and C215-R215 provide frequency compensation.

This stage is made up primarily of integrated circuit U214, which is the same type as used for the Trigger Channel Switch. An input/output table for U214 is shown in Fig. 4-15. U214 provides a high impedance differential input for the signal from the left vertical unit at pins 2 and 15, and the signal from the right vertical unit at pins 7 and 10. The output signal at pins 12 and 13 is a differential signal which is connected to the Delay-Line Driver stage through R222-R224. The sum of the DC output currents at

| Input | | Output |
|--------------------------|-------------------|---------------------------------|
| Trigger Mode Signal 4 | Trigger ADD 14 | Trigger Output Signal 12, 13 |
| LO | LO | Left trigger signal |
| HI | LO | Right trigger signal |
| LO | HI | Both (added algebraically) |

Fig. 4-15. Input/output table for Trigger Channel Switch stage.

VERTICAL INTERFACE

The Vertical Interface circuit selects the vertical deflection signal from the output of the left vertical and/or the right vertical plug-in unit. Fig. 4-16 shows a detailed block diagram

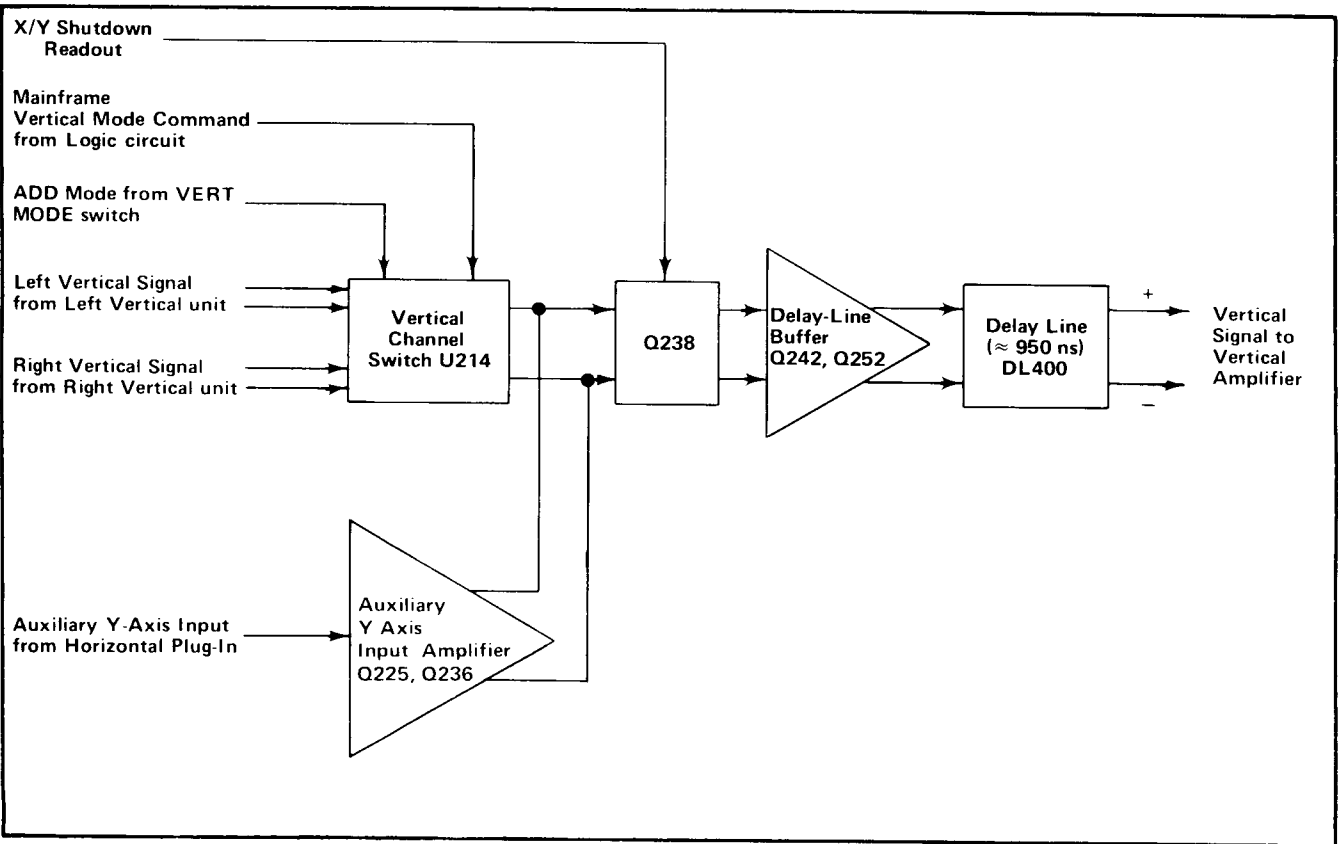


Fig. 4-16. Vertical Interface detailed block diagram.

| Input | | Output |
|--------------------------------------|-----------------------|----------------------------|
| Mainframe Vertical Mode Command 4 | ADD Mode (Vert) 14 | Output signal 12, 13 |
| LO | LO | Left vertical signal |
| HI | LO | Right vertical signal |
| LO | HI | Both (added algebraically) |

Fig. 4-17. Input/output table for Vertical Channel Switch.

pins 12 and 13 is always equal to the sum of the DC input currents at pins 1, 8, 9, and 16 in all modes. This provides a constant DC bias to the following stage as the VERT MODE switch is changed.

When the VERT MODE switch is set to LEFT, the level at pin 4 is LO. This level allows the signal from the left vertical unit to pass to the output while the signal from the right vertical unit is blocked. In the RIGHT position of the VERT MODE switch, the level at pin 4 is HI. Now, the signal from the right vertical unit is connected to the output while the signal from the left vertical unit is blocked.

When the VERT MODE switch is set to either ALT or CHOP, the Mainframe Vertical Mode Command at pin 4 switches between the LO and HI levels at a rate determined by either the Chop Counter or the Vertical Binary stages (see Logic circuit description). This action allows the signal from the left vertical unit to be displayed when the Mainframe Vertical Mode Command is LO and the signal from the right vertical unit is displayed when the Mainframe Vertical Mode Command is HI. When ADD vertical mode operation is selected, a HI level is applied to pin 14 and the level at pin 4 is LO as determined by the Vertical Mode Control stage in the Logic Circuit. This allows both the right and left vertical signals to pass to the output pins. Now, the signal from both vertical units is algebraically added and the resultant signal determines the vertical deflection.

The X/Y Shutdown signal from the Readout system is applied to pin 6 of U214. It has final control over the output signal from U214. Quiescently, the X/Y Shutdown signal is LO and the signal from the selected vertical can pass to the output pins 12 and 13. However, when the

Readout system is ready to display Readout information, the level at pin 6 goes HI. This level blocks the signals from both vertical compartments and there is no output from U214 under this condition. Transistor Q238 will conduct and provide about the same current for the output stage as under normal conditions. This limits any change in positioning that would otherwise occur when the X/Y Shutdown signal from the Readout system is applied.

Auxiliary Y-Axis Input Amplifier

The Auxiliary Y-Axis Input Amplifier accepts an input from horizontal plug-in units having compatible features. Normally, this input is a positioning voltage to offset the display. The single-ended signal connected to the input of this stage is converted to a push-pull signal at the collectors of Q225 and Q236. This signal is connected to the Delay-Line Buffer stage along with the output from the Vertical Channel Switch.

Delay-Line Buffer

The output of the Vertical Channel Switch stage, along with any signal from the Auxiliary Y-Axis Input Amplifier, is connected to the emitters of Q242-Q252. These transistors are connected as common-base amplifiers to provide a low-impedance current-summing point. The signal at the collectors of Q242-Q252 is connected to Delay Line DL400. Resistor R260 provides reverse termination for the Delay Line.

Delay Line

Delay Line DL400 provides approximately 150 nanoseconds delay for the vertical signal, to allow the horizontal circuits time to initiate a sweep before the vertical signal reaches the vertical deflection plates of the CRT. This allows the instrument to display the leading edge of the signal originating the trigger pulse when using internal triggering. The delay line used in this instrument has a characteristic impedance of about 50 ohms per side, or about 100 ohms differentially. It is of the coaxial type, which does not produce preshoot or phase distortion in the CRT display.

VERTICAL AMPLIFIER

The Vertical Amplifier circuit provides final amplification for the vertical signal before it is applied to the vertical deflection plates of the CRT. This circuit includes an input from the BEAM FINDER switch to compress an over-scanned display within the viewing area of the CRT. Fig. 4-18 shows a detailed block diagram of the Vertical Amplifier circuit. A schematic of this circuit is shown on diagram 4 at the rear of this manual.

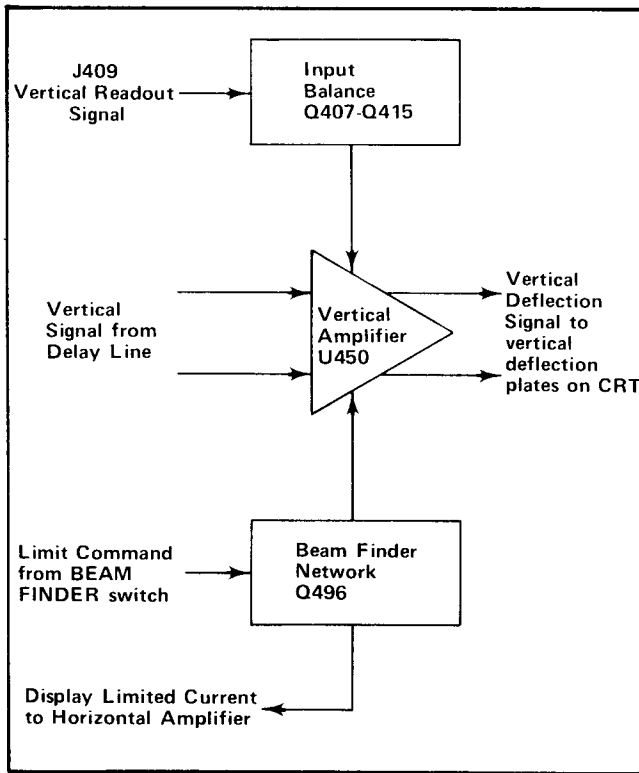


Fig. 4-18. Vertical Amplifier detailed block diagram.

Input Balance

Q407-Q415 comprise a paraphase amplifier to provide input balance for the Vertical Amplifier by changing the DC levels at pins 2 and 4 of U450. Vertical Centering adjustment R403 determines the bias at the base of Q407. As this bias is changed, the levels at the collectors of Q407 and Q415 change due to paraphase action. This DC level is connected to pin 2 of U450 through R408-R423 and to pin 4 through R414-R424. R403 is adjusted so the trace is displayed at the center of the CRT when the inputs to this circuit are at the same potential.

The input to the base of Q407 through J409 is used for Vertical readout signal.

Output Amplifier

Amplification of the vertical signal is accomplished by integrated circuit U450. The circuit shown within the shaded area is a representation of the circuit contained within U450. Notice that the circuit is made up of three similar push-pull stages. Each stage has a pair of common emitter transistors driving a pair of low input impedance common base transistors. Frequency compensation is provided by the networks connected between pins 2 and 4 in the first amplifier stage and pins 7 and 8, 13 and 14 in the

third amplifier stage. The resistive network connected to pins 3, 6, and 16 determines the gain of the Vertical Amplifier. Vertical Gain adjustment R447 sets the gain of the second amplifier stage to determine the overall gain of the vertical deflection system and thereby provide a calibrated deflection factor. Bias adjustment R486 sets the voltage level at pin 10 of U450 (nominally 4.3 volts) to balance the third amplifier stage for maximum gain-bandwidth operation.

Beam Finder Network

The Beam Finder Network, consisting of transistor Q496 and associated components, provides a means of locating a display which overscans the graticule area. Under normal operation, -15 volts is connected to the base of Q496 from the BEAM FINDER switch (see diagram 7) to reverse bias it. Therefore, the normal operating levels for U450 are determined by the resistive network connected to pins 3, 6, and 16. When the BEAM FINDER switch is pressed, the -15 volts is interrupted and the base of Q496 rises positive to turn it on. The resulting change in current of U450 unbalances the second amplifier stage so as to limit its gain. This action compresses the display vertically within the display area.

HORIZONTAL AMPLIFIER

The Horizontal Amplifier circuit amplifies the push-pull horizontal deflection signals from the plug-in unit in the horizontal compartment and connects it to the horizontal deflection plates of the CRT. Fig. 4-19 shows a detailed block diagram of the Horizontal Amplifier circuit. A schematic of this circuit is shown on diagram 5 at the rear of this manual.

Horizontal Channel Switch

The horizontal signals from the plug-in unit in the horizontal compartment are connected to pin 2 and pin 15 of U510. The Readout signal is connected to pin 7 of U510. Integrated circuit U510 determines which input signal will provide the signal for the Horizontal amplifier circuit as controlled by the X/Y Shutdown signal from the Readout system. When the X/Y Shutdown is LO, the signal from horizontal compartment is passed to the output of U510. When the X/Y Shutdown is high, the Readout signal is passed to the output of U510. Resistors R514, R515, R521, and R522 establish the operating levels for this circuit. R512 adjusts the circuit gain. R511 and R513 establish the range for the gain adjustment (see Trigger Channel Switch under TRIGGER SELECTOR in this section).

For normal operation, the gain and current level resistors are connected to the Display Limit Command line. The

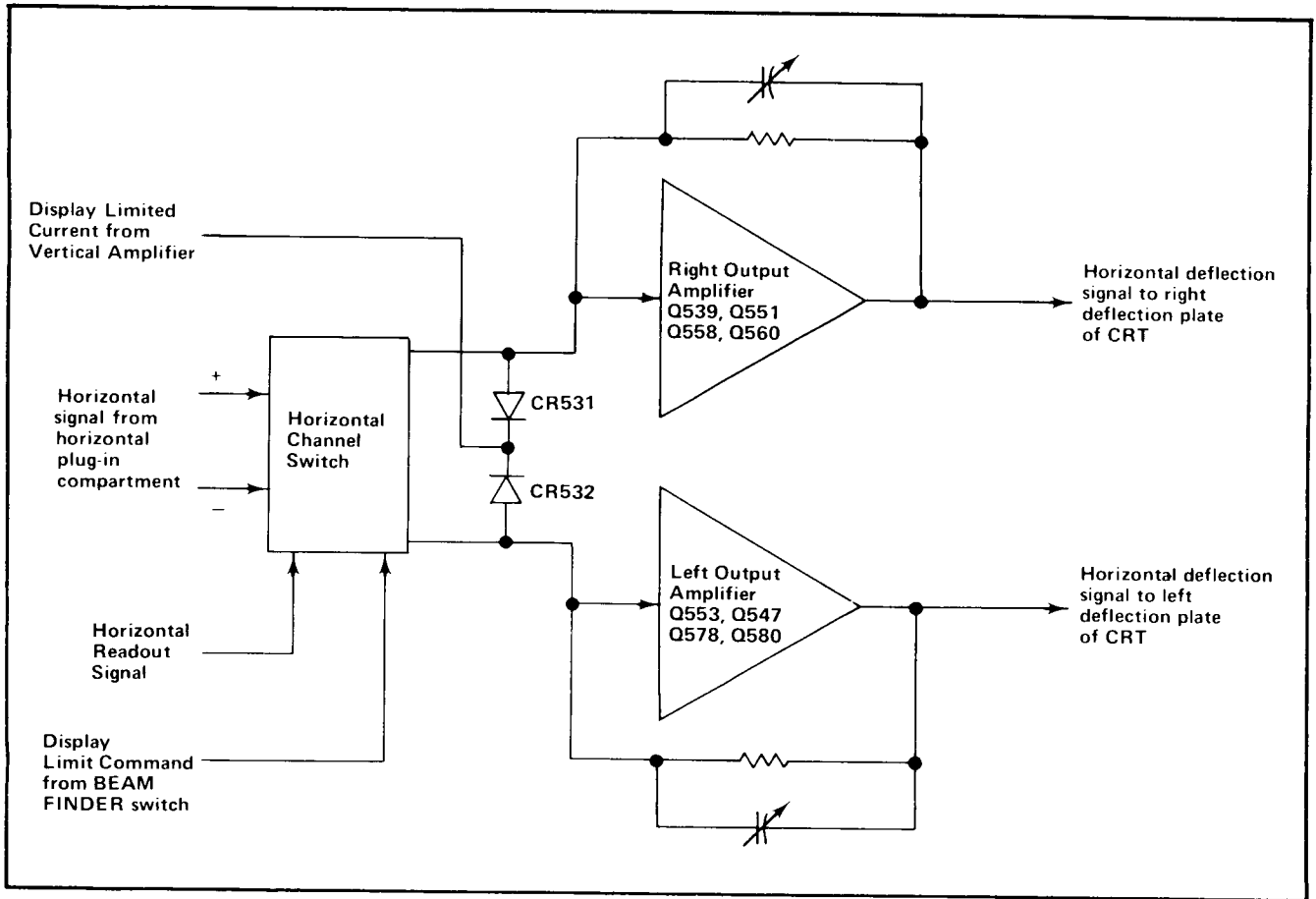


Fig. 4-19. Horizontal Amplifier detailed block diagram.

Display Limit Command is connected to the -15 supply through the BEAM FINDER switch. When the BEAM FINDER switch is actuated, the -15 volt is interrupted to limit the current to U510. At the same time, current is added through CR531 and CR532 from the display limited current line. This added current maintains about the same DC currents through the output circuit in both positions of the BEAM FINDER switch. The signal at the output is connected to the right and left amplifier inputs. Resistor R525 adjusts the amplifier for center screen deflection in the absence of an input signal to U510.

Output Amplifier

Transistors Q539, Q551, Q558, and Q560 function as a current driven feedback amplifier. The input current is converted to a voltage output signal to drive the right horizontal CRT deflection plate. R558 establishes the quiescent current level for series connected transistors Q558 and Q560.

The CRT deflection plates present a capacitive load to the amplifier, which requires additional current during fast transients. Extra current for positive excursions is provided

by Q551 via R555, C555, and Q558; for negative excursions, by Q560 via R563.

Resistor R556 reduces the power dissipation in Q558. Resistors R566, R567, and R569 provide DC feedback and establish low frequency gain. Capacitors C566 and C588 (C568 for lower serial numbers) are adjusted for correct gain at fastest sweep rates (in later serial numbered instruments, C588 replaces C568 and a differently located C588, a thermal compensation network C584-R584 is added).

Basic operation of the Left Output Amplifier stage is the same as described for the Right Output Amplifier. C586 and C588 set the gain for the fastest sweep rates (C588 is relocated for later serial numbers and affects both Right and Left Output Amplifiers). The output signal at the collectors of Q578-Q580 connects to the left deflection plate of the CRT through R585.

The series circuit CR549 and R549 stabilize the output amplifier during fast retrace intervals. R535 is adjusted to balance the negative excursions of the right and left sides of the amplifier when the time base plug-in is used in X10 Magnified mode.

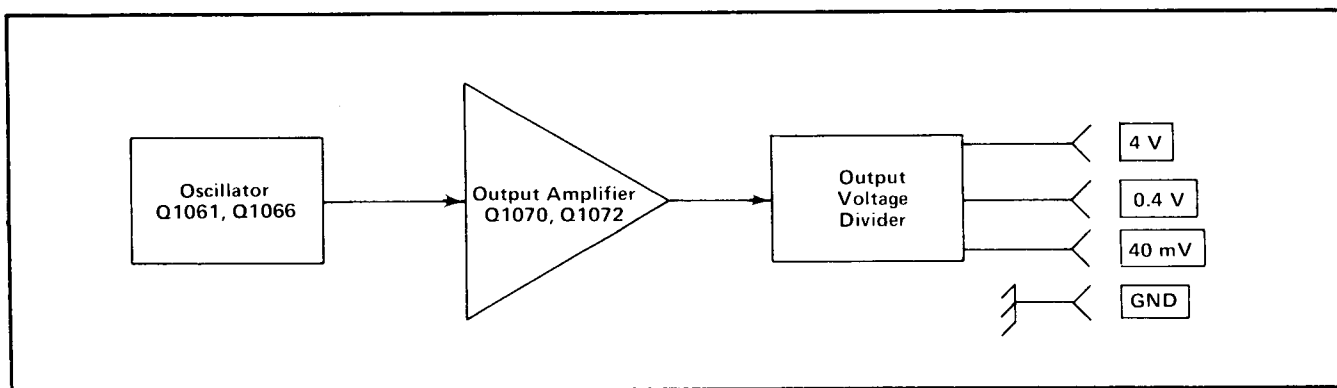


Fig. 4-20. Calibrator detailed block diagram.

CALIBRATOR AND FRONT PANEL SWITCHING

The Calibrator and Front Panel Switching circuit provides output voltage to the front-panel Calibrator pin-jacks and includes the front-panel switches and controls. Fig. 4-20 shows a detailed block diagram of the Calibrator portion of this circuit. A schematic of this circuit is shown on diagram 7 at the rear of this manual.

Mode Switch Logic

The VERT MODE switch determines the operating mode of the Vertical Interface circuit. The levels established by this switch are also used in various other circuits throughout this instrument. This switch is designed so it is self-cancelling (i.e., only one button can be pressed at a time). Specific operation of this switch is described in connection with the circuits that it controls.

The TRIG SOURCE switch controls the operation of the Trigger Selector circuit. This switch is also self-cancelling so only one of the buttons can be pressed at a time. Operation of this switch is discussed in connection with the Trigger Selector circuit.

Calibrator

General. The Calibrator circuit provides accurate voltage output at the front-panel Calibrator pin-jacks. Repetition rate of the output signal is about one kilohertz.

Oscillator. Q1061 and Q1066 are connected as a square-wave oscillator to determine the repetition rate of the Calibrator circuit. Oscillation occurs as follows: Assume that Q1061 is conducting and Q1066 is off. The collector current of Q1061 through R1061 produces a voltage level which holds the base of Q1066 low. This keeps Q1066

turned off, and since there is no current through it, its collector goes positive to produce the positive portion of the square wave. At the same time, C1064 begins to charge toward -15 volts through R1069. The emitter of Q1066 goes negative also as C1064 charges, until it reaches a level about 0.6 volt more negative than the level at its base. Then, Q1066 is forward biased and its emitter rapidly rises positive. Since C1064 cannot change its charge instantaneously, the sudden change in voltage at the emitter of Q1066 pulls the emitter of Q1061 positive also, to reverse bias it. The current through Q1066 produces a voltage drop at its collector to produce the negative portion of the square wave.

Now, conditions are reversed. Since Q1061 is reverse biased, there is no current through it. Therefore, C1064 can begin to discharge through R1063. The emitter level of Q1061 follows the discharge of C1064 until it reaches about -0.6 volt. Then, Q1061 is forward biased and its collector drops negative to reverse bias Q1066. This interrupts the current through Q1066, and its collector goes positive again to complete the square wave. Once again, C1064 begins to charge through R1069 to start the second cycle. The signal produced at the collector of Q1066 has a repetition rate of about one kilohertz.

The Oscillator stage can be changed by jumper P1066. When this jumper is installed in the DC position, the Oscillator is disabled and the collector of Q1066 rises positive. This produces a positive DC voltage output to the front-panel Calibrator pin-jacks.

Output Amplifier. Transistors Q1070 and Q1072 are connected as a comparator with the reference level at the base of Q1072 determined by the network R1073-R1074-R1076-R1077. The 4 Volts adjustment R1077, is set to provide accurate output voltage at the 4 V Calibrator pin-jack.

The output of the Oscillator stage is connected to the base of Q1070. This signal controls the conduction of comparator Q1070-Q1072. When the base of Q1070 is high, it is off and Q1072 is conducting. This produces a positive output voltage at the Calibrator pin-jacks. When the level at the base of Q1070 is switched low, Q1070 conducts and Q1072 is reverse biased. Now, the voltage level at the Calibrator pin-jacks drops to zero.

divider made up of resistors R1079 through R1085. This divider is designed to provide a low output resistance in the 40 mV and 0.4 V positions while providing accurate output voltages. The output resistance at the 4 V pin-jack is about 450 ohms and at the 0.4 V and 40 mV pin-jacks is about 50 ohms.

Output Voltage Divider. The collector current of Q1072 in the Output Amplifier stage is applied across the voltage

CRT CIRCUIT

The CRT Circuit produces the high-voltage potentials and provides the control circuits necessary for the operation of the cathode-ray tube (CRT). This circuit also includes the Z-Axis Amplifier stage to set the intensity of the CRT display and the Auto Focus amplifier to assure

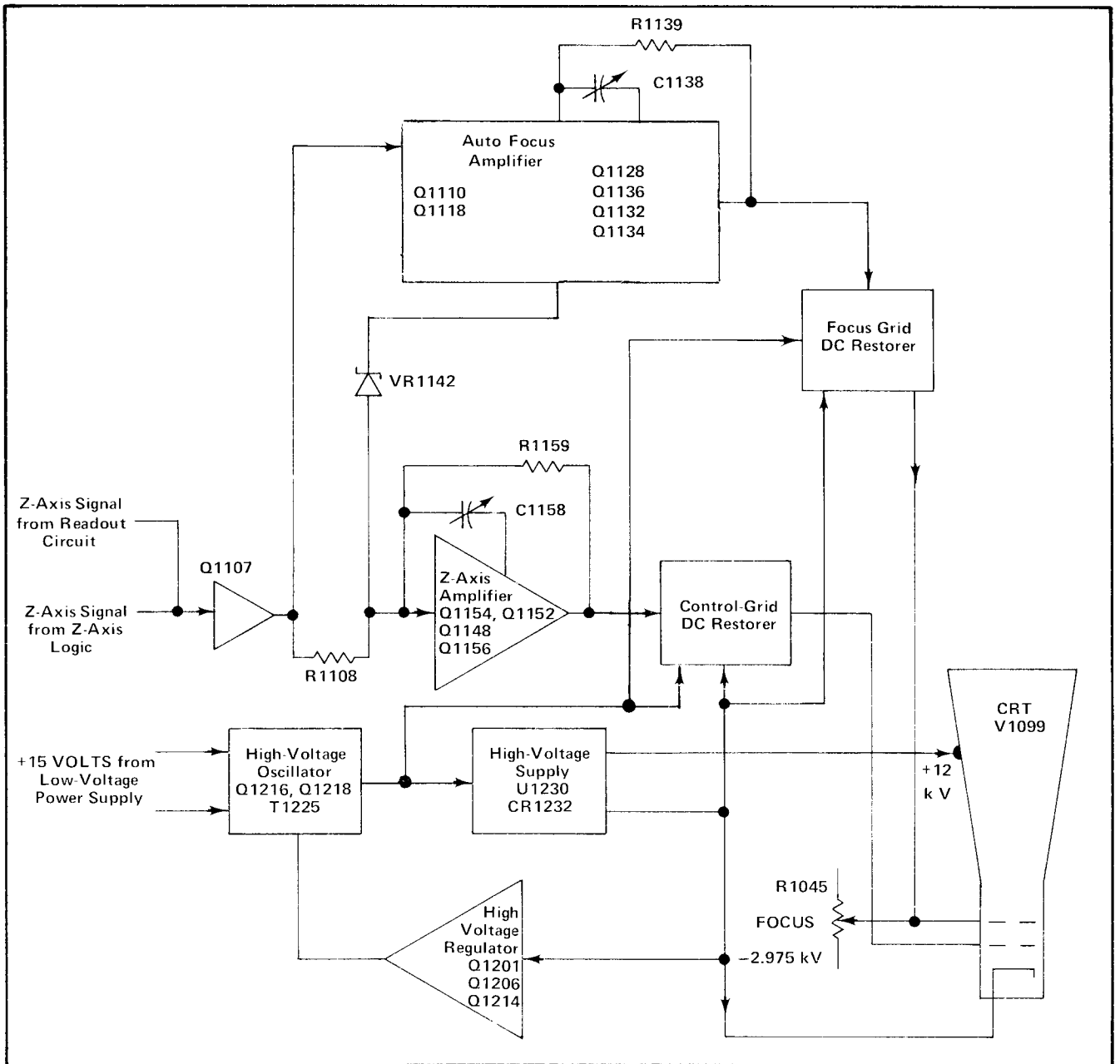


Fig. 4-21. CRT Circuit detailed block diagram.

optimum focus. Fig. 4-21 shows a detailed block diagram of the CRT Circuit. A schematic of this circuit is shown on diagram 8 at the rear of this manual.

Z-Axis Amplifier

The Z-Axis signal from the Logic circuit and the Z-Axis signal from the Readout system are connected to the emitter of Q1107. Transistor Q1107 is a common-base amplifier to establish a low input impedance for the input signals. Transistors Q1148, Q1152, Q1154, and Q1156 form a current driven operational amplifier. The input and output transistors are complementary to provide a fast rise-time and a fast fall-time response. The amplifier input is through resistor R1108. Resistor R1152 establishes a low current in the series connected output transistors. Transistor Q1148 supplies additional current through C1151 for the positive transients, and transistor Q1156 supplies additional current through C1158 for negative transients. Capacitor C1158 is adjusted for optimum square-wave output, resistors R1158 and R1159 along with capacitor C1158 form the feedback network. Zener diode VR1142 provides the necessary change of voltage from the collector of Q1107 to the base of Q1156.

Auto Focus Amplifier

The voltage developed across R1108 by the Z-Axis amplifier driving current is inverted and amplified non-linearly by Q1110 and Q1118, to conform to the requirements of the CRT focus electrode. As the base of Q1110 is driven negative CR1115 is forward biased, producing a knee in the amplifier response. The Level where the knee occurs is determined by the adjustment R1121. The operation of the remaining amplifier is identical to the Z-Axis amplifier.

High-Voltage Oscillator

Power for operation of the high-voltage supply is provided from the +15-Volt Supply. At the time of turn-on, CR1215 is reversed biased holding the collector of Q1214 positive. This allows the starting base bias current for the High-Voltage Oscillator to be supplied from the +5-Volt Supply through R1214, Q1214, and the base feedback windings of T1225 while the emitter potential of Q1216-Q1218 is established by the negative side of the +15-Volt Supply. As the output of the high-voltage supply increases to its required output level, the collector of Q1214 goes negative until CR1215 is forward biased. Then the collector level of Q1214 is clamped about 0.6 volt more negative than the negative side of the +15-Volt Supply. This configuration provides a controlled starting current for the High-Voltage Oscillator at turn-on, and at the same time allows the High-Voltage Regulator stage to control the

current for the High-Voltage Oscillator after the stage reaches operating potentials to provide a regulated high-voltage output.

Q1216-Q1218 and the associated circuitry comprise an oscillator to drive high-voltage transformer T1225. When the instrument is turned on, assume that Q1216 comes into conduction first. The collector current of Q1216 produces a corresponding current increase in the base-feedback winding of T1225 to further increase the conductivity of Q1216. At the same time, the voltage developed across the base-feedback winding connected to Q1216 holds Q1218 reverse biased.

As long as the collector current of Q1216 continues to increase, voltage is induced into the base-feedback windings of T1225 which holds Q1216 forward biased and Q1218 reverse biased. However, when the collector current of Q1216 stabilizes, the magnetic field built up in T1225 begins to collapse. This induces an opposite current into the base windings which reverse biases Q1216, but forward biases Q1218. When the induced voltage at the base of Q1218 exceeds the bias set by the High-Voltage Regulator, Q1218 conducts and the amplified current at its collector adds to the current flowing through T1225 due to the collapsing field. Then, as the current through T1225 stabilizes again, the magnetic field around it once more begins to collapse. This reverses the conditions to start another cycle.

The signal produced across the primary of T1225 is a sine wave at a frequency of 35 to 45 kilohertz. The amplitude of the oscillations in the primary of T1225 is controlled by the High-Voltage Regulator to set the total accelerating potential for the CRT. Filter network C1222-L1222 decouples high peak operating current from the +15-Volt Supply.

High-Voltage Regulator

A sample of the secondary voltage from T1225 is connected to the High-Voltage Regulator stage through divider R1245A-R1245B. Q1201 and Q1206 are connected as an error amplifier to sense any change in the voltage level at the base of Q1201. The ground reference for the emitter of Q1201 through R1202, establishes the reference level for this stage. The output voltage is set by the fixed values of the components in this circuit.

Regulation occurs as follows: If the output voltage at the -2975 V test point starts to go positive (less negative), a sample of this positive-going change is connected to the base of Q1201 through R1245B. Both Q1201 and Q1206

Circuit Description—7603/R7603 Service

are forward biased by this positive change, which in turn increases the conduction of Q1214. This results in a greater bias current delivered to the bases of Q1216-Q1218 through Q1214. Now, the bases of both Q1216 and Q1218 are biased closer to their conduction level so the feedback voltage induced into their base-feedback windings produces a larger collector current. This results in a larger induced voltage in the secondary of T1225 to produce a more negative level at the -2975 V test point to correct the original error. In a similar manner, the circuit compensates for output changes in a negative direction. Since the amplitude of the voltage induced into the secondary of T1225 also determines the output level of the positive High-Voltage Supply and the Control-Grid Supply, the total high-voltage output is regulated by sampling the output of the negative High-Voltage Supply.

High-Voltage Supplies

High-voltage transformer T1225 has two output windings. One winding provides filament voltage for the cathode-ray tube. The other winding provides the negative and positive accelerating potential for the CRT and the bias voltage for the control grid. All of these voltages are regulated by the High-Voltage Regulator stage to maintain a constant output voltage as previously described.

Positive accelerating potential for the CRT anode is supplied by the voltage quadrupler U1230. The applied voltage from the secondary of T1225 is about six kilovolts peak-to-peak. This results in an output voltage of about +12 kilovolts at the CRT anode. The negative accelerating potential for the CRT cathode is also obtained from this same secondary winding. Half-wave rectifier CR1232 provides an output voltage of about -2.975 kilovolts which is connected to the CRT cathode through R1234. The cathode and filament are connected together through R1275 to prevent cathode-to-filament breakdown due to a large difference in potential between these CRT elements. A sample of the negative accelerating voltage is connected to the High-Voltage Regulator to maintain a regulated high-voltage output.

The network consisting of diodes CR1269-CR1268-CR1270-CR1264-VR1264 provides the negative voltage for the control grid of the CRT. Output level of this supply is set by CRT Grid Bias adjustment R1261. Approximately 800 volts peak-to-peak from the secondary of T1225 is connected to the Control-Grid Supply through C1266 and R1266. Diodes CR1268 and CR1264 clip this signal to determine the operating level at the control grid. CR1268 limits the negative excursion of the signal; quiescently when the CRT is blanked, the anode of CR1268 is set at about +15 volts by the Z-Axis Amplifier stage. The positive clipping level at the cathode of CR1264 is set by CRT Grid Bias adjustment R1261. R1261 is adjusted to bias the control grid of the CRT just

enough negative so the trace is blanked between sweeps. Under normal conditions, this biases the control grid about 80 volts more negative than the cathode.

The negative level at the CRT cathode is connected to the cathode of CR1270. This level is held constant by the High-Voltage Regulator as described previously. The clipped voltage developed by diodes CR1264 and CR1268 is peak to peak rectified by diodes CR1269 and CR1270 and super-imposed on this negative voltage to result in a level at the grid of the CRT which is more negative than the CRT cathode level. C1269 acts as a filter to provide a constant voltage output level. The unblanking gate level developed by the Z-Axis Amplifier stage is applied to the anode of CR1268 through R1157. The fast rising and falling portions of this signal are coupled directly to the output through C1269. The overall effect of the unblanking gate is to further clip the negative excursions thereby reducing the voltage difference between grid and cathode of the CRT. This allows the cathode current of the CRT to pass to the anode so the display can be viewed.

CRT Control Circuits

The focus of the display is determined by the FOCUS control R1045. This control and the Auto Focus amplifier maintains a well-defined display for fast changes in the intensity of the display. The network consisting of CR1255, CR1254, CR1253, CR1258, and VR1258 provide the negative voltage for the focus grid of the CRT. Approximately 800 volts peak to peak from the secondary of T1225 is connected to the focus grid supply through C1257 and R1257. The positive clipping level at the anode of CR1258 is set by the FOCUS control setting. This determines the operating level at the focus grid. Under normal operating conditions the voltage applied to the focus grid is more positive (less negative) than the control grid or the cathode of the CRT. The signal developed by the Auto Focus amplifier is coupled to the focus grid by C1254. When there is a sudden change in intensity levels the focus grid level will change to maintain a well-defined display. Astigmatism adjustment R1193, which is used in conjunction with the FOCUS control to obtain a well-defined display, varies the positive level on the astigmatism grid. Geometry adjustment R1184 varies the positive level on the horizontal deflection-plate shield to control the overall geometry of the display.

Two adjustments control the trace alignment by varying the magnetic field induced by coils around the CRT. Y-Axis Alignment R1190 controls the current through L1098, which affects the CRT beam after vertical deflection, but before horizontal deflection. Therefore, it affects only the vertical (Y) components of the display. Beam Rotation adjustment R1181 controls the current through L1099 and affects both the vertical and horizontal rotation of the display.

LOW-VOLTAGE POWER SUPPLY

The Low-Voltage Power Supply circuit provides the operating power for this instrument from six regulated supplies. Electronic regulation is used to provide stable, low-ripple output voltages. Each supply (except the +130 V supply, which is fused) contains a short-protection circuit to prevent instrument damage if a supply is inadvertently over-loaded or shorted to ground. Fig. 4-22 shows a detailed block diagram of the Low-Voltage Power Supply circuit. A schematic of this circuit is shown on diagram 9 at the rear of this manual.

Power Input

Power is applied to the primary of transformer T801 through line fuse F1000, thermal cutout S1000, and POWER switch S1001. The Voltage-Selector Jumper, P1001, connects the two halves of the primary of T801 in parallel for 110-volt (nominal) operation. Voltage-Selector Jumper P1002 connects the two halves of the primary in series for 220-volt (nominal) operation. The line fuse, F1000, must be changed to provide the correct protection for 220-volt nominal operation.

Each half of the primary of T801 has taps above and below the 110-volt (220-volt) nominal point. When the Voltage Selector Jumper is moved from LOW to MED to HI, more turns are effectively added to the primary winding and the turns ratio is decreased to compensate for the increased primary voltage. This configuration extends the regulating range of the 7603.

For the R7603 a fan provides forced-air cooling. The fan is connected in parallel with one half of the primary winding of T801. Therefore, it always has the same voltage applied regardless of the position of the Voltage-Selector Jumper.

Thermal cutout S1000 provides thermal protection for this instrument. If the internal temperature of the instrument exceeds a safe operating level, S1000 opens to interrupt the applied power. When the temperature returns to a safe level, S1000 automatically closes to re-apply the power.

-50-Volt Supply

The following discussion includes the description of the 50 V Rectifier, -50 V Series Regulator, -50 V Feedback Amplifier, -50 V Reference, and -50 V Current Limiting stages. Since these stages are closely related in the operation of the -50-volt regulated output, their performance is most easily understood when discussed as a unit.

The 50 V Rectifier assembly CR808 rectifies the output at the secondary of T801 to provide the unregulated voltage source for both the -50- and +50-volt supplies. CR808 is connected as a bridge rectifier and its output is filtered by C808-C809. Transistors Q886, Q896, Q900 operate as a feedback-stabilized regulator circuit to maintain a constant -50-volt output level. Q886 is connected as a differential amplifier to compare the feedback voltage at the base of Q886B against the reference voltage at the base of Q886A. The error output at the collector of Q886B reflects the difference, if any, between these two inputs. The change in error-output level at the collector of Q886B is always opposite in direction to the change in the feedback input at the base of Q886B (out of phase).

Zener diode VR890 sets a reference level of about -9 volts at the base of Q886A. A feedback sample of the output voltage from this supply is connected to the base of Q886B through divider R880-R881-R882. R881 in this divider is adjustable to set the output level of this supply. Notice that the feedback voltage to this divider is obtained from a line labeled -50 V Sense. Fig. 4-23 illustrates the reason for this configuration. The inherent resistance of the interconnecting wire between the output of the -50-Volt Supply and the load produces a voltage drop which is equal to the output current multiplied by the resistance of the interconnecting wire. Even though the resistance of the wire is small, it results in a substantial voltage drop due to the high output current of this supply. Therefore, if the feedback voltage were obtained ahead of this drop, the voltage at the load might not maintain close regulation. However, the -50 V Sense feedback configuration overcomes this problem since it obtains the feedback voltage from a point as close as practical to the load. Since the current in the -50 V Sense line is small and constant, the feedback voltage is an accurate sample of the voltage applied to the load.

Regulation occurs as follows: If the output level of this supply decreases (less negative) due to an increase in load, or a decrease in input voltage (as a result of line voltage changes or ripple), the voltage across divider R880-R881-R882 decreases also. This results in a more positive feedback level at the base of Q886B than that established by the -50 V Reference stage at the base of Q886A. Since the transistor with the more positive base controls the conduction of the differential amplifier, the output current at the collector of Q886B increases. This increase in output from Q886B allows more current to flow through Q896 and Q900 to result in increased conduction of -50 V Series Regulator Q903. The load current increases and the output voltage of this supply also increases (more negative). As a result, the feedback voltage from the -50 V Sense line increases and the base of Q886B returns to the same level as the base of Q886A. Similarly, if the output level of this supply increases (more negative), the output current of Q886B decreases. The feedback through Q896 and Q900 reduces the conduction of the -50 V Series Regulator to decrease the output voltage of this supply.

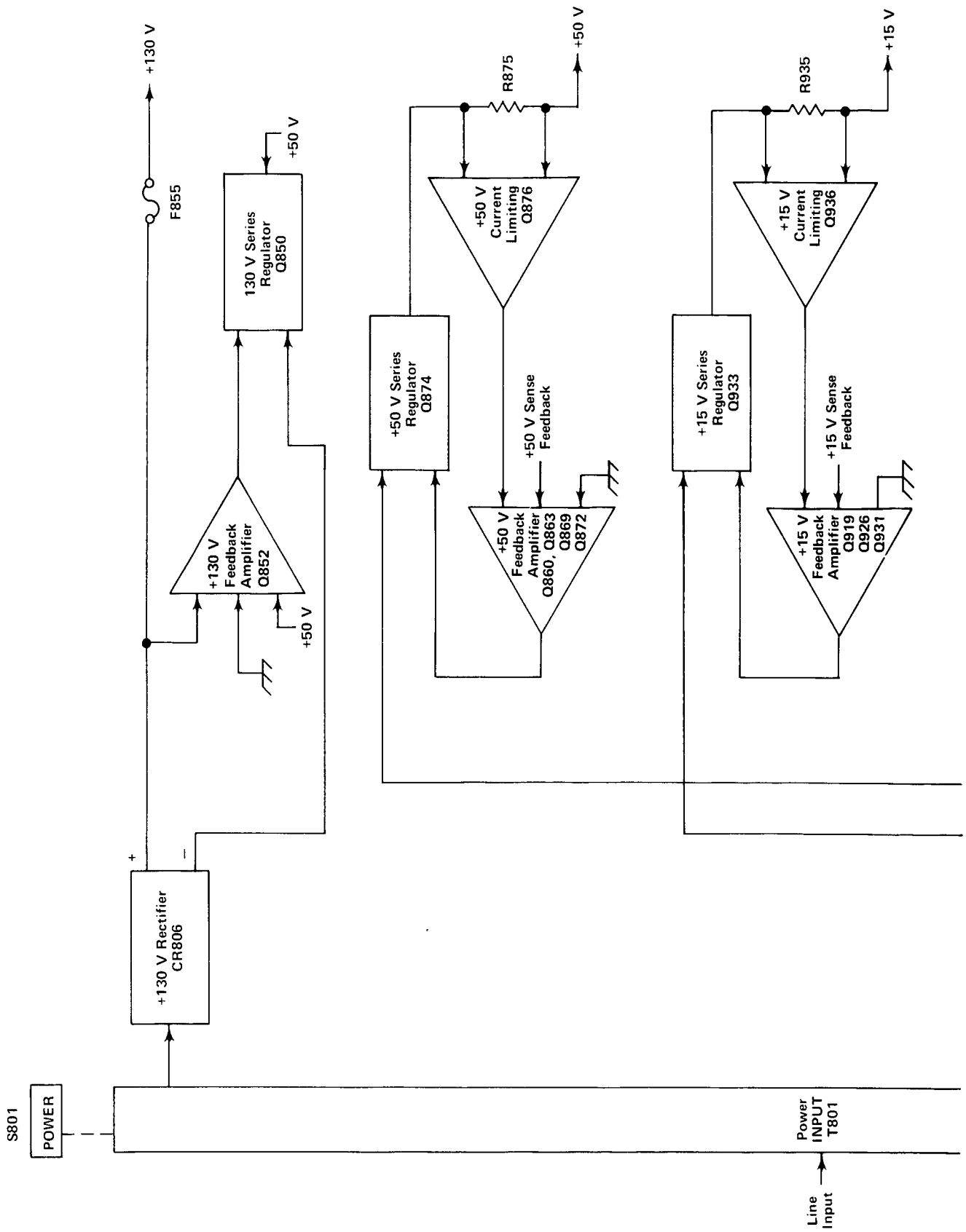


Fig. 4-22. Low-Voltage Power Supply detailed block diagram.

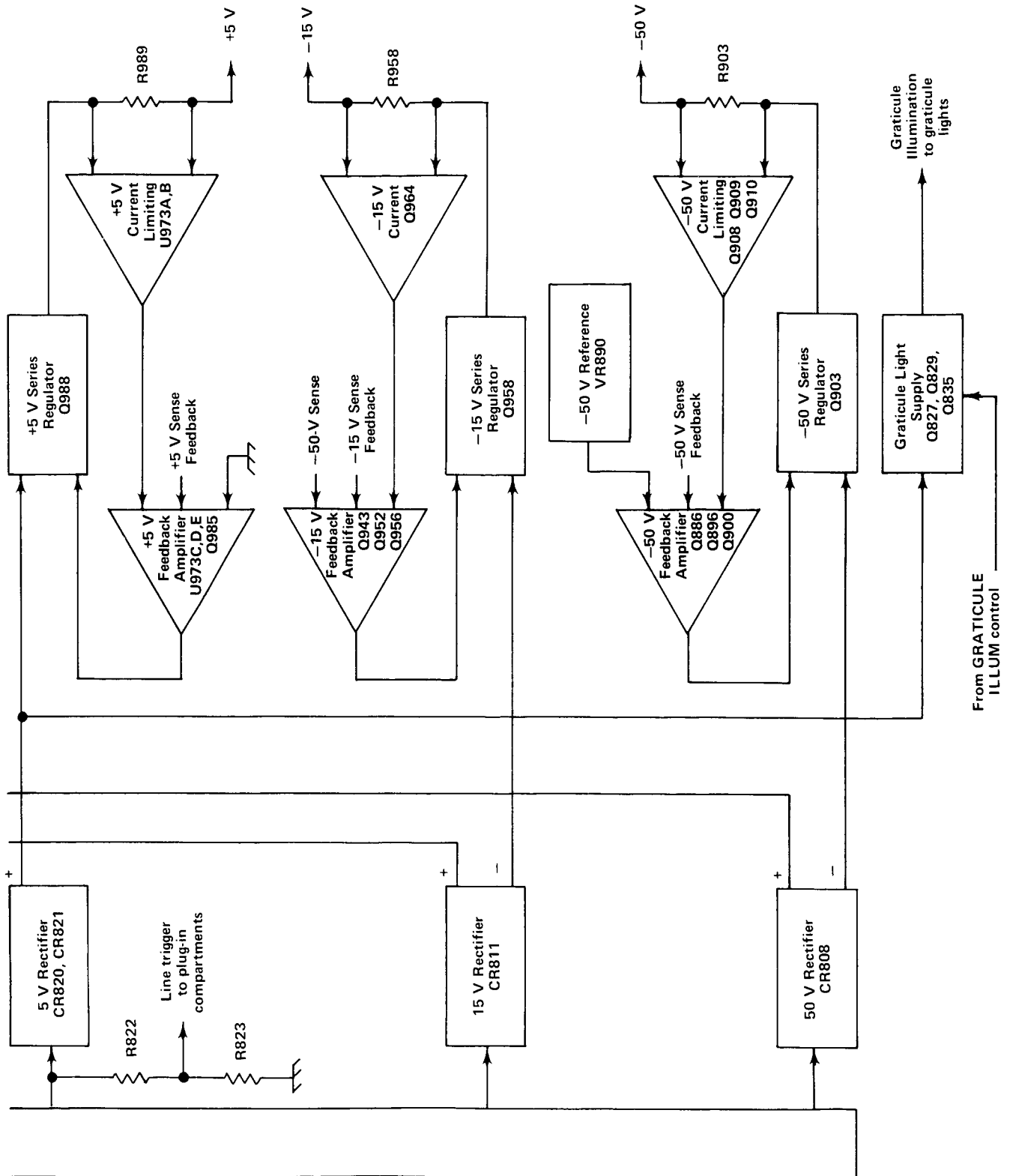


Fig. 4-22. Low-Voltage Power Supply detailed block diagram (cont).

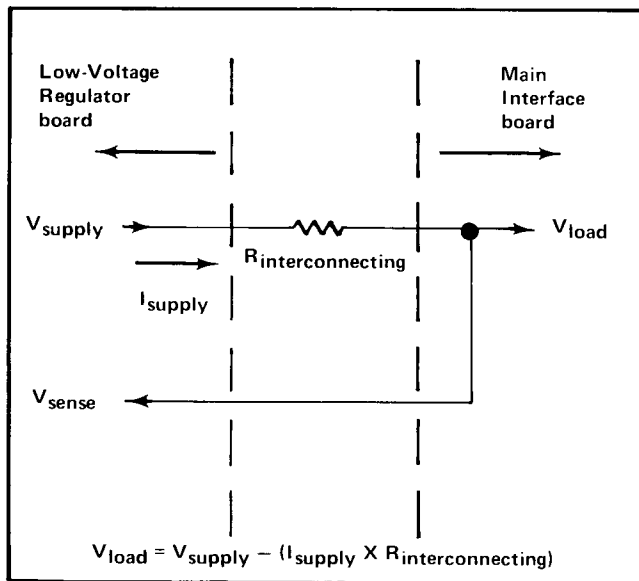


Fig. 4-23. Schematic illustrating voltage drop between power supply output and load due to resistance of interconnecting wire.

–50 Volts adjustment R881 determines the divider ratio to the base of Q886B and thereby determines the feedback voltage. This adjustment sets the output level of the supply in the following manner: If R881 is adjusted so the voltage at its variable arm goes less negative (closer to ground), this appears as an error signal at the base of Q886B. In the same manner as described previously, this positive-going change at the feedback input of the differential amplifier increases the conduction of the –50 V Series Regulator to produce more current to the load, and thereby increase the output voltage of this supply. This places more voltage across divider R880-R881-R882 and the divider action returns the base of Q886B to about –9 volts. Notice that the feedback action of this supply forces a change in the output level which always returns the base of Q886B to the same level as the base of Q886A. In this manner, the output level of the –50-Volt Supply can be set to exactly –50 volts by correct adjustment of R881.

The –50 V Current Limiting stage Q908-Q909-Q910 protects the –50-Volt Supply if excess current is demanded from this supply. All of the output current from the –50-Volt Supply flows through R903. Transistor Q908 senses the voltage at the collector of the –50 V Series Regulator Q903 and compares it against the –50 V output level at the base of Q909 which is obtained from the other side of R903. Under normal operation, Q908 is held in conduction and Q909 is off. However, when excess current is demanded from the –50 V Series Regulator due to a short circuit or similar malfunction at the output of this supply, the voltage drop across R903 increases until the base of Q908 goes more negative than the level at the base of Q909. Then Q909 takes over conduction of the comparator. The collector current of Q909 increases the

voltage drop across R896 to reduce the conduction of Q896 in the –50 V Feedback Amplifier and limit the conduction of Q903. Q910 is connected as a constant-current source for Q908-Q909.

–15-Volt Supply

Basic operation of all stages in the –15-V Supply is the same as for the –50-Volt Supply. Reference level for this supply is established by divider R945-R946 between supply ground and the –50 V Sense voltage. The divider ratio of R945-R946 sets a level of –15 volts at the base of Q943A. The level on the –50 V Sense line is held stable by the –50-Volt Supply as described previously. The –15 V Sense voltage is connected to the base of Q943B through R940. Any change at the output of the –15-Volt Supply appears at the base of Q943B as an error signal. The output voltage is regulated in the same manner as described for the –50-Volt Supply.

+5-Volt Supply

Basic operation of the +5-Volt Supply is the same as described for the previous supplies. The +5 V Current Limiting and +5 V Feedback Amplifier (except for Q985) is made up of a five-transistor array U973. Notice that both U973C and Q985 in the +5 V Feedback Amplifier are connected as emitter followers, since inversion is not necessary in the feedback path for positive output voltages. Reference voltage for the +5 V Feedback Amplifier stage is established by divider R970-R971 between the +5 V Sense and –50 V Sense feedback voltages. This divider establishes a quiescent level of about 0 volt at the base of U973E.

+15-Volt Supply

The +15-Volt Supply operates in the same manner as described for the previous supplies. The unregulated +15-Volt Supply provides the source voltage for the High-Voltage Oscillator stage in the CRT circuit through fuse F814 and P870.

+50-Volt Supply

Operation of the +50-Volt Supply is the same as described for the previous supplies. The unregulated +50 volts, from 50 V Rectifier CR808, is used to provide a positive starting voltage for the –50-Volt Supply.

+130-Volt Supply

The +130-V Rectifier CR806 provides the rectified voltage for the +130-Volt Supply. However, this secondary winding of T801 does not supply the full potential necessary to obtain the +130-volt output level. To provide the required output level, the +50-Volt Supply is connected in series with this supply through Q850. Basic regulation of

the output voltage is provided by +130 V Feedback Amplifier Q852, and +130 V Series Regulator Q850.

The output voltage of this supply is connected across divider R855-R856. This divider provides a quiescent level of about +50 volts at the base of Q852. The reference level for this supply is provided by the +50-Volt Supply connected to the emitter of Q852. If the output of this supply changes, this change is sensed by Q852 and an amplified error signal is connected to the base of Q850. This error signal changes the conduction of the +130 V Series Regulator Q850 to correct the output error. Fuse F855 protects this supply if the output is shorted. However, since the response time of F855 is slow to a shorted condition, VR851 provides additional current to the base of Q850 to protect it from damage due to overvoltage. Diode CR852 limits the reverse bias on Q852 to about 0.6 volt when F855 is blown.

Graticule Light Supply

Power for the graticule lights is supplied by the Graticule Light Supply. Rectified voltage for this supply is provided by 5 V Rectifier CR820-CR821. Q835 operates as a series regulator transistor. Emitter follower Q829 determines the conduction of this series regulator as controlled by front panel GRATICULE ILLUM Control R1095. Current-limiting to protect this supply is provided by Q827. Under normal operation, divider R830-R831-R833 sets the base of Q827 below its conduction level. However, if excess current is demanded from this supply, the voltage drop across R837-R838 increases until Q827 comes into conduction. The collector of Q827 then limits the conduction of this supply to limit its output current.

Divider R822-R823 provides a sample of the line voltage in the secondary of T801 to the plug-in unit. This provides a line-frequency reference to the plug-in units for internal triggering at line frequency or for other applications.

DC Fan (R7603 only)

The DC fan (Option 5) uses a brushless, Hall-effect motor. The Hall-effect devices, located inside the motor housing, control the base current to motor-driving transistors Q1034-Q1035-Q1037-Q1038 depending upon the magnitude and polarity of the magnetic field around them. A permanent magnet, located in the rotor, changes the magnetic field as the rotor turns, causing the Hall-effect devices to turn on the appropriate transistors to drive the motor windings.

Transistor Q1041 provides a constant current source for the Hall-effect devices, responding to voltage changes at the emitters of the driving transistors, thus controlling the

motor current. Transistor Q1030, along with R1203, provides a biasing arrangement to make the Hall-effect devices compatible with the silicon driving transistors.

SIGNAL OUT BOARD

VERT SIG OUT

The vertical signal is selected by the TRIG SOURCE switch. The vertical signal selected is applied to the bases of a differential amplifier Q606 and Q618. A single-ended signal is taken off the collector of Q618 and connected to an output buffer Q620. CR621 and CR622 provide protection against a high voltage inadvertently applied to the output connector.

+ GATE OUT

The gate signal is connected to a comparator circuit Q662 and Q666 through resistor R660. From the comparator the gate signal is connected to the emitter of an output buffer Q672. Gate Selector switch connects one of the gate signals to R660, the input of the Gate Amplifier. Possible gate signals are MAIN gate and, with a dual-sweep time-base unit, a DELAY or an AUXILIARY gate signal can be selected. CR674 and CR676 provide protection against a high voltage inadvertently applied to the output connector.

+ SAWTOOTH OUT

The sawtooth signal is connected to the Sawtooth Amplifier through R36. Q631, Q634, and Q640 comprise a negative feedback amplifier with a gain of two, determined by the ratio of feedback resistor R645 to the combined input resistance of R630 and R63. CR635 and CR676 provide protection against a high voltage inadvertently applied to the output connector.

READOUT SYSTEM

The Readout System in the 7603 provides alphanumeric display of information encoded by the plug in units. This display is presented on the CRT and is written by the CRT beam on a time-shared basis. Schematics for the total Readout System are shown on diagrams at the rear of this manual.

The definitions of several terms must be clearly understood to follow this description of the Readout System. These are:

Character—A character is a single number, letter, or symbol which is displayed on the CRT, either alone or in combination with other characters.

Circuit Description—7603/R7603 Service

Word—A word is made up of a related group of characters.

In the 7603 Readout System, a word can consist of up to ten characters.

Frame—A frame is a display of all words for a given operating mode and plug-in combination. Up to six words can be displayed in one frame. Fig. 4-24 shows one complete frame (simulated readout) and the position at which each of the six words is displayed.

Column—One of the vertical lines in the Character Selection Matrix (see Fig. 4-25). Columns C-0 (column zero) to C-10 (column 10) can be addressed in the 7603 system.

Row—One of the horizontal lines in the Character Selection Matrix (Fig. 4-25). Rows R-1 (row 1) to R-10 (row 10) can be addressed in the 7603 system.

Time-slot—A location in a pulse train. In the 7603 Readout System, the pulse train consists of 10 negative-going pulses. Each of these time-slots is assigned a number between one and ten. For example, the first time-slot is TS-1.

Time-multiplexing—Transmission of data from two or more sources over a common path by using different time intervals for different signals.

Display Format. Up to six words of readout information can be displayed on the 7603 CRT. The position of

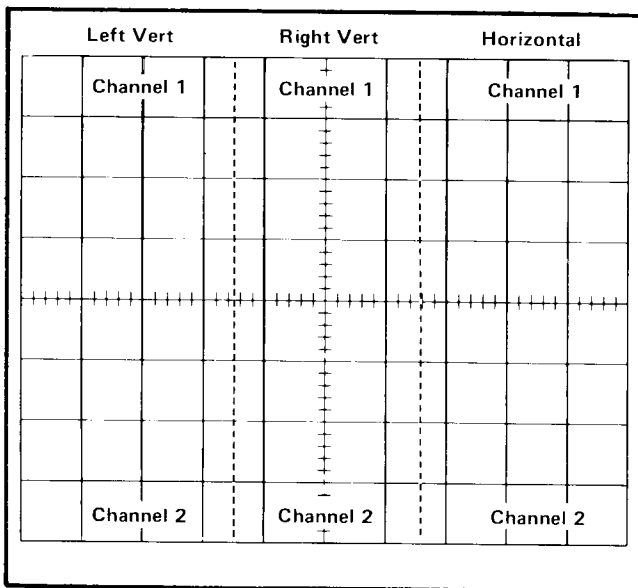


Fig. 4-24. Location of readout words on the CRT identifying the originating plug-in unit and channel (one complete frame shown, simulated readout).

each word is fixed and is directly related to the plug-in unit from which it originated. Fig. 4-24 shows the area of the graticule where the readout from each plug-in unit is displayed. Notice that channel 1 of each plug-in unit is displayed within the top division of the CRT and channel 2 is displayed directly below within the bottom division. Fig. 4-26 shows a typical display.

Each word in the readout display can contain up to 10 characters, although the typical display will contain between two and seven characters per word. The characters are selected from the Character Selection Matrix shown in Fig. 4-25. Any one of the 50 separate characters can be addressed and displayed on the CRT. In addition, 12 operational addresses are provided for special instructions to the Readout System. The unused locations in the Matrix (shaded areas) are available for future expansion of the Readout System. The method of addressing the locations in the Character Selection Matrix is described in the following discussion.

Developing the Display. The following basic description of the Readout System uses the block diagram shown in Fig. 4-27. This description is intended to relate the basic function of each stage to the operation of the overall Readout System. Detailed information on circuit operation is given later.

The key block in the Readout System is the Timer stage. This stage produces the basic signals which establish the timing sequences within the Readout System. Period of the timing signal is about 250 microseconds (drops to about 210 microseconds when Display-Skip is received; see detailed description of Timing stage for further information). This stage also produces control signals for other stages within this circuit and interrupt signals to the Vertical Interface, Horizontal Interface, CRT Circuit, and Z-Axis Logic stage which allow a readout display to be presented. The Time-Slot Counter stage receives a trapezoidal voltage signal from the Timer stage and directs it to one of ten output lines. These output lines are labeled TS-1 through TS-10 (time-slots one through ten) and are connected to the vertical and horizontal plug-in compartments as well as to various stages within the Readout System. The output lines are energized sequentially so there is a pulse on only one of the 10 lines during any 250 microsecond timing period. When the Time-Slot Counter stage has completed time-slot 10, it produces an End-of-Word pulse which advances the system to the next channel.

Two output lines, row and column, are connected from each channel of the plug-in units back to the Readout System. Data is encoded on these output lines by connecting resistors between them and the time-slot input lines. The resultant output is a sequence of ten analog

| COLUMN NUMBER | C-0 | C-1 | C-2 | C-3 | C-4 | C-5 | C-6 | C-7 | C-8 | C-9 | C-10 |
|---------------|--|----------------------------------|------------------------------|---|--|--|--|--|----------|-------------------------------|-----------------------|
| ROW NUMBER | 0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | ≥ 1.0 |
| R-1 | 0 | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| R-2 | \neq | < | I | SHIFT ^a PREFIX | / | + | - | + | C | Δ | > |
| R-3 | ADD ^a ONE ZERO | ADD ^a TWO ZEROS | SHIFT ^a PREFIX | SHIFT ^a PREFIX AND ADD ONE ZERO | | | | | | | IDENTIFY ^a |
| R-4 | m | μ | n | p | X | K | M | G | T | R | |
| R-5 | S | V | A | W | H | d | B | c | Ω | E | |
| R-6 | U | N | L | Z | Y | P | F | J | Q | D | |
| R-7 | | | | DECIMAL ^a POINT LOCATION NO. 3 | DECIMAL ^a POINT LOCATION NO. 4 | DECIMAL ^a POINT LOCATION NO. 5 | DECIMAL ^a POINT LOCATION NO. 6 | DECIMAL ^a POINT LOCATION NO. 7 | | | |
| R-8 | | | | | | | | | | DECIMAL ^b POINT | |
| R-9 | | | | | | | | | | | |
| R-10 | ADD SPACE IN DISPLAY ^a | | | | | | | | | | |

Fig. 4-25. Character Selection Matrix for 7603 Readout System.

UNUSED LOCATIONS. AVAILABLE FOR FUTURE EXPANSION OF READOUT SYSTEM

^a OPERATIONAL ADDRESS.

^b DECIMAL POINT CHARACTER. SEE DECIMAL POINT CHARACTER DESCRIPTION IN TEXT.

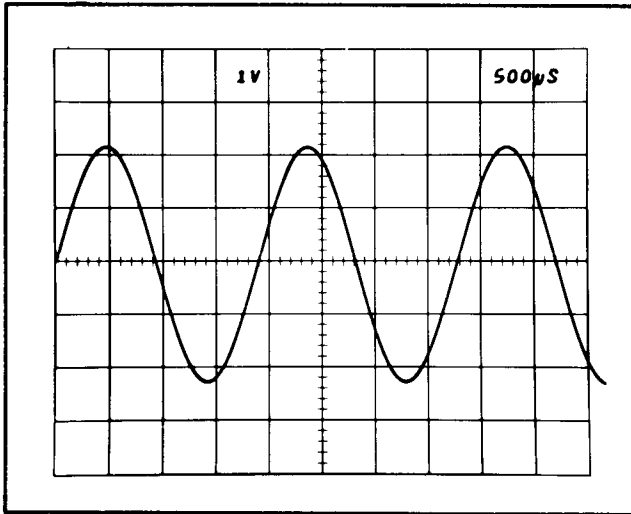


Fig. 4-26. Typical readout display where only channel 1 of the Right Vertical and Horizontal units is displayed.

current levels which range from zero to one milliamperes (100 microamperes/step) on the row and column output lines. This row and column correspond to the row and column of the Character Selection Matrix in Fig. 4-25. The standard format in which information is encoded onto the output lines is given in Table 4-2 (special purpose plug-in units may have their own format for readout; these special formats will be defined in the manuals for these units).

The encoded column and row data from the plug-in units is selected by the Column Data Switch and Row Data Switch stages respectively. These stages take the analog currents from the six data lines (two channels from each of the three plug-in compartments) and produce a single time-multiplexed analog voltage output which contains all of the column or row information from the plug-ins. The Column Data Switch and Row Data Switch are sequenced by the binary Channel Address No. 1 code from the Channel Counter.

The time multiplexed output of the Column Data Switch is monitored by the Display-Skip Generator to determine if it represents valid information which should be displayed. Whenever information is not encoded in a time-slot, the Display-Skip Generator produces an output level to prevent the Timer stage from producing the control signals which normally interrupt the CRT display and present a character.

The analog outputs of the Column Data Switch and Row Data Switch are connected to the Column Decoder and Row Decoder stages respectively. These stages sense the magnitude of the analog voltage input and produce an

output current on one of ten lines. The outputs of the Column Decoder stage are identified as C-1 to C-10 (column 1 to 10) which correspond to the column information encoded by the plug-in unit. Likewise, the outputs of the Row Decoder stage are identified as R-1 to R-10 (row 1 to 10) which correspond to the row information encoded by the plug-in unit. The primary function of the row and column outputs is to select a character from the Character Selection Matrix to be produced by the Character Generator stage. However, these outputs are also used at other points within the system to indicate when certain information has been encoded. One such stage is the Zeros Logic and Memory. During time-slot 1 (TS-1), this stage checks if zero-adding or prefix-shifting information has been encoded by the plug-in unit and stores it in memory until time-slots 5, 6, or 8. After storing this information, it triggers the Display-Skip Generator stage so there is no display during this time slot (as defined by Standard Readout Format; see Table 4-2). When time-slots 5, 6, and 8 occur, the memory is addressed and any information stored there during time-slot 1 is transferred out and connected to the input of the Column Decoder stage to modify the analog data during the applicable time-slot.

TABLE 4-2
Standard Readout Format

| Time-Slot Number | Description |
|----------------------|---|
| TS-1 | Determines decimal magnitude (number of zeros displayed or prefix change information) or the IDENTIFY function (no display during this time-slot). |
| TS-2 | Indicates normal or inverted input (no display for normal). |
| TS-3 | Indicates calibrated or uncalibrated condition of plug-in variable control (no display for calibrated condition). |
| TS-4 | 1-2-5 scaling. |
| TS-5 TS-6 TS-7 | Not encoded by plug-in unit. Left blank to allow addition of zeros by Readout System. |
| TS-8 | Defines the prefix which modifies the units of measurement. |
| TS-9 TS-10 | Define the units of measurement of the plug-in unit. May be standard units of measurement (V, A, S, etc.,) or special units selected from the Character Selection Matrix. |

Another operation of the Zeros Logic and Memory stage is to produce the IDENTIFY function. When time-slot 1 is encoded for IDENTIFY (column 10, row 3), this stage produces an output level which connects the Column Data Switch and Row Data Switch to a coding network within the Readout System. Then, during time-slots 2 through 9, an analog current output is produced from the Column Data Switch and Row Data Switch which addresses the correct points in the Character Selection Matrix to display the word "IDENTIFY" on the CRT. The Zeros Logic and Memory stage is reset after each word by the Word Trigger pulse.

The Character Generator stage produces the characters which are displayed on the CRT. Any of the 50 characters shown on the Character Selection Matrix of Fig. 4-24 can be addressed by proper selection of the column and row current. Only one character is addressable in any one time-slot; a space can be added into the displayed word by the Decimal Point Logic and Character Position Counter stage when encoded by the plug-in. The latter stage counts how many characters have been generated and produces an output current to step the display one character position to the right for each character. In addition, the character position is advanced once during each of time-slots 1, 2, and 3 whether a character is generated during these time-slots or not. This action fixes the starting point of the standard-format display such that the first digit of the scaling factor always starts at the same point within each word regardless of the information encoded in time-slot 2 (normal/invert) or time-slot 3 (cal/uncal) which precedes this digit. Also, by encoding row 10 and column 0 during any time-slot, a blank space can be added to the display. Decimal points can be added to the display at any time by addressing row 7 and columns 3 through 7 (see Character Selection Matrix for location of these decimal points). The Decimal Point Logic and Character Position Counter stage is reset after each word by the Word Trigger pulse.

The Format Generator stage provides the output signals to the vertical and horizontal deflection systems of the instrument to produce the character display. The binary Channel Address No. 2 code from the Channel Counter stage is connected to this stage so that the display from each channel is positioned to the area of the CRT which is associated with the plug-in and channel originating the word (see Fig. 4-24). The positioning current or decimal point location current generated by the Decimal Point Logic and Character Position Counter stage is added to the horizontal (X) signal at the input to the Format Generator stage to provide horizontal positioning of the characters within each word. The X- and Y-output signals are connected to the Horizontal Amplifier and Vertical Amplifier through the Horizontal Output and Vertical Output stages respectively.

The Word Trigger stage produces a trigger from the End-of-Word pulse generated by the Time-Slot Counter

stage after the tenth time-slot. This Word Trigger pulse advances the Channel Counter to display the information from the next channel or plug-in. It also provides a reset pulse to the Zeros Logic and Memory stage and the Decimal Point Logic and Character Position Counter stage. The Word Trigger stage can also be advanced to jump a complete word or a portion of a word when a Jump command is received from the Row Decoder stage.

The Single-Shot Lockout stage allows the display sequence of the Readout System to be changed. Normally, the Readout System operates in a free-running mode so the waveform display is interrupted randomly to display characters. However, under certain conditions (such as single-shot photography), it is desirable that the Readout System operate in a triggered mode where the readout portion of the display is normally blanked out but can be presented on command. The Readout Mode switch determines the operating mode of the readout system.

Circuit Analysis of Readout System

The following analysis of the Readout System describes the operation of each stage in detail. Complete schematics of the Readout System are shown on diagram 10 at the read of this manual.

Timer

Timer U2126 establishes the timing sequence for all circuits within the Readout System. This stage produces seven time-related output waveforms (see Fig. 4-28). The triangle waveform produced at pin 6 forms the basis for the remaining signals. The basic period of this triangle waveform is about 250 microseconds as controlled by RC network C2135-R2135. The triangle waveform is clipped and amplified by U2126 to form the trapezoidal output signal at pin 10. The amplitude of this output signal is exactly 15 volts as determined by U2126 (exact amplitude necessary to accurately encode data in plug-in units; see Encoding the Data). The Trigger output at pin 5 provides the switching signal for the Time-Slot Counter and Word Trigger stages.

The signals at pins 12, 13, 14, and 16 are produced only when the triangle waveform is on its negative slope and the trapezoidal waveform has reached the lower level. The timing sequence of these waveforms is very important to the correct operation of the Readout System (see expanded waveforms in Fig. 4-29). The Z-Axis Logic OFF Command at pin 14 is produced first. This negative-going signal provides a blanking pulse to the Z-Axis Logic stage (see diagram 2) to blank the CRT before the display is switched to the Readout System. It also produces the Strobe pulse through R2137, Q2138, and CR2142 to signal other stages within the Readout System to begin the sequence necessary

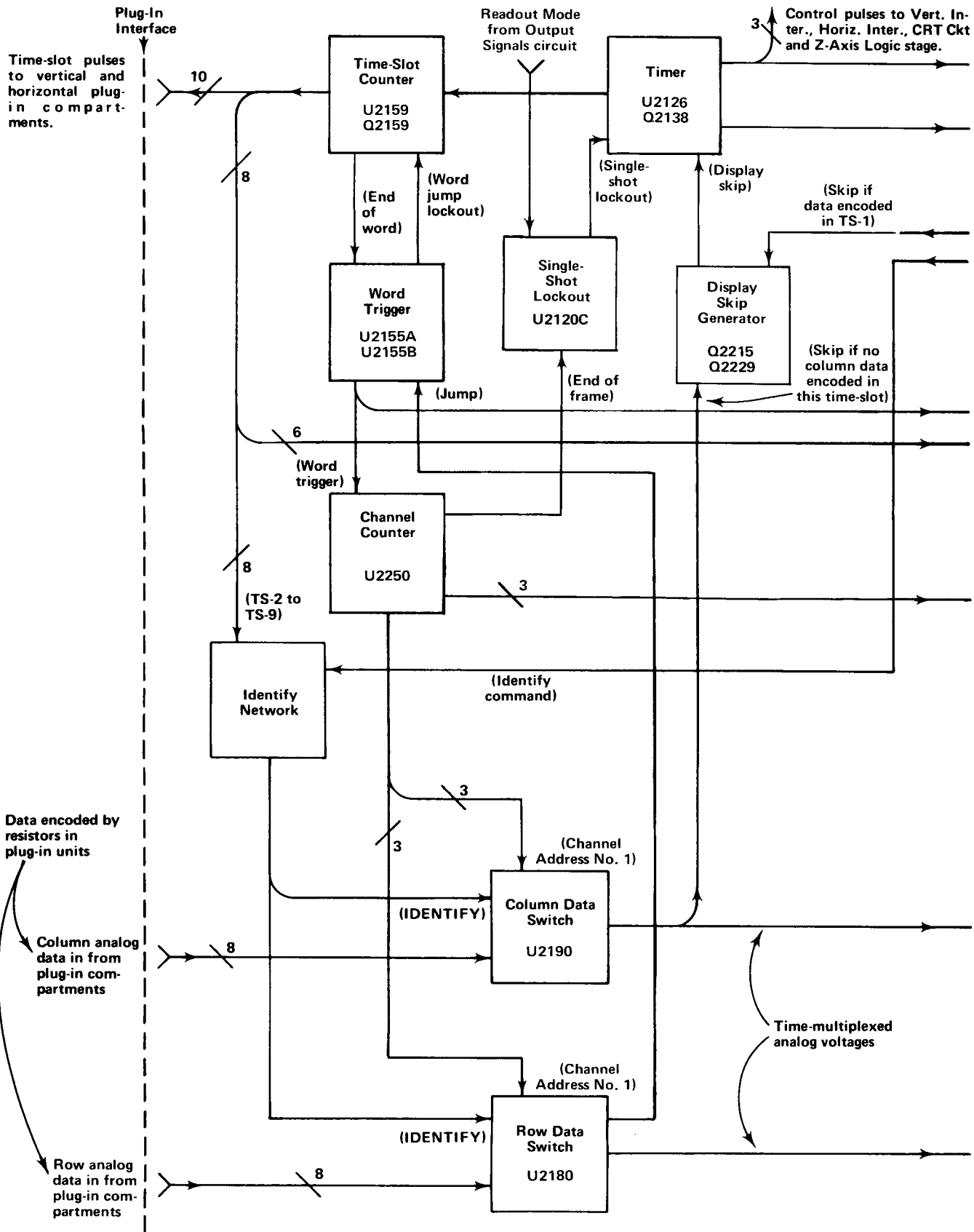


Fig. 4-27. Detailed block diagram of Readout System.

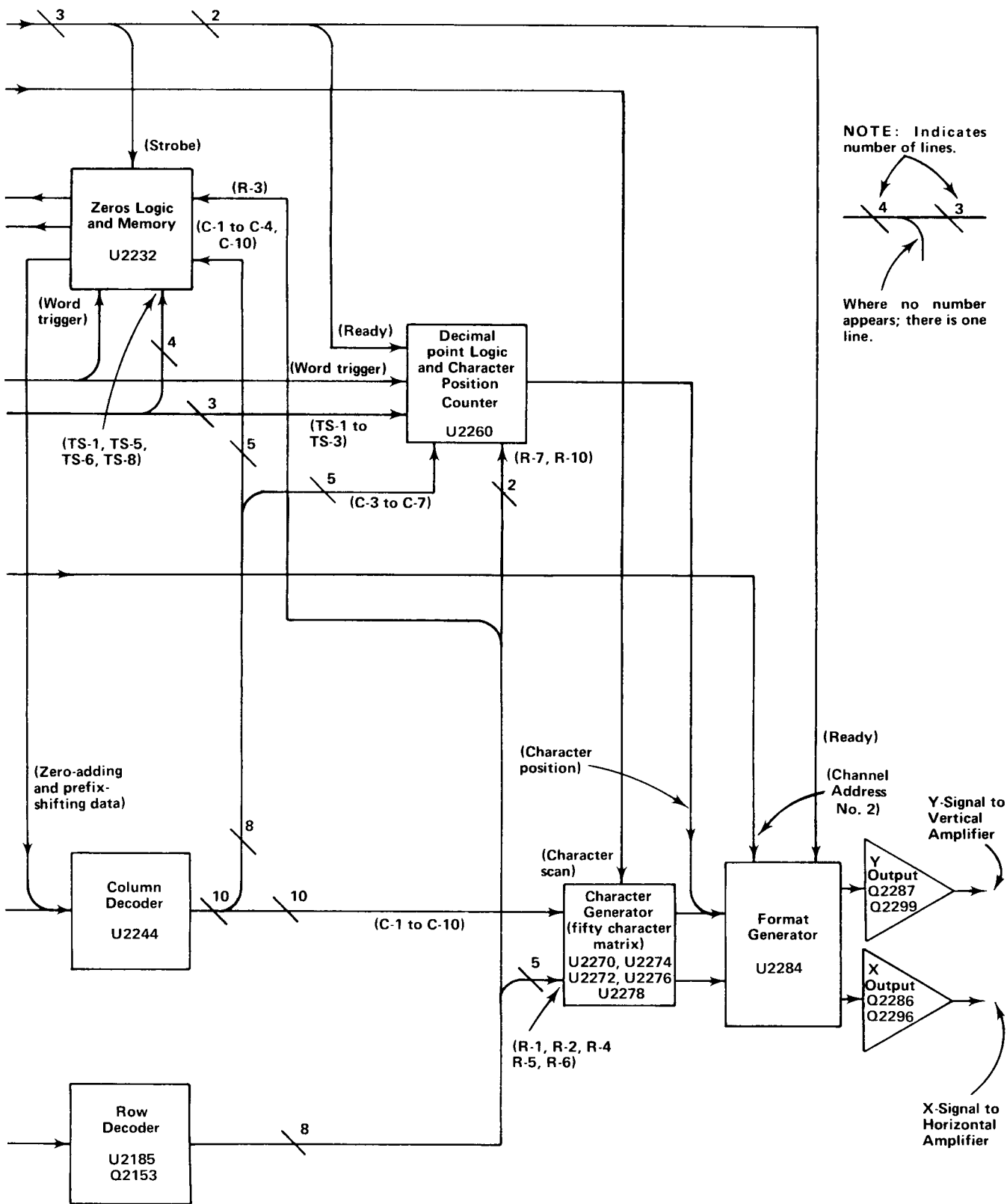


Fig. 4-27. Detailed block diagram of Readout System (cont).

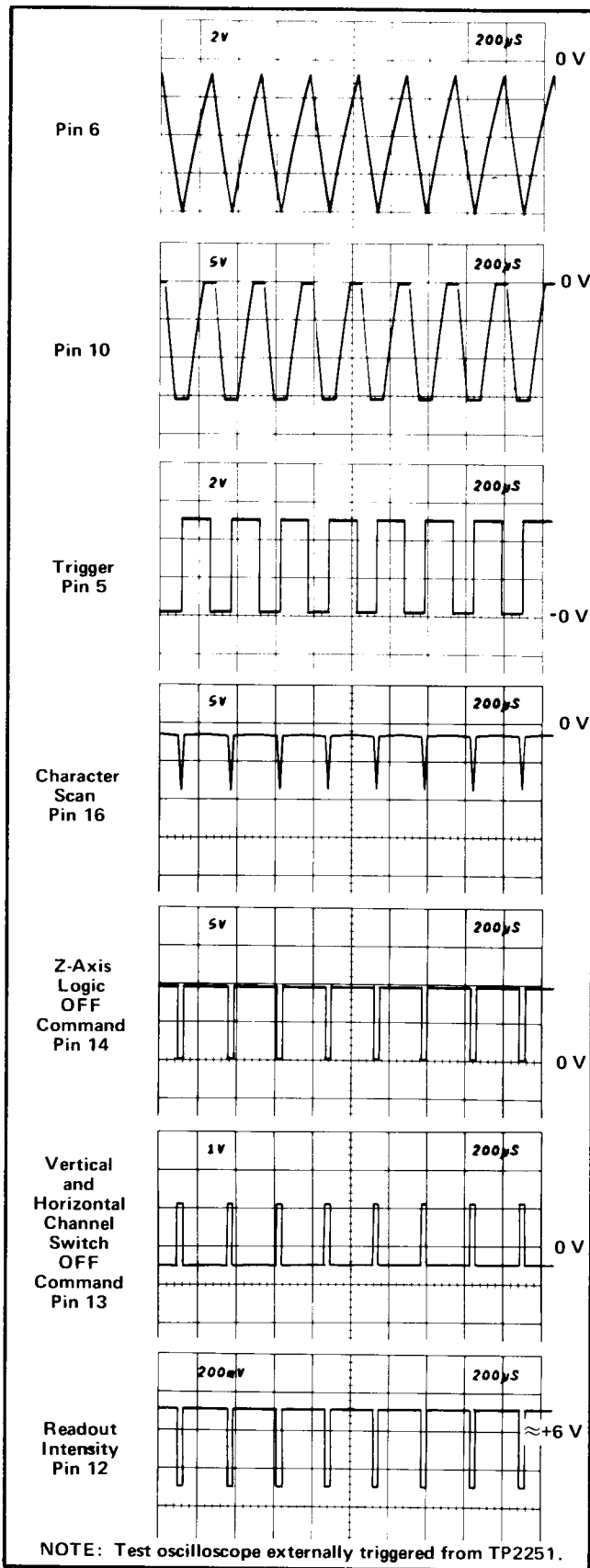


Fig. 4-28. Output waveforms of Timer stage.

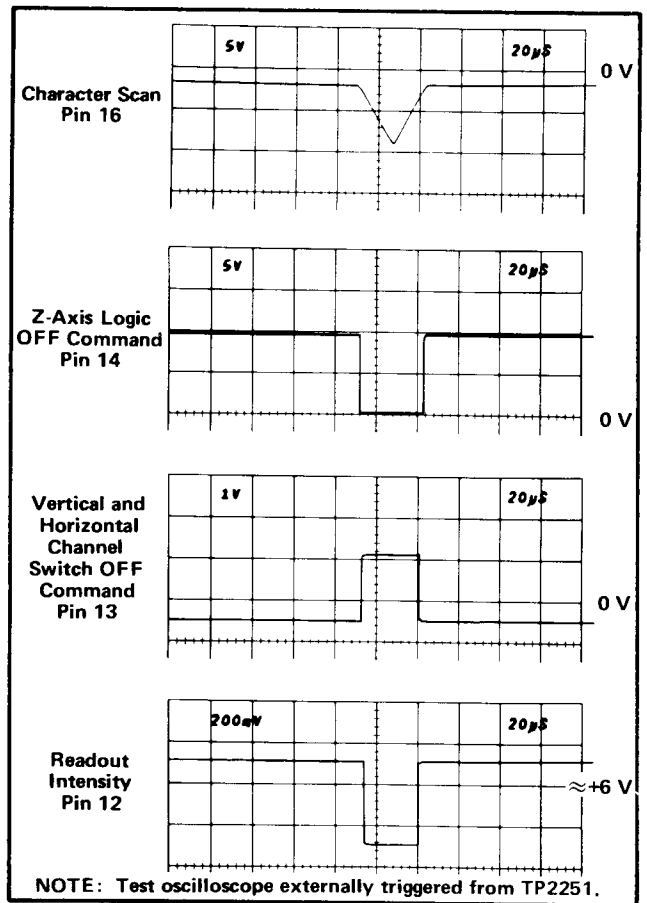


Fig. 4-29. Detail of outputs at pins 12, 13, 14, and 16 of U1226.

to produce a character. The collector of Q2138 is also connected to Character Generator No. 2, U2272 through C2140, CR2140. This activated U2272 during the quiescent period of the Strobe pulse (collector of Q2138 negative) and diverts the output current of Row Decoder U2185 to row 2. The purpose of this configuration is to prevent the Zeros Logic and Memory stage U2232 from storing incorrect data during the quiescent period of the Strobe pulse. When the Strobe pulse goes positive, CR2140 is reverse biased to disconnect Q2138 from U2272 and allow the Row Decoder stage to operate in the normal manner.

The next signal to be produced is the Vertical/Horizontal Channel Switch OFF Command at pin 13. This positive-going signal disconnects the plug-in signals in the vertical and horizontal deflection systems so the plug-in units do not control the position of the CRT beam during the readout display. The Ready signal derived from this output is connected to the Decimal Point Logic and Character Position Counter stage and the Format Generator stage (see diagram 10). The Readout Intensity output at pin 12 is produced next. This current is connected to the CRT Circuit to unblank the CRT to the intensity level determined by READOUT intensity control R2124. The Character Scan ramp at pin 16 started to go negative as this

timing sequence began. However, character-generation does not start until the readout intensity level has been established. The triangular Character Scan ramp runs negatively from about -2 volts to about -8.5 volts and then returns back to the original level. This waveform provides the scanning signal for the Character Generator stages (see diagram 10). The Full Character Scan adjustment R2128 sets the DC level of the Character Scan ramp to provide complete characters on the display.

The Timer stage operates in one of two modes as controlled by the Display-Skip level at pin 4. The basic mode just described is a condition which does not occur unless all ten characters of each word (60 characters total) are displayed on the CRT. Under typical conditions only a few characters are displayed in each word. The Display-Skip level at pin 4 determines the period of the Timer output signal. When a character is to be generated, pin 4 is LO and the circuit operates as just described. However, when a character is not to be displayed, a HI level is applied to pin 4 of U2126 through CR2125 from the Display-Skip Generator stage. This signal causes the Timer to shorten its period of operation to about 210 microseconds. The waveforms shown in Fig. 4-30 show the operation of the Timer stage when the Display-Skip condition occurs for all positions in a word. Notice that there is no output at pin 12, 13, 14, and 16 under this condition. This means that the CRT display is not interrupted to display characters. Also notice that the triangle waveform at pin 6 does not go as far negative and that the negative portion of the trapezoidal waveform at pin 10 is shorter. Complete details on operation of the Display-Skip Generator are given later.

The Single-Shot Lockout level at pin 2 determines the operating mode of U2126. If this level is LO, the Timer operates as just described. However, if the Single-Shot Lockout stage sets a HI level at this pin, the Timer stage is locked out and can not produce any output signals (see Single-Shot Lockout description for further information).

The READOUT intensity control R2124 sets the intensity of the readout display independently of the INTENSITY control. The READOUT intensity control also provides a means of turning the Readout System off when a readout display is not desired. When R2124 is turned fully counterclockwise, switch S102 opens. The current to pin 11 of U2126 is interrupted and at the same time a positive voltage is applied to pin 4 through R2122 and CR2124. This positive voltage switches the stage to the same conditions as were present under the Display-Skip condition. Therefore, the CRT display is not interrupted to present characters. However, time-slot pulse continue to be generated.

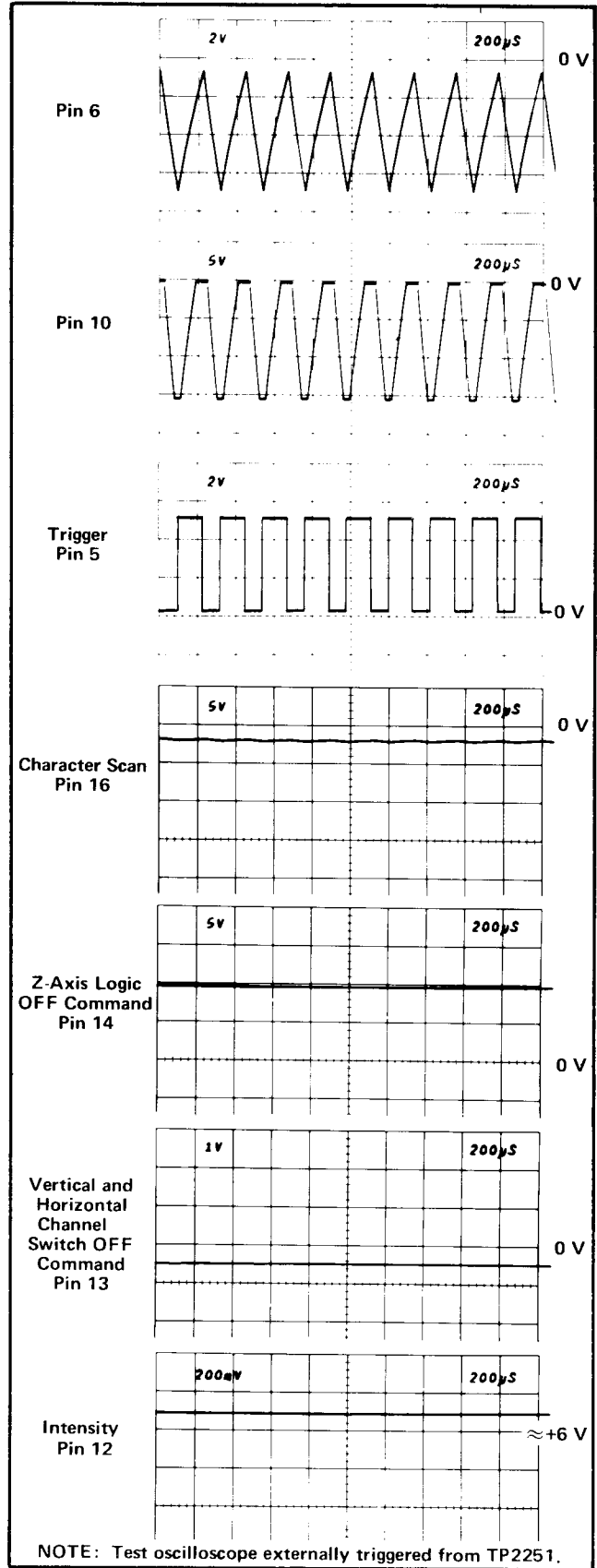


Fig. 4-30. Timer stage operation when Display-Skip condition occurs.

Time-Slot Counter

Time-Slot Counter U2126 is a sequential switch which directs the trapezoidal waveform input at pin 8 to one of its 10 output lines. These time-slot pulses are used to interrogate the plug-in units to obtain data for the Readout System. The Trigger pulse at pin 15 switches the Time-Slot Counter to the next output line; the output signal is sequenced consecutively from time-slot 1 through time-slot 10. Fig. 4-31 shows the time-relationship of the time-slot pulses. Notice that only one of the lines carries a time-slot pulse at any given time. When time-slot 10 is completed, a negative-going End-of-Word pulse is produced at pin 2. The End-of-Word pulse provides a drive pulse for the Word Trigger stage and also provides an enabling level to the Display-Skip Generator during time-slot 1 only.

Pin 16 is a reset input for the Time-Slot Counter. When this pin is held LO, the Time-Slot Counter resets to time-slot 1. The Time-Slot Counter can be reset in this manner only when a Jump signal is received by U2155C (see following discussion).

Word Trigger

The Word Trigger stage is made up of the 4 two-input NOR gates contained in U2155. Quiescently, pin 2 of U2155A is LO as established by the operating conditions of U2155D and U2155C. Therefore, the LO End-of-Word pulse produced by the Time-Slot Counter results in a HI level at pin 1 of U2155A. This level is inverted by U2155B to provide a negative-going advance pulse to the Channel Counter.

An advance pulse is also produced by U2155A when a Jump signal is received at pin 8 of U2155C. This condition can occur during any time-slot (see Row Decoder for further information on origin of the Jump signal). U2155D and U2155C are connected as a bistable flip-flop. The positive-going Jump signal at pin 8 of U2155C produces a LO at pin 10. This LO is inverted by U2155D to produce a HI at pin 13, which allows pin 9 of U2155C to be pulled HI through R2155. The flip-flop has now been set and it remains in this condition until reset, even though the Jump signal at pin 8 returns to its LO level. The HI output level at pin 13 turns on Q2159 through R2158 to pull pin 16 of the Time-Slot Counter LO. This resets the Time-Slot Counter to time-slot 1 and holds it there until U2155C is reset. At the same time, a HI level is applied to pin 4 of the Timer through CR2125 and CR2124. This HI level causes the Timer to operate in the display-skip mode so that a character is not generated.

The next Trigger pulse is not recognized by the Time-Slot Counter since U2159 is locked in time-slot 1 by U2155. However, this Trigger pulse resets the Word Trigger

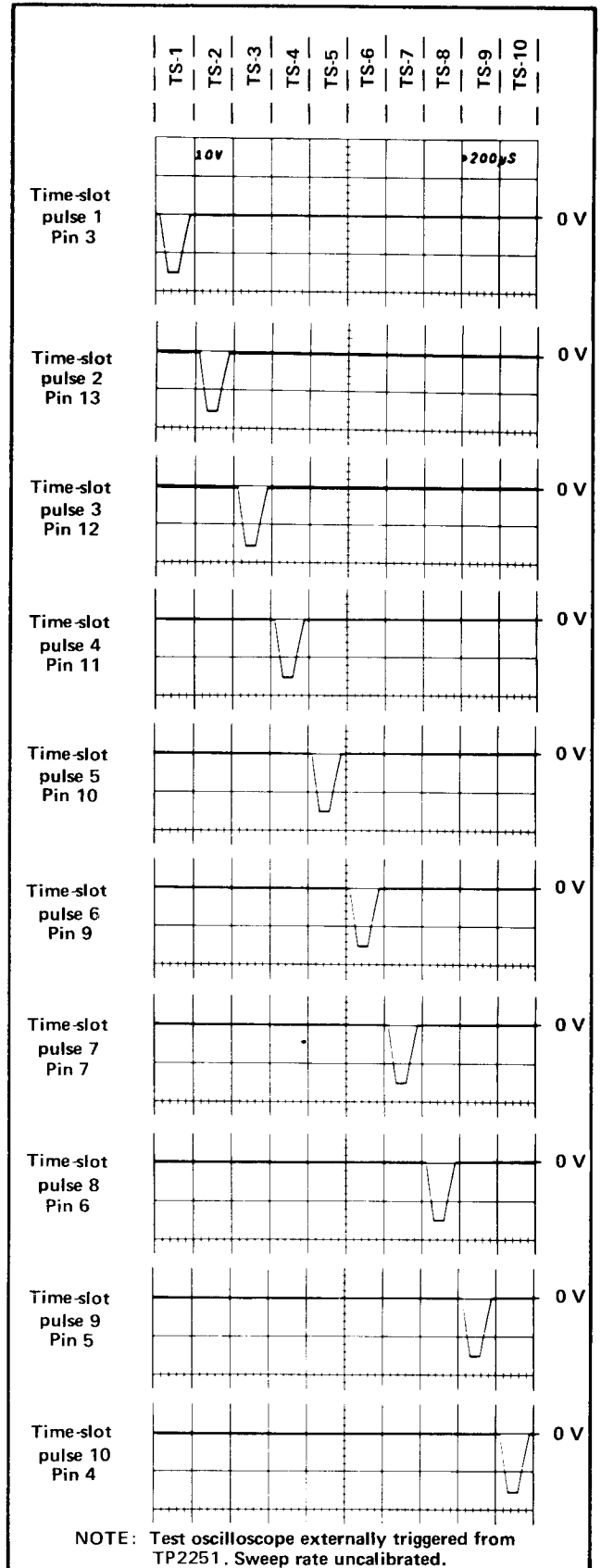


Fig. 4-31. Time relationship of the time-slot (TS) pulses produced by U2126.

stage through C2155. Pin 13 of U2155D goes LO to enable the Time-Slot Counter and Timer stages for the next time-slot pulse. At the same time, the negative-going edge produced at U2155D switches output states which is connected to pin 3 of U2155D. This results in a negative-going Word Trigger output at pin 4 of U2155B to advance the Channel Counter to the next word. When the next Trigger pulse is received at pin 15, the Time-Slot Counter returns to the normal sequence of operation and produces an output on the time-slot 1 line.

Channel Counter

The Channel Counter, made up of integrated circuit U2250 is a binary counter which produces the Channel Address code for the Column and Row Decoder stages and the Format Generator stage. This code instructs these stages to sequentially select and display the six channels of data from the plug-in units. The input channel which is displayed with each combination of the Channel Address code is given in the discussion of the applicable stages.

Single-Shot Lockout

Q2108, Q2117, and U2120 makes up the Single-Shot Lockout stage. This stage allows a single readout frame (Six complete words) to be displayed on the CRT, after which the Readout System is locked out so further readout displays are not presented until the circuit is reset. U2120C and U2120B are connected to form a bistable flip-flop. For normal operation, pin 3 of U2120 is pulled HI through R2108. This activates U2120C to result in a LO output level at pin 10. This level enables the Timer stage so it can operate in the free-running manner as described previously. The LO at pin 10 of U2120C is also applied to pin 5 of U2120B. Since pin 6 of U2120A is LO, U2120B is disabled and its output goes HI.

The output of this stage remains LO to allow U2126 to operate in the free-running mode until a LO is received at pin 8 of U2120C. When this occurs, the output level at pin 10 of U2120C does not change immediately. However, the Readout System is now enabled as far as the single-shot lockout function is concerned. If the Channel Counter has not completed word six (Channel 2 of the Horizontal unit), the Readout System continues to operate in the normal manner. However, when word six is completed, a positive-going End-of-Frame pulse is produced at pin 9 of U2120B as the Channel Counter shifts to the code necessary to display word one. This pulse is coupled to pin 3 of U2120A and pin 12 of U2120D. The momentary HI at pin 3 activates U2120B and its output goes LO to disable U2120C (pin 3 already LO). The output of U2120C goes HI to disable the Timer so it operates in the display-skip mode. The HI at pin 10 of U2120C also holds U2120B enabled so it maintains control of the flip-flop.

The Single-Shot Lockout stage remains in this condition until a positive-going trigger pulse is applied to pin 8 of U2120C. This trigger pulse produces a LO at pin 10 of U2120C which enables U2120B and disables U2120C. Now, the Timer can operate in the normal manner for another complete frame. When word six is completed, the Channel Counter produces another End-of-Frame pulse to again lock out the Timer stage.

Encoding the Data

Data is conveyed from the plug-in units to the Readout System in the form of an analog code having up to 11 current levels (from zero to one milliampere in 100 microampere steps). The characters which can be selected by the encoded data are shown on the Character Selection Matrix (see Fig. 4-25). Each character requires two currents to define it; these currents are identified as the column current and the row current which correspond to the column and row of the matrix. The column and row data is encoded by resistive programming in the plug-in units. Fig. 4-32 shows a typical encoding scheme for a voltage-sensing amplifier plug-in unit. Notice that the 10 time-slot (TS) pulses produced by the Time-Slot Counter stage are connected to the plug-in unit. However, time-slots 5, 6, 7, and 10 are not used by the plug-in unit to encode data when using the Standard Readout Format (see Table 4-2 for Standard Readout Format). The amplitude of the time-slot pulses is exactly -15 volts as determined by the Timer stage. Therefore, the resultant output current from the plug-in units can be accurately controlled by the programming resistors in the plug-in units.

For example, in Fig. 4-32, resistors R10 through R90 control the row analog data which is connected back to the Readout System. These resistors are of fixed value and define the format in which the information will be presented by the Readout System. Fig. 4-33A shows an idealized output current waveform of row analog data which results from the 10 time-slot pulses. Each of the steps of current shown in these waveforms corresponds to 100 microamperes of current. The row numbers on the left-hand side of the waveform correspond to the rows in the Character Selection Matrix shown in Fig. 4-35. The row analog data is connected back to the Readout System via terminal B37 of the plug-in interface.

The Column analog data is defined by resistors R110 through R190. The program resistors are connected to the time-slot lines by switch closures to encode the desired data. The data as encoded by the circuit shown in Fig. 4-32 indicates a 100 microvolt sensitivity with the display inverted and calibrated vertical deflection factors. This results in the idealized output current waveforms shown in Fig. 4-33B at the column analog data output, terminal A37 of the plug-in interface. Resistor R111, connected between time-slot 1 and the column analog data output, encodes two units of current during time-slot 1. Referring to the

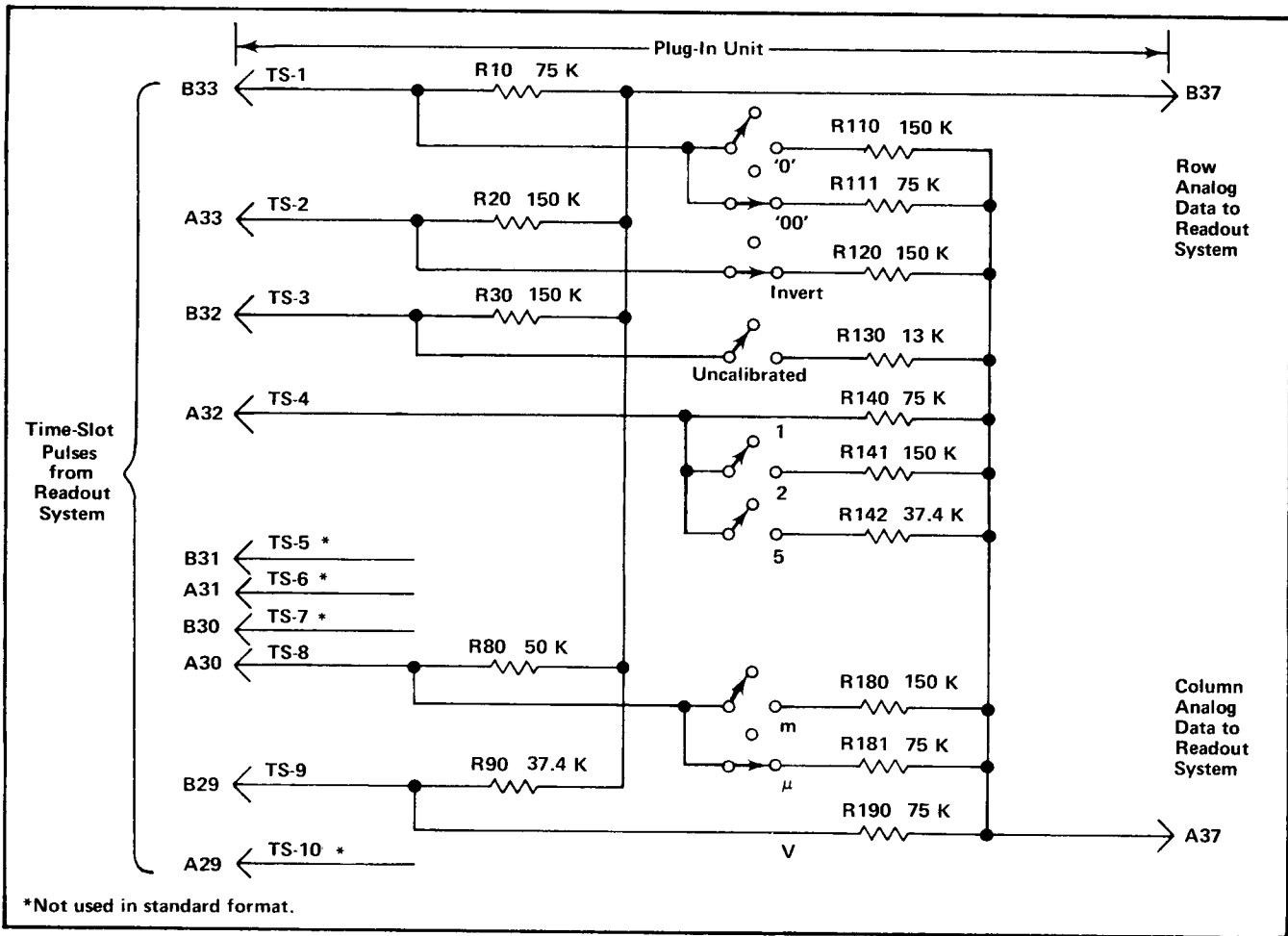


Fig. 4-32. Typical encoding scheme for voltage-sensing amplifier plug-in unit. Coding shown for deflection factor of 100 microvolts.

Character Selection Matrix, two units of column current along with the two units of row current encoded by R10 (row 3) indicates that two zeros should be added to the display. Resistor R120 adds one unit of column current during time-slot 2 and along with the one unit of current from the row output, the Readout System is instructed to add an invert arrow to the display. R130 is not connected to the time-slot 3 line since the vertical deflection factors are calibrated. Therefore, there is no column current output during this time-slot and there is no display on the CRT (see Display-Skip Generator for further information). During time-slot 4, two units of column current are encoded by R140. There is no row current encoded during this time-slot and this results in the numeral 1 being displayed on the CRT. Neither row nor column analog data is encoded during time-slots 5, 6, and 7 as defined by the Standard Readout Format. During time-slot 8, two units of column current and three units of row current are encoded by resistors R181 and R80 respectively. This addresses the μ prefix in the Character Selection Matrix. The final data output is provided from time-slot 9 by R190 connected to the column output and R90 to the row output. These resistors encode three units of column current and four units of row current to cause a V (volts) to be displayed.

Time-slot 10 is not encoded in accordance with the Standard Readout Format. The resultant CRT readout will be $\downarrow 100 \mu V$.

In the above example, the row analog data was programmed to define which row of the Character Selection Matrix was addressed to obtain information in each time-slot. The column data changes to encode the applicable readout data as the operating conditions change. For example, if the variable control of the plug-in unit was activated, R130 would be connected between time-slot 3 and the column analog data output lines. This encodes 10 units of column current (see shaded area in time-slot 3 of the waveform shown in Fig. 4-33B). Since one unit of row current is also encoded during this time-slot by R30, a $>$ symbol is added to the display. The CRT readout will now say $\downarrow >100 \mu V$. In a similar manner, the other switches can change the encoded data for the column output and thereby change the readout display. See the descriptions which follow for decoding this information.

The column analog data encoded by the plug-in can be modified by attenuator probes connected to the input

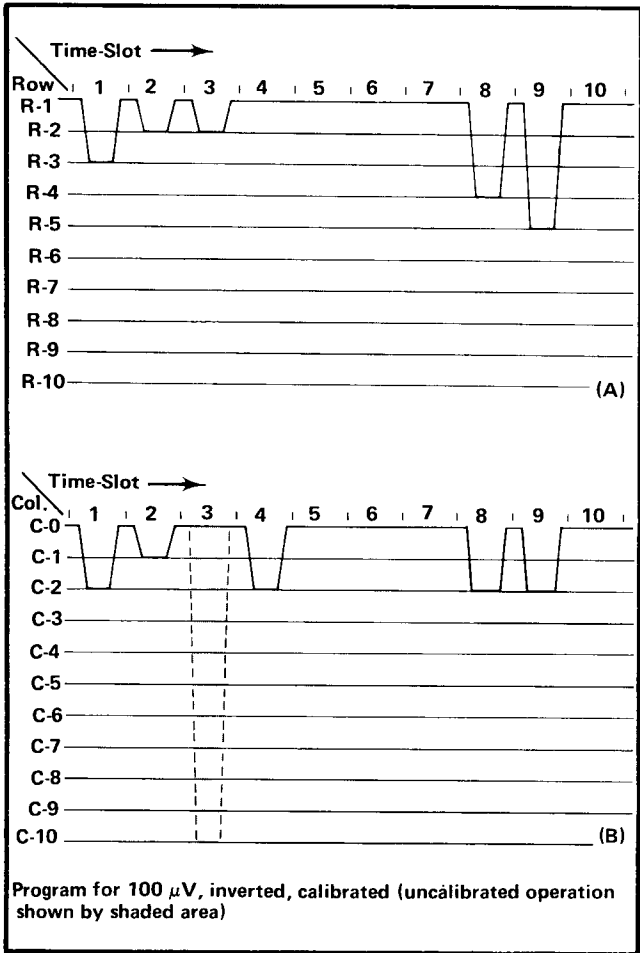


Fig. 4-33. Idealized current waveforms of: (A) Row analog data, (B) Column analog data.

connectors of vertical plug-in units. A special coding ring around the input connector of the plug-in unit senses the attenuation ratio of the probe (with readout-coded probes only). The probe contains a resistor which results in additional column current. For example, if a 10X attenuator probe is connected to a plug-in with the coding for 100 microvolts as shown in Fig. 4-32, an additional unit of current is added to the column analog data during time-slot 1. Since two units of current were encoded by R111 (see Fig. 4-32), this additional current results in a total of three units of column analog current during this time-slot. Referring to the Character Selection Matrix, three units of column current along with the two units of row current encoded by R10 indicates that the prefix should be reduced. Since this instruction occurs in the same time-slot which previously indicated that two zeros should be added to the display and only one instruction can be encoded during a time-slot, the zeros do not appear in the display. The CRT readout will now be changed to 1 mV (readout) program produced by plug-in same as for previous example.

Likewise, if a 100X readout-coded probe is connected to the input of the plug-in unit, the column current during

time-slot 1 will be increased two units for a total of four units of column current. This addresses an instruction in the Character Selection Matrix which reduces the prefix and adds one zero to the display. The resultant CRT readout with the previous program is 10 mV.

Three other lines of information are connected from the plug-in compartments to the Readout System. The column and row analog data from channel 2 of a dual-channel plug-in are connected to the Readout System through terminals A38 and B38 of the plug-in interface, respectively. Force readout information is encoded on terminal A35; function of this input is described under Column and Row Data Switches.

The preceding information gave a typical example of encoding data from an amplifier plug-in unit. Specific encoding data and circuitry is shown in the individual plug-in unit manual.

Column and Row Data Switches

The readout data from the plug-in units is connected to the Column and Row Data Switch stages in the Readout System. A column-data line and a row-data line convey analog data from each of the eight data sources (two channels from each of the four plug-in compartments).

TABLE 4-3

Channel Address

| Pin 1 U2232 "Identify" Command | Pin 11 U2250 | Pin 8 U2250 | Pin 9 U2250 | Channel Selected |
|---|-----------------|----------------|----------------|-----------------------------|
| HI | HI | HI | HI | Channel 1 Left Vertical |
| HI | HI | HI | LO | Channel 2 Left Vertical |
| HI | HI | LO | HI | Channel 1 Right Vertical |
| HI | HI | LO | LO | Channel 2 Right Vertical |
| HI | LO | HI | HI | Channel 1 Horizontal |
| HI | LO | HI | LO | Channel 2 Horizontal |

The Column Data Switch U2190 and the Row Data Switch U2180 receive the Channel Address No. 1 code from the Channel Counter. This binary code directs the Column Data Switch and the Row Data Switch as to which channel should be the source of the readout data. Table 4-3

gives the eight combinations of the Channel Address No. 1 code and the resultant channel which is selected with each combination. These stages have nine inputs and provide a single time-multiplexed output at pin 7 which includes the information from all of the input channels. Eight of the nine inputs to each stage originate in the plug-in units; the ninth input comes from a special data-encoding network composed of resistors R2201 through R2209 and R2191 through R2199 (see Zeros Logic and Memory description for further information on ninth channel).

In addition to the data inputs from the plug-in units, channel-inhibit inputs are provided from each of the plug-in units. The channel inhibit lines are LO only when the associated plug-in unit has been selected for display. When a plug-in unit is not selected, the respective line is HI which forward biases the associated diode CR2162, CR2163, CR2167, CR2166, CR2171, CR2170, CR2175, or CR1174 to by-pass the encoded data from this plug-in. However, since it may be desired to display information from special-purpose plug-ins even though they do not produce a normal waveform display on the CRT, a feature is provided to over-ride the channel inhibit. This is done by applying a LO to the associated forcing over-ride input. The LO level diverts the HI channel inhibit current and allows the data from this plug-in unit to reach the Column Data Switch, even though it has not been selected for display by the mode switches.

Display-Skip Generator

The Display-Skip Generator, Q2215, Q2223, Q2229, and Q2225 monitors the time-multiplexed column data at the output of the Column Data Switch during each time-slot to determine if the information at this point is valid data which should result in a CRT display. The voltage at the base of Q2215B is set by divider R2219, R2220, and R2221. Quiescently, there is about 100 microamperes of current flowing through R2213 and R2214 from Q2240 and the Zeros Logic and Memory stage (purpose of this quiescent current will be discussed in connection with the Zeros Logic and Memory stage). This current biases Q2215A so its base is about 0.2 volt more positive than the base of Q2215B in the absence of column data. Therefore, since Q2215A and Q2215B are connected as a comparator, Q2215A will remain on unless its base is pulled more negative than the base of Q2215B. The analog data output from the Column Data Switch produces a 0.5 volt change at the base of Q2215A for each unit of column current that has been encoded by the plug-in unit. Therefore, whenever any information appears at the output of the Column Data Switch, the base of Q2215A is pulled more negative than the base of Q2215B resulting in a negative (LO) Display-Skip output to the Timer stage through Q2225. Recall that a LO was necessary at the skip input of the Timer so it could perform the complete sequence necessary to display a character.

Q2223-Q2229 also provide display-skip action. The End-of-Word level connected to their emitters through R2229 is LO only during time-slot 1. This means that Q2223-Q2229 are enabled only during time-slot. These transistors allow the Zeros Logic and Memory stage to generate a display-skip signal during time-slot 1 when information has been stored in memory which is not to be displayed on the CRT (further information given under Zeros Logic and Memory discussion).

Column and Row Decoder

The Column Decoder U2244 and Row Decoder U2185 sense the magnitude of the analog voltages at their inputs and produce a binary output on one of ten lines corresponding to the column or row data which was encoded by the plug-in. These outputs provide the Column Digital Data and Row Digital Data which is used by the Character Generator stages to select the desired character for display on the CRT. The column and row data is also used throughout the Readout System to perform other functions. The input current at pin 9 of the Column Decoder stage is steered to only one of the ten Column Digital Data outputs. The size of the character which will be displayed on the CRT is determined by the value of R2227. When a display-skip signal is present (collector of Q2225 is HI), pin 9 is pulled HI through CR2226. This ensures that no current is connected to the Character Generator stage under this condition. Notice the corresponding input on the Row Decoder. This input is connected to ground and causes only one of the ten row outputs to saturate to ground.

The network at the input of the Row Decoder, made up of Q2153 and its associated components, is a Row 13 detector which produces the Jump command. This row current is encoded by special-purpose plug-ins to cause all or part of a word to be jumped. Whenever row 13 (thirteen units of row current; 1.3 milliamperes) is encoded, the base of Q2153 is pulled negative enough so that this transistor is reverse biased to produce a HI Jump output at its collector. This Jump command is connected to the Word Trigger stage (diagram 10) to advance the Channel Counter stage to the next word and to reset the Time-Slot Counter to time-slot 1.

Zeros Logic and Memory

The Zeros Logic and Memory stage U2232 stores data encoded by the plug-in units to provide zeros-adding and prefix-shifting logic for the Readout System. The Strobe pulse at pin 15 goes positive when the data has stabilized and can be inspected. This activates the Zeros Logic and Memory stage so it can store the encoded data. A block representation of the memory sequence is shown in Fig. 4-34. Typical output waveforms for the five possible input conditions that can occur are shown in Fig. 4-35. When time-slot 1 occurs, a store command is given to all of the

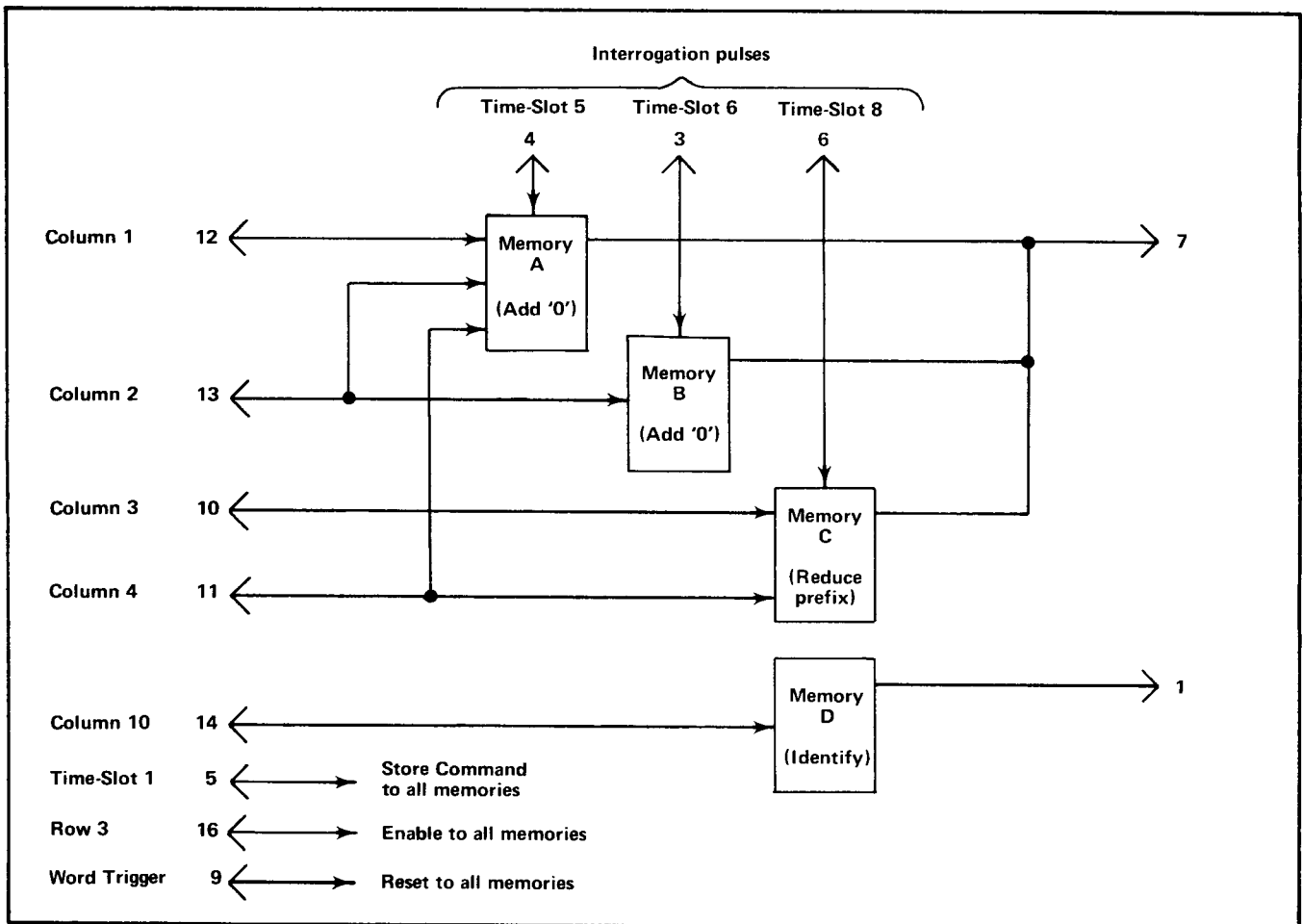


Fig. 4-34. Block representation of memory sequence in U2232.

memories. If the plug-in unit encoded data for column 1, 2, 3, 4, or 10 during time-slot 1, the appropriate memory (or memories) is set. Notice that row 3 information from the Row Decoder must also be present at pin 16 for data to be stored in the memory of U2232. If data was encoded during time-slot 1, a negative-going output is produced at pin 7 as the memories are being set. This negative-going pulse is connected to the base of Q2229 in the Display-Skip Generator to produce a Display-Skip output. Since the information that was encoded during time-slot 1 was only provided to set the memories and was not intended to be displayed on the CRT at this time, the display-skip output prevents a readout display during this time-slot.

During time-slot 5, memory A is interrogated. If information was stored in this memory, a positive-going output is produced at pin 7. This pulse is connected to pin 10 of the Column Decoder through Q2240 to add one unit of current at the input of the Column Decoder. This produces a zero after the character displayed on the CRT during time-slot 4. During time-slot 6, memory B is interrogated to see if another zero should be added. If another zero is necessary, a second positive output is

produced at pin 7 which again results in a column 1 output from the Column Decoder and a second zero in the CRT display.

Finally, memory C is interrogated during time-slot 8 to obtain information on whether the prefix should be reduced or left at the value which was encoded. If data has been encoded which calls for a reduction in prefix, a negative-going output level is produced at pin 7. This negative level subtracts one unit of column current from the data at the input to the Column Decoder. Notice on the Character Selection Matrix of Fig. 4-24 that a reduction of one column when row 4 is programmed results in a one unit reduction of the prefix. For example, with the 100 μ V program shown in Fig. 4-31, if the data received from the plug-in called for a reduction in prefix, the CRT readout would be changed to 1 mV (zeros deleted by program; see Encoding the Data).

The 100 microamperes of quiescent current through R2213 and R2214 that was provided by Q2240 (see Display-Skip Generator) allows the prefix to be reduced

| Input Pins of Zeros Logic & Memory | Command | Time Slot |
|------------------------------------|----------------------------------|-----------|
| 14 | IDENTIFY | |
| 12 | Add one zero | |
| 13 | Add two zeros | |
| 10 | Decrease prefix | |
| 11 | Decrease prefix and add one zero | |

Fig. 4-35. Typical output waveforms for Zeros Logic and Memory stage operation (at pin 7 of U2232).

from m (100 microamperes column current; column 1) to no prefix (zero column current; column zero) so only the unit of measurement encoded during time-slot 9 is displayed. Notice that reducing the prefix program from column 1 to column 0 programs the Readout System to not display a character at this readout location.

A further feature of the Zeros Logic and Memory is the Identify function. If 10 units of column current are encoded by the plug-in unit along with row 3 during time-slot 1, the Zeros Logic and Memory produces a negative-going output pulse at pin 1 which switches the Column Data Switch and Row Data Switch to the ninth channel. Then, time-slot pulses 2 through 9 encode an output current through resistors R2191-R2199 for column data and R2201-R2209 for row data. This provides the currents necessary to display the word IDENTIFY on the CRT in the word position allotted to the channel which originated the Identify command. After completion of this word, the Column Data Switch and Row Data Switch continue with the next word in the sequence.

The Word Trigger signal from the Word Trigger stage is connected to pin 9 of U2232 through C2242. At the end of each word of readout information, this pulse goes LO. This erases the four memories in the Zeros Logic and Memory in preparation for the data to be received from the next channel.

Character Generators

The Character Generator stage consists of five similar integrated circuits U2270, U2272, U2274, U2276, and U2278, which generate the X (horizontal) and Y (vertical) outputs at pins 16 and 1 respectively to produce the character displayed on the CRT. Each integrated circuit can produce 10 individual characters. U2270, which is designated as the "Numerals" Character Generator, can produce the numerals 0 through 9 shown in row 1 of the Character Selection Matrix (Fig. 4-24). U2272 can produce the symbols shown in row 2 of the Character Selection Matrix and U2274 produces the prefixes and some letters of the alphabet which are used as prefixes in row 4. U2276 and U2278 produce the remaining letters of the alphabet shown in rows 5 and 6 of the Character Selection Matrix. All of the stages receive the column digital data from Column Decoder U2244 in parallel. However, only one of the character generators receives row data at a particular time; only the stage which receives both row and column data is activated. For example, if column 2 is encoded by a plug-in unit, the five Character Generators are enabled so that either a 1, μ , V, or an N can be produced. However, if at the same time row 4 has also been encoded by the plug-in unit, only the Prefix Character Generator U2274 will produce an output to result in a μ displayed on the screen. This integrated circuit provides current outputs to the Format Generator which produce the selected character on

the CRT. In a similar manner, any of the 50 characters shown in the Character Selection Matrix can be displayed by correct addressing of the row and column.

Decimal Point Logic and Character Position Counter

The Decimal Point Logic and Character Position Counter stage U2260 performs two functions. The first function is to produce a staircase current which is added to the X (horizontal) signal to space the characters horizontally on the CRT. After each character is generated, the negative-going edge of the Ready signal at pin 5 advances the Character Position Counter. This produces a current step output at pin 3 which, when added to the X signal, causes the next character to be produced one character space to the right. This stage can also be advanced when a Space instruction is encoded by the plug-in unit so that a space is left between the displayed characters on the CRT. Row 10 information from the Row Decoder is connected to pin 4 of U2260 through R2265. When row 10 and column 0 are encoded, the output of this stage advances one step to move the next character another space to the right. However, under this condition, no display is produced on the CRT during this time-slot.

Time-slot pulses 1, 2, and 3 are also connected to pin 4 of U2260 through VR2262, VR2263, and VR2264 respectively and R2262-R2265. This configuration adds a space to the displayed word during time-slots 1, 2, and 3 even if information is not encoded for display during these time-slots. With this feature, the information which is displayed during time-slot 4 (1-2-5 data) always starts in the fourth character position whether data has been displayed in the previous time-slots or not. Therefore, the resultant CRT display does not shift position as normal/invert or cal/uncal information is encoded by the plug-in. The Word Trigger pulse connected to pin 8 of U2260 through C2255 resets the Character Position Counter to the first character position at the end of each word.

The Decimal Point Logic portion of this stage allows decimal points to be added to the CRT display as encoded by the plug-in units. When row 7 is encoded in coincidence with columns 3 through 7 (usually encoded during time-slot 1), a decimal point is placed at one of the five locations on the CRT identified in row 7 of the Character Selection Matrix (Fig. 4-24). This instruction refers to the decimal point location in relation to the total number of characters that can be displayed on the CRT (see Fig. 4-36). For example, if column 3 and row 7 are encoded during time-slot 1, the system is instructed to place a decimal point in location No. 3. As shown in Fig. 4-36, this displays a decimal point before the third character that can be displayed on the CRT (first three time-slots produce a space whether data is encoded or not; see previous paragraph). The simultaneous application of row 7 data to the Y-input

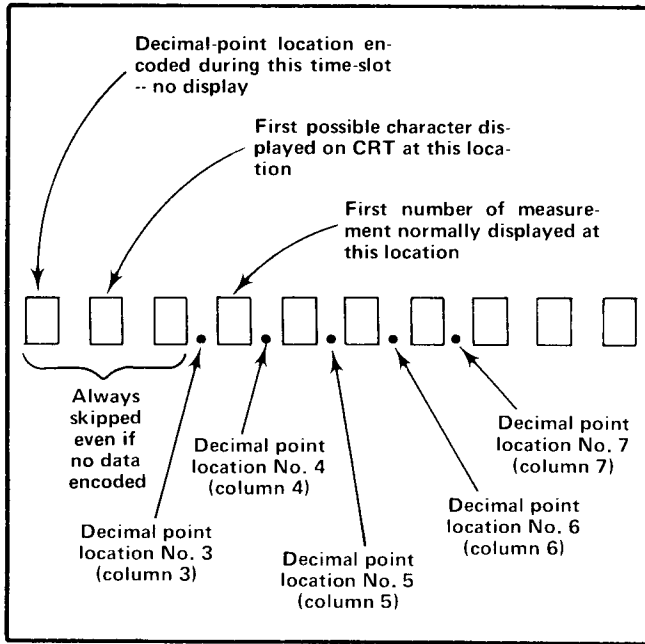


Fig. 4-36. Readout word relating 10 possible character locations to the decimal-point instructions that can be encoded and the resulting display.

of the Format Generator through R2280 raises the decimal point so it appears between the displayed characters.

When decimal-point data is encoded, the CRT is unblanked so a readout display is presented. However, since row 7 does not activate any of the five Character Generators, the CRT beam is not deflected but instead remains in a fixed position to display a decimal point between the characters along the bottom line of the readout word. After the decimal point is produced in the addressed location, the CRT beam returns to the location indicated by the Character Position Counter to produce the remainder of the display.

Format Generator

The X- and Y-deflection signals produced by the Character Generator stage, are connected to pins 2 and 7 respectively of Format Generator U2284. The Channel Address No. 2 code from the Channel Counter is also connected to pins 1, 8, and 15 of this stage. The Channel Address No. 2 code directs the Format Generator to add current to the X and Y signals to deflect the CRT beam to the area of the CRT which is associated with the plug-in channel that originated the information (see Fig. 4-24). The Channel Address No. 2 Code and the resultant word positions are shown in Table 4-4. In addition, the character

position current from the Decimal Point Logic and Character Position stage is added to the X (horizontal) input signal to space the characters horizontally on the CRT (see previous discussion). The Ready signal at pin 13 (coincident with Vertical/Horizontal Channel Switch OFF Command) activates this stage when a character is to be displayed on the CRT.

TABLE 4-4
Channel Address

| Pin 11 U2250 | Pin 8 U2250 | Pin 9 U2250 | Channel Displayed |
|--------------|-------------|-------------|-----------------------------|
| LO | LO | LO | Channel 1 Left Vertical |
| LO | LO | HI | Channel 2 Left Vertical |
| LO | HI | LO | Channel 1 Right Vertical |
| LO | HI | HI | Channel 2 Right Vertical |
| HI | LO | LO | Channel 1 Horizontal |
| HI | LO | HI | Channel 2 Horizontal |

Y-Output Amplifiers

The Y-output signal at pin 6 of U2284 is connected to the Y-Output Amplifier Q2287-Q2299. This stage provides a low impedance load for the Format Generator while providing isolation between the Readout System and the Vertical Amplifier. Vertical Separation adjustment R2291 changes the gain of this stage to control the vertical separation between the readout words displayed at the top and bottom of the graticule area.

X-Output Amplifier

The X-Output Amplifier Q2286-Q2296 operates similarly to the Y-Output Amplifier to provide the horizontal deflection from the readout signal available at pin 4 of U2284. The gain of this stage is fixed by the values of the resistors in the circuit.

Display Sequence

Fig. 4-37 shows a flow chart for the Readout System. This chart illustrates the sequence of events which occurs in the Readout System each time a character is generated and displayed on the CRT.

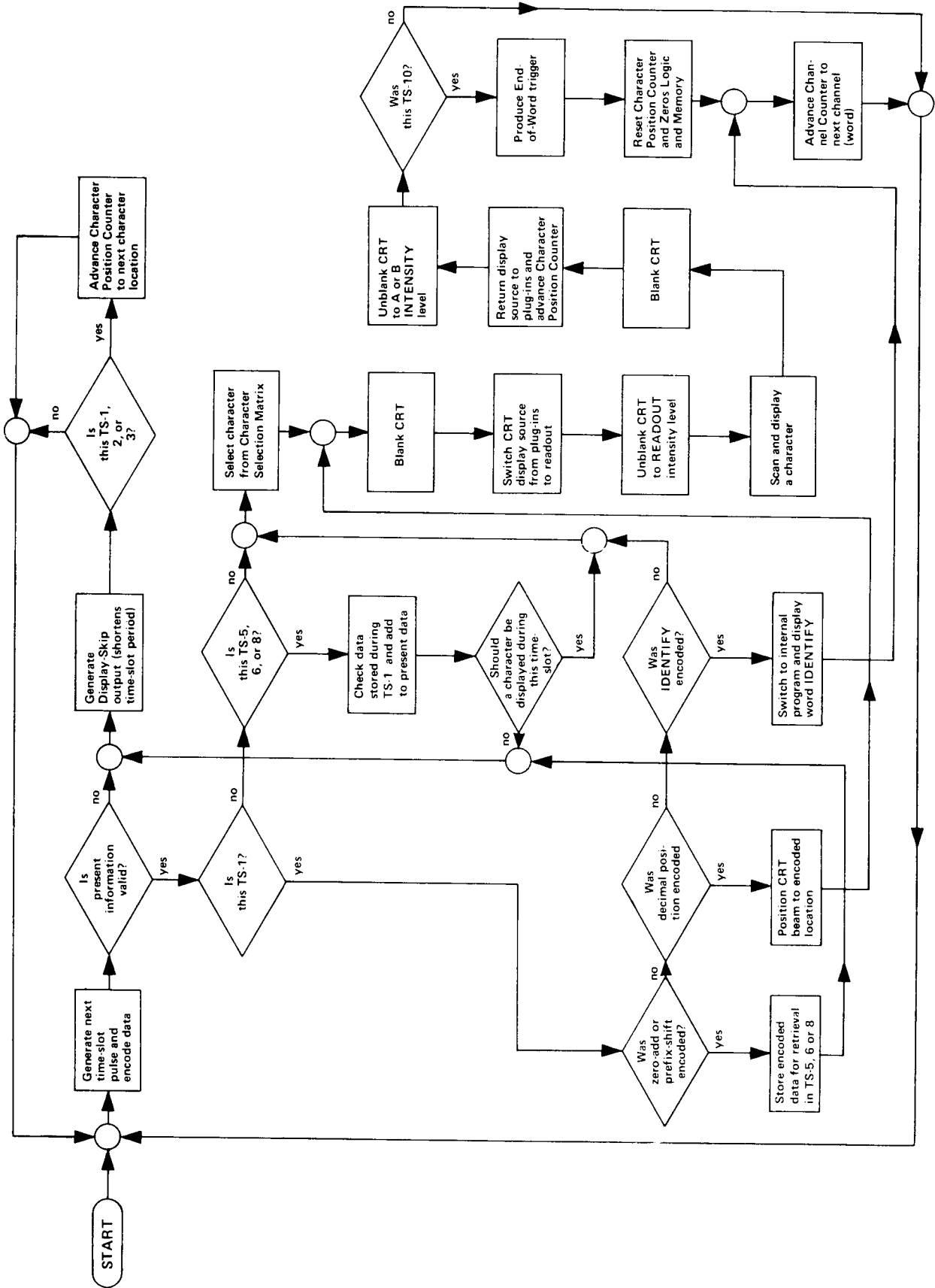


Fig. 4-37. Flow chart of character generation sequence by the Readout System.



MAINTENANCE

This section of the manual contains maintenance information for use in preventive maintenance, corrective maintenance, or troubleshooting of the 7603.

Panel Removal

WARNING

Dangerous potentials exist at several points throughout this instrument. When the instrument is operated with the covers removed, do not touch exposed connections or components. Some transistors have voltages present on their cases. Disconnect power before cleaning the instrument or replacing parts.

Cabinet Model. The side panels of the 7603 are held in place by spring-action of the panels themselves. To remove the panels, push the panel toward the top of the instrument until the bottom of the panel is clear of the slot along the bottom rail of the instrument. Then, pull the panel out at the bottom and lift away from the instrument. The bottom panel is held in place with eight screws. The panels protect this instrument from dust in the interior, and also provide protection to personnel from the operating potentials present. They also reduce the EMI radiation from this instrument or EMI interference to the display due to other equipment.

Rack Model. The top cover is held in place with six screws. To remove the cover, the screws need only be loosened slightly to slide the cover out of the slots.

A panel on the left side of the instrument, held in place with six screws, allows access to the vertical amplifier circuit board.

A plastic cover on the rear of the instrument, held in place with four screws, allows access to the power supply regulating transistors. It also allows access to three of the five screws holding the regulating circuit board assembly in the instrument.

Power-Unit Removal

The power unit can be slid out of the back of the 7603 to gain access to the Logic and Rectifier circuit boards and for power-unit maintenance. The power unit can be left connected to the rest of the instrument so that it can be operated in this position for troubleshooting. To remove the power unit, use the following procedure:

1. Remove the side panels (top panel for R7603).
2. Remove the five screws which secure the power unit to the sides of the instrument, and the four rear panel screws (see Fig. 5-1 for locations of screws on R7603).
3. Slide the power unit out of the rear of the instrument until it can be set down on the work surface (guide the interconnecting cables so they do not catch on other parts of the instrument).

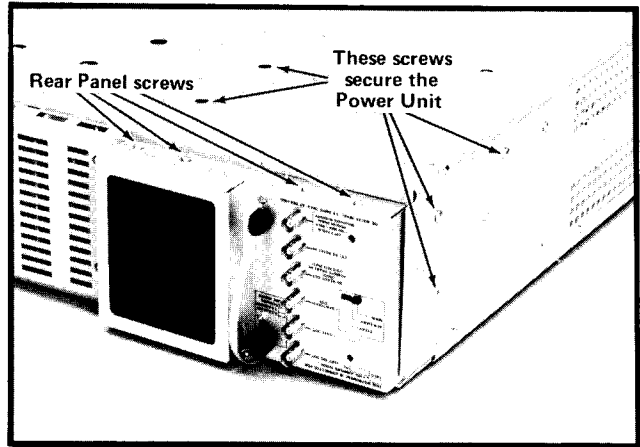


Fig. 5-1. Power unit removal for the R7603.

PREVENTIVE MAINTENANCE

General

Preventive maintenance consists of cleaning, visual inspection, lubrication, etc. Preventive maintenance performed on a regular basis may prevent instrument breakdown and will improve the reliability of this instrument. The severity of the environment to which the 7603 is subjected determines the frequency of maintenance. A convenient time to perform preventive maintenance is preceding recalibration of the instrument.

Cleaning

The 7603 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 side panels provide protection against dust in the interior of the instrument. Operation without the panels in place necessitates more frequent cleaning.

CAUTION

Avoid the use of chemical cleaning agents which might damage the plastics used in this instrument. Avoid chemicals which contain benzene, toluene, xylene, acetone, or similar solvents.

Exterior. Loose dust accumulated on the outside of the 7603 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 plastic light filter, faceplate protector, and the CRT face with a soft, lint-free cloth dampened with denatured alcohol.

The optional CRT mesh filter can be cleaned in the following manner:

1. Hold the mesh filter in a vertical position and brush lightly with a soft No. 7 water-color brush to remove light coatings of dust or lint.
2. Greasy residues or dried-on dirt can be removed with a solution of warm water and a neutral-pH liquid detergent. Use the brush to lightly scrub the filter.
3. Rinse the filter thoroughly in clean water and allow to air dry.
4. If any lint or dirt remains, use clean low-pressure air to remove it. Do not use tweezers or other hard cleaning tools on the filter, as the special finish may be damaged.
5. When not in use, store the mesh filter in a lint-free, dust-proof container such as a plastic bag.

Interior. Dust in the interior of this instrument should be removed occasionally due to its electrical conductivity under high-humidity conditions. The best way to clean the interior is to blow off the accumulated dust with dry, low-pressure air. 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 ceramic terminal strips and circuit boards.

The high-voltage circuits, particularly parts located in the high-voltage compartment and the area surrounding the post-deflection anode lead, should receive special attention. Excessive dirt in these areas may cause high-voltage arcing and result in improper instrument operation.

Air Filter (For Rackmount Versions only). The air filter should be visually checked every few weeks and cleaned or replaced if dirty. More frequent inspections are required under severe operating conditions. If the filter is to be replaced, order new filters from your local Tektronix Field Office or representative; order by Tektronix Part No. 378-0041-01. The following procedure is suggested for cleaning the filter.

1. Remove the filter by pulling it out of the retaining frame on the rear panel. Be careful not to drop any of the accumulated dirt into the instrument.
2. Flush the loose dirt from the filter with a stream of hot water.
3. Place the filter in a solution of mild detergent and hot water and let soak for several minutes.
4. Squeeze the filter to wash out any dirt which remains.
5. Rinse the filter in clean water and let dry.

6. Coat the dry filter with an air-filter coating (available from air conditioner suppliers or order Tektronix Part No. 006-0580-00).

7. Let the filter thoroughly dry.

8. Re-install the filter in the retaining frame.

Lubrication

The reliability of potentiometers, switches, and other moving parts can be maintained if they are kept properly lubricated. However, over-lubrication is as detrimental as too little lubrication. A lubrication kit containing necessary lubricants and instructions is available from Tektronix, Inc. Order Part No. 003-0342-01.

Visual Inspection

The 7603 should be inspected occasionally for such defects as broken connections, improperly seated semi-conductors, 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 components 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 the semiconductors in the 7603 are not recommended. The best check of semiconductor performance is actual operation in the instrument. More details on checking semiconductor operation are given under troubleshooting.

Recalibration

To assure accurate measurements, check the calibration of this instrument after each 1000 hours of operation or every six months if used infrequently. In addition, replacement of components may necessitate recalibration of the affected circuits. The calibration procedure can also be helpful in localizing certain troubles in the instrument. In some cases, minor troubles may be revealed and/or corrected by recalibration.

TROUBLESHOOTING

Introduction

The following information is provided to facilitate troubleshooting of the 7603. Information contained in other sections of this manual should be used along with the following information to aid in locating the defective component. An understanding of the circuit operation is very helpful in locating troubles, particularly where integrated circuits are used. See the Circuit Description section for complete information.

Troubleshooting Aids

Diagrams. Complete circuit diagrams are given on fold-out pages in the Diagrams section. The component number and electrical value of each component in this instrument are shown on these diagrams. Each main circuit is assigned a series of component numbers. Table 5-1 lists the main circuits in the 7603 and the series of component numbers assigned to each. Important voltages and waveforms are also shown on the diagrams. The portions of the circuit mounted on circuit boards are enclosed with blue lines.

Circuit Boards. Fig. 5-2 shows the location of the circuit boards within the 7603; Fig. 5-3 shows the location of circuit boards in the R7603. Pictures of these circuit boards are shown in Figs. 8-1 through 8-10. These pictures are located in the Diagrams section on the back of the page opposite the circuit diagram, to aid the cross-referencing between the diagrams and the circuit-board components. Each electrical component on the boards is identified by its circuit number. The color and location of the inter-connecting connectors are also shown. The circuit boards are also outlined on the diagrams with a blue line to show which portions of the circuit are located on a circuit board.

TABLE 5-1
Component Numbers

| Component numbers on diagrams | Diagram numbers | Circuit |
|-------------------------------|-----------------|------------------------------|
| 1-49 | 1 | Main Interface |
| 50-199 | 2 | Logic Circuit |
| 300-399 | 3 | Trigger Selector |
| 200-299 | 3 | Vertical Interface |
| 400-499 | 4 | Vertical Amplifier |
| 500-599 | 5 | Horizontal Amplifier |
| 600-699 | 6 | Output Signals |
| 1000-1099 | 7 | Calibrator and Front Panel |
| 1100-1299 | 8 | CRT Circuit and High Voltage |
| 800-999 | 9 | Low Voltage Power Supply |
| 2100-2299 | 10 | Readout System |

Wiring Color-Code. All insulated wire and cable used in the 7603 is color-coded to facilitate circuit tracing.

Power Cord Conductor Identification

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

Resistor Color-Code. In addition to the brown composition resistors, some metal-film resistors and some wire-wound resistors are used in the 7603. The resistance values of wire-wound resistors are usually printed on the body of the component. The resistance values of composition resistors and metal-film resistors are color-coded on the components with 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 (see Fig. 5-2). Metal-film resistors have five stripes consisting of three significant figures, a multiplier, and a tolerance value.

Capacitor Marking. The capacitance values of common disc capacitors and small electrolytics are marked on the side of the component body. The white ceramic capacitors used in the 7603 are color-coded in picofarads using a modified EIA code (see Fig. 5-4).

Diode Color-Code. The cathode end of each glass-encased diode is indicated by a stripe, a series of stripes, or a dot. For most silicon or germanium diodes with a series of stripes, the color-code identifies the three significant digits of the TEKTRONIX Part Number using the resistor color-code system (e.g., a diode color-coded pink- or blue-, brown-gray-green indicates TEKTRONIX Part No. 152-0185-00). The cathode and anode ends of metal-encased diodes can be identified by the diode symbol marked on the body.

Semiconductor Lead Configuration. Fig. 5-5 shows the lead configuration for the semiconductors used in this instrument. This view is as seen from the bottom of the semiconductors.

Troubleshooting Equipment

The following equipment is useful for troubleshooting the 7603.

1. Transistor Tester

Description: TEKTRONIX Type 576 Transistor-Curve Tracer or equivalent.

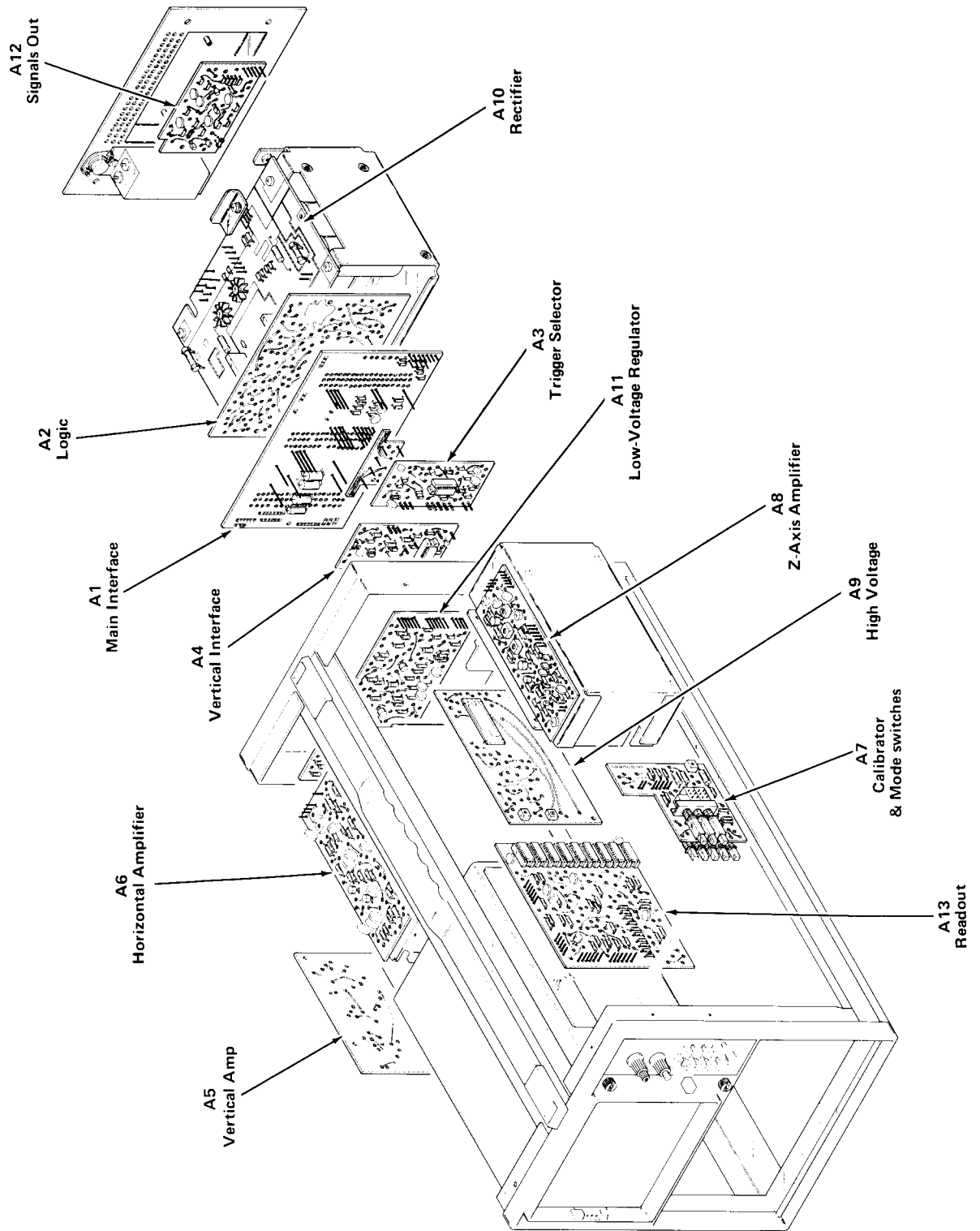


Fig. 5-2. Location of circuit boards in the 7603.

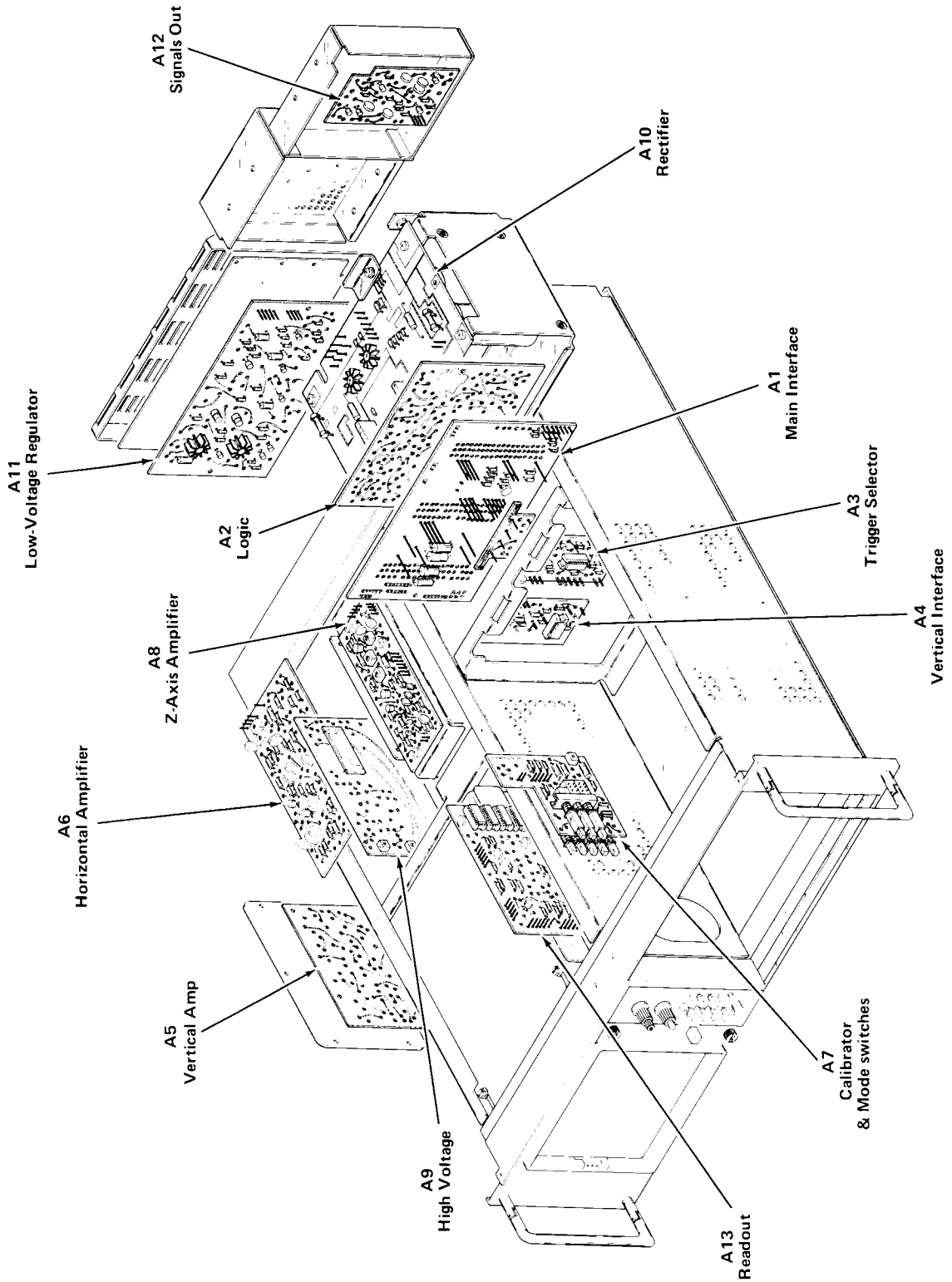


Fig. 5-3. Location of circuit boards in the R7603.

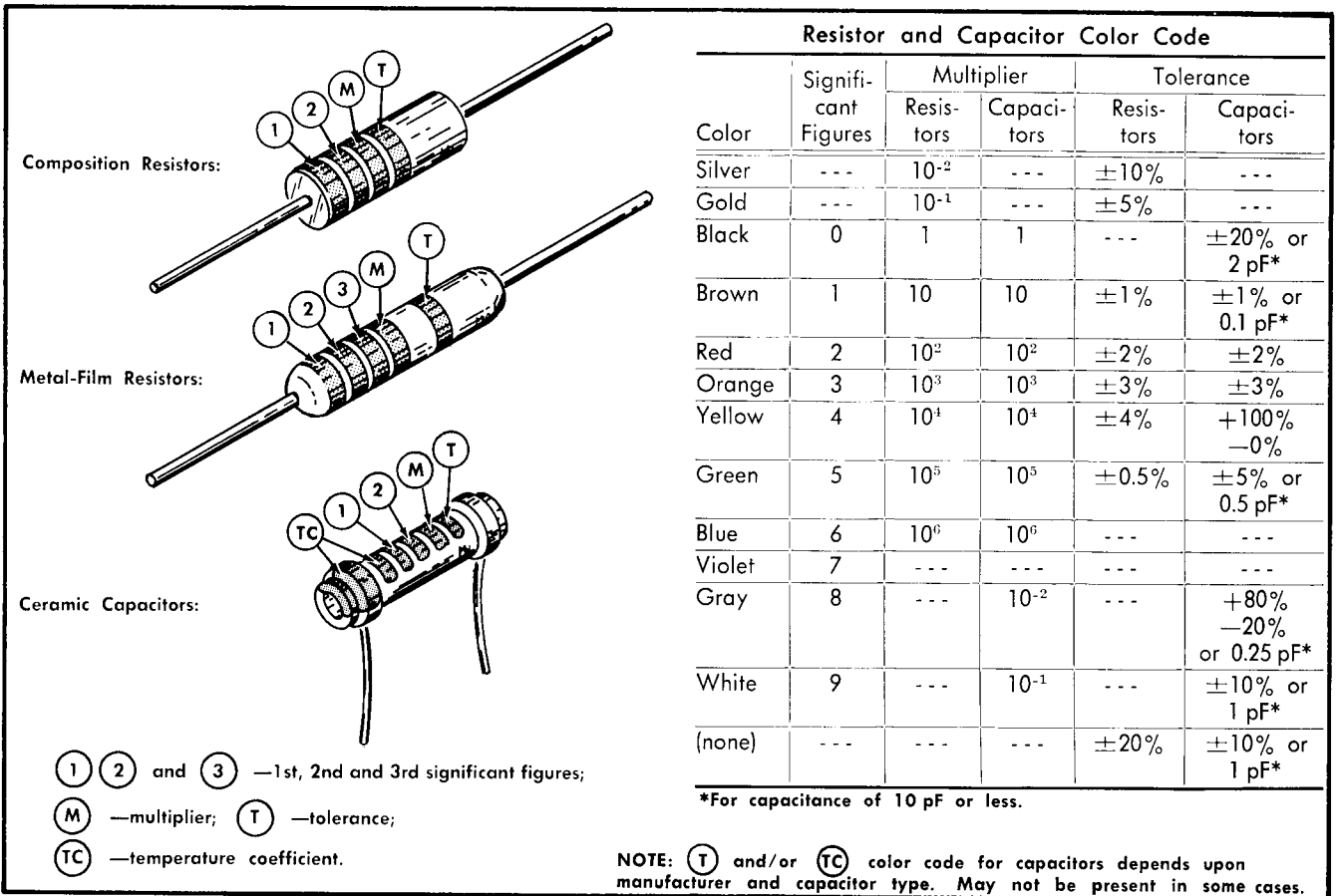


Fig. 5-4. Color code for resistors and ceramic capacitors.

Purpose: To test the semiconductors used in this instrument.

2. Multimeters

Description: Digital voltmeter, 10 megohm input impedance and 0 to 500 volts range; ohmmeter, 0 to 2 megohms. Accuracy, within 1%. Test probes must be insulated to prevent accidental shorting.

Purpose: To check voltages and for general troubleshooting in this instrument.

NOTE

A 20,000 ohms/volt VOM can be used to check the voltages in this instrument if allowances are made for the circuit loading of the VOM at high-impedance points.

3. Test Oscilloscope

Description: Frequency response, DC to 50 megahertz; deflection factor, 50 volts/division. A 10X probe should be used to reduce circuit loading.

Purpose: To check operating waveforms in this instrument.

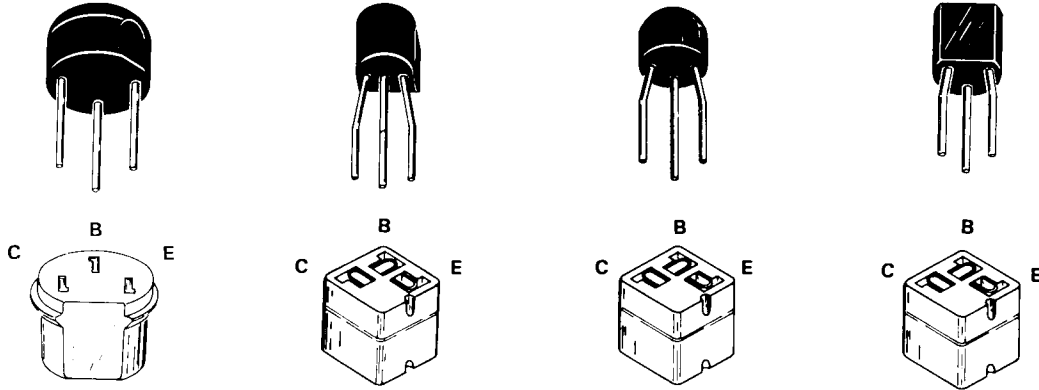
Troubleshooting Techniques

This troubleshooting procedure is arranged in an order which checks the simple trouble possibilities before proceeding with extensive troubleshooting. The first few checks assure proper connection, operation, and calibration. 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 following the replacement procedures given under corrective maintenance.

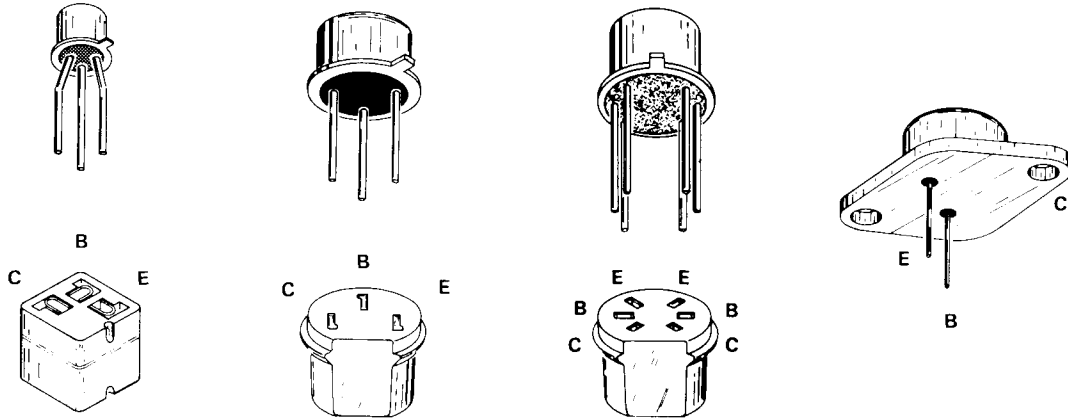
1. Check Control Settings. Incorrect control settings can indicate a trouble that does not exist. If there is any question about the correct function or operation of any control, see the Operating Instructions section.

2. Check Associated Equipment. Before proceeding with troubleshooting of the 7603, check that the equipment used with this instrument is operating correctly.

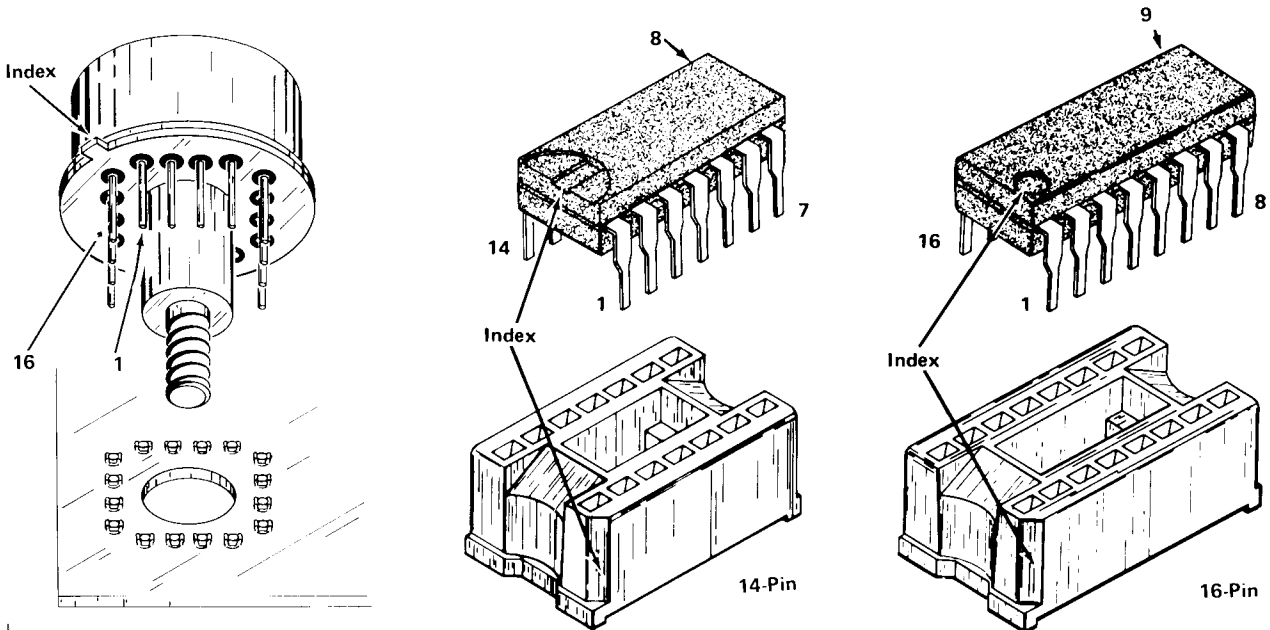
NOTE
LEAD CONFIGURATIONS AND CASE STYLES ARE TYPICAL, BUT MAY VARY DUE TO VENDOR CHANGES OR INSTRUMENT MODIFICATIONS.



Plastic-Cased Transistors



Metal-Cased Transistors



Integrated Circuits

1429-20

Fig. 5-5. Electrode configuration for semiconductors used in this instrument.

Check that the signal is properly connected and that the interconnecting cables are not defective. Also, check the power source. The associated plug-in units can be checked for proper operation by substituting other units which are known to be operating properly (preferably of the same types). If the trouble persists after substitution, the 7603 is probably at fault.

3. Visual Check. Visually check the portion of the instrument in which the trouble is located. Many troubles can be located by visual indications such as unsoldered connections, broken wires, damaged circuit boards, damaged components, etc.

4. Check Instrument Calibration. Check the calibration of this instrument, or the affected circuit if the trouble appears in one circuit. The apparent trouble may only be a result of misadjustment, or may be corrected by calibration. Complete calibration instructions are given in the Calibration section.

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. For example, poor focus indicates that the CRT circuit (includes high-voltage supplies) is probably at fault. When trouble symptoms appear in more than one circuit, check affected circuits by taking voltage and waveform readings. Typical voltages and waveforms are given on the schematics in the Diagrams section.

Incorrect operation of all circuits often indicates trouble in the power supply. Check first for correct 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 5-2 lists the tolerances of the power supplies in this instrument. These voltages are measured between the power-supply test points (see Section 3 for test-point location) and ground. If a power-supply voltage is within the listed tolerance, the supply can be assumed to be working correctly. If outside the tolerance, the supply may be misadjusted or operating incorrectly. Use the procedure given in the Calibration section to adjust the power supplies.

Fig. 5-6 provides a guide for locating a defective circuit. This chart does not include checks for all possible defects; use steps 6 and 7 in such cases. Start from the top of the chart and perform the given checks on the left side of the page until a step is found which does not produce the indicated results. Further checks and/or the circuit in which the trouble is probably located are listed to the right of this step.

TABLE 5-2
Power Supply Tolerance and Ripple

| Power Supply | Test Point | Output Voltage Tolerance | Maximum ripple (peak-to-peak) |
|--------------|---|--------------------------|-------------------------------|
| -50 Volt | TP-50 (back of Main Interface board) on P1171-Pin 8 | ±0.2 volt | 2 mV |
| -15 Volt | P1171-Pin 1 | ±0.15 V | 2 mV |
| +5 Volt | P1171-Pin 2 | ±0.1 V | 2 mV |
| +15 Volt | P1171-Pin 3 | ±0.15 V | 2 mV |
| +50 Volt | P1171-Pin 4 | ±0.5 V | 5 mV |
| +130 Volt | P1171-Pin 6 | ±5.2 volts | 300 mV |

If incorrect operation of the power supplies is suspected, connect the 7603 to a variable autotransformer. Then, check for correct regulation with a DC voltmeter (0.1% accuracy) and correct ripple with a test oscilloscope while varying the autotransformer throughout the regulating range of this instrument.

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 voltage or waveform in the circuit. Typical voltages and waveforms are given on the diagrams.

NOTE

Voltages and waveforms given on the diagrams are not absolute and may vary slightly between instruments. To obtain operating conditions similar to those used to take these readings, see the first diagram page.

7. Check Individual Components. The following procedures describe methods of checking individual components in the 7603. Components which are soldered in place are best checked by first disconnecting one end. This isolates the measurement from the effects of surrounding circuitry.

A. SEMICONDUCTORS.



Power switch must be turned off before removing or replacing semiconductors.

CIRCUIT ISOLATION TROUBLESHOOTING CHART

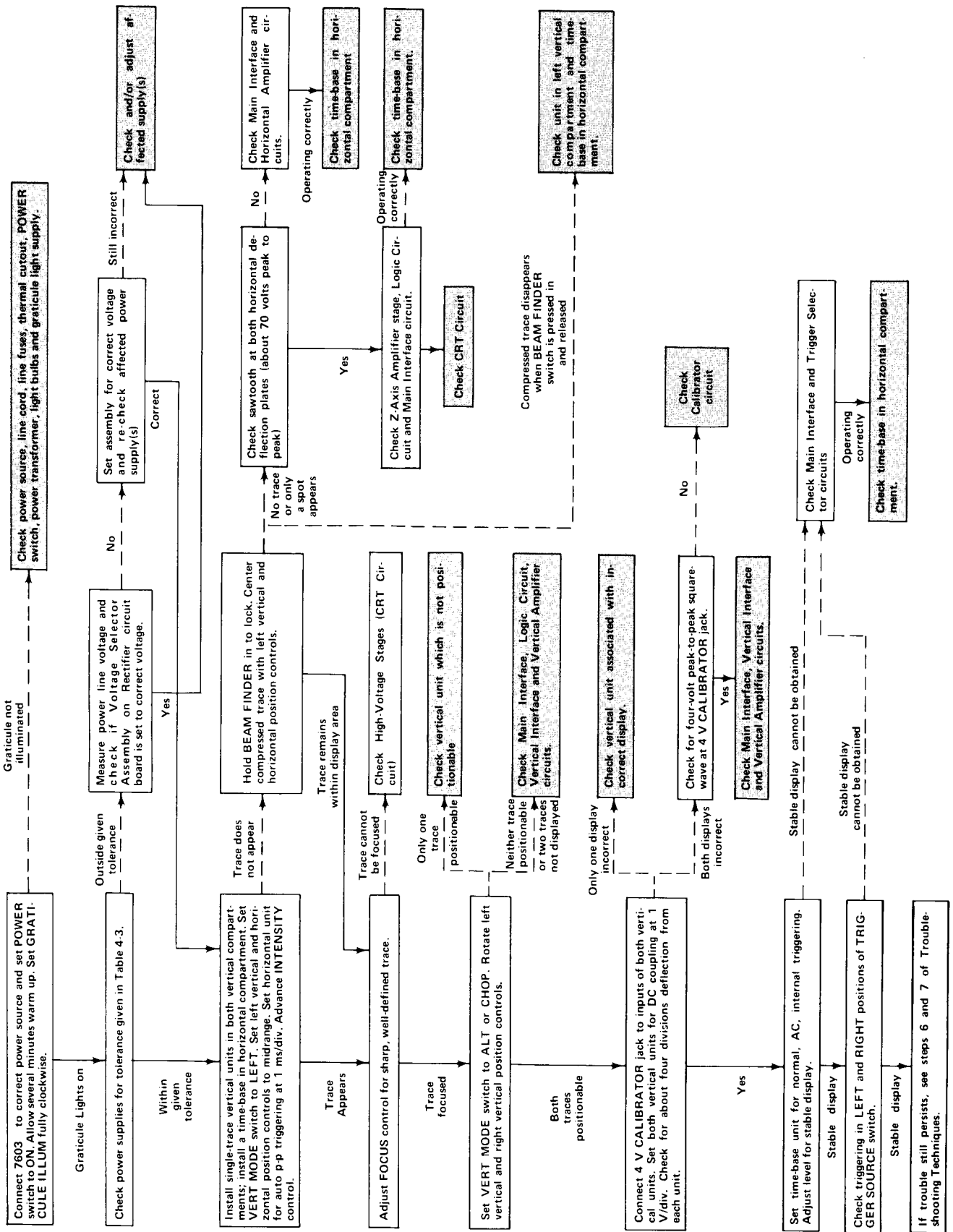


Fig. 5-6.

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 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 integrated circuits. In addition, operating waveforms, logic levels, and other operating information for the integrated circuits are given in the Circuit Description section. Use care when checking voltages and waveforms around the integrated circuits so adjacent leads are not shorted together. A convenient means of clipping a test probe to the 14- and 16-pin integrated circuits is with an integrated-circuit test clip. This device also doubles as an integrated-circuit extraction tool.

B. DIODES.

A diode can be checked for an open or for a short circuit by measuring the resistance between terminals with an ohmmeter set to the R X 1k scale. The diode resistance should be very high in one direction and very low when the meter leads are reversed. Do not check tunnel diodes or back diodes with an ohmmeter.

CAUTION

Do not use an ohmmeter scale that has a high internal current. High currents may damage the diodes under test.

C. RESISTORS.

Check the resistors with the ohmmeter. See the Electrical Parts List for the tolerance of the resistors used in this instrument. Resistors normally do not need to be replaced unless the measured value varies widely from the specified value.

D. 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 (roll-off).

E. 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 in this section. Be sure to check the performance of any circuit that has been repaired or that has had any electrical components replaced.

CORRECTIVE MAINTENANCE

General

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 for the 7603 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 purchasing or ordering replacement parts, check the parts list for value, tolerance, rating, and description.

NOTE

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

Special Parts. In addition to the standard electronic components, some special components are used in the 7603. These components 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 Tektronix, Inc., include the following information:

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

Soldering Techniques

WARNING

Disconnect the instrument from the power source before soldering.

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, use a 35- to 40-watt pencil-type soldering iron with a 1/8-inch wide, wedge-shaped tip. Keep the tip properly tinned for best heat transfer to the solder joint. A higher wattage soldering iron may separate the wiring from the base material. Avoid excessive heat; apply only enough heat to remove the component or to make a good solder joint. Also, apply only enough solder to make a firm solder joint; do not apply too much solder.

For metal terminals (e.g., switch terminals, potentiometers, etc.) a higher wattage-rating soldering iron may be required. Match the soldering iron to the work being done. For example, if the component is connected to the chassis or other large heat-radiating surface, it will require a 75-watt or larger soldering iron. The pencil-type soldering iron used on the circuit board can be used for soldering to switch terminals, potentiometers, or metal terminals mounted in plastic holders.

After soldering is completed, clean the area around the solder connection with a flux-remover solvent. Be careful not to remove any information printed in the area.

Component Replacement

WARNING

Disconnect the instrument from the power source before replacing components.

General. The exploded-view drawings associated with the Mechanical Parts List (located at rear of manual) may be helpful in the removal or disassembly of individual components or sub-assemblies.

Circuit Board Replacement. If a circuit board is damaged beyond repair, the entire assembly including all soldered-on components, can be replaced. Part numbers are given in the Mechanical Parts List for either the completely wired (670-xxxx-xx) or the unwired board (388-xxxx-xx).

NOTE

Even though unwired boards are available without components, use of the completely wired replacement board is recommended due to the large number of components mounted on most of the boards.

Most of the circuit boards in this instrument are mounted on the chassis; pin connectors are used for interconnection with other circuits. Use the following procedure to remove the chassis-mounted circuit boards (removal instructions for the exceptions will be given later).

A. CHASSIS-MOUNTED BOARDS.

1. Disconnect any pin connectors on the board or connected to other portions of the instrument. Note the order of these connectors so they can be correctly replaced.

2. Remove the securing screws.

3. Remove the board.

4. To replace the board, reverse the order of removal. Match the arrows on the multi-pin connectors to the arrows on the board. Correct location of the pin connectors is shown in the circuit board illustrations in the Diagrams section.

B. TRIGGER SELECTOR AND VERTICAL INTERFACE CIRCUIT BOARD REPLACEMENT.

The Trigger Selector and Vertical Interface circuit boards plug onto the front of the Main Interface circuit board. Use the following procedure to replace either board.

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1. Remove the securing screws.

2. Pull out on the edges of the board until the board clears the interconnecting terminals. Hold the board parallel to the Main Interface board until the board is free, so as not to bend the interconnecting terminals.

3. To replace the circuit board, position it so the interconnecting pins and sockets mate properly.

4. Gently press the circuit board against the mounting surface. Be sure that all the interconnecting pins and sockets mate properly.

5. Replace the securing screws.

C. LOGIC CIRCUIT BOARD REPLACEMENT.

1. Slide out the power unit as described previously.

2. Disengage the plastic snaps which secure the sides of the board.

3. Pull out on the edges of the board until the board clears the interconnecting terminals. Hold the board parallel to the Main Interface board until the board is free, so as not to bend the interconnecting terminals.

4. To replace the Logic board, position it so the guide holes in the board mate with the guide posts. Check that all the interconnecting pins and sockets mate properly.

5. Gently press the board against the Main Interface board until the plastic snaps secure the board.

D. MAIN INTERFACE CIRCUIT BOARD REPLACEMENT.

1. Slide out the power unit as described previously.

2. Remove all of the plug-on circuit boards from the Main Interface board (remove plug-in units to gain access to plug-on boards on front of Main Interface board).

3. Disconnect the multi-pin connectors from the rear of the Main Interface board. Note the order of these connectors so they can be correctly replaced.

4. Remove the three screws from inside each plug-in compartment which hold the plug-in interface connectors to the chassis (total of nine screws). Also remove the hexagonal posts which secure the ground straps to the Main Interface board.

5. Remove the Main Interface board assembly through the rear of the instrument.

6. To replace the Main Interface board, reverse the order of removal. Match the arrows on the multi-pin connectors to the arrows on the board. Correct location of the pin connectors is shown in the circuit board illustration in the Diagrams section.

E. LOW-VOLTS REGULATOR CIRCUIT BOARD REPLACEMENT.

1. Remove the four screws which secure the heat radiator to the rear frame of the instrument.

2. Slide the heat radiator out of the rear of the instrument and disconnect the pin connectors. Remove the heat radiator from the instrument.

3. Remove the four screws which secure the plastic protective cover to the heat radiator.

4. Remove the power transistors from the back of the heat radiator. Note the location of each power transistor.

5. To replace the Low-Voltage Regulator board, reverse the order of removal.

NOTE

After replacing the power transistors, check that the transistor cases are not shorted to the heat radiator before applying power.

F. RECTIFIER BOARD REPLACEMENT.

To replace the Rectifier board, proceed as follows:

1. Slide out the power unit as described previously.

2. Disconnect the pin connectors from the board.

3. Disconnect the wires soldered to the top of the board.

4. Unsolder all of the power transformer wires connected to the top of the board. Use a vacuum-type desoldering tool to remove the solder from the hole in the circuit board.

5. Remove the screws holding each corner of the board to the chassis.

6. To replace the Rectifier board, reverse the order of removal. Be sure that all of the transformer wires are properly placed before resoldering. Match the arrows on the multi-pin connectors to the arrows on the board. Correct location of the pin connectors and the wire color code is shown on the circuit board illustration in the Diagrams section.

G. CALIBRATOR BOARD REPLACEMENT.

1. Unsolder power on/off indicator.

2. Remove FOCUS, INTENSITY, BEAM FINDER and GRATICULE ILLUM knobs.

3. Remove securing nut which holds INTENSITY and GRATICULE ILLUM control to front panel.

4. Disengage the power switch actuating rod from the coupler. Remove the rod and plastic bushing through the front of the instrument.

5. Remove two screws holding the VERT MODE switch to the front sub-panel.

6. Remove the screw holding the calibrator board to the support on the CRT shield.

7. Pull the Calibrator board out far enough to allow the multi-pin connectors and wire leads to be disconnected from the Calibrator board (note the wire color code).

8. Remove the board.

9. To replace the circuit board, reverse the removal procedure. Match the arrows on the multi-pin connectors to the arrows on the circuit board.

Plug-In Interface Connectors. The individual contacts of the plug-in interface connectors can be replaced. However, it is recommended that the entire Main Interface board be

replaced if a large number of the contacts are damaged. An alternative solution is to refer the maintenance of the damaged Main Interface board to your local TEKTRONIX Field Office or representative. Use the following procedure to replace an individual contact of the plug-in interface connector.

1. Remove the Main Interface circuit board from the instrument as described previously.

2. Snap the connector cover (white plastic) off the side of the plug-in interface connector which needs repair.

3. Unsolder and remove the damaged contact.

4. Install the replacement contact. Carefully form it to the required shape to fit against the connector body.

5. Snap the connector cover back onto the plug-in interface connector. Check that the contact which was replaced is aligned with the other contacts.

6. Replace the Main Interface board.

Semiconductor Replacement. 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 calibration of this instrument. When semiconductors are replaced, check the operation of the part of the instrument which may be affected.



POWER switch must be turned off before removing or replacing semiconductors.

Replacement semiconductors should be of the original type or a direct replacement. Fig. 5-5 shows the lead configuration of the semiconductors used in this instrument. Some plastic case transistors have lead configurations which do not agree with those shown here. 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 in this instrument are wired for the standard basing as used for metal-cased transistors. Transistors which have heat radiators or are mounted on the chassis use silicone grease to increase heat transfer. Replace the silicone grease when replacing these transistors.

WARNING

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

An extracting tool should be used to remove the 14- and 16-pin integrated circuits to prevent damage to the pins. This tool is available from Tektronix, Inc. Order TEKTRONIX Part No. 003-0619-00. If an extracting tool is not available when removing one of these integrated circuits, pull slowly and evenly on both ends of the device. Try to avoid having one end of the integrated circuit disengage from the socket before the other, as this may damage the pins.

Access to Power Transistors. The power transistors associated with the Low-Voltage Power Supply are mounted on the heat radiator at the rear of the instrument. To gain access to these transistors, remove the screws which secure the plastic protective cover to the heat radiator. The transistors are mounted in sockets so they can be removed from the rear by taking out the two screws in the mounting tabs (cases elevated above chassis; be sure power is off). To replace the sockets, refer to the procedure for removal of the Low-Voltage Regulator circuit board.

NOTE

After replacing a power transistor, check that the collector is not shorted to ground before applying power.

Interconnecting Pin Replacement. Interconnecting pins are used to interconnect many of the circuit boards in the 7603. Two types of mating connectors are used for these interconnecting pins. If the mating connector is mounted on a plug-on circuit board, a special socket is soldered into the board. If the mating connector is on the end of a lead, an end-lead pin connector is used which mates with the interconnecting pin. The following information provides the replacement procedure for the various types of interconnecting methods.

A. CIRCUIT-BOARD PINS.

NOTE

A circuit-board pin replacement kit including necessary tools, instructions and replacement pins is available from Tektronix, Inc. Order TEKTRONIX Part No. 040-0542-00.

To replace a pin which is mounted on a circuit board, first disconnect the pin connectors. Then, unsolder the damaged pin and pull it out of the circuit board with a pair of pliers. Be careful not to damage the wiring on the board with too much heat. Ream out the hole in the circuit board with a 0.031-inch drill. Remove the ferrule from the new interconnecting pin and press the new pin into the hole in the circuit board. Position the pin in the same manner as the old pin. Then, solder the pin on both sides of the circuit board. If the old pin was bent at an angle to mate with a connector, bend the new pin to match the associated pins.

B. CIRCUIT-BOARD PIN SOCKETS.

The pin sockets on the circuit boards are soldered to the rear of the board. To replace one of these sockets, first unsolder the pin (use a vacuum-type desoldering tool to remove excess solder). Then straighten the tabs on the socket and remove it from the hole in the circuit board. Place the new socket in the circuit board hole and press the tabs down against the board. Solder the tabs of the socket to the circuit board; be careful not to get solder into the socket.

NOTE

The spring tension of the pin sockets ensures a good connection between the circuit board and the pin. This spring tension can be destroyed by using the pin sockets as a connecting point for spring-loaded probe tips, alligator clips, etc.

C. END-LEAD PIN CONNECTORS.

The pin connectors used to connect the wires to the interconnecting pins are clamped to the ends of the associated leads. To replace damaged end-lead pin connectors, remove the old pin connector from the end of the lead and clamp the replacement connector to the lead.

Some of the pin connectors are grouped together and mounted in a plastic holder; the overall result is that these connectors are removed and installed as a multi-pin connector. To provide correct orientation of this multi-pin connector when it is replaced, an arrow is stamped on the circuit board and a matching arrow is molded into the plastic housing of the multi-pin connector. Be sure these arrows are aligned as the multi-pin connector is replaced. If the individual end-lead pin connectors are removed from the plastic holder, note the color of the individual wires for replacement.

Cathode-Ray Tube Replacement. To replace the cathode-ray tube, proceed as follows:

WARNING

Use care when handling a CRT. Protective clothing and safety glasses should be worn. Avoid striking it 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 to protect it from scratches.

A. REMOVAL.

1. Remove the heat radiator/Low-Voltage Regulator circuit board assembly as described previously.
2. Remove the CRT base socket from the rear of the CRT.
3. Loosen the two screws located on each side of the CRT socket until the tension of the springs on these screws is released. Then, press in on the screws to be sure that the CRT clamp is loose.
4. Disconnect the deflection-plate connectors. Be careful not to bend these pins.
5. Disconnect the CRT anode plug from the jack located on the front of the high-voltage compartment. Ground this lead to the chassis to dissipate any stored charge.
6. Remove the two screws securing the CRT bezel to the front panel. Remove the plastic faceplate protector and light filter.
7. Hold one hand on the CRT faceplate and push forward on the CRT base with the other. As the CRT starts out of the shield, grasp it firmly. Guide the anode lead through the cutout in the CRT shield as the CRT is removed.

B. REPLACEMENT.

1. Loosen clamp blocks located at each corner of CRT shield. Insert the CRT into the shield. Guide the anode lead through the hole in the CRT shield.
2. Clean the CRT faceplate, plastic faceplate protector, and the light filter with denatured alcohol.

3. Re-install the CRT bezel, faceplate protector, and light filter. Firmly tighten the two screws.

4. Push forward on the CRT base to be certain that the CRT is as far forward as possible. Then tighten the two screws beside the CRT base until the springs on the screws are fully compressed.

5. Reposition and tighten down clamp blocks to hold the faceplate of the CRT tightly against the implosion shield. The clamps are located at each corner of the CRT shield.

6. Replace the CRT base socket.

7. Reconnect the CRT anode plug.

8. Re-install the heat radiator/Low-Voltage Regulator circuit board assembly.

9. Carefully reconnect the deflection-plate connectors. After each connector is installed, lightly pull on its lead to be sure that it will remain in its socket.

10. Check the calibration of the complete instrument. Calibration procedure is given in Section 3.

Switch Replacement. The pushbutton switches used in the 7603 are not repairable and should be replaced as a unit if defective.

Graticule-Bulb Replacement. To remove a graticule bulb, first remove the two screws securing the CRT bezel to the front panel. Remove the plastic light shield and retaining spring. Now, firmly grasp the defective bulb and pull straight out. Push the replacement bulb straight into the socket as far as it will go. Replace the retaining spring, light shield, and CRT bezel.

Power Transformer Replacement. Replace the power transformer only with a direct replacement transformer. When removing the transformer, tag the leads with the corresponding terminal numbers to aid in connecting the new transformer. After the transformer has been replaced, check the performance of the complete instrument using the procedure given in the Calibration section.

High-Voltage Compartment. The components located in the high-voltage compartment can be reached for maintenance or replacement by using the following procedure. Diagram 8 shows the location of the components in the high-voltage compartment and color-coding of the wires.

NOTE

All solder joints in the high-voltage compartment should have smooth surfaces. Any protrusions may cause high-voltage arcing at high altitudes.

1. Remove the heat radiator/Low-Voltage Regulator assembly as described previously.
2. Disconnect the CRT base socket.
3. Disconnect the CRT anode plug and discharge it to the chassis. Using an insulated probe or wire, discharge the jack portion of the CRT anode connector to chassis ground.
4. Disconnect the multi-pin connectors on the Z-Axis Amplifier board.
5. Remove the screw on the bottom of the high-voltage compartment and the two screws located at the top.
6. Guide the high-voltage compartment away from the instrument chassis. Be careful not to damage any of the components or the pin connectors on the High-Voltage or Z-Axis Amplifier circuit boards. Disconnect the multi-pin connectors on the High-Voltage board.
7. Using an insulated shorting strap, discharge the exposed connections to chassis ground.

8. Remove the two power transistors and the four screws which secure the High-Voltage board to the high-voltage compartment. Now, all of the circuitry in the high-voltage box can be reached for maintenance or replacement except those in the encapsulated assembly.

9. To replace the encapsulated assembly, remove the four screws located on the bottom of the High-Voltage circuit board (remove board to reach screws).

10. To replace the high-voltage compartment, reverse the above procedure. Be careful not to pinch any of the interconnecting wires when re-attaching the high-voltage compartment to the chassis.

Fuse Replacement. See the Electrical Parts List for fuse information.

Recalibration After Repair

After any electrical component has been replaced, the calibration of that particular circuit should be checked, as well as the calibration of other closely related circuits. Since the low-voltage supply affects all circuits, calibration of the entire instrument should be checked if work has been done in the low-voltage supply or if the power transformer has been replaced.

RACKMOUNTING

Introduction

The R7603 Oscilloscope is designed to be installed in a standard 19-inch wide rack. It can be mounted in racks with Universal, EIA, RETMA, or Western Electric mounting-hole spacing. The following information provides complete rackmounting instructions for this instrument.

WARNING

During rackmount installation, interchanging the left and right slide-out track assemblies defeats the extension stop (safety latch) feature of the tracks. Equipment could, when extended, come out of the slides and fall from the rack, possibly causing personal injury and equipment damage.

When mounting the supplied slide-out tracks, inspect both assemblies to find the LH (left hand) and RH (right hand) designations to determine correct placement. Install the LH assembly to your left side as you face the front of the rack and install the RH assembly to your right side. Refer to the rackmounting instructions in this manual for complete information.

Instrument Dimensions

A dimensional drawing showing the major dimensions of the R7603 is shown in Fig. 6-6.

Rack Dimensions

Height. At least 5¼ inches of vertical space is required to mount this instrument in a rack. This allows sufficient clearance for adjacent instruments or panels. Additional height may be necessary if an oscilloscope camera system is to be used with this instrument.

Width. Minimum dimension between the front rails of the rack is 17 5/8 inches. This allows room on each side of the instrument for the slide-out tracks to operate freely, permitting the instrument to move in and out of the rack.

Depth. Total depth necessary to mount this instrument in an enclosed cabinet rack is 24 inches. This allows sufficient room for air circulation, power cord and signal connections, and for the necessary mounting hardware.

NOTE

If this instrument is mounted in a shallow rack where the rear mounting brackets must extend behind the instrument, a maximum of 26 inches clearance behind the front rails is required.

The rear mounting brackets supplied allow mounting this instrument in racks which have rear rails spaced between 14 5/8 and 28 1/2 inches from the front rail. Do not mount the R7603 in an installation where it is not correctly supported at the rear, as the instrument may be damaged.

Slide-Out Tracks

The slide-out tracks provided with this instrument permit it to be extended out of the rack for maintenance and calibration without removing it from the rack. To operate this instrument in the extended position, be sure the power cord and any signal cables are long enough for this purpose.

The slide-out tracks consist of two assemblies; one for the left side of the instrument and one for the right side. Fig. 6-1 shows the complete slide-out track assemblies. The stationary section of each assembly attaches to the front and rear rails of the track, and the chassis section is attached to the instrument. The intermediate section slides between the stationary and chassis sections to allow the instrument to be extended out of the rack.

The hardware needed to mount the slide-out tracks to the rack is shown in Fig. 6-1. Since the hardware supplied is intended to make the tracks compatible with a variety of cabinet racks and installation methods, not all of it will be needed for this installation. Use only the hardware that is required for the mounting method used.

Mounting Procedure

Use the following procedure to install this instrument in a rack:

1. Select the proper front-rail mounting holes for the stationary sections using the measurements shown in Fig. 6-2.
2. Mount the front-flanges of the stationary sections to the front rails of the rack with a bar nut and two pan-head screws (see Fig. 6-3A).

NOTE

If the rails of the rack are tapped, drill out these three holes with a 0.196-inch drill.

3. Mount the rear of the stationary sections to the rear rails using the method shown in either 6-3B or 6-3C. Be sure the tracks are mounted level.

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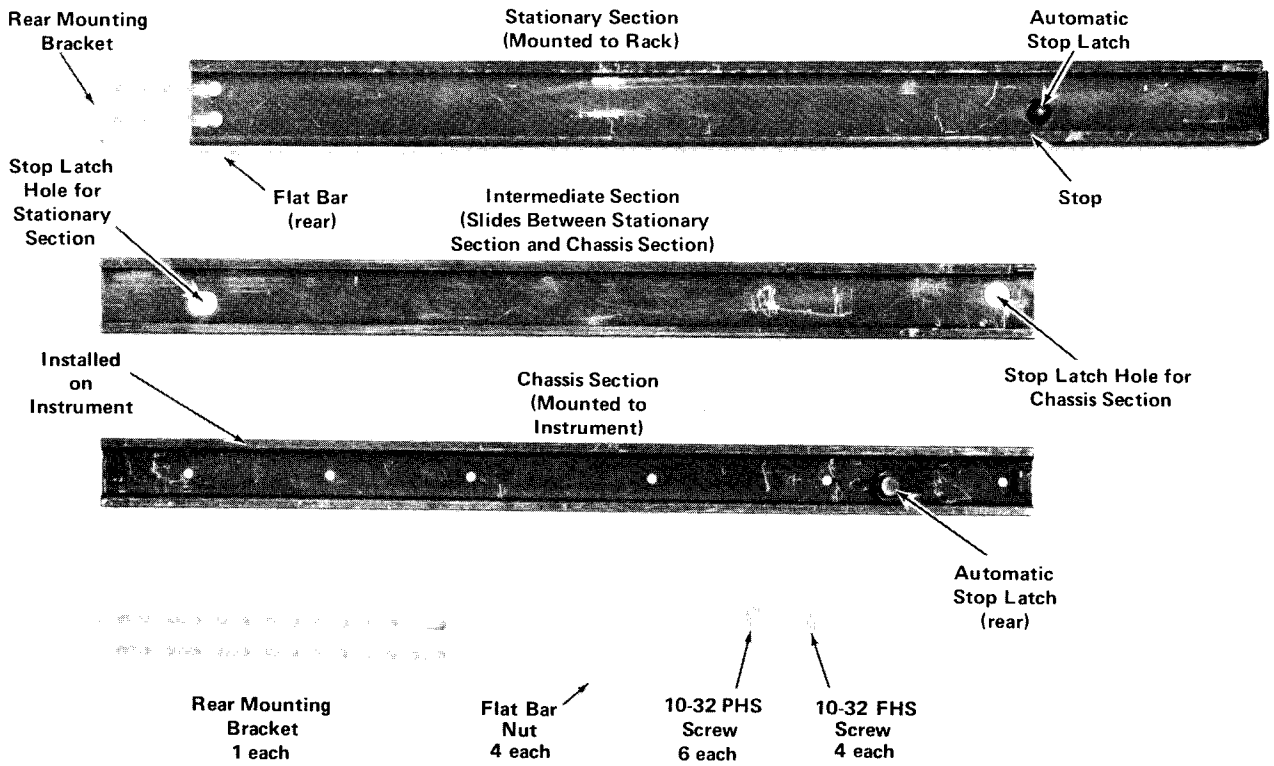


Fig. 6-1. Left side slide-out track assembly.

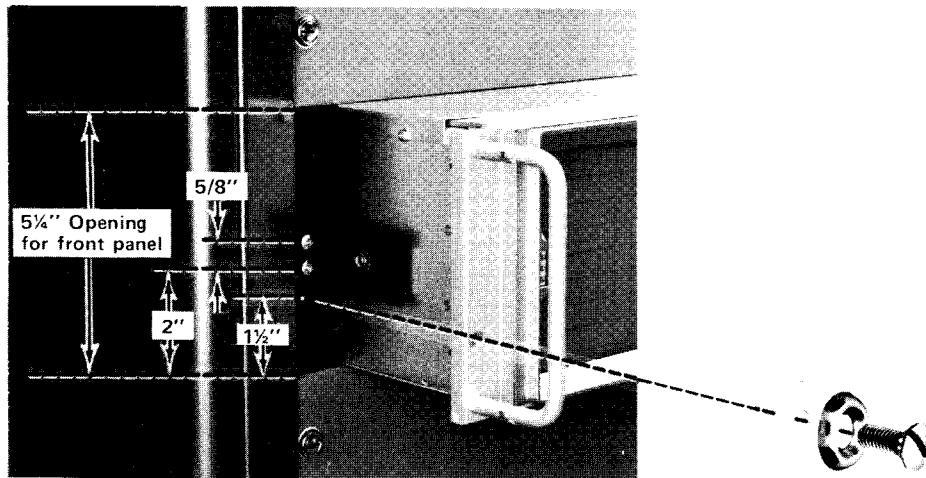


Fig. 6-2. Locating the mounting holes for the left stationary section. Same dimensions apply to right stationary section.

4. Refer to Fig. 6-4 to install the instrument into the rack.
5. Follow the procedure given in Fig. 6-5 to adjust the alignment of the stationary sections.

6. After the tracks operate smoothly, connect the power cord to the power source and connect any necessary cables to the rear panel connectors.
7. Push the instrument all the way into the rack and secure it to the front-rail of the rack with the securing

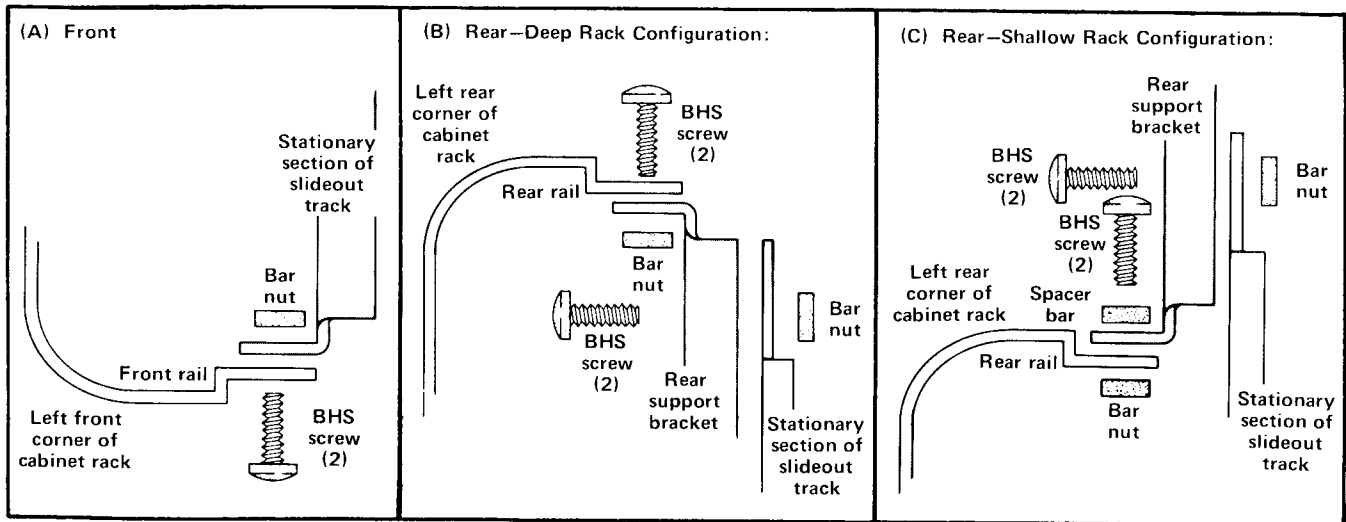


Fig. 6-3. Details for mounting stationary sections.

TO INSTALL

1. Pull the slideout track intermediate sections out to the fully extended position.
2. Insert the instrument chassis sections into the intermediate sections.
3. Press stop latches and push instrument toward rack until the latches snap into their holes.
4. Again press stop latches and push instrument into rack.
5. Secure the instrument in place with the front-panel securing screws.

NOTE

If the instrument does not slide all the way into the rack, loosen the screws used to join the stationary section and rear mounting bracket. Push the instrument into the rack and tighten the screws.

TO REMOVE

1. Remove the front-panel securing screws.
2. Pull the instrument outward until the stop latches snap into the holes.
3. Press stop latches and remove the instrument.

Fig. 6-4. Installing and removing the instrument after the tracks have been installed.

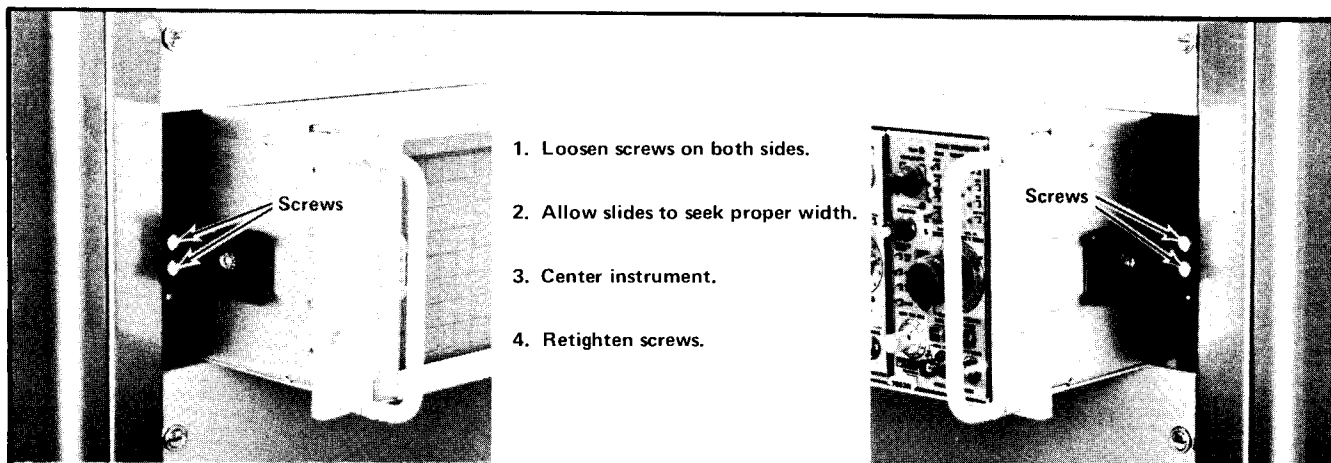


Fig. 6-5. Adjusting the slide-out tracks for smooth sliding action.

screws and washers shown in Fig. 6-2. If the securing hole is not tapped, use a "speed-nut" or similar item to install the securing screw.

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 Fig. 6-4. No further adjustments are required under normal conditions.

Slide-Out Track Lubrication

The special finish on the sliding surfaces of the slide-out tracks provides permanent lubrication. However, if the tracks do not slide smoothly even after proper adjustment, a thin coating of paraffin can be rubbed onto the sliding surfaces for additional lubrication.

NOTES

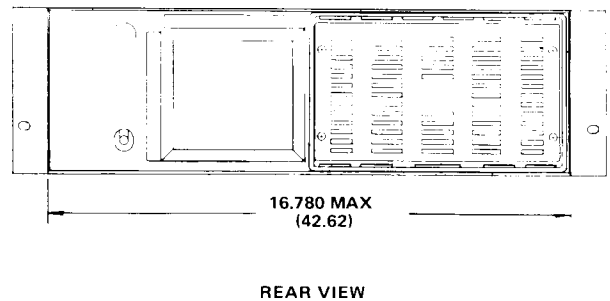
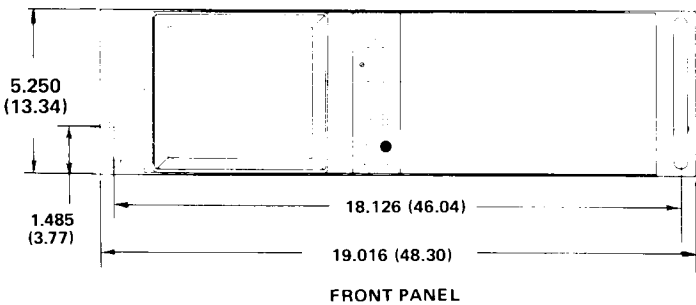
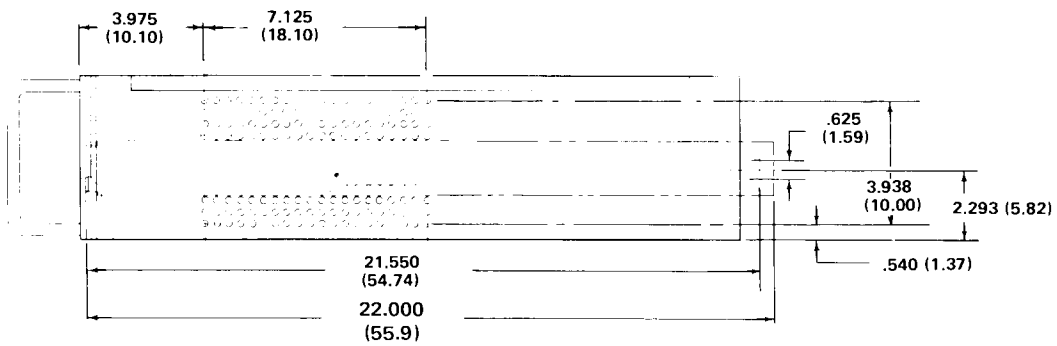
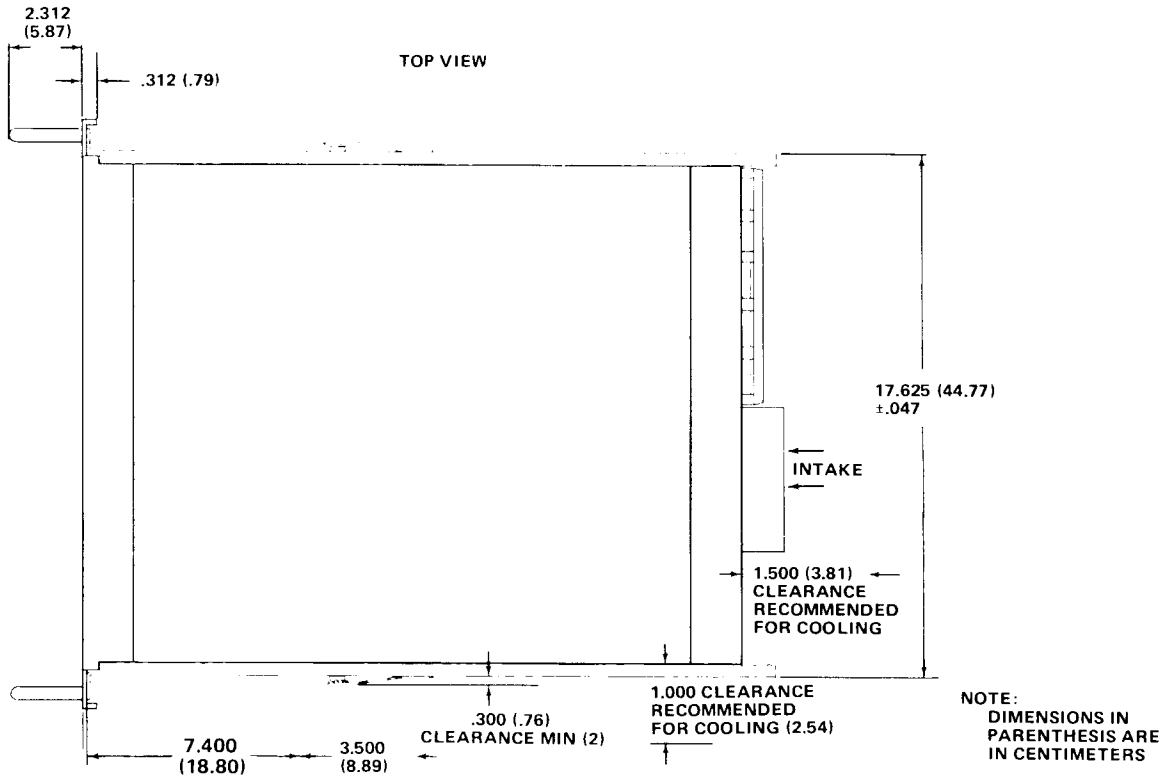


Fig. 6-6. Dimensional drawing.



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 |

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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 | DALLAS, TX 75222 |
| 02111 | SPECTROL ELECTRONICS CORPORATION | 17070 EAST GALE AVENUE | CITY OF INDUSTRY, CA 91745 |
| 02114 | FERROXCUBE CORPORATION | PO BOX 359, MARION ROAD | SAUGERTIES, NY 12477 |
| 02735 | RCA CORPORATION, SOLID STATE DIVISION | ROUTE 202 | SOMERVILLE, NY 08876 |
| 02777 | HOPKINS ENGINEERING COMPANY | 12900 FOOTHILL BLVD. | SAN FERNANDO, CA 91342 |
| 03508 | GENERAL ELECTRIC COMPANY, SEMI-CONDUCTOR PRODUCTS DEPARTMENT | ELECTRONICS PARK P O BOX 867 | SYRACUSE, NY 13201 |
| 04222 | AVX CERAMICS, DIVISION OF AVX CORP. | 5005 E MCDOWELL RD, PO BOX 20923 | MYRTLE BEACH, SC 29577 |
| 04713 | MOTOROLA, INC., SEMICONDUCTOR PROD. DIV. | 1300 ROCK STREET | PHOENIX, AZ 85036 |
| 05624 | BARBER-COLMAN COMPANY | | ROCKFORD, IL 61101 |
| 05828 | GENERAL INSTRUMENT CORP ELECTRONIC SYSTEMS DIV. | 600 W JOHN ST. | HICKSVILLE LI, NY 11802 |
| 07263 | FAIRCHILD SEMICONDUCTOR, A DIV. OF FAIRCHILD CAMERA AND INSTRUMENT CORP. | 464 ELLIS STREET | MOUNTAIN VIEW, CA 94042 |
| 12294 | ERIE TECHNOLOGICAL PROD. OF CANADA LTD. | 5 FRASER AVENUE | TRENTON, ONTARIO, CANADA |
| 12697 | CLAROSTAT MFG. CO., INC. | LOWER WASHINGTON STREET | DOVER, NH 03820 |
| 12954 | SIEMENS CORPORATION, COMPONENTS GROUP | 8700 E THOMAS RD, P O BOX 1390 | SCOTTSDALE, AZ 85252 |
| 12969 | UNITRODE CORPORATION | 580 PLEASANT STREET | WATERTOWN, MA 02172 |
| 13511 | AMPHENOL CARDRE DIV., BUNKER RAMO CORP. | | LOS GATOS, CA 95030 |
| 14193 | CAL-R, INC. | 1601 OLYMPIC BLVD. | SANTA MONICA, CA 90404 |
| 14552 | MICRO SEMICONDUCTOR CORP. | 2830 E FAIRVIEW ST. | SANTA ANA, CA 92704 |
| 14859 | TEXAS INSTRUMENTS INC., CONTROL DIV. | 300 NORTH MAIN | VERSAILLES, KY 40383 |
| 14936 | GENERAL INSTRUMENT CORP., SEMICONDUCTOR PRODUCTS GROUP | P.O. BOX 600, 600 W. JOHN ST. | HICKSVILLE, NY 11802 |
| 15454 | RODAN INDUSTRIES, INC. | 2905 BLUE STAR ST. | ANAHEIM, CA 92806 |
| 22526 | BERG ELECTRONICS, INC. | YOUK EXPRESSWAY | NEW CUMBERLAND, PA 17070 |
| 27014 | NATIONAL SEMICONDUCTOR CORP. | 2900 SEMICONDUCTOR DR. | SANTA CLARA, CA 95051 |
| 28875 | IMC MAGNETICS CORP., NEW HAMPSHIRE DIV. | ROUTE 16 | ROCHESTER, NH 03867 |
| 32997 | BOURNS, INC., TRIMPOT PRODUCTS DIV. | 1200 COLUMBIA AVE. | RIVERSIDE, CA 92507 |
| 50157 | MIDWEST COMPONENTS INC. | P. O. BOX 787 1981 PORT CITY BLVD. 2 WESTCHESTER PLAZA | MUSKEGON, MI 49443 ELMSFORD, NY 10523 |
| 51406 | MURATA CORPORATION OF AMERICA | 7485 AVENUE 304 | VISALIA, CA 93277 |
| 52306 | HIGH VOLTAGE DEVICES, INC. | 134 FULTON AVENUE | GARDEN CITY PARK, NY 11040 |
| 52769 | SPRAGUE GOODMAN ELEC., INC. | 1 PANASONIC WAY | SECAUCUS, NJ 07094 |
| 54473 | MATSUSHITA ELECTRIC, CORP. OF AMERICA | 6435 N PROESEL AVENUE | CHICAGO, IL 60645 |
| 55680 | NICHICON/AMERICA/CORP. | 87 MARSHALL ST. | NORTH ADAMS, MA 01247 |
| 56289 | SPRAGUE ELECTRIC CO. | 16931 MILLIKEN AVE. | IRVINE, CA 92713 |
| 57668 | R-OHM CORP. | 2155 N FORBES BLVD | TUCSON, AZ 85705 |
| 59660 | TUSONIX INC. | 7158 MERCHANT AVE | EL PASO, TX 79915 |
| 59821 | CENTRALAB INC SUB NORTH AMERICAN PHILIPS CORP | | |
| 60705 | CERA-MITE CORP. | 1327 6TH AVE. | GRAFTON, WI 53024 |
| 71400 | BUSSMAN MFG., DIVISION OF MCGRAW-EDISON CO. | 2536 W. UNIVERSITY ST. 644 W. 12TH ST. | ST. LOUIS, MO 63107 ERIE, PA 16512 |
| 72982 | ERIE TECHNOLOGICAL PRODUCTS, INC. | 2500 HARBOR BLVD. | FULLERTON, CA 92634 |
| 73138 | BECKMAN INSTRUMENTS, INC., HELIPOT DIV. | 1933 HECK AVE. | NEPTUNE, NJ 07753 |
| 74276 | SIGNALITE DIV., GENERAL INSTRUMENT CORP. | 299 10TH AVE. S. W. | WASECA, MN 56093 |
| 74970 | JOHNSON, E. F., CO. | | |
| 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 | WARMINSTER, PA 18974 |
| 80009 | TEKTRONIX, INC. | P O BOX 500 | BEAVERTON, OR 97077 |
| 83003 | VARO, INC. | P O BOX 411, 2203 WALNUT STREET | GARLAND, TX 75040 |
| 84411 | TRW ELECTRONIC COMPONENTS, TRW CAPACITORS | 112 W. FIRST ST. | OGALLALA, NE 69153 |
| 91637 | DALE ELECTRONICS, INC. | P. O. BOX 609 | COLUMBUS, NE 68601 |
| 91929 | HONEYWELL, INC., MICRO SWITCH DIV. | CHICAGO & SPRING STS. | FREEMPORT, IL 61032 |
| 92702 | IMC MAGNETICS CORP., EASTERN DIV. | 570 MAIN ST. | WESTBURY, L.I., NY 11591 |
| 92966 | SYLVANIA MINIATURE LIGHTING PRODUCTS, INC., SUB OF GTE SYLVANIA, LIGHT. PROD. | 526 ELM STREET | KEARNY, NJ 07032 |
| 93410 | ESSEX INTERNATIONAL, INC., CONTROLS DIV. LEXINGTON PLANT | | |
| 95121 | QUALITY COMPONENTS, INC. | P. O. BOX 1007 | MANSFIELD, OH 44903 |
| 96733 | SAN FERNANDO ELECTRIC MFG CO | P O BOX 113 1501 FIRST ST | ST. MARYS, PA 15857 SAN FERNANDO, CA 91341 |

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

| Mfr. Code | Manufacturer | Address | City, State, Zip |
|-----------|--|-------------------|---------------------|
| T0058 | NEC ELECTRON INC. | 252 HUMBOLT COURT | SUNNYVALE, CA 94086 |
| T0510 | PANASONIC COMPANY DIVISION OF MATSUSHITA ELECTRIC CORP OF AMERICA | ONE PANASONIC WAY | SECAUCUS, NJ 07094 |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|----------------------|---------|------------------------------------|----------|-----------------|
| A1 | 670-1956-00 | B010100 | B159999 | CKT BOARD ASSY:INTERFACE | 80009 | 670-1956-00 |
| A1 | 670-1956-01 | B160000 | B373096 | CKT BOARD ASSY:INTERFACE | 80009 | 670-1956-01 |
| A1 | 670-1956-03 | B373097 | | CKT BOARD ASSY:INTERFACE | 80009 | 670-1956-03 |
| A1 | 670-1956-04 | | | CKT BOARD ASSY:INTERFACE | 80009 | 670-1956-04 |
| A1 | ----- | | | (OPTION 20 ONLY) | | |
| A2 | 670-1370-02 | B010100 | B129999 | CKT BOARD ASSY:LOGIC | 80009 | 670-1370-02 |
| A2 | 670-1370-04 | B130000 | B373096 | CKT BOARD ASSY:LOGIC | 80009 | 670-1370-04 |
| A2 | 670-1370-06 | B373097 | | CKT BOARD ASSY:LOGIC | 80009 | 670-1370-06 |
| A3 | 670-1371-05 | | | CKT BOARD ASSY:TRIGGER SELECTOR | 80009 | 670-1371-05 |
| A4 | 670-1373-06 | B010100 | B112349 | CKT BOARD ASSY:VERTICAL INTERFACE | 80009 | 670-1373-06 |
| A4 | 670-1373-08 | B112350 | B372669 | CKT BOARD ASSY:VERTICAL INTERFACE | 80009 | 670-1373-08 |
| A4 | 670-1373-09 | B372670 | | CKT BOARD ASSY:VERTICAL INTERFACE | 80009 | 670-1373-09 |
| A5 | 670-1958-00 | B010100 | B019999 | CKT BOARD ASSY:VERTICAL AMPLIFIER | 80009 | 670-1958-00 |
| A5 | 670-1958-02 | B020000 | B343049 | CKT BOARD ASSY:VERTICAL AMPLIFIER | 80009 | 670-1958-02 |
| A5 | 670-1958-04 | B343050 | B343399 | CKT BOARD ASSY:VERTICAL AMPLIFIER | 80009 | 670-1958-04 |
| A5 | 670-1958-05 | B343400 | B369788 | CKT BOARD ASSY:VERTICAL AMPLIFIER | 80009 | 670-1958-05 |
| A5 | 670-1958-06 | B369789 | B372669 | CKT BOARD ASSY:VERTICAL AMPLIFIER | 80009 | 670-1958-06 |
| A5 | 670-1958-07 | B372670 | B376999 | CKT BOARD ASSY:VERTICAL AMPLIFIER | 80009 | 670-1958-07 |
| A5 | 670-1958-08 | B377000 | | CKT BOARD ASSY:VERTICAL AMPLIFIER | 80009 | 670-1958-08 |
| A6 | 670-1957-00 | B010100 | B029999 | CKT BOARD ASSY:HORIZ AMPLIFIER | 80009 | 670-1957-00 |
| A6 | 670-1957-01 | B030000 | B059999 | CKT BOARD ASSY:HORIZ AMPLIFIER | 80009 | 670-1957-01 |
| A6 | 670-1957-02 | B060000 | B169999 | CKT BOARD ASSY:HORIZ AMPLIFIER | 80009 | 670-1957-02 |
| A6 | 670-1957-03 | B170000 | | CKT BOARD ASSY:HORIZ AMPLIFIER | 80009 | 670-1957-03 |
| A7 | 670-1379-01 | | | CKT BOARD ASSY:VERTICAL MODE & CAL | 80009 | 670-1379-01 |
| A8 | 670-1951-01 | B010100 | B357899 | CKT BOARD ASSY:Z AXIS | 80009 | 670-1951-01 |
| A8 | 670-1951-04 | B357900 | | CKT BOARD ASSY:Z AXIS | 80009 | 670-1951-04 |
| A8 | 670-1951-02 | B030492 | B357899 | CKT BOARD ASSY:Z AXIS | 80009 | 670-1951-02 |
| A8 | ----- | | | (OPTION 04 ONLY) | | |
| A8 | 670-1951-05 | B357900 | | CKT BOARD ASSY:Z AXIS | 80009 | 670-1951-05 |
| A8 | ----- | | | (OPTION 04 ONLY) | | |
| A9 | 670-2128-00 | B010100 | B099999 | CKT BOARD ASSY:HIGH VOLTAGE | 80009 | 670-2128-00 |
| A9 | 670-2128-02 | B100000 | B149999 | CKT BOARD ASSY:HIGH VOLTAGE | 80009 | 670-2128-02 |
| A9 | 670-2128-04 | B150000 | B254774 | CKT BOARD ASSY:HIGH VOLTAGE | 80009 | 670-2128-04 |
| A9 | 670-2128-06 | B254775 | B329999 | CKT BOARD ASSY:HIGH VOLTAGE | 80009 | 670-2128-06 |
| A9 | 670-2128-08 | B330000 | | CKT BOARD ASSY:HIGH VOLTAGE | 80009 | 670-2128-08 |
| A9 | 670-2128-01 | B030492 | B099999 | CKT BOARD ASSY:HIGH VOLTAGE | 80009 | 670-2128-01 |
| A9 | ----- | | | (OPTION 04 ONLY) | | |
| A9 | 670-2128-03 | B100000 | B149999 | CKT BOARD ASSY:HIGH VOLTAGE | 80009 | 670-2128-03 |
| A9 | ----- | | | (OPTION 04 ONLY) | | |
| A9 | 670-2128-05 | B150000 | B254774 | CKT BOARD ASSY:HIGH VOLTAGE | 80009 | 670-2128-05 |
| A9 | ----- | | | (OPTION 04 ONLY) | | |
| A9 | 670-2128-07 | B254775 | B329999 | CKT BOARD ASSY:HIGH VOLTAGE | 80009 | 670-2128-07 |
| A9 | ----- | | | (OPTION 04 ONLY) | | |
| A9 | 670-2128-09 | B330000 | | CKT BOARD ASSY:HIGH VOLTAGE | 80009 | 670-2128-09 |
| A9 | ----- | | | (OPTION 04 ONLY) | | |
| A10 | 670-1382-05 | B010100 | B249999 | CKT BOARD ASSY:RECTIFIER | 80009 | 670-1382-05 |
| A10 | 670-1382-06 | B250000 | B375509 | CKT BOARD ASSY:RECTIFIER | 80009 | 670-1382-01 |
| A10 | 670-1382-07 | B375510 | | CKT BOARD ASSY:RECTIFIER | 80009 | 670-1382-07 |
| A11 | 670-1376-10 | B010100 | B199999 | CKT BOARD ASSY:REGULATOR | 80009 | 670-1376-10 |
| A11 | 670-1376-16 | B020000 | B309999 | CKT BOARD ASSY:REGULATOR | 80009 | 670-1376-16 |
| A11 | 670-1376-17 | B310000 | B343770 | CKT BOARD ASSY:REGULATOR | 80009 | 670-1376-17 |
| A11 | 670-1376-20 | B343771 | B369019 | CKT BOARD ASSY:REGULATOR | 80009 | 670-1376-20 |
| A11 | 670-1376-22 | B369020 | B371209 | CKT BOARD ASSY:REGULATOR | 80009 | 670-1376-22 |
| A11 | 670-1376-24 | B371210 | B373030 | CKT BOARD ASSY:REGULATOR | 80009 | 670-1376-24 |
| A11 | 670-1376-26 | B373031 | | CKT BOARD ASSY:REGULATOR | 80009 | 670-1376-26 |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|----------------------|---------|--|----------|------------------|
| A12 | 670-1961-00 | | | CKT BOARD ASSY:SIGNAL OUTPUT | 80009 | 670-1961-00 |
| A13 | 670-1900-01 | B010100 | B139999 | CKT BOARD ASSY:READOUT | 80009 | 670-1900-01 |
| A13 | 670-1900-03 | B140000 | B346349 | CKT BOARD ASSY:READOUT | 80009 | 670-1900-03 |
| A13 | 670-1900-04 | B346350 | B371798 | CKT BOARD ASSY:READOUT | 80009 | 670-1900-04 |
| A13 | 670-1900-05 | B371799 | B373408 | CKT BOARD ASSY:READOUT | 80009 | 670-1900-05 |
| A13 | 670-1900-06 | B373409 | | CKT BOARD ASSY:READOUT SYSTEM | 80009 | 670-1900-06 |
| A14 | 670-4346-00 | B270000 | | CKT BOARD ASSY:READOUT PROTECTION #1 | 80009 | 670-4346-00 |
| A15 | 670-4856-00 | B330000 | | CKT BOARD ASSY:FOCUS DC RESTORER | 80009 | 670-4856-00 |
| A16 | 670-4856-01 | B330000 | | CKT BOARD ASSY:Z AXIS DC RESTORER | 80009 | 670-4856-01 |
| A17 | 670-7774-00 | | | CKT BOARD ASSY:GPIB | 80009 | 670-7774-00 |
| A17 | ----- | | | (OPTION 20 ONLY. SEE RMPL FOR BREAKDOWN) | | |
| B1001 | 147-0008-00 | B368865 | | MOTOR,AC:SHADED P,3200 RMM,115V,60HZ | 05624 | AYAA-13080 |
| B1001 | 119-0390-00 | | | FAN,VENTILATING:115V,19W,3200 RPM | 28875 | MBS2107FL |
| B1001 | 119-0396-00 | | | FAN,TUBEAXIAL:115V,47-440HZ,40 CFM | 92702 | MBC2206F6 |
| B1001 | ----- | | | (OPTION 05 ONLY) | | |
| C1 | 290-0271-00 | B010100 | B373096 | CAP.,FXD,ELCTLT:9UF, +20-15%,125V | 56289 | 109D905C2125F2 |
| C1 | 290-0969-00 | B373097 | | CAP.,FXD,ELCTLT:22UF, +50-10%,100V | 55680 | TLB2A220TCAANA |
| C3 | 290-0302-00 | B010100 | B373096 | CAP.,FXD,ELCTLT:100UF,10%,20V | 12954 | ST613C107K010M |
| C3 | 290-0966-00 | B373097 | | CAP.,FXD,ELCTLT:220UF, +50-10%,25V | T0510 | ECEB1EV221S |
| C5 | 290-0302-00 | B010100 | B373096 | CAP.,FXD,ELCTLT:100UF,10%,20V | 12954 | ST613C107K010M |
| C5 | 290-0966-00 | B373097 | | CAP.,FXD,ELCTLT:220UF, +50-10%,25V | T0510 | ECEB1EV221S |
| C7 | 290-0302-00 | B010100 | B373096 | CAP.,FXD,ELCTLT:100UF,10%,20V | 12954 | ST613C107K010M |
| C7 | 290-0966-00 | B373097 | | CAP.,FXD,ELCTLT:220UF, +50-10%,25V | T0510 | ECEB1EV221S |
| C9 | 290-0271-00 | B010100 | B373096 | CAP.,FXD,ELCTLT:9UF, +20-15%,125V | 56289 | 109D905C2125F2 |
| C9 | 290-0969-00 | B373097 | | CAP.,FXD,ELCTLT:22UF, +50-10%,100V | 55680 | TLB2A220TCAANA |
| C16 | 283-0068-00 | | | CAP.,FXD,CER DI:0.01UF, +100-0%,500V | 59660 | 871-533E103P |
| C18 | 283-0068-00 | | | CAP.,FXD,CER DI:0.01UF, +100-0%,500V | 59660 | 871-533E103P |
| C44 | 283-0068-00 | B010100 | B159999 | CAP.,FXD,CER DI:0.01UF, +100-0%,500V | 59660 | 871-533E103P |
| C44 | 283-0081-00 | B160000 | | CAP.,FXD,CER DI:0.1UF, +80-20%,25V | 59821 | 2DDU69E104Z |
| C47 | 281-0638-00 | B010100 | B159999 | CAP.,FXD,CER DI:240PF,5%,500V | 72982 | 301000Z5D241J |
| C48 | 283-0068-00 | B010100 | B159999 | CAP.,FXD,CER DI:0.01UF, +100-0%,500V | 59660 | 871-533E103P |
| C48 | 283-0081-00 | B160000 | | CAP.,FXD,CER DI:0.1UF, +80-20%,25V | 59821 | 2DDU69E104Z |
| C55 | 283-0003-00 | | | CAP.,FXD,CER DI:0.01UF, +80-20%,150V | 59821 | 2DDH66J103Z |
| C58 | 283-0003-00 | | | CAP.,FXD,CER DI:0.01UF, +80-20%,150V | 59821 | 2DDH66J103Z |
| C59 | 283-0672-00 | | | CAP.,FXD,MICA D:200PF,1%,500V | 00853 | D155F2010F0 |
| C60 | 281-0564-00 | | | CAP.,FXD,CER DI:24PF,5%,500V | 59660 | 301-000C0G0240J |
| C67 | 281-0605-00 | B010100 | B373096 | CAP.,FXD,CER DI:200PF,10%,500V | 59660 | 301000Y5D201K |
| C67 | 281-0809-00 | B373097 | | CAP.,FXD,CER DI:200PF,5%,100V | 04222 | GC101A201J |
| C76 | 283-0000-00 | | | CAP.,FXD,CER DI:0.001UF, +100-0%,500V | 59660 | 831610Y5U0102P |
| C89 | 283-0003-00 | | | CAP.,FXD,CER DI:0.01UF, +80-20%,150V | 59821 | 2DDH66J103Z |
| C136 | 281-0547-00 | | | CAP.,FXD,CER DI:2.7PF,10%,500V | 04222 | 7001--COJ-2R7C |
| C137 | 283-0000-00 | | | CAP.,FXD,CER DI:0.001UF, +100-0%,500V | 59660 | 831610Y5U0102P |
| C138 | 281-0503-00 | | | CAP.,FXD,CER DI:8PF, +/-0.5PF,500V | 59660 | 0301-080-COHO-80 |
| C146 | 281-0547-00 | | | CAP.,FXD,CER DI:2.7PF,10%,500V | 04222 | 7001--COJ-2R7C |
| C148 | 281-0503-00 | | | CAP.,FXD,CER DI:8PF, +/-0.5PF,500V | 59660 | 0301-080-COHO-80 |
| C149 | 283-0000-00 | | | CAP.,FXD,CER DI:0.001UF, +100-0%,500V | 59660 | 831610Y5U0102P |
| C152 | 283-0000-00 | | | CAP.,FXD,CER DI:0.001UF, +100-0%,500V | 59660 | 831610Y5U0102P |
| C166 | 281-0547-00 | | | CAP.,FXD,CER DI:2.7PF,10%,500V | 04222 | 7001--COJ-2R7C |
| C168 | 281-0503-00 | | | CAP.,FXD,CER DI:8PF, +/-0.5PF,500V | 59660 | 0301-080-COHO-80 |
| C193 | 283-0026-00 | | | CAP.,FXD,CER DI:0.2UF, +80-20%,25V | 56289 | 274C3 |
| C195 | 283-0003-00 | | | CAP.,FXD,CER DI:0.01UF, +80-20%,150V | 59821 | 2DDH66J103Z |
| C196 | 283-0026-00 | | | CAP.,FXD,CER DI:0.2UF, +80-20%,25V | 56289 | 274C3 |
| C198 | 283-0026-00 | | | CAP.,FXD,CER DI:0.2UF, +80-20%,25V | 56289 | 274C3 |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|----------------------|---------|--------------------------------------|----------|------------------|
| C207 | 281-0538-00 | | | CAP.,FXD,CER DI:1PF,20%,500V | 95121 | OC-1MM 20% |
| C208 | 281-0528-00 | | | CAP.,FXD,CER DI:82PF, +/-8.2PF,500V | 59660 | 301-000U2M0820K |
| C215 | 281-0589-00 | | | CAP.,FXD,CER DI:170PF,5%,500V | 72982 | 301000Z5D0171J |
| C217 | 281-0537-00 | | | CAP.,FXD,CER DI:0.68PF,20%,600V | 95121 | OC-.68MM 20% |
| C220 | 283-0177-00 | | | CAP.,FXD,CER DI:1UF,+80-20%,25V | 04222 | SR302E105ZAA |
| C227 | 281-0503-00 | | | CAP.,FXD,CER DI:8PF,+/-0.5PF,500V | 59660 | 0301-080-COHO-80 |
| C260 | 283-0000-00 | | | CAP.,FXD,CER DI:0.001UF,+100-0%,500V | 59660 | 831610Y5U0102P |
| C301 | 283-0003-00 | | | CAP.,FXD,CER DI:0.01UF,+80-20%,150V | 59821 | 2DDH66J103Z |
| C305 | 283-0004-00 | | | CAP.,FXD,CER DI:0.02UF,+80-20%,150V | 59821 | SDDH69J203Z |
| C322 | 281-0572-00 | | | CAP.,FXD,CER DI:6.8PF,+/-0.5PF,500V | 59660 | 301-000C0H0689D |
| C329 | 281-0572-00 | | | CAP.,FXD,CER DI:6.8PF,+/-0.5PF,500V | 59660 | 301-000C0H0689D |
| C342 | 283-0000-00 | | | CAP.,FXD,CER DI:0.001UF,+100-0%,500V | 59660 | 831610Y5U0102P |
| C348 | 283-0000-00 | | | CAP.,FXD,CER DI:0.001UF,+100-0%,500V | 59660 | 831610Y5U0102P |
| C401 | 290-0522-00 | | | CAP.,FXD,ELCTLT:1UF,20%,50V | 56289 | 196D105X0050HA1 |
| C412 | 283-0103-00 | B344932 | | CAP.,FXD,CER DI:180PF,5%,500V | 59660 | 831-518-Z5D0181J |
| C412 | ----- | | | (NOMINAL VALUE,SELECTED) | | |
| C418 | 281-0629-00 | | | CAP.,FXD,CER DI:33PF,5%,600V | 04222 | 7027-C0G-330J |
| C420 | 281-0153-00 | | | CAP.,VAR,AIR DI:1.7-10PF,250V | 74970 | 187-0106-005 |
| C421 | 281-0504-00 | | | CAP.,FXD,CER DI:10PF,+/-1PF,500V | 04222 | 7001-COG-100F |
| C425 | 281-0160-00 | | | CAP.,VAR,CER DI:7-25PF,350V | 59660 | 538-011B7-25 |
| C427 | 281-0160-00 | | | CAP.,VAR,CER DI:7-25PF,350V | 59660 | 538-011B7-25 |
| C433 | 290-0522-00 | | | CAP.,FXD,ELCTLT:1UF,20%,50V | 56289 | 196D105X0050HA1 |
| C455 | 283-0100-00 | | | CAP.,FXD,CER DI:0.0047UF,10%,200V | 56289 | 2C20C0G472K200B |
| C456 | 283-0119-00 | | | CAP.,FXD,CER DI:2200PF,5%,200V | 59660 | 855-536Y5E0222J |
| C458 | 283-0116-00 | | | CAP.,FXD,CER DI:820PF,5%,500V | 59660 | 801547B821J |
| C460 | 281-0799-00 | B372670 | | CAP.,FXD,CER DI:62PF,2%,100V | 04222 | MA101A620GAA |
| C465 | 283-0211-00 | | | CAP.,FXD,CER DI:0.1UF,10%,200V | 04222 | SR406C104KAA |
| C466 | 283-0187-00 | B010100 | B029999 | CAP.,FXD,CER DI:0.047UF,10%,400V | 72982 | 8131N401X5R0473K |
| C466 | 283-0341-00 | B030000 | | CAP.,FXD,CER DI:0.047UF,10%,100V | 72982 | 8121N153X7R0473K |
| C468 | 283-0005-00 | | | CAP.,FXD,CER DI:0.01UF,+100-0%,250V | 72982 | 8131N300Z5U0103P |
| C480 | 290-0522-00 | | | CAP.,FXD,ELCTLT:1UF,20%,50V | 56289 | 196D105X0050HA1 |
| C486 | 283-0000-00 | | | CAP.,FXD,CER DI:0.001UF,+100-0%,500V | 59660 | 831610Y5U0102P |
| C492 | 290-0522-00 | | | CAP.,FXD,ELCTLT:1UF,20%,50V | 56289 | 196D105X0050HA1 |
| C494 | 283-0000-00 | | | CAP.,FXD,CER DI:0.001UF,+100-0%,500V | 59660 | 831610Y5U0102P |
| C496 | 281-0523-00 | | | CAP.,FXD,CER DI:100PF,+/-20PF,500V | 59660 | 301-000U2M0101M |
| C521 | ----- | B010100 | B029999 | (ADDED IF NECESSARY) | | |
| C522 | ----- | B010100 | B029999 | (ADDED IF NECESSARY) | | |
| C527 | 281-0504-00 | B010100 | B029999 | CAP.,FXD,CER DI:10PF,+/-1PF,500V | 04222 | 7001-COG-100F |
| C545 | 281-0550-00 | | | CAP.,FXD,CER DI:120PF,10%,500V | 59660 | 301000X5P121K |
| C552 | 283-0002-00 | | | CAP.,FXD,CER DI:0.01UF,+80-20%,500V | 59821 | SDDH69L103Z |
| C555 | 283-0083-00 | | | CAP.,FXD,CER DI:0.0047UF,20%,500V | 72982 | 811-565C471J |
| C566 | 281-0095-00 | B030000 | B059999 | CAP.,VAR,PLSTC:0.25-1.5PF,600V | 12294 | 057001 |
| C566 | 281-0064-00 | B060000 | | CAP.,VAR,PLSTC:0.25-1.5PF,600V | 74970 | 273-0001-101 |
| C567 | 281-0557-00 | B010100 | B029999 | CAP.,FXD,CER DI:1.8PF,10%,500V | 04222 | 7001-COK-1R8B |
| C568 | 281-0097-00 | B010100 | B029999 | CAP.,VAR,CER DI:9-35PF,200V | 72982 | 538-006-D9-35 |
| C568 | 281-0089-00 | B030000 | B059999 | CAP.,VAR,CER DI:2-8PF,350V | 59660 | 538-006-A2-8 |
| C569 | 281-0579-00 | B010100 | B029999 | CAP.,FXD,CER DI:21PF,5%,500V | 04222 | 7001-NPO-210J |
| C571 | 283-0002-00 | | | CAP.,FXD,CER DI:0.01UF,+80-20%,500V | 59821 | SDDH69L103Z |
| C574 | 283-0002-00 | | | CAP.,FXD,CER DI:0.01UF,+80-20%,500V | 59821 | SDDH69L103Z |
| C575 | 283-0083-00 | | | CAP.,FXD,CER DI:0.0047UF,20%,500V | 72982 | 811-565C471J |
| C584 | 281-0546-00 | B060000 | | CAP.,FXD,CER DI:330PF,10%,500V | 59660 | 301000X5P331K |
| C586 | 281-0095-00 | B030000 | B059999 | CAP.,VAR,PLSTC:0.25-1.5PF,600V | 12294 | 057001 |
| C586 | 281-0064-00 | B060000 | | CAP.,VAR,PLSTC:0.25-1.5PF,600V | 74970 | 273-0001-101 |
| C587 | 281-0557-00 | B010100 | B029999 | CAP.,FXD,CER DI:1.8PF,10%,500V | 04222 | 7001-COK-1R8B |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix | | Serial/Model No. | | Name & Description | Mfr Code | Mfr Part Number |
|---------|-------------|---------|------------------|--|---------------------------------------|----------|------------------|
| | Part No. | Eff | Dscont | | | | |
| C588 | 281-0092-00 | B010100 | B029999 | | CAP.,VAR,CER DI:9-35PF,200V | 59660 | 538-011 D9-35 |
| C588 | 281-0091-00 | B030000 | | | CAP.,VAR,CER DI:2-8PF,350V | 59660 | 538-011 A2-8 |
| C589 | 281-0579-00 | B010100 | B029999 | | CAP.,FXD,CER DI:21PF,5%,500V | 04222 | 7001-NPO-210J |
| C591 | 283-0002-00 | | | | CAP.,FXD,CER DI:0.01UF,+80-20%,500V | 59821 | SDDH69L103Z |
| C593 | 283-0002-00 | | | | CAP.,FXD,CER DI:0.01UF,+80-20%,500V | 59821 | SDDH69L103Z |
| C595 | 283-0081-00 | B010100 | B039999 | | CAP.,FXD,CER DI:0.1UF,+80-20%,25V | 59821 | 2DDU69E104Z |
| C595 | 283-0024-00 | B040000 | | | CAP.,FXD,CER DI:0.1UF,+80-20%,50V | 72982 | 8121N083Z5U0104Z |
| C597 | 283-0081-00 | B010100 | B039999 | | CAP.,FXD,CER DI:0.1UF,+80-20%,25V | 59821 | 2DDU69E104Z |
| C597 | 283-0024-00 | B040000 | | | CAP.,FXD,CER DI:0.1UF,+80-20%,50V | 72982 | 8121N083Z5U0104Z |
| C599 | 283-0081-00 | B010100 | B039999 | | CAP.,FXD,CER DI:0.1UF,+80-20%,25V | 59821 | 2DDU69E104Z |
| C599 | 283-0024-00 | B040000 | | | CAP.,FXD,CER DI:0.1UF,+80-20%,50V | 72982 | 8121N083Z5U0104Z |
| C605 | 281-0612-00 | B010100 | B285249 | | CAP.,FXD,CER DI:5.6PF,+/-0.5PF,500V | 59660 | 374-018-COH0569D |
| C605 | 281-0584-00 | B285250 | | | CAP.,FXD,CER DI:100PF,5%,500V | 72982 | 0301000Y5E0101J |
| C610 | 283-0000-00 | | | | CAP.,FXD,CER DI:0.001UF,+100-0%,500V | 59660 | 831610Y5U0102P |
| C615 | 281-0513-00 | | | | CAP.,FXD,CER DI:27PF,+/-5.4PF,500V | 59660 | 301-055P2G0270M |
| C619 | 283-0000-00 | | | | CAP.,FXD,CER DI:0.001UF,+100-0%,500V | 59660 | 831610Y5U0102P |
| C622 | 283-0003-00 | | | | CAP.,FXD,CER DI:0.01UF,+80-20%,150V | 59821 | 2DDH66J103Z |
| C637 | 281-0510-00 | | | | CAP.,FXD,CER DI:22PF,+/-4.4PF,500V | 59660 | 301-000C0G0220M |
| C639 | 283-0111-00 | | | | CAP.,FXD,CER DI:0.1UF,20%,50V | 96733 | R2632 |
| C643 | 283-0111-00 | | | | CAP.,FXD,CER DI:0.1UF,20%,50V | 96733 | R2632 |
| C662 | 283-0080-00 | | | | CAP.,FXD,CER DI:0.022UF,+80-20%,25V | 59821 | 2DDU60E223Z |
| C667 | 283-0000-00 | | | | CAP.,FXD,CER DI:0.001UF,+100-0%,500V | 59660 | 831610Y5U0102P |
| C669 | 283-0111-00 | | | | CAP.,FXD,CER DI:0.1UF,20%,50V | 96733 | R2632 |
| C679 | 283-0111-00 | | | | CAP.,FXD,CER DI:0.1UF,20%,50V | 96733 | R2632 |
| C806 | 290-0468-00 | | | | CAP.,FXD,ELCTLT:250UF,+75-10%,150V | 56289 | 68D10470 |
| C808 | 290-0507-00 | | | | CAP.,FXD,ELCTLT:1800UF,+75-10%,75V | 56289 | 68D10472 |
| C809 | 290-0507-00 | | | | CAP.,FXD,ELCTLT:1800UF,+75-10%,75V | 56289 | 68D10472 |
| C810 | 285-0555-00 | | | | CAP.,FXD,PLSTC:0.1UF,20%,100V | 56289 | 192P10302 |
| C811 | 290-0581-00 | | | | CAP.,FXD,ELCTLT:14,000UF,+75-10%,25V | 56289 | 68D10489 |
| C813 | 290-0506-00 | | | | CAP.,FXD,ELCTLT:9600UF,+100-10%,25V | 56289 | 68D10471 |
| C814 | 290-0506-00 | | | | CAP.,FXD,ELCTLT:9600UF,+100-10%,25V | 56289 | 68D10471 |
| C820 | 285-0555-00 | | | | CAP.,FXD,PLSTC:0.1UF,20%,100V | 56289 | 192P10302 |
| C821 | 290-0508-00 | | | | CAP.,FXD,ELCTLT:18,000UF,+100-10%,15V | 56289 | 68D10444 |
| C823 | 283-0004-00 | | | | CAP.,FXD,CER DI:0.02UF,+80-20%,150V | 59821 | SDDH69J203Z |
| C827 | 283-0077-00 | B070000 | | | CAP.,FXD,CER DI:330PF,5%,500V | 59660 | 831-500B331J |
| C858 | 283-0078-00 | | | | CAP.,FXD,CER DI:0.001UF,20%,500V | 59660 | 0801 547X5F0102M |
| C866 | 283-0078-00 | B010100 | B373030 | | CAP.,FXD,CER DI:0.001UF,20%,500V | 59660 | 0801 547X5F0102M |
| C866 | 283-0032-00 | B373031 | | | CAP.,FXD,CER DI:470PF,5%,500V | 59660 | 0831085Z5E00471J |
| C876 | 283-0328-00 | B060000 | | | CAP.,FXD,CER DI:0.03UF,+80-20%,200V | 72982 | 8131N225Z5U0303Z |
| C880 | 283-0638-00 | | | | CAP.,FXD,MICA D:130PF,1%,100V | 00853 | D151F131F0 |
| C889 | 290-0415-00 | B010100 | B343770 | | CAP.,FXD,ELCTLT:5.6UF,10%,35V | 56289 | 150D565X9035B2 |
| C889 | 290-0782-00 | B343771 | B369019 | | CAP.,FXD,ELCTLT:4.7UF,+75-10%,35V | 55680 | ULA1V4R7TEA |
| C889 | 290-0525-00 | B369020 | | | CAP.,FXD,ELCTLT:4.7UF,20%,50V | 56289 | 196D475X0050KA1 |
| C923 | 281-0591-00 | B010100 | B344949 | | CAP.,FXD,CER DI:5600PF,20%,200V | 72982 | 393001Z5V0562Z |
| C923 | 283-0180-00 | B344950 | B373030 | | CAP.,FXD,CER DI:5600PF,20%,200V | 72982 | 8121N204 E 562M |
| C923 | 281-0812-00 | B373031 | | | CAP.,FXD,CER DI:1000PF,10%,100V | 04222 | MA101C102KAA |
| C936 | 283-0178-00 | B060000 | | | CAP.,FXD,CER DI:0.1UF,+80-20%,100V | 72982 | 8131N145651 104Z |
| C943 | 283-0078-00 | B090000 | | | CAP.,FXD,CER DI:0.001UF,20%,500V | 59660 | 0801 547X5F0102M |
| C950 | 283-0083-00 | B010100 | B344449 | | CAP.,FXD,CER DI:0.0047UF,20%,500V | 72982 | 811-565C471J |
| C950 | 283-0239-00 | B344450 | | | CAP.,FXD,CER DI:0.022UF,10%,50V | 72982 | 8121N083X7R0223K |
| C975 | 283-0000-00 | B010175 | B373030 | | CAP.,FXD,CER DI:0.001UF,+100-0%,500V | 59660 | 831610Y5U0102P |
| C979 | 281-0591-00 | B010100 | B344949 | | CAP.,FXD,CER DI:5600PF,20%,200V | 72982 | 393001Z5V0562Z |
| C979 | 283-0180-00 | B344950 | B373030 | | CAP.,FXD,CER DI:5600PF,20%,200V | 72982 | 8121N204 E 562M |
| C979 | 281-0812-00 | B373031 | | | CAP.,FXD,CER DI:1000PF,10%,100V | 04222 | MA101C102KAA |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix Part No. | Serial/Model No. | | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|------------------|---------|--------------------------------------|----------|------------------|
| | | Eff | Dscont | | | |
| C985 | 283-0083-00 | | | CAP.,FXD,CER DI:0.0047UF,20%,500V | 72982 | 811-565C471J |
| C1002 | 285-0562-00 | | | CAP.,FXD,PLSTC:0.47UF,20%,400V | 56289 | 430P474X04M016 |
| C1002 | ----- | | | (OPTION 05 ONLY) | | |
| C1064 | 285-0703-00 | | | CAP.,FXD,PLSTC:0.1UF,5%,100V | 56289 | 192P10452 |
| C1079 | 281-0605-00 | | | CAP.,FXD,CER DI:200PF,10%,500V | 59660 | 301000Y5D201K |
| C1105 | 283-0003-00 | | | CAP.,FXD,CER DI:0.01UF,+80-20%,150V | 59821 | 2DDH66J103Z |
| C1124 | 283-0004-00 | B010100 | B319999 | CAP.,FXD,CER DI:0.02UF,+80-20%,150V | 59821 | SDDH69J203Z |
| C1124 | 283-0068-00 | B320000 | | CAP.,FXD,CER DI:0.01UF,+100-0%,500V | 59660 | 871-533E103P |
| C1126 | 283-0004-00 | | | CAP.,FXD,CER DI:0.02UF,+80-20%,150V | 59821 | SDDH69J203Z |
| C1128 | 283-0111-00 | | | CAP.,FXD,CER DI:0.1UF,20%,50V | 96733 | R2632 |
| C1131 | 283-0004-00 | B010100 | B319999 | CAP.,FXD,CER DI:0.02UF,+80-20%,150V | 59821 | SDDH69J203Z |
| C1131 | 283-0068-00 | B320000 | | CAP.,FXD,CER DI:0.01UF,+100-0%,500V | 59660 | 871-533E103P |
| C1138 | 281-0053-00 | | | CAP.,VAR,PLSTC:0.7-3PF,350V | 52769 | ER535-060 |
| C1141 | 283-0004-00 | | | CAP.,FXD,CER DI:0.02UF,+80-20%,150V | 59821 | SDDH69J203Z |
| C1144 | 283-0004-00 | B010100 | B319999 | CAP.,FXD,CER DI:0.02UF,+80-20%,150V | 59821 | SDDH69J203Z |
| C1144 | 283-0068-00 | B320000 | | CAP.,FXD,CER DI:0.01UF,+100-0%,500V | 59660 | 871-533E103P |
| C1146 | 283-0004-00 | | | CAP.,FXD,CER DI:0.02UF,+80-20%,150V | 59821 | SDDH69J203Z |
| C1148 | 283-0111-00 | | | CAP.,FXD,CER DI:0.1UF,20%,50V | 96733 | R2632 |
| C1151 | 283-0004-00 | B010100 | B319999 | CAP.,FXD,CER DI:0.02UF,+80-20%,150V | 59821 | SDDH69J203Z |
| C1151 | 283-0068-00 | B320000 | | CAP.,FXD,CER DI:0.01UF,+100-0%,500V | 59660 | 871-533E103P |
| C1158 | 281-0053-00 | | | CAP.,VAR,PLSTC:0.7-3PF,350V | 52769 | ER535-060 |
| C1184 | 283-0003-00 | | | CAP.,FXD,CER DI:0.01UF,+80-20%,150V | 59821 | 2DDH66J103Z |
| C1193 | 283-0003-00 | | | CAP.,FXD,CER DI:0.01UF,+80-20%,150V | 59821 | 2DDH66J103Z |
| C1196 | 283-0004-00 | B010100 | B319999 | CAP.,FXD,CER DI:0.02UF,+80-20%,150V | 59821 | SDDH69J203Z |
| C1196 | 283-0068-00 | B320000 | | CAP.,FXD,CER DI:0.01UF,+100-0%,500V | 59660 | 871-533E103P |
| C1215 | 285-0629-00 | B010100 | B329999 | CAP.,FXD,PLSTC:0.047UF,20%,100V | 56289 | 192P47302 |
| C1215 | 283-0341-00 | B330000 | | CAP.,FXD,CER DI:0.047UF,10%,100V | 72982 | 8121N153X7R0473K |
| C1222 | 290-0272-00 | B010100 | B029999 | CAP.,FXD,ELCTLT:47UF,20%,50V | 56289 | 109D476X0050F2 |
| C1222 | 290-0287-00 | B030000 | B329999 | CAP.,FXD,ELCTLT:47UF,20%,25V | 56289 | 30D476X0025CC4 |
| C1222 | 290-0770-00 | B330000 | | CAP.,FXD,ELCTLT:100UF,+50-10%,25V | 56289 | 502D230 |
| C1232 | 283-0082-00 | B010100 | B329999 | CAP.,FXD,CER DI:0.01UF,+80-20%,4000V | 59660 | 3904SW703C1037 |
| C1232 | 283-0261-00 | B330000 | | CAP.,FXD,CER DI:0.01UF,20%,4000V | 04222 | 5742-0001 |
| C1234 | 283-0082-00 | | | CAP.,FXD,CER DI:0.01UF,+80-20%,4000V | 59660 | 3904SW703C1037 |
| C1240 | 290-0410-00 | B010100 | B329999 | CAP.,FXD,ELCTLT:15UF,+50-10%,100V | 56289 | 30D156F100DD4 |
| C1240 | 290-0768-00 | B330000 | | CAP.,FXD,ELCTLT:10UF,+50-10%,100V | 54473 | ECE-A100V10L |
| C1241 | 283-0203-00 | B010100 | B109999 | CAP.,FXD,CER DI:0.47UF,20%,50V | 04222 | 5R305SE474MAA |
| C1241 | 283-0221-00 | B110000 | | CAP.,FXD,CER DI:0.47UF,20%,50V | 72982 | 8131N087X7R0474M |
| C1241 | 283-0129-00 | B112360 | | CAP.,FXD,CER DI:0.56UF,20%,100V | 56289 | 3C37X5R564M050B |
| C1241 | ----- | | | (OPTION 04 ONLY) | | |
| C1247 | 283-0279-00 | B010100 | B329999 | CAP.,FXD,CER DI:0.001UF,20%,3000V | 59660 | 878-521-S-Y5S-10 |
| C1247 | 283-0188-00 | B330000 | | CAP.,FXD,CER DI:0.001UF,20%,6000V | 59660 | 8486KVX5T0102M |
| C1247 | 283-0271-00 | B030492 | B329999 | CAP.,FXD,CER DI:0.001UF,20%,4000V | 59660 | 0828552Y5SO102M |
| C1247 | ----- | | | (OPTION 04 ONLY) | | |
| C1247 | 283-0188-00 | B330000 | | CAP.,FXD,CER DI:0.001UF,20%,6000V | 59660 | 8486KVX5T0102M |
| C1247 | ----- | | | (OPTION 04 ONLY) | | |
| C1250 | 283-0013-00 | B010100 | B329999 | CAP.,FXD,CER DI:0.01UF,+100-0%,1000V | 59660 | 818-602ZSUO103P |
| C1250 | 283-0188-00 | B330000 | | CAP.,FXD,CER DI:0.001UF,20%,6000V | 59660 | 8486KVX5T0102M |
| C1254 | 283-0279-00 | B010100 | B329999 | CAP.,FXD,CER DI:0.001UF,20%,3000V | 59660 | 878-521-S-Y5S-10 |
| C1254 | 283-0271-00 | B030492 | B329999 | CAP.,FXD,CER DI:0.001UF,20%,4000V | 59660 | 0828552Y5SO102M |
| C1254 | ----- | | | (OPTION 04 ONLY) | | |
| C1255 | 283-0279-00 | B010100 | B329999 | CAP.,FXD,CER DI:0.001UF,20%,3000V | 59660 | 878-521-S-Y5S-10 |
| C1255 | 283-0271-00 | B030492 | B329999 | CAP.,FXD,CER DI:0.001UF,20%,4000V | 59660 | 0828552Y5SO102M |
| C1255 | ----- | | | (OPTION 04 ONLY) | | |
| C1257 | 281-0513-00 | | | CAP.,FXD,CER DI:27PF,+/-5.4PF,500V | 59660 | 301-055P2G0270M |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|----------------------|---------|---|----------|------------------|
| C1258 | 290-0164-00 | | | CAP.,FXD,ELCTLT:1UF, + 50-10%,150V | 56289 | 500D105F150BA7 |
| C1264 | 290-0164-00 | B010100 | B329999 | CAP.,FXD,ELCTLT:1UF, + 50-10%,150V | 56289 | 500D105F150BA7 |
| C1264 | 290-0766-00 | B330000 | | CAP.,FXD,ELCTLT:2.2UF, + 50-10%,160V | 54473 | ECEA2CS2R2 |
| C1266 | 281-0513-00 | | | CAP.,FXD,CER DI:27PF, +/-5.4PF,500V | 59660 | 301-055P2G0270M |
| C1268 | 283-0279-00 | B010100 | B329999 | CAP.,FXD,CER DI:0.001UF,20%,3000V | 59660 | 878-521-S-Y5S-10 |
| C1268 | 283-0271-00 | B030492 | B329999 | CAP.,FXD,CER DI:0.001UF,20%,4000V | 59660 | 0828552Y5S0102M |
| C1268 | ----- | | | (OPTION 04 ONLY) | | |
| C1269 | 283-0082-00 | B010100 | B329999 | CAP.,FXD,CER DI:0.01UF, + 80-20%,4000V | 59660 | 3904SW703C1037 |
| C1275 | 281-0543-00 | B010100 | B099999 | CAP.,FXD,CER DI:270PF,10%,500V | 72982 | 301055X5P271K |
| C1275 | 281-0589-00 | B100000 | B329999 | CAP.,FXD,CER DI:170PF,5%,500V | 72982 | 301000Z5D0171J |
| C1275 | 281-0638-00 | B330000 | | CAP.,FXD,CER DI:240PF,5%,500V | 72982 | 301000Z5D241J |
| C1276 | 283-0279-00 | B010100 | B099999 | CAP.,FXD,CER DI:0.001UF,20%,3000V | 59660 | 878-521-S-Y5S-10 |
| C1276 | 283-0261-00 | B100000 | B329999 | CAP.,FXD,CER DI:0.01UF,20%,4000V | 04222 | 5742-0001 |
| C1276 | 283-0034-00 | B330000 | | CAP.,FXD,CER DI:0.005UF,20%,4000V | 51406 | DHR23Z5V502M4KV |
| C1276 | 283-0271-00 | B030492 | B329999 | CAP.,FXD,CER DI:0.001UF,20%,4000V | 59660 | 0828552Y5S0102M |
| C1276 | ----- | | | (OPTION 04 ONLY) | | |
| C1276 | 283-0034-00 | B330000 | | CAP.,FXD,CER DI:0.005UF,20%,4000V | 51406 | DHR23Z5V502M4KV |
| C1276 | ----- | | | (OPTION 04 ONLY) | | |
| C1310 | 283-0402-00 | B330000 | | CAP.,FXD,CER,DI:0.001UF, + 80-20%,4000V | 60705 | 564CZA402EL102ZA |
| C1312 | 283-0402-00 | B330000 | | CAP.,FXD,CER,DI:0.001UF, + 80-20%,4000V | 60705 | 564CZA402EL102ZA |
| C1410 | 283-0402-00 | B330000 | | CAP.,FXD,CER,DI:0.001UF, + 80-20%,4000V | 60705 | 564CZA402EL102ZA |
| C1411 | 283-0402-00 | B330000 | | CAP.,FXD,CER,DI:0.001UF, + 80-20%,4000V | 60705 | 564CZA402EL102ZA |
| C1412 | 283-0402-00 | B330000 | | CAP.,FXD,CER,DI:0.001UF, + 80-20%,4000V | 60705 | 564CZA402EL102ZA |
| C2101 | 283-0004-00 | | | CAP.,FXD,CER DI:0.02UF, + 80-20%,.150V | 59821 | SDDH69J203Z |
| C2109 | 283-0003-00 | | | CAP.,FXD,CER DI:0.01UF, + 80-20%,.150V | 59821 | 2DDH66J103Z |
| C2112 | 283-0077-00 | | | CAP.,FXD,CER DI:330PF,5%,500V | 59660 | 831-500B331J |
| C2115 | 290-0534-00 | B010100 | B371798 | CAP.,FXD,ELCTLT:1UF,20%,.35V | 56289 | 196D105X0035HA1 |
| C2115 | 290-0782-00 | B371799 | | CAP.,FXD,ELCTLT:4.7UF, + 75-10%,.35V | 55680 | ULA1V4R7TEA |
| C2117 | 290-0534-00 | B010100 | B371798 | CAP.,FXD,ELCTLT:1UF,20%,.35V | 56289 | 196D105X0035HA1 |
| C2117 | 290-0782-00 | B371799 | | CAP.,FXD,ELCTLT:4.7UF, + 75-10%,.35V | 55680 | ULA1V4R7TEA |
| C2119 | 290-0534-00 | B010100 | B371798 | CAP.,FXD,ELCTLT:1UF,20%,.35V | 56289 | 196D105X0035HA1 |
| C2119 | 290-0782-00 | B371799 | | CAP.,FXD,ELCTLT:4.7UF, + 75-10%,.35V | 55680 | ULA1V4R7TEA |
| C2121 | 283-0594-00 | | | CAP.,FXD,MICA D:0.001UF,1%,100V | 00853 | D151F102F0 |
| C2135 | 285-0698-00 | | | CAP.,FXD,PLSTC:0.0082UF,5%,100V | 84411 | TEK44-82251 |
| C2140 | 283-0103-00 | | | CAP.,FXD,CER DI:180PF,5%,500V | 59660 | 831-518-Z5D0181J |
| C2144 | 281-0544-00 | B010100 | B371798 | CAP.,FXD,CER DI:5.6PF,10%,500V | 04222 | 7001-COH-5R6D |
| C2144 | 281-0810-00 | B371799 | | CAP.,FXD,CER DI:5.6PF,0.5%,100V | 04222 | GC10-1A5R6D |
| C2145 | 290-0534-00 | B010100 | B371798 | CAP.,FXD,ELCTLT:1UF,20%,.35V | 56289 | 196D105X0035HA1 |
| C2145 | 290-0782-00 | B371799 | | CAP.,FXD,ELCTLT:4.7UF, + 75-10%,.35V | 55680 | ULA1V4R7TEA |
| C2155 | 283-0103-00 | | | CAP.,FXD,CER DI:180PF,5%,500V | 59660 | 831-518-Z5D0181J |
| C2183 | 283-0032-00 | | | CAP.,FXD,CER DI:470PF,5%,500V | 59660 | 0831085Z5E00471J |
| C2185 | 283-0004-00 | | | CAP.,FXD,CER DI:0.02UF, + 80-20%,.150V | 59821 | SDDH69J203Z |
| C2214 | 283-0032-00 | | | CAP.,FXD,CER DI:470PF,5%,500V | 59660 | 0831085Z5E00471J |
| C2242 | 283-0000-00 | | | CAP.,FXD,CER DI:0.001UF, + 100-0%,500V | 59660 | 831610Y5U0102P |
| C2244 | 283-0004-00 | | | CAP.,FXD,CER DI:0.02UF, + 80-20%,.150V | 59821 | SDDH69J203Z |
| C2255 | 283-0000-00 | | | CAP.,FXD,CER DI:0.001UF, + 100-0%,500V | 59660 | 831610Y5U0102P |
| C2281 | 283-0054-00 | B140000 | | CAP.,FXD,CER DI:150PF,5%,200V | 59660 | 855-535U2J0 151J |
| C2284 | 283-0251-00 | B373409 | | CAP.,FXD,CER DI:87 PF,5%,100V | 72982 | 8121B145C0G0870J |
| CR26 | 152-0141-02 | | | SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR27 | 152-0141-02 | | | SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR33 | 152-0141-02 | | | SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR42 | 152-0141-02 | B010100 | B159999 | SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR44 | 152-0141-02 | B160000 | | SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR48 | 152-0141-02 | B160000 | | SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix Part No. | Serial/Model No. | | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|------------------|---------|---|----------|------------------|
| | | Eff | Dscont | | | |
| CR84 | 152-0333-00 | | | SEMICON DVC DI:SW,SI,55V,200MA,DO-35 | 03508 | DJ2011 |
| CR85 | 152-0333-00 | | | SEMICON DVC DI:SW,SI,55V,200MA,DO-35 | 03508 | DJ2011 |
| CR93 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR124 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR125 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR126 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR130 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR140 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR155 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR160 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR238 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR341 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR349 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR460 | 152-0269-00 | B010100 | B372669 | SEMICON DEVICE:SILICON,VAR V CAP,.4V,33PF | 04713 | SMV1263 |
| CR461 | 152-0269-00 | B010100 | B372669 | SEMICON DEVICE:SILICON,VAR V CAP,.4V,33PF | 04713 | SMV1263 |
| CR496 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR530 | 152-0153-00 | | | SEMICON DVC,DI:SW,SI,10V,50MA,DO-7 | 07263 | FD7003 |
| CR531 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR532 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR533 | 152-0153-00 | | | SEMICON DVC,DI:SW,SI,10V,50MA,DO-7 | 07263 | FD7003 |
| CR543 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR544 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR549 | 152-0153-00 | | | SEMICON DVC,DI:SW,SI,10V,50MA,DO-7 | 07263 | FD7003 |
| CR621 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR622 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR635 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR641 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR672 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR674 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR676 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR806 | 152-0488-00 | | | SEMICON DEVICE:SILICON,200V,1500MA | 04713 | SDA317 |
| CR808 | 152-0488-00 | | | SEMICON DEVICE:SILICON,200V,1500MA | 04713 | SDA317 |
| CR811 | 152-0406-00 | | | SEMICON DEVICE:SILICON,200V,3A | 80009 | 152-0406-00 |
| CR820 | 152-0423-00 | | | SEMICON DEVICE:SILICON,400V,3A | 04713 | 1N5000 |
| CR821 | 152-0423-00 | | | SEMICON DEVICE:SILICON,400V,3A | 04713 | 1N5000 |
| CR852 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR861 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR867 | 152-0061-00 | | | SEMICON DEVICE:SILICON,175V,100MA | 07263 | FDH2161 |
| CR868 | 152-0061-00 | | | SEMICON DEVICE:SILICON,175V,100MA | 07263 | FDH2161 |
| CR875 | 152-0066-00 | | | SEMICON DVC DI:RECT,SI,400V,1A,DO-41 | 05828 | GP10G-020 |
| CR883 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR885 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR888 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR891 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR894 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR895 | 152-0141-02 | B200000 | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR896 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR903 | 152-0066-00 | | | SEMICON DVC DI:RECT,SI,400V,1A,DO-41 | 05828 | GP10G-020 |
| CR920 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR924 | 152-0061-00 | | | SEMICON DEVICE:SILICON,175V,100MA | 07263 | FDH2161 |
| CR925 | 152-0061-00 | | | SEMICON DEVICE:SILICON,175V,100MA | 07263 | FDH2161 |
| CR935 | 152-0066-00 | | | SEMICON DVC DI:RECT,SI,400V,1A,DO-41 | 05828 | GP10G-020 |
| CR941 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR950 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix | | Serial/Model No. | | Name & Description | Mfr Code | Mfr Part Number |
|---------|-------------|---------|------------------|--|--|----------|------------------|
| | Part No. | Eff | Dscont | | | | |
| CR951 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR952 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR958 | 152-0066-00 | | | | SEMICON DVC,DI:RECT,SI,400V,1A,D0-41 | 05828 | GP10G-020 |
| CR961 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR973 | 152-0061-00 | B050000 | | | SEMICON DEVICE:SILICON,175V,100MA | 07263 | FDH2161 |
| CR980 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR981 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR989 | 152-0066-00 | | | | SEMICON DVC,DI:RECT,SI,400V,1A,D0-41 | 05828 | GP10G-020 |
| CR1021 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR1023 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR1024 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR1026 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR1028 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR1115 | 152-0153-00 | | | | SEMICON DVC,DI:SW,SI,10V,50MA,D0-7 | 07263 | FD7003 |
| CR1215 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR1216 | 152-0141-02 | B150000 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR1232 | 152-0409-00 | | | | SEMICON DEVICE:SILICON,12,000V,5MA | 83003 | VG12X-1 |
| CR1244 | 152-0333-00 | | | | SEMICON DVC,DI:SW,SI,55V,200MA,D0-35 | 03508 | DJ2011 |
| CR1253 | 152-0242-00 | B010100 | B329999 | | SEMICON DVC,SIG,SI,225V,0.2A,D0-7 | 07263 | FDH5004 |
| CR1254 | 152-0242-00 | B010100 | B329999 | | SEMICON DVC,SIG,SI,225V,0.2A,D0-7 | 07263 | FDH5004 |
| CR1255 | 152-0242-00 | B010100 | B329999 | | SEMICON DVC,SIG,SI,225V,0.2A,D0-7 | 07263 | FDH5004 |
| CR1258 | 152-0242-00 | | | | SEMICON DVC,SIG,SI,225V,0.2A,D0-7 | 07263 | FDH5004 |
| CR1262 | 152-0586-00 | B330000 | | | SEMICON DEVICE:SILICON,600V,500MA | 14936 | RGP10J-011 |
| CR1263 | 152-0586-00 | B330000 | | | SEMICON DEVICE:SILICON,600V,500MA | 14936 | RGP10J-011 |
| CR1264 | 152-0242-00 | | | | SEMICON DVC,SIG,SI,225V,0.2A,D0-7 | 07263 | FDH5004 |
| CR1268 | 152-0242-00 | B010100 | B329999 | | SEMICON DVC,SIG,SI,225V,0.2A,D0-7 | 07263 | FDH5004 |
| CR1269 | 152-0242-00 | B010100 | B329999 | | SEMICON DVC,SIG,SI,225V,0.2A,D0-7 | 07263 | FDH5004 |
| CR1270 | 152-0242-00 | B010100 | B329999 | | SEMICON DVC,SIG,SI,225V,0.2A,D0-7 | 07263 | FDH5004 |
| CR1313 | 152-0242-00 | B330000 | | | SEMICON DVC,SIG,SI,225V,0.2A,D0-7 | 07263 | FDH5004 |
| CR1315 | 152-0242-00 | B330000 | | | SEMICON DVC,SIG,SI,225V,0.2A,D0-7 | 07263 | FDH5004 |
| CR1317 | 152-0242-00 | B330000 | | | SEMICON DVC,SIG,SI,225V,0.2A,D0-7 | 07263 | FDH5004 |
| CR1413 | 152-0242-00 | B330000 | | | SEMICON DVC,SIG,SI,225V,0.2A,D0-7 | 07263 | FDH5004 |
| CR1415 | 152-0242-00 | B330000 | | | SEMICON DVC,SIG,SI,225V,0.2A,D0-7 | 07263 | FDH5004 |
| CR1417 | 152-0242-00 | B330000 | | | SEMICON DVC,SIG,SI,225V,0.2A,D0-7 | 07263 | FDH5004 |
| CR2124 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR2125 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR2127 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR2140 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR2141 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR2142 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR2145 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR2146 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR2156 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR2157 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR2162 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR2163 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR2166 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR2167 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR2170 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR2171 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR2174 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR2175 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR2192 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |
| CR2193 | 152-0141-02 | | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V.DO-35 | 12969 | NDP0263 (1N4152) |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix Part No. | Serial/Model No. | | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|------------------|---------|---|----------|------------------|
| | | Eff | Dscont | | | |
| CR2196 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR2198 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR2226 | 152-0141-02 | | | SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35 | 12969 | NDP0263 (1N4152) |
| CR2335 | 152-0333-00 | B270000 | | SEMICON DVC DI:SW,SI,55V,200MA,DO-35 | 03508 | DJ2011 |
| THRU | ----- | | | | | |
| CR2366 | 152-0333-00 | B270000 | | SEMICON DVC DI:SW,SI,55V,200MA,DO-35 | 03508 | DJ2011 |
| DL400 | 119-0288-02 | | | DELAY LINE,ELEC:148NS,100 OHM,W/BEAM ROTR | 80009 | 119-0288-02 |
| DS1001 | 150-0121-02 | | | LAMP,CARTRIDGE:GREEN,5V,60MA | 80009 | 150-0121-02 |
| DS1090 | 150-0047-00 | | | LAMP,INCAND:6.3V,0.2A #398,MIDGET GRV | 92966 | 398 |
| DS1091 | 150-0047-00 | | | LAMP,INCAND:6.3V,0.2A #398,MIDGET GRV | 92966 | 398 |
| DS1092 | 150-0047-00 | | | LAMP,INCAND:6.3V,0.2A #398,MIDGET GRV | 92966 | 398 |
| DS1270 | 150-0030-00 | B330000 | | LAMP,GLOW:NEON,T-2.60 TO 90 VOLTS | 74276 | NE2V-T |
| DS1271 | 150-0030-00 | B330000 | | LAMP,GLOW:NEON,T-2.60 TO 90 VOLTS | 74276 | NE2V-T |
| DS1272 | 150-0030-00 | B330000 | | LAMP,GLOW:NEON,T-2.60 TO 90 VOLTS | 74276 | NE2V-T |
| DS1273 | 150-0030-00 | B330000 | | LAMP,GLOW:NEON,T-2.60 TO 90 VOLTS | 74276 | NE2V-T |
| DS1274 | 150-0030-00 | B330000 | | LAMP,GLOW:NEON,T-2.60 TO 90 VOLTS | 74276 | NE2V-T |
| F805 | 159-0153-00 | B375510 | | FUSE,WIRE LEAD:1.5A,125V,FAST BLOW | 71400 | GFA 1-1/2 |
| F814 | 159-0021-00 | | | FUSE,CARTRIDGE:3AG,2A,250V,FAST-BLOW | 71400 | AGC 2 |
| F820 | 159-0096-00 | B375510 | | FUSE,CARTRIDGE:3AG,7.5A,32V,0.5 SEC | 80009 | 159-0096-00 |
| F855 | 159-0083-00 | | | FUSE,CARTRIDGE:0.15A,250V,FAST-BLOW | 71400 | AGC 15/100 |
| F1000 | 159-0026-00 | B010100 | B357055 | FUSE,CARTRIDGE:3AG,3.2A,125V,SLOW-BLOW | 71400 | MDX 3 2/10 |
| F1000 | 159-0015-00 | B357056 | B368899 | FUSE,CARTRIDGE:3AG,3A,250V,0.65 SEC | 71400 | AGC 3 |
| F1000 | 159-0023-00 | B368900 | | FUSE,CARTRIDGE:3AG,2A,250V,5 SEC | 71400 | MDX2 |
| F1000 | 159-0019-00 | B010100 | B371741 | FUSE,CARTRIDGE:3AG,1A,250V,SLOW BLOW | 71400 | MDL1 |
| F1000 | 159-0041-00 | B371742 | | FUSE,CARTRIDGE:3AG,1.25A,250V,SLOW-BLOW | 71400 | MDX 1 25/100 |
| FL1000 | 119-0113-05 | B010100 | B357055 | FILTER,RFI:3.25A,250V,400HZ | 72982 | 9604-000-9000 |
| FL1000 | ----- | | | (OPTION 03 ONLY) | | |
| FL1000 | 119-0420-01 | B357056 | | FILTER,RFI:6A,250VAC,48-440 HZ | 02777 | F12034-6 |
| FL1000 | ----- | | | (OPTION 03 ONLY) | | |
| FL1000 | 119-1924-00 | | | FILTER,RFI:6A | | |
| FL1000 | ----- | | | (OPTION 23 ONLY) | | |
| J1 | 131-0767-02 | B010100 | B039999 | CONNECTOR,RCPT,:76 CONTACT | 80009 | 131-0767-02 |
| J1 | 131-0767-08 | B040000 | | CONNECTOR,RCPT,:PLUG-IN CKT BD,70 CONTACT | 80009 | 131-0767-08 |
| J2 | 131-0767-02 | B010100 | B039999 | CONNECTOR,RCPT,:76 CONTACT | 80009 | 131-0767-02 |
| J2 | 131-0767-08 | B040000 | | CONNECTOR,RCPT,:PLUG-IN CKT BD,70 CONTACT | 80009 | 131-0767-08 |
| J3 | 131-0767-00 | B010100 | B039999 | CONNECTOR,RCPT,:76 CONTACT | 80009 | 131-0767-00 |
| J3 | 131-0767-07 | B040000 | | CONNECTOR,RCPT,:PLUG-IN CKT BD,70 CONTACT | 80009 | 131-0767-07 |
| J3 | 131-0767-00 | | | CONNECTOR,RCPT,:76 CONTACT | 80009 | 131-0767-00 |
| J3 | ----- | | | (OPTION 20 ONLY) | | |
| J26 | 131-1003-00 | | | CONN,RCPT,ELEC:CKT BD MT,3 PRONG | 80009 | 131-1003-00 |
| J27 | 131-1003-00 | | | CONN,RCPT,ELEC:CKT BD MT,3 PRONG | 80009 | 131-1003-00 |
| J401 | 131-1003-00 | | | CONN,RCPT,ELEC:CKT BD MT,3 PRONG | 80009 | 131-1003-00 |
| J409 | 131-1003-00 | | | CONN,RCPT,ELEC:CKT BD MT,3 PRONG | 80009 | 131-1003-00 |
| J431 | 131-1003-00 | | | CONN,RCPT,ELEC:CKT BD MT,3 PRONG | 80009 | 131-1003-00 |
| J503 | 131-1003-00 | | | CONN,RCPT,ELEC:CKT BD MT,3 PRONG | 80009 | 131-1003-00 |
| J508 | 131-1003-00 | | | CONN,RCPT,ELEC:CKT BD MT,3 PRONG | 80009 | 131-1003-00 |
| J601 | 131-1003-00 | | | CONN,RCPT,ELEC:CKT BD MT,3 PRONG | 80009 | 131-1003-00 |
| J603 | 131-1003-00 | | | CONN,RCPT,ELEC:CKT BD MT,3 PRONG | 80009 | 131-1003-00 |
| J629 | 131-0955-00 | | | CONN,RCPT,ELEC:BNC,FEMALE | 13511 | 31-279 |
| J649 | 131-0955-00 | | | CONN,RCPT,ELEC:BNC,FEMALE | 13511 | 31-279 |
| J679 | 131-0955-00 | | | CONN,RCPT,ELEC:BNC,FEMALE | 13511 | 31-279 |
| J1047 | 131-0955-00 | | | CONN,RCPT,ELEC:BNC,FEMALE | 13511 | 31-279 |
| J1049 | 131-0955-00 | | | CONN,RCPT,ELEC:BNC,FEMALE | 13511 | 31-279 |
| J1050 | 131-0955-00 | | | CONN,RCPT,ELEC:BNC,FEMALE | 13511 | 31-279 |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|----------------------|---------|----------------------------------|----------|-----------------|
| J1132 | 131-1003-00 | | | CONN.RCPT,ELEC:CKT BD MT.3 PRONG | 80009 | 131-1003-00 |
| J2132 | 131-1003-00 | | | CONN.RCPT,ELEC:CKT BD MT.3 PRONG | 80009 | 131-1003-00 |
| J2138 | 131-1003-00 | | | CONN.RCPT,ELEC:CKT BD MT.3 PRONG | 80009 | 131-1003-00 |
| J2139 | 131-1003-00 | | | CONN.RCPT,ELEC:CKT BD MT.3 PRONG | 80009 | 131-1003-00 |
| J2192 | 131-1003-00 | | | CONN.RCPT,ELEC:CKT BD MT.3 PRONG | 80009 | 131-1003-00 |
| J2296 | 131-1003-00 | | | CONN.RCPT,ELEC:CKT BD MT.3 PRONG | 80009 | 131-1003-00 |
| L425 | 108-0707-00 | | | COIL,RF:150NH | 80009 | 108-0707-00 |
| L475 | 276-0528-00 | B010100 | B343049 | SHIELDING BEAD.:0.1UH | 02114 | 56-0590-65C/3B |
| L479 | 276-0528-00 | B010100 | B343049 | SHIELDING BEAD.:0.1UH | 02114 | 56-0590-65C/3B |
| L1098 | 108-0605-00 | | | COIL,TUBE DEFLE:Y AXIS ALIGNMENT | 80009 | 108-0605-00 |
| L1099 | 108-0647-00 | | | COIL,TUBE DEFLE:TRACE ROTATION | 80009 | 108-0647-00 |
| L1099 | ----- | | | (FURNISHED AS A UNIT WITH DL400) | | |
| L1222 | 108-0646-00 | B010100 | B149999 | COIL,RF:80UH | 80009 | 108-0646-00 |
| L1222 | 108-0422-00 | B150000 | | COIL,RF:FIXED.82UH | 80009 | 108-0422-00 |
| L2283 | 108-0331-00 | | | COIL,RF:0.75UH | 80009 | 108-0331-00 |
| LR55 | 108-0245-00 | B130000 | | COIL,RF:3.9UH | 76493 | B6310-1 |
| LR193 | 108-0604-00 | B010100 | B129999 | COIL,RF:3.2UH | 80009 | 108-0604-00 |
| LR193 | 108-0245-00 | B130000 | | COIL,RF:3.9UH | 76493 | B6310-1 |
| LR195 | 108-0604-00 | B010100 | B129999 | COIL,RF:3.2UH | 80009 | 108-0604-00 |
| LR195 | 108-0245-00 | B130000 | | COIL,RF:3.9UH | 76493 | B6310-1 |
| LR198 | 108-0604-00 | B010100 | B129999 | COIL,RF:3.2UH | 80009 | 108-0604-00 |
| LR198 | 108-0245-00 | B130000 | | COIL,RF:3.9UH | 76493 | B6310-1 |
| LR442 | 108-0284-00 | B377000 | | COIL,RF:FIXED.0.1UH | 80009 | 108-0284-00 |
| LR444 | 108-0284-00 | B377000 | | COIL,RF:FIXED.0.1UH | 80009 | 108-0284-00 |
| LR473 | 108-0715-00 | | | COIL,RF:FIXED.240NH | 80009 | 108-0715-00 |
| LR479 | 108-0715-00 | | | COIL,RF:FIXED.240NH | 80009 | 108-0715-00 |
| LR482 | 108-0331-00 | | | COIL,RF:0.75UH | 80009 | 108-0331-00 |
| P60 | 131-0589-00 | B160000 | | TERMINAL,PIN:0.46 L X 0.025 SQ | 22526 | 48283-029 |
| Q90 | 151-0232-00 | | | TRANSISTOR:SILICON,NPN,DUAL | 07263 | SP12141 |
| Q108 | 151-0199-00 | | | TRANSISTOR:PNP,SI,T0-92 | 04713 | SPS6866K |
| Q132 | 151-0199-00 | | | TRANSISTOR:PNP,SI,T0-92 | 04713 | SPS6866K |
| Q137 | 151-0223-00 | | | TRANSISTOR:NPN,SI,T0-92 | 04713 | SPS8026 |
| Q142 | 151-0199-00 | | | TRANSISTOR:PNP,SI,T0-92 | 04713 | SPS6866K |
| Q147 | 151-0223-00 | | | TRANSISTOR:NPN,SI,T0-92 | 04713 | SPS8026 |
| Q150 | 151-0223-00 | | | TRANSISTOR:NPN,SI,T0-92 | 04713 | SPS8026 |
| Q162 | 151-0199-00 | | | TRANSISTOR:PNP,SI,T0-92 | 04713 | SPS6866K |
| Q167 | 151-0223-00 | | | TRANSISTOR:NPN,SI,T0-92 | 04713 | SPS8026 |
| Q236 | 151-0232-00 | | | TRANSISTOR:SILICON,NPN,DUAL | 07263 | SP12141 |
| Q238 | 151-0190-00 | | | TRANSISTOR:NPN,SI,T0-92 | 04713 | SPS7969 |
| Q242 | 151-0221-00 | | | TRANSISTOR:SILICON,PNP | 04713 | SPS246 |
| Q252 | 151-0221-00 | | | TRANSISTOR:SILICON,PNP | 04713 | SPS246 |
| Q314 | 151-0190-00 | | | TRANSISTOR:NPN,SI,T0-92 | 04713 | SPS7969 |
| Q334 | 151-0190-00 | | | TRANSISTOR:NPN,SI,T0-92 | 04713 | SPS7969 |
| Q336 | 151-0190-00 | | | TRANSISTOR:NPN,SI,T0-92 | 04713 | SPS7969 |
| Q344 | 151-0221-00 | | | TRANSISTOR:SILICON,PNP | 04713 | SPS246 |
| Q346 | 151-0221-00 | | | TRANSISTOR:SILICON,PNP | 04713 | SPS246 |
| Q407 | 151-0301-00 | | | TRANSISTOR:SILICON,PNP | 27014 | 2N2907A |
| Q415 | 151-0301-00 | | | TRANSISTOR:SILICON,PNP | 27014 | 2N2907A |
| Q496 | 151-0190-00 | | | TRANSISTOR:NPN,SI,T0-92 | 04713 | SPS7969 |
| Q539 | 151-0220-00 | | | TRANSISTOR:PNP,SI,T0-92 | 07263 | S036228 |
| Q547 | 151-0220-00 | | | TRANSISTOR:PNP,SI,T0-92 | 07263 | S036228 |
| Q551 | 151-0103-00 | | | TRANSISTOR:SILICON,NPN | 80009 | 151-0103-00 |
| Q553 | 151-0103-00 | | | TRANSISTOR:SILICON,NPN | 80009 | 151-0103-00 |
| Q558 | 151-0270-00 | B010100 | B029999 | TRANSISTOR:SILICON,PNP | 04713 | ORD BY DESCR |
| Q558 | 151-0406-00 | B030000 | | TRANSISTOR:SILICON,PNP | 04713 | ORD BY DESCR |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix | Serial/Model No. | | Name & Description | Mfr | Mfr Part Number |
|---------|-------------|------------------|---------|--|-------|-----------------|
| | Part No. | Eff | Dscont | | Code | |
| Q560 | 151-0347-00 | B010100 | B341619 | TRANSISTOR:SILICON,NPN | 56289 | T7916 |
| Q560 | 151-0347-01 | B341620 | | TRANSISTOR:SILICON,NPN,PRESTRESSED | 80009 | 151-0347-01 |
| Q578 | 151-0270-00 | B010100 | B029999 | TRANSISTOR:SILICON,PNP | 04713 | ORD BY DESCR |
| Q578 | 151-0406-00 | B030000 | | TRANSISTOR:SILICON,PNP | 04713 | ORD BY DESCR |
| Q580 | 151-0347-00 | B010100 | B341619 | TRANSISTOR:SILICON,NPN | 56289 | T7916 |
| Q580 | 151-0347-01 | B341620 | | TRANSISTOR:SILICON,NPN,PRESTRESSED | 80009 | 151-0347-01 |
| Q606 | 151-0221-00 | | | TRANSISTOR:SILICON,PNP | 04713 | SPS246 |
| Q618 | 151-0221-00 | | | TRANSISTOR:SILICON,PNP | 04713 | SPS246 |
| Q620 | 151-0220-00 | B010100 | B285249 | TRANSISTOR:PNP,SI,TO-92 | 07263 | S036228 |
| Q620 | 151-0221-00 | B285250 | | TRANSISTOR:SILICON,PNP | 04713 | SPS246 |
| Q631 | 151-0190-00 | | | TRANSISTOR:NPN,SI,TO-92 | 04713 | SPS7969 |
| Q634 | 151-0190-00 | | | TRANSISTOR:NPN,SI,TO-92 | 04713 | SPS7969 |
| Q640 | 151-0220-00 | | | TRANSISTOR:PNP,SI,TO-92 | 07263 | S036228 |
| Q662 | 151-0190-00 | | | TRANSISTOR:NPN,SI,TO-92 | 04713 | SPS7969 |
| Q666 | 151-0190-00 | | | TRANSISTOR:NPN,SI,TO-92 | 04713 | SPS7969 |
| Q672 | 151-0188-00 | | | TRANSISTOR:PNP,SI,TO-92 | T0058 | 2N3906 |
| Q827 | 151-0223-00 | | | TRANSISTOR:NPN,SI,TO-92 | 04713 | SPS8026 |
| Q829 | 151-0223-00 | | | TRANSISTOR:NPN,SI,TO-92 | 04713 | SPS8026 |
| Q835 | 151-0334-00 | | | TRANSISTOR:SILICON,NPN | 04713 | SJE914 |
| Q850 | 151-0337-00 | | | TRANSISTOR:SILICON,NPN | 02735 | 61443 |
| Q852 | 151-0276-00 | | | TRANSISTOR:SILICON,PNP | 04713 | 2N5087 |
| Q860 | 151-0347-00 | | | TRANSISTOR:SILICON,NPN | 56289 | T7916 |
| Q863 | 151-0347-00 | | | TRANSISTOR:SILICON,NPN | 56289 | T7916 |
| Q869 | 151-0347-00 | | | TRANSISTOR:SILICON,NPN | 56289 | T7916 |
| Q872 | 151-0279-00 | B010100 | B309999 | TRANSISTOR:SILICON,NPN | 07263 | S25381 |
| Q872 | 151-0407-00 | B310000 | | TRANSISTOR:SILICON,NPN | 04713 | SS2456 |
| Q874 | 151-0336-00 | B010100 | B193849 | TRANSISTOR:SILICON,NPN | 04713 | SJ7023 |
| Q874 | 151-0487-00 | B193850 | | TRANSISTOR:SILICON,NPN,SEL FROM 2N3773 | 04713 | SJ7025 |
| Q876 | 151-0232-00 | | | TRANSISTOR:SILICON,NPN,DUAL | 07263 | SP12141 |
| Q886 | 151-0232-00 | | | TRANSISTOR:SILICON,NPN,DUAL | 07263 | SP12141 |
| Q896 | 151-0228-00 | | | TRANSISTOR:SILICON,PNP,SEL FROM 2N4888 | 80009 | 151-0228-00 |
| Q900 | 151-0347-00 | | | TRANSISTOR:SILICON,NPN | 56289 | T7916 |
| Q903 | 151-0336-00 | B010100 | B193849 | TRANSISTOR:SILICON,NPN | 04713 | SJ7023 |
| Q903 | 151-0487-00 | B193850 | | TRANSISTOR:SILICON,NPN,SEL FROM 2N3773 | 04713 | SJ7025 |
| Q908 | 151-0292-00 | | | TRANSISTOR:SILICON,NPN | 56289 | ORDER BY DESCR |
| Q909 | 151-0292-00 | | | TRANSISTOR:SILICON,NPN | 56289 | ORDER BY DESCR |
| Q910 | 151-0292-00 | | | TRANSISTOR:SILICON,NPN | 56289 | ORDER BY DESCR |
| Q919 | 151-0232-00 | | | TRANSISTOR:SILICON,NPN,DUAL | 07263 | SP12141 |
| Q926 | 151-0347-00 | | | TRANSISTOR:SILICON,NPN | 56289 | T7916 |
| Q931 | 151-0260-02 | | | TRANSISTOR:SILICON,NPN | 04713 | ST1149 |
| Q933 | 151-0337-00 | B010100 | B193849 | TRANSISTOR:SILICON,NPN | 02735 | 61443 |
| Q933 | 151-0487-00 | B193850 | | TRANSISTOR:SILICON,NPN,SEL FROM 2N3773 | 04713 | SJ7025 |
| Q936 | 151-0232-00 | | | TRANSISTOR:SILICON,NPN,DUAL | 07263 | SP12141 |
| Q943 | 151-0232-00 | | | TRANSISTOR:SILICON,NPN,DUAL | 07263 | SP12141 |
| Q952 | 151-0134-00 | | | TRANSISTOR:SILICON,PNP | 80009 | 151-0134-00 |
| Q956 | 151-0260-00 | | | TRANSISTOR:SILICON,NPN | 04713 | ST1083 |
| Q958 | 151-0337-00 | B010100 | B193849 | TRANSISTOR:SILICON,NPN | 02735 | 61443 |
| Q958 | 151-0487-00 | B193850 | | TRANSISTOR:SILICON,NPN,SEL FROM 2N3773 | 04713 | SJ7025 |
| Q964 | 151-0232-00 | | | TRANSISTOR:SILICON,NPN,DUAL | 07263 | SP12141 |
| Q985 | 151-0136-00 | | | TRANSISTOR:SILICON,NPN | 02735 | 35495 |
| Q988 | 151-0337-00 | | | TRANSISTOR:SILICON,NPN | 02735 | 61443 |
| Q1061 | 151-0224-00 | | | TRANSISTOR:SILICON,NPN | 07263 | SA24850 |
| Q1066 | 151-0224-00 | | | TRANSISTOR:SILICON,NPN | 07263 | SA24850 |
| Q1070 | 151-0220-00 | | | TRANSISTOR:PNP,SI,TO-92 | 07263 | S036228 |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix | | Serial/Model No. | | Name & Description | Mfr | |
|---------|-------------|---------|------------------|--|-----------------------------------|-------|-----------------|
| | Part No. | Eff | Dscont | | | Code | Mfr Part Number |
| Q1072 | 151-0220-00 | | | | TRANSISTOR:PNP,SI,TO-92 | 07263 | S036228 |
| Q1107 | 151-0190-00 | | | | TRANSISTOR:NPN,SI,TO-92 | 04713 | SPS7969 |
| Q1110 | 151-0188-00 | | | | TRANSISTOR:PNP,SI,TO-92 | T0058 | 2N3906 |
| Q1118 | 151-0188-00 | | | | TRANSISTOR:PNP,SI,TO-92 | T0058 | 2N3906 |
| Q1128 | 151-0188-00 | | | | TRANSISTOR:PNP,SI,TO-92 | T0058 | 2N3906 |
| Q1132 | 151-0270-00 | B010100 | B029999 | | TRANSISTOR:SILICON,PNP | 04713 | ORD BY DESCR |
| Q1132 | 151-0406-00 | B030000 | | | TRANSISTOR:SILICON,PNP | 04713 | ORD BY DESCR |
| Q1134 | 151-0347-00 | | | | TRANSISTOR:SILICON,NPN | 56289 | T7916 |
| Q1136 | 151-0223-00 | | | | TRANSISTOR:NPN,SI,TO-92 | 04713 | SPS8026 |
| Q1148 | 151-0188-00 | | | | TRANSISTOR:PNP,SI,TO-92 | T0058 | 2N3906 |
| Q1152 | 151-0270-00 | B010100 | B029999 | | TRANSISTOR:SILICON,PNP | 04713 | ORD BY DESCR |
| Q1152 | 151-0406-00 | B030000 | | | TRANSISTOR:SILICON,PNP | 04713 | ORD BY DESCR |
| Q1154 | 151-0347-00 | | | | TRANSISTOR:SILICON,NPN | 56289 | T7916 |
| Q1156 | 151-0223-00 | B010100 | B090000 | | TRANSISTOR:NPN,SI,TO-92 | 04713 | SPS8026 |
| Q1156 | 151-0195-00 | B100000 | | | TRANSISTOR:SILICON,NPN | 80009 | 151-0195-00 |
| Q1201 | 151-0126-00 | | | | TRANSISTOR:SILICON,NPN | 04713 | ST1046 |
| Q1206 | 151-0188-00 | | | | TRANSISTOR:PNP,SI,TO-92 | T0058 | 2N3906 |
| Q1214 | 151-0136-00 | | | | TRANSISTOR:SILICON,NPN | 02735 | 35495 |
| Q1216 | 151-0140-00 | | | | TRANSISTOR:SILICON,NPN | 02735 | 36568 |
| Q1218 | 151-0140-00 | | | | TRANSISTOR:SILICON,NPN | 02735 | 36568 |
| Q2108 | 151-0223-00 | | | | TRANSISTOR:NPN,SI,TO-92 | 04713 | SPS8026 |
| Q2112 | 151-0221-00 | | | | TRANSISTOR:SILICON,PNP | 04713 | SPS246 |
| Q2138 | 151-0188-00 | | | | TRANSISTOR:PNP,SI,TO-92 | T0058 | 2N3906 |
| Q2153 | 151-0192-00 | | | | TRANSISTOR:SELECTED | 04713 | SPS8801 |
| Q2159 | 151-0190-00 | | | | TRANSISTOR:NPN,SI,TO-92 | 04713 | SPS7969 |
| Q2215 | 151-0232-00 | | | | TRANSISTOR:SILICON,NPN,DUAL | 07263 | SP12141 |
| Q2223 | 151-0190-00 | | | | TRANSISTOR:NPN,SI,TO-92 | 04713 | SPS7969 |
| Q2225 | 151-0188-00 | | | | TRANSISTOR:PNP,SI,TO-92 | T0058 | 2N3906 |
| Q2229 | 151-0190-00 | | | | TRANSISTOR:NPN,SI,TO-92 | 04713 | SPS7969 |
| Q2240 | 151-0190-00 | | | | TRANSISTOR:NPN,SI,TO-92 | 04713 | SPS7969 |
| Q2286 | 151-0188-00 | | | | TRANSISTOR:PNP,SI,TO-92 | T0058 | 2N3906 |
| Q2287 | 151-0188-00 | | | | TRANSISTOR:PNP,SI,TO-92 | T0058 | 2N3906 |
| Q2296 | 151-0188-00 | | | | TRANSISTOR:PNP,SI,TO-92 | T0058 | 2N3906 |
| Q2299 | 151-0188-00 | | | | TRANSISTOR:PNP,SI,TO-92 | T0058 | 2N3906 |
| R12 | 321-0260-00 | | | | RES.,FXD,FILM:4.99K OHM,1%,0.125W | 91637 | MFF1816G49900F |
| R14 | 321-0260-00 | | | | RES.,FXD,FILM:4.99K OHM,1%,0.125W | 91637 | MFF1816G49900F |
| R20 | 315-0103-00 | | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 57668 | NTR25J-E10K0 |
| R21 | 315-0103-00 | | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 57668 | NTR25J-E10K0 |
| R26 | 315-0122-00 | B160000 | | | RES.,FXD,CMPSN:1.2K OHM,5%,0.25W | 57668 | NTR25J-E01K2 |
| R28 | 315-0510-00 | | | | RES.,FXD,CMPSN:51 OHM,5%,0.25W | 57668 | NTR25J-E51E0 |
| R29 | 315-0510-00 | | | | RES.,FXD,CMPSN:51 OHM,5%,0.25W | 57668 | NTR25J-E51E0 |
| R31 | 315-0122-00 | | | | RES.,FXD,CMPSN:1.2K OHM,5%,0.25W | 57668 | NTR25J-E01K2 |
| R33 | 315-0682-00 | | | | RES.,FXD,CMPSN:6.8K OHM,5%,0.25W | 57668 | NTR25J-E06K8 |
| R34 | 315-0122-00 | | | | RES.,FXD,CMPSN:1.2K OHM,5%,0.25W | 57668 | NTR25J-E01K2 |
| R35 | 315-0122-00 | | | | RES.,FXD,CMPSN:1.2K OHM,5%,0.25W | 57668 | NTR25J-E01K2 |
| R36 | 321-0231-00 | | | | RES.,FXD,FILM:2.49K OHM,1%,0.125W | 91637 | MFF1816G24900F |
| R37 | 315-0152-00 | B160000 | | | RES.,FXD,CMPSN:1.5K OHM,5%,0.25W | 57668 | NTR25J-E01K5 |
| R38 | 315-0152-00 | | | | RES.,FXD,CMPSN:1.5K OHM,5%,0.25W | 57668 | NTR25J-E01K5 |
| R39 | 315-0152-00 | | | | RES.,FXD,CMPSN:1.5K OHM,5%,0.25W | 57668 | NTR25J-E01K5 |
| R42 | 315-0105-00 | | | | RES.,FXD,CMPSN:1M OHM,5%,0.25W | 01121 | CB1055 |
| R44 | 315-0334-00 | B010100 | B159999 | | RES.,FXD,CMPSN:330K OHM,5%,0.25W | 01121 | CB3345 |
| R44 | 315-0152-00 | B160000 | | | RES.,FXD,CMPSN:1.5K OHM,5%,0.25W | 57668 | NTR25J-E01K5 |
| R46 | 315-0151-00 | B010100 | B159999 | | RES.,FXD,CMPSN:150 OHM,5%,0.25W | 57668 | NTR25J-E150E |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix Part No. | Serial/Model No. | | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|------------------|---------|--|----------|-----------------|
| | | Eff | Dscont | | | |
| R47 | 315-0683-00 | B010100 | B159999 | RES.,FXD,CMPSN:68K OHM,5%,0.25W | 57668 | NTR25J-E68K0 |
| R47 | 315-0243-00 | B160000 | | RES.,FXD,CMPSN:24K OHM,5%,0.25W | 57668 | NTR25J-E24K0 |
| R48 | 315-0334-00 | B010100 | B159999 | RES.,FXD,CMPSN:330K OHM,5%,0.25W | 01121 | CB3345 |
| R48 | 315-0152-00 | B160000 | | RES.,FXD,CMPSN:1.5K OHM,5%,0.25W | 57668 | NTR25J-E01K5 |
| R49 | 315-0105-00 | B010100 | B159999 | RES.,FXD,CMPSN:1M OHM,5%,0.25W | 01121 | CB1055 |
| R49 | 315-0104-00 | B160000 | | RES.,FXD,CMPSN:100K OHM,5%,0.25W | 57668 | NTR25J-E100K |
| R50 | 315-0223-00 | | | RES.,FXD,CMPSN:22K OHM,5%,0.25W | 57668 | NTR25J-E 22K |
| R51 | 321-0193-00 | | | RES.,FXD,FILM:1K OHM,1%,0.125W | 01121 | ORD BY DESCR |
| R53 | 315-0223-00 | | | RES.,FXD,CMPSN:22K OHM,5%,0.25W | 57668 | NTR25J-E 22K |
| R54 | 321-0193-00 | | | RES.,FXD,FILM:1K OHM,1%,0.125W | 01121 | ORD BY DESCR |
| R55 | 315-0470-00 | B010100 | B129999 | RES.,FXD,CMPSN:47 OHM,5%,0.25W | 57668 | NTR25J-E47E0 |
| R56 | 315-0471-00 | B010100 | B129999 | RES.,FXD,CMPSN:470 OHM,5%,0.25W | 57668 | NTR25J-E470E |
| R56 | 321-0169-00 | B130000 | | RES.,FXD,FILM:562 OHM,1%,0.125W | 91637 | MFF1816G562R0F |
| R57 | 315-0682-00 | B010100 | B129999 | RES.,FXD,CMPSN:6.8K OHM,5%,0.25W | 57668 | NTR25J-E06K8 |
| R57 | 321-0266-00 | B130000 | | RES.,FXD,FILM:5.76K OHM,1%,0.125W | 91637 | MFF1816G57600F |
| R58 | 315-0101-00 | | | RES.,FXD,CMPSN:100 OHM,5%,0.25W | 57668 | NTR25J-E 100E |
| R59 | 315-0103-00 | B010100 | B129999 | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 57668 | NTR25J-E10K0 |
| R59 | 321-0282-00 | B130000 | | RES.,FXD,FILM:8.45K OHM,1%,0.125W | 91637 | MFF1816G84500F |
| R61 | 315-0512-00 | | | RES.,FXD,CMPSN:5.1K OHM,5%,0.25W | 57668 | NTR25J-E05K1 |
| R62 | 315-0103-00 | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 57668 | NTR25J-E10K0 |
| R63 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R67 | 315-0512-00 | | | RES.,FXD,CMPSN:5.1K OHM,5%,0.25W | 57668 | NTR25J-E05K1 |
| R74 | 315-0510-00 | | | RES.,FXD,CMPSN:51 OHM,5%,0.25W | 57668 | NTR25J-E51E0 |
| R76 | 315-0222-00 | | | RES.,FXD,CMPSN:2.2K OHM,5%,0.25W | 57668 | NTR25J-E02K2 |
| R77 | 315-0392-00 | B010100 | B129999 | RES.,FXD,CMPSN:3.9K OHM,5%,0.25W | 57668 | NTR25J-E03K9 |
| R77 | 315-0362-00 | B130000 | | RES.,FXD,CMPSN:3.6K OHM,5%,0.25W | 01121 | CB3625 |
| R78 | 315-0392-00 | | | RES.,FXD,CMPSN:3.9K OHM,5%,0.25W | 57668 | NTR25J-E03K9 |
| R80 | 321-0258-00 | | | RES.,FXD,FILM:4.75K OHM,1%,0.125W | 91637 | MFF1816G47500F |
| R82 | 315-0510-00 | | | RES.,FXD,CMPSN:51 OHM,5%,0.25W | 57668 | NTR25J-E51E0 |
| R83 | 315-0510-00 | | | RES.,FXD,CMPSN:51 OHM,5%,0.25W | 57668 | NTR25J-E51E0 |
| R84 | 315-0510-00 | | | RES.,FXD,CMPSN:51 OHM,5%,0.25W | 57668 | NTR25J-E51E0 |
| R85 | 315-0471-00 | | | RES.,FXD,CMPSN:470 OHM,5%,0.25W | 57668 | NTR25J-E470E |
| R86 | 315-0100-00 | | | RES.,FXD,CMPSN:10 OHM,5%,0.25W | 57668 | NTR25J-E 10E0 |
| R88 | 321-0230-00 | | | RES.,FXD,FILM:2.43K OHM,1%,0.125W | 91637 | MFF1816G24300F |
| R89 | 315-0910-00 | | | RES.,FXD,CMPSN:91 OHM,5%,0.25W | 01121 | CB9105 |
| R90 | 315-0362-00 | | | RES.,FXD,CMPSN:3.6K OHM,5%,0.25W | 01121 | CB3625 |
| R92 | 321-0202-00 | | | RES.,FXD,FILM:1.24K OHM,1%,0.125W | 91637 | MFF1816G12400F |
| R93 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R95 | 315-0152-00 | | | RES.,FXD,CMPSN:1.5K OHM,5%,0.25W | 57668 | NTR25J-E01K5 |
| R96 | 315-0511-00 | | | RES.,FXD,CMPSN:510 OHM,5%,0.25W | 01121 | CB5115 |
| R98 | 315-0511-00 | | | RES.,FXD,CMPSN:510 OHM,5%,0.25W | 01121 | CB5115 |
| R99 | 315-0221-00 | | | RES.,FXD,CMPSN:220 OHM,5%,0.25W | 57668 | NTR25J-E220E |
| R101 | 315-0302-00 | | | RES.,FXD,CMPSN:3K OHM,5%,0.25W | 57668 | NTR25J-E03K0 |
| R102 | 311-1404-00 | | | RES.,VAR,NONWIR:5K OHM X 5K OHM,20%,1W | 01121 | 18M824 |
| R104 | 315-0103-00 | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 57668 | NTR25J-E10K0 |
| R105 | 315-0472-00 | | | RES.,FXD,CMPSN:4.7K OHM,5%,0.25W | 57668 | NTR25J-E04K7 |
| R106 | 315-0273-00 | | | RES.,FXD,CMPSN:27K OHM,5%,0.25W | 57668 | NTR25J-E27K0 |
| R109 | 321-0243-00 | | | RES.,FXD,FILM:3.32K OHM,1%,0.125W | 91637 | MFF1816G33200F |
| R110 | 321-0097-00 | | | RES.,FXD,FILM:100 OHM,1%,0.125W | 91637 | MFF1816G100R0F |
| R112 | 321-0097-00 | | | RES.,FXD,FILM:100 OHM,1%,0.125W | 91637 | MFF1816G100R0F |
| R123 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R124 | 315-0511-00 | | | RES.,FXD,CMPSN:510 OHM,5%,0.25W | 01121 | CB5115 |
| R125 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R126 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|----------------------|--------|------------------------------------|----------|------------------|
| R130 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R132 | 315-0222-00 | | | RES.,FXD,CMPSN:2.2K OHM,5%,0.25W | 57668 | NTR25J-E02K2 |
| R133 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R134 | 315-0821-00 | | | RES.,FXD,CMPSN:820 OHM,5%,0.25W | 57668 | NTR25J-E 820E |
| R135 | 315-0123-00 | | | RES.,FXD,CMPSN:12K OHM,5%,0.25W | 57668 | NTR25J-E12K0 |
| R136 | 315-0681-00 | | | RES.,FXD,CMPSN:680 OHM,5%,0.25W | 57668 | NTR25J-E680E |
| R137 | 315-0221-00 | | | RES.,FXD,CMPSN:220 OHM,5%,0.25W | 57668 | NTR25J-E220E |
| R138 | 315-0472-00 | | | RES.,FXD,CMPSN:4.7K OHM,5%,0.25W | 57668 | NTR25J-E04K7 |
| R140 | 315-0391-00 | | | RES.,FXD,CMPSN:390 OHM,5%,0.25W | 57668 | NTR25J-E390E |
| R141 | 315-0122-00 | | | RES.,FXD,CMPSN:1.2K OHM,5%,0.25W | 57668 | NTR25J-E01K2 |
| R142 | 315-0222-00 | | | RES.,FXD,CMPSN:2.2K OHM,5%,0.25W | 57668 | NTR25J-E02K2 |
| R143 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R144 | 315-0821-00 | | | RES.,FXD,CMPSN:820 OHM,5%,0.25W | 57668 | NTR25J-E 820E |
| R145 | 315-0123-00 | | | RES.,FXD,CMPSN:12K OHM,5%,0.25W | 57668 | NTR25J-E12K0 |
| R146 | 315-0681-00 | | | RES.,FXD,CMPSN:680 OHM,5%,0.25W | 57668 | NTR25J-E680E |
| R147 | 315-0181-00 | | | RES.,FXD,CMPSN:180 OHM,5%,0.25W | 57668 | NTR25J-E180E |
| R148 | 315-0472-00 | | | RES.,FXD,CMPSN:4.7K OHM,5%,0.25W | 57668 | NTR25J-E04K7 |
| R149 | 315-0100-00 | | | RES.,FXD,CMPSN:10 OHM,5%,0.25W | 57668 | NTR25J-E 10E0 |
| R150 | 315-0103-00 | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 57668 | NTR25J-E10K0 |
| R152 | 315-0101-00 | | | RES.,FXD,CMPSN:100 OHM,5%,0.25W | 57668 | NTR25J-E 100E |
| R154 | 315-0223-00 | | | RES.,FXD,CMPSN:22K OHM,5%,0.25W | 57668 | NTR25J-E 22K |
| R155 | 315-0391-00 | | | RES.,FXD,CMPSN:390 OHM,5%,0.25W | 57668 | NTR25J-E390E |
| R157 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R159 | 315-0510-00 | | | RES.,FXD,CMPSN:51 OHM,5%,0.25W | 57668 | NTR25J-E51E0 |
| R160 | 315-0391-00 | | | RES.,FXD,CMPSN:390 OHM,5%,0.25W | 57668 | NTR25J-E390E |
| R161 | 315-0122-00 | | | RES.,FXD,CMPSN:1.2K OHM,5%,0.25W | 57668 | NTR25J-E01K2 |
| R162 | 315-0222-00 | | | RES.,FXD,CMPSN:2.2K OHM,5%,0.25W | 57668 | NTR25J-E02K2 |
| R163 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R164 | 315-0821-00 | | | RES.,FXD,CMPSN:820 OHM,5%,0.25W | 57668 | NTR25J-E 820E |
| R165 | 315-0123-00 | | | RES.,FXD,CMPSN:12K OHM,5%,0.25W | 57668 | NTR25J-E12K0 |
| R166 | 315-0681-00 | | | RES.,FXD,CMPSN:680 OHM,5%,0.25W | 57668 | NTR25J-E680E |
| R168 | 315-0472-00 | | | RES.,FXD,CMPSN:4.7K OHM,5%,0.25W | 57668 | NTR25J-E04K7 |
| R200 | 321-1068-02 | | | RES.,FXD,FILM:50.5 OHM,0.5%,0.125W | 91637 | MFF1816D50R50D |
| R202 | 321-1068-02 | | | RES.,FXD,FILM:50.5 OHM,0.5%,0.125W | 91637 | MFF1816D50R50D |
| R204 | 321-1068-02 | | | RES.,FXD,FILM:50.5 OHM,0.5%,0.125W | 91637 | MFF1816D50R50D |
| R206 | 321-1068-02 | | | RES.,FXD,FILM:50.5 OHM,0.5%,0.125W | 91637 | MFF1816D50R50D |
| R208 | 315-0393-00 | | | RES.,FXD,CMPSN:39K OHM,5%,0.25W | 57668 | NTR25J-E39K0 |
| R209 | 321-0741-02 | | | RES.,FXD,FILM:40.9 OHM,0.5%,0.125W | 91637 | MFF1816D40R90D |
| R211 | 322-0197-00 | | | RES.,FXD,FILM:1.1K OHM,1%,0.25W | 91637 | MFF1421G11000F |
| R212 | 321-0741-02 | | | RES.,FXD,FILM:40.9 OHM,0.5%,0.125W | 91637 | MFF1816D40R90D |
| R214 | 322-0212-00 | | | RES.,FXD,FILM:1.58K OHM,1%,0.25W | 75042 | CEBT0-1581F |
| R215 | 315-0393-00 | | | RES.,FXD,CMPSN:39K OHM,5%,0.25W | 57668 | NTR25J-E39K0 |
| R216 | 321-0741-02 | | | RES.,FXD,FILM:40.9 OHM,0.5%,0.125W | 91637 | MFF1816D40R90D |
| R218 | 322-0197-00 | | | RES.,FXD,FILM:1.1K OHM,1%,0.25W | 91637 | MFF1421G11000F |
| R219 | 321-0741-02 | | | RES.,FXD,FILM:40.9 OHM,0.5%,0.125W | 91637 | MFF1816D40R90D |
| R223 | 315-0330-00 | | | RES.,FXD,CMPSN:33 OHM,5%,0.25W | 01121 | CB3305 |
| R223 | 315-0750-00 | B372670 | | RES.,FXD,CMPSN:75 OHM,5%,0.25W | 57668 | NTR25J-E75E0 |
| R224 | 315-0330-00 | | | RES.,FXD,CMPSN:33 OHM,5%,0.25W | 01121 | CB3305 |
| R225 | 315-0911-00 | | | RES.,FXD,CMPSN:910 OHM,5%,0.25W | 57668 | NTR25J-E910E |
| R226 | 321-0069-00 | | | RES.,FXD,FILM:51.1 OHM,1%,0.125W | 91637 | CMF55116G51R10F |
| R228 | 321-0060-00 | | | RES.,FXD,FILM:41.2 OHM,1%,0.125W | 91637 | CMF55-116G41R20F |
| R230 | 321-0236-00 | | | RES.,FXD,FILM:2.8K OHM,1%,0.125W | 91637 | MFF1816G28000F |
| R232 | 321-0060-00 | | | RES.,FXD,FILM:41.2 OHM,1%,0.125W | 91637 | CMF55-116G41R20F |
| R234 | 321-0069-00 | | | RES.,FXD,FILM:51.1 OHM,1%,0.125W | 91637 | CMF55116G51R10F |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix Part No. | Serial/Model No. | | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|------------------|---------|-----------------------------------|----------|-----------------|
| | | Eff | Dscont | | | |
| R236 | 315-0911-00 | | | RES.,FXD,CMPSN:910 OHM,5%,0.25W | 57668 | NTR25J-E910E |
| R238 | 315-0912-00 | | | RES.,FXD,CMPSN:9.1K OHM,5%,0.25W | 57668 | NTR25J-E09K1 |
| R240 | 323-0149-00 | | | RES.,FXD,FILM:348 OHM,1%,0.50W | 75042 | CECT0-3480F |
| R241 | 321-0212-00 | | | RES.,FXD,FILM:1.58K OHM,1%,0.125W | 91637 | MFF1816G15800F |
| R246 | 315-0331-00 | | | RES.,FXD,CMPSN:330 OHM,5%,0.25W | 57668 | NTR25J-E330E |
| R250 | 323-0149-00 | | | RES.,FXD,FILM:348 OHM,1%,0.50W | 75042 | CECT0-3480F |
| R251 | 321-0212-00 | | | RES.,FXD,FILM:1.58K OHM,1%,0.125W | 91637 | MFF1816G15800F |
| R259 | 321-0069-00 | | | RES.,FXD,FILM:51.1 OHM,1%,0.125W | 91637 | CMF55116G51R10F |
| R261 | 321-0069-00 | | | RES.,FXD,FILM:51.1 OHM,1%,0.125W | 91637 | CMF55116G51R10F |
| R301 | 307-0106-00 | | | RES.,FXD,CMPSN:4.7 OHM,5%,0.25W | 01121 | CB47G5 |
| R303 | 307-0106-00 | | | RES.,FXD,CMPSN:4.7 OHM,5%,0.25W | 01121 | CB47G5 |
| R305 | 307-0103-00 | | | RES.,FXD,CMPSN:2.7 OHM,5%,0.25W | 01121 | CB27G5 |
| R307 | 321-0069-00 | | | RES.,FXD,FILM:51.1 OHM,1%,0.125W | 91637 | CMF55116G51R10F |
| R308 | 321-0069-00 | | | RES.,FXD,FILM:51.1 OHM,1%,0.125W | 91637 | CMF55116G51R10F |
| R310 | 315-0103-00 | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 57668 | NTR25J-E10K0 |
| R312 | 315-0562-00 | | | RES.,FXD,CMPSN:5.6K OHM,5%,0.25W | 57668 | NTR25J-E05K6 |
| R314 | 315-0103-00 | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 57668 | NTR25J-E10K0 |
| R315 | 315-0513-00 | | | RES.,FXD,CMPSN:51K OHM,5%,0.25W | 57668 | NTR25J-E51K0 |
| R317 | 321-0069-00 | | | RES.,FXD,FILM:51.1 OHM,1%,0.125W | 91637 | CMF55116G51R10F |
| R319 | 321-0069-00 | | | RES.,FXD,FILM:51.1 OHM,1%,0.125W | 91637 | CMF55116G51R10F |
| R320 | 321-0218-00 | | | RES.,FXD,FILM:1.82K OHM,1%,0.125W | 91637 | MFF1816G18200F |
| R321 | 321-0061-00 | | | RES.,FXD,FILM:42.2 OHM,1%,0.125W | 91637 | MFF1816G42R20F |
| R322 | 315-0101-00 | | | RES.,FXD,CMPSN:100 OHM,5%,0.25W | 57668 | NTR25J-E 100E |
| R323 | 321-0061-00 | | | RES.,FXD,FILM:42.2 OHM,1%,0.125W | 91637 | MFF1816G42R20F |
| R324 | 322-0184-00 | | | RES.,FXD,FILM:806 OHM,1%,0.25W | 75042 | CEBT0-8060F |
| R326 | 321-0061-00 | | | RES.,FXD,FILM:42.2 OHM,1%,0.125W | 91637 | MFF1816G42R20F |
| R327 | 322-0184-00 | | | RES.,FXD,FILM:806 OHM,1%,0.25W | 75042 | CEBT0-8060F |
| R328 | 321-0061-00 | | | RES.,FXD,FILM:42.2 OHM,1%,0.125W | 91637 | MFF1816G42R20F |
| R329 | 315-0101-00 | | | RES.,FXD,CMPSN:100 OHM,5%,0.25W | 57668 | NTR25J-E 100E |
| R330 | 321-0049-00 | | | RES.,FXD,FILM:31.6 OHM,1%,0.125W | 91637 | MFF1816G31R60F |
| R332 | 321-0220-00 | | | RES.,FXD,FILM:1.91K OHM,1%,0.125W | 91637 | MFF1816G19100F |
| R333 | 321-0143-00 | | | RES.,FXD,FILM:301 OHM,1%,0.125W | 91637 | MFF1816G301R0F |
| R334 | 321-0082-00 | | | RES.,FXD,FILM:69.8 OHM,1%,0.125W | 91637 | MFF1816G69R80F |
| R335 | 321-0049-00 | | | RES.,FXD,FILM:31.6 OHM,1%,0.125W | 91637 | MFF1816G31R60F |
| R336 | 321-0129-00 | | | RES.,FXD,FILM:215 OHM,1%,0.125W | 91637 | MFF1816G215R0F |
| R337 | 321-0129-00 | | | RES.,FXD,FILM:215 OHM,1%,0.125W | 91637 | MFF1816G215R0F |
| R338 | 321-0069-00 | | | RES.,FXD,FILM:51.1 OHM,1%,0.125W | 91637 | CMF55116G51R10F |
| R339 | 321-0069-00 | | | RES.,FXD,FILM:51.1 OHM,1%,0.125W | 91637 | CMF55116G51R10F |
| R340 | 321-0214-00 | | | RES.,FXD,FILM:1.65K OHM,1%,0.125W | 91637 | MFF1816G16500F |
| R341 | 315-0680-00 | | | RES.,FXD,CMPSN:68 OHM,5%,0.25W | 57668 | NTR25J-E68E0 |
| R342 | 315-0331-00 | | | RES.,FXD,CMPSN:330 OHM,5%,0.25W | 57668 | NTR25J-E330E |
| R344 | 321-0040-00 | | | RES.,FXD,FILM:25.5 OHM,1%,0.125W | 91637 | CMF55116G25R50F |
| R345 | 315-0561-00 | | | RES.,FXD,CMPSN:560 OHM,5%,0.25W | 01121 | CB5615 |
| R346 | 321-0040-00 | | | RES.,FXD,FILM:25.5 OHM,1%,0.125W | 91637 | CMF55116G25R50F |
| R348 | 315-0331-00 | | | RES.,FXD,CMPSN:330 OHM,5%,0.25W | 57668 | NTR25J-E330E |
| R349 | 315-0680-00 | | | RES.,FXD,CMPSN:68 OHM,5%,0.25W | 57668 | NTR25J-E68E0 |
| R350 | 321-0214-00 | | | RES.,FXD,FILM:1.65K OHM,1%,0.125W | 91637 | MFF1816G16500F |
| R352 | 315-0430-00 | | | RES.,FXD,CMPSN:43 OHM,5%,0.25W | 01121 | CB4305 |
| R401 | 321-0068-00 | | | RES.,FXD,FILM:49.9 OHM,1%,0.125W | 91637 | MFF1816G49R90F |
| R403 | 311-1228-00 | | | RES.,VAR,NONWIR:10K OHM,20%,0.50W | 32997 | 3386F-T04-103 |
| R404 | 321-0326-00 | | | RES.,FXD,FILM:24.3K OHM,1%,0.125W | 91637 | CMF55116G24301F |
| R405 | 321-0322-00 | B010100 | B372669 | RES.,FXD,FILM:22.1K OHM,1%,0.125W | 91637 | MFF1816G22101F |
| R405 | 315-0273-00 | B372670 | | RES.,FXD,CMPSN:27K OHM,5%,0.25W | 57668 | NTR25J-E27K0 |
| R407 | 321-0306-00 | | | RES.,FXD,FILM:15K OHM,1%,0.125W | 91637 | MFF1816G15001F |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|----------------------|---------|--|----------|-----------------|
| R408 | 321-0230-00 | | | RES.,FXD,FILM:2.43K OHM,1%.0.125W | 91637 | MFF1816G24300F |
| R409 | 323-0237-00 | | | RES.,FXD,FILM:2.87K OHM,1%.0.50W | 75042 | CECT0-2871F |
| R411 | 321-0236-00 | | | RES.,FXD,FILM:2.8K OHM,1%.0.125W | 91637 | MFF1816G28000F |
| R412 | 315-0104-00 | B344932 | | RES.,FXD,CMPSN:100K OHM,5%.0.25W | 57668 | NTR25J-E100K |
| R412 | ----- | | | (NOMINAL VALUE,SELECTED) | | |
| R413 | 323-0237-00 | | | RES.,FXD,FILM:2.87K OHM,1%.0.50W | 75042 | CECT0-2871F |
| R414 | 321-0230-00 | | | RES.,FXD,FILM:2.43K OHM,1%.0.125W | 91637 | MFF1816G24300F |
| R415 | 315-0153-00 | | | RES.,FXD,CMPSN:15K OHM,5%.0.25W | 01121 | CB1535 |
| R416 | 315-0911-00 | B010100 | B372669 | RES.,FXD,CMPSN:910 OHM,5%.0.25W | 57668 | NTR25J-E910E |
| R416 | 315-0241-00 | B372670 | B376999 | RES.,FXD,CMPSN:240 OHM,5%.0.25W | 01121 | CB2415 |
| R417 | 315-0431-00 | B010100 | B376999 | RES.,FXD,CMPSN:430 OHM,5%.0.25W | 01121 | CB4315 |
| R417 | 321-0177-00 | B377000 | | RES.,FXD,FILM:681 OHM,1%.0.125W | 01121 | ORD BY DESCR |
| R418 | 315-0751-00 | | | RES.,FXD,CMPSN:750 OHM,5%.0.25W | 57668 | NTR25J-E750E |
| R420 | 315-0271-00 | | | RES.,FXD,CMPSN:270 OHM,5%.0.25W | 01121 | CB2715 |
| R421 | 311-1261-00 | | | RES.,VAR,NONWIR:500 OHM,10%.0.50W | 32997 | 3329P-L58-501 |
| R423 | 317-0470-00 | | | RES.,FXD,CMPSN:47 OHM,5%.0.125W | 01121 | BB4705 |
| R424 | 317-0470-00 | | | RES.,FXD,CMPSN:47 OHM,5%.0.125W | 01121 | BB4705 |
| R425 | 311-1260-00 | | | RES.,VAR,NONWIR:250 OHM,10%.0.50W | 32997 | 3329P-L58-251 |
| R427 | 311-1007-00 | | | RES.,VAR,NONWIR:20 OHM,20%.0.50W | 73138 | 82-38-1 |
| R429 | 321-0114-00 | | | RES.,FXD,FILM:150 OHM,1%.0.125W | 91637 | MFF1816G150R0F |
| R433 | 321-0068-00 | | | RES.,FXD,FILM:49.9 OHM,1%.0.125W | 91637 | MFF1816G49R90F |
| R440 | 321-0181-00 | | | RES.,FXD,FILM:750 OHM,1%.0.125W | 91637 | MFF1816G750R0F |
| R442 | 321-0092-00 | B010100 | B372669 | RES.,FXD,FILM:88.7 OHM,1%.0.125W | 91637 | MFF1816G88R70F |
| R442 | 315-0121-00 | B372670 | B376999 | RES.,FXD,CMPSN:120 OHM,5%.0.25W | 01121 | CB1215 |
| R442 | 321-0104-00 | B377000 | | RES.,FXD,FILM:118 OHM,1%.0.125W | 01121 | ORD BY DESCR |
| R443 | 321-0201-00 | | | RES.,FXD,FILM:1.21K OHM,1%.0.125W | 91637 | MFF1816G12100F |
| R444 | 321-0092-00 | B010100 | B372669 | RES.,FXD,FILM:88.7 OHM,1%.0.125W | 91637 | MFF1816G88R70F |
| R444 | 315-0121-00 | B372670 | B376999 | RES.,FXD,CMPSN:120 OHM,5%.0.25W | 01121 | CB1215 |
| R444 | 321-0104-00 | B377000 | | RES.,FXD,FILM:118 OHM,1%.0.125W | 01121 | ORD BY DESCR |
| R446 | 321-0097-00 | | | RES.,FXD,FILM:100 OHM,1%.0.125W | 91637 | MFF1816G100R0F |
| R446 | ----- | | | (NOMINAL VALUE,SELECTED) | | |
| R447 | 311-1261-00 | | | RES.,VAR,NONWIR:500 OHM,10%.0.50W | 32997 | 3329P-L58-501 |
| R448 | 321-0097-00 | | | RES.,FXD,FILM:100 OHM,1%.0.125W | 91637 | MFF1816G100R0F |
| R448 | ----- | | | (NOMINAL VALUE,SELECTED) | | |
| R450 | 321-0181-00 | | | RES.,FXD,FILM:750 OHM,1%.0.125W | 91637 | MFF1816G750R0F |
| R452 | 323-0150-00 | | | RES.,FXD,FILM:357 OHM,1%.0.50W | 91637 | MFF1226G357R0F |
| R453 | 323-0150-00 | | | RES.,FXD,FILM:357 OHM,1%.0.50W | 91637 | MFF1226G357R0F |
| R455 | 311-0635-00 | | | RES.,VAR,NONWW:TRMR,1K OHM,10%.0.5%.0.5W | 02111 | 65Y102T010 |
| R456 | 315-0181-00 | B010100 | B029999 | RES.,FXD,CMPSN:180 OHM,5%.0.25W | 57668 | NTR25J-E180E |
| R456 | 315-0181-00 | B030000 | B376999 | RES.,FXD,CMPSN:180 OHM,5%.0.25W | 57668 | NTR25J-E180E |
| R456 | ----- | | | (NOMINAL VALUE,SELECTED) | | |
| R456 | 311-0634-00 | B377000 | | RES.,VAR,NONWIR:TRMR,500 OHM,0.5W | 32997 | 3329H-L58-501 |
| R458 | 315-0161-00 | B010100 | B029999 | RES.,FXD,CMPSN:160 OHM,5%.0.25W | 57668 | NTR25J-E 160E |
| R458 | 315-0161-00 | B030000 | B376999 | RES.,FXD,CMPSN:160 OHM,5%.0.25W | 57668 | NTR25J-E 160E |
| R458 | ----- | | | (NOMINAL VALUE,SELECTED) | | |
| R458 | 311-0634-00 | B377000 | | RES.,VAR,NONWIR:TRMR,500 OHM,0.5W | 32997 | 3329H-L58-501 |
| R459 | 315-0473-00 | B369789 | B372669 | RES.,FXD,CMPSN:47K OHM,5%.0.25W | 57668 | NTR25J-E47K0 |
| R459 | 321-0128-00 | B372670 | | RES.,FXD,FILM:210 OHM,1%.0.125W | 91637 | MFF1816G210R0F |
| R460 | 315-0620-00 | B010100 | B259999 | RES.,FXD,CMPSN:62 OHM,5%.0.25W | 01121 | CB6205 |
| R460 | 315-0620-00 | B260000 | B372669 | RES.,FXD,CMPSN:62 OHM,5%.0.25W | 01121 | CB6205 |
| R460 | ----- | | | (NOMINAL VALUE,SELECTED) | | |
| R460 | 321-0086-00 | B372670 | | RES.,FXD,FILM:76.8 OHM,1%.0.125W,TC : TO | 91637 | MFF1816G76R80F |
| R461 | 315-0824-00 | B010100 | B369788 | RES.,FXD,CMPSN:820K OHM,5%.0.25W | 01121 | CB8245 |
| R461 | 315-0434-00 | B369789 | B372669 | RES.,FXD,CMPSN:430K OHM,5%.0.25W | 57668 | NTR25J-E430K |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix | Serial/Model No. | | Name & Description | Mfr | Mfr Part Number |
|---------|-------------|------------------|---------|--|-------|-----------------|
| | Part No. | Eff | Dscont | | Code | |
| R462 | 323-0150-00 | | | RES.,FXD,FILM:357 OHM,1%,0.50W | 91637 | MFF1226G357R0F |
| R463 | 323-0150-00 | | | RES.,FXD,FILM:357 OHM,1%,0.50W | 91637 | MFF1226G357R0F |
| R465 | 315-0681-00 | B010100 | B029999 | RES.,FXD,CMPSN:680 OHM,5%,0.25W | 57668 | NTR25J-E680E |
| R465 | 315-0681-00 | B030000 | B376999 | RES.,FXD,CMPSN:680 OHM,5%,0.25W | 57668 | NTR25J-E680E |
| R465 | ----- | | | (NOMINAL VALUE,SELECTED) | | |
| R465 | 311-0635-00 | B377000 | | RES.,VAR,NONWW:TRMR,1K OHM,10%,0.5%,0.5W | 02111 | 65Y102T010 |
| R466 | 311-0635-00 | | | RES.,VAR,NONWW:TRMR,1K OHM,10%,0.5%,0.5W | 02111 | 65Y102T010 |
| R468 | 315-0301-00 | B010100 | B029999 | RES.,FXD,CMPSN:300 OHM,5%,0.25W | 57668 | NTR25J-E300E |
| R468 | 315-0301-00 | B030000 | B376999 | RES.,FXD,CMPSN:300 OHM,5%,0.25W | 57668 | NTR25J-E300E |
| R468 | ----- | | | (NOMINAL VALUE,SELECTED) | | |
| R468 | 311-0635-00 | B377000 | | RES.,VAR,NONWW:TRMR,1K OHM,10%,0.5%,0.5W | 02111 | 65Y102T010 |
| R474 | 310-0701-00 | B010100 | B343049 | RES.,FXD,WW:430 OHM,1%,8W | 80009 | 310-0701-00 |
| R474 | 308-0758-00 | B343050 | | RES.,FXD,WW:430 OHM,1%,7W | 14193 | SP1151S-430R0F |
| R478 | 310-0701-00 | B010100 | B343049 | RES.,FXD,WW:430 OHM,1%,8W | 80009 | 310-0701-00 |
| R478 | 308-0758-00 | B343050 | | RES.,FXD,WW:430 OHM,1%,7W | 14193 | SP1151S-430R0F |
| R480 | 307-0103-00 | | | RES.,FXD,CMPSN:2.7 OHM,5%,0.25W | 01121 | CB27G5 |
| R484 | 321-0197-00 | | | RES.,FXD,FILM:1.1K OHM,1%,0.125W | 91637 | MFF1816G11000F |
| R486 | 311-1260-00 | | | RES.,VAR,NONWIR:250 OHM,10%,0.50W | 32997 | 3329P-L58-251 |
| R488 | 323-0054-00 | | | RES.,FXD,FILM:35.7 OHM,1%,0.50W | 91637 | CMF65116G35R70F |
| R490 | 307-0103-00 | | | RES.,FXD,CMPSN:2.7 OHM,5%,0.25W | 01121 | CB27G5 |
| R491 | 315-0100-00 | | | RES.,FXD,CMPSN:10 OHM,5%,0.25W | 57668 | NTR25J-E 10E0 |
| R492 | 307-0103-00 | | | RES.,FXD,CMPSN:2.7 OHM,5%,0.25W | 01121 | CB27G5 |
| R495 | 315-0822-00 | | | RES.,FXD,CMPSN:8.2K OHM,5%,0.25W | 01121 | CB8225 |
| R496 | 315-0431-00 | B010100 | B279999 | RES.,FXD,CMPSN:430 OHM,5%,0.25W | 01121 | CB4315 |
| R496 | ----- | | | (NOMINAL VALUE,SELECTED) | | |
| R496 | 315-0361-00 | B280000 | | RES.,FXD,CMPSN:360 OHM,5%,0.25W | 01121 | CB3615 |
| R496 | ----- | | | (NOMINAL VALUE,SELECTED) | | |
| R501 | 321-1068-01 | | | RES.,FXD,FILM:50.5 OHM,0.5%,0.125W | 91637 | MFF1816G50R50D |
| R502 | 315-0100-00 | | | RES.,FXD,CMPSN:10 OHM,5%,0.25W | 57668 | NTR25J-E 10E0 |
| R503 | 321-1068-01 | | | RES.,FXD,FILM:50.5 OHM,0.5%,0.125W | 91637 | MFF1816G50R50D |
| R505 | 321-0297-00 | | | RES.,FXD,FILM:12.1K OHM,1%,0.125W | 91637 | MFF1816G12101F |
| R506 | 321-0069-00 | | | RES.,FXD,FILM:51.1 OHM,1%,0.125W | 91637 | CMF55116G51R10F |
| R508 | 321-0184-00 | | | RES.,FXD,FILM:806 OHM,1%,0.125W | 91637 | MFF1816G806R0F |
| R509 | 321-0069-00 | | | RES.,FXD,FILM:51.1 OHM,1%,0.125W | 91637 | CMF55116G51R10F |
| R511 | 321-0155-00 | | | RES.,FXD,FILM:402 OHM,1%,0.125W | 91637 | MFF1816G402R0F |
| R512 | 311-1224-00 | | | RES.,VAR,NONWIR:500 OHM,20%,0.50W | 32997 | 3386F-T04-501 |
| R513 | 321-0136-00 | | | RES.,FXD,FILM:255 OHM,1%,0.125W | 91637 | MFF1816G255R0F |
| R514 | 323-0219-00 | | | RES.,FXD,FILM:1.87K OHM,1%,0.50W | 75042 | CECT0-1871F |
| R515 | 323-0219-00 | | | RES.,FXD,FILM:1.87K OHM,1%,0.50W | 75042 | CECT0-1871F |
| R517 | 321-0212-00 | | | RES.,FXD,FILM:1.58K OHM,1%,0.125W | 91637 | MFF1816G15800F |
| R519 | 321-0108-00 | B010100 | B129999 | RES.,FXD,FILM:130 OHM,1%,0.125W | 91637 | MFF1816G130R0F |
| R519 | 321-0108-00 | B130000 | | RES.,FXD,FILM:130 OHM,1%,0.125W | 91637 | MFF1816G130R0F |
| R519 | ----- | | | (NOMINAL VALUE,SELECTED) | | |
| R520 | ----- | | | (ADDED IF NECESSARY) | | |
| R521 | 321-0261-00 | B010100 | B029999 | RES.,FXD,FILM:5.11K OHM,1%,0.125W | 91637 | MFF1816G51100F |
| R522 | 321-0261-00 | | | RES.,FXD,FILM:5.11K OHM,1%,0.125W | 91637 | MFF1816G51100F |
| R524 | 321-0202-00 | | | RES.,FXD,FILM:1.24K OHM,1%,0.125W | 91637 | MFF1816G12400F |
| R525 | 311-1222-00 | | | RES.,VAR,NONWIR:100 OHM,20%,0.50W | 32997 | 3386F-T04-101 |
| R526 | 321-0202-00 | | | RES.,FXD,FILM:1.24K OHM,1%,0.125W | 91637 | MFF1816G12400F |
| R527 | 315-0222-00 | B010100 | B029999 | RES.,FXD,CMPSN:2.2K OHM,5%,0.25W | 57668 | NTR25J-E02K2 |
| R529 | 315-0473-00 | | | RES.,FXD,CMPSN:47K OHM,5%,0.25W | 57668 | NTR25J-E47K0 |
| R531 | 323-0222-00 | | | RES.,FXD,FILM:2K OHM,1%,0.50W | 75042 | CECT0-2001F |
| R532 | 323-0222-00 | | | RES.,FXD,FILM:2K OHM,1%,0.50W | 75042 | CECT0-2001F |
| R534 | 321-0269-00 | | | RES.,FXD,FILM:6.19K OHM,1%,0.125W | 91637 | MFF1816G61900F |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|----------------------|---------|--------------------------------------|----------|-----------------|
| R535 | 311-1225-00 | | | RES.,VAR.NONWIR:1K OHM,20%.0.50W | 32997 | 3386F-T04-102 |
| R536 | 321-0269-00 | | | RES.,FXD,FILM:6.19K OHM,1%.0.125W | 91637 | MFF1816G61900F |
| R538 | 321-0320-00 | | | RES.,FXD,FILM:21K OHM,1%.0.125W | 91637 | MFF1816G21001F |
| R540 | 321-0225-00 | | | RES.,FXD,FILM:2.15K OHM,1%.0.125W | 91637 | MFF1816G21500F |
| R542 | 315-0300-00 | | | RES.,FXD,CMPSN:30 OHM,5%.0.25W | 01121 | CB3005 |
| R543 | 321-0193-00 | | | RES.,FXD,FILM:1K OHM,1%.0.125W | 01121 | ORD BY DESCR |
| R544 | 315-0300-00 | | | RES.,FXD,CMPSN:30 OHM,5%.0.25W | 01121 | CB3005 |
| R546 | 321-0320-00 | | | RES.,FXD,FILM:21K OHM,1%.0.125W | 91637 | MFF1816G21001F |
| R548 | 321-0225-00 | | | RES.,FXD,FILM:2.15K OHM,1%.0.125W | 91637 | MFF1816G21500F |
| R549 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%.0.25W | 57668 | NTR25JE01K0 |
| R551 | 303-0470-00 | | | RES.,FXD,CMPSN:47 OHM,5%.1W | 01121 | GB4705 |
| R555 | 315-0470-00 | | | RES.,FXD,CMPSN:47 OHM,5%.0.25W | 57668 | NTR25J-E47E0 |
| R556 | 301-0393-00 | | | RES.,FXD,CMPSN:39K OHM,5%.0.5W | 57668 | TR50J-E 39K |
| R558 | 323-0231-00 | | | RES.,FXD,FILM:2.49K OHM,1%.0.50W | 75042 | CECT0-2491F |
| R559 | 315-0100-00 | | | RES.,FXD,CMPSN:10 OHM,5%.0.25W | 57668 | NTR25J-E 10E0 |
| R561 | 315-0100-00 | | | RES.,FXD,CMPSN:10 OHM,5%.0.25W | 57668 | NTR25J-E 10E0 |
| R562 | 323-0097-00 | | | RES.,FXD,FILM:100 OHM,1%.0.50W | 75042 | CECT0-1000F |
| R563 | 323-0066-00 | | | RES.,FXD,FILM:47.5 OHM,1%.0.50W | 75042 | CECT0-47R50F |
| R565 | 315-0101-00 | | | RES.,FXD,CMPSN:100 OHM,5%.0.25W | 57668 | NTR25J-E 100E |
| R565 | ----- | | | (NOMINAL VALUE,SELECTED) | | |
| R566 | 323-0287-00 | | | RES.,FXD,FILM:9.53K OHM,1%.0.50W | 75042 | CECT0-9531F |
| R567 | 323-0287-00 | | | RES.,FXD,FILM:9.53K OHM,1%.0.50W | 75042 | CECT0-9531F |
| R568 | 315-0471-00 | B010100 | B029999 | RES.,FXD,CMPSN:470 OHM,5%.0.25W | 57668 | NTR25J-E470E |
| R568 | ----- | | | (NOMINAL VALUE,SELECTED) | | |
| R569 | 321-0189-00 | | | RES.,FXD,FILM:909 OHM,1%.0.125W | 91637 | MFF1816G909R0F |
| R570 | 321-0251-00 | | | RES.,FXD,FILM:4.02K OHM,1%.0.125W | 91637 | MFF1816G40200F |
| R571 | 321-0830-03 | | | RES.,FXD,FILM:2.41K OHM,0.25%.0.125W | 91637 | MFF1816D24100C |
| R573 | 321-0273-00 | | | RES.,FXD,FILM:6.81K OHM,1%.0.125W | 91637 | MFF1816G68100F |
| R574 | 323-0352-00 | | | RES.,FXD,FILM:45.3K OHM,1%.0.50W | 75042 | CECT0-4532F |
| R575 | 315-0470-00 | | | RES.,FXD,CMPSN:47 OHM,5%.0.25W | 57668 | NTR25J-E47E0 |
| R576 | 301-0393-00 | | | RES.,FXD,CMPSN:39K OHM,5%.0.5W | 57668 | TR50J-E 39K |
| R578 | 323-0231-00 | | | RES.,FXD,FILM:2.49K OHM,1%.0.50W | 75042 | CECT0-2491F |
| R579 | 315-0100-00 | | | RES.,FXD,CMPSN:10 OHM,5%.0.25W | 57668 | NTR25J-E 10E0 |
| R581 | 315-0100-00 | | | RES.,FXD,CMPSN:10 OHM,5%.0.25W | 57668 | NTR25J-E 10E0 |
| R582 | 323-0097-00 | | | RES.,FXD,FILM:100 OHM,1%.0.50W | 75042 | CECT0-1000F |
| R583 | 323-0066-00 | | | RES.,FXD,FILM:47.5 OHM,1%.0.50W | 75042 | CECT0-47R50F |
| R584 | 315-0185-00 | B060000 | | RES.,FXD,CMPSN:1.8M OHM,5%.0.25W | 01121 | CB1855 |
| R585 | 315-0101-00 | | | RES.,FXD,CMPSN:100 OHM,5%.0.25W | 57668 | NTR25J-E 100E |
| R586 | 323-0287-00 | | | RES.,FXD,FILM:9.53K OHM,1%.0.50W | 75042 | CECT0-9531F |
| R587 | 323-0287-00 | | | RES.,FXD,FILM:9.53K OHM,1%.0.50W | 75042 | CECT0-9531F |
| R588 | 315-0471-00 | B010100 | B029999 | RES.,FXD,CMPSN:470 OHM,5%.0.25W | 57668 | NTR25J-E470E |
| R589 | 321-0189-00 | | | RES.,FXD,FILM:909 OHM,1%.0.125W | 91637 | MFF1816G909R0F |
| R593 | 315-0100-00 | | | RES.,FXD,CMPSN:10 OHM,5%.0.25W | 57668 | NTR25J-E 10E0 |
| R595 | 307-0106-00 | | | RES.,FXD,CMPSN:4.7 OHM,5%.0.25W | 01121 | CB47G5 |
| R597 | 315-0100-00 | | | RES.,FXD,CMPSN:10 OHM,5%.0.25W | 57668 | NTR25J-E 10E0 |
| R599 | 307-0103-00 | | | RES.,FXD,CMPSN:2.7 OHM,5%.0.25W | 01121 | CB27G5 |
| R602 | 315-0101-00 | | | RES.,FXD,CMPSN:100 OHM,5%.0.25W | 57668 | NTR25J-E 100E |
| R605 | 315-0561-00 | | | RES.,FXD,CMPSN:560 OHM,5%.0.25W | 01121 | CB5615 |
| R607 | 321-0020-00 | | | RES.,FXD,FILM:15.8 OHM,1%.0.125W | 91637 | CMF55116G15R80F |
| R608 | 321-0089-00 | | | RES.,FXD,FILM:82.5 OHM,1%.0.125W | 91637 | MFF1816G82R50F |
| R610 | 307-0106-00 | | | RES.,FXD,CMPSN:4.7 OHM,5%.0.25W | 01121 | CB47G5 |
| R612 | 321-0193-00 | B010100 | B285249 | RES.,FXD,FILM:1K OHM,1%.0.125W | 01121 | ORD BY DESCR |
| R612 | 321-0612-00 | B285250 | | RES.,FXD,FILM:500 OHM,1%.0.125W | 91637 | MFF1816G500R0F |
| R613 | 321-0222-00 | B010100 | B285249 | RES.,FXD,FILM:2K OHM,1%.0.125W | 91637 | MFF1816G20000F |
| R613 | 321-0193-00 | B285250 | | RES.,FXD,FILM:1K OHM,1%.0.125W | 01121 | ORD BY DESCR |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|----------------------|---------|-----------------------------------|----------|-----------------|
| R615 | 315-0240-00 | | | RES.,FXD,CMPSN:24 OHM,5%,0.25W | 57668 | NTR25J-E24E0 |
| R617 | 321-0020-00 | | | RES.,FXD,FILM:15.8 OHM,1%,0.125W | 91637 | CMF55116G15R80F |
| R619 | 315-0101-00 | | | RES.,FXD,CMPSN:100 OHM,5%,0.25W | 57668 | NTR25J-E 100E |
| R622 | 321-0208-00 | | | RES.,FXD,FILM:1.43K OHM,1%,0.125W | 91637 | MFF1816G14300F |
| R623 | 307-0106-00 | | | RES.,FXD,CMPSN:4.7 OHM,5%,0.25W | 01121 | CB47G5 |
| R625 | 321-0224-00 | | | RES.,FXD,FILM:2.1K OHM,1%,0.125W | 91637 | MFF1816G21000F |
| R627 | 315-0101-00 | | | RES.,FXD,CMPSN:100 OHM,5%,0.25W | 57668 | NTR25J-E 100E |
| R630 | 315-0101-00 | | | RES.,FXD,CMPSN:100 OHM,5%,0.25W | 57668 | NTR25J-E 100E |
| R633 | 315-0222-00 | | | RES.,FXD,CMPSN:2.2K OHM,5%,0.25W | 57668 | NTR25J-E02K2 |
| R636 | 315-0241-00 | | | RES.,FXD,CMPSN:240 OHM,5%,0.25W | 01121 | CB2415 |
| R637 | 315-0152-00 | | | RES.,FXD,CMPSN:1.5K OHM,5%,0.25W | 57668 | NTR25J-E01K5 |
| R639 | 315-0101-00 | | | RES.,FXD,CMPSN:100 OHM,5%,0.25W | 57668 | NTR25J-E 100E |
| R641 | 315-0272-00 | | | RES.,FXD,CMPSN:2.7K OHM,5%,0.25W | 57668 | NTR25J-E02K7 |
| R643 | 315-0220-00 | | | RES.,FXD,CMPSN:22 OHM,5%,0.25W | 01121 | CB2205 |
| R645 | 321-0260-00 | | | RES.,FXD,FILM:4.99K OHM,1%,0.125W | 91637 | MFF1816G49900F |
| R647 | 321-0190-00 | | | RES.,FXD,FILM:931 OHM,1%,0.125W | 91637 | MFF1816G931R0F |
| R651 | 315-0201-00 | | | RES.,FXD,CMPSN:200 OHM,5%,0.25W | 57668 | NTR25J-E200E |
| R652 | 315-0123-00 | | | RES.,FXD,CMPSN:12K OHM,5%,0.25W | 57668 | NTR25J-E12K0 |
| R654 | 315-0201-00 | | | RES.,FXD,CMPSN:200 OHM,5%,0.25W | 57668 | NTR25J-E200E |
| R655 | 315-0123-00 | | | RES.,FXD,CMPSN:12K OHM,5%,0.25W | 57668 | NTR25J-E12K0 |
| R657 | 315-0201-00 | | | RES.,FXD,CMPSN:200 OHM,5%,0.25W | 57668 | NTR25J-E200E |
| R658 | 315-0123-00 | | | RES.,FXD,CMPSN:12K OHM,5%,0.25W | 57668 | NTR25J-E12K0 |
| R660 | 315-0101-00 | | | RES.,FXD,CMPSN:100 OHM,5%,0.25W | 57668 | NTR25J-E 100E |
| R662 | 315-0821-00 | | | RES.,FXD,CMPSN:820 OHM,5%,0.25W | 57668 | NTR25J-E 820E |
| R663 | 321-0193-00 | | | RES.,FXD,FILM:1K OHM,1%,0.125W | 01121 | ORD BY DESCR |
| R667 | 315-0561-00 | | | RES.,FXD,CMPSN:560 OHM,5%,0.25W | 01121 | CB5615 |
| R669 | 307-0106-00 | | | RES.,FXD,CMPSN:4.7 OHM,5%,0.25W | 01121 | CB47G5 |
| R670 | 321-0143-00 | | | RES.,FXD,FILM:301 OHM,1%,0.125W | 91637 | MFF1816G301R0F |
| R672 | 321-0180-00 | | | RES.,FXD,FILM:732 OHM,1%,0.125W | 91637 | MFF1816G732R0F |
| R673 | 321-0226-00 | | | RES.,FXD,FILM:2.21K OHM,1%,0.125W | 91637 | MFF1816G22100F |
| R675 | 321-0189-00 | | | RES.,FXD,FILM:909 OHM,1%,0.125W | 91637 | MFF1816G909R0F |
| R677 | 315-0390-00 | | | RES.,FXD,CMPSN:39 OHM,5%,0.25W | 57668 | NTR25J-E39E0 |
| R679 | 307-0106-00 | | | RES.,FXD,CMPSN:4.7 OHM,5%,0.25W | 01121 | CB47G5 |
| R805 | 307-0113-00 | B010100 | B139999 | RES.,FXD,CMPSN:5.1 OHM,5%,0.25W | 01121 | CB51G5 |
| R806 | 302-0473-00 | B020000 | | RES.,FXD,CMPSN:47K OHM,10%,0.5W | 01121 | EB4731 |
| R808 | 302-0223-00 | B020000 | | RES.,FXD,CMPSN:22K OHM,10%,0.50W | 01121 | EB2231 |
| R809 | 302-0223-00 | B020000 | | RES.,FXD,CMPSN:22K OHM,10%,0.50W | 01121 | EB2231 |
| R811 | 302-0472-00 | B020000 | | RES.,FXD,CMPSN:4.7K OHM,10%,0.50W | 01121 | EB4721 |
| R813 | 302-0472-00 | B020000 | | RES.,FXD,CMPSN:4.7K OHM,10%,0.50W | 01121 | EB4721 |
| R821 | 302-0472-00 | B020000 | | RES.,FXD,CMPSN:4.7K OHM,10%,0.50W | 01121 | EB4721 |
| R822 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R823 | 315-0151-00 | | | RES.,FXD,CMPSN:150 OHM,5%,0.25W | 57668 | NTR25J-E150E |
| R824 | 315-0470-00 | | | RES.,FXD,CMPSN:47 OHM,5%,0.25W | 57668 | NTR25J-E47E0 |
| R826 | 315-0302-00 | | | RES.,FXD,CMPSN:3K OHM,5%,0.25W | 57668 | NTR25J-E03K0 |
| R827 | 315-0472-00 | | | RES.,FXD,CMPSN:4.7K OHM,5%,0.25W | 57668 | NTR25J-E04K7 |
| R830 | 315-0911-00 | | | RES.,FXD,CMPSN:910 OHM,5%,0.25W | 57668 | NTR25J-E910E |
| R831 | 315-0392-00 | | | RES.,FXD,CMPSN:3.9K OHM,5%,0.25W | 57668 | NTR25J-E03K9 |
| R833 | 315-0683-00 | | | RES.,FXD,CMPSN:68K OHM,5%,0.25W | 57668 | NTR25J-E68K0 |
| R837 | 307-0054-00 | | | RES.,FXD,CMPSN:3.6 OHM,5%,0.50W | 01121 | EB36G5 |
| R838 | 307-0054-00 | | | RES.,FXD,CMPSN:3.6 OHM,5%,0.50W | 01121 | EB36G5 |
| R853 | 315-0473-00 | | | RES.,FXD,CMPSN:47K OHM,5%,0.25W | 57668 | NTR25J-E47K0 |
| R855 | 323-0309-00 | | | RES.,FXD,FILM:16.2K OHM,1%,0.50W | 75042 | CECT0-1622F |
| R856 | 323-0289-00 | | | RES.,FXD,FILM:10K OHM,1%,0.50W | 75042 | CECT0-1002F |
| R858 | 321-0924-07 | | | RES.,FXD,FILM:40K OHM,0.1%,0.125W | 91637 | MFF1816C40001B |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|----------------------|---------|-----------------------------------|----------|-----------------|
| R859 | 321-0924-07 | | | RES.,FXD,FILM:40K OHM,0.1%,0.125W | 91637 | MFF1816C40001B |
| R860 | 315-0684-00 | | | RES.,FXD,CMPSN:680K OHM,5%,0.25W | 01121 | CB6845 |
| R862 | 315-0204-00 | | | RES.,FXD,CMPSN:200K OHM,5%,0.25W | 01121 | CB2045 |
| R864 | 315-0203-00 | | | RES.,FXD,CMPSN:20K OHM,5%,0.25W | 57668 | NTR25J-E20K0 |
| R866 | 315-0332-00 | | | RES.,FXD,CMPSN:3.3K OHM,5%,0.25W | 57668 | NTR25J-E03K3 |
| R867 | 315-0824-00 | | | RES.,FXD,CMPSN:820K OHM,5%,0.25W | 01121 | CB8245 |
| R869 | 315-0123-00 | B343771 | | RES.,FXD,CMPSN:12K OHM,5%,0.25W | 57668 | NTR25J-E12K0 |
| R870 | 315-0122-00 | | | RES.,FXD,CMPSN:1.2K OHM,5%,0.25W | 57668 | NTR25J-E01K2 |
| R872 | 315-0151-00 | | | RES.,FXD,CMPSN:150 OHM,5%,0.25W | 57668 | NTR25J-E150E |
| R875 | 308-0677-00 | B010100 | B371209 | RES.,FXD,WW:1 OHM,5%,2W | 75042 | BWH-1R000J |
| R875 | 308-0831-00 | B371210 | | RES.,FXD,WW:1 OHM,5%,2W.FUSIBLE | 75042 | BWF 1.0 OHM 5% |
| R876 | 315-0204-00 | B010100 | B019999 | RES.,FXD,CMPSN:200K OHM,5%,0.25W | 01121 | CB2045 |
| R876 | 315-0154-00 | B020000 | | RES.,FXD,CMPSN:150K OHM,5%,0.25W | 57668 | NTR25J-E150K |
| R877 | 315-0511-00 | B010100 | B369019 | RES.,FXD,CMPSN:510 OHM,5%,0.25W | 01121 | CB5115 |
| R877 | 311-0177-00 | B369020 | | RES.,VAR,WW: | 80009 | 311-0177-00 |
| R878 | 315-0104-00 | B010100 | B369019 | RES.,FXD,CMPSN:100K OHM,5%,0.25W | 57668 | NTR25J-E100K |
| R878 | 321-0400-00 | B369020 | | RES.,FXD,FILM:143K OHM,1%,0.125W | 91637 | MFF55116G14302F |
| R879 | 315-0124-00 | B010100 | B369019 | RES.,FXD,CMPSN:120K OHM,5%,0.25W | 01121 | CB1245 |
| R879 | 321-0403-00 | B369020 | | RES.,FXD,FILM:154K OHM,1%,0.125W | 91637 | MFF1816G15402F |
| R880 | 323-0272-00 | B010100 | B369019 | RES.,FXD,FILM:6.65K OHM,1%,0.50W | 75042 | CECT0-6651F |
| R880 | 323-0269-09 | B369020 | | RES.,FXD,FILM:6.19K OHM,1%,0.50W | 91637 | MFF1226C61900F |
| R881 | 311-1223-00 | | | RES.,VAR,NONWIR:TRMR,250 OHM,0.5W | 73138 | 72-5-0 |
| R882 | 323-0206-00 | B010100 | B369019 | RES.,FXD,FILM:1.37K OHM,1%,0.50W | 75042 | CECT0-1371F |
| R882 | 321-0202-09 | B369020 | | RES.,FXD,FILM:1.24K OHM,1%,0.125W | 91637 | MFF1816C12400F |
| R883 | 321-0223-00 | | | RES.,FXD,FILM:2.05K OHM,1%,0.125W | 91637 | MFF1816G20500F |
| R884 | 323-0306-00 | | | RES.,FXD,FILM:15K OHM,1%,0.50W | 75042 | CECT0-1502F |
| R886 | 315-0224-00 | | | RES.,FXD,CMPSN:220K OHM,5%,0.25W | 57668 | NTR25J-E220K |
| R889 | 315-0911-00 | | | RES.,FXD,CMPSN:910 OHM,5%,0.25W | 57668 | NTR25J-E910E |
| R890 | 323-0264-00 | | | RES.,FXD,FILM:5.49K OHM,1%,0.50W | 91637 | MFF1226G54900F |
| R891 | 315-0473-00 | | | RES.,FXD,CMPSN:47K OHM,5%,0.25W | 57668 | NTR25J-E47K0 |
| R892 | 315-0682-00 | | | RES.,FXD,CMPSN:6.8K OHM,5%,0.25W | 57668 | NTR25J-E06K8 |
| R894 | 315-0245-00 | | | RES.,FXD,CMPSN:2.4M OHM,5%,0.25W | 01121 | CB2455 |
| R896 | 301-0363-00 | | | RES.,FXD,CMPSN:36K OHM,5%,0.5W | 01121 | EB3635 |
| R898 | 315-0182-00 | | | RES.,FXD,CMPSN:1.8K OHM,5%,0.25W | 57668 | NTR25J-E1K8 |
| R901 | 315-0151-00 | | | RES.,FXD,CMPSN:150 OHM,5%,0.25W | 57668 | NTR25J-E150E |
| R903 | 308-0677-00 | B010100 | B371209 | RES.,FXD,WW:1 OHM,5%,2W | 75042 | BWH-1R000J |
| R903 | 308-0831-00 | B371210 | | RES.,FXD,WW:1 OHM,5%,2W.FUSIBLE | 75042 | BWF 1.0 OHM 5% |
| R904 | 308-0679-00 | | | RES.,FXD,WW:0.51 OHM,5%,2W | 75042 | BWH-R5100J |
| R906 | 315-0304-00 | B010100 | B369019 | RES.,FXD,CMPSN:300K OHM,5%,0.25W | 57668 | NTR25J-E300K |
| R906 | 321-0442-00 | B369020 | | RES.,FXD,FILM:392K OHM,1%,0.125W | 91637 | MFF1816G39202F |
| R907 | 315-0104-00 | B010100 | B129999 | RES.,FXD,CMPSN:100K OHM,5%,0.25W | 57668 | NTR25J-E100K |
| R907 | 315-0753-00 | B130000 | B369019 | RES.,FXD,CMPSN:75K OHM,5%,0.25W | 57668 | NTR25J-E75K0 |
| R907 | 321-0382-00 | B369020 | | RES.,FXD,FILM:93.1K OHM,1%,0.125W | 91637 | MFF1816G93101F |
| R908 | 315-0431-00 | B010100 | B369019 | RES.,FXD,CMPSN:430 OHM,5%,0.25W | 01121 | CB4315 |
| R908 | 321-0168-00 | B369020 | | RES.,FXD,FILM:549 OHM,1%,0.125W | 91637 | MFF1816G549R0F |
| R910 | 315-0681-00 | | | RES.,FXD,CMPSN:680 OHM,5%,0.25W | 57668 | NTR25J-E680E |
| R911 | 315-0563-00 | | | RES.,FXD,CMPSN:56K OHM,5%,0.25W | 01121 | CB5635 |
| R912 | 315-0182-00 | | | RES.,FXD,CMPSN:1.8K OHM,5%,0.25W | 57668 | NTR25J-E1K8 |
| R915 | 321-1296-07 | | | RES.,FXD,FILM:12K OHM,0.1%,0.125W | 91637 | MFF1816C12001B |
| R916 | 321-0924-07 | | | RES.,FXD,FILM:40K OHM,0.1%,0.125W | 91637 | MFF1816C40001B |
| R918 | 301-0683-00 | | | RES.,FXD,CMPSN:68K OHM,5%,0.50W | 57668 | TR50J-E68K |
| R921 | 315-0912-00 | | | RES.,FXD,CMPSN:9.1K OHM,5%,0.25W | 57668 | NTR25J-E09K1 |
| R922 | 315-0623-00 | | | RES.,FXD,CMPSN:62K OHM,5%,0.25W | 01121 | CB6235 |
| R923 | 315-0512-00 | B010100 | B373030 | RES.,FXD,CMPSN:5.1K OHM,5%,0.25W | 57668 | NTR25J-E05K1 |
| R923 | 315-0103-00 | B373031 | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 57668 | NTR25J-E10K0 |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|----------------------|---------|-----------------------------------|----------|------------------|
| R924 | 315-0623-00 | | | RES.,FXD,CMPSN:62K OHM,5%,0.25W | 01121 | CB6235 |
| R927 | 315-0472-00 | | | RES.,FXD,CMPSN:4.7K OHM,5%,0.25W | 57668 | NTR25J-E04K7 |
| R932 | 315-0182-00 | | | RES.,FXD,CMPSN:1.8K OHM,5%,0.25W | 57668 | NTR25J-E1K8 |
| R934 | 308-0832-00 | B371210 | | RES.,FXD,WW:0.2 OHM,5%,1W,FUSIBLE | 75042 | BW-20F-0.2 OHM5% |
| R935 | 308-0678-00 | B010100 | B369019 | RES.,FXD,WW:0.1 OHM,5%,2W | 75042 | BWH-R1000J |
| R935 | 308-0643-00 | B369030 | B371209 | RES.,FXD,WW:0.1 OHM,3%,3W | 91637 | RS2B-ER1000H TR |
| R935 | 308-0832-00 | B371210 | | RES.,FXD,WW:0.2 OHM,5%,1W,FUSIBLE | 75042 | BW-20F-0.2 OHM5% |
| R936 | 301-0273-00 | | | RES.,FXD,CMPSN:27K OHM,5%,0.5W | 57668 | TR50J-E27K |
| R937 | 315-0361-00 | B010100 | B119999 | RES.,FXD,CMPSN:360 OHM,5%,0.25W | 01121 | CB3615 |
| R937 | 321-0151-00 | B120000 | | RES.,FXD,FILM:365 OHM,1%,0.125W | 91637 | MFF1816G365R0F |
| R938 | 315-0303-00 | B010100 | B119999 | RES.,FXD,CMPSN:30K OHM,5%,0.25W | 01121 | CB3035 |
| R938 | 321-0330-00 | B120000 | | RES.,FXD,FILM:26.7K OHM,1%,0.125W | 91637 | MFF1816G26701F |
| R939 | 315-0184-00 | B010100 | B119999 | RES.,FXD,CMPSN:180K OHM,5%,0.25W | 01121 | CB1845 |
| R939 | 321-0409-00 | B120000 | | RES.,FXD,FILM:178K OHM,1%,0.125W | 91637 | MFF1816G17802F |
| R940 | 315-0822-00 | | | RES.,FXD,CMPSN:8.2K OHM,5%,0.25W | 01121 | CB8225 |
| R942 | 315-0154-00 | | | RES.,FXD,CMPSN:150K OHM,5%,0.25W | 57668 | NTR25J-E150K |
| R945 | 321-0332-07 | | | RES.,FXD,FILM:28K OHM,0.1%,0.125W | 91637 | MFF1816C28001B |
| R946 | 321-1296-07 | | | RES.,FXD,FILM:12K OHM,0.1%,0.125W | 91637 | MFF1816C12001B |
| R948 | 315-0914-00 | | | RES.,FXD,CMPSN:910K OHM,5%,0.25W | 01121 | CB9145 |
| R950 | 315-0681-00 | B010100 | B344449 | RES.,FXD,CMPSN:680 OHM,5%,0.25W | 57668 | NTR25J-E680E |
| R950 | 315-0272-00 | B344450 | | RES.,FXD,CMPSN:2.7K OHM,5%,0.25W | 57668 | NTR25J-E02K7 |
| R952 | 301-0303-00 | B010100 | B343770 | RES.,FXD,CMPSN:30K OHM,5%,0.5W | 01121 | EB3035 |
| R952 | 303-0303-00 | B343771 | | RES.,FXD,CMPSN:30K OHM,5%,1W | 01121 | GB3035 |
| R954 | 315-0472-00 | | | RES.,FXD,CMPSN:4.7K OHM,5%,0.25W | 57668 | NTR25J-E04K7 |
| R956 | 307-0103-00 | | | RES.,FXD,CMPSN:2.7 OHM,5%,0.25W | 01121 | CB27G5 |
| R957 | 315-0151-00 | B010100 | B309999 | RES.,FXD,CMPSN:150 OHM,5%,0.25W | 57668 | NTR25J-E150E |
| R957 | 315-0510-00 | B310000 | | RES.,FXD,CMPSN:51 OHM,5%,0.25W | 57668 | NTR25J-E51E0 |
| R958 | 308-0678-00 | B010100 | B369019 | RES.,FXD,WW:0.1 OHM,5%,2W | 75042 | BWH-R1000J |
| R958 | 308-0643-00 | B369020 | B371209 | RES.,FXD,WW:0.1 OHM,3%,3W | 91637 | RS2B-ER1000H TR |
| R958 | 308-0832-00 | B371210 | | RES.,FXD,WW:0.2 OHM,5%,1W,FUSIBLE | 75042 | BW-20F-0.2 OHM5% |
| R960 | 308-0832-00 | B371210 | | RES.,FXD,WW:0.2 OHM,5%,1W,FUSIBLE | 75042 | BW-20F-0.2 OHM5% |
| R959 | 308-0680-00 | | | RES.,FXD,WW:0.045 OHM,10%,3W | 91637 | LVR-3R0450K |
| R961 | 315-0221-00 | B010100 | B369019 | RES.,FXD,CMPSN:220 OHM,5%,0.25W | 57668 | NTR25J-E220E |
| R961 | 321-0147-00 | B369020 | | RES.,FXD,FILM:332 OHM,1%,0.125W | 91637 | MFF1816G332R0F |
| R963 | 315-0682-00 | | | RES.,FXD,CMPSN:6.8K OHM,5%,0.25W | 57668 | NTR25J-E06K8 |
| R966 | 315-0123-00 | B010100 | B369019 | RES.,FXD,CMPSN:12K OHM,5%,0.25W | 57668 | NTR25J-E12K0 |
| R966 | 321-0322-00 | B369020 | | RES.,FXD,FILM:22.1K OHM,1%,0.125W | 91637 | MFF1816G22101F |
| R967 | 315-0364-00 | B010100 | B369019 | RES.,FXD,CMPSN:360K OHM,5%,0.25W | 57668 | NTR25J-E360K |
| R967 | 321-0445-00 | B369020 | | RES.,FXD,FILM:422K OHM,1%,0.125W | 91637 | MFF1816G42202F |
| R970 | 321-0926-07 | | | RES.,FXD,FILM:4K OHM,0.1%,0.125W | 91637 | MFF1816C40000B |
| R971 | 321-0924-07 | | | RES.,FXD,FILM:40K OHM,0.1%,0.125W | 91637 | MFF1816C40001B |
| R973 | 315-0104-00 | B010100 | B049999 | RES.,FXD,CMPSN:100K OHM,5%,0.25W | 57668 | NTR25J-E100K |
| R973 | 315-0683-00 | B050000 | | RES.,FXD,CMPSN:68K OHM,5%,0.25W | 57668 | NTR25J-E68K0 |
| R974 | 315-0303-00 | B050000 | | RES.,FXD,CMPSN:30K OHM,5%,0.25W | 01121 | CB3035 |
| R975 | 315-0362-00 | | | RES.,FXD,CMPSN:3.6K OHM,5%,0.25W | 01121 | CB3625 |
| R977 | 315-0184-00 | | | RES.,FXD,CMPSN:180K OHM,5%,0.25W | 01121 | CB1845 |
| R979 | 315-0822-00 | B010100 | B373030 | RES.,FXD,CMPSN:8.2K OHM,5%,0.25W | 01121 | CB8225 |
| R979 | 315-0103-00 | B373031 | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 57668 | NTR25J-E10K0 |
| R980 | 315-0164-00 | | | RES.,FXD,CMPSN:160K OHM,5%,0.25W | 57668 | NTR25J-E160K |
| R983 | 315-0472-00 | | | RES.,FXD,CMPSN:4.7K OHM,5%,0.25W | 57668 | NTR25J-E04K7 |
| R985 | 304-0470-00 | | | RES.,FXD,CMPSN:47 OHM,10%,1W | 01121 | GB4701 |
| R986 | 315-0122-00 | | | RES.,FXD,CMPSN:1.2K OHM,5%,0.25W | 57668 | NTR25J-E01K2 |
| R988 | 308-0832-00 | B371210 | | RES.,FXD,WW:0.2 OHM,5%,1W,FUSIBLE | 75042 | BW-20F-0.2 OHM5% |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|----------------------|---------|---------------------------------------|----------|------------------|
| R989 | 308-0678-00 | B010100 | B369019 | RES.,FXD,WW:0.1 OHM,5%,2W | 75042 | BWH-R1000J |
| R989 | 308-0643-00 | B369020 | B371209 | RES.,FXD,WW:0.1 OHM,3%,3W | 91637 | RS2B-ER1000H TR |
| R989 | 308-0832-00 | B371210 | | RES.,FXD,WW:0.2 OHM,5%,1W,FUSIBLE | 75042 | BW-20F-0.2 OHM5% |
| R991 | 315-0753-00 | | | RES.,FXD,CMPSN:75K OHM,5%,0.25W | 57668 | NTR25J-E75K0 |
| R993 | 315-0241-00 | B010100 | B369019 | RES.,FXD,CMPSN:240 OHM,5%,0.25W | 01121 | CB2415 |
| R993 | 321-0147-00 | B369020 | | RES.,FXD,FILM:332 OHM,1%,0.125W | 91637 | MFF1816G332R0F |
| R994 | 315-0124-00 | B010100 | B369019 | RES.,FXD,CMPSN:120K OHM,5%,0.25W | 01121 | CB1245 |
| R994 | 321-0403-00 | B369020 | | RES.,FXD,FILM:154K OHM,1%,0.125W | 91637 | MFF1816G15402F |
| R995 | 315-0562-00 | B010100 | B369019 | RES.,FXD,CMPSN:5.6K OHM,5%,0.25W | 57668 | NTR25J-E05K6 |
| R995 | 321-0280-00 | B369020 | | RES.,FXD,FILM:8.06K OHM,1%,0.125W | 91637 | MFF1816G80600F |
| R1000 | 301-0105-00 | B343636 | B357055 | RES.,FXD,CMPSN:1M OHM,5%,0.50W | 01121 | EB1055 |
| R1000 | 305-0105-00 | B375943 | | RES.,FXD,CMPSN:1M OHM,5%,2W | 01121 | HB1055 |
| R1018 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R1019 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R1020 | 315-0150-00 | | | RES.,FXD,CMPSN:15 OHM,5%,0.25W | 01121 | CB1505 |
| R1022 | 315-0303-00 | | | RES.,FXD,CMPSN:30K OHM,5%,0.25W | 01121 | CB3035 |
| R1045 | 311-1044-00 | B010100 | B039999 | RES.,VAR,NONWIR:PNL,50K OHM,0.50W | 01121 | W-7542A |
| R1045 | 311-1529-00 | B040000 | | RES.,VAR,NONWIR:PNL,50K OHM,1W | 12697 | 381-CM39977 |
| R1061 | 315-0223-00 | | | RES.,FXD,CMPSN:22K OHM,5%,0.25W | 57668 | NTR25J-E 22K |
| R1062 | 315-0362-00 | | | RES.,FXD,CMPSN:3.6K OHM,5%,0.25W | 01121 | CB3625 |
| R1063 | 315-0433-00 | | | RES.,FXD,CMPSN:43K OHM,5%,0.25W | 57668 | NTR25J-E043K |
| R1066 | 315-0183-00 | | | RES.,FXD,CMPSN:18K OHM,5%,0.25W | 01121 | CB1835 |
| R1067 | 315-0513-00 | | | RES.,FXD,CMPSN:51K OHM,5%,0.25W | 57668 | NTR25J-E51K0 |
| R1069 | 315-0433-00 | | | RES.,FXD,CMPSN:43K OHM,5%,0.25W | 57668 | NTR25J-E043K |
| R1071 | 323-0260-00 | | | RES.,FXD,FILM:4.99K OHM,1%,0.50W | 75042 | CECT0-4991F |
| R1073 | 315-0222-00 | | | RES.,FXD,CMPSN:2.2K OHM,5%,0.25W | 57668 | NTR25J-E02K2 |
| R1074 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R1076 | 315-0752-00 | | | RES.,FXD,CMPSN:7.5K OHM,5%,0.25W | 57668 | NTR25J-E07K5 |
| R1077 | 311-1227-00 | | | RES.,VAR,NONWIR:5K OHM,20%,0.50W | 32997 | 3386F-T04-502 |
| R1079 | 321-0318-00 | | | RES.,FXD,FILM:20K OHM,1%,0.125W | 91637 | MFF1816G20001F |
| R1081 | 321-0812-07 | | | RES.,FXD,FILM:455 OHM,0.1%,0.125W | 91637 | MFF1816C455R0B |
| R1082 | 321-0825-03 | | | RES.,FXD,FILM:50.8 OHM,0.25%,0.125W | 91637 | MFF1816D50R80C |
| R1084 | 321-0816-07 | | | RES.,FXD,FILM:5K OHM,0.1%,0.125W | 91637 | MFF1816C50000B |
| R1085 | 321-1068-07 | | | RES.,FXD,FILM:50.5 OHM,0.1%,0.125W | 91637 | MFF1816C50R50B |
| R1087 | 308-0679-00 | | | RES.,FXD,WW:0.51 OHM,5%,2W | 75042 | BWH-R5100J |
| R1095 | 311-1055-00 | | | RES.,VAR,NONWIR:5K OHM,20%,0.50W,W/SW | 12697 | 381-CM40034 |
| R1101 | 315-0470-00 | | | RES.,FXD,CMPSN:47 OHM,5%,0.25W | 57668 | NTR25J-E47E0 |
| R1103 | 315-0471-00 | | | RES.,FXD,CMPSN:470 OHM,5%,0.25W | 57668 | NTR25J-E470E |
| R1105 | 315-0103-00 | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 57668 | NTR25J-E10K0 |
| R1106 | 315-0123-00 | | | RES.,FXD,CMPSN:12K OHM,5%,0.25W | 57668 | NTR25J-E12K0 |
| R1108 | 315-0471-00 | | | RES.,FXD,CMPSN:470 OHM,5%,0.25W | 57668 | NTR25J-E470E |
| R1111 | 321-0233-00 | | | RES.,FXD,FILM:2.61K OHM,1%,0.125W | 91637 | MFF1816G26100F |
| R1113 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R1114 | 315-0511-00 | | | RES.,FXD,CMPSN:510 OHM,5%,0.25W | 01121 | CB5115 |
| R1115 | 315-0121-00 | | | RES.,FXD,CMPSN:120 OHM,5%,0.25W | 01121 | CB1215 |
| R1116 | 311-1248-00 | | | RES.,VAR,NONWIR:500 OHM,10%,0.50W | 73138 | 72-23-0 |
| R1119 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R1120 | 301-0563-00 | | | RES.,FXD,CMPSN:56K OHM,5%,0.50W | 01121 | EB5635 |
| R1121 | 311-1237-00 | | | RES.,VAR,NONWIR:1K OHM,10%,0.50W | 32997 | 3386X-T07-102 |
| R1122 | 315-0912-00 | | | RES.,FXD,CMPSN:9.1K OHM,5%,0.25W | 57668 | NTR25J-E09K1 |
| R1124 | 315-0562-00 | | | RES.,FXD,CMPSN:5.6K OHM,5%,0.25W | 57668 | NTR25J-E05K6 |
| R1126 | 303-0203-00 | | | RES.,FXD,CMPSN:20K OHM,5%,1W | 01121 | GB2035 |
| R1128 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R1129 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|----------------------|---------|------------------------------------|----------|------------------|
| R1131 | 315-0100-00 | | | RES.,FXD,CMPSN:10 OHM,5%,0.25W | 57668 | NTR25J-E 10E0 |
| R1132 | 315-0392-00 | | | RES.,FXD,CMPSN:3.9K OHM,5%,0.25W | 57668 | NTR25J-E03K9 |
| R1135 | 315-0103-00 | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 57668 | NTR25J-E10K0 |
| R1137 | 315-0121-00 | | | RES.,FXD,CMPSN:120 OHM,5%,0.25W | 01121 | CB1215 |
| R1138 | 315-0682-00 | | | RES.,FXD,CMPSN:6.8K OHM,5%,0.25W | 57668 | NTR25J-E06K8 |
| R1139 | 323-0312-00 | | | RES.,FXD,FILM:17.4K OHM,1%,0.50W | 91637 | MFF1226G17401F |
| R1139 | 323-0314-00 | B030492 | | RES.,FXD,FILM:18.2K OHM,1%,0.50W | 75042 | CECT0-1822F |
| R1139 | ----- | | | (OPTION 04 ONLY) | | |
| R1141 | 315-0912-00 | | | RES.,FXD,CMPSN:9.1K OHM,5%,0.25W | 57668 | NTR25J-E09K1 |
| R1144 | 315-0562-00 | | | RES.,FXD,CMPSN:5.6K OHM,5%,0.25W | 57668 | NTR25J-E05K6 |
| R1146 | 303-0203-00 | | | RES.,FXD,CMPSN:20K OHM,5%,1W | 01121 | GB2035 |
| R1148 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R1149 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R1151 | 315-0100-00 | | | RES.,FXD,CMPSN:10 OHM,5%,0.25W | 57668 | NTR25J-E 10E0 |
| R1152 | 315-0392-00 | | | RES.,FXD,CMPSN:3.9K OHM,5%,0.25W | 57668 | NTR25J-E03K9 |
| R1155 | 315-0103-00 | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 57668 | NTR25J-E10K0 |
| R1157 | 315-0121-00 | | | RES.,FXD,CMPSN:120 OHM,5%,0.25W | 01121 | CB1215 |
| R1158 | 315-0392-00 | | | RES.,FXD,CMPSN:3.9K OHM,5%,0.25W | 57668 | NTR25J-E03K9 |
| R1159 | 323-0312-00 | | | RES.,FXD,FILM:17.4K OHM,1%,0.50W | 91637 | MFF1226G17401F |
| R1159 | 323-0317-00 | B030492 | | RES.,FXD,FILM:19.6K OHM,1%,0.50W | 75042 | CECT0-1962F |
| R1159 | ----- | | | (OPTION 04 ONLY) | | |
| R1181 | 311-1227-00 | | | RES.,VAR,NONWIR:5K OHM,20%,0.50W | 32997 | 3386F-T04-502 |
| R1184 | 311-1235-00 | | | RES.,VAR,NONWIR:100K OHM,20%,0.50W | 32997 | 3386F-T04-104 |
| R1190 | 311-1227-00 | | | RES.,VAR,NONWIR:5K OHM,20%,0.50W | 32997 | 3386F-T04-502 |
| R1193 | 311-1235-00 | | | RES.,VAR,NONWIR:100K OHM,20%,0.50W | 32997 | 3386F-T04-104 |
| R1195 | 315-0183-00 | B010100 | B079999 | RES.,FXD,CMPSN:18K OHM,5%,0.25W | 01121 | CB1835 |
| R1195 | 315-0362-00 | B080000 | | RES.,FXD,CMPSN:3.6K OHM,5%,0.25W | 01121 | CB3625 |
| R1196 | 315-0183-00 | B010100 | B079999 | RES.,FXD,CMPSN:18K OHM,5%,0.25W | 01121 | CB1835 |
| R1196 | 315-0362-00 | B080000 | | RES.,FXD,CMPSN:3.6K OHM,5%,0.25W | 01121 | CB3625 |
| R1201 | 315-0103-00 | B150000 | B329999 | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 57668 | NTR25J-E10K0 |
| R1201 | 315-0103-03 | B330000 | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 01121 | CB1035 |
| R1202 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R1204 | 315-0474-00 | | | RES.,FXD,CMPSN:470K OHM,5%,0.25W | 57668 | NTR25J-E470K |
| R1205 | 315-0202-00 | | | RES.,FXD,CMPSN:2K OHM,5%,0.25W | 57668 | NTR25J-E02K0 |
| R1207 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R1208 | 315-0104-00 | | | RES.,FXD,CMPSN:100K OHM,5%,0.25W | 57668 | NTR25J-E100K |
| R1210 | 315-0562-00 | B010100 | B329999 | RES.,FXD,CMPSN:5.6K OHM,5%,0.25W | 57668 | NTR25J-E05K6 |
| R1210 | 315-0152-00 | B330000 | | RES.,FXD,CMPSN:1.5K OHM,5%,0.25W | 57668 | NTR25J-E01K5 |
| R1211 | 315-0562-00 | | | RES.,FXD,CMPSN:5.6K OHM,5%,0.25W | 57668 | NTR25J-E05K6 |
| R1214 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R1217 | 315-0470-03 | B330000 | | RES.,FXD,CMPSN:47 OHM,5%,0.25W | 01121 | CB4705 |
| R1234 | 315-0203-00 | B010100 | B329999 | RES.,FXD,CMPSN:20K OHM,5%,0.25W | 57668 | NTR25J-E20K0 |
| R1234 | 315-0472-03 | B330000 | | RES.,FXD,CMPSN:4.7K OHM,5%,0.25W | 01121 | CB4725 |
| R1235 | 315-0470-03 | B330000 | | RES.,FXD,CMPSN:47 OHM,5%,0.25W | 01121 | CB4705 |
| R1242 | 315-0101-00 | B010175 | | RES.,FXD,CMPSN:100 OHM,5%,0.25W | 57668 | NTR25J-E 100E |
| R1243 | 315-0434-00 | B010100 | B109999 | RES.,FXD,CMPSN:430K OHM,5%,0.25W | 57668 | NTR25J-E430K |
| R1243 | 315-0364-00 | B110000 | | RES.,FXD,CMPSN:360K OHM,5%,0.25W | 57668 | NTR25J-E360K |
| R1243 | 321-0407-00 | B030492 | B329999 | RES.,FXD,FILM:169K OHM,1%,0.125W | 91637 | MFF1816G16902F |
| R1243 | ----- | | | (OPTION 04 ONLY) | | |
| R1244 | 321-0335-00 | B030492 | | RES.,FXD,FILM:30.1K OHM,1%,0.125W | 91637 | CMF55116G30101F |
| R1244 | ----- | | | (OPTION 04 ONLY) | | |
| R1245 | 307-0359-00 | | | RES.,FXD,FILM:HV DIVIDER | 80009 | 307-0359-00 |
| R1250 | 311-1256-00 | | | RES.,VAR,NONWIR:2.5M OHM,20%,0.50W | 73138 | 72PMR2.5 MEG-78B |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix | | Serial/Model No. | | Name & Description | Mfr Code | Mfr Part Number |
|---------|-------------|---------|------------------|--|-----------------------------------|----------|-----------------|
| | Part No. | Eff | Dscont | | | | |
| R1252 | 315-0915-00 | B010100 | B329999 | | RES.,FXD,CMPSN:9.1M OHM,5%,0.25W | 01121 | CB9155 |
| R1252 | 322-0524-01 | B330000 | | | RES.,FXD,FILM:2.8M OHM,0.5%,0.25W | 91637 | HFF143G28003D |
| R1253 | 315-0103-00 | B102280 | B329999 | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 57668 | NTR25J-E10K0 |
| R1253 | 315-0103-00 | B030492 | B329999 | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 57668 | NTR25J-E10K0 |
| R1253 | ----- | | | | (OPTION 04 ONLY) | | |
| R1254 | 315-0103-00 | B254775 | B329999 | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 57668 | NTR25J-E10K0 |
| R1257 | 315-0105-00 | B010100 | B099999 | | RES.,FXD,CMPSN:1M OHM,5%,0.25W | 01121 | CB1055 |
| R1257 | 315-0754-00 | B100000 | B329999 | | RES.,FXD,CMPSN:750K OHM,5%,0.25W | 01121 | CB7545 |
| R1257 | 315-0754-03 | B330000 | | | RES.,FXD,CMPSN:750K OHM,5%,0.25W | 01121 | CB7545 |
| R1258 | 315-0103-03 | B102280 | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 01121 | CB1035 |
| R1258 | 315-0103-03 | B030492 | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 01121 | CB1035 |
| R1258 | ----- | | | | (OPTION 04 ONLY) | | |
| R1259 | 315-0513-00 | | | | RES.,FXD,CMPSN:51K OHM,5%,0.25W | 57668 | NTR25J-E51K0 |
| R1260 | 315-0103-03 | B330000 | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 01121 | CB1035 |
| R1261 | 311-1232-00 | | | | RES.,VAR,NONWIR:50K OHM,20%,0.50W | 32997 | 3386F-T04-503 |
| R1262 | 315-0103-03 | B102280 | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 01121 | CB1035 |
| R1262 | 315-0103-03 | B030492 | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 01121 | CB1035 |
| R1262 | ----- | | | | (OPTION 04 ONLY) | | |
| R1263 | 315-0513-00 | | | | RES.,FXD,CMPSN:51K OHM,5%,0.25W | 57668 | NTR25J-E51K0 |
| R1266 | 315-0125-00 | B010100 | B099999 | | RES.,FXD,CMPSN:1.2M OHM,5%,0.25W | 01121 | CB1255 |
| R1266 | 315-0754-00 | B100000 | B329999 | | RES.,FXD,CMPSN:750K OHM,5%,0.25W | 01121 | CB7545 |
| R1266 | 315-0754-03 | B330000 | | | RES.,FXD,CMPSN:750K OHM,5%,0.25W | 01121 | CB7545 |
| R1270 | 315-0103-00 | B102280 | B329999 | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 57668 | NTR25J-E10K0 |
| R1270 | 315-0103-00 | B030492 | B329999 | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 57668 | NTR25J-E10K0 |
| R1270 | ----- | | | | (OPTION 04 ONLY) | | |
| R1271 | 315-0915-00 | B010100 | B329999 | | RES.,FXD,CMPSN:9.1M OHM,5%,0.25W | 01121 | CB9155 |
| R1274 | 315-0104-00 | | | | RES.,FXD,CMPSN:100K OHM,5%,0.25W | 57668 | NTR25J-E100K |
| R1275 | 315-0474-00 | B010100 | B099999 | | RES.,FXD,CMPSN:470K OHM,5%,0.25W | 57668 | NTR25J-E470K |
| R1275 | 315-0563-00 | B100000 | B329999 | | RES.,FXD,CMPSN:56K OHM,5%,0.25W | 01121 | CB5635 |
| R1275 | 315-0134-03 | B330000 | | | RES.,FXD,CMPSN:130K OHM,5%,0.25W | 01121 | CB1345 |
| R1276 | 308-0703-00 | B030492 | | | RES.,FXD,WW:1.8 OHM,5%,.2W | 75042 | BWH-1R800J |
| R1276 | ----- | | | | (OPTION 04 ONLY) | | |
| R1278 | 315-0470-03 | B330000 | | | RES.,FXD,CMPSN:47 OHM,5%,0.25W | 01121 | CB4705 |
| R1313 | 315-0243-03 | B330000 | | | RES.,FXD,CMPSN:24K OHM,5%,0.25W | 01121 | CB2435 |
| R1315 | 315-0103-03 | B330000 | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 01121 | CB1035 |
| R1317 | 315-0206-01 | B330000 | | | RES.,FXD,CMPSN:20M OHM,5%,0.25W | 01121 | CB2065 |
| R1319 | 315-0103-03 | B330000 | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 01121 | CB1035 |
| R1413 | 315-0243-03 | B330000 | | | RES.,FXD,CMPSN:24K OHM,5%,0.25W | 01121 | CB2435 |
| R1415 | 315-0103-03 | B330000 | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 01121 | CB1035 |
| R1417 | 315-0206-01 | B330000 | | | RES.,FXD,CMPSN:20M OHM,5%,0.25W | 01121 | CB2065 |
| R1419 | 315-0824-02 | B330000 | | | RES.,FXD,CMPSN:820K OHM,5%,0.25W | 01121 | CB8245 |
| R2101 | 315-0682-00 | | | | RES.,FXD,CMPSN:6.8K OHM,5%,0.25W | 57668 | NTR25J-E06K8 |
| R2102 | 315-0103-00 | | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 57668 | NTR25J-E10K0 |
| R2104 | 315-0333-00 | | | | RES.,FXD,CMPSN:33K OHM,5%,0.25W | 57668 | NTR25J-E33K0 |
| R2105 | 315-0153-00 | | | | RES.,FXD,CMPSN:15K OHM,5%,0.25W | 01121 | CB1535 |
| R2107 | 315-0510-00 | | | | RES.,FXD,CMPSN:51 OHM,5%,0.25W | 57668 | NTR25J-E51E0 |
| R2108 | 315-0512-00 | | | | RES.,FXD,CMPSN:5.1K OHM,5%,0.25W | 57668 | NTR25J-E05K1 |
| R2109 | 315-0221-00 | | | | RES.,FXD,CMPSN:220 OHM,5%,0.25W | 57668 | NTR25J-E220E |
| R2112 | 315-0102-00 | | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R2113 | 315-0301-00 | | | | RES.,FXD,CMPSN:300 OHM,5%,0.25W | 57668 | NTR25J-E300E |
| R2122 | 315-0432-00 | | | | RES.,FXD,CMPSN:4.3K OHM,5%,0.25W | 57668 | NTR25J-E04K3 |
| R2123 | 315-0683-00 | | | | RES.,FXD,CMPSN:68K OHM,5%,0.25W | 57668 | NTR25J-E68K0 |
| R2127 | 315-0302-00 | | | | RES.,FXD,CMPSN:3K OHM,5%,0.25W | 57668 | NTR25J-E03K0 |
| R2128 | 311-1225-00 | B010100 | B139999 | | RES.,VAR,NONWIR:1K OHM,20%,0.50W | 32997 | 3386F-T04-102 |
| R2128 | 311-1263-00 | B140000 | | | RES.,VAR,NONWIR:1K OHM,10%,0.50W | 32997 | 3329P-L58-102 |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix | | Serial/Model No. | | Name & Description | Mfr Code | Mfr Part Number |
|---------|-------------|-----|------------------|--|-----------------------------------|----------|-----------------|
| | Part No. | Eff | Dscont | | | | |
| R2129 | 315-0183-00 | | | | RES.,FXD,CMPSN:18K OHM,5%,0.25W | 01121 | CB1835 |
| R2135 | 315-0393-00 | | | | RES.,FXD,CMPSN:39K OHM,5%,0.25W | 57668 | NTR25J-E39K0 |
| R2137 | 315-0752-00 | | | | RES.,FXD,CMPSN:7.5K OHM,5%,0.25W | 57668 | NTR25J-E07K5 |
| R2139 | 315-0242-00 | | | | RES.,FXD,CMPSN:2.4K OHM,5%,0.25W | 57668 | NTR25J-E02K4 |
| R2144 | 315-0104-00 | | | | RES.,FXD,CMPSN:100K OHM,5%,0.25W | 57668 | NTR25J-E100K |
| R2146 | 315-0152-00 | | | | RES.,FXD,CMPSN:1.5K OHM,5%,0.25W | 57668 | NTR25J-E01K5 |
| R2148 | 315-0103-00 | | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 57668 | NTR25J-E10K0 |
| R2150 | 321-0403-00 | | | | RES.,FXD,FILM:154K OHM,1%,0.125W | 91637 | MFF1816G15402F |
| R2151 | 321-0372-00 | | | | RES.,FXD,FILM:73.2K OHM,1%,0.125W | 91637 | MFF1816G73201F |
| R2153 | 315-0103-00 | | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 57668 | NTR25J-E10K0 |
| R2155 | 315-0512-00 | | | | RES.,FXD,CMPSN:5.1K OHM,5%,0.25W | 57668 | NTR25J-E05K1 |
| R2158 | 315-0152-00 | | | | RES.,FXD,CMPSN:1.5K OHM,5%,0.25W | 57668 | NTR25J-E01K5 |
| R2161 | 315-0102-00 | | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R2162 | 315-0751-00 | | | | RES.,FXD,CMPSN:750 OHM,5%,0.25W | 57668 | NTR25J-E750E |
| R2163 | 315-0751-00 | | | | RES.,FXD,CMPSN:750 OHM,5%,0.25W | 57668 | NTR25J-E750E |
| R2165 | 315-0102-00 | | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R2166 | 315-0751-00 | | | | RES.,FXD,CMPSN:750 OHM,5%,0.25W | 57668 | NTR25J-E750E |
| R2167 | 315-0751-00 | | | | RES.,FXD,CMPSN:750 OHM,5%,0.25W | 57668 | NTR25J-E750E |
| R2169 | 315-0102-00 | | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R2170 | 315-0751-00 | | | | RES.,FXD,CMPSN:750 OHM,5%,0.25W | 57668 | NTR25J-E750E |
| R2171 | 315-0751-00 | | | | RES.,FXD,CMPSN:750 OHM,5%,0.25W | 57668 | NTR25J-E750E |
| R2173 | 315-0102-00 | | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R2174 | 315-0751-00 | | | | RES.,FXD,CMPSN:750 OHM,5%,0.25W | 57668 | NTR25J-E750E |
| R2175 | 315-0751-00 | | | | RES.,FXD,CMPSN:750 OHM,5%,0.25W | 57668 | NTR25J-E750E |
| R2177 | 315-0511-00 | | | | RES.,FXD,CMPSN:510 OHM,5%,0.25W | 01121 | CB5115 |
| R2178 | 315-0511-00 | | | | RES.,FXD,CMPSN:510 OHM,5%,0.25W | 01121 | CB5115 |
| R2179 | 315-0511-00 | | | | RES.,FXD,CMPSN:510 OHM,5%,0.25W | 01121 | CB5115 |
| R2182 | 321-0262-00 | | | | RES.,FXD,FILM:5.23K OHM,1%,0.125W | 91637 | MFF1816G52300F |
| R2183 | 311-1224-00 | | | | RES.,VAR,NONWIR:500 OHM,20%,0.50W | 32997 | 3386F-T04-501 |
| R2191 | 315-0513-00 | | | | RES.,FXD,CMPSN:51K OHM,5%,0.25W | 57668 | NTR25J-E51K0 |
| R2192 | 315-0133-00 | | | | RES.,FXD,CMPSN:13K OHM,5%,0.25W | 01121 | CB1335 |
| R2193 | 315-0133-00 | | | | RES.,FXD,CMPSN:13K OHM,5%,0.25W | 01121 | CB1335 |
| R2194 | 315-0753-00 | | | | RES.,FXD,CMPSN:75K OHM,5%,0.25W | 57668 | NTR25J-E75K0 |
| R2196 | 321-0308-00 | | | | RES.,FXD,FILM:15.8K OHM,1%,0.125W | 91637 | MFF1816G15801F |
| R2197 | 315-0513-00 | | | | RES.,FXD,CMPSN:51K OHM,5%,0.25W | 57668 | NTR25J-E51K0 |
| R2198 | 321-0319-00 | | | | RES.,FXD,FILM:20.5K OHM,1%,0.125W | 91637 | MFF1816G20501F |
| R2199 | 321-0335-00 | | | | RES.,FXD,FILM:30.1K OHM,1%,0.125W | 91637 | CMF55116G30101F |
| R2201 | 315-0154-00 | | | | RES.,FXD,CMPSN:150K OHM,5%,0.25W | 57668 | NTR25J-E150K |
| R2202 | 321-0335-00 | | | | RES.,FXD,FILM:30.1K OHM,1%,0.125W | 91637 | CMF55116G30101F |
| R2203 | 321-0344-00 | | | | RES.,FXD,FILM:37.4K OHM,1%,0.125W | 91637 | MFF1816G37401F |
| R2204 | 321-0335-00 | | | | RES.,FXD,FILM:30.1K OHM,1%,0.125W | 91637 | CMF55116G30101F |
| R2206 | 315-0513-00 | | | | RES.,FXD,CMPSN:51K OHM,5%,0.25W | 57668 | NTR25J-E51K0 |
| R2207 | 315-0154-00 | | | | RES.,FXD,CMPSN:150K OHM,5%,0.25W | 57668 | NTR25J-E150K |
| R2208 | 321-0335-00 | | | | RES.,FXD,FILM:30.1K OHM,1%,0.125W | 91637 | CMF55116G30101F |
| R2209 | 321-0335-00 | | | | RES.,FXD,FILM:30.1K OHM,1%,0.125W | 91637 | CMF55116G30101F |
| R2211 | 315-0752-00 | | | | RES.,FXD,CMPSN:7.5K OHM,5%,0.25W | 57668 | NTR25J-E07K5 |
| R2213 | 321-0259-00 | | | | RES.,FXD,FILM:4.87K OHM,1%,0.125W | 91637 | MFF1816G48700F |
| R2214 | 311-1224-00 | | | | RES.,VAR,NONWIR:500 OHM,20%,0.50W | 32997 | 3386F-T04-501 |
| R2215 | 315-0133-00 | | | | RES.,FXD,CMPSN:13K OHM,5%,0.25W | 01121 | CB1335 |
| R2217 | 315-0124-00 | | | | RES.,FXD,CMPSN:120K OHM,5%,0.25W | 01121 | CB1245 |
| R2219 | 315-0752-00 | | | | RES.,FXD,CMPSN:7.5K OHM,5%,0.25W | 57668 | NTR25J-E07K5 |
| R2220 | 321-0299-00 | | | | RES.,FXD,FILM:12.7K OHM,1%,0.125W | 91637 | MFF1816G12701F |
| R2221 | 321-0212-00 | | | | RES.,FXD,FILM:1.58K OHM,1%,0.125W | 91637 | MFF1816G15800F |
| R2226 | 315-0222-00 | | | | RES.,FXD,CMPSN:2.2K OHM,5%,0.25W | 57668 | NTR25J-E02K2 |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|----------------------|---------|---|----------|-----------------|
| R2227 | 321-0268-00 | | | RES.,FXD,FILM:6.04K OHM,1%,0.125W | 91637 | MFF1816G60400F |
| R2229 | 321-0210-00 | | | RES.,FXD,FILM:1.5K OHM,1%,0.125W | 91637 | MFF1816G15000F |
| R2231 | 315-0303-00 | | | RES.,FXD,CMPSN:30K OHM,5%,0.25W | 01121 | CB3035 |
| R2235 | 315-0203-00 | | | RES.,FXD,CMPSN:20K OHM,5%,0.25W | 57668 | NTR25J-E20K0 |
| R2236 | 315-0203-00 | | | RES.,FXD,CMPSN:20K OHM,5%,0.25W | 57668 | NTR25J-E20K0 |
| R2237 | 315-0203-00 | | | RES.,FXD,CMPSN:20K OHM,5%,0.25W | 57668 | NTR25J-E20K0 |
| R2238 | 315-0203-00 | | | RES.,FXD,CMPSN:20K OHM,5%,0.25W | 57668 | NTR25J-E20K0 |
| R2241 | 321-0326-00 | | | RES.,FXD,FILM:24.3K OHM,1%,0.125W | 91637 | CMF55116G24301F |
| R2251 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R2252 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R2253 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R2254 | 315-0303-00 | B140000 | | RES.,FXD,CMPSN:30K OHM,5%,0.25W | 01121 | CB3035 |
| R2261 | 315-0272-00 | | | RES.,FXD,CMPSN:2.7K OHM,5%,0.25W | 57668 | NTR25J-E02K7 |
| R2262 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R2265 | 315-0512-00 | | | RES.,FXD,CMPSN:5.1K OHM,5%,0.25W | 57668 | NTR25J-E05K1 |
| R2266 | 315-0912-00 | | | RES.,FXD,CMPSN:9.1K OHM,5%,0.25W | 57668 | NTR25J-E09K1 |
| R2268 | 321-0296-00 | B010100 | B346349 | RES.,FXD,FILM:11.8K OHM,1%,0.125W | 91637 | MFF1816G11801F |
| R2268 | 321-0297-00 | B346350 | | RES.,FXD,FILM:12.1K OHM,1%,0.125W | 91637 | MFF1816G12101F |
| R2273 | 311-1226-00 | | | RES.,VAR,NONWIR:2.5K OHM,20%,0.50W | 32997 | 3386F-T04-252 |
| R2274 | 321-0153-00 | | | RES.,FXD,FILM:383 OHM,1%,0.125W | 91637 | MFF1816G383R0F |
| R2275 | 321-0170-00 | | | RES.,FXD,FILM:576 OHM,1%,0.125W | 91637 | MFF1816G576R0F |
| R2276 | 315-0223-00 | | | RES.,FXD,CMPSN:22K OHM,5%,0.25W | 57668 | NTR25J-E 22K |
| R2277 | 321-0250-00 | | | RES.,FXD,FILM:3.92K OHM,1%,0.125W | 91637 | MFF1816G39200F |
| R2278 | 315-0823-00 | B140000 | | RES.,FXD,CMPSN:82K OHM,5%,0.25W | 57668 | NTR25J-E82K |
| R2279 | 321-0222-00 | | | RES.,FXD,FILM:2K OHM,1%,0.125W | 91637 | MFF1816G20000F |
| R2280 | 315-0823-00 | | | RES.,FXD,CMPSN:82K OHM,5%,0.25W | 57668 | NTR25J-E82K |
| R2281 | 315-0101-00 | B140000 | | RES.,FXD,CMPSN:100 OHM,5%,0.25W | 57668 | NTR25J-E 100E |
| R2282 | 315-0332-00 | | | RES.,FXD,CMPSN:3.3K OHM,5%,0.25W | 57668 | NTR25J-E03K3 |
| R2283 | 315-0753-00 | B140000 | | RES.,FXD,CMPSN:75K OHM,5%,0.25W | 57668 | NTR25J-E75K0 |
| R2284 | 321-0216-00 | | | RES.,FXD,FILM:1.74K OHM,1%,0.125W | 91637 | MFF1816G17400F |
| R2285 | 321-0245-00 | | | RES.,FXD,FILM:3.48K OHM,1%,0.125W | 91637 | MFF1816G34800F |
| R2286 | 321-0209-00 | B010100 | B326669 | RES.,FXD,FILM:1.47K OHM,1%,0.125W | 91637 | MFF1816G14700F |
| R2286 | 321-0210-00 | B326670 | | RES.,FXD,FILM:1.5K OHM,1%,0.125W | 91637 | MFF1816G15000F |
| R2287 | 321-0199-00 | | | RES.,FXD,FILM:1.15K OHM,1%,0.125W | 91637 | MFF1816G11500F |
| R2288 | 321-0273-00 | | | RES.,FXD,FILM:6.81K OHM,1%,0.125W | 91637 | MFF1816G68100F |
| R2289 | 321-0193-00 | | | RES.,FXD,FILM:1K OHM,1%,0.125W | 01121 | ORD BY DESCR |
| R2291 | 311-1225-00 | | | RES.,VAR,NONWIR:1K OHM,20%,0.50W | 32997 | 3386F-T04-102 |
| R2292 | 315-0132-00 | | | RES.,FXD,CMPSN:1.3K OHM,5%,0.25W | 57668 | NTR25J-E01K3 |
| R2293 | 321-0245-00 | | | RES.,FXD,FILM:3.48K OHM,1%,0.125W | 91637 | MFF1816G34800F |
| R2294 | 321-0255-00 | | | RES.,FXD,FILM:4.42K OHM,1%,0.125W | 91637 | MFF1816G44200F |
| R2295 | 321-0241-00 | | | RES.,FXD,FILM:3.16K OHM,1%,0.125W | 91637 | MFF1816G31600F |
| R2297 | 315-0102-00 | B010100 | B039999 | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R2297 | 315-0152-00 | B040000 | | RES.,FXD,CMPSN:1.5K OHM,5%,0.25W | 57668 | NTR25J-E01K5 |
| R2298 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 57668 | NTR25JE01K0 |
| R2299 | 315-0511-00 | B010100 | B139999 | RES.,FXD,CMPSN:510 OHM,5%,0.25W | 01121 | CB5115 |
| R2299 | 315-0431-00 | B140000 | | RES.,FXD,CMPSN:430 OHM,5%,0.25W | 01121 | CB4315 |
| RT223 | 307-0250-00 | B372670 | | RES.,THERMAL:390 OHM,10% | 15454 | DG125390K |
| RT417 | 307-0125-00 | B010100 | B372669 | RES.,THERMAL:500 OHM,10%,25 DEG C | 50157 | 2D1595 |
| RT460 | 307-0125-00 | B372670 | | RES.,THERMAL:500 OHM,10%,25 DEG C | 50157 | 2D1595 |
| RT461 | 307-0181-00 | B010100 | B372669 | RES.,THERMAL:100K OHM,10%,4MW/DEG C | 15454 | 1DE104-K-220EC |
| RT461 | 307-0126-00 | B372670 | | RES.,THERMAL:100 OHM,10% | 14193 | 2D21-101-D |
| S659 | 260-0984-00 | | | SWITCH,SLIDE:DP3T,0.5A,125V | 79727 | G-128-S-0012 |
| S1000 | 260-0724-00 | B010100 | B153278 | SWITCH,THRMSCT:NC,OPEN 83.3,CL 66.7,10V | 93410 | 430-367 |
| S1000 | 260-1759-00 | B153279 | | SWITCH,THRMSCT:NC,OPEN 83.3,CL 66.7,10A | 14859 | 20700L66-322 |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix | Serial/Model No. | | Name & Description | Mfr | Mfr Part Number |
|---------|-------------|------------------|---------|--|-------|-----------------|
| | Part No. | Eff | Dscont | | Code | |
| S1001 | 260-1222-00 | | | SWITCH,PUSH-PUL:10A,250VAC | 91929 | 2DM301 |
| S1011 | 260-1379-00 | | | SWITCH,PUSH:TRIG SOURCE | 59821 | 2KBC120000595 |
| S1021 | 260-1378-00 | | | SWITCH,PUSH:VERT MODE | 59821 | 2KBC140000608 |
| S1030 | ----- | | | (PART OF R1095) | | |
| S2110 | 260-0723-00 | | | SWITCH,SLIDE:DPDT,0.5A,125VAC | 79727 | GF126-0028 |
| T523 | 120-0546-00 | B030000 | | XFMR,TOROID:4 TURNS BIFILAR | 80009 | 120-0546-00 |
| T801 | 120-0708-00 | | | XFMR,PWR,STPDN:LV | 80009 | 120-0708-00 |
| T1225 | 120-0709-00 | B010100 | B029999 | XFMR,PWR,SDN&SU:HV | 80009 | 120-0709-00 |
| T1225 | 120-0823-00 | B030000 | B099999 | XFMR,PWR,SDN&SU:HV | 80009 | 120-0823-00 |
| T1225 | 120-0879-00 | B100000 | B329999 | XFMR,PWR,STPDN:HV | 80009 | 120-0879-00 |
| T1225 | 120-1087-00 | B330000 | | XFMR,PWR,SDN&SU:HIGH VOLTAGE | 80009 | 120-1087-00 |
| U55 | 155-0011-00 | | | MICROCIRCUIT,DI:ML,CLOCK AND CHOP BLANKING | 80009 | 155-0011-00 |
| U99 | 156-0048-00 | | | MICROCIRCUIT,LI:FIVE NPN TRANSISTOR ARRAY | 02735 | CA3046 |
| U123 | 156-0041-05 | | | MICROCIRCUIT,DI:DUAL D-FLIP FLOP | 01295 | SN7474 |
| U156 | 156-0041-05 | | | MICROCIRCUIT,DI:DUAL D-FLIP FLOP | 01295 | SN7474 |
| U214 | 155-0022-00 | | | MICROCIRCUIT,DI:ML,CHANNEL SWITCH | 80009 | 155-0022-00 |
| U324 | 155-0022-00 | | | MICROCIRCUIT,DI:ML,CHANNEL SWITCH | 80009 | 155-0022-00 |
| U450 | 155-0080-00 | | | MICROCIRCUIT,LI:HYBRID | 80009 | 155-0080-00 |
| U510 | 155-0022-00 | | | MICROCIRCUIT,DI:ML,CHANNEL SWITCH | 80009 | 155-0022-00 |
| U973 | 156-0065-00 | B010100 | B346649 | MICROCIRCUIT,LI:FIVE NPN TRANSISTOR ARRAY | 02735 | CA3045F |
| U973 | 156-0065-01 | B346650 | | MICROCIRCUIT,LI:5 XSTR ARRAY,SCRN | 80009 | 156-0065-01 |
| U1230 | 119-0286-00 | B010100 | B029999 | MULTIPLIER,HV:4 X 12KVDC OUT | 80009 | 119-0286-00 |
| U1230 | ----- | | | (EITHER OF THESE HV MULTIPLIERS MAY BE USED IN AN INSTRUMENT.) | | |
| U1230 | ----- | | | | | |
| U1230 | 119-0401-00 | B030000 | | MULTIPLIER,HV:4 X 12VDC OUT | 80009 | 119-0401-00 |
| U1230 | ----- | | | (EITHER OF THESE HV MULTIPLIERS MAY BE USED IN AN INSTRUMENT. (OPTION 04 ONLY) | | |
| U1230 | ----- | | | | | |
| U1230 | 152-0495-00 | | | SEMICONV DVC,DI:V MULTR,6KV IN,12KV OUT | 52306 | CMX294 |
| U1230 | ----- | | | (EITHER OF THESE HV MULTIPLIERS MAY BE USED IN AN INSTRUMENT.) | | |
| U1230 | ----- | | | | | |
| U2120 | 156-0043-03 | | | MICROCIRCUIT,DI:QUAD 2-INP NOR GATE,SCRN | 01295 | SN7402 |
| U2126 | 155-0021-00 | B010100 | B122784 | MICROCIRCUIT,DI:ML,TIMING GENERATOR | 80009 | 155-0021-00 |
| U2126 | 155-0021-01 | B122785 | | MICROCIRCUIT,DI:SCAN OSCILLATOR & LOGIC | 80009 | 155-0021-01 |
| U2155 | 156-0043-03 | | | MICROCIRCUIT,DI:QUAD 2-INP NOR GATE,SCRN | 01295 | SN7402 |
| U2159 | 155-0017-00 | | | MICROCIRCUIT,DI:ML,ZERO LOGIC COUNTER | 80009 | 155-0017-00 |
| U2180 | 155-0015-01 | | | MICROCIRCUIT,DI:ML,ANALOG DATA SWITCH | 80009 | 155-0015-01 |
| U2185 | 155-0014-01 | | | MICROCIRCUIT,DI:ML,ANALOG TO DECIMAL CONV | 80009 | 155-0014-01 |
| U2190 | 155-0015-01 | | | MICROCIRCUIT,DI:ML,ANALOG DATA SWITCH | 80009 | 155-0015-01 |
| U2232 | 155-0018-00 | | | MICROCIRCUIT,DI:ML,ZERO LOGIC | 80009 | 155-0018-00 |
| U2244 | 155-0014-01 | | | MICROCIRCUIT,DI:ML,ANALOG TO DECIMAL CONV | 80009 | 155-0014-01 |
| U2250 | 156-0032-03 | | | MICROCIRCUIT,DI:4 BIT BINARY COUNTER,SCRN | 07263 | 7493(PCQR) |
| U2260 | 155-0019-00 | | | MICROCIRCUIT,DI:ML,DECIMAL POINT AND SPACE | 80009 | 155-0019-00 |
| U2270 | 155-0023-00 | | | MICROCIRCUIT,DI:ML,CHAR GEN NUMERALS | 80009 | 155-0023-00 |
| U2272 | 155-0024-00 | | | MICROCIRCUIT,DI:ML,CHAR GEN SPCL SYMBOLS | 80009 | 155-0024-00 |
| U2274 | 155-0025-00 | | | MICROCIRCUIT,DI:ML,CHAR GEN PREFIXES | 80009 | 155-0025-00 |
| U2276 | 155-0026-00 | | | MICROCIRCUIT,DI:ML,CHAR GEN LETTERS | 80009 | 155-0026-00 |
| U2278 | 155-0027-00 | | | MICROCIRCUIT,DI:ML,CHAR GEN SPCL ALPHA | 80009 | 155-0027-00 |
| U2284 | 155-0020-00 | | | MICROCIRCUIT,DI:ML,CHANNEL SW OUTPUT ASSY | 80009 | 155-0020-00 |
| V1099 | 154-0640-00 | B010100 | B019999 | ELECTRON TUBE:CRT,P31 INT SCALE | 80009 | 154-0640-00 |
| V1099 | 154-0640-05 | B020000 | B338845 | ELECTRON TUBE:CRT,P31 INT SCALE | 80009 | 154-0640-05 |
| V1099 | 154-0640-10 | B338846 | B346720 | ELECTRON TUBE:CRT,P31 INT SCALE | 80009 | 154-0640-10 |
| V1099 | 154-0841-00 | B346721 | | ELECTRON TUBE:CRT,P31 INT SCALE | 80009 | 154-0841-00 |
| V1099 | 154-0672-00 | B030492 | B344949 | ELECTRON TUBE:CRT,P31 INT SCALE | 80009 | 154-0672-00 |
| V1099 | ----- | | | (OPTION 04 ONLY) | | |

Replaceable Electrical—7603/R7603 Service

| Ckt No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|----------------------|---------|--------------------------------------|----------|-----------------|
| V1099 | 154-0672-05 | B344950 | B346720 | ELECTRON TUBE:CRT,P31,INT SCALE | 80009 | 154-0672-05 |
| V1099 | ----- | | | (OPTION 04 ONLY) | | |
| V1099 | 154-0840-00 | B346721 | | ELECTRON TUBE:CRT,P31,INT SCALE | 80009 | 154-0840-00 |
| V1099 | ----- | | | (OPTION 04 ONLY) | | |
| V1099 | 154-0673-05 | B010100 | B346720 | ELECTRON TUBE:CRT,P31,INTERNAL SCALE | 80009 | 154-0673-05 |
| V1099 | ----- | | | (OPTION 06 ONLY) | | |
| V1099 | 154-0673-10 | B346721 | | ELECTRON TUBE:CRT,P31,INT SCALE | 80009 | 154-0673-10 |
| V1099 | ----- | | | (OPTION 06 ONLY) | | |
| VR244 | 152-0243-00 | | | SEMICONV DEVICE:ZENER,0.4W,15V,5% | 14552 | TD3810983 |
| VR254 | 152-0243-00 | | | SEMICONV DEVICE:ZENER,0.4W,15V,5% | 14552 | TD3810983 |
| VR851 | 152-0283-00 | | | SEMICONV DEVICE:ZENER,0.4W,43V,5% | 12954 | DZ750903B1N976B |
| VR890 | 152-0124-00 | | | SEMICONV DEVICE:ZENER,0.5W,9V,5% | 80009 | 152-0124-00 |
| VR1142 | 152-0055-00 | | | SEMICONV DEVICE:ZENER,0.4W,11V,5% | 04713 | SZG35009K1 |
| VR1258 | 152-0283-00 | B010100 | B329999 | SEMICONV DEVICE:ZENER,0.4W,43V,5% | 12954 | DZ750903B1N976B |
| VR1258 | 152-0287-00 | B330000 | | SEMICONV DEVICE:ZENER,0.4W,110V,5% | 12954 | 1N986B |
| VR1262 | 152-0428-00 | B330000 | | SEMICONV DEVICE:ZENER,0.4W,120V,5% | 80009 | 152-0428-00 |
| VR1264 | 152-0282-00 | | | SEMICONV DEVICE:ZENER,0.4W,30V,5% | 14552 | 1N972B |
| VR2262 | 152-0405-00 | | | SEMICONV DEVICE:ZENER,1W,15V,5% | 80009 | 152-0405-00 |
| VR2263 | 152-0405-00 | | | SEMICONV DEVICE:ZENER,1W,15V,5% | 80009 | 152-0405-00 |
| VR2264 | 152-0405-00 | | | SEMICONV DEVICE:ZENER,1W,15V,5% | 80009 | 152-0405-00 |
| W805 | 131-0566-00 | B375509 | | BUS CONDUCTOR:DUMMY RES,2.375,22 AWG | 57668 | JWW-0200E0 |



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 (μ F).
 Resistors = Ohms (Ω).

Graphic symbols and class designation letters 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 overline on a signal name indicates that the signal performs its intended function when it goes to the low state.

Abbreviations are based on ANSI Y1.1-1972.

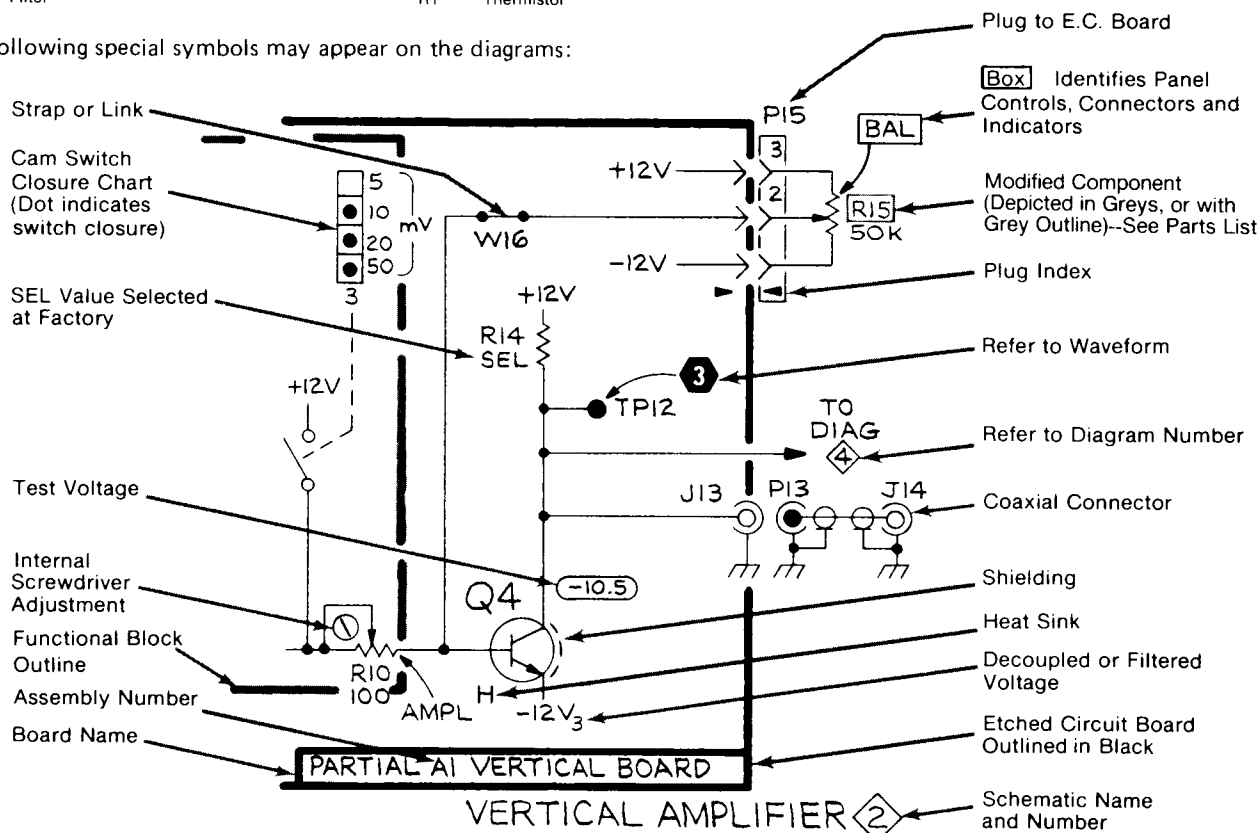
Other ANSI standards that are used in the preparation of diagrams by Tektronix, Inc. are:

- Y14.15, 1966 Drafting Practices.
 Y14.2, 1973 Line Conventions and Lettering.
 Y10.5, 1968 Letter Symbols for Quantities Used in Electrical Science and Electrical Engineering.

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

The following special symbols may appear on the diagrams:



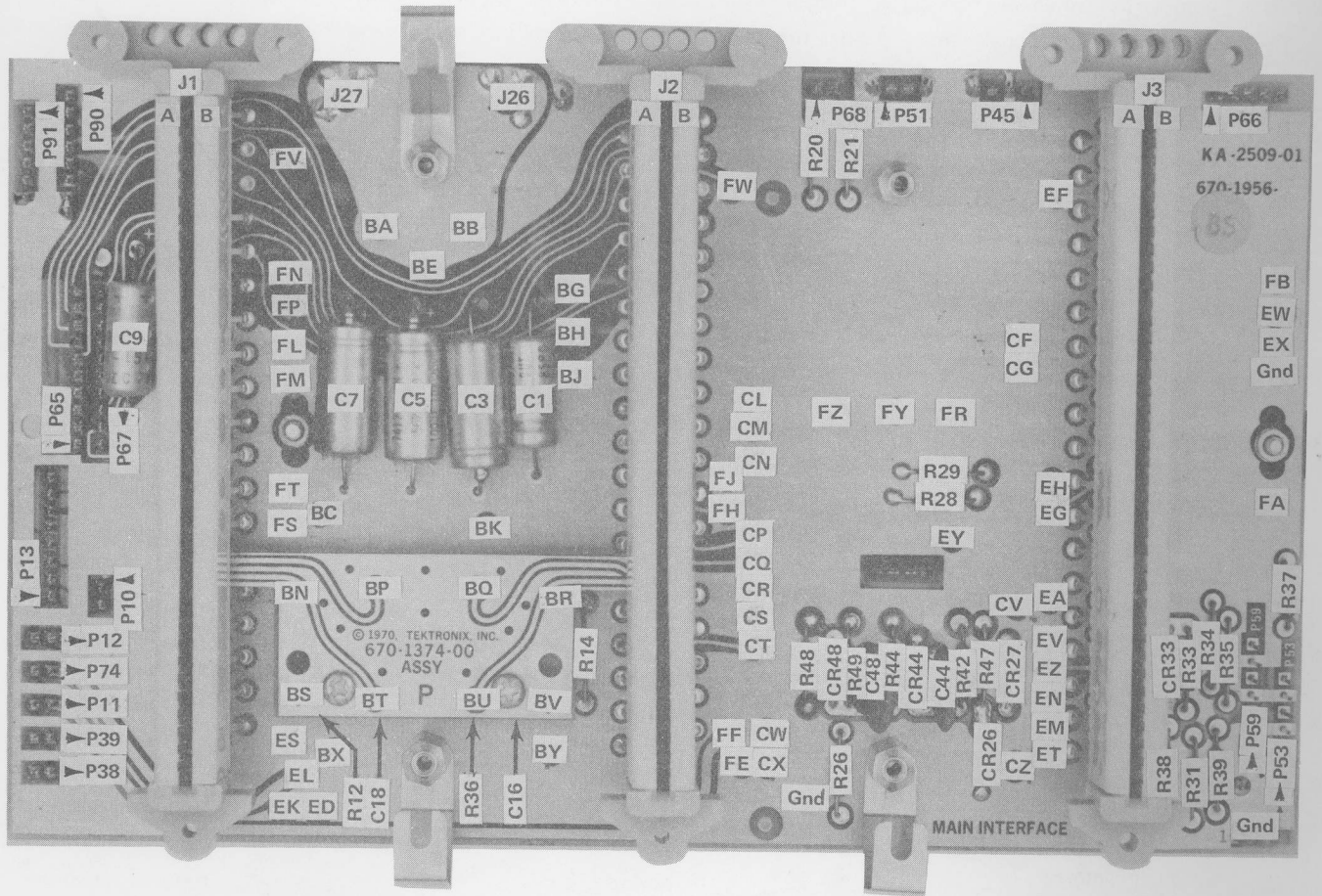
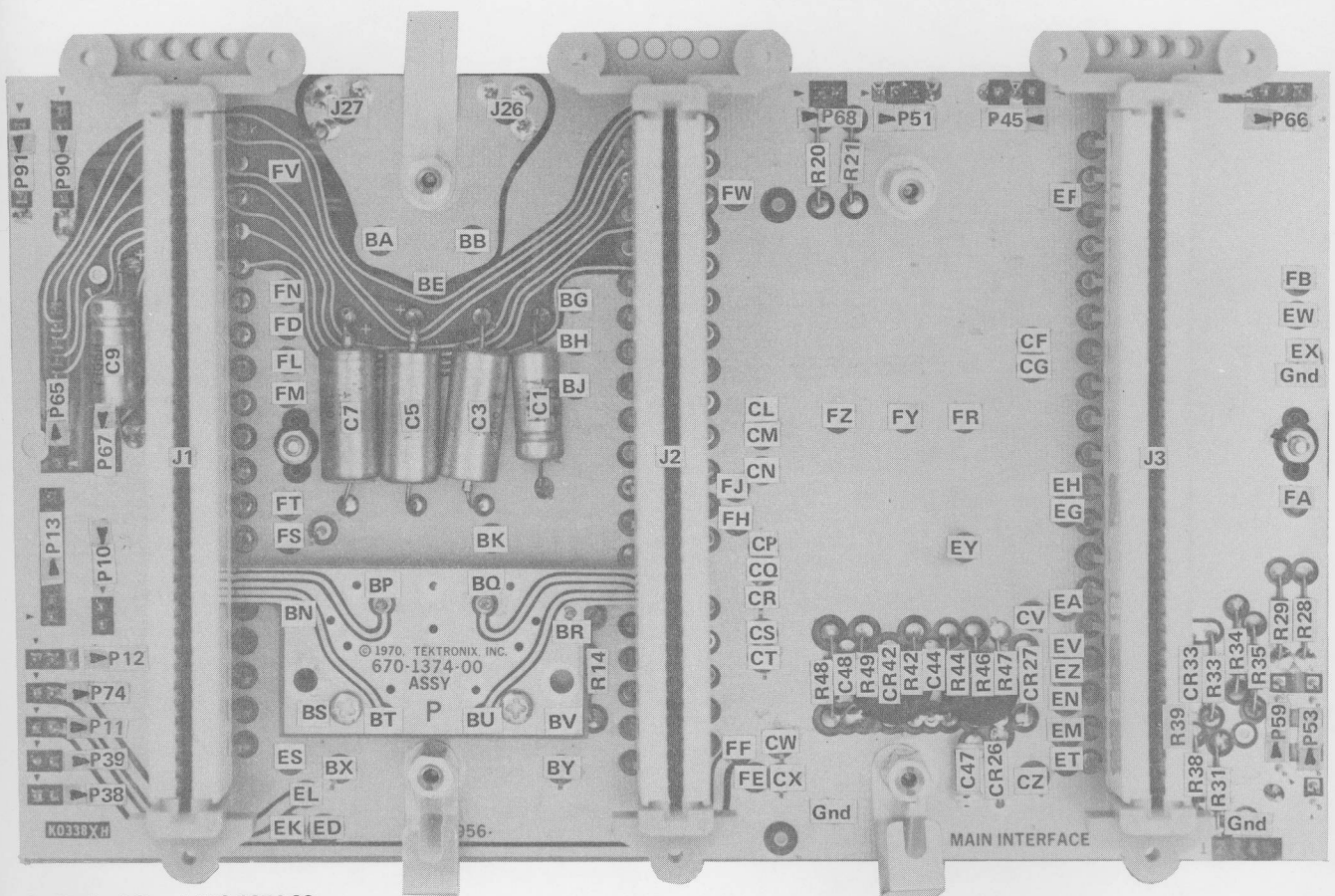
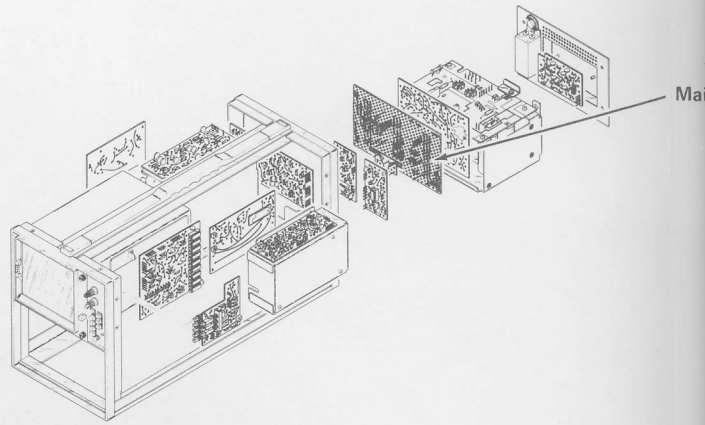


Fig. 8-1A. AI. Main Interface (front) circuit board, SN B160000-up.

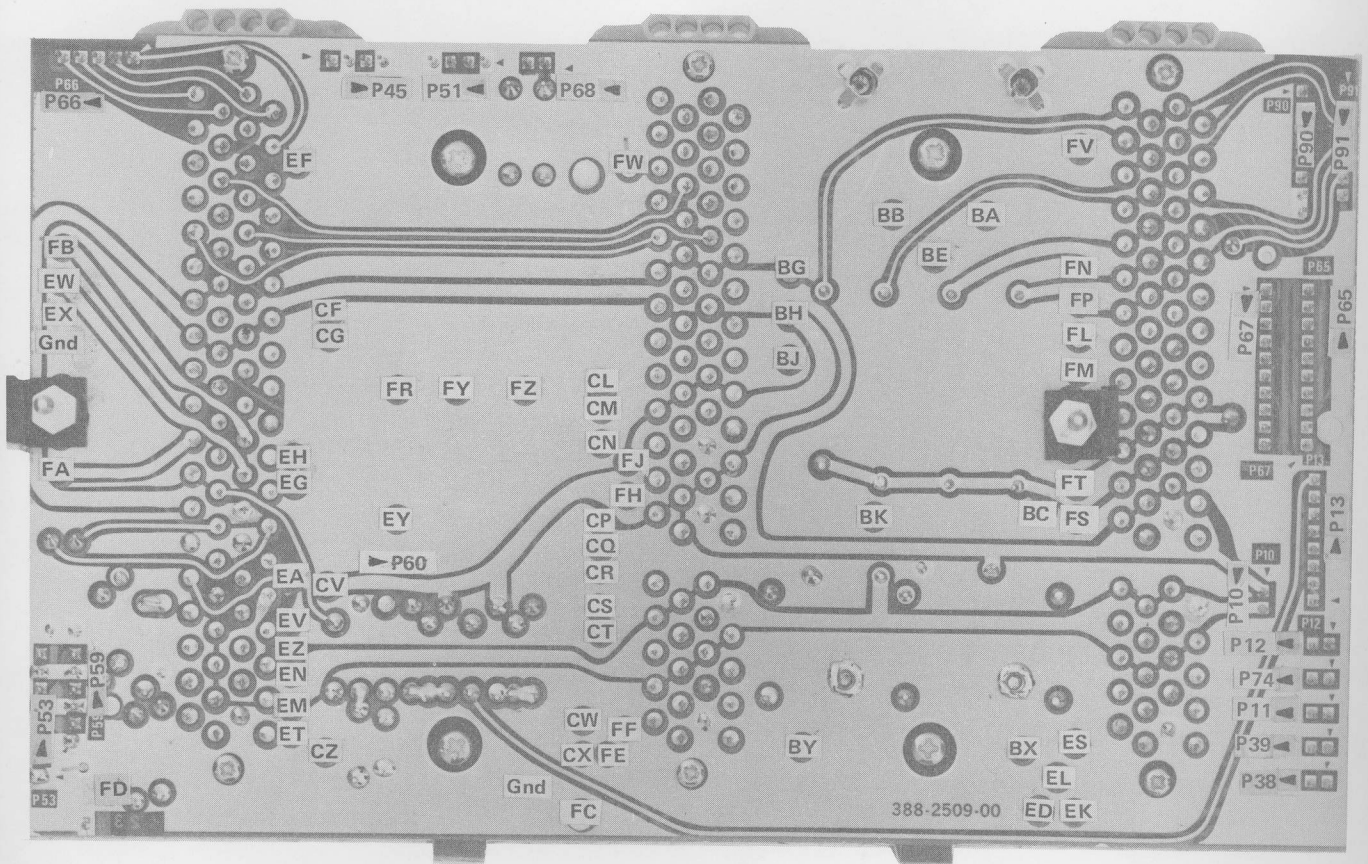
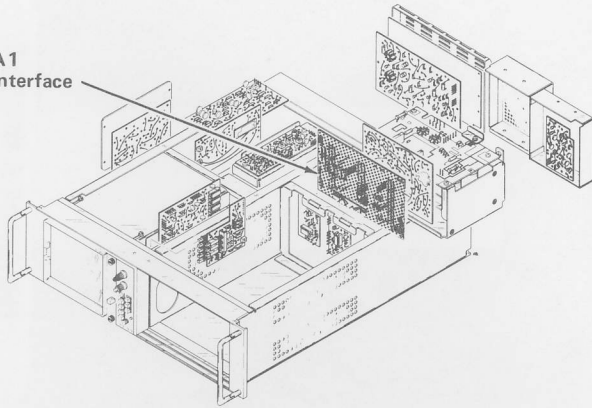


On Back of Board 670-1374-00:

- C16
- C18
- R12
- R36

Fig. 8-1B. A1. Main Interface (front) circuit board below SN B160000.

A1
Main Interface



*See Parts List for
serial number ranges.

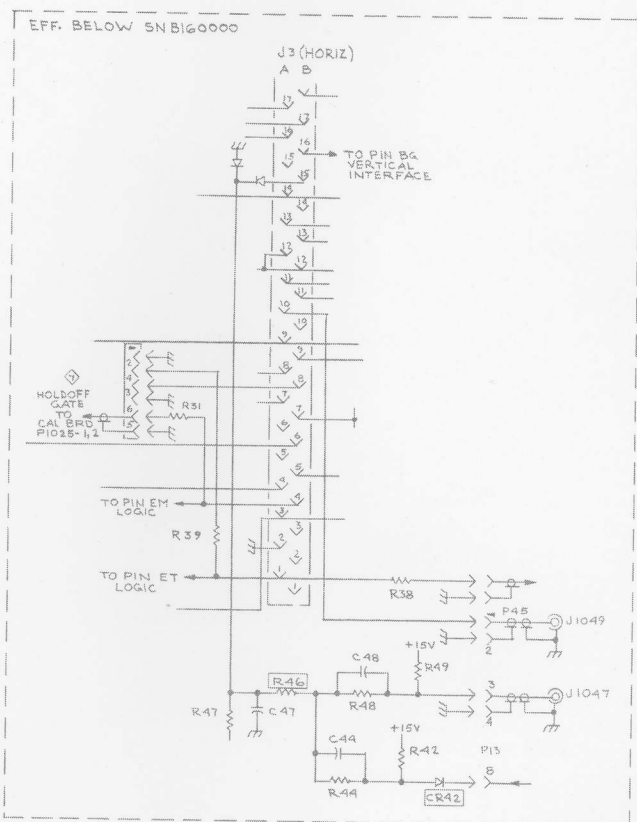
Fig. 8-2. A1. Main Interface (rear) circuit board.

ANALOG DATA

FORCE REA PLUG-IN M

INTER PLUG

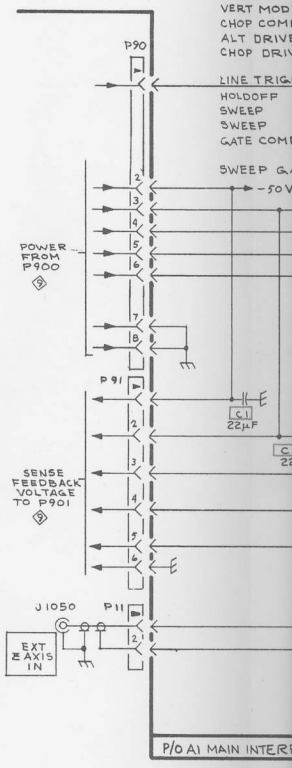
INTER PLUG



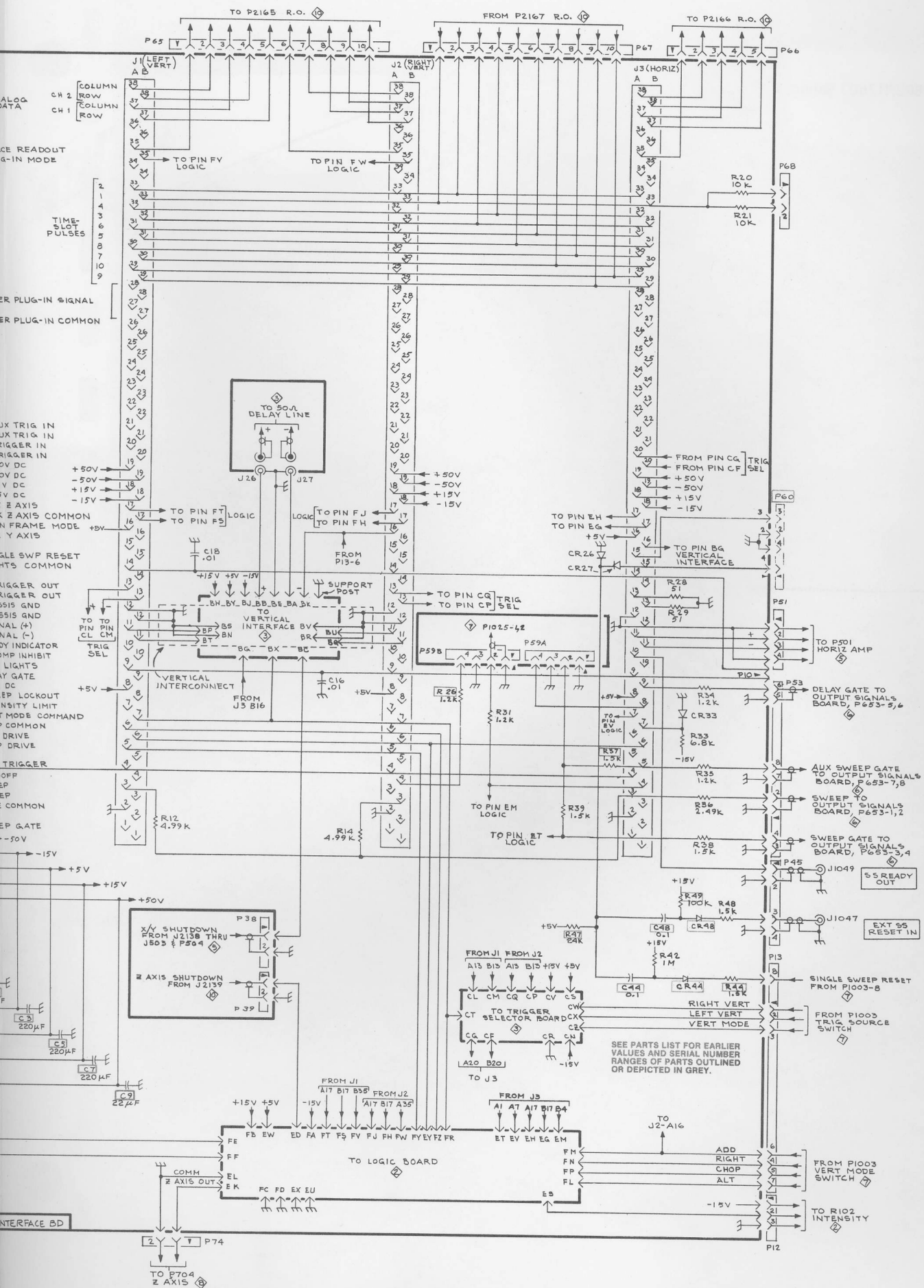
- + AUX TRIG
- AUX TRIG
- + TRIGGER
- TRIGGER
- + 50V DC
- 50V DC
- + 15V DC
- 15V DC
- AUX Z AXIS
- AUX Z AXIS
- MAIN FRAM
- AUX Y AXIS

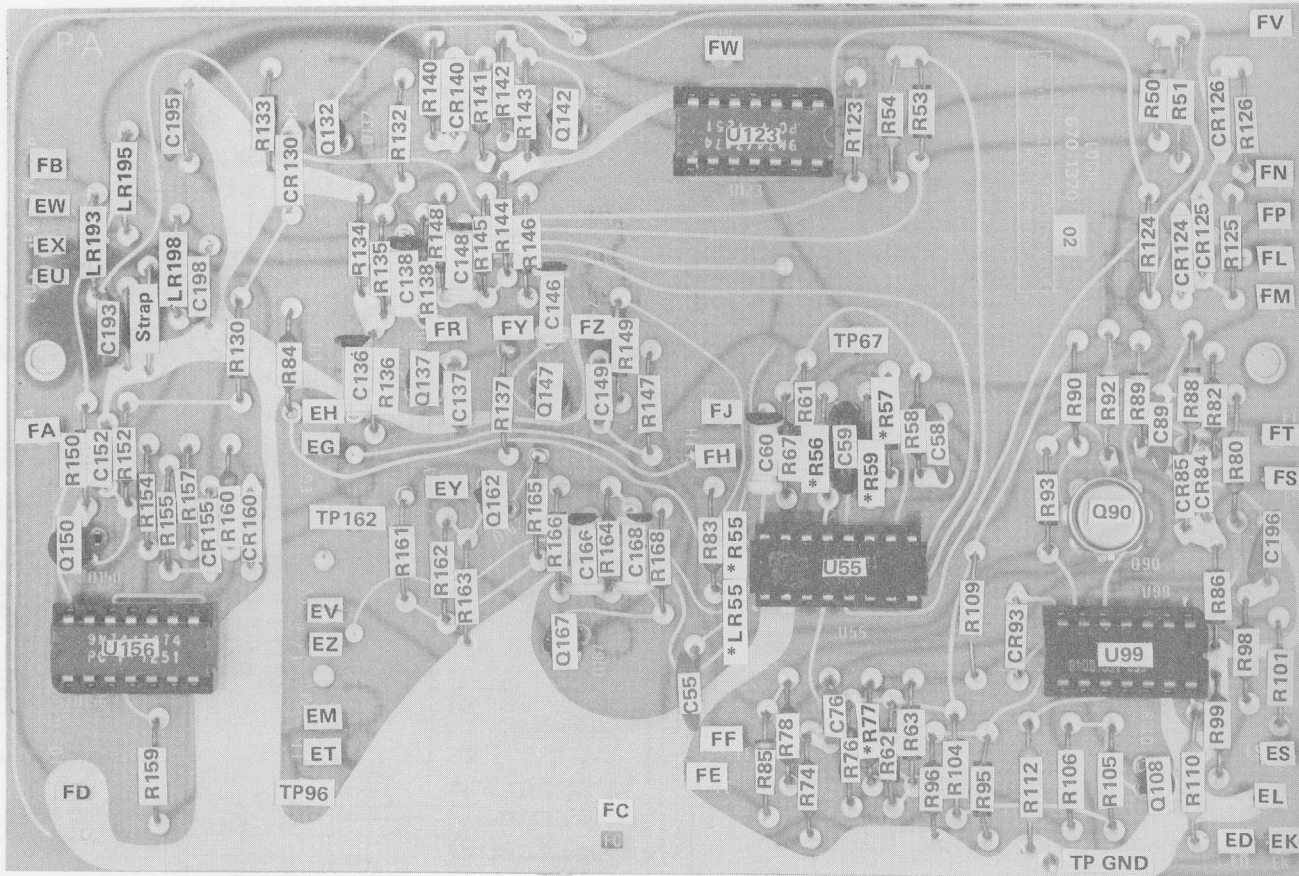
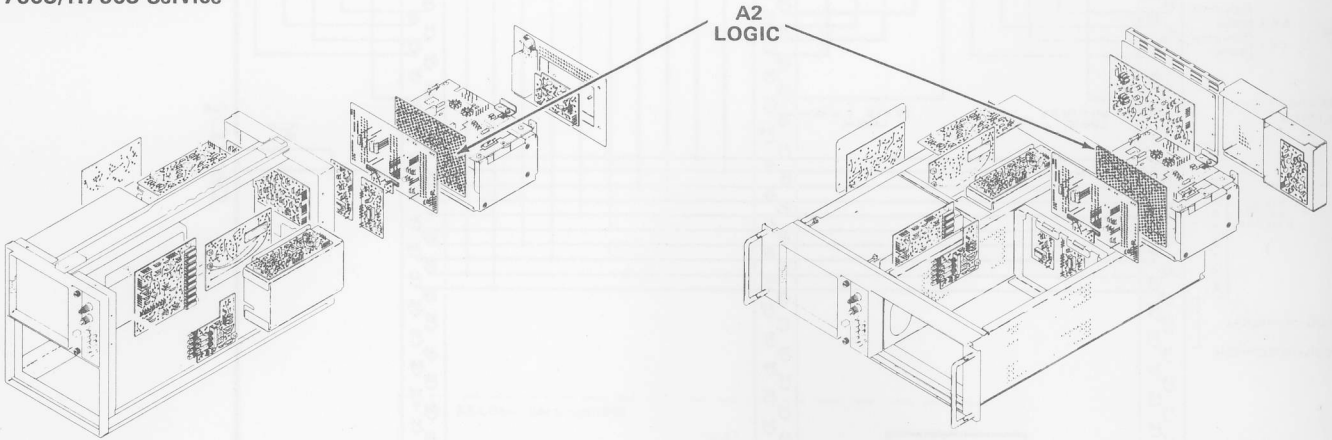
SINGLE SW LIGHTS C

- + TRIGGER
- TRIGGER
- CHASSIS GN
- CHASSIS GN
- SIGNAL (+)
- SIGNAL (-)
- READY INDIC
- X-COMP INH
- +5V LIGHT
- DELAY GATE
- +5V DC
- SWEEP LO
- INTENSITY
- VERT MODE
- CHOP COMM
- ALT DRIVE
- CHOP DRIVE



P10 A1 MAIN INTERF



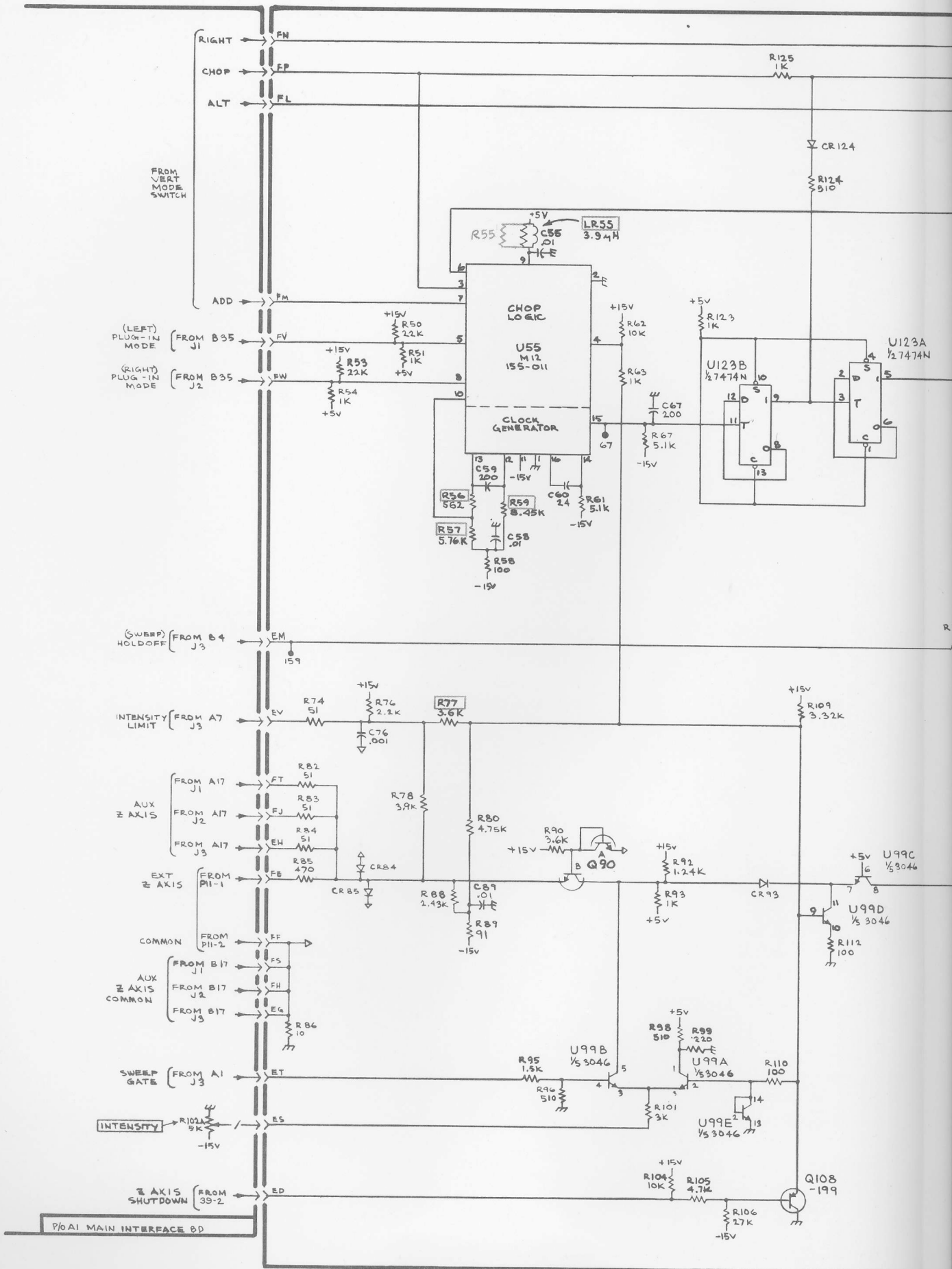


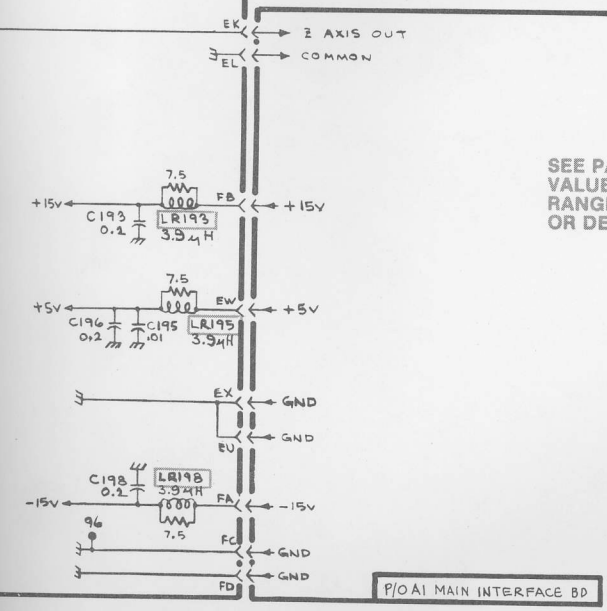
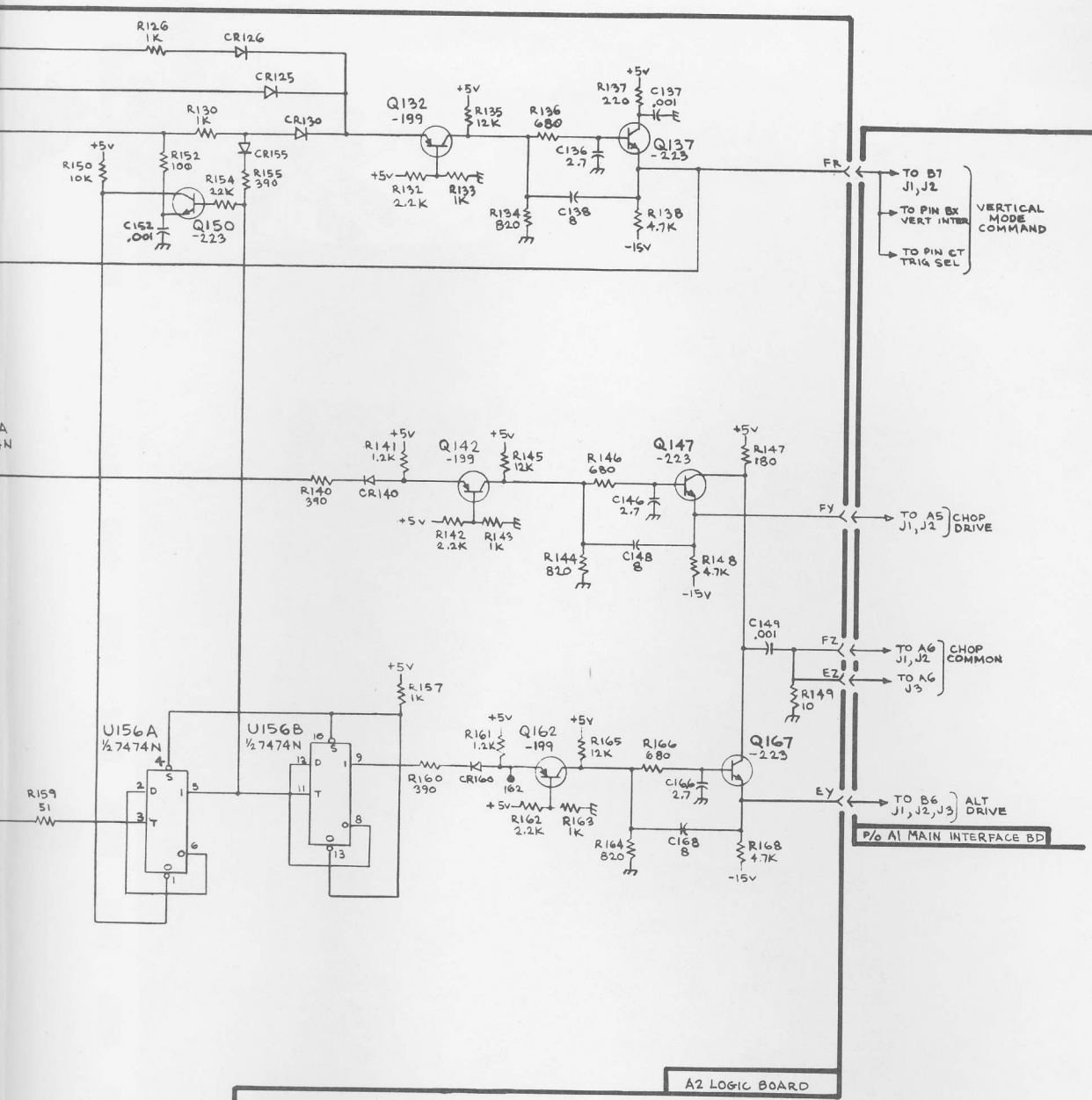
*See Parts List for serial number ranges.

Fig. 8-3. A2. Logic circuit board.

C67 Located on back of board.

AZ BOARD PHOTO





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

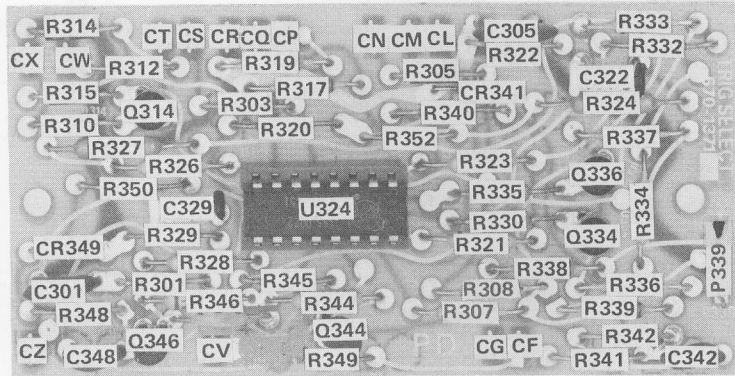
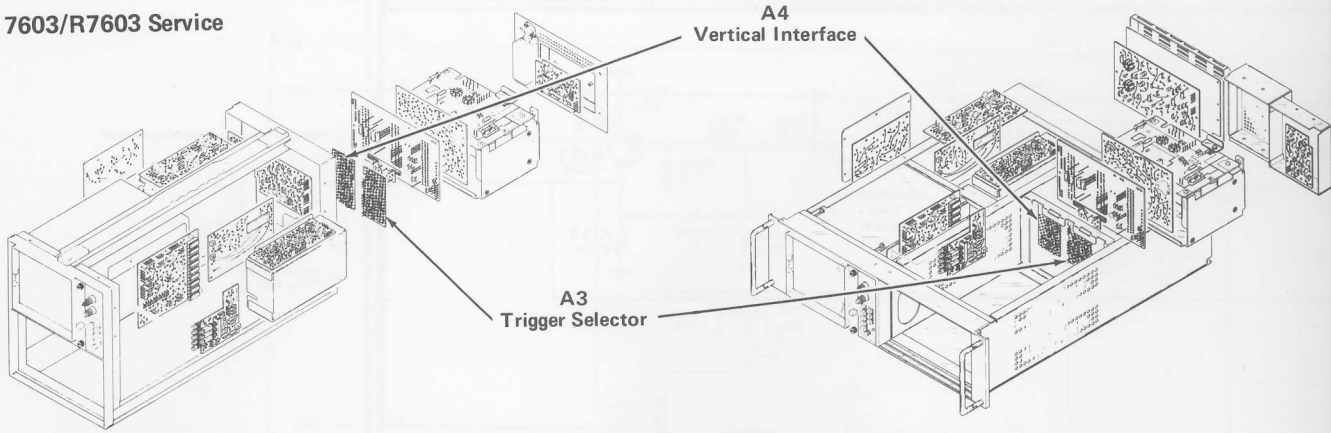


Fig. 8-4. A3. Trigger Selector circuit board.

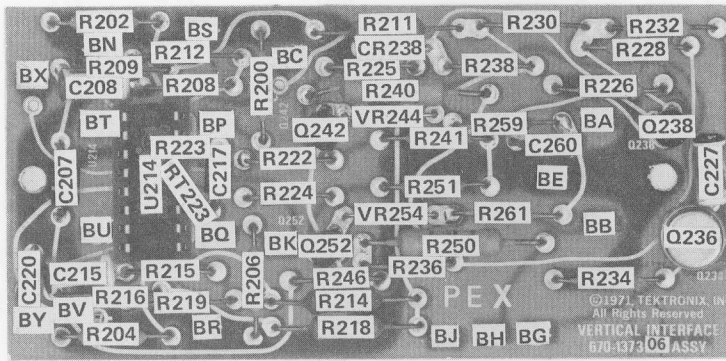
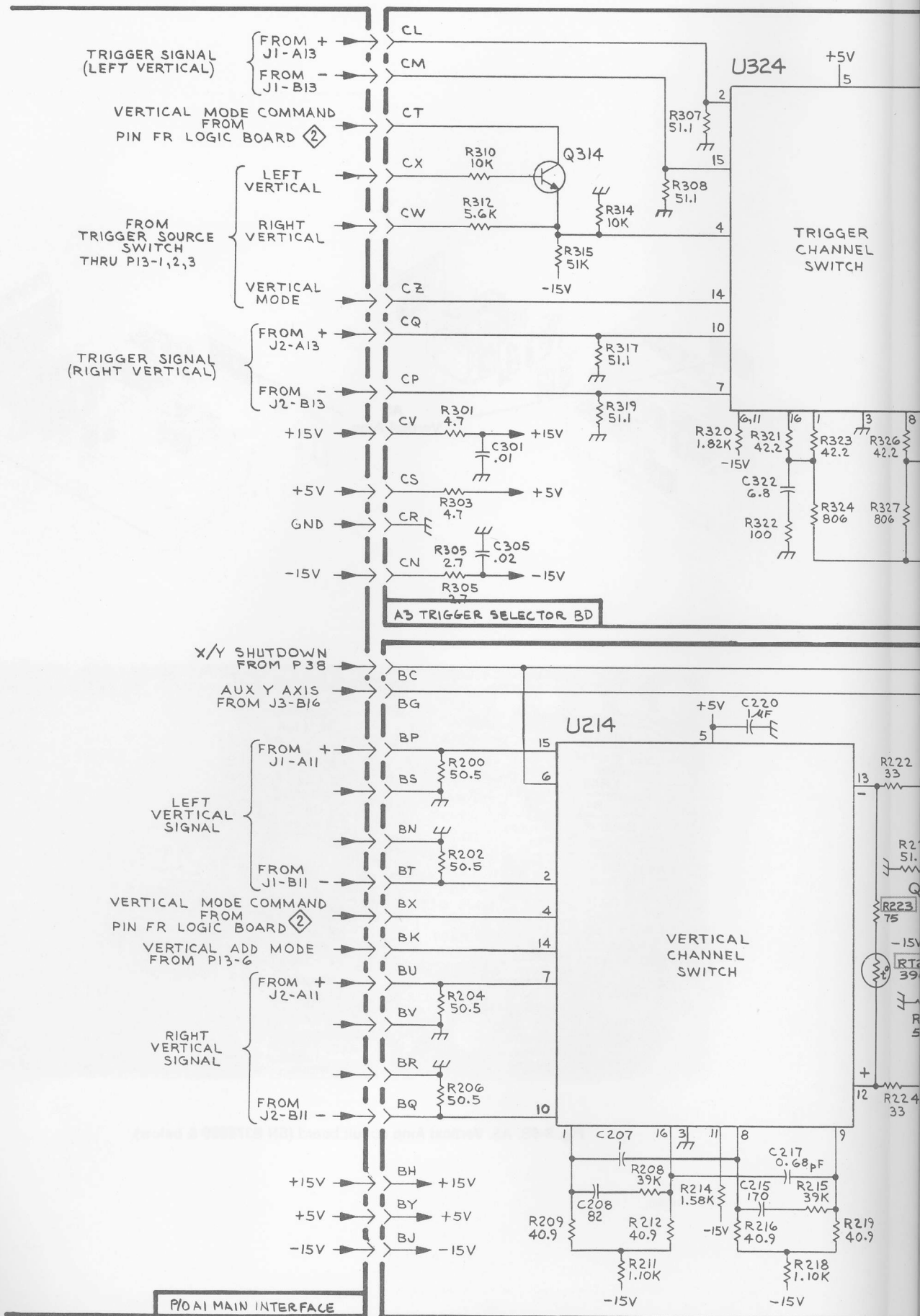
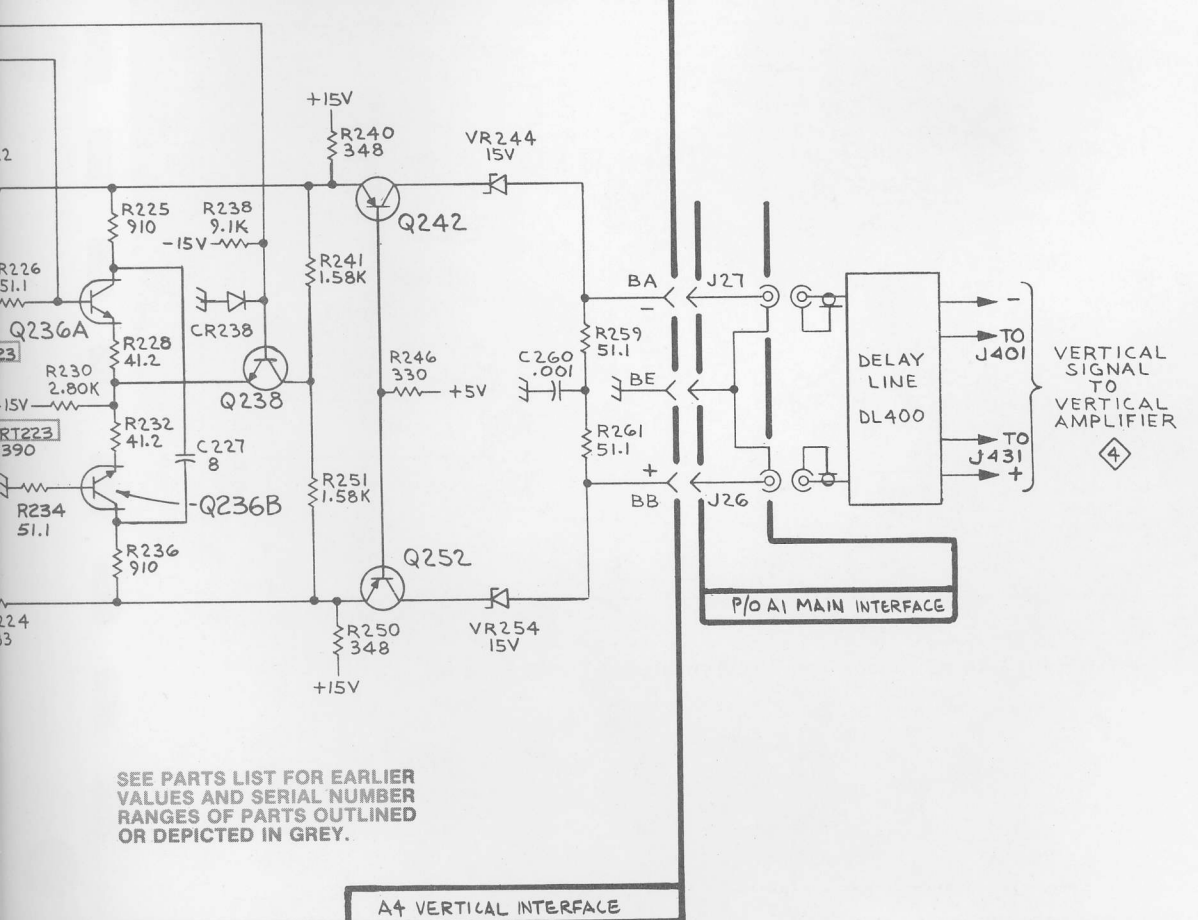
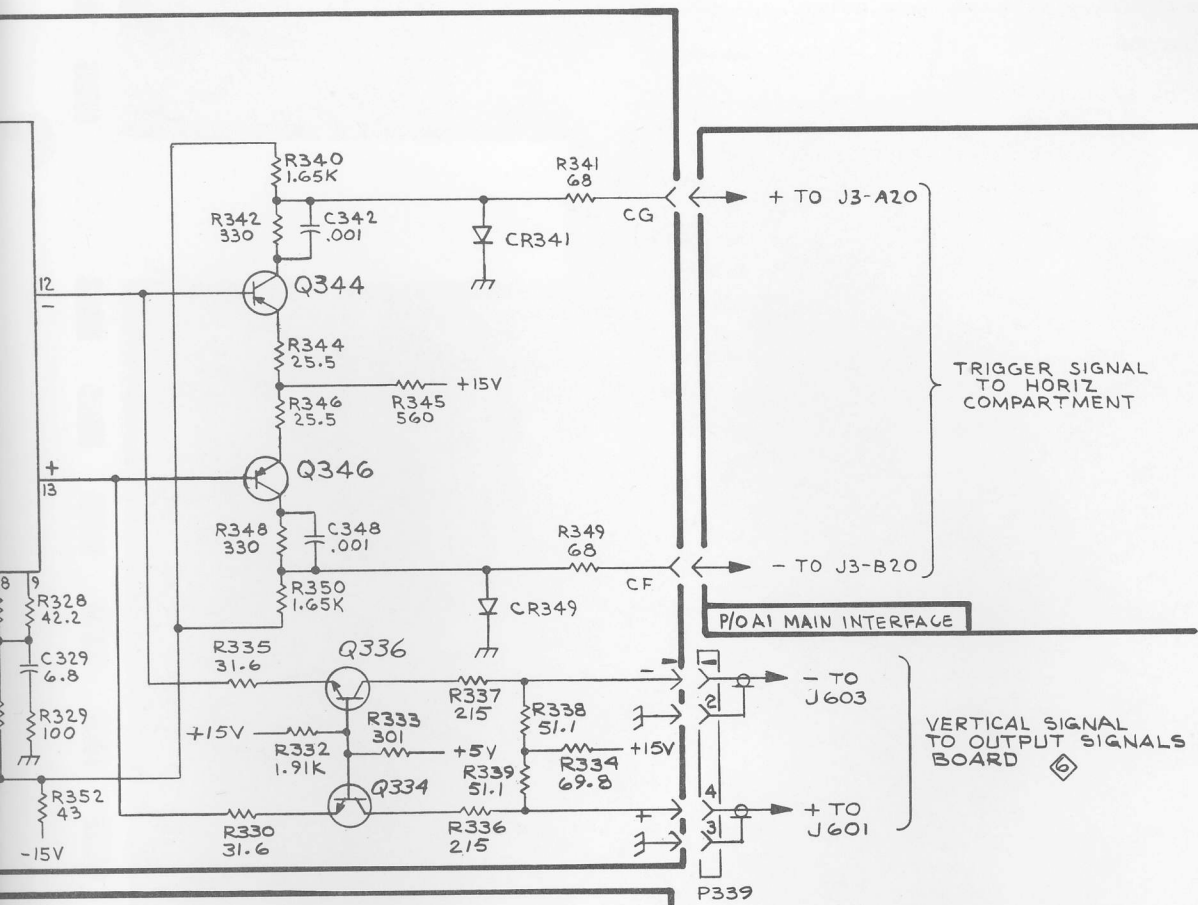


Fig. 8-5. A4. Vertical Interface circuit board.

A3 & A4 BOARD PHOTO





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

A4 VERTICAL INTERFACE

TRIGGER SELECTOR VERTICAL INTERFACE

3

mgf 173

TRIGGER SELECTOR & VERTICAL INTERFACE

3

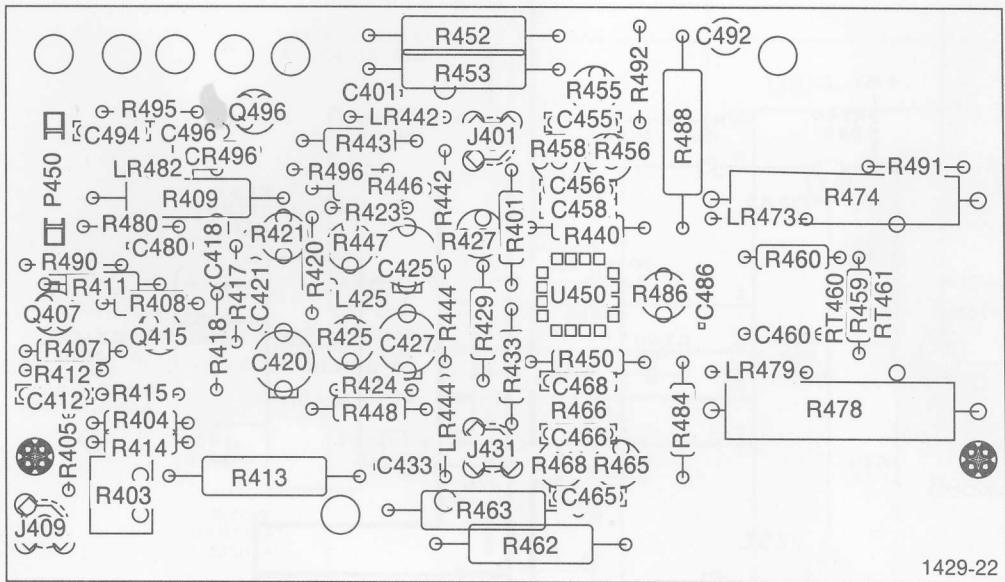


Fig. 8-6A. A5. Vertical Amp circuit board (SN B377000 & above).

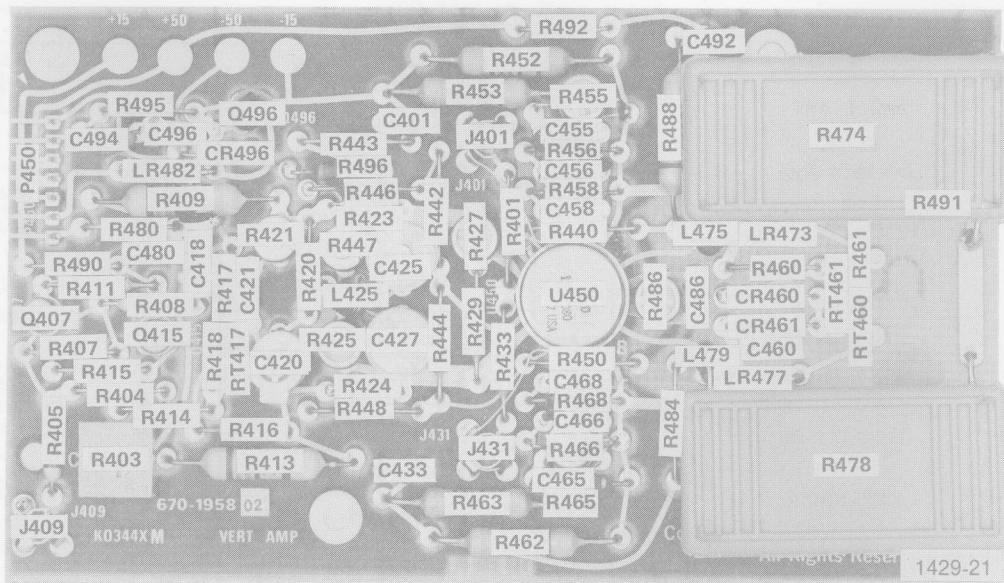
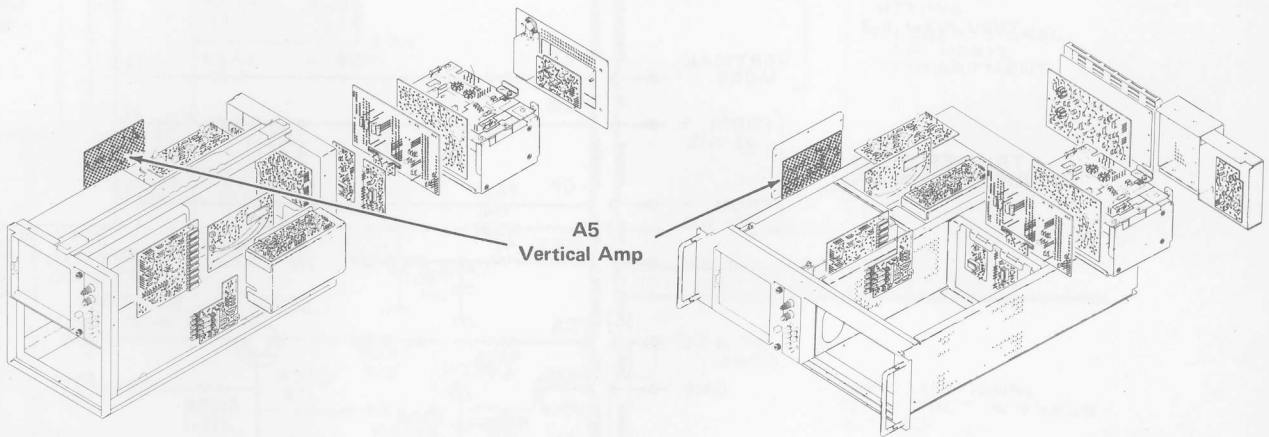
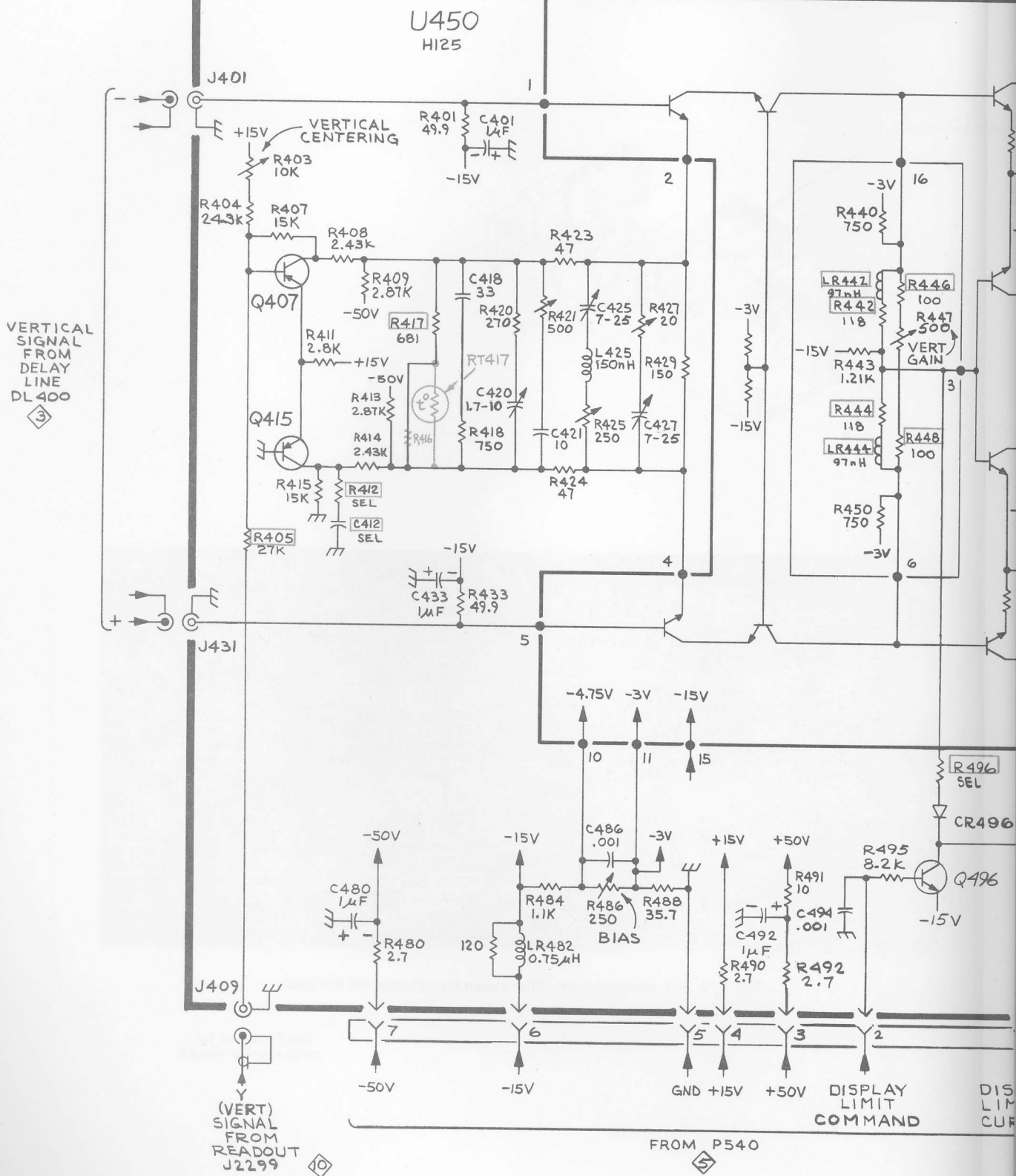
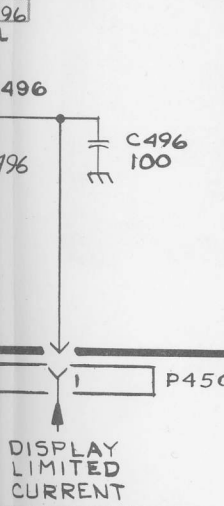
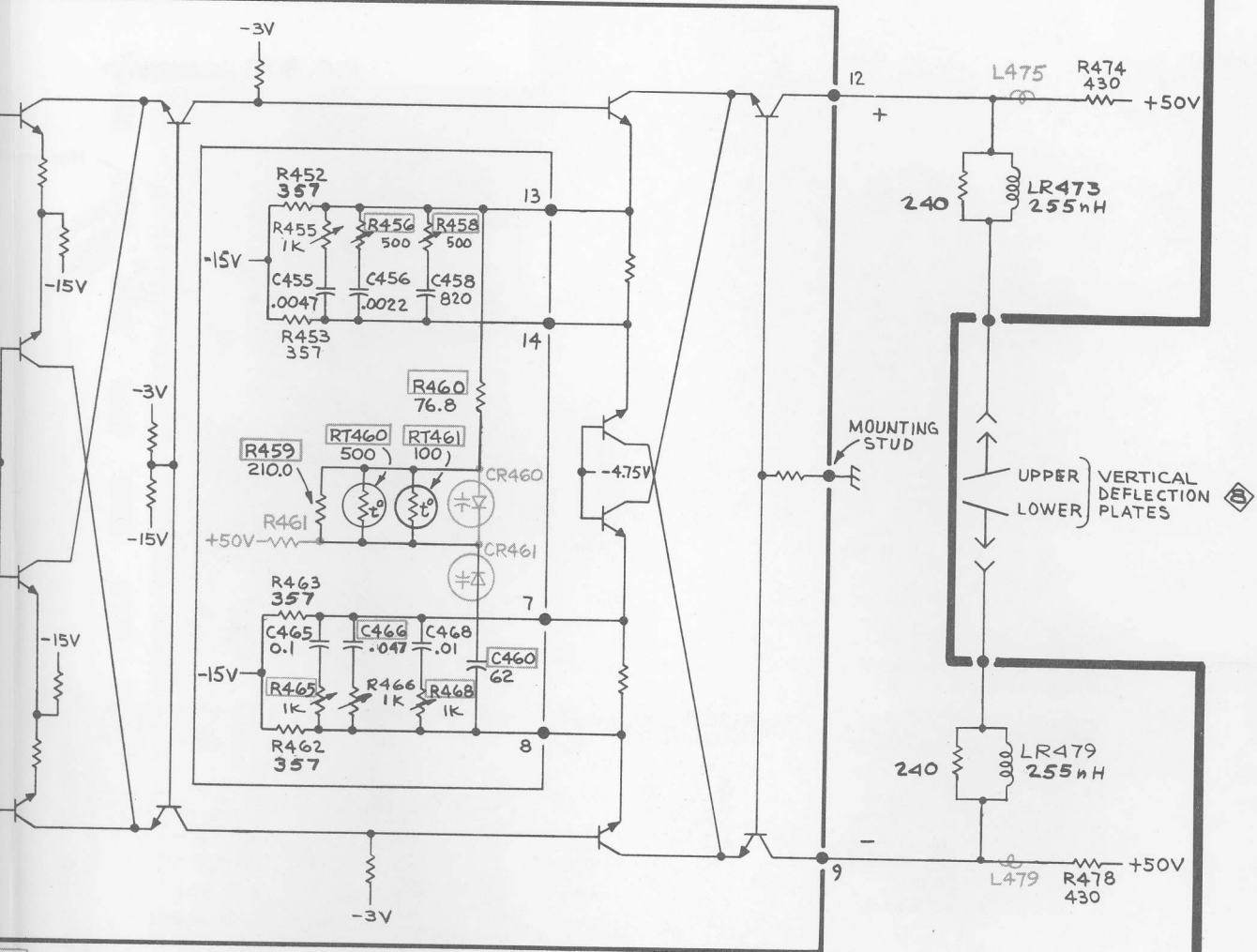


Fig. 8-6B. A5. Vertical Amp circuit board (SN B376999 & below).

*See Parts List for serial number ranges.



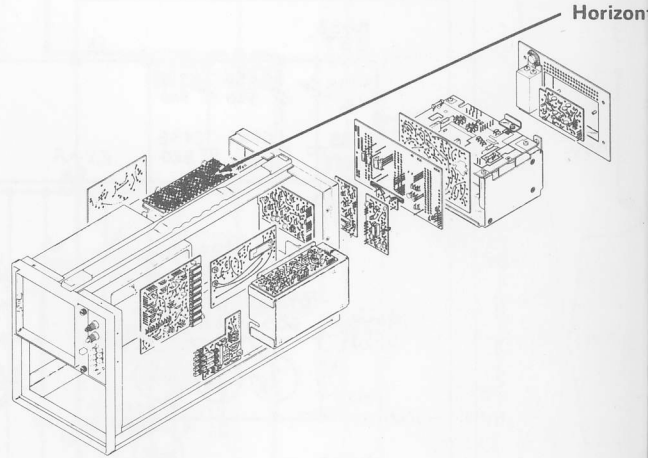
7603/R7603



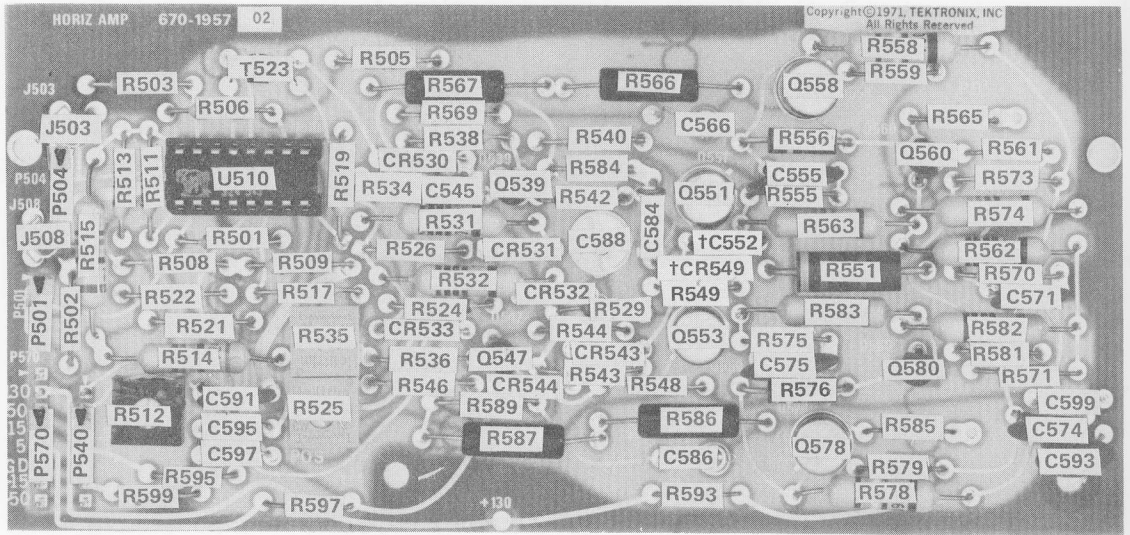
SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.

A5 VERTICAL OUTPUT BOARD

FIG. 8-7B 

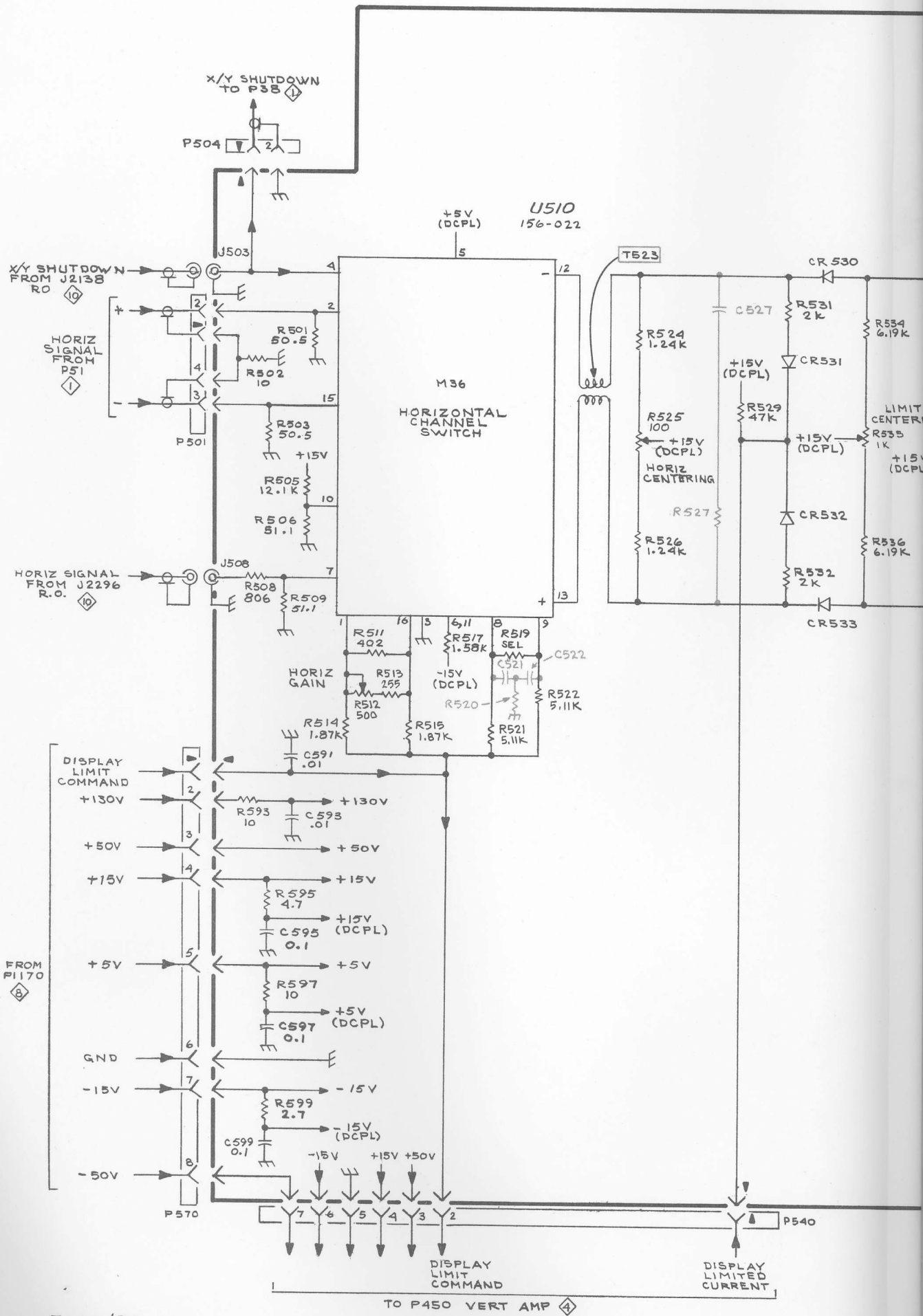


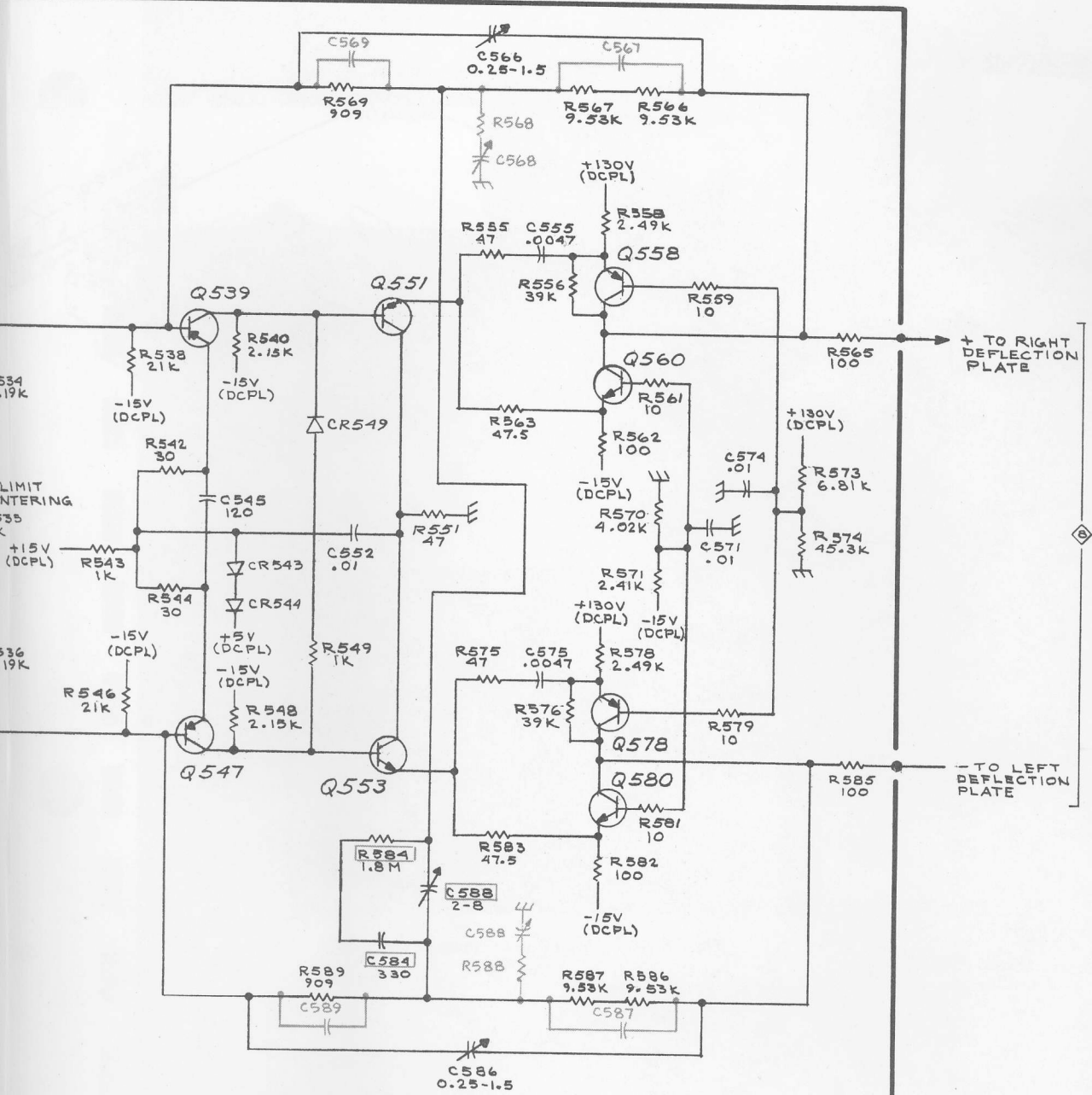
†CR549 & C552 transposed in some instruments.



REV. D AUG 1976

Fig. 8-7A. A6. Horizontal Amplifier circuit board SN B060000-up.





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

A6 HORIZONTAL AMPLIFIER BOARD

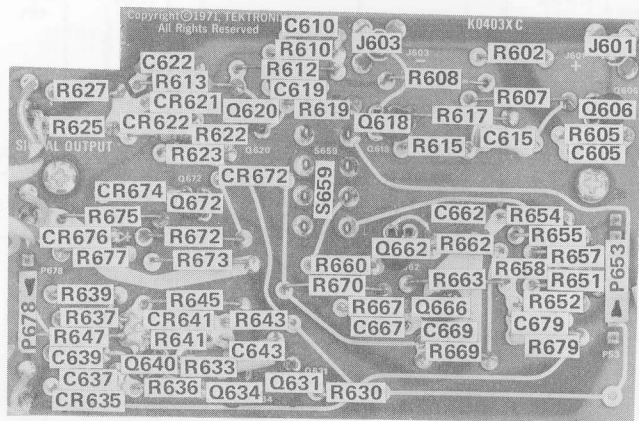
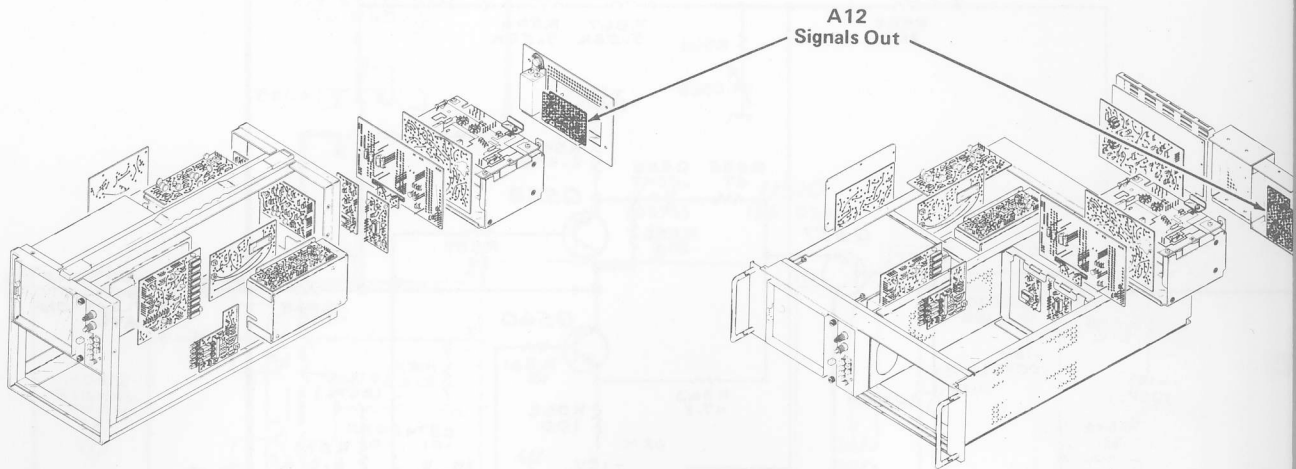
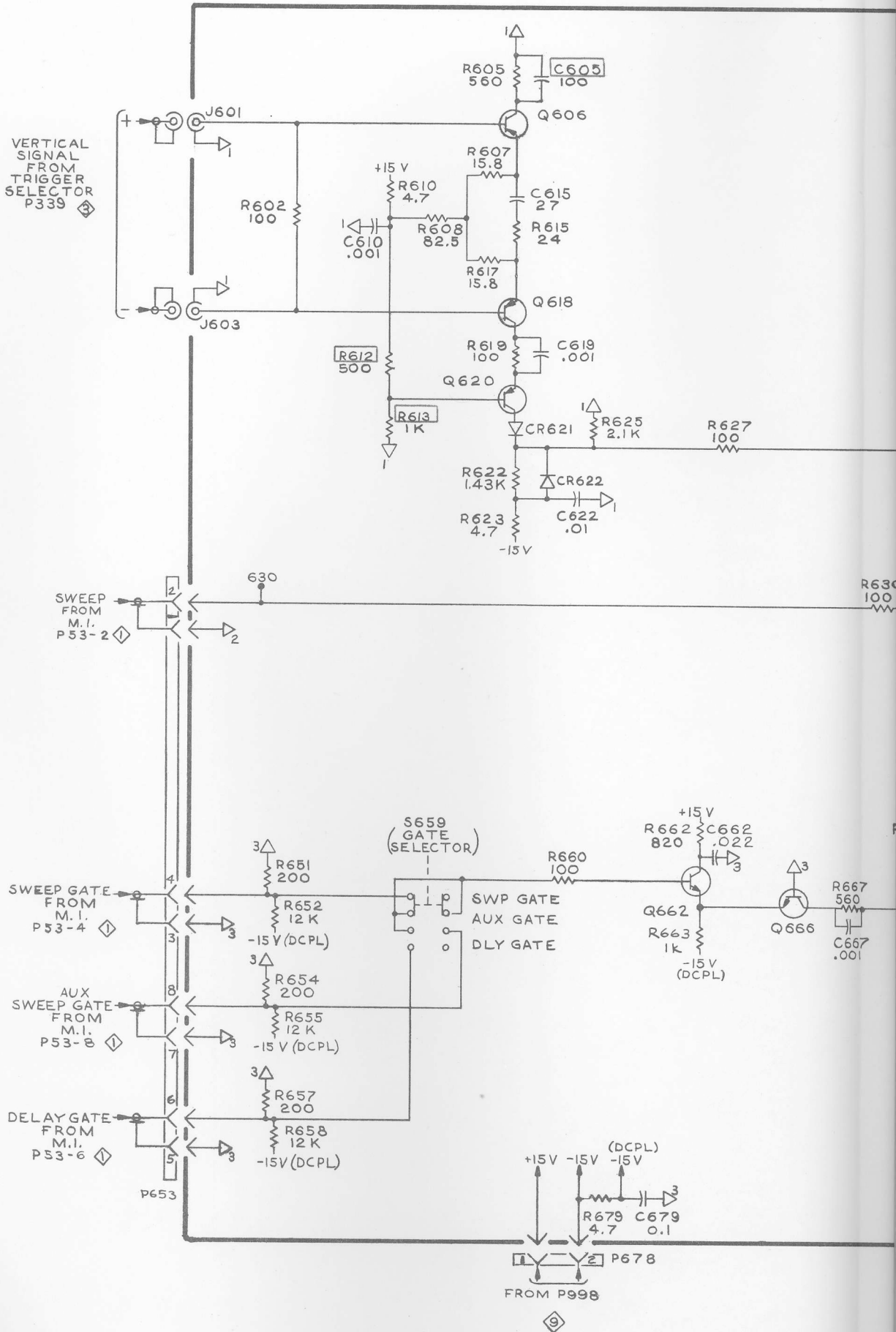
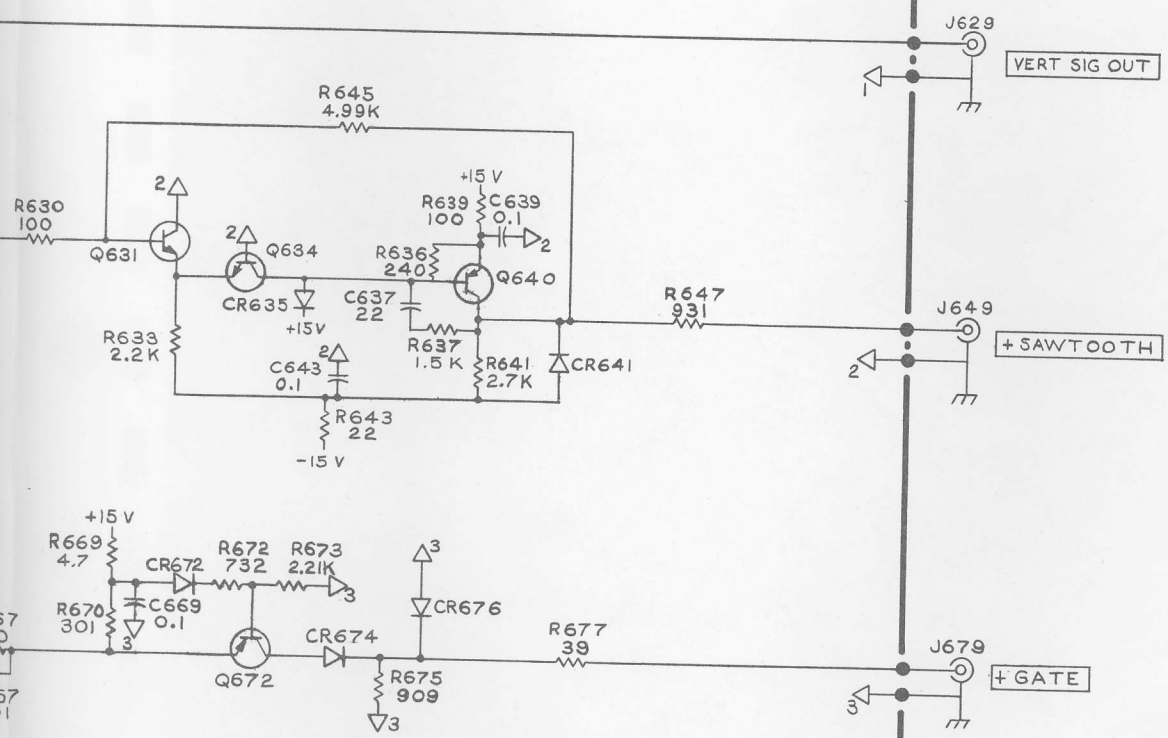


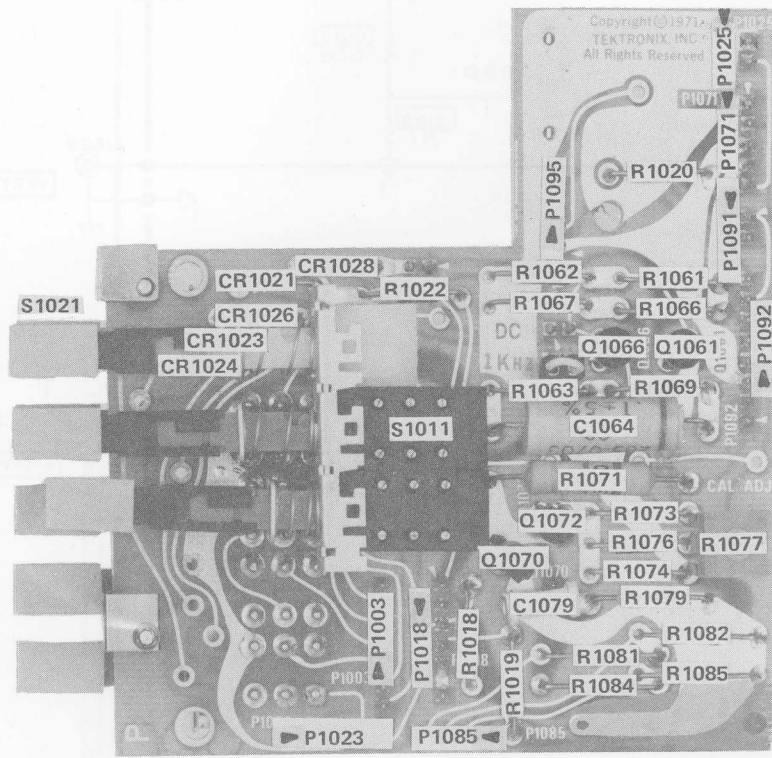
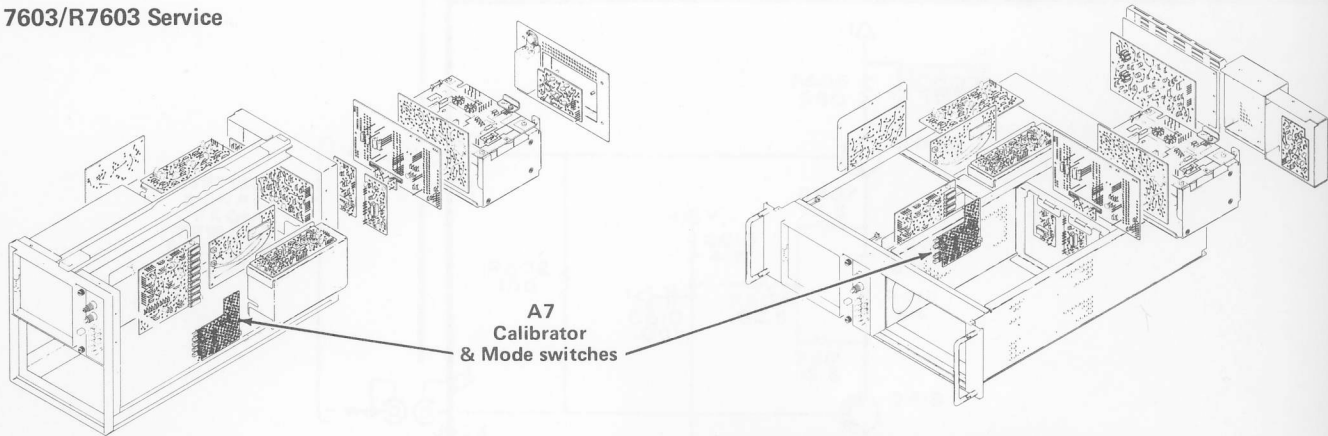
Fig. 8-8. A12. Signal Output circuit board.





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

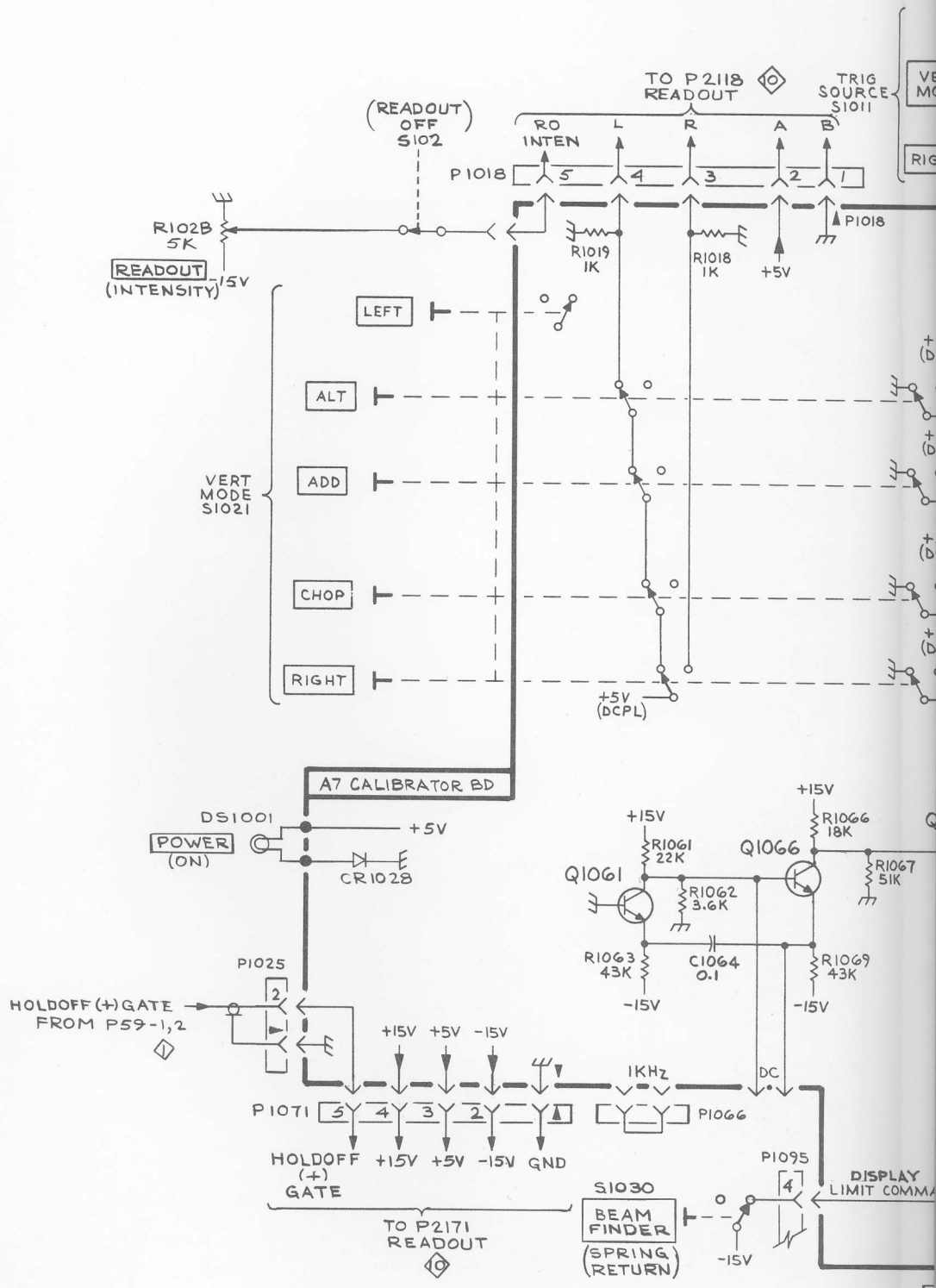
A12 SIGNAL OUTPUT BOARD



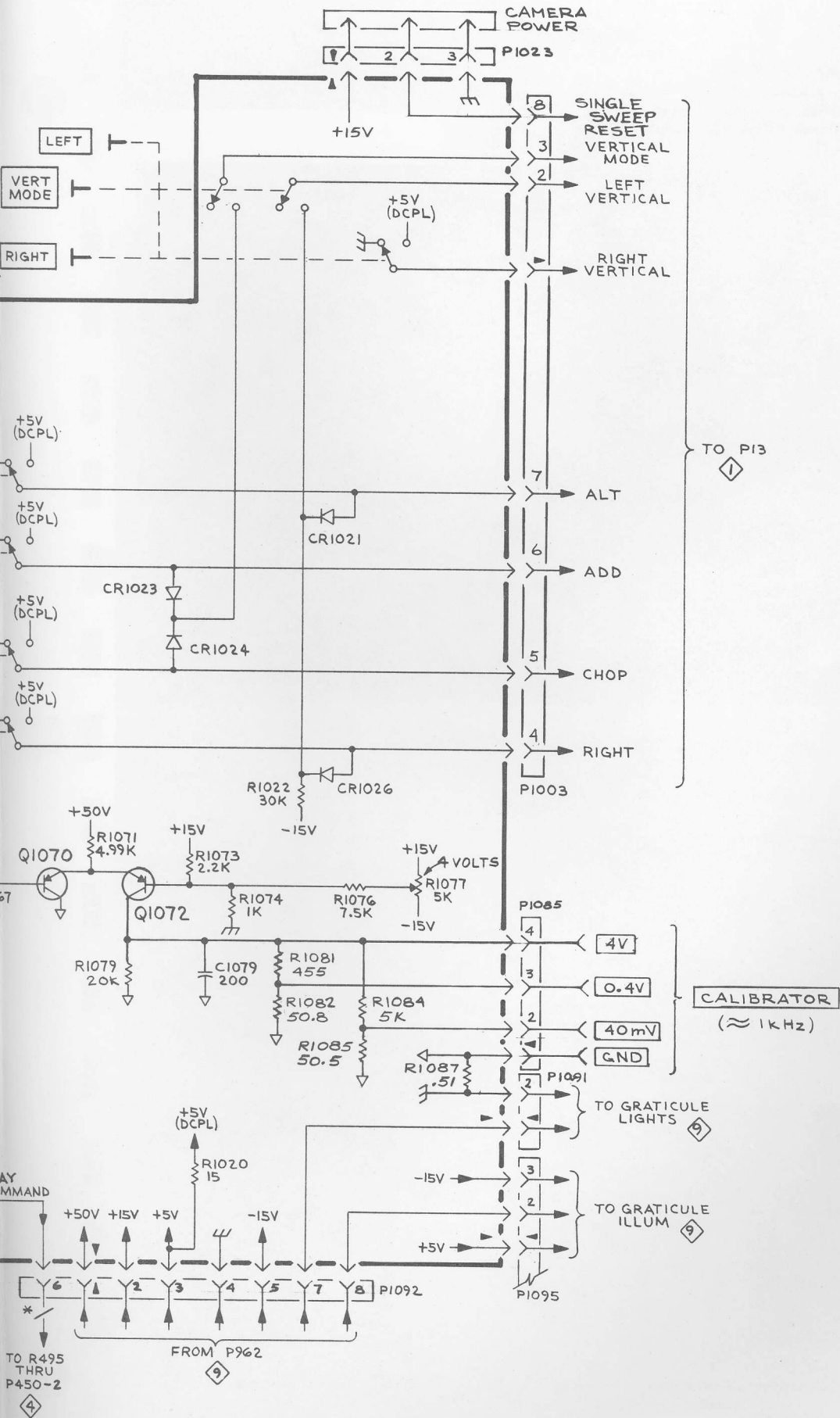
R1087
(On back
of board)

Fig. 8-9. A7. Calibrator and Mode switches circuit board.

A7 BOARD PHOTO



* SEE 9 8 5 FOR CONNECTOR DETAILS



CALIBRATOR & FRONT PANEL SWITCHING 7 mgf 173

CALIBRATOR & FRONT PANEL SWITCHING

CAUTION

C1234 lead soldered to this point must originate from the capacitor side facing T1225.

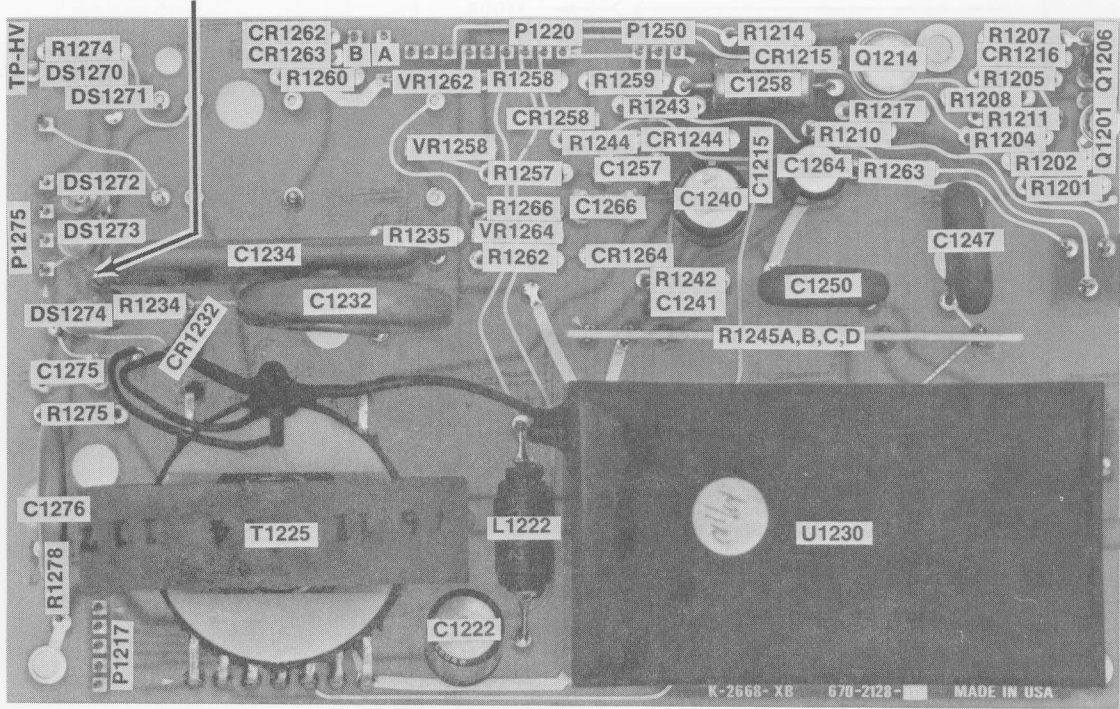


Fig. 8-10. A9 High Voltage circuit board SN B330000 & up.

NOTE

C1232 and C1234 must be cemented together after replacement.

Located on back of board:

- R1250
- R1252
- R1261

CAUTION

Capacitor leads soldered to these points must originate from outer side of capacitor, with respect to circuit board. This applies to C1410.

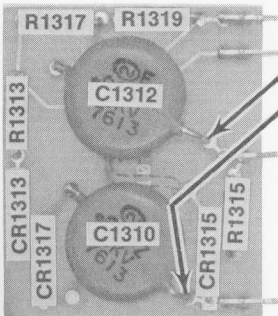


Fig. 8-11A. A15 Focus DC Restorer circuit board.

Located on back of board:

- C1410

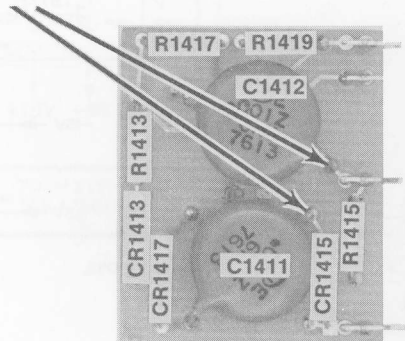
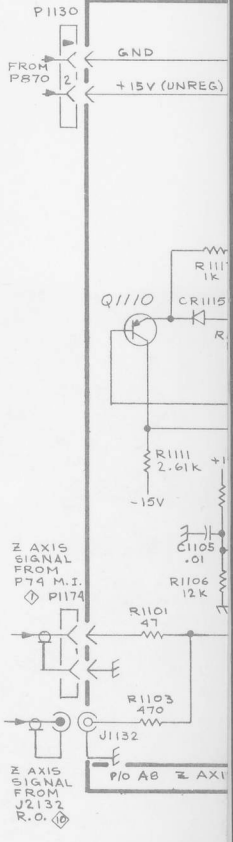
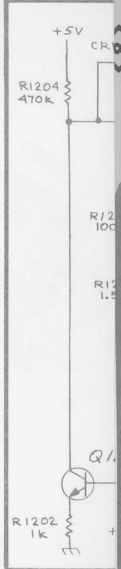
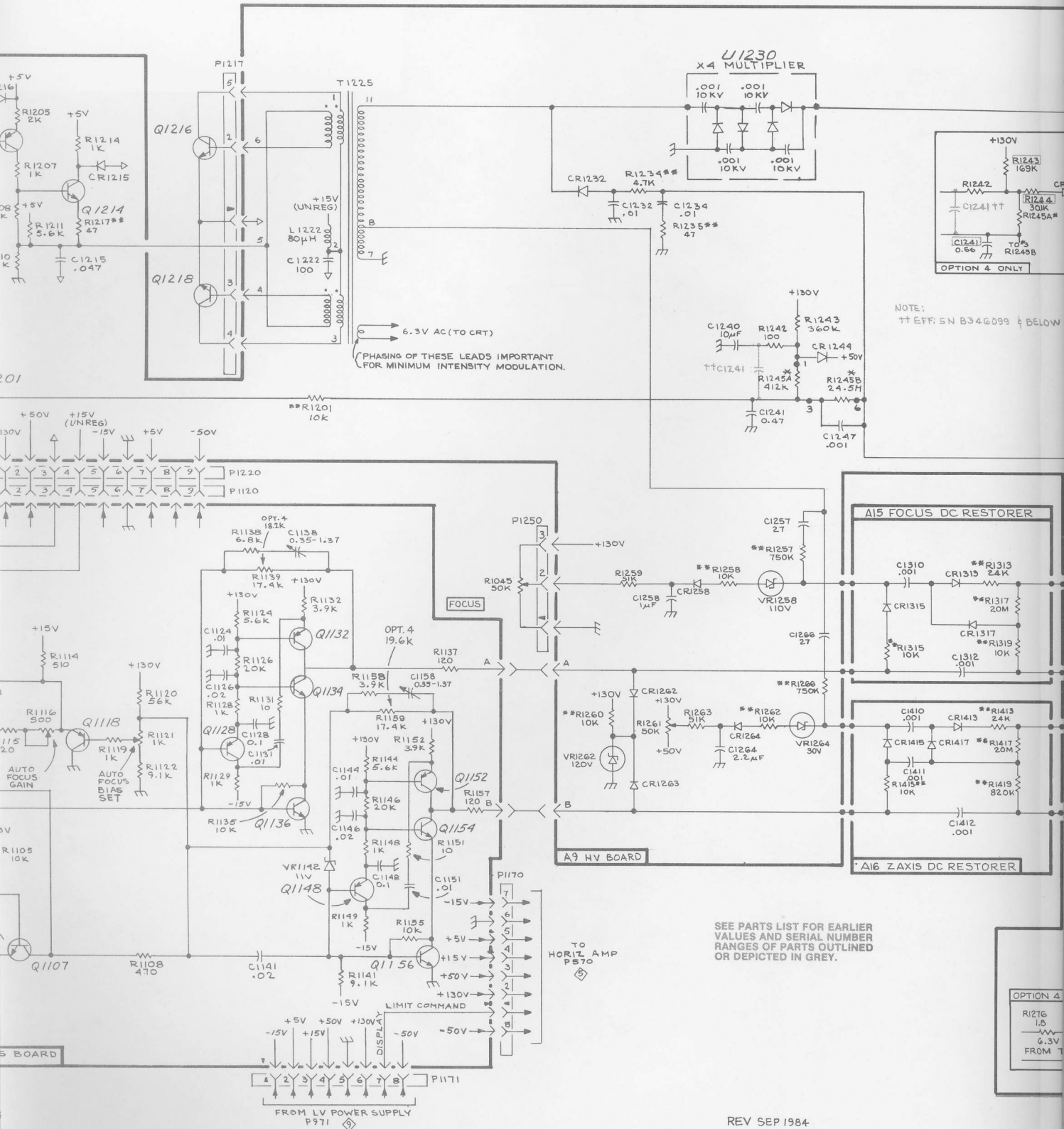


Fig. 8-11B. A16 Z Axis DC Restorer circuit board.



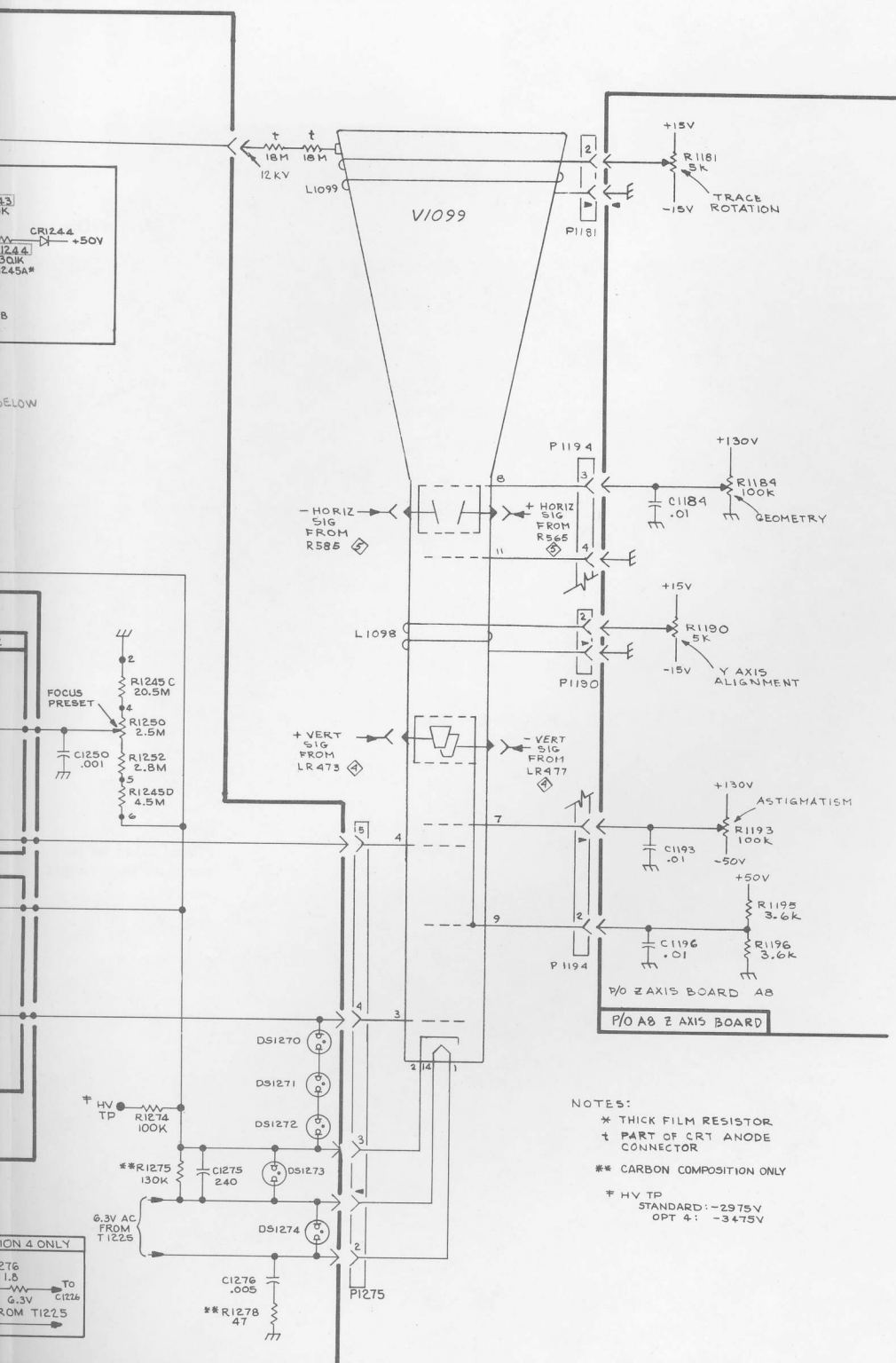
7603/R7603



NOTE:
 †† EFF. SN B34G099 & BELOW

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


OPTION 4
 R1216
 1.0
 -4V
 6.3V
 FROM T



NOTES:
 * THICK FILM RESISTOR
 † PART OF CRT ANODE CONNECTOR
 ** CARBON COMPOSITION ONLY
 ‡ HV TP
 STANDARD: -2975V
 OPT 4: -3475V

(SN B330000 + UP)
 CRT CIRCUIT

SN B330000 & UP

FIG. 8-11B 

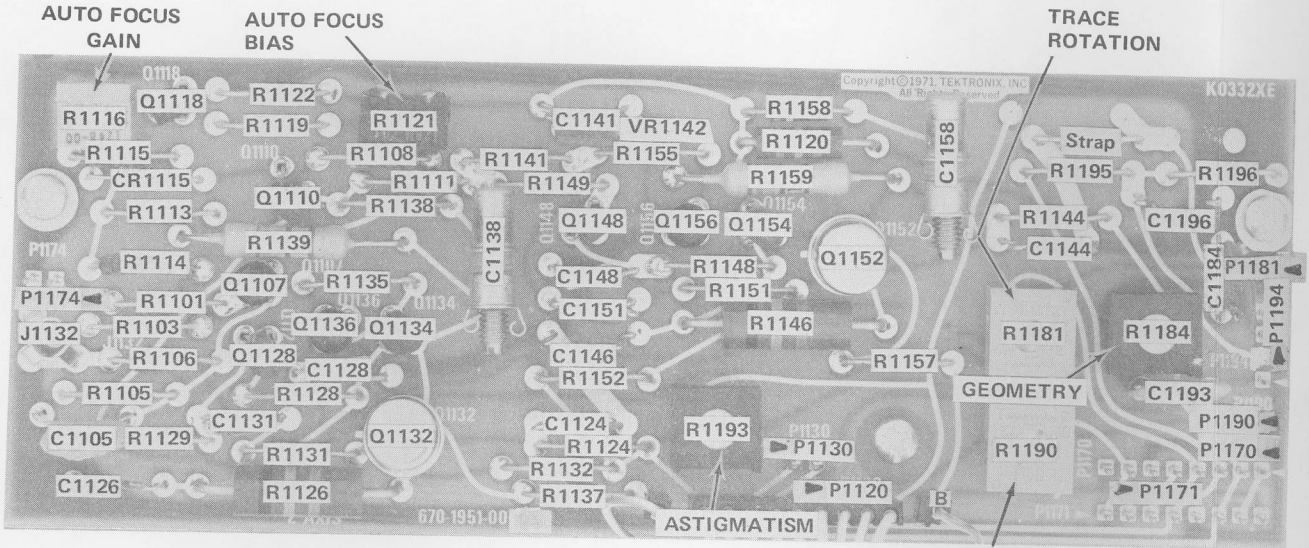
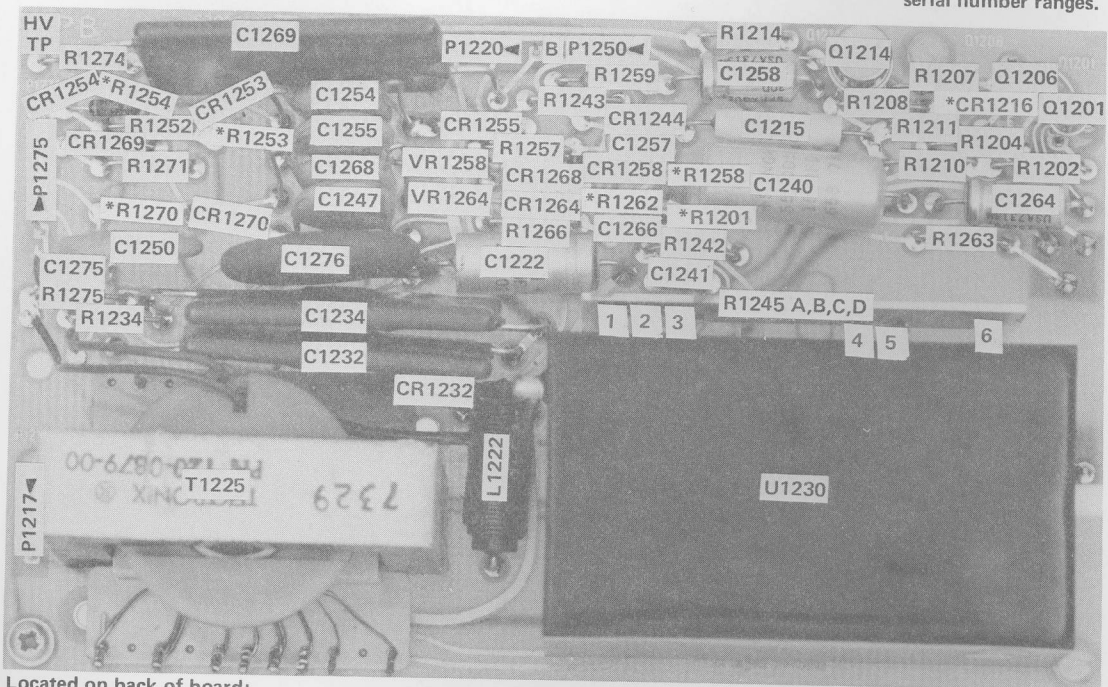


Fig. 8-11C. A8. Z-Axis Amplifier circuit board.

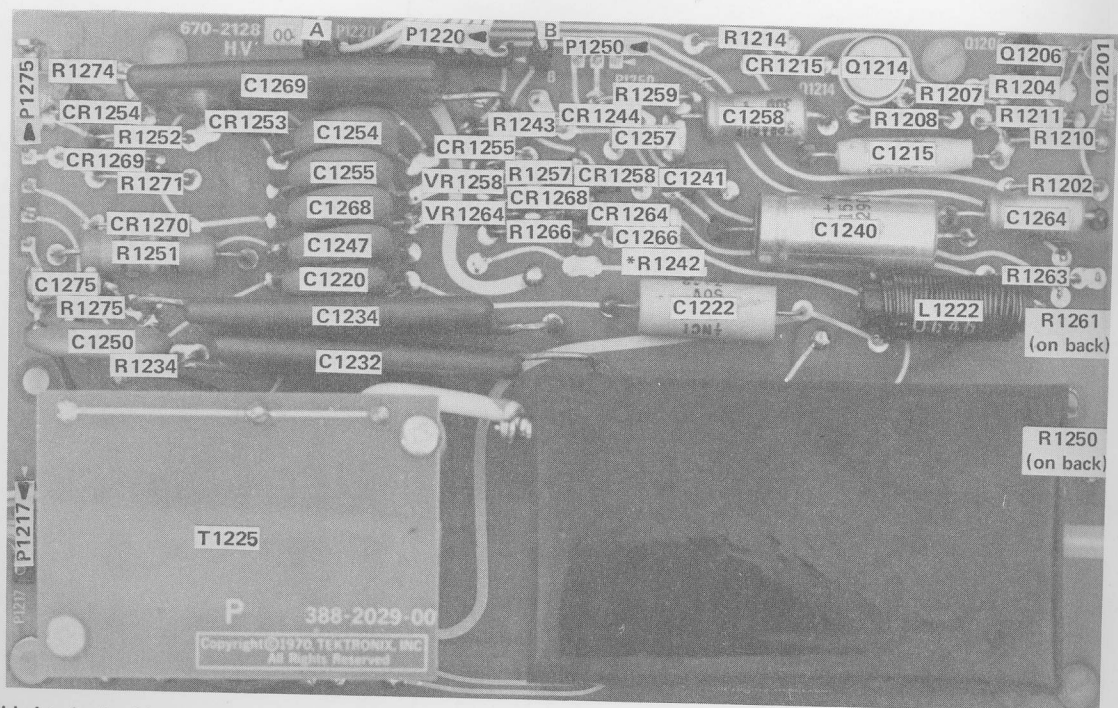
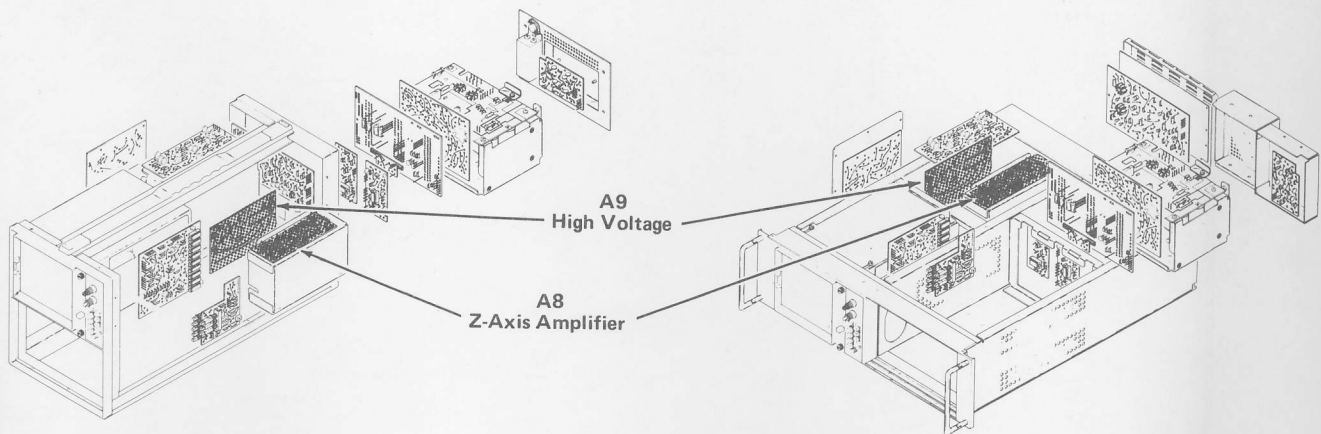
*See Parts List for serial number ranges.



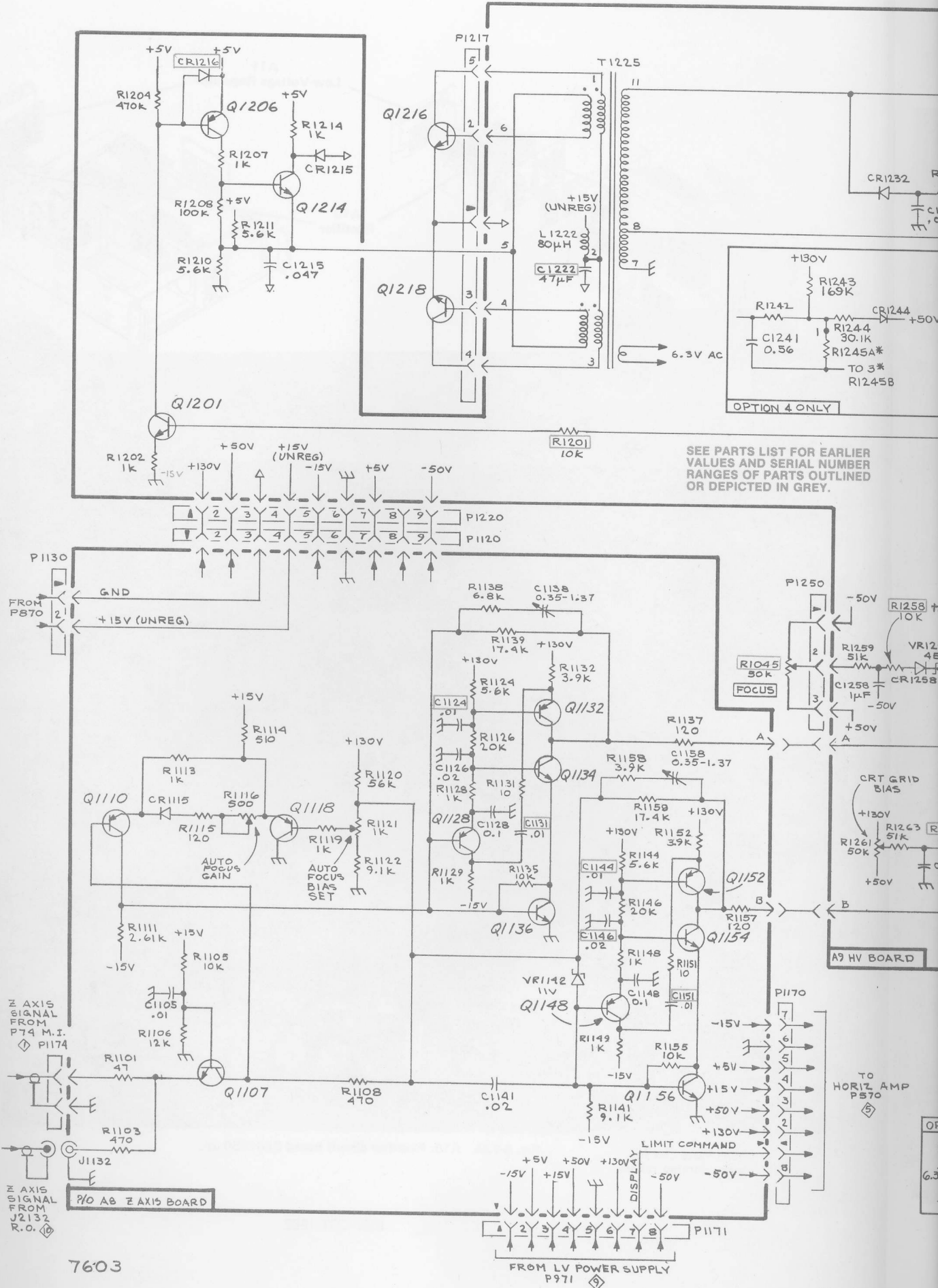
Located on back of board:

- R1250
- R1261
- R1201

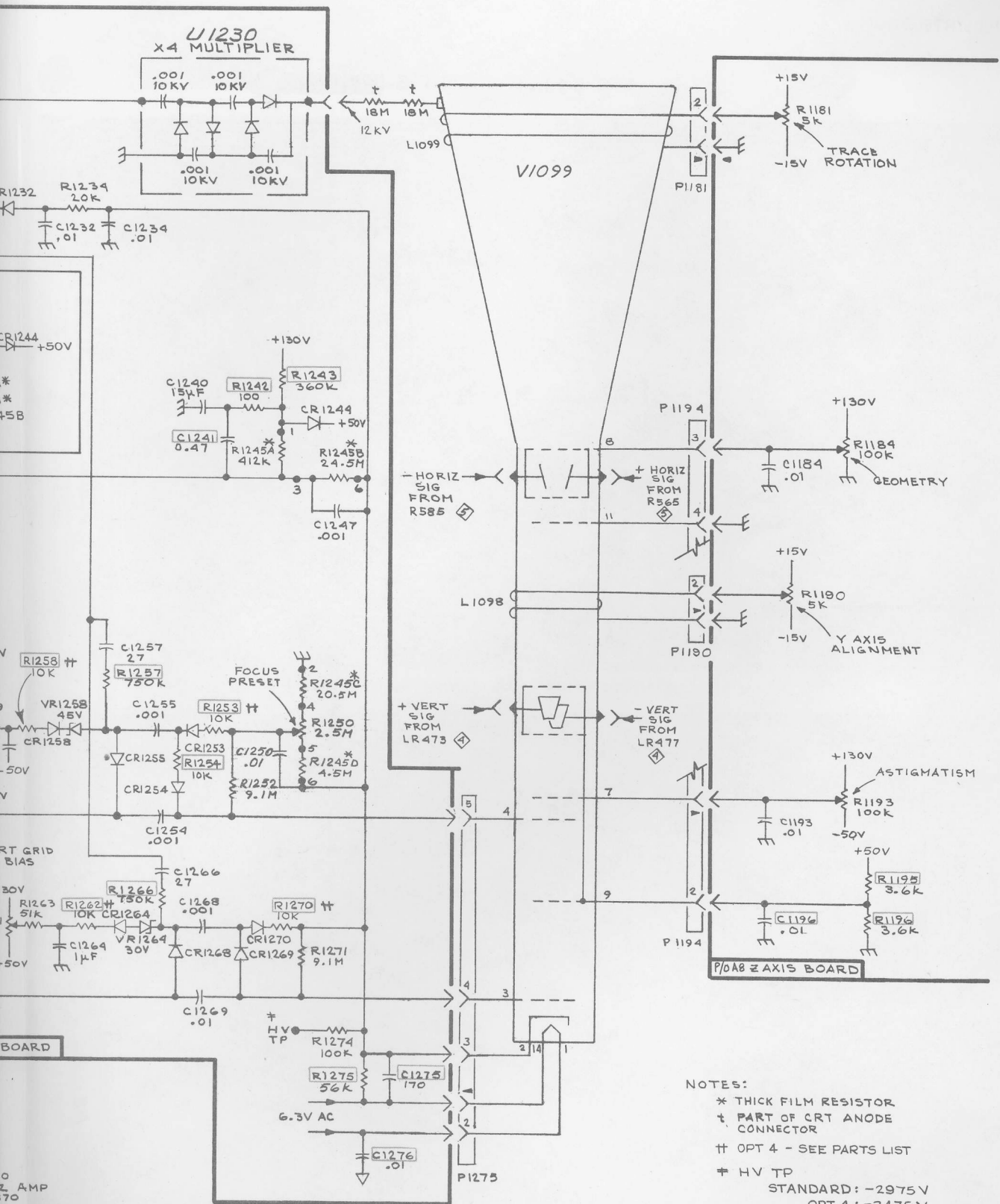
Fig. 8-11D. A9. High Voltage circuit board SN B100000 - B329999.



*R1242 added to back of board SN B010175. Later moved to front. Fig. 8-11E. A9. High Voltage circuit board SN B99999 & below.



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



OPTION 4 ONLY

R1276 TO I-5 C1276

6.3V AC FROM T1215

- NOTES:
- * THICK FILM RESISTOR
 - † PART OF CRT ANODE CONNECTOR
 - ‡ OPT 4 - SEE PARTS LIST
 - ‡ HV TP
- STANDARD: -2975V
OPT 4: -3475V

FIG. 8-13A & FIG. 8-13B

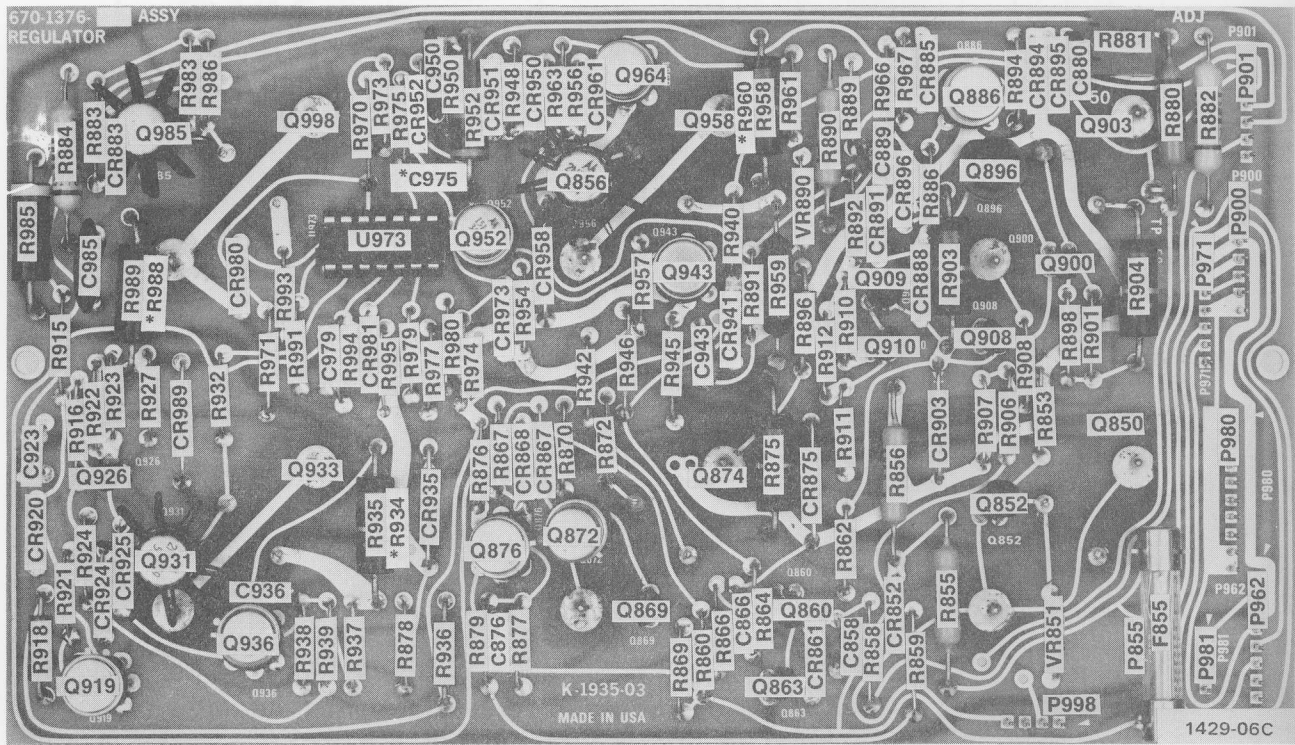
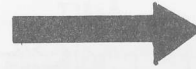
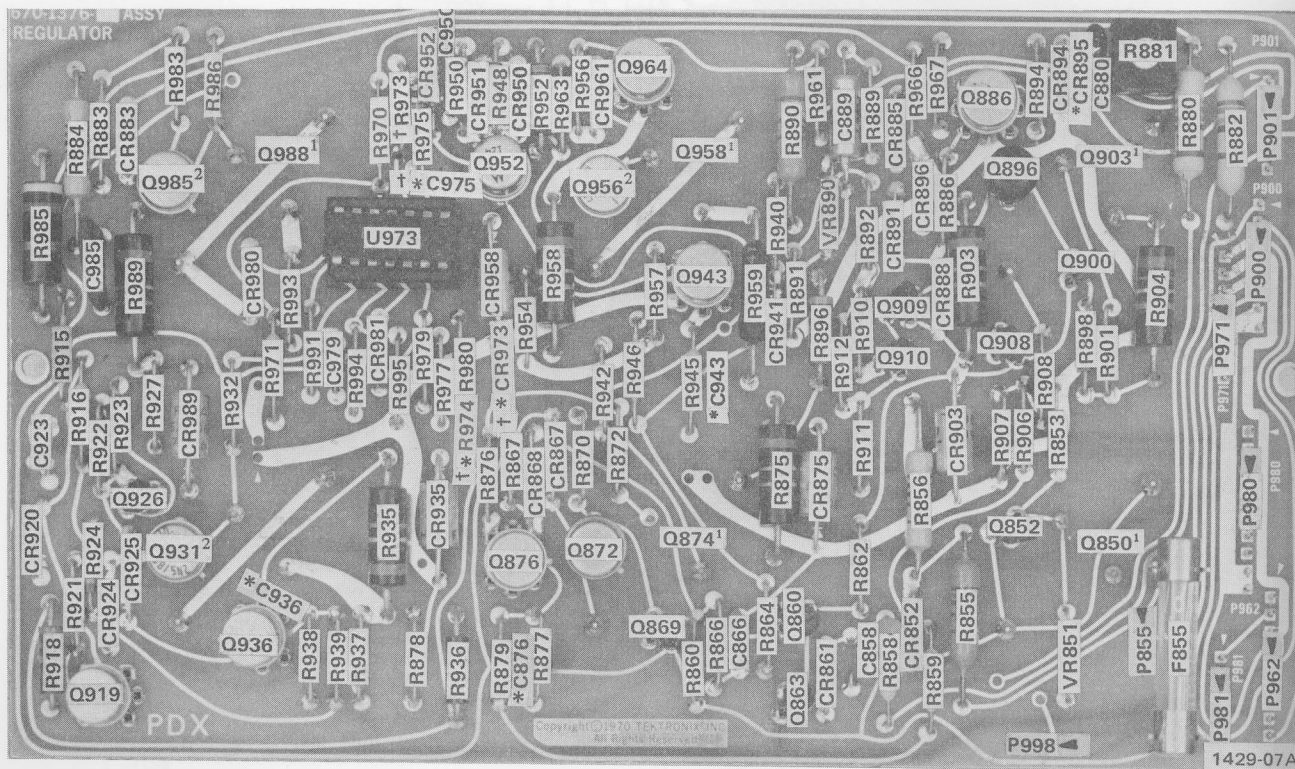


Fig. 8-12A. A11. Low-Voltage Regulator circuit board SN B343771-up.



Added to back of board:

- *C827
- *CR975

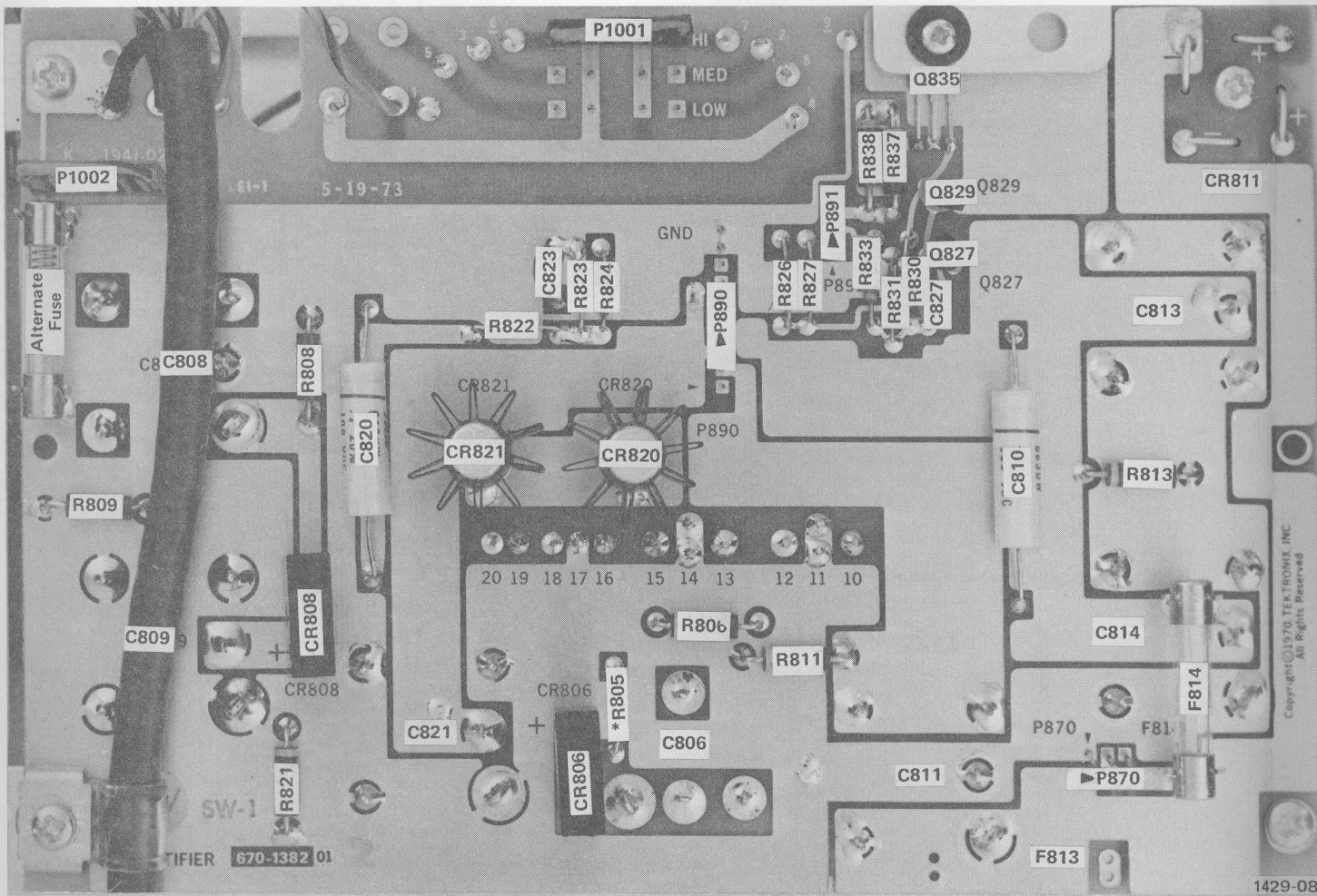
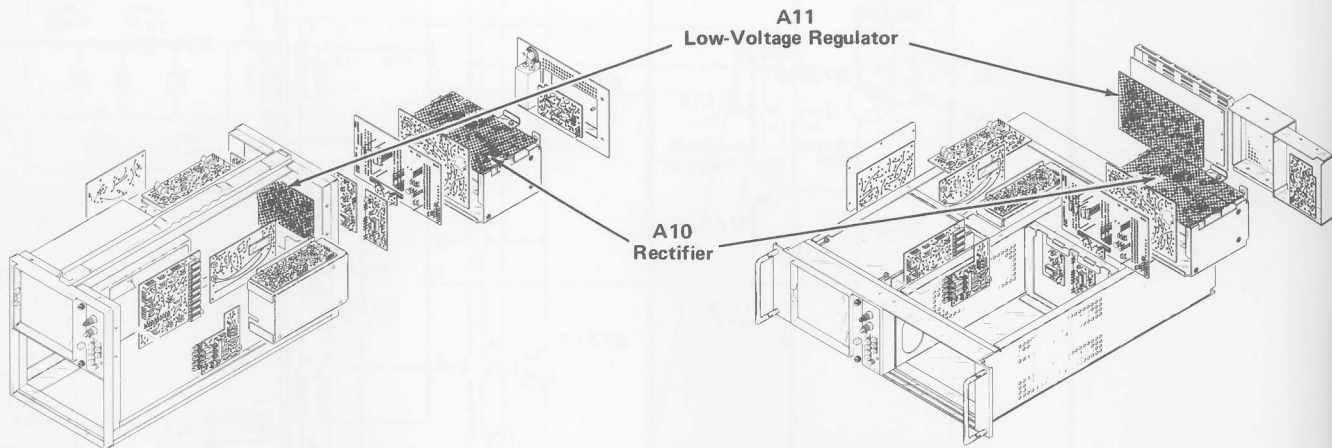
¹Mounted on heat sink

²Have heat sinks

[†]Located on back of board some serial numbers.

Fig. 8-12B. A11. Low-Voltage Regulator circuit board SN B343770 & below.

*See Parts List for serial number ranges.



*See Parts List for serial number ranges.

Fig. 8-13A. A10. Rectifier circuit board B061550-up.

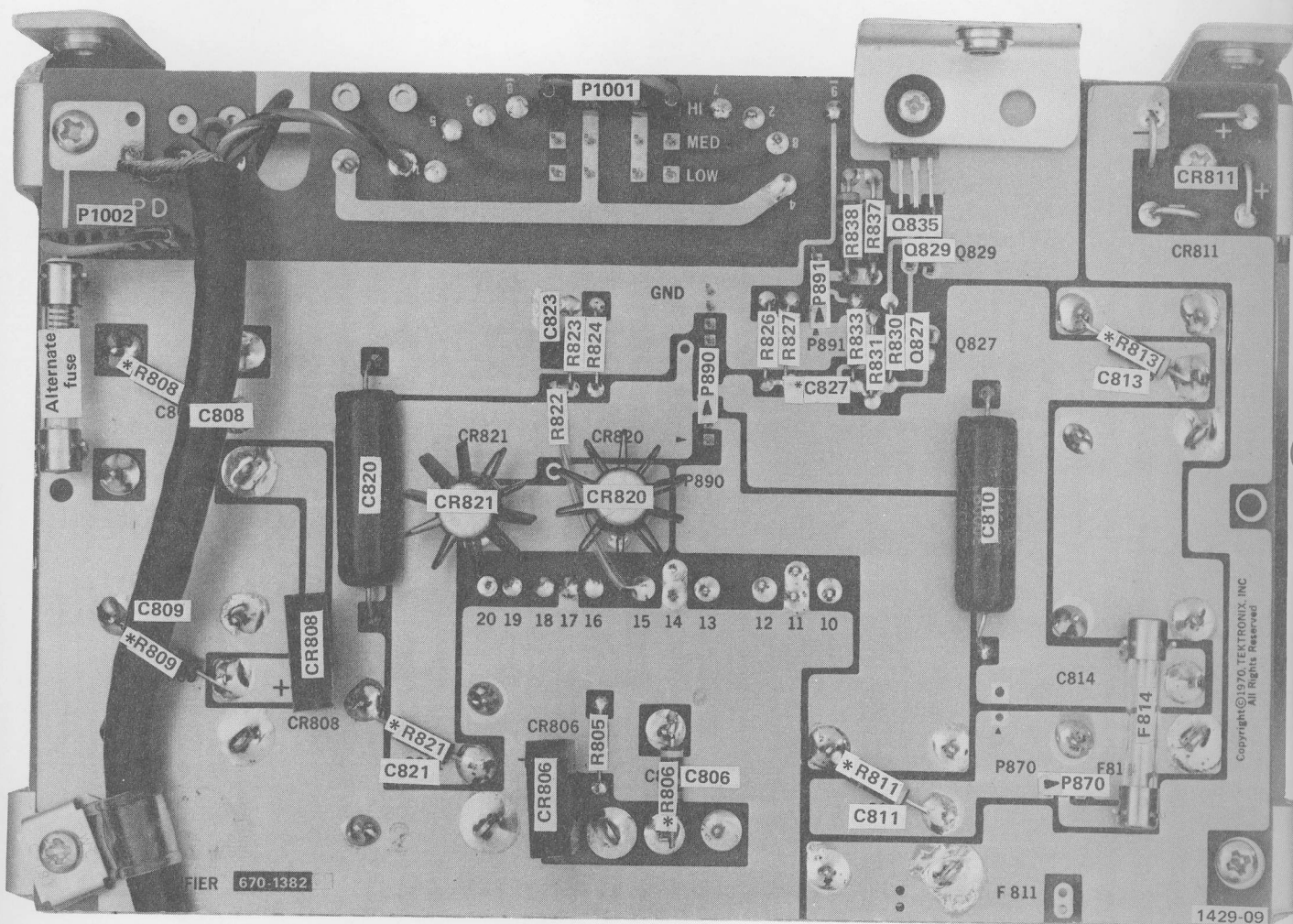
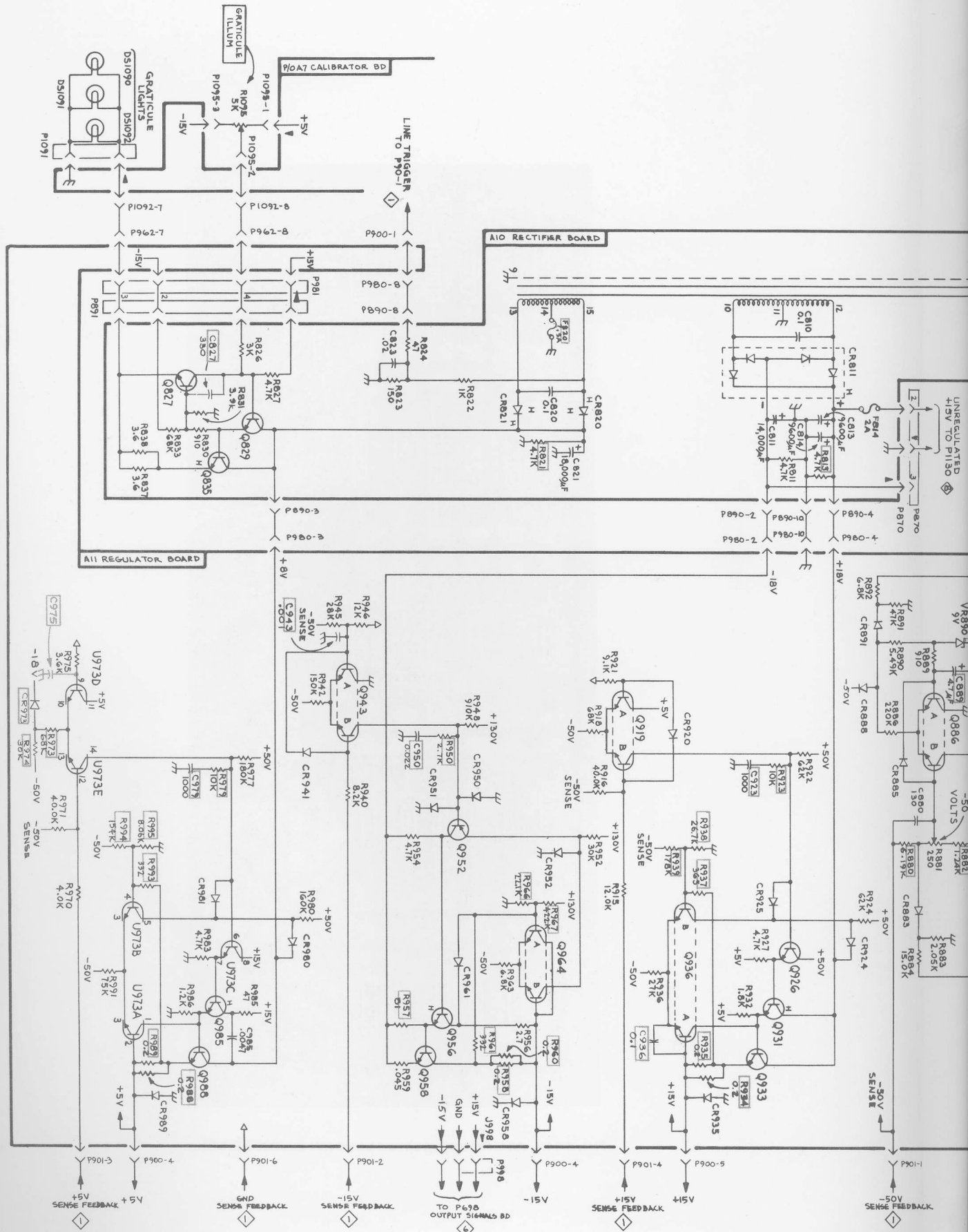
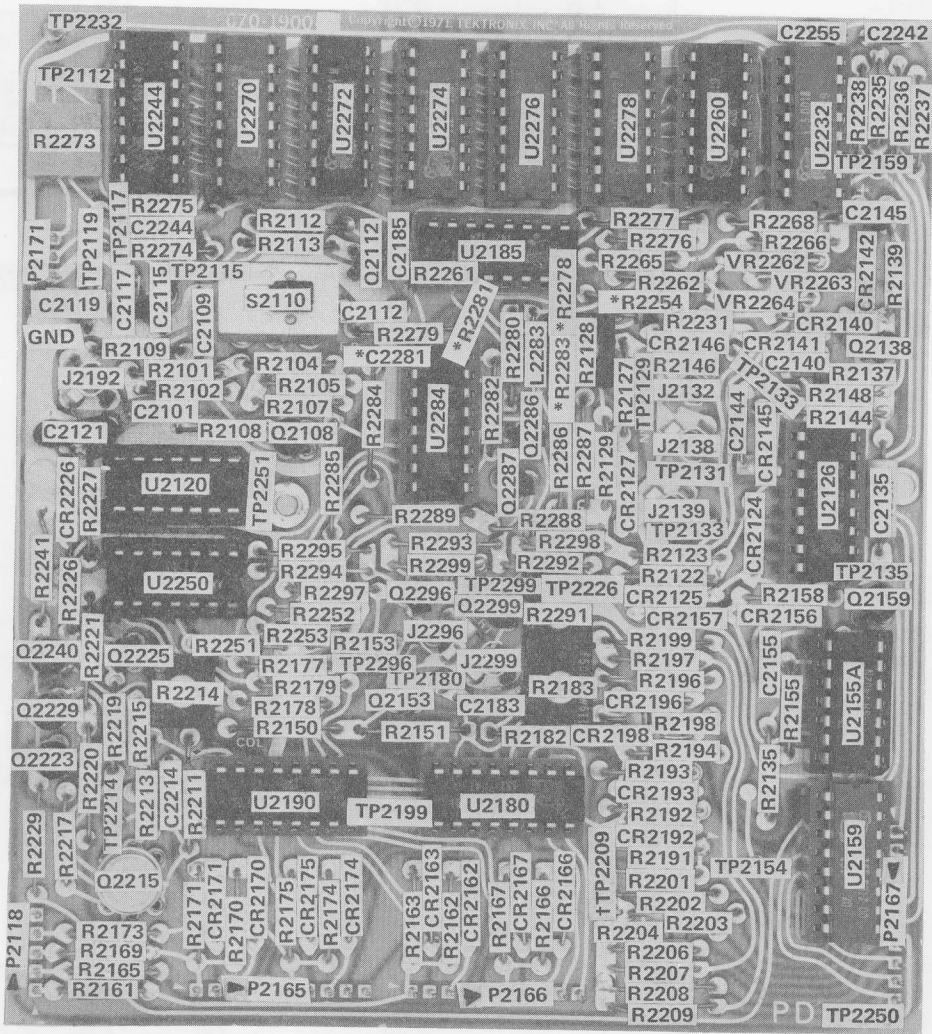
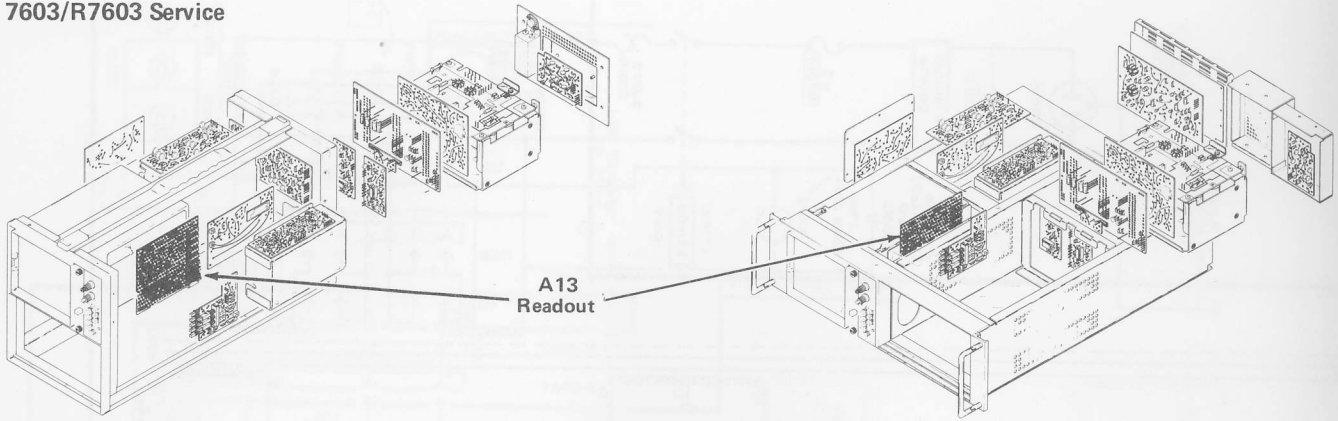


Fig. 8-13B. A10. Rectifier circuit board below B061550.

*See Parts List for serial number ranges.



7603/R7603



*See Parts List for serial number ranges.

†Removed SN B260000-UP

Fig. 8-14. A13. Readout circuit board.

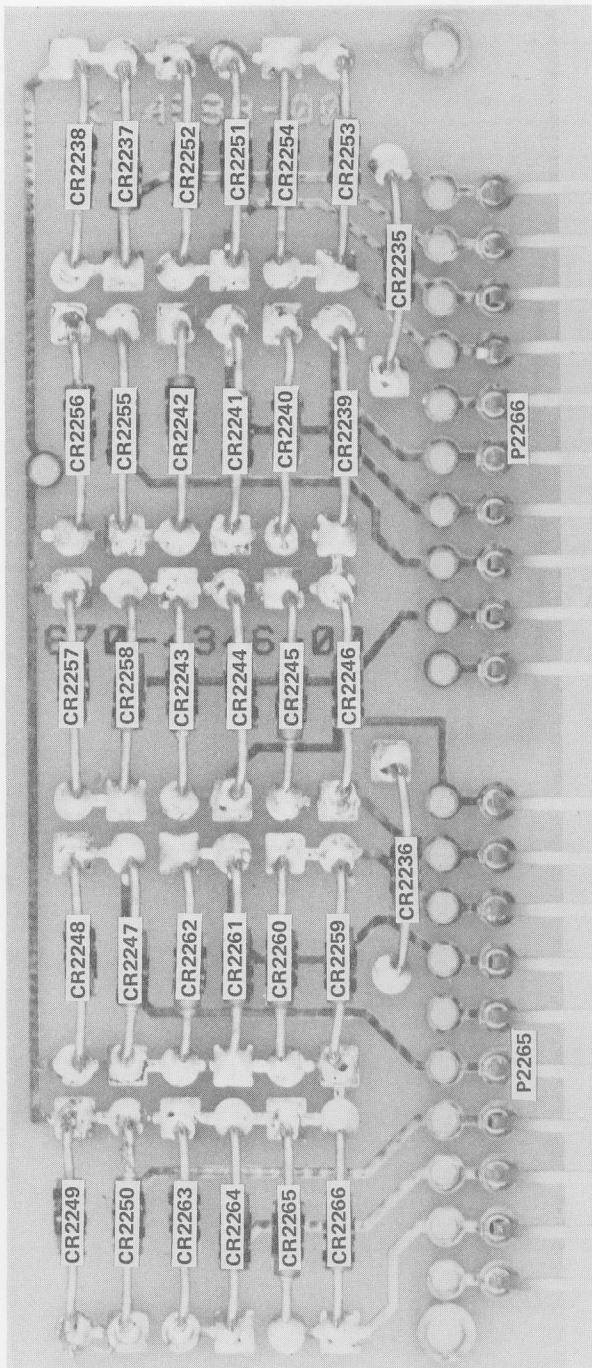
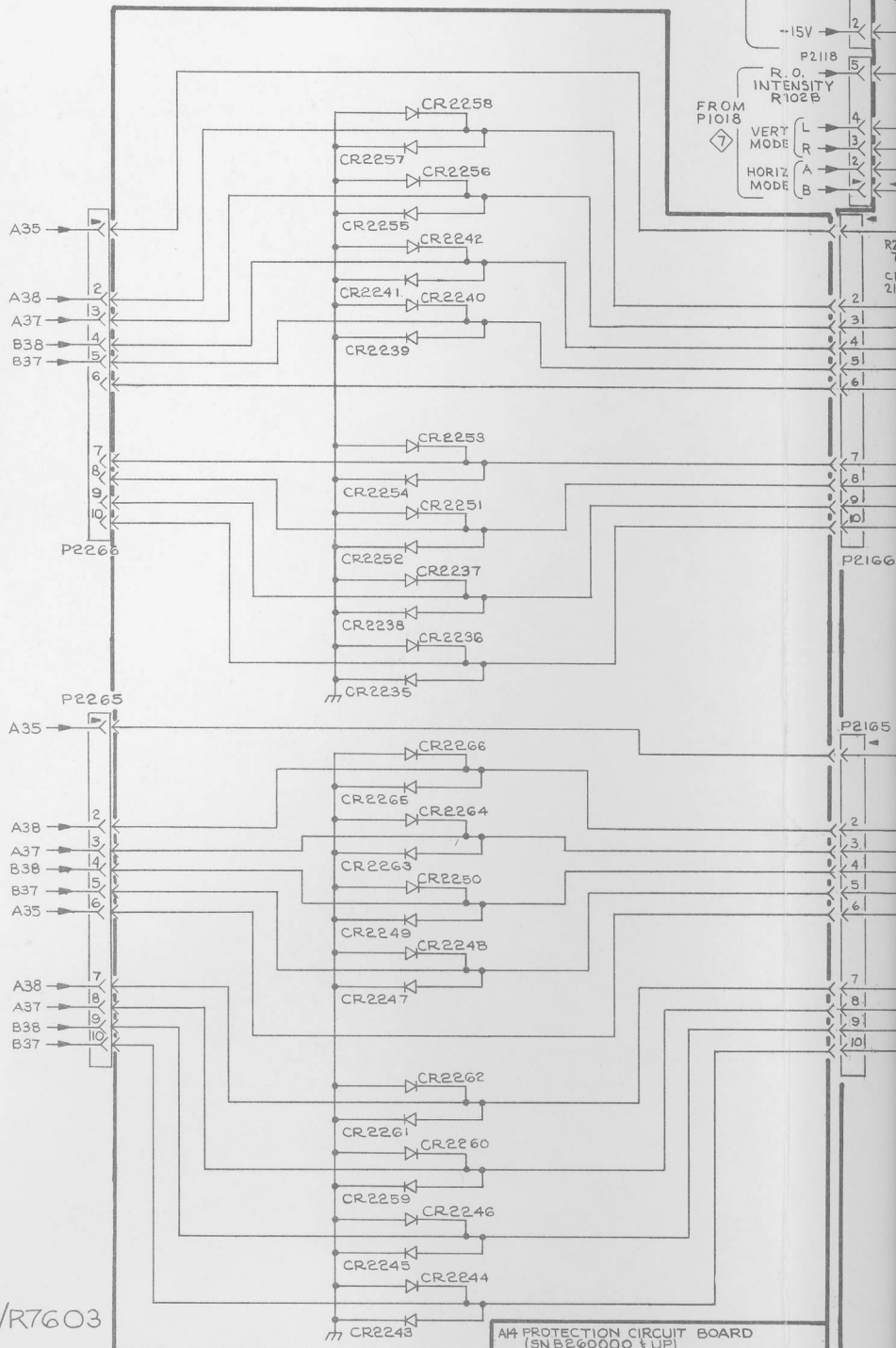


FIG. 8-14A A14. Protection circuit board (SN B260000 & UP).

FROM P66
 A HORIZ

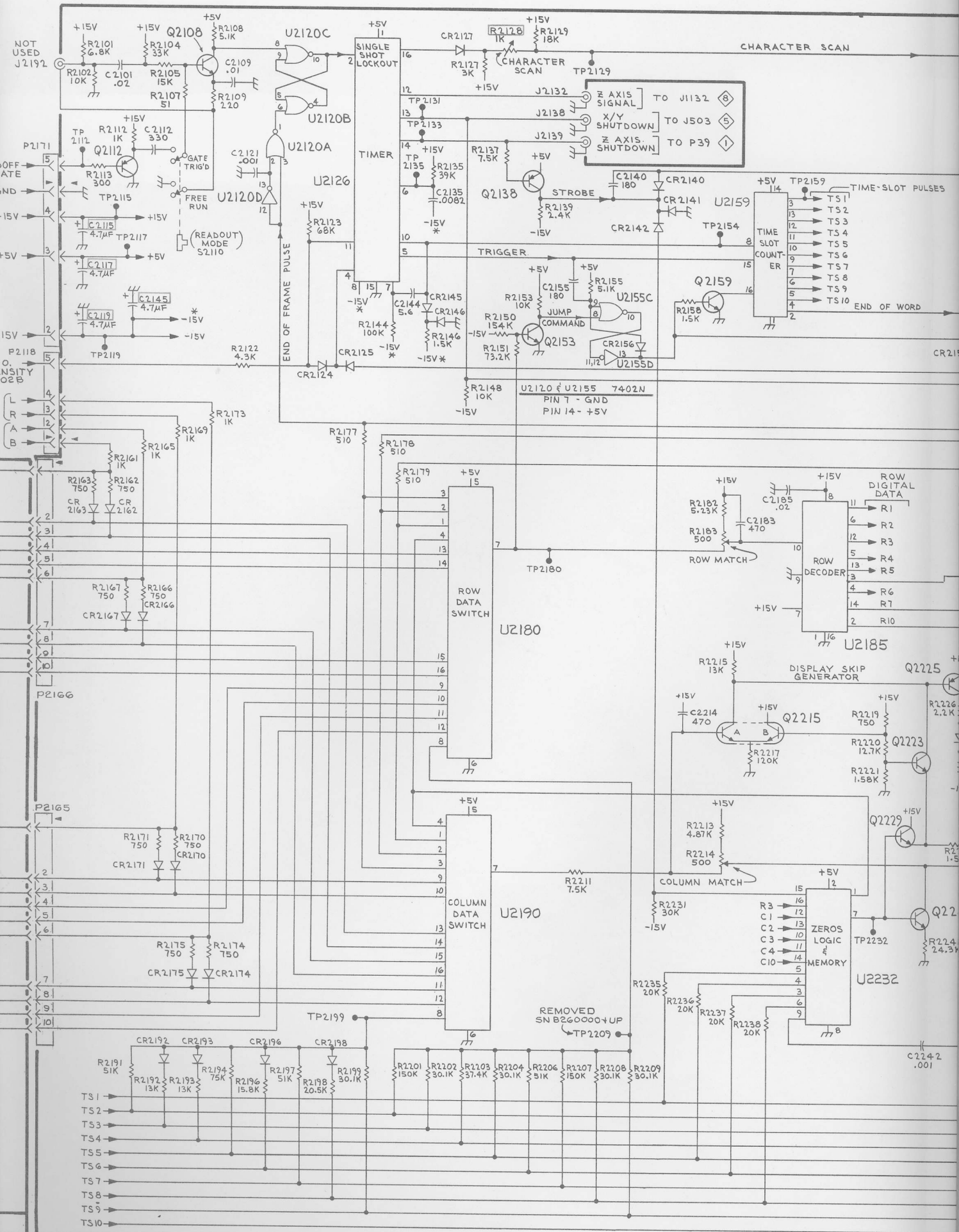
FROM P65
 LEFT VERT
 RIGHT VERT

NOT USED
 J2192
 P2171
 HOLDOFF (+) GATE
 GND
 +15V
 +5V
 -15V
 P2118
 R.O. INTENSITY R102B
 FROM P1018
 VERT MODE
 HORIZ MODE

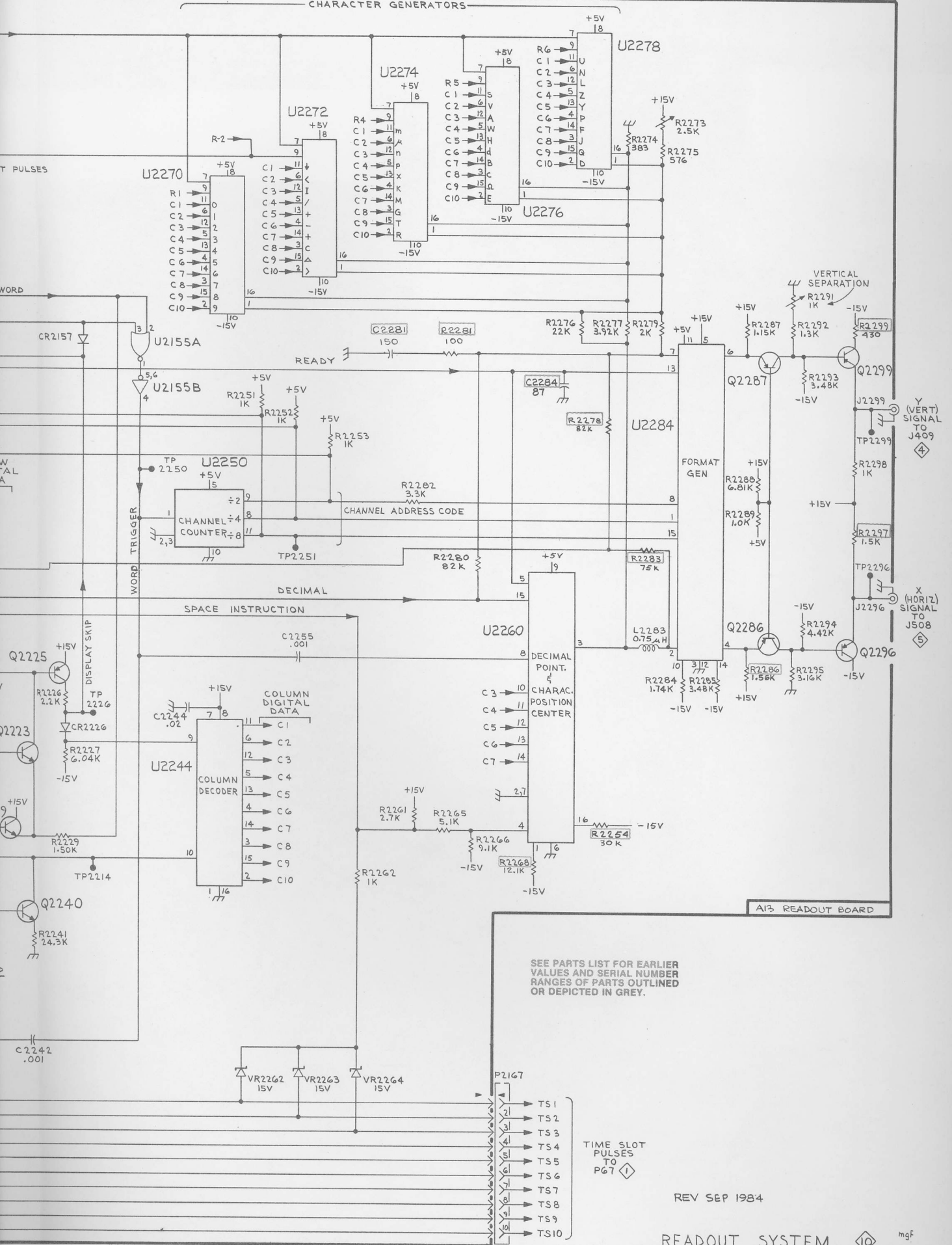


7603/R7603

A4 PROTECTION CIRCUIT BOARD
 (SN B260000 & UP)



CHARACTER GENERATORS



A13 READOUT BOARD

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

REV SEP 1984

READOUT SYSTEM

mgf

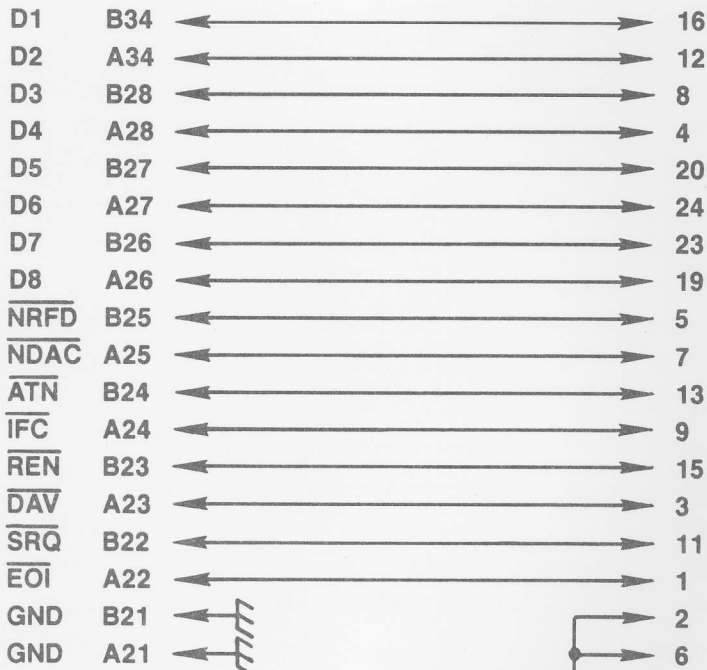
P/O A1-MAIN INTERFACE board

GPIB function

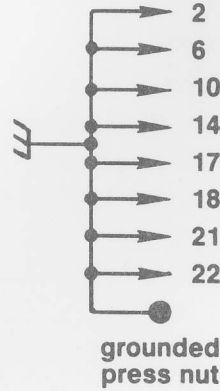
J3

J701

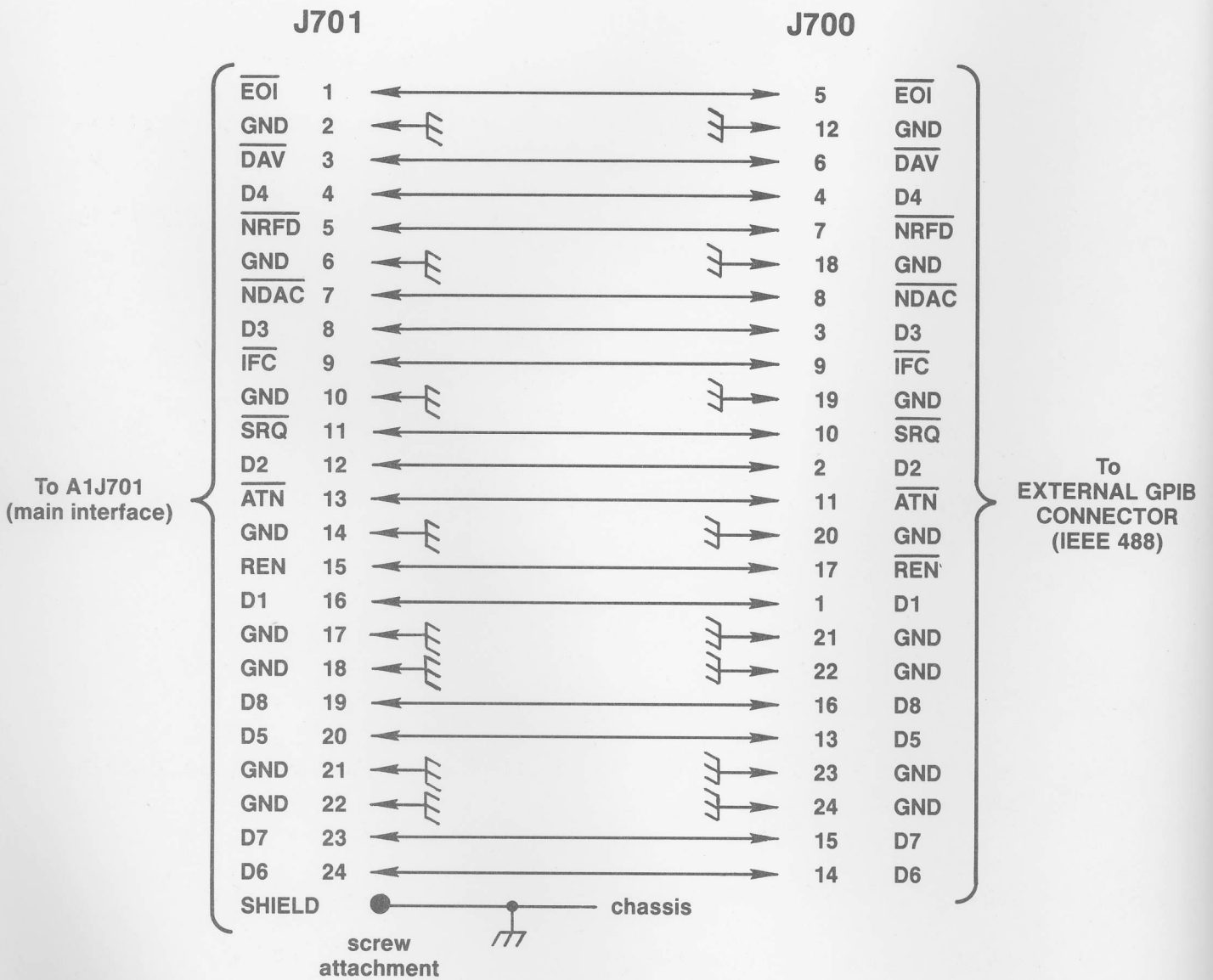
To right
(horizontal)
plug-in



To
A17J701
(GPIB CONNECTOR BOARD)



A17-GPIB CONNECTOR board



OPTION 20 (R7603 ONLY)

This option is only available on the R7603 and is used exclusively with the 7D20.

OPTION 20 conveniently makes a GPIB connector available at the rear panel of the R7603, for accessing the 7D20.

This option eliminates the Signal Output board in the R7603 and three rear panel bnc connectors associated with the signal output circuitry.

The three outputs are:

- + GATE OUT
- + SAWTOOTH OUT
- VERT SIG OUT

NOTE

See Figure 7 for mechanical parts and exploded view.

The GPIB signal lines may exceed IEEE 488 capacitance specifications by up to 25 pf, with the 7D20 installed.

Standard accessories with OPTION 20

(1) 7D20 GPIB Accessory Cable kit

020-0903-00

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

Replaceable Mechanical Parts—7603/R7603 Service

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

| Mfr. Code | Manufacturer | Address | City, State, Zip |
|-----------|---|--------------------------------|-----------------------------|
| 000BK | STAUFFER SUPPLY | 105 SE TAYLOR | PORTLAND, OR 97214 |
| 000CY | NORTHWEST FASTENER SALES, INC. | 7923 SW CIRRUS DRIVE | BEAVERTON, OR 97005 |
| 000FR | POWER ONE INC. DEPT. EM | POWER-ONE DR. | CAMARILLO, CALIF 93010 |
| 000GY | DEK INC. | 3480 SWENSEN AVE. | ST. CHARLES, IL 60174 |
| 000JA | J. PHILLIP INDUSTRIES INC. | 5713 NORTHWEST HIGHWAY | CHICAGO, ILL 60646 |
| 00779 | AMP. INC. | P.O. BOX 3608 | HARRISBURG, PA 17105 |
| 01881 | ANACONDA AMERICAN BRASS COMPANY, A DIV. OF ANACONDA COMPANY | 414 MEADOW STREET | WATERBURY, CT 06720 |
| 04963 | MINNESOTA MINING AND MFG. CO., ADHESIVES COATINGS AND SEALERS DIVISION | 3M CENTER | ST. PAUL, MN 55101 |
| 05820 | WAKEFIELD ENGINEERING, INC. | AUDUBON ROAD | WAKEFIELD, MA 01880 |
| 06383 | PANDUIT CORPORATION | 17301 RIDGELAND | TINLEY PARK, IL 60477 |
| 06470 | WEST AMERICAN RUBBER COMPANY | 750 NORTH MAIN STREET | ORANGE, CA 92668 |
| 06540 | AMATOM ELECTRONIC HARDWARE, DIV. OF MITE CORP. | 446 BLAKE ST. | NEW HAVEN, CT 06515 |
| 06666 | GENERAL DEVICES CO., INC. | 525 S. WEBSTER AVE. | INDIANAPOLIS, IN 46219 |
| 07700 | TECHNICAL WIRE AND PRODUCTS, INC. | 129 DERMODY ST. | CRANFORD, NJ 07016 |
| 07707 | USM CORP., USM FASTENER DIV. | 510 RIVER RD. | SHELTON, CT 06484 |
| 08261 | SPECTRA-STRIP CORP. | 7100 LAMPSON AVE. | GARDEN GROVE, CA 92642 |
| 09422 | PLASTIC STAMPING CORPORATION | 2216 W. ARMITAGE AVE. | CHICAGO, IL 60647 |
| 09922 | BURNDY CORPORATION | RICHARDS AVENUE | NORWALK, CT 06852 |
| 11897 | PLASTIGLIDE MFG. CORPORATION | P O BOX 867, 1757 STANFORD ST. | SANTA MONICA, CA 90406 |
| 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 |
| 13511 | AMPHENOL CARDRE DIV., BUNKER RAMO CORP. | P. O. BOX 1331 | LOS GATOS, CA 95030 |
| 16428 | BELDEN CORP. | 50 LACKAWANNA AVE. | RICHMOND, IN 47374 |
| 19738 | AUDEL CORP. | YOUK EXPRESSWAY | PARSIPPANY, NJ 07054 |
| 22526 | BERG ELECTRONICS, INC. | 2620 ENDRESS PLACE | NEW CUMBERLAND, PA 17070 |
| 24931 | SPECIALITY CONNECTOR CO., INC. | | GREENWOOD, IN 46142 |
| 26365 | GRIES REPRODUCER CO., DIV. OF COATS AND CLARK, INC. | 125 BEECHWOOD AVE. | NEW ROCHELLE, NY 10802 |
| 28520 | HEYMAN MFG. CO. | 147 N. MICHIGAN AVE. | KENILWORTH, NJ 07033 |
| 30817 | INSTRUMENT SPECIALTIES COMPANY, INC. | | LITTLE FALLS, NJ 07424 |
| 52306 | HIGH VOLTAGE DEVICES, INC. | 7485 AVENUE 304 | VISALIA, CA 93277 |
| 52792 | THORGREN TOOL AND MOLDING CO., INC. | 1100 EVANS AVENUE | VALPARAISO, IN 46383 |
| 53387 | MINNESOTA MINING AND MFG. CO., ELECTRO PRODUCTS DIVISION | 3M CENTER | ST. PAUL, MN 55101 |
| 57668 | R-OHM CORP. | 16931 MILLIKEN AVE. | IRVINE, CA 92713 |
| 59730 | THOMAS AND BETTS COMPANY | 36 BUTLER ST. | ELIZABETH, NJ 07207 |
| 59821 | CENTRALAB INC | 7158 MERCHANT AVE | EL PASO, TX 79915 |
| 70276 | SUB NORTH AMERICAN PHILIPS CORP ALLEN MFG. CO. | P. O. DRAWER 570 | HARTFORD, CT 06101 |
| 70485 | ATLANTIC INDIA RUBBER WORKS, INC. | 571 W. POLK ST. | CHICAGO, IL 60607 |
| 71279 | CAMBRIDGE THERMIONIC CORP. | 445 CONCORD AVE. | CAMBRIDGE, MA 02138 |
| 71286 | REXNORD, INC., SPECIALTY FASTENER DIV. | 22 SPRING VALLEY RD. | PARAMUS, NJ 07652 |
| 71590 | CENTRALAB ELECTRONICS, DIV. OF GLOBE-UNION, INC. | P O BOX 858 | FORT DODGE, IA 50501 |
| 71744 | CHICAGO MINIATURE LAMP WORKS | 4433 RAVENSWOOD AVE. | CHICAGO, IL 60640 |
| 71785 | TRW, CINCH CONNECTORS | 1501 MORSE AVENUE | ELK GROVE VILLAGE, IL 60007 |
| 72653 | G. C. ELECTRONICS CO., A DIVISION OF HYDROMETALS, INC. | 400 S. WYMAN ST. | ROCKFORD, IL 61101 |
| 73743 | FISCHER SPECIAL MFG. CO. | 446 MORGAN ST. | CINCINNATI, OH 45206 |
| 74921 | ITEN FIBRE CO., | 4001 BENEFIT AVE., P O BOX 9 | ASHTABULA, OH 44004 |
| 75915 | LITTELFUSE, INC. | 800 E. NORTHWEST HWY | DES PLAINES, IL 60016 |
| 76854 | OAK INDUSTRIES, INC., SWITCH DIV. | S. MAIN ST. | CRYSTAL LAKE, IL 60014 |
| 78189 | ILLINOIS TOOL WORKS, INC. SHAKEPROOF DIVISION | ST. CHARLES ROAD | ELGIN, IL 60120 |
| 79727 | C-W INDUSTRIES | 550 DAVISVILLE RD., P O BOX 96 | WARMINSTER, PA 18974 |
| 79807 | WROUGHT WASHER MFG. CO. | 2100 S. O BAY ST. | MILWAUKEE, WI 53207 |
| 80009 | TEKTRONIX, INC. | P O BOX 500 | BEAVERTON, OR 97077 |
| 82389 | SWITCHCRAFT, INC. | 5555 N. ELSTON AVE. | CHICAGO, IL 60630 |
| 83058 | CARR COMPANY, THE UNITED-CARR DIV. OF TRW, INC | 31 AMES ST. | CAMBRIDGE, MA 02142 |
| 83385 | CENTRAL SCREW CO. | 2530 CRESCENT DR. | BROADVIEW, IL 60153 |
| 86445 | PENN FIBRE AND SPECIALTY CO., INC. | 2032 E. WESTMORELAND ST. | PHILADELPHIA, PA 19134 |
| 86928 | SEASTROM MFG. COMPANY, INC. | 701 SONORA AVENUE | GLENDALE, CA 91201 |
| 88245 | LITTON SYSTEMS, INC., USECO DIV. | 13536 SATICOY ST. | VAN NUYS, CA 91409 |

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

| Mfr. Code | Manufacturer | Address | City, State, Zip |
|-----------|---|--|------------------------|
| 90201 | MALLORY CAPACITOR CO., DIV. OF P. R. MALLORY AND CO., INC. | 3029 E. WASHINGTON STREET P. O. BOX 372 | INDIANAPOLIS, IN 46206 |
| 91094 | ESSEX GROUP INC. SUFLEX/IMP DIV. | BAY RD. | NEWMARKET, NH 03857 |
| 91929 | HONEYWELL, INC., MICRO SWITCH DIV. | CHICAGO & SPRING STS. | FREEPORT, IL 61032 |
| 93907 | TEXTRON INC. CAMCAR DIV | 600 18TH AVE | ROCKFORD, IL 61101 |
| 95987 | WECKESSER CO., INC. | 4444 WEST IRVING PARK RD. | CHICAGO, IL 60641 |
| 97913 | INDUSTRIAL ELECTRONIC HARDWARE CORP. | 109 PRINCE STREET | NEW YORK, NY 10012 |
| 98003 | NIELSEN HARDWARE CORP. | 770 WETHERSFIELD AVE.,PO BOX 568 | HARTFORD, CT 06101 |
| S3109 | C/O PANEL COMPONENTS CORP. | P.O. BOX 6626 | SANTA ROSA, CA 95406 |
| S3629 | PANEL COMPONENTS CORP. | 2015 SECOND ST. | BERKELEY, CA 94170 |
| T0608 | PLATT ELECTRIC SUPPLY INC | 1305 N.W. DAVIS | PORTLAND,OR 97209 |
| T0858 | STAUFFER SUPPLY CO | 105 SE TAYLOR | PORTLAND, OR 97214 |
| T0920 | PACIFIC METALS CO. | 3400 SW BOND | PORTLAND, OREG 97201 |
| T1105 | J PHILLIP INDUSTRIES INC | 5713 NORTHWEST HIGHWAY | CHICAGO, IL 60646 |
| T1372 | ELECTRI-CORD MFG CO INC | 312 E. MAIN ST. | WESTFIELD, PA 16950 |

Replaceable Mechanical Parts—7603/R7603 Service

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | 1 2 3 4 5 | Name & Description | Mfr Code | Mfr Part Number |
|------------------------|-----------------------|------------------|---------|-----|-----------|---|-------------|------------------|
| | | Eff | Dscont | | | | | |
| 1-1 | 200-1209-03 | | | 1 | | RTNR,IMPLOSION:6.75 X 5.504 X 0.437,AL ***** (ATTACHING PARTS)***** | 80009 | 200-1209-03 |
| -2 | 211-0634-00 | | | 2 | | THUMBSCREW:6-32 X 0.850 L | 80009 | 211-0634-00 |
| -3 | 210-0894-00 | | | 2 | | WASHER,FLAT:0.19 ID X 0.031 THK ***** (END ATTACHING PARTS)***** | 09422 | ORD BY DESCR |
| | 198-2595-00 | | | 1 | | WIRE SET,ELEC: | 80009 | 198-2595-00 |
| | 175-2111-00 | B340351 | | 1 | | CA ASSY,SP,ELEC:3,26 AWG,21.0 L | 80009 | 175-2111-00 |
| | 175-0826-00 | B340351 | | FT | | .WIRE,ELECTRICAL:3 WIRE RIBBON | 80009 | 175-0826-00 |
| | 131-0707-00 | B340351 | | 3 | | .CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD | 22526 | 47439 |
| | 352-0161-03 | B340351 | | 1 | | .CONN BODY,PL,EL:3 WIRE ORANGE | 80009 | 352-0161-03 |
| -4 | 204-0476-00 | | | 1 | | BODY,TERMINAL:CAMERA POWER ***** (ATTACHING PARTS)***** | 80009 | 204-0476-00 |
| -5 | 213-0055-00 | B010100 | B369599 | 2 | | SCR,TPG,THD FOR:2-32 X 0.188 INCH,PNH STL | 93907 | ORD BY DESCR |
| | 213-0241-00 | B369600 | | 2 | | SCREW,TPG,TF:2-56 X 0.188,TYPE T,PNH ***** (END ATTACHING PARTS)***** | 93907 | ORD BY DESCR |
| -6 | 210-0713-01 | B010100 | B340350 | 3 | | EYELET,METALLIC:0.059 DIA X 0.125 INCH LON | 80009 | 210-0713-01 |
| | 210-3072-01 | B340351 | | 3 | | RIVET,TUBULAR:0.15 L X 0.059 OD,FILH,BRS | 80009 | 210-3072-01 |
| -7 | 337-1700-00 | | | 1 | | SHLD,IMPLOSION:SMOKEY GREY | 80009 | 337-1700-00 |
| -8 | 378-0624-00 | | | 1 | | REFLECTOR,LIGHT:SCALE ILLUMINATION | 80009 | 378-0624-00 |
| -9 | 214-1253-00 | | | 1 | | SPR HSG,SC LAMP:2.420 INCH L | 80009 | 214-1253-00 |
| -10 | 358-0378-00 | | | 1 | | BUSHING,SLEEVE:0.131 ID X 0.125 L | 80009 | 358-0378-00 |
| -11 | 366-1391-02 | | | 1 | | KNOB:GY,0.081 ID,0.28 OD,0.32 L | 80009 | 366-1391-02 |
| | 213-0140-00 | | | 1 | | .SETSCREW:2-56 X 0.94 INCH,HEX SOC ST | 70276 | ORD BY DESCR |
| -12 | 366-1077-00 | | | 1 | | KNOB:GRAY | 80009 | 366-1077-00 |
| | 213-0153-00 | | | 1 | | .SETSCREW:5-40 X 0.125,STL BK OXD,HEX | 000CY | ORD BY DESCR |
| -13 | 366-1059-00 | | | 1 | | PUSH BUTTON:GRAY | 80009 | 366-1059-00 |
| -14 | 366-1215-00 | | | 1 | | KNOB:GRAY | 80009 | 366-1215-00 |
| | 213-0153-00 | | | 1 | | .SETSCREW:5-40 X 0.125,STL BK OXD,HEX | 000CY | ORD BY DESCR |
| -15 | 366-1402-02 | | | 2 | | PUSH BUTTON:LEFT | 80009 | 366-1402-02 |
| -16 | 366-1402-03 | | | 1 | | PUSH BUTTON:ALT | 80009 | 366-1402-03 |
| -17 | 366-1402-04 | | | 1 | | PUSH BUTTON:ADD | 80009 | 366-1402-04 |
| -18 | 366-1257-31 | | | 1 | | PUSH BUTTON:SIL GRAY,CHOP | 80009 | 366-1257-31 |
| -19 | 366-1402-06 | | | 2 | | PUSH BUTTON:RIGHT | 80009 | 366-1402-06 |
| -20 | 366-1402-07 | | | 2 | | PUSH BUTTON:VERT MODE | 80009 | 366-1402-07 |
| -21 | 426-0681-00 | | | 8 | | FR,PUSH BUTTON: | 80009 | 426-0681-00 |
| -22 | 136-0387-01 | | | 1 | | JACK,TIP:BLACK | 71279 | 450-4252-01-0310 |
| -23 | 136-0387-00 | | | 3 | | JACK,TIP:GRAY | 71279 | 450-4352-01-0318 |
| -24 | 358-0216-00 | | | 1 | | BUSHING,PLASTIC:0.257 ID X 0.412 INCH OD | 80009 | 358-0216-00 |
| -25 | 333-1587-00 | | | 1 | | PANEL,FRONT: | 80009 | 333-1587-00 |
| -26 | ----- | | | 1 | | LIGHT,INDICATOR(SEE DS1001 REPL) | | |
| -27 | 386-2269-00 | | | 1 | | SUBPANEL,FRONT:CENTER ***** (ATTACHING PARTS)***** | 80009 | 386-2269-00 |
| -28 | 211-0559-00 | | | 3 | | SCREW,MACHINE:6-32 X 0.375"100 DEG,FLH ST ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -29 | 136-0445-00 | | | 1 | | LAMPHOLDER ASSY:3 SUBMIN GROOVE BASE ***** (ATTACHING PARTS)***** | 71744 | 4609-005 |
| -30 | 211-0501-00 | | | 2 | | SCREW,MACHINE:6-32 X 0.125 INCH,PNH STL ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -31 | 385-0079-00 | | | 2 | | SPACER,POST:0.375 L W/6-32 THD THRU,AL ***** (ATTACHING PARTS)***** | 80009 | 385-0079-00 |
| | 211-0541-00 | | | 1 | | SCREW,MACHINE:6-32 X 0.25"100 DEG,FLH STL ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -32 | 407-0915-00 | | | 1 | | BRACKET,ANGLE:ALUMINUM ***** (ATTACHING PARTS)***** | 80009 | 407-0915-00 |
| | 211-0541-00 | | | 2 | | SCREW,MACHINE:6-32 X 0.25"100 DEG,FLH STL ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -33 | ----- | | | 2 | | RESISTOR,VAR:(SEE R102A,B REPL) ***** (ATTACHING PARTS)***** | | |
| -34 | 210-0583-00 | | | 2 | | NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS | 73743 | 2X20317-402 |
| -35 | 210-0940-00 | | | 2 | | WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL ***** (END ATTACHING PARTS)***** | 79807 | ORD BY DESCR |
| -36 | ----- | | | 1 | | CKT BOARD ASSY:VERT MODE & CAL(SEE A7 REPL) | | |
| -37 | 131-0608-00 | | | 46 | | .TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD | 22526 | 48283-036 |
| -38 | 136-0252-07 | | | 12 | | .SOCKET,PIN CONN:W/O DIMPLE | 22526 | 75060-012 |

Replaceable Mechanical Parts—7603/R7603 Service

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | 1 2 3 4 5 | Name & Description | Mfr Code | Mfr Part Number |
|------------------------|-----------------------|------------------|---------|-----|-----------|--|-------------|------------------|
| | | Eff | Dscont | | | | | |
| 1-39 | 260-1379-00 | | | 1 | | .SWITCH,PUSH:TRIG SOURCE(ATTACHING PARTS)..... | 59821 | 2KBC120000595 |
| -40 | 361-0411-00 | | | 4 | | .SPACER,PUSH SW:0.13 W X 0.375 INCH L.PLST(END ATTACHING PARTS)..... | 71590 | J64285-00 |
| | 131-0993-00 | | | 1 | | .BUS,CONDUCTOR:2 WIRE BLACK | 00779 | 850100-01 |
| -41 | 260-1378-00 | | | 1 | | .SWITCH,PUSH:VERT MODE | 59821 | 2KBC140000608 |
| | 361-0411-00 | | | 8 | | .SPACER,PUSH SW:0.13 W X 0.375 INCH L.PLST | 71590 | J64285-00 |
| -42 | 386-2285-00 | | | 1 | | .PL,VAR RES MTG:CIRCUIT BOARD | 80009 | 386-2285-00 |
| -43 | 352-0161-00 | | | 1 | | .HLDR,TERM CONN:3 WIRE,BLACK,0.1 SPACING | 80009 | 352-0161-00 |
| -44 | 131-0707-00 | | | 2 | | .CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD(ATTACHING PARTS FOR CKT BD)..... | 22526 | 47439 |
| | 211-0008-00 | | | 2 | | SCREW,MACHINE:4-40 X 0.250.PNH.STL.POZ | 83385 | ORD BY DESCR |
| -45 | 211-0040-00 | | | 1 | | SCREW,MACHINE:4-40 X 0.25",BDGH PLSTC(END ATTACHING PARTS)..... | 26365 | ORD BY DESCR |
| -46 | ----- | | | 1 | | RESISTOR,VAR:(SEE R1095 REPL)(ATTACHING PARTS)..... | | |
| -47 | 210-0583-00 | | | 1 | | NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS | 73743 | 2X20317-402 |
| -48 | 210-0940-00 | | | 1 | | WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL(END ATTACHING PARTS)..... | 79807 | ORD BY DESCR |
| -49 | 220-0455-00 | | | 2 | | NUT,BLOCK:0.281" SQ,THREE 4-40 THRU TH(ATTACHING PARTS)..... | 80009 | 220-0455-00 |
| -50 | 211-0101-00 | | | 2 | | SCREW,MACHINE:4-40 X 0.25,FLH,100 DEG,STL(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |
| -51 | 361-0137-00 | | | 1 | | POST,ELEC-MECH:1.345 INCH,W:4-40 THREAD(ATTACHING PARTS)..... | 80009 | 361-0137-00 |
| | 211-0008-00 | | | 1 | | SCREW,MACHINE:4-40 X 0.250.PNH.STL.POZ(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |
| -52 | 376-0029-00 | B010100 | B039999 | 1 | | CPLG,SHAFT,RGD:0.128 ID X 0.312 OD X 0.5"L | 80009 | 376-0029-00 |
| -53 | 384-1136-00 | | | 3 | | EXTENSION SHAFT:0.95 INCH LONG | 80009 | 384-1136-00 |
| -54 | 384-1112-01 | B010100 | B039999 | 1 | | EXTENSION SHAFT:1.910 INCH L,EPOXY GLASS | 80009 | 384-1112-01 |
| -55 | 348-0278-00 | | | 2 | | SHLD GSKT,ELEK:FINGER TYPE,7.936 L | 80009 | 348-0278-00 |
| -56 | 351-0295-00 | | | 3 | | GUIDE,SLIDE:PLUG-IN,LWR(ATTACHING PARTS)..... | 80009 | 351-0295-00 |
| -57 | 213-0088-00 | B010100 | B234532 | 3 | | SCR,TPG,THD CTG:4-24 X 0.25 INCH.PNH STL | 83385 | ORD BY DESCR |
| | 213-0054-00 | B234533 | | 3 | | SCR,TPG,THD FOR:6-32 X 0.312 INCH.PNH STL(END ATTACHING PARTS)..... | 93907 | ORD BY DESCR |
| -58 | 131-0930-00 | | | 2 | | CONTACT,ELEC:PLUG-IN GROUND(ATTACHING PARTS)..... | 80009 | 131-0930-00 |
| -59 | 211-0008-00 | | | 2 | | SCREW,MACHINE:4-40 X 0.250.PNH.STL.POZ | 83385 | ORD BY DESCR |
| -60 | 210-0586-00 | | | 2 | | NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL(END ATTACHING PARTS)..... | 78189 | 211-041800-00 |
| -61 | 131-0799-00 | | | 2 | | CONTACT,ELEC:PLUG-IN GROUND(ATTACHING PARTS)..... | 80009 | 131-0799-00 |
| -62 | 211-0008-00 | | | 2 | | SCREW,MACHINE:4-40 X 0.250.PNH.STL.POZ | 83385 | ORD BY DESCR |
| -63 | 210-0586-00 | | | 2 | | NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL(END ATTACHING PARTS)..... | 78189 | 211-041800-00 |
| -64 | 131-1018-00 | | | 4 | | CONTACT,ELEC:PLUG-IN GROUND(ATTACHING PARTS)..... | 80009 | 131-1018-00 |
| -65 | 211-0008-00 | | | 4 | | SCREW,MACHINE:4-40 X 0.250.PNH.STL.POZ | 83385 | ORD BY DESCR |
| -66 | 210-0586-00 | | | 4 | | NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL(END ATTACHING PARTS)..... | 78189 | 211-041800-00 |
| -67 | 385-0113-00 | B010100 | B368864 | 1 | | INSULATOR,STDF:1.125 L W/6-32 THD ONE END | 80009 | 385-0113-00 |
| | 129-0858-00 | B368865 | | 1 | | SPACER,POST:1.125 L,W/6-32 INT THD(ATTACHING PARTS)..... | 80009 | 129-0858-00 |
| -68 | 211-0538-00 | | | 1 | | SCREW,MACHINE:6-32 X 0.312" 100 DEG,FLH(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |
| | 210-0202-00 | B368865 | | 1 | | TERMINAL,LUG:0.146 ID,LOCKING,BRZ,TIN PL(ATTACHING PARTS)..... | 78189 | 2104-06-00-2520N |
| | 210-0457-00 | B368865 | | 1 | | NUT,PL,ASSEM WA:6-32 X 0.312,STL CD PL | 83385 | ORD BY DESCR |
| | 211-0538-00 | B368865 | | 1 | | SCREW,MACHINE:6-32 X 0.312" 100 DEG,FLH(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |
| | 343-0004-00 | B368865 | | 1 | | CLAMP,LOOP:0.312ID,PLSTC(ATTACHING PARTS)..... | 95987 | 5-16-6B |
| | 210-0457-00 | B368865 | | 1 | | NUT,PL,ASSEM WA:6-32 X 0.312,STL CD PL | 83385 | ORD BY DESCR |
| | 211-0559-00 | B368865 | | 1 | | SCREW,MACHINE:6-32 X 0.375" 100 DEG,FLH ST(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |

Replaceable Mechanical Parts—7603/R7603 Service

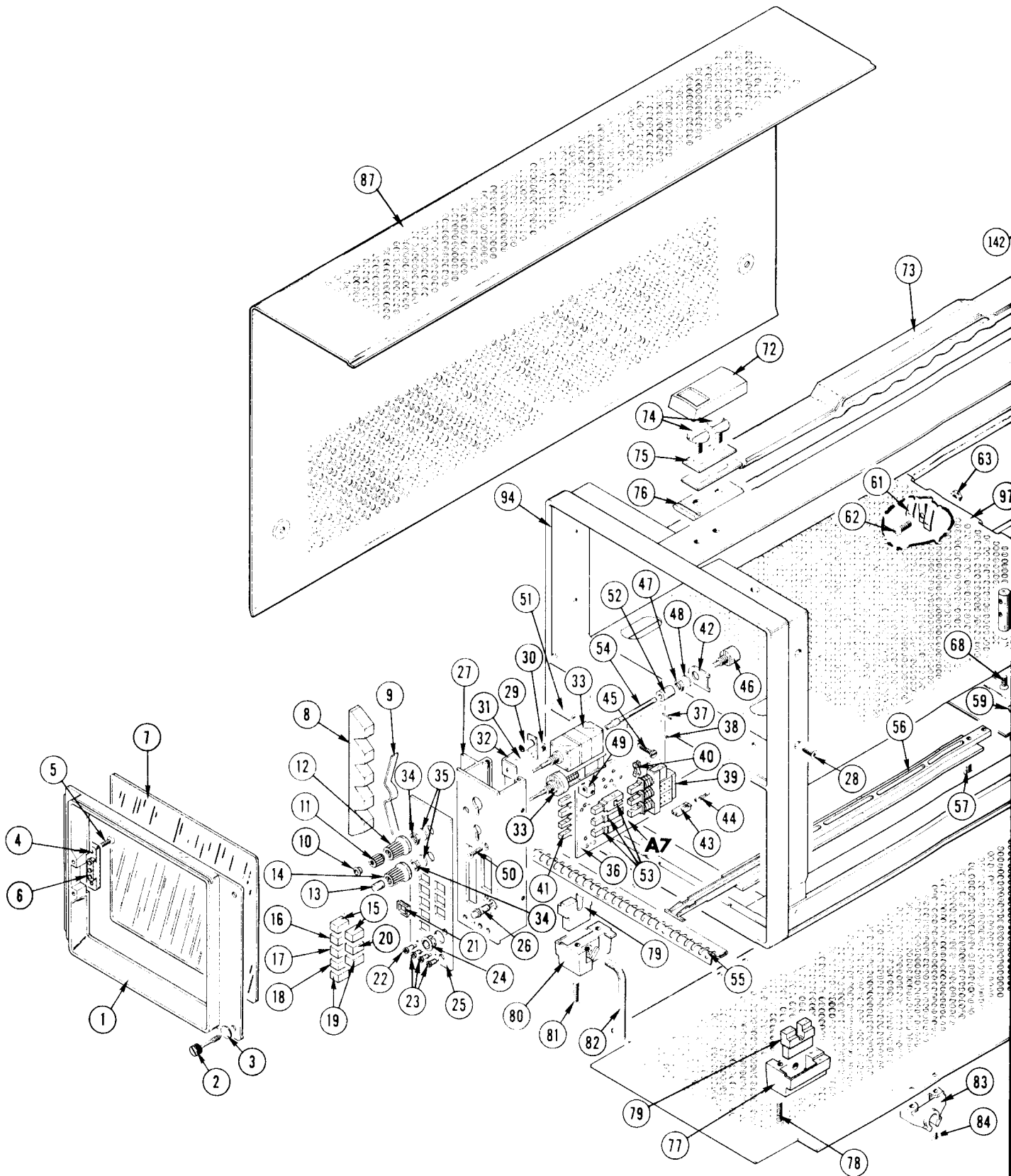
| Fig & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | Name & Description | | | | | Mfr Code | Mfr Part Number |
|-----------------|--------------------|------------------|---------|-----|---|---|---|---|---|----------|------------------|
| | | Eff | Dscont | | 1 | 2 | 3 | 4 | 5 | | |
| 1-69 | 210-0202-00 | | | 1 | TERMINAL,LUG:0.146 ID,LOCKING,BRZ,TIN PL *****{ATTACHING PARTS}***** | | | | | 78189 | 2104-06-00-2520N |
| -70 | 211-0504-00 | | | 1 | SCREW,MACHINE:6-32 X 0.250,PNH STL,CD PL | | | | | 83385 | ORD BY DESCR |
| -71 | 210-0407-00 | | | 1 | NUT,PLAIN,HEX.:6-32 X 0.25 INCH,BRS *****{END ATTACHING PARTS}***** | | | | | 73743 | 3038-0228-402 |
| -72 | 200-0728-00 | | | 2 | COV,HANDLE END: | | | | | 80009 | 200-0728-00 |
| -73 | 367-0108-00 | | | 1 | HANDLE,CARRYING:19.19 L,BLUE VINYL *****{ATTACHING PARTS}***** | | | | | 80009 | 367-0108-00 |
| -74 | 212-0597-00 | B010100 | B339549 | 4 | SCREW,MACHINE:10-32 X 0.50 INCH,STL | | | | | 93907 | ORD BY DESCR |
| | 212-0628-00 | B339550 | | 4 | SCREW,SHOULDER:10-32 X 0.4 L W/0.3 DIA | | | | | 93907 | ORD BY DESCR |
| -75 | 386-1624-00 | | | 2 | PLATE,HDL RTNG:STAINLESS STEEL | | | | | 80009 | 386-1624-00 |
| -76 | 386-1283-02 | B010100 | B019999 | 2 | PLATE,HDL MTG:FRONT | | | | | 80009 | 386-1283-02 |
| | 386-1283-03 | B020000 | | 2 | PLATE,HDL MTG:FRONT | | | | | 80009 | 386-1283-03 |
| | 358-0485-00 | B020000 | B339549 | 4 | BUSHING,SLEEVE:0.196ID X 0.287OD X 0.13" L *****{END ATTACHING PARTS}***** | | | | | 80009 | 358-0485-00 |
| -77 | 348-0074-00 | | | 2 | HINGE BLOCK,STA:R FR,L REAR,BLACK ACETAL *****{ATTACHING PARTS}***** | | | | | 80009 | 348-0074-00 |
| -78 | 211-0532-00 | | | 2 | SCREW,MACHINE:6-32 X 0.75 INCH,FILH STL *****{END ATTACHING PARTS}***** | | | | | 83385 | ORD BY DESCR |
| -79 | 377-0119-00 | | | 4 | INSERT,FOOT:0.352 X 0.832 X 0.934,PU | | | | | 80009 | 377-0119-00 |
| -80 | 348-0073-00 | | | 2 | HINGE BLOCK,STA:L FR,R REAR,BLACK ACETAL *****{ATTACHING PARTS}***** | | | | | 80009 | 348-0073-00 |
| -81 | 211-0532-00 | | | 4 | SCREW,MACHINE:6-32 X 0.75 INCH,FILH STL *****{END ATTACHING PARTS}***** | | | | | 83385 | ORD BY DESCR |
| | 386-3286-00 | B214383 | | 1 | PLATE,GROUNDING:BAIL | | | | | 80009 | 386-3286-00 |
| -82 | 348-0282-00 | | | 1 | FLIPSTAND,CAB.:3.438 H,SST | | | | | 80009 | 348-0282-00 |
| -83 | 343-0256-00 | | | 2 | RTNR BLK,SCOPE: *****{ATTACHING PARTS}***** | | | | | 80009 | 343-0256-00 |
| -84 | 211-0578-00 | | | 2 | SCREW,MACHINE:6-32 X 0.438 1NCH,PNH STL *****{END ATTACHING PARTS}***** | | | | | 83385 | ORD BY DESCR |
| -85 | 390-0204-00 | B010100 | B368864 | 1 | CAB-BOT,SCOPE:BOTTOM | | | | | 80009 | 390-0204-00 |
| | 390-0798-00 | B368865 | | 1 | CABINET TOP:DISPLAY UNIT *****{ATTACHING PARTS}***** | | | | | 80009 | 390-0798-00 |
| -86 | 211-0503-00 | | | 4 | SCREW,MACHINE:6-32 X 0.188 INCH,PNH STL *****{END ATTACHING PARTS}***** | | | | | 83385 | ORD BY DESCR |
| | 352-0084-02 | | | 1 | LAMPHOLDER:T-2 OR SMALLER UNBASED LAMP | | | | | 80009 | 352-0084-02 |
| -87 | 390-0306-00 | B010100 | B368864 | 2 | COVER,SCOPE:RIGHT & LEFT SIDE | | | | | 80009 | 390-0306-00 |
| | 390-0799-00 | B368865 | | 1 | CABINET SIDE:LEFT | | | | | 80009 | 390-0799-00 |
| | 390-0800-00 | B368865 | | 1 | CABINET SIDE:RIGHT | | | | | 80009 | 390-0800-00 |
| | 214-0812-00 | | | 2 | FASTENER,PAWL: | | | | | 80009 | 214-0812-00 |
| -88 | 214-0603-01 | | | 1 | .PIN,SECURING:0.27 INCH LONG | | | | | 80009 | 214-0603-01 |
| -89 | 214-0604-00 | | | 1 | .WASH.,SPG TNSN:0.26 ID X 0.47 INCH OD | | | | | 80009 | 214-0604-00 |
| -90 | 386-0227-00 | | | 1 | .STOP,CLP,RIM CL:ACETAL | | | | | 80009 | 386-0227-00 |
| -91 | 386-0226-00 | | | 1 | .CLAMP,RIM CLENC:SPG STL CD PL | | | | | 80009 | 386-0226-00 |
| | 426-1042-00 | | | 1 | FRAME ASSY,CAB.: | | | | | 80009 | 426-1042-00 |
| -92 | 426-0857-00 | | | 1 | .FRAME SECT,CAB.:BOTTOM RIGHT *****{ATTACHING PARTS}***** | | | | | 80009 | 426-0857-00 |
| | 210-0782-00 | B010100 | B373171 | 5 | .RIVET,SOLID:0.125 OD X 0.312"100 DEG FL | | | | | 12360 | ORD BY DESCR |
| | 210-3099-00 | B373172 | | 5 | .RIVET,SOLID:0.187 L X 0.116 OD *****{END ATTACHING PARTS}***** | | | | | 19738 | 75021-0406 |
| -93 | 426-0858-00 | | | 1 | .FRAME SECT,CAB.:LOWER LEFT *****{ATTACHING PARTS}***** | | | | | 80009 | 426-0858-00 |
| | 210-0782-00 | B010100 | B373171 | 5 | .RIVET,SOLID:0.125 OD X 0.312"100 DEG FL | | | | | 12360 | ORD BY DESCR |
| | 210-3094-00 | B373172 | | 5 | .RIVET,SOLID:0.25 L X 0.125 OD,FLH,100 D *****{END ATTACHING PARTS}***** | | | | | T0920 | ORD BY DESCR |
| -94 | 426-0741-06 | | | 1 | .FRAME SECT,CAB.:FRONT *****{ATTACHING PARTS}***** | | | | | 80009 | 426-0741-06 |
| | 210-0782-00 | B010100 | B373171 | 4 | .RIVET,SOLID:0.125 OD X 0.312"100 DEG FL | | | | | 12360 | ORD BY DESCR |
| | 210-3094-00 | B373172 | | 5 | .RIVET,SOLID:0.25 L X 0.125 OD,FLH,100 D *****{END ATTACHING PARTS}***** | | | | | T0920 | ORD BY DESCR |
| -95 | 426-0741-03 | | | 1 | .FRAME SECT,CAB.:REAR *****{ATTACHING PARTS}***** | | | | | 80009 | 426-0741-03 |
| | 210-0782-00 | B010100 | B373171 | 4 | .RIVET,SOLID:0.125 OD X 0.312"100 DEG FL | | | | | 12360 | ORD BY DESCR |
| | 210-3094-00 | B373172 | | 4 | .RIVET,SOLID:0.25 L X 0.125 OD,FLH,100 D *****{END ATTACHING PARTS}***** | | | | | T0920 | ORD BY DESCR |

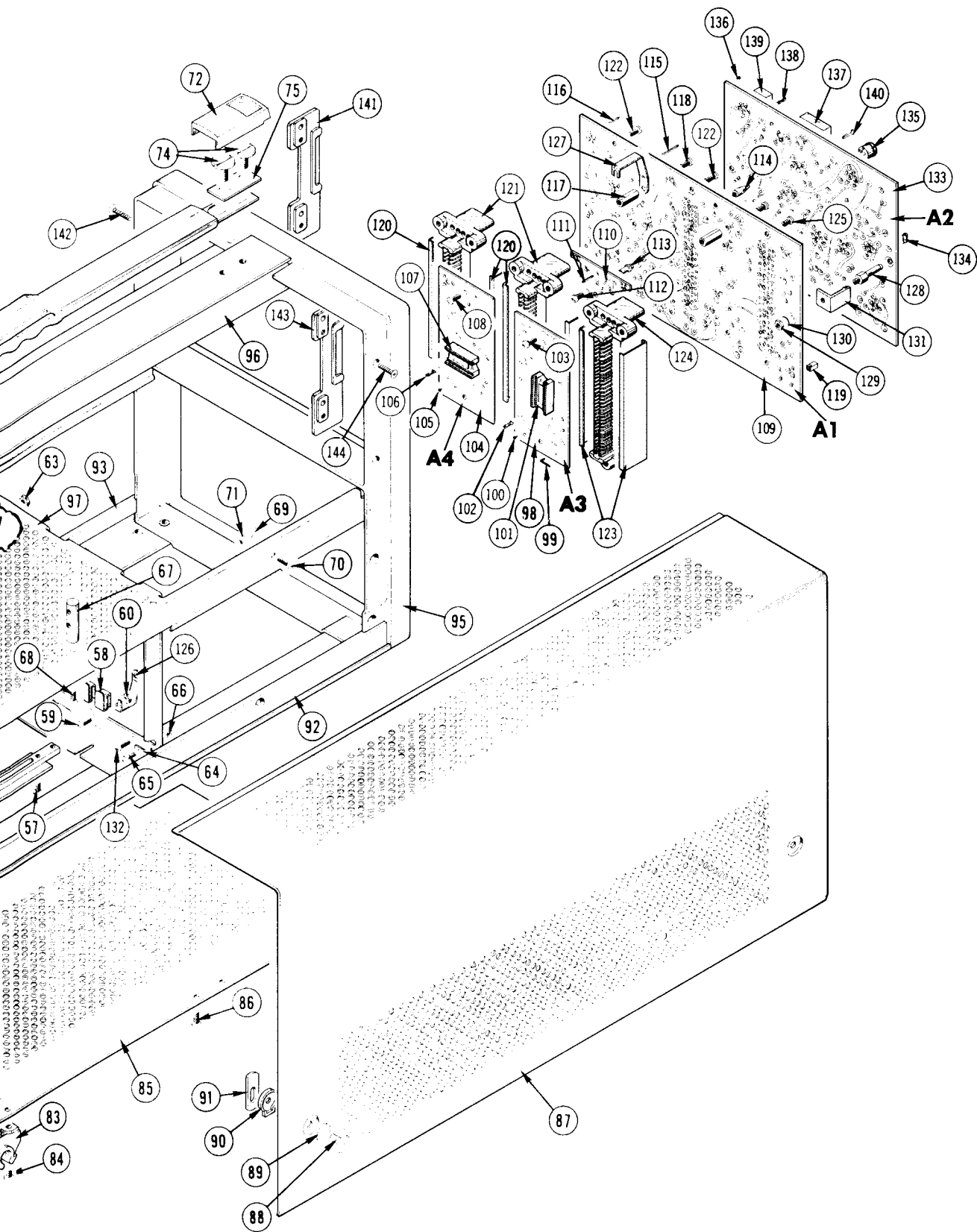
Replaceable Mechanical Parts—7603/R7603 Service

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | | | | | | Name & Description | Mfr Code | Mfr Part Number |
|------------------|--------------------|------------------|---------|-----|---|---|---|---|---|--|----------|-----------------|
| | | Eff | Dscont | | 1 | 2 | 3 | 4 | 5 | | | |
| 1- | 343-0853-00 | B346500 | | 1 | | | | | | .CLAMP,LOOP:0.5 DIA,NYLON | 000GY | 021-0500 |
| -96 | 426-0753-00 | | | 1 | | | | | | .FRAME SECT,CAB.:TOP CENTER | 80009 | 426-0753-00 |
| -97 | 380-0238-00 | | | 1 | | | | | | .HOUSING,PLUG-IN:ALUMINUM | 80009 | 380-0238-00 |
| -98 | ----- | | | 1 | | | | | | CKT BOARD ASSY:TRIGGER SEL(SEE A3 REPL) | | |
| -99 | 131-0589-00 | | | 4 | | | | | | .TERMINAL,PIN:0.46 L X 0.025 SQ | 22526 | 48283-029 |
| -100 | 136-0252-01 | B010100 | B122799 | 15 | | | | | | .CONTACT,ELEC:0.178 INCH LONG | 00779 | 1-332095-2 |
| | 136-0350-00 | B122800 | B343343 | 5 | | | | | | .SOCKET,PLUG-IN:3 PIN,LOW PROFILE | 80009 | 136-0350-00 |
| | 136-0252-04 | B343344 | | 15 | | | | | | .SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS | 22526 | 75060-007 |
| -101 | 136-0260-02 | B010100 | B372599 | 1 | | | | | | .SKT,PL-IN ELEK:MICROCIRCUIT.16 DIP,LOW CL | 09922 | DILB16P-108T |
| | 136-0729-00 | B372600 | | 1 | | | | | | .SKT,PL-IN ELEK:MICROCKT.16 CONTACT | 09922 | DILB16P-108T |
| -102 | 136-0263-03 | | | 16 | | | | | | .SOCKET,PIN TERM:U/W 0.025 SQUARE PIN | 00779 | 85864-2 |
| | | | | | | | | | |(ATTACHING PARTS)..... | | |
| -103 | 211-0008-00 | | | 2 | | | | | | .SCREW,MACHINE:4-40 X 0.250.PNH.STL.POZ | 83385 | ORD BY DESCR |
| | | | | | | | | | |(END ATTACHING PARTS)..... | | |
| -104 | ----- | | | 1 | | | | | | CKT BOARD ASSY:VERT INTERFACE(SEE A4 REPL) | | |
| -105 | 136-0252-04 | B010100 | B122799 | 21 | | | | | | .SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS | 22526 | 75060-007 |
| | 136-0252-04 | B122800 | | 12 | | | | | | .SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS | 22526 | 75060-007 |
| | 136-0350-00 | B122800 | B341999 | 3 | | | | | | .SOCKET,PLUG-IN:3 PIN,LOW PROFILE | 80009 | 136-0350-00 |
| | 136-0252-07 | B342000 | | 9 | | | | | | .SOCKET,PIN CONN:W/O DIMPLE | 22526 | 75060-012 |
| -106 | 136-0263-03 | | | 16 | | | | | | .SOCKET,PIN TERM:U/W 0.025 SQUARE PIN | 00779 | 85864-2 |
| -107 | 136-0260-02 | B010100 | B373529 | 1 | | | | | | .SKT,PL-IN ELEK:MICROCIRCUIT.16 DIP,LOW CL | 09922 | DILB16P-108T |
| | 136-0729-00 | B373530 | | 1 | | | | | | .SKT,PL-IN ELEK:MICROCKT.16 CONTACT | 09922 | DILB16P-108T |
| | | | | | | | | | |(ATTACHING PARTS FOR CKT BD)..... | | |
| -108 | 211-0008-00 | | | 2 | | | | | | .SCREW,MACHINE:4-40 X 0.250.PNH.STL.POZ | 83385 | ORD BY DESCR |
| | | | | | | | | | |(END ATTACHING PARTS)..... | | |
| -109 | ----- | | | 1 | | | | | | CKT BOARD ASSY:MAIN INTERFACE(SEE A1 REPL) | | |
| -110 | 670-1374-00 | | | 1 | | | | | | .CKT BOARD ASSY:VERTICAL INTERCONNECT | 80009 | 670-1374-00 |
| -111 | 131-0787-00 | | | 8 | | | | | | ...TERMINAL,PIN:0.64L X 0.025 SQ | 22526 | 47359-000 |
| | | | | | | | | | |(ATTACHING PARTS FOR CKT BD)..... | | |
| -112 | 211-0008-00 | | | 2 | | | | | | .SCREW,MACHINE:4-40 X 0.250.PNH.STL.POZ | 83385 | ORD BY DESCR |
| -113 | 351-0213-00 | | | 2 | | | | | | .POST,CKT BD MTG:0.285 L X 0.219 OD,BRS | 80009 | 351-0213-00 |
| | | | | | | | | | |(END ATTACHING PARTS)..... | | |
| -114 | 386-1558-00 | | | 2 | | | | | | .SPACER,CKT BD:0.335 H,ACETAL | 80009 | 386-1558-00 |
| | 131-0591-00 | | | 32 | | | | | | .TERMINAL,PIN:0.835L X 0.025 SQ | 22526 | 47352 |
| -115 | 131-0592-00 | | | 26 | | | | | | .CONTACT,ELEC:0.885 INCH LONG | 22526 | 47353 |
| | 136-0252-07 | B163700 | | 15 | | | | | | .SOCKET,PIN CONN:W/O DIMPLE | 22526 | 75060-012 |
| -116 | 131-0608-00 | | | 74 | | | | | | .TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD | 22526 | 48283-036 |
| -117 | 129-0308-00 | | | 4 | | | | | | .POST,ELEC-MECH:HEX.0.25 X 0.465 INCH LON | 80009 | 129-0308-00 |
| | | | | | | | | | |(ATTACHING PARTS)..... | | |
| -118 | 211-0008-00 | | | 4 | | | | | | .SCREW,MACHINE:4-40 X 0.250.PNH.STL.POZ | 83385 | ORD BY DESCR |
| | 210-0803-00 | B050000 | | 4 | | | | | | .WASHER,FLAT:0.15 ID X 0.032 THK,STL CD | 12327 | ORD BY DESCR |
| | | | | | | | | | |(END ATTACHING PARTS)..... | | |
| -119 | 131-1003-00 | | | 2 | | | | | | .CONN,RCPT,ELEC:CKT BD MT.3 PRONG | 80009 | 131-1003-00 |
| | 131-0767-02 | B010100 | B039999 | 2 | | | | | | .CONNECTOR,RCPT.:76 CONTACT | 80009 | 131-0767-02 |
| | 131-0767-08 | B040000 | | 2 | | | | | | .CONNECTOR,RCPT.:PLUG-IN CKT BD.70 CONTACT | 80009 | 131-0767-08 |
| -120 | 200-0950-00 | | | 4 | | | | | | .COVER,ELEC CONN:PLASTIC | 80009 | 200-0950-00 |
| -121 | 204-0365-00 | B010100 | B338999 | 2 | | | | | | .BODY,CONNECTOR:PLUG-IN CIRCUIT CARD | 80009 | 204-0365-00 |
| | 204-0365-02 | B339000 | | 2 | | | | | | .BODY,CONNECTOR:PLUG-IN CIRCUIT CARD | 80009 | 204-0365-02 |
| | 131-0726-00 | B010100 | B039999 | 72 | | | | | | .CONTACT,ELEC:STRAIGHT | 80009 | 131-0726-00 |
| | 131-0726-00 | B040000 | | 66 | | | | | | .CONTACT,ELEC:STRAIGHT | 80009 | 131-0726-00 |
| | 131-0727-00 | B010100 | B039999 | 72 | | | | | | .CONTACT,ELEC:OFFSET | 80009 | 131-0727-00 |
| | 131-0727-00 | B040000 | | 66 | | | | | | .CONTACT,ELEC:OFFSET | 80009 | 131-0727-00 |
| | 131-0899-00 | | | 8 | | | | | | .CONTACT,ELEC:0.048 X 0.006 INCH THK | 80009 | 131-0899-00 |
| | | | | | | | | | |(ATTACHING PARTS FOR EACH CONN).... | | |
| -122 | 213-0232-00 | | | 2 | | | | | | .SCR,TPG,THD FOR:2-32 X 0.312 INCH,PNH STL | 83385 | ORD BY DESCR |
| | | | | | | | | | |(END ATTACHING PARTS)..... | | |
| | 131-0767-00 | B010100 | B039999 | 1 | | | | | | .CONNECTOR,RCPT.:76 CONTACT | 80009 | 131-0767-00 |
| | 131-0767-07 | B040000 | | 1 | | | | | | .CONNECTOR,RCPT.:PLUG-IN CKT BD.70 CONTACT | 80009 | 131-0767-07 |
| -123 | 200-0950-00 | | | 2 | | | | | | .COVER,ELEC CONN:PLASTIC | 80009 | 200-0950-00 |
| -124 | 204-0365-02 | | | 1 | | | | | | .BODY,CONNECTOR:PLUG-IN CIRCUIT CARD | 80009 | 204-0365-02 |
| | 131-0726-00 | B010100 | B039999 | 38 | | | | | | .CONTACT,ELEC:STRAIGHT | 80009 | 131-0726-00 |
| | 131-0726-00 | B040000 | | 35 | | | | | | .CONTACT,ELEC:STRAIGHT | 80009 | 131-0726-00 |

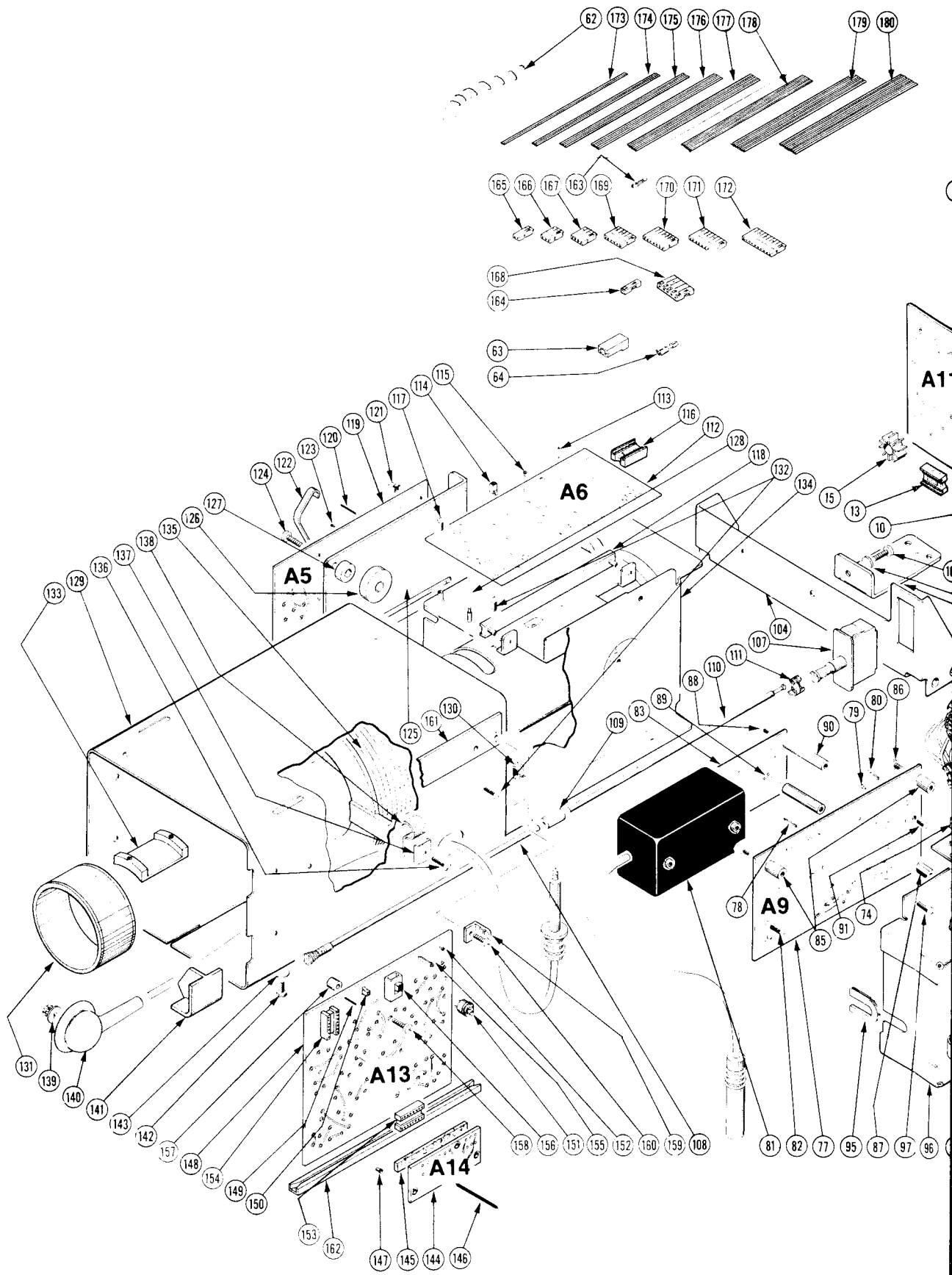
Replaceable Mechanical Parts—7603/R7603 Service

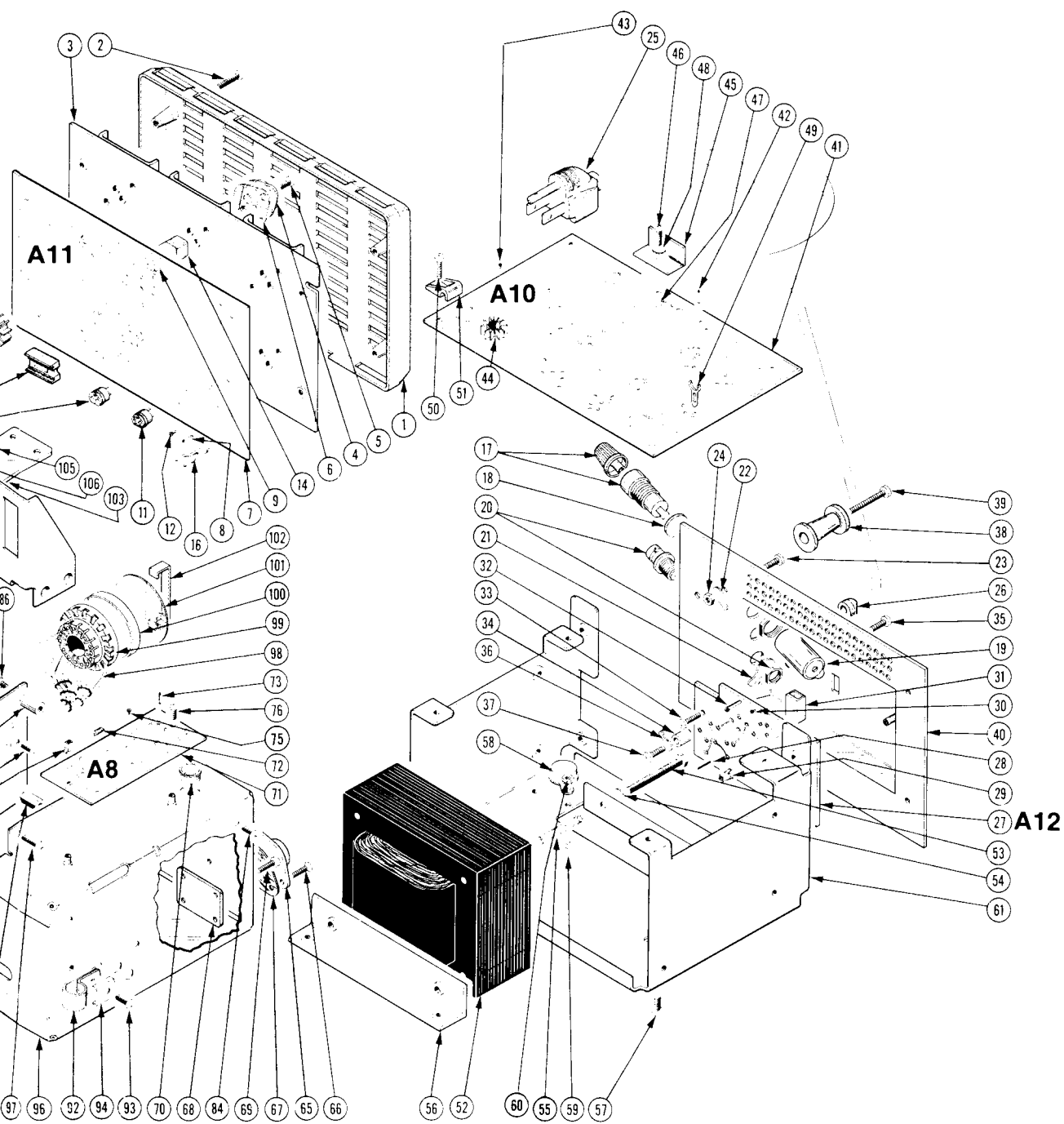
| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | 1 2 3 4 5 | Name & Description | Mfr | |
|------------------------|-----------------------|------------------|---------|-----|-----------|--|-------|-----------------|
| | | Eff | Dscont | | | | Code | Mfr Part Number |
| 1- | 131-0727-00 | B010100 | B039999 | 38 | | ..CONTACT,ELEC:OFFSET | 80009 | 131-0727-00 |
| | 131-0727-00 | B040000 | | 35 | | ..CONTACT,ELEC:OFFSET(ATTACHING PARTS)..... | 80009 | 131-0727-00 |
| -125 | 213-0232-00 | B374768 | | 2 | | .SCR,TPG,THD FOR:2-32 X 0.312 INCH,PNH STL | 83385 | ORD BY DESCR |
| | 210-0054-00 | | | 2 | | .WASHER,LOCK:#4 SPLIT,0.025 THK STL CD P | 83385 | ORD BY DESCR |
| | 210-0906-00 | | | 2 | | .WASHER,NONMETAL:FIBER,0.125 ID X 0.203" OD(END ATTACHING PARTS)..... | 86928 | ORD BY DESCR |
| -126 | 131-0804-00 | | | 1 | | .LINK,TERM.CONNE:J-SHAPE | 80009 | 131-0804-00 |
| -127 | 131-0805-00 | | | 2 | | .LINK,TERM.CONNE:J-SHAPE,0.90X0.82 X 0.312 | 80009 | 131-0805-00 |
| -128 | 214-1568-00 | | | 2 | | .PIN,GUIDE:0.119 DIA X 1.035 W/0.25 HE(ATTACHING PARTS)..... | 80009 | 214-1568-00 |
| -129 | 210-0406-00 | | | 2 | | .NUT,PLAIN,HEX:4-40 X 0.188,BRS,CD PL | 73743 | 12161-50 |
| -130 | 210-0054-00 | | | 2 | | .WASHER,LOCK:#4 SPLIT,0.025 THK STL CD P(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |
| -131 | 344-0147-00 | | | 2 | | .CLIP,SPR,TNSN:CIRCUIT CARD MOUNTING(ATTACHING PARTS FOR CKT BD)..... | 80009 | 344-0147-00 |
| -132 | 213-0034-00 | B010100 | B338899 | 9 | | .SCR,TPG,THD CTG:4-40 X 0.188 INCH,PNH STL | T0858 | ORD BY DESCR |
| | 213-0263-00 | B338900 | B343843 | 9 | | .SCREW,TPG,TF:4-24 X 0.375 INCH,PNH STL | 83385 | ORD BY DESCR |
| | 213-0119-00 | B343844 | | 9 | | .SCR,TPG,THD FOR:4-24 X 0.375 INCH,PNH STL(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |
| -133 | ----- | | | 1 | | .CKT BOARD ASSY:LOGIC(SEE A2 REPL) | | |
| -134 | 131-0566-00 | | | 1 | | .BUS CONDUCTOR:DUMMY RES,2.375,22 AWG | 57668 | JWW-0200E0 |
| -135 | 136-0235-00 | | | 1 | | .SOCKET,PLUG-IN:6 CONTACT,ROUND | 71785 | 133-96-12-062 |
| -136 | 136-0252-04 | B010100 | B122799 | 24 | | .SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS | 22526 | 75060-007 |
| | 136-0350-00 | B122800 | B343343 | 8 | | .SOCKET,PLUG-IN:3 PIN,LOW PROFILE | 80009 | 136-0350-00 |
| | 136-0252-07 | B343344 | | 24 | | .SOCKET,PIN CONN:W/O DIMPLE | 22526 | 75060-012 |
| -137 | 136-0260-02 | B010100 | B372599 | 1 | | .SKT,PL-IN ELEK:MICROCIRCUIT,16 DIP,LOW CL | 09922 | DILB16P-108T |
| | 136-0729-00 | B372600 | | 1 | | .SKT,PL-IN ELEK:MICROCKT,16 CONTACT | 09922 | DILB16P-108T |
| -138 | 136-0263-03 | | | 33 | | .SOCKET,PIN TERM:U/W 0.025 SQUARE PIN | 00779 | 85864-2 |
| -139 | 136-0269-02 | B010100 | B372599 | 3 | | .SKT,PL-IN ELEK:MICROCIRCUIT,14 DIP | 09922 | DILB149P-108 |
| | 136-0728-00 | B372600 | | 3 | | .SKT,PL-IN ELEK:MICROCKT,14 CONTACT | 09922 | DILB14P-108 |
| -140 | 214-0579-00 | B010100 | B376224 | 4 | | .TERM,TEST POINT:BRS CD PL | 80009 | 214-0579-00 |
| | 214-0579-00 | B376225 | | 3 | | .TERM,TEST POINT:BRS CD PL | 80009 | 214-0579-00 |
| -141 | 407-1145-01 | B010100 | B368864 | 1 | | .BRACKET,HEAT SK:LEFT,DELRLN(ATTACHING PARTS)..... | 80009 | 407-1145-01 |
| -142 | 211-0538-00 | B010100 | B368864 | 2 | | .SCREW,MACHINE:6-32 X 0.312"100 DEG,FLH(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |
| -143 | 407-1145-02 | B010100 | B368864 | 1 | | .BRACKET,HEAT SK:RIGHT,DELRLN(ATTACHING PARTS)..... | 80009 | 407-1145-02 |
| -144 | 211-0538-00 | B010100 | B368864 | 2 | | .SCREW,MACHINE:6-32 X 0.312"100 DEG,FLH(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |





7603/R7603 OSCILLOSCOPE





Replaceable Mechanical Parts—7603/R7603 Service

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | 1 2 3 4 5 | | | | | Name & Description | Mfr Code | Mfr Part Number |
|------------------|--------------------|------------------|---------|-----|-----------|--|--|--|--|--|----------|------------------|
| | | Eff | Dscont | | | | | | | | | |
| 2-1 | 337-1425-00 | B010100 | B368864 | 1 | | | | | | SHIELD,ELEC:REGULATOR | 80009 | 337-1425-00 |
| | 337-1757-00 | B368865 | | 1 | | | | | | SHIELD,ELEC:REGULATOR *****ATTACHING PARTS)***** | 80009 | 337-1757-00 |
| -2 | 211-0516-00 | B010100 | B368864 | 4 | | | | | | SCREW,MACHINE:6-32 X 0.875,PNH STL,CD PL | 83385 | ORD BY DESCR |
| | 211-0008-00 | B368865 | | 8 | | | | | | SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ *****END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -3 | 441-1060-01 | B010100 | B368864 | 1 | | | | | | CHAS,ELEC EQPT:MAIN | 80009 | 441-1060-01 |
| | 441-1129-00 | B368865 | | 1 | | | | | | CHASSIS,SCOPE:REGULATOR *****ATTACHING PARTS)***** | 80009 | 441-1129-00 |
| | 211-0538-00 | | | 4 | | | | | | SCREW,MACHINE:6-32 X 0.312"100 DEG,FLH *****END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -4 | ----- | | | 6 | | | | | | TRANSISTOR: *****ATTACHING PARTS)***** | | |
| -5 | 211-0511-00 | B010100 | B369019 | 12 | | | | | | SCREW,MACHINE:6-32 X 0.500,PNH,STL,CD PL | 83385 | ORD BY DESCR |
| | 211-0145-00 | B369020 | | 12 | | | | | | SCREW,MACHINE:4-40 X 1 INCH,PNH BRS | 83385 | ORD BY DESCR |
| -6 | 386-0978-00 | | | 6 | | | | | | INSULATOR,PLATE:TRANSISTOR,MICA *****END ATTACHING PARTS)***** | 80009 | 386-0978-00 |
| -7 | ----- | | | 1 | | | | | | CKT BOARD ASSY:REGULATOR(SEE A11 REPL) | | |
| -8 | 131-0608-00 | | | 45 | | | | | | .TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD | 22526 | 48283-036 |
| -9 | 131-0847-00 | B010100 | B369019 | 12 | | | | | | .TERMINAL,STUD:6-32 X 0.435 INCH LONG | 80009 | 131-0847-00 |
| | 166-0032-00 | B369020 | | 12 | | | | | | .SPACER,SLEEVE:0.18 ID X 0.313 INCH LONG | 80009 | 166-0032-00 |
| -10 | 136-0183-00 | | | 3 | | | | | | SOCKET,PLUG-IN:3 PIN,ROUND | 80009 | 136-0183-00 |
| -11 | 136-0235-00 | | | 6 | | | | | | .SOCKET,PLUG-IN:6 CONTACT,ROUND | 71785 | 133-96-12-062 |
| -12 | 136-0252-04 | B010100 | B343770 | 36 | | | | | | .SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS | 22526 | 75060-007 |
| | 136-0252-07 | B343771 | | 27 | | | | | | .SOCKET,PIN CONN:W/O DIMPLE | 22526 | 75060-012 |
| -13 | 136-0269-02 | | | 1 | | | | | | .SKT,PL-IN ELEK:MICROCIRCUIT,14 DIP | 09922 | DILB149P-108 |
| -14 | 136-0361-00 | | | 6 | | | | | | .SPACER,XSTR: | 80009 | 136-0361-00 |
| | 136-0384-00 | | | 12 | | | | | | .SOCKET,PIN TERM:FOR 0.04 DIAMETER PIN | 00779 | 52120 |
| -15 | 214-1291-00 | | | 3 | | | | | | .HEAT SINK,ELEC:XSTR,0.72 OD X 0.375"H | 05820 | 207SB |
| -16 | 344-0154-00 | | | 2 | | | | | | .CLIP,ELECTRICAL:FUSE,CKT BD MT | 80009 | 344-0154-00 |
| | 214-0973-00 | B373031 | | 1 | | | | | | .HEAT SINK,ELEC:0.28 X 0.18 OVAL X 0.187"H | 80009 | 214-0973-00 |
| | 337-1756-00 | | | 1 | | | | | | SHIELD,ELEC:FAN MOTOR *****ATTACHING PARTS)***** | 80009 | 337-1756-00 |
| | 212-0557-00 | | | 2 | | | | | | SCREW,MACHINE:10-32 X 0.50 INCH,RDH SST | 83385 | ORD BY DESCR |
| | 210-1003-00 | | | 2 | | | | | | WASHER,FLAT:# 10 X 0.036 THICK,BRS *****END ATTACHING PARTS)***** | 12327 | ORD BY DESCR |
| | ----- | | | 1 | | | | | | MOTOR,AC:(SEE B1001 REPL) | | |
| | 369-0037-01 | | | 1 | | | | | | IMPLR,FAN,AXIAL:3.5 DIA BL,CW,0.125 ID | 52792 | 3500-CW125W |
| | 378-0811-00 | | | 1 | | | | | | BAFFLER,AIR: | 80009 | 378-0811-00 |
| -17 | 352-0076-00 | B010100 | B357055 | 1 | | | | | | FUSEHOLDER:W/HARDWARE | 75915 | 342012-L |
| | 204-0833-00 | B357056 | | 1 | | | | | | BODY,FUSEHOLDER:3AG & 5 X 20MM FUSES | S3629 | 031.1653(MDLFEU) |
| | 200-2264-00 | B357056 | | 1 | | | | | | CAP.,FUSEHOLDER:3AG FUSES | S3629 | FEK 031 1666 |
| | 210-1039-00 | B357056 | | 1 | | | | | | WASHER,LOCK:INT,0.521 ID X 0.625 INCH O | 24931 | ORD BY DESCR |
| -18 | 210-0873-00 | | | 1 | | | | | | WASHER,NONMETAL:0.5 ID X 0.688 INCH OD,NPR | 70485 | ORD BY DESCR |
| | 614-0104-00 | B010100 | B224392 | 1 | | | | | | SUBPANEL ASSY:REAR,SIG OUT | 80009 | 614-0104-00 |
| | 614-0104-03 | B224393 | B357055 | 1 | | | | | | SUBPANEL ASSY:REAR,SIG OUT | 80009 | 614-0104-03 |
| | 614-0104-04 | B357056 | B368899 | 1 | | | | | | SUBPANEL ASSY:REAR,SIG OUT | 80009 | 614-0104-04 |
| | 614-0104-07 | B368900 | B371741 | 1 | | | | | | SUBPANEL ASSY:REAR,SIG OUT | 80009 | 614-0104-07 |
| | 614-0104-08 | B371742 | | 1 | | | | | | SUBPANEL ASSY:REAR,SIG OUT | 80009 | 614-0104-08 |
| -19 | 200-1388-00 | B010100 | B234589 | 1 | | | | | | .COVER,FUSE LEAD: | 80009 | 200-1388-00 |
| | 200-1388-01 | B234590 | B357055 | 1 | | | | | | .COVER,FUSE: | 80009 | 200-1388-01 |
| -20 | 131-0955-00 | | | 6 | | | | | | .CONN,RCPT,ELEC:BNC,FEMALE | 13511 | 31-279 |
| -21 | 210-0255-00 | | | 6 | | | | | | .TERMINAL,LUG:0.391 ID,LOCKING,BRS CD PL | 80009 | 210-0255-00 |
| -22 | 210-0202-00 | B010100 | B224392 | 1 | | | | | | .TERMINAL,LUG:0.146 ID,LOCKING,BRZ,TIN PL | 78189 | 2104-06-00-2520N |
| | 210-0202-00 | B224393 | | 2 | | | | | | .TERMINAL,LUG:0.146 ID,LOCKING,BRZ,TIN PL *****ATTACHING PARTS)***** | 78189 | 2104-06-00-2520N |
| -23 | 211-0504-00 | B010100 | B224392 | 1 | | | | | | .SCREW,MACHINE:6-32 X 0.250,PNH STL,CD PL | 83385 | ORD BY DESCR |
| | 211-0507-00 | B224393 | B357055 | 1 | | | | | | .SCREW,MACHINE:6-32 X 0.312,PNH STL,CD PL | 83385 | ORD BY DESCR |
| | 211-0578-00 | B357056 | | 1 | | | | | | .SCREW,MACHINE:6-32 X 0.438 1INCH,PNH STL | 83385 | ORD BY DESCR |
| -24 | 210-0407-00 | B010100 | B224392 | 1 | | | | | | .NUT,PLAIN,HEX.:6-32 X 0.25 INCH,BRS | 73743 | 3038-0228-402 |
| | 210-0407-00 | B224393 | B357055 | 2 | | | | | | .NUT,PLAIN,HEX.:6-32 X 0.25 INCH,BRS | 73743 | 3038-0228-402 |
| | 210-0407-00 | B357056 | | 3 | | | | | | .NUT,PLAIN,HEX.:6-32 X 0.25 INCH,BRS *****END ATTACHING PARTS)***** | 73743 | 3038-0228-402 |

Replaceable Mechanical Parts—7603/R7603 Service

| Fig. & Index No. | Tektronix Part No. | Serial:Model No. Eff | Dscont | Qty | 1 | 2 | 3 | 4 | 5 | Name & Description | Mfr Code | Mfr Part Number |
|------------------|--------------------|----------------------|---------|-----|---|---|---|---|---|---|----------|------------------|
| 2-25 | 161-0033-09 | B010100 | B357055 | 1 | | | | | | .CABLE ASSY,PWR.:3 WIRE.92 INCH LONG | 16428 | CH8393 |
| | 161-0066-00 | B357056 | | 1 | | | | | | .CABLE ASSY,PWR.:3.18 AWG.115V.98.0 L | T1372 | ORD BY DESCR |
| -26 | 358-0323-00 | B010100 | B357055 | 1 | | | | | | .BSHG,STRAIN RLF:90 DEG.0.515 DIA HOLE | 28520 | SR-15-1 |
| | 131-1084-00 | B357056 | | 1 | | | | | | .CONNECTOR,RCPT.:3 BLADE.6A.250V ***** (ATTACHING PARTS)***** | 82389 | EAC-302 |
| | 210-0586-00 | B357056 | | 2 | | | | | | .NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL | 78189 | 211-041800-00 |
| | 211-0012-00 | B357056 | | 2 | | | | | | .SCREW,MACHINE:4-40 X 0.375,PNH STL CD PL ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| | 334-3379-01 | B357056 | | 1 | | | | | | .MARKER,IDENT.MARKED GROUND SYMBOL | 80009 | 334-3379-01 |
| | 198-2452-01 | B357056 | | 1 | | | | | | .WIRE SET,ELEC: | 80009 | 198-2452-01 |
| -27 | ----- | | | 1 | | | | | | .CKT BOARD ASSY:SIGNAL OUT(SEE A12 REPL) | | |
| -28 | 131-0608-00 | | | 11 | | | | | | .TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD | 22526 | 48283-036 |
| -29 | 131-1003-00 | | | 2 | | | | | | .CONN,RCPT,ELEC:CKT BD MT,3 PRONG | 80009 | 131-1003-00 |
| -30 | 136-0252-01 | | | 2 | | | | | | .CONTACT,ELEC:0.178 INCH LONG | 00779 | 1-332095-2 |
| | 136-0252-04 | B010100 | B122799 | 27 | | | | | | .SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS | 22526 | 75060-007 |
| | 136-0350-00 | B122800 | B343343 | 9 | | | | | | .SOCKET,PLUG-IN:3 PIN,LOW PROFILE | 80009 | 136-0350-00 |
| | 136-0252-07 | B343344 | | 27 | | | | | | .SOCKET,PIN CONN:W/O DIMPLE | 22526 | 75060-012 |
| -31 | 260-0984-00 | | | 1 | | | | | | .SWITCH,SLIDE:DP3T,0.5A,125V | 79727 | G-128-S-0012 |
| -32 | 214-0579-00 | | | 1 | | | | | | .TERM,TEST POINT:BRS CD PL ***** (ATTACHING PARTS FOR CKT BD)***** | 80009 | 214-0579-00 |
| -33 | 211-0008-00 | | | 2 | | | | | | .SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -34 | 385-0100-00 | | | 1 | | | | | | .SPACER,POST:0.5 L W/6-32 THD THRU,NYLON ***** (ATTACHING PARTS)***** | 80009 | 385-0100-00 |
| -35 | 211-0504-00 | | | 1 | | | | | | .SCREW,MACHINE:6-32 X 0.250,PNH STL,CD PL ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -36 | 210-0202-00 | | | 1 | | | | | | .TERMINAL,LUG:0.146 ID,LOCKING,BRZ,TIN PL ***** (ATTACHING PARTS)***** | 78189 | 2104-06-00-2520N |
| -37 | 211-0504-00 | | | 1 | | | | | | .SCREW,MACHINE:6-32 X 0.250,PNH STL,CD PL ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -38 | 348-0191-00 | B010100 | B357055 | 1 | | | | | | .LEG,ELEC EQUIP.:PLASTIC | 80009 | 348-0191-00 |
| -39 | 211-0529-00 | B010100 | B357055 | 1 | | | | | | .SCREW,MACHINE:6-32 X 1.25 INCHES,PNH STL | 83385 | ORD BY DESCR |
| -40 | 386-2199-00 | B010100 | B357055 | 1 | | | | | | .PANEL,REAR:POWER | 80009 | 386-2199-00 |
| | 386-4125-00 | B357056 | B368899 | 1 | | | | | | .REAR PANEL ASSY: | 80009 | 386-4125-00 |
| | 386-4125-01 | B368900 | B371741 | 1 | | | | | | .REAR PANEL ASSY: | 80009 | 386-4125-01 |
| | 386-4125-02 | B371742 | | 1 | | | | | | .REAR PANEL ASSY: | 80009 | 386-4125-02 |
| -41 | ----- | | | 1 | | | | | | .CKT BOARD ASSY:RECTIFIER(SEE A10 REPL) | | |
| -42 | 131-0608-00 | | | 28 | | | | | | .TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD | 22526 | 48283-036 |
| -43 | 136-0252-04 | B010100 | B122799 | 6 | | | | | | .SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS | 22526 | 75060-007 |
| | 136-0350-00 | B122800 | B343343 | 2 | | | | | | .SOCKET,PLUG-IN:3 PIN,LOW PROFILE | 80009 | 136-0350-00 |
| | 136-0252-07 | B343344 | | 6 | | | | | | .SOCKET,PIN CONN:W/O DIMPLE | 22526 | 75060-012 |
| | 337-3125-00 | B375510 | | 1 | | | | | | .SHIELD,ELEC: :CKT BD | 80009 | 337-3125-00 |
| | 337-3126-00 | B375510 | | 1 | | | | | | .SHIELD,ELEC:CKT BOARD | 80009 | 337-3126-00 |
| | 129-0338-00 | B375510 | | 4 | | | | | | .POST,ELEC-MECH:HEX.,0.188 X 0.64 INCH LON | 80009 | 129-0338-00 |
| -44 | 214-1292-00 | | | 2 | | | | | | .HEAT SINK,ELEC:TRANSISTOR | 05820 | 205SB |
| -45 | 214-1731-00 | B010100 | B030812 | 1 | | | | | | .HEAT SINK,ELEC:TRANSISTOR | 80009 | 214-1731-00 |
| | 214-1731-01 | B030813 | | 1 | | | | | | .HEAT SINK,ELEC:TRANSISTOR ***** (ATTACHING PARTS)***** | 80009 | 214-1731-01 |
| -46 | 211-0014-00 | B010100 | B316169 | 1 | | | | | | .SCREW,MACHINE:4-40 X 0.50 INCH,PNH STL | 83385 | ORD BY DESCR |
| | 211-0016-00 | B316170 | | 1 | | | | | | .SCREW,MACHINE:4-40 X 0.625 INCH,PNH STL | 83385 | ORD BY DESCR |
| -47 | 210-0586-00 | | | 1 | | | | | | .NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL | 78189 | 211-041800-00 |
| -48 | 210-0935-00 | | | 1 | | | | | | .WASHER,NONMETAL:FIBER,0.14 ID X 0.375 OD | 74921 | ORD BY DESCR |
| | 210-0851-00 | B316170 | | 1 | | | | | | .WASHER,FLAT:0.119 ID X 0.375 INCH OD,ST ***** (END ATTACHING PARTS)***** | 12327 | ORD BY DESCR |
| | 131-0566-00 | B140000 | B375699 | 1 | | | | | | .BUS CONDUCTOR:DUMMY RES.2.375,22 AWG | 57668 | JWW-0200E0 |
| -49 | 344-0154-00 | B010100 | B375509 | 6 | | | | | | .CLIP,ELECTRICAL:FUSE,CKT BD MT | 80009 | 344-0154-00 |
| | 344-0154-00 | B375510 | | 4 | | | | | | .CLIP,ELECTRICAL:FUSE,CKT BD MT | 80009 | 344-0154-00 |
| | 344-0326-00 | B375510 | | 4 | | | | | | .CLIP,ELECTRICAL:FUSE,BRASS ***** (ATTACHING PARTS FOR CKT BD)***** | 75915 | 102071 |
| -50 | 211-0507-00 | | | 3 | | | | | | .SCREW,MACHINE:6-32 X 0.312,PNH STL,CD PL | 83385 | ORD BY DESCR |
| | 211-0511-00 | | | 1 | | | | | | .SCREW,MACHINE:6-32 X 0.500,PNH,STL,CD PL | 83385 | ORD BY DESCR |
| | 211-0008-00 | B030813 | | 1 | | | | | | .SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |

Replaceable Mechanical Parts—7603/R7603 Service

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | 1 2 3 4 5 | Name & Description | Mfr Code | Mfr Part Number |
|------------------------|-----------------------|------------------|---------|-----|-----------|--|-------------|-----------------|
| | | Eff | Dscont | | | | | |
| 2-51 | 343-0081-00 | B010100 | B357055 | 1 | | STRAP,RETAINING: | 95987 | 3/16-H |
| | 343-0004-00 | B357056 | | 1 | | CLAMP,LOOP:0.312ID,PLSTC | 95987 | 5-16-6B |
| | 210-0863-00 | B357056 | | 1 | | WSHR,LOOP CLAMP:0.187 ID U/W 0.5 W CLP,STL | 95987 | C191 |
| -52 | ----- | | | 1 | | TRANSFORMER:(SEE T801 REPL) ***** (ATTACHING PARTS)***** | | |
| -53 | 212-0522-00 | | | 2 | | SCREW,MACHINE:10-32 X 2.50",HEX HD STL | 83385 | ORD BY DESCR |
| -54 | 210-0812-00 | | | 2 | | WASHER,NONMETAL:#10,FIBER | 86445 | ORD BY DESCR |
| -55 | 166-0457-00 | | | 2 | | INSUL SLVG.ELEC:0.19 ID X 1.875"LONG MYLAR ***** (END ATTACHING PARTS)***** | 80009 | 166-0457-00 |
| | 407-1837-00 | B316170 | | 1 | | BRACKET,CKT BD:POLYCARBONATE ***** (ATTACHING PARTS)***** | 80009 | 407-1837-00 |
| | 220-0410-00 | B316170 | | 1 | | NUT,EXTENDED WA:10-32 X 0.375 INCH,STL | 83385 | ORD BY DESCR |
| | 212-0522-00 | B316170 | | 1 | | SCREW,MACHINE:10-32 X 2.50",HEX HD STL | 83385 | ORD BY DESCR |
| | 210-0805-00 | B316170 | | 1 | | WASHER,FLAT:0.204 ID X 0.438 INCH OD | 12327 | ORD BY DESCR |
| | 166-0457-00 | B316170 | | 1 | | INSUL SLVG.ELEC:0.19 ID X 1.875"LONG MYLAR ***** (END ATTACHING PARTS)***** | 80009 | 166-0457-00 |
| -56 | 407-0921-00 | | | 1 | | BRACKET,XFMR:ALUMINUM ***** (ATTACHING PARTS)***** | 80009 | 407-0921-00 |
| -57 | 212-0023-00 | | | 2 | | SCREW,MACHINE:8-32 X 0.375,PNH,STL,CD PL | 83385 | ORD BY DESCR |
| | 210-0804-00 | B031007 | | 2 | | WASHER,FLAT:0.17 ID X 0.375 INCH OD,STL ***** (END ATTACHING PARTS)***** | 12327 | ORD BY DESCR |
| -58 | ----- | | | 1 | | SWITCH,THERMO: ***** (ATTACHING PARTS)***** | | |
| -59 | 211-0008-00 | | | 2 | | SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ | 83385 | ORD BY DESCR |
| -60 | 210-0586-00 | | | 2 | | NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL ***** (END ATTACHING PARTS)***** | 78189 | 211-041800-00 |
| -61 | 441-0993-01 | B010100 | B357055 | 1 | | CHASSIS,SCOPE:POWER SUPPLY | 80009 | 441-0993-01 |
| | 441-0993-04 | B357056 | | 1 | | CHASSIS,SCOPE:POWER SUPPLY ***** (ATTACHING PARTS)***** | 80009 | 441-0993-04 |
| | 212-0040-00 | | | 6 | | SCREW,MACHINE:8-32 X 0.375 100 DEG,FLH ST ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -62 | 179-1637-00 | B010100 | B357055 | 1 | | WIRING HARNESS,:POWER | 80009 | 179-1637-00 |
| | 195-0213-00 | B357056 | | 1 | | WIRE SET,ELEC: | 80009 | 195-0213-00 |
| -63 | 200-1075-00 | | | 4 | | .COVER,TERM:QUICK DISCONNECT | 00779 | 1-480435-0 |
| -64 | 131-0861-00 | | | 4 | | .TERM,QIK DISC:16-20 AWG,0.22 W X 0.02 THK | 00779 | 42617-2 |
| -65 | ----- | | | 2 | | TRANSISTOR: ***** (ATTACHING PARTS)***** | | |
| -66 | 213-0146-00 | | | 4 | | SCR,TPG,THD FOR:6-20 X 0.313 INCH,PNH STL | 83385 | ORD BY DESCR |
| -67 | 386-0978-00 | | | 2 | | INSULATOR,PLATE:TRANSISTOR,MICA ***** (END ATTACHING PARTS)***** | 80009 | 386-0978-00 |
| -68 | 136-0280-00 | | | 2 | | SOCKET,PLUG-IN:TRANSISTOR,3 CONTACT ***** (ATTACHING PARTS)***** | 97913 | LST 2202-2 |
| -69 | 211-0101-00 | | | 4 | | SCREW,MACHINE:4-40 X 0.25,FLH,100 DEG,STL ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -70 | 348-0063-00 | | | 1 | | GROMMET,PLASTIC:0.50 INCH DIA | 80009 | 348-0063-00 |
| -71 | ----- | | | 1 | | CKT BOARD ASSY:Z AXIS(SEE REPL A8) | | |
| -72 | 131-0566-00 | | | 1 | | .BUS CONDUCTOR:DUMMY RES,2.375,22 AWG | 57668 | JWW-0200E0 |
| -73 | 131-0608-00 | | | 36 | | .TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD | 22526 | 48283-036 |
| -74 | 131-1003-00 | | | 1 | | .CONN,RCPT,ELEC:CKT BD MT,3 PRONG | 80009 | 131-1003-00 |
| -75 | 136-0252-04 | B010100 | B122799 | 33 | | .SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS | 22526 | 75060-007 |
| | 136-0252-04 | B122800 | | 6 | | .SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS | 22526 | 75060-007 |
| | 136-0350-00 | B122800 | B341999 | 9 | | .SOCKET,PLUG-IN:3 PIN,LOW PROFILE | 80009 | 136-0350-00 |
| | 136-0252-07 | B342000 | | 27 | | .SOCKET,PIN CONN:W/O DIMPLE | 22526 | 75060-012 |
| | 136-0252-01 | | | 1 | | .CONTACT,ELEC:0.178 INCH LONG ***** (ATTACHING PARTS FOR CKT BD)***** | 00779 | 1-332095-2 |
| -76 | 211-0008-00 | | | 3 | | SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| | 672-0658-00 | B330000 | | 1 | | CKT BOARD ASSY:HIGH VOLTAGE | 80009 | 672-0658-00 |
| | ----- | B330000 | | 1 | | .CKT BD ASSY:Z AXIS DC RESTR(SEE A16 REPL) | | |
| | 131-1261-00 | B330000 | | 4 | | .CONTACT,ELEC:F-SHAPED | 00779 | 1-380953-0 |
| | ----- | B330000 | | 1 | | .CKT BD ASSY:FOCUS DC RESTR(SEE A15 REPL) | | |
| | 131-1261-00 | B330000 | | 4 | | .CONTACT,ELEC:F-SHAPED | 00779 | 1-380953-0 |

Replaceable Mechanical Parts—7603/R7603 Service

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Qty | 1 2 3 4 5 | Name & Description | Mfr Code | Mfr Part Number |
|------------------|--------------------|----------------------|---------|-----|-----------|---|----------|------------------|
| 2-77 | ----- | | | 1 | | .CKT BOARD ASSY:HIGH VOLTAGE(SEE A9 REPL) | | |
| -78 | 131-0589-00 | | | 5 | | .TERMINAL,PIN:0.46 L X 0.025 SQ | 22526 | 48283-029 |
| | 131-0608-00 | | | 17 | | .TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD | 22526 | 48283-036 |
| -79 | 136-0252-07 | | | 9 | | .SOCKET,PIN CONN:W/O DIMPLE | 22526 | 75060-012 |
| -80 | 214-0579-00 | | | 1 | | .TERM,TEST POINT:BRS CD PL | 80009 | 214-0579-00 |
| | 166-0292-00 | | | 2 | | .SPACER,SLEEVE:PLSTC,0.155 DIA X 0.065"L | 80009 | 166-0292-00 |
| -81 | 152-0495-00 | B010200 | | 1 | | .SEMICONDCONV,DIV MULTR,6KV IN,12KV OUT(ATTACHING PARTS)..... | 52306 | CMX294 |
| -82 | 211-0008-00 | B010100 | B229999 | 3 | | .SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ | 83385 | ORD BY DESCR |
| | 210-0008-00 | B230000 | | 2 | | .WASHER,LOCK:INTL,0.02 THK(END ATTACHING PARTS)..... | 78189 | 1208-00-00-0541C |
| | 119-0286-00 | B010100 | B029999 | 1 | | .MULTIPLIER,HV:4 X 12KVDC OUT | 80009 | 119-0286-00 |
| | 119-0401-00 | B030000 | | 1 | | .MULTIPLIER,HV:4 X 12VDC OUT | 80009 | 119-0401-00 |
| -83 | 388-2029-00 | B010100 | B029999 | 1 | | .CIRCUIT BOARD:TRANSFORMER,MTG(ATTACHING PARTS)..... | 80009 | 388-2029-00 |
| | 211-0040-00 | B010100 | B029999 | 1 | | .SCREW,MACHINE:4-40 X 0.25",BDGH PLSTC(END ATTACHING PARTS).....(ATTACHING PARTS FOR CKT BD)..... | 26365 | ORD BY DESCR |
| -84 | 211-0008-00 | B010100 | B229999 | 3 | | .SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ | 83385 | ORD BY DESCR |
| | 211-0008-00 | B230000 | | 2 | | .SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |
| | 129-0236-00 | B230000 | | 1 | | .SPACER,POST:0.188 HEX X 0.375 INCH LONG(ATTACHING PARTS)..... | 06540 | 9726-A-0440 |
| | 211-0008-00 | B230000 | | 1 | | .SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ | 83385 | ORD BY DESCR |
| | 210-0004-00 | B230000 | | 1 | | .WASHER,LOCK:#4 INTL,0.015 THK,STL CD PL(END ATTACHING PARTS)..... | 000BK | ORD BY DESCR |
| -85 | 129-0143-00 | | | 3 | | .INSULATOR,STDF:0.312 OD X 0.406" L,NYLON(ATTACHING PARTS)..... | 80009 | 129-0143-00 |
| -86 | 211-0008-00 | | | 3 | | .SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |
| -87 | 129-0098-00 | | | 1 | | .POST,ELEC-MECH:0.250 HEX,X0.406 INCH L,BR | 80009 | 129-0098-00 |
| -88 | 129-0305-00 | B010100 | B029999 | 1 | | .SPACER,POST:1.265 L,W/4-40 THD(ATTACHING PARTS)..... | 80009 | 129-0305-00 |
| -89 | 211-0008-00 | B010100 | B029999 | 1 | | .SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |
| -90 | 129-0304-00 | B010100 | B029999 | 1 | | .INSULATOR,STDF:0.25 OD X 1.23 INCH LONG(ATTACHING PARTS)..... | 80009 | 129-0304-00 |
| -91 | 211-0008-00 | B010100 | B029999 | 1 | | .SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |
| -92 | 343-0006-00 | | | 1 | | .CLAMP,LOOP:0.50 INCH DIAMETER,PLSTC(ATTACHING PARTS)..... | 95987 | 1-2-6B |
| -93 | 211-0510-00 | | | 1 | | .SCREW,MACHINE:6-32 X 0.375,PNH,STL,CD PL | 83385 | ORD BY DESCR |
| -94 | 210-0863-00 | | | 1 | | .WSHR,LOOP CLAMP:0.187 ID U/W 0.5 W CLP,STL(END ATTACHING PARTS)..... | 95987 | C191 |
| -95 | 255-0334-00 | B010100 | B040974 | FT | | .PLASTIC CHANNEL:12.75 X 0.175 X 0.155,NYL | 11897 | 122-37-2500 |
| | 255-0334-00 | B040795 | B051189 | FT | | .PLASTIC CHANNEL:12.75 X 0.175 X 0.155,NYL | 11897 | 122-37-2500 |
| | 348-0012-00 | B040975 | | 1 | | .GROMMET,RUBBER:0.625 INCH DIA | 72653 | 1043-1M |
| | 348-0085-00 | B051190 | B244724 | 1 | | .GROMMET,PLASTIC:GRAY,U-SHAPED,0.48 ID | 80009 | 348-0085-00 |
| | 358-0166-00 | B244725 | | 1 | | .GROMMET,PLASTIC:BLACK | 80009 | 358-0166-00 |
| | 214-2736-00 | B341500 | | 3 | | .PLUG,HOLE:0.312 DIA,PLASTIC | 28520 | DP3122613 |
| -96 | 337-1538-01 | B010100 | B341499 | 1 | | .SHIELD,ELEC:HIGH VOLTAGE | 80009 | 337-1538-01 |
| | 337-1538-02 | B341500 | | 1 | | .SHIELD,ELEC:HIGH VOLTAGE(ATTACHING PARTS)..... | 80009 | 337-1538-02 |
| -97 | 211-0504-00 | | | 3 | | .SCREW,MACHINE:6-32 X 0.250,PNH,STL,CD PL(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |
| | 343-0004-00 | B375765 | | 1 | | .CLAMP,LOOP:0.312ID,PLSTC(ATTACHING PARTS)..... | 95987 | 5-16-6B |
| | 211-0511-00 | B375765 | | 1 | | .SCREW,MACHINE:6-32 X 0.500,PNH,STL,CD PL | 83385 | ORD BY DESCR |
| | 210-0803-00 | B375765 | | 1 | | .WASHER,FLAT:0.15 ID X 0.032 THK,STL CD(END ATTACHING PARTS)..... | 12327 | ORD BY DESCR |
| -98 | 136-0505-00 | B010100 | B149999 | 1 | | .SKT,PL-IN ELEK:ELCTR N TUBE,14 CONT W/LEADS | 80009 | 136-0505-00 |
| | 136-0505-01 | B150000 | | 1 | | .SKT,PL-IN ELEK:W/6 PIN CONNECTOR | 80009 | 136-0505-01 |
| -99 | 136-0304-02 | B010100 | B340949 | 1 | | .SOCKET,PLUG-IN:CRT,14 PIN SOCKET,W/PINS | 80009 | 136-0304-02 |
| | 136-0304-03 | B340950 | | 1 | | .SKT,PL-IN ELEK:ELECTRON TUBE,14 CONTACT | 80009 | 136-0304-03 |

Replaceable Mechanical Parts—7603/R7603 Service

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | 1 2 3 4 5 | Name & Description | Mfr Code | Mfr Part Number |
|------------------------|-----------------------|------------------|---------|-----|-----------|---|-------------|-----------------|
| | | Eff | Dscont | | | | | |
| 2- | 352-0201-00 | B010100 | B149999 | 1 | | .CONN BODY, PL, EL: 5 WIRE BLACK | 80009 | 352-0201-00 |
| | 352-0202-00 | B150000 | | 1 | | .HLDR, TERM CONN: 6 WIRE BLACK | 80009 | 352-0202-00 |
| | 131-0621-00 | | | 5 | | .CONNECTOR, TERM: 22-26 AWG, BRS & CU BE GOLD | 22526 | 46231 |
| | 131-0707-00 | | | 4 | | .CONTACT, ELEC: 22-26 AWG, BRS & CU BE GOLD | 22526 | 47439 |
| | 352-0162-00 | | | 1 | | .HLDR, TERM CONN: 4 WIRE BLACK | 80009 | 352-0162-00 |
| -100 | 200-0917-01 | | | 1 | | .COV, CRT SKT: 2.052 OD X 0.291 H, PLASTIC | 80009 | 200-0917-01 |
| -101 | 367-0117-00 | | | 1 | | .PULL, SOCKET: CRT, PLASTIC | 80009 | 367-0117-00 |
| -102 | 343-0235-00 | | | 1 | | .CLAMP, CRT SKT: DELRIN | 80009 | 343-0235-00 |
| | 343-0549-00 | | | 4 | | .STRAP, TIEDOWN: 0.091 W X 4.0 L, ZYTEL | 06383 | PLT1M |
| | 346-0189-00 | | | 1 | | .STRAP, TIEDOWN, E: 8.5 L, NYLON W/MARKER | 59730 | TY53M |
| -103 | 386-2390-00 | | | 1 | | SUPPORT, CHASSIS: REAR | 80009 | 386-2390-00 |
| | | | | | | ***** (ATTACHING PARTS) ***** | | |
| | 211-0538-00 | | | 2 | | SCREW, MACHINE: 6-32 X 0.312" 100 DEG, FLH | 83385 | ORD BY DESCR |
| | 210-0457-00 | | | 2 | | NUT, PL, ASSEM WA: 6-32 X 0.312, STL CD PL | 83385 | ORD BY DESCR |
| | | | | | | ***** (END ATTACHING PARTS) ***** | | |
| | 343-0213-00 | B368865 | | 1 | | CLAMP, LOOP: 0.2 ID, PLASTIC | 80009 | 343-0213-00 |
| -104 | 407-0914-00 | | | 1 | | BRACKET, CHASSIS: ALUMINUM | 80009 | 407-0914-00 |
| | | | | | | ***** (ATTACHING PARTS) ***** | | |
| | 211-0538-00 | | | 4 | | SCREW, MACHINE: 6-32 X 0.312" 100 DEG, FLH | 83385 | ORD BY DESCR |
| | 210-0457-00 | | | 4 | | NUT, PL, ASSEM WA: 6-32 X 0.312, STL CD PL | 83385 | ORD BY DESCR |
| -105 | 211-0510-00 | | | 2 | | SCREW, MACHINE: 6-32 X 0.375, PNH, STL, CD PL | 83385 | ORD BY DESCR |
| -106 | 210-0949-00 | | | 2 | | WASHER, FLAT: 0.141 ID X 0.50 INCH OD, BRS | 12327 | ORD BY DESCR |
| | | | | | | ***** (END ATTACHING PARTS) ***** | | |
| | 407-2600-00 | B368865 | | 1 | | BRACKET, ANGLE: POWER SWITCH, AL | 80009 | 407-2600-00 |
| | | | | | | ***** (ATTACHING PARTS) ***** | | |
| | 210-0457-00 | B368865 | | 2 | | NUT, PL, ASSEM WA: 6-32 X 0.312, STL CD PL | 83385 | ORD BY DESCR |
| | 211-0559-00 | B368865 | | 2 | | SCREW, MACHINE: 6-32 X 0.375" 100 DEG, FLH ST | 83385 | ORD BY DESCR |
| | | | | | | ***** (END ATTACHING PARTS) ***** | | |
| -107 | 260-1222-00 | | | 1 | | SWITCH, PUSH-PUL: 10A, 250VAC | 91929 | 2DM301 |
| -108 | 384-1081-00 | B010100 | B368864 | 1 | | EXTENSION SHAFT: W/KNOB | 80009 | 384-1081-00 |
| | 384-1601-01 | B368865 | | 1 | | EXTENSION: 8.265 L X 0.125 OD, AL | 80009 | 384-1601-01 |
| -109 | 376-0053-00 | B010100 | B368864 | 1 | | CPLG, SHAFT, RGD: 0.128 ID X 0.312 OD | 80009 | 376-0053-00 |
| -110 | 384-1107-00 | B010100 | B368864 | 1 | | EXTENSION SHAFT: 7.07 L X 0.125 OD AL | 80009 | 384-1107-00 |
| -111 | 376-0127-00 | | | 1 | | COUPLER, SHAFT: PLASTIC | 80009 | 376-0127-00 |
| -112 | ----- | | | 1 | | CKT BOARD ASSY: HORIZ AMPL (SEE A6 REPL) | | |
| -113 | 131-0608-00 | | | 17 | | .TERMINAL, PIN: 0.365 L X 0.025 PH BRZ GOLD | 22526 | 48283-036 |
| -114 | 131-1003-00 | | | 2 | | .CONN, RCPT, ELEC: CKT BD MT, 3 PRONG | 80009 | 131-1003-00 |
| -115 | 136-0252-04 | B010100 | B122799 | 24 | | .SOCKET, PIN TERM: U/W 0.016-0.018 DIA PINS | 22526 | 75060-007 |
| | 136-0252-07 | B342000 | | 24 | | .SOCKET, PIN CONN: W/O DIMPLE | 22526 | 75060-012 |
| | 136-0365-00 | B122800 | B341999 | 6 | | ...SKT, PL-IN ELEK: TRANSISTOR, 3 CONTACT | 80009 | 136-0365-00 |
| | 136-0350-00 | B122800 | B341999 | 2 | | ...SOCKET, PLUG-IN: 3 PIN, LOW PROFILE | 80009 | 136-0350-00 |
| | 136-0252-01 | | | 2 | | .CONTACT, ELEC: 0.178 INCH LONG | 00779 | 1-332095-2 |
| -116 | 136-0260-02 | B010100 | B373529 | 1 | | .SKT, PL-IN ELEK: MICRO CIRCUIT, 16 DIP, LOW CL | 09922 | DILB16P-108T |
| | 136-0729-00 | B373530 | | 1 | | .SKT, PL-IN ELEK: MICROCKT, 16 CONTACT | 09922 | DILB16P-108T |
| | | | | | | ***** (ATTACHING PARTS FOR CKT BD) ***** | | |
| -117 | 211-0008-00 | | | 2 | | SCREW, MACHINE: 4-40 X 0.250, PNH, STL, POZ | 83385 | ORD BY DESCR |
| | | | | | | ***** (END ATTACHING PARTS) ***** | | |
| -118 | 351-0087-00 | | | 2 | | GUIDE, CKT BOARD: 4.75 INCH LONG, PLASTIC | 80009 | 351-0087-00 |
| -119 | ----- | | | 1 | | CKT BOARD ASSY: VERT AMPL (SEE A5 REPL) | | |
| -120 | 131-0589-00 | | | 7 | | .TERMINAL, PIN: 0.46 L X 0.025 SQ | 22526 | 48283-029 |
| -121 | 131-1003-00 | | | 3 | | .CONN, RCPT, ELEC: CKT BD MT, 3 PRONG | 80009 | 131-1003-00 |
| -122 | 131-1303-00 | | | 9 | | .CONTACT, ELEC: IC GROUND | 000FR | MG-100 |
| -123 | 136-0252-04 | B010100 | B122799 | 9 | | .SOCKET, PIN TERM: U/W 0.016-0.018 DIA PINS | 22526 | 75060-007 |
| | 136-0350-00 | B122800 | B341999 | 3 | | SOCKET, PLUG-IN: 3 PIN, LOW PROFILE | 80009 | 136-0350-00 |
| | 136-0252-07 | B342000 | | 9 | | .SOCKET, PIN CONN: W/O DIMPLE | 22526 | 75060-012 |
| | 136-0252-01 | | | 19 | | .CONTACT, ELEC: 0.178 INCH LONG | 00779 | 1-332095-2 |
| | 346-0171-00 | B343400 | | 1 | | .STRAP, GROUNDING: 2.0 L, COPPER | 80009 | 346-0171-00 |
| | | | | | | ***** (ATTACHING PARTS FOR CKT BD) ***** | | |
| -124 | 211-0014-00 | | | 2 | | SCREW, MACHINE: 4-40 X 0.50 INCH, PNH, STL | 83385 | ORD BY DESCR |
| | 211-0008-00 | | | 1 | | SCREW, MACHINE: 4-40 X 0.250, PNH, STL, POZ | 83385 | ORD BY DESCR |
| | | | | | | ***** (END ATTACHING PARTS) ***** | | |
| -125 | 214-1652-00 | | | 1 | | HEAT SINK, ELEC: VERT CKT BOARD, AL | 80009 | 214-1652-00 |
| -126 | 214-1757-00 | | | 1 | | HEAT SINK, ELEC: 1.0 DIA X 0.27 THICK | 80009 | 214-1757-00 |
| -127 | 361-0477-00 | | | 2 | | SPACER, SLEEVE: 0.25 L X 0.238 ID | 80009 | 361-0477-00 |

Replaceable Mechanical Parts—7603/R7603 Service

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | Name & Description | | | | | Mfr Code | Mfr Part Number |
|------------------|--------------------|------------------|---------|-----------------------------------|---|---|---|---|---|----------|-----------------|
| | | Eff | Dscont | | 1 | 2 | 3 | 4 | 5 | | |
| 2-128 | 195-0085-00 | | | 1 | LEAD SET,ELEC: CRT DEFLECTION | | | | | 80009 | 195-0085-00 |
| | 131-0865-00 | | | 4 | .CONTACT,ELEC:0.450 INCH L | | | | | 80009 | 131-0865-00 |
| | 352-0071-00 | B290000 | | 1 | INS,STANDOFF:0.25 OD X 0.525 LONG | | | | | 80009 | 352-0071-00 |
| | | | | | ***** (ATTACHING PARTS) ***** | | | | | | |
| | 211-0008-00 | B290000 | | 1 | SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ | | | | | 83385 | ORD BY DESCR |
| | | | | | ***** (END ATTACHING PARTS) ***** | | | | | | |
| | 348-0340-00 | B346721 | | 1 | SHLD,GSKT,ELEC:0.125 X 0.125 FT L,FOAM | | | | | 07700 | 85-10168 |
| | 337-1432-04 | B050410 | | 1 | SHIELD,CRT:W/CHAS & COIL | | | | | 80009 | 337-1432-04 |
| | | | | | ***** (ATTACHING PARTS) ***** | | | | | | |
| | 211-0541-00 | | | 2 | SCREW,MACHINE:6-32 X 0.25"100 DEG,FLH STL | | | | | 83385 | ORD BY DESCR |
| | | | | ***** (END ATTACHING PARTS) ***** | | | | | | | |
| -129 | 337-1432-00 | | | 1 | .SHIELD,CRT: | | | | | 80009 | 337-1432-00 |
| -130 | 348-0056-00 | | | 2 | .GROMMET,PLASTIC:0.375 INCH DIA | | | | | 80009 | 348-0056-00 |
| -131 | ----- | | | 1 | .COIL:(SEE L1098 REPL) | | | | | | |
| | | | | | ***** (ATTACHING PARTS) ***** | | | | | | |
| -132 | 213-0138-00 | | | 2 | .SCR,TPG,TF:4-24 X 0.188 INCH,PNH STL | | | | | 83385 | ORD BY DESCR |
| -133 | 343-0217-00 | | | 1 | .CLAMP,COIL:Y-AXIS | | | | | 80009 | 343-0217-00 |
| | | | | | ***** (END ATTACHING PARTS) ***** | | | | | | |
| | 252-0562-00 | | | FT | .PLASTIC EXTR:0.100 X 0.12,POLYETHYLENE | | | | | T0608 | ORD BY DESCR |
| -134 | 441-1124-00 | | | 1 | .CHAS ASSY,SCOPE: | | | | | 80009 | 441-1124-00 |
| | | | | | ***** (ATTACHING PARTS) ***** | | | | | | |
| | 210-0781-00 | B010100 | B139999 | 2 | .RIVET,BLIND:0.125 L X 0.156 OD,AL | | | | | 83385 | ORD BY DESCR |
| | 211-0590-00 | B140000 | | 2 | .SCREW,MACHINE:6-32 X 0.250,PNH,BRS.CD PL | | | | | 83385 | ORD BY DESCR |
| | 210-0457-00 | B140000 | | 2 | .NUT,PL,ASSEM WA:6-32 X 0.312,STL CD PL | | | | | 83385 | ORD BY DESCR |
| | | | | | ***** (END ATTACHING PARTS) ***** | | | | | | |
| | 348-0070-01 | | | 1 | .PAD,CUSHIONING:2.03 X 0.69 X 0.18 SI RBR | | | | | 80009 | 348-0070-01 |
| -135 | 119-0288-02 | | | 1 | .DELAY LINE,ELEC:148NS,100 OHM,W/BEAM ROTR | | | | | 80009 | 119-0288-02 |
| | | | | | ***** (ATTACHING PARTS) ***** | | | | | | |
| -136 | 213-0034-00 | | | 2 | .SCR,TPG,THD CTG:4-40 X 0.188 INCH,PNH STL | | | | | T0858 | ORD BY DESCR |
| -137 | 210-0863-00 | | | 1 | .WSHR,LOOP CLAMP:0.187 ID U/W 0.5 W CLP,STL | | | | | 95987 | C191 |
| | | | | | ***** (END ATTACHING PARTS) ***** | | | | | | |
| -138 | 343-0013-00 | | | 1 | .CLAMP,LOOP:0.375 ID,PLASTIC | | | | | 95987 | 3-8-6B |
| 138.1 | 131-1093-00 | | | 1 | .LEAD,ELECTRICAL:ANODE | | | | | 80009 | 131-1093-00 |
| -139 | 131-0026-00 | | | 1 | .BUTTON,PLUG:0.578 OD X 0.125 THK STL CD | | | | | 83058 | SS-48149 |
| -140 | 200-0544-00 | | | 1 | .SHLD,ELEC CONN:ANODE,SIL RUBBER | | | | | 06470 | 7562-86 |
| -141 | 386-1952-00 | | | 4 | .SUPPORT,CRT:FRONT | | | | | 80009 | 386-1952-00 |
| | | | | | ***** (ATTACHING PARTS) ***** | | | | | | |
| -142 | 211-0603-00 | | | 4 | .SCREW,MACHINE:6-32 X 0.312 INCH,HEX HD ST | | | | | 83385 | ORD BY DESCR |
| -143 | 210-0803-00 | | | 4 | .WASHER,FLAT:0.15 ID X 0.032 THK,STL CD | | | | | 12327 | ORD BY DESCR |
| | | | | | ***** (END ATTACHING PARTS) ***** | | | | | | |
| | 672-0572-00 | B220000 | | 1 | .CKT BOARD ASSY:READOUT PROTECTION #1 | | | | | 80009 | 672-0572-00 |
| -144 | ----- | B220000 | | 1 | .CKT BOARD ASSY:PROTECTION(SEE A14 REPL) | | | | | | |
| -145 | 253-0162-00 | B220000 | B342019 | FT | .TAPE,PRESS SENS:POLYURETHANE SPONGE | | | | | 04963 | 4116 TYPE A |
| | 253-0160-00 | B342020 | | 1 | .TAPE,PRESS SENS:ADHESIVE,2.124 FT LONG | | | | | 04963 | 4116 TYPE A |
| -146 | 131-0589-00 | B220000 | | 20 | .TERMINAL,PIN:0.46 L X 0.025 SQ | | | | | 22526 | 48283-029 |
| -147 | 210-0702-00 | B220000 | | 2 | .EYELET,METALLIC:0.047 OD X 0.125 INCH LO | | | | | 07707 | S6127 |
| -148 | ----- | | | 1 | .CKT BOARD ASSY:READOUT(SEE A13 REPL) | | | | | | |
| -149 | 131-0608-00 | | | 42 | .TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD | | | | | 22526 | 48283-036 |
| -150 | 131-1003-00 | | | 6 | .CONN,RCPT,ELEC:CKT BD MT,3 PRONG | | | | | 80009 | 131-1003-00 |
| -151 | 136-0235-00 | | | 1 | .SOCKET,PLUG-IN:6 CONTACT,ROUND | | | | | 71785 | 133-96-12-062 |
| -152 | 136-0252-07 | B010100 | B143165 | 42 | .SOCKET,PIN CONN:W/O DIMPLE | | | | | 22526 | 75060-012 |
| | 136-0235-00 | B143166 | | 1 | .SOCKET,PLUG-IN:6 CONTACT,ROUND | | | | | 71785 | 133-96-12-062 |
| | 136-0220-00 | B143166 | | 13 | .SKT,PL-IN ELEK:TRANSISTOR 3 CONTACT,PCB | | | | | 71785 | 133-23-11-034 |
| | 136-0252-01 | | | 14 | .CONTACT,ELEC:0.178 INCH LONG | | | | | 00779 | 1-332095-2 |
| -153 | 136-0260-02 | B010100 | B372599 | 14 | .SKT,PL-IN ELEK:MICROCIRCUIT,16 DIP,LOW C | | | | | 09922 | DILB16P-108T |
| | 136-0729-00 | B372600 | | 14 | .SKT,PL-IN ELEK:MICROCKT,16 CONTACT | | | | | 09922 | DILB16P-108T |
| -154 | 136-0269-02 | B010100 | B372599 | 3 | .SKT,PL-IN ELEK:MICROCIRCUIT,14 DIP | | | | | 09922 | DILB149P-108 |
| | 136-0728-00 | B372600 | | 3 | .SKT,PL-IN ELEK:MICROCKT,14 CONTACT | | | | | 09922 | DILB14P-108 |
| -155 | 214-0579-00 | B010100 | B219999 | 21 | .TERM,TEST POINT:BRS CD PL | | | | | 80009 | 214-0579-00 |
| | 214-0579-00 | B220000 | | 20 | .TERM,TEST POINT:BRS CD PL | | | | | 80009 | 214-0579-00 |
| -156 | 260-0723-00 | | | 1 | .SWITCH,SLIDE:DPDT,0.5A,125VAC | | | | | 79727 | GF126-0028 |
| -157 | 361-0527-00 | | | 1 | .SPACER,CKT CARD:0.188 OD X 0.13 INCH LON | | | | | 80009 | 361-0527-00 |
| | 211-0205-00 | | | 1 | .SCREW MACHINE:RDH SST | | | | | 80009 | 211-0205-00 |
| | | | | | ***** (ATTACHING PARTS FOR CKT BD) ***** | | | | | | |
| -158 | 211-0008-00 | | | 1 | .SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ | | | | | 83385 | ORD BY DESCR |
| | | | | | ***** (END ATTACHING PARTS) ***** | | | | | | |

Replaceable Mechanical Parts—7603/R7603 Service

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | 1 | 2 | 3 | 4 | 5 | Name & Description | Mfr Code | Mfr Part Number |
|------------------|--------------------|------------------|---------|-----|---|---|---|---|---|---|----------|-----------------|
| | | Eff | Dscont | | | | | | | | | |
| 2-159 | 344-0133-00 | | | 2 | | | | | | CLIP,SPR,TNSN:CIRCUIT CARD MOUNTING *****ATTACHING PARTS***** | 80009 | 344-0133-00 |
| -160 | 213-0088-00 | | | 2 | | | | | | SCR,TPG,THD CTG:4-24 X 0.25 INCH,PNH STL *****END ATTACHING PARTS***** | 83385 | ORD BY DESCR |
| -161 | 441-1048-00 | | | 1 | | | | | | CHASSIS SCOPE:LOGIC *****ATTACHING PARTS***** | 80009 | 441-1048-00 |
| | 211-0008-00 | B010100 | B341829 | 2 | | | | | | SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ *****END ATTACHING PARTS***** | 83385 | ORD BY DESCR |
| | 211-0193-00 | B341830 | | 2 | | | | | | SCREW,MACHINE:1-72 X 0.125 INCH,PNH STL | 83385 | ORD BY DESCR |
| | 210-0004-00 | B341830 | | 2 | | | | | | WASHER,LOCK:#4 INTL,0.015 THK,STL CD PL | 000BK | ORD BY DESCR |
| | 210-0586-00 | B341830 | | 2 | | | | | | NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL | 78189 | 211-041800-00 |
| -162 | 351-0179-00 | | | 1 | | | | | | GUIDE,CKT CARD:6.75 INCH LONG,PLASTIC *****ATTACHING PARTS***** | 80009 | 351-0179-00 |
| | 211-0101-00 | B010100 | B341829 | 2 | | | | | | SCREW,MACHINE:4-40 X 0.25,FLH,100 DEG,STL | 83385 | ORD BY DESCR |
| | 211-0193-00 | B341830 | | 2 | | | | | | SCREW,MACHINE:1-72 X 0.125 INCH,PNH STL | 83385 | ORD BY DESCR |
| | 210-0004-00 | B341830 | | 2 | | | | | | WASHER,LOCK:#4 INTL,0.015 THK,STL CD PL | 000BK | ORD BY DESCR |
| | 210-0586-00 | B341830 | | 2 | | | | | | NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL *****END ATTACHING PARTS***** | 78189 | 211-041800-00 |
| -163 | 131-0707-00 | B010100 | B375699 | 260 | | | | | | CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD | 22526 | 47439 |
| | 131-0707-00 | B375700 | | 240 | | | | | | CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD | 22526 | 47439 |
| | 131-1810-00 | B375700 | | 21 | | | | | | CONTACT,ELEC:FEMALE,FOR 0.025 SQ PIN | 00779 | 87124-1 |
| | 131-0708-00 | | | 9 | | | | | | CONTACT,ELEC:0.48" L,28-32 AWG WIRE | 22526 | 47437 |
| -164 | 352-0171-00 | | | 4 | | | | | | HLDR,TERM CONN:1 WIRE,BLACK | 80009 | 352-0171-00 |
| -165 | 352-0169-00 | | | 2 | | | | | | HLDR,TERM CONN:2 WIRE,BLACK | 80009 | 352-0169-00 |
| | 352-0169-01 | B010100 | B075699 | 1 | | | | | | HLDR TERM CONN:2 WIRE,BROWN | 80009 | 352-0169-01 |
| | 204-0739-00 | B075700 | | 1 | | | | | | CONN BODY,PLUG:2 CONTACTS,SGL ROW,LKG CLIP | 00779 | 87175-6 |
| | 352-0169-04 | | | 1 | | | | | | HLDR,TERM CONN:2 WIRE,YELLOW | 80009 | 352-0169-04 |
| | 352-0169-05 | | | 2 | | | | | | HLDR,TERM CONN:2 WIRE,GREEN | 80009 | 352-0169-05 |
| | 352-0169-08 | | | 2 | | | | | | HLDR,TERM CONN:2 WIRE,GRAY | 80009 | 352-0169-08 |
| | 352-0169-09 | | | 1 | | | | | | HLDR,TERM CONN:2 WIRE,WHITE | 80009 | 352-0169-09 |
| -166 | 352-0161-00 | | | 2 | | | | | | HLDR,TERM CONN:3 WIRE,BLACK,0.1 SPACING | 80009 | 352-0161-00 |
| | 352-0161-02 | | | 1 | | | | | | CONN BODY,PL,EL:3 WIRE RED | 80009 | 352-0161-02 |
| | 352-0161-03 | | | 1 | | | | | | CONN BODY,PL,EL:3 WIRE ORANGE | 80009 | 352-0161-03 |
| | 352-0161-08 | | | 1 | | | | | | CONN BODY,PL,EL:3 WIRE GRAY | 80009 | 352-0161-08 |
| -167 | 352-0162-00 | | | 5 | | | | | | HLDR,TERM CONN:4 WIRE BLACK | 80009 | 352-0162-00 |
| | 352-0162-09 | | | 1 | | | | | | HLDR,TERM CONN:4 WIRE,WHITE | 80009 | 352-0162-09 |
| -168 | 352-0163-00 | | | 3 | | | | | | HLDR,TERM CONN:5 WIRE BLACK,0.1 SPACING | 80009 | 352-0163-00 |
| | 352-0163-06 | | | 2 | | | | | | HLDR,TERM CONN:5 WIRE,BLUE | 80009 | 352-0163-06 |
| | 352-0163-08 | | | 2 | | | | | | HLDR,TERM CONN:5 WIRE,GRAY | 80009 | 352-0163-08 |
| -169 | 352-0164-01 | | | 4 | | | | | | HLDR,TERM CONN:6 WIRE,BROWN | 80009 | 352-0164-01 |
| -170 | 352-0165-00 | | | 2 | | | | | | HLDR,TERM CONN:7 WIRE,BLACK | 80009 | 352-0165-00 |
| -171 | 352-0166-00 | | | 6 | | | | | | HLDR,TERM CONN:8 WIRE,BLACK | 80009 | 352-0166-00 |
| | 352-0166-01 | | | 2 | | | | | | HLDR,TERM CONN:8 WIRE,BROWN | 80009 | 352-0166-01 |
| | 352-0166-02 | | | 3 | | | | | | HLDR,TERM CONN:8 WIRE,RED | 80009 | 352-0166-02 |
| | 352-0166-03 | | | 2 | | | | | | HLDR,TERM CONN:8 WIRE,ORANGE | 80009 | 352-0166-03 |
| -172 | 352-0168-00 | | | 2 | | | | | | HLDR,TERM CONN:10 WIRE,BLACK | 80009 | 352-0168-00 |
| | 352-0168-05 | | | 2 | | | | | | HLDR,TERM CONN:10 WIRE,GREEN | 80009 | 352-0168-05 |
| | 352-0168-07 | | | 2 | | | | | | HLDR,TERM CONN:10 WIRE,VIOLET | 80009 | 352-0168-07 |
| -173 | 175-0825-00 | | | FT | | | | | | WIRE,ELECTRICAL:2 WIRE RIBBON | 80009 | 175-0825-00 |
| -174 | 175-0826-00 | | | FT | | | | | | WIRE,ELECTRICAL:3 WIRE RIBBON | 80009 | 175-0826-00 |
| -175 | 175-0827-00 | | | FT | | | | | | CABLE,SP,ELEC:4,26 AWG,STRD,PVC JKT,RBN | 08261 | SS04267(1061)0C |
| -176 | 175-0828-00 | | | FT | | | | | | WIRE,ELECTRICAL:5 WIRE RIBBON | 08261 | SS-0526-710610C |
| -177 | 175-0829-00 | | | FT | | | | | | WIRE,ELECTRICAL:6 WIRE RIBBON | 08261 | SS-0626-710610C |
| -178 | 175-0830-00 | | | FT | | | | | | WIRE,ELECTRICAL:7 WIRE RIBBON | 08261 | SS-0726-710610C |
| -179 | 175-0831-00 | | | FT | | | | | | WIRE,ELECTRICAL:8 WIRE RIBBON | 08261 | SS-0826-710610C |
| | 175-0857-00 | | | FT | | | | | | WIRE,ELECTRICAL:8 WIRE RIBBON | 08261 | SS-0822-7(1061) |
| -180 | 175-0855-00 | | | FT | | | | | | WIRE,ELECTRICAL:10 WIRE RIBBON | 08261 | SS-1022(1061)0C |
| | 175-5830-01 | B375700 | | 1 | | | | | | CABLE ASSY,RF:50 OHM COAX,17.5 L,9-0 | 80009 | 175-5830-01 |
| | 175-5831-00 | B375700 | | 1 | | | | | | CABLE ASSY,RF:50 OHM COAX,2.5 L,9-1 | 80009 | 175-5831-00 |
| | 175-5832-00 | B375700 | | 1 | | | | | | CABLE ASSY,RF:500 OHM COAX,2.5 L,9-2 | 80009 | 175-5832-00 |
| | 175-5833-00 | B375700 | | 1 | | | | | | CABLE ASSY,RF:50 OHM,2.5 L,9-3 | 80009 | 175-5833-00 |
| | 179-1825-00 | B010100 | B375699 | 1 | | | | | | WIRING HARNESS:VERTICAL SIGNAL | 80009 | 179-1825-00 |
| | 179-1825-01 | B375700 | | 1 | | | | | | WIRING HARNESS:VERTICAL SIGNAL | 80009 | 179-1825-01 |
| | 131-0707-00 | | | 4 | | | | | | CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD | 22526 | 47439 |

Replaceable Mechanical Parts—7603/R7603 Service

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | 1 2 3 4 5 | Name & Description | Mfr Code | Mfr Part Number |
|------------------------|-----------------------|------------------|---------|-----|-----------|--|-------------|-----------------|
| | | Eff | Dscont | | | | | |
| 2- | 352-0162-09 | B010100 | B375699 | 1 | | .HLDR,TERM CONN:4 WIRE,WHITE | 80009 | 352-0162-09 |
| | 204-0736-00 | B375700 | | 1 | | .CONN BODY,PLUG:4 CONTACTS,SGL ROW,LKG CLI | 00779 | 1-87175-0 |
| | 343-0549-00 | | | 3 | | .STRAP,TIEDOWN:0.091 W X 4.0 L,ZYTEL | 06383 | PLT1M |
| | 346-0187-00 | | | 1 | | .STRAP,TIEDOWN,E:4.375 L,NYLON W/MARKER | 59730 | TY51M |
| | 175-5930-01 | B375700 | | 1 | | .CABLE ASSY,RF:50 OHM COAX,17.25 L 9-07 | 80009 | 175-5930-01 |
| | 175-5931-01 | B375700 | | 1 | | .CABLE ASSY,RF:50 OHM COAX,17.25 L 9-08 | 80009 | 175-5931-01 |
| | 179-1826-00 | B010100 | B375699 | 1 | | WIRING HARNESS.:SWEEP GATE | 80009 | 179-1826-00 |
| | 179-1826-01 | B375700 | | 1 | | WIRING HARNESS.:SWEEP GATE | 80009 | 179-1826-01 |
| | 131-0707-00 | | | 16 | | .CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD | 22526 | 47439 |
| | 352-0166-03 | B010100 | B375699 | 2 | | .HLDR,TERM CONN:8 WIRE,ORANGE | 80009 | 352-0166-03 |
| | 204-0738-00 | B375700 | | 2 | | .CONN BODY,PLUG:8 CONTACTS,SGL ROW,LKG CLI | 00779 | 1-87175-7 |
| | 343-0549-00 | | | 3 | | .STRAP,TIEDOWN:0.091 W X 4.0 L,ZYTEL | 06383 | PLT1M |
| | 175-5341-01 | B375700 | | 1 | | .CABLE ASSY,RF:50 OHM COAX,15.25L,9-1 | 80009 | 175-5341-01 |
| | 175-5342-01 | B375700 | | 1 | | .CABLE ASSY,RF:50 OHM COAX,15.25L,9-2 | 80009 | 175-5342-01 |
| | 175-5343-01 | B375700 | | 1 | | .CABLE ASSY,RF:50 OHM COAX,15.25L,9-3 | 80009 | 175-5343-01 |
| | 175-5344-01 | B375700 | | 1 | | .CABLE ASSY,RF:50 OHM COAX,15.25L,9-4 | 80009 | 175-5344-01 |
| | 346-0189-00 | | | 1 | | .STRAP,TIEDOWN,E:8.5 L,NYLON W/MARKER | 59730 | TY53M |
| | 179-1827-00 | | | 1 | | WIRING HARNESS:RESET | 80009 | 179-1827-00 |
| | 131-0707-00 | | | 4 | | .CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD | 22526 | 47439 |
| | 352-0162-09 | | | 1 | | .HLDR,TERM CONN:4 WIRE,WHITE | 80009 | 352-0162-09 |
| | 346-0187-00 | | | 1 | | .STRAP,TIEDOWN,E:4.375 L,NYLON W/MARKER | 59730 | TY51M |

Replaceable Mechanical Parts—7603/R7603 Service

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | Name & Description | | | | | Mfr Code | Mfr Part Number |
|------------------------|-----------------------|------------------|---------|-----|--|---|---|---|---|-------------|------------------|
| | | Eff | Dscont | | 1 | 2 | 3 | 4 | 5 | | |
| 3-1 | 200-1209-03 | | | 1 | RTNR,IMPLOSION:6.75 X 5.504 X 0.437,AL ***** (ATTACHING PARTS)***** | | | | | 80009 | 200-1209-03 |
| -2 | 211-0634-00 | | | 2 | THUMBSCREW:6-32 X 0.850 L | | | | | 80009 | 211-0634-00 |
| -3 | 210-0894-00 | | | 2 | WASHER,FLAT:0.19 ID X 0.031 THK ***** (END ATTACHING PARTS)***** | | | | | 09422 | ORD BY DESCR |
| | 198-2595-00 | | | 1 | WIRE SET,ELEC: | | | | | 80009 | 198-2595-00 |
| | 175-2111-00 | B340351 | | 1 | CA ASSY,SP,ELEC:3,26 AWG,21.0 L | | | | | 80009 | 175-2111-00 |
| | 175-0826-00 | B340351 | | FT | .WIRE,ELECTRICAL:3 WIRE RIBBON | | | | | 80009 | 175-0826-00 |
| | 131-0707-00 | B340351 | | 3 | .CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD | | | | | 22526 | 47439 |
| | 352-0161-03 | B340351 | | 1 | .CONN BODY,PL,EL:3 WIRE ORANGE | | | | | 80009 | 352-0161-03 |
| -4 | 204-0476-00 | | | 1 | BODY,TERMINAL:CAMERA POWER ***** (ATTACHING PARTS FOR ASSY)***** | | | | | 80009 | 204-0476-00 |
| -5 | 213-0055-00 | B010100 | B369599 | 2 | SCR.TPG,THD FOR:2-32 X 0.188 INCH,PNH STL | | | | | 93907 | ORD BY DESCR |
| | 213-0241-00 | B369600 | | 2 | SCREW,TPG,TF:2-56 X 0.188,TYPE T,PNH ***** (END ATTACHING PARTS)***** | | | | | 93907 | ORD BY DESCR |
| -6 | 210-0713-01 | B010100 | B340350 | 3 | EYELET,METALLIC:0.059 DIA X 0.125 INCH LON | | | | | 80009 | 210-0713-01 |
| | 210-3072-01 | B340351 | | 3 | RIVET,TUBULAR:0.15 L X 0.059 OD,FILH,BRS | | | | | 80009 | 210-3072-01 |
| -7 | 337-1700-00 | | | 1 | SHLD,IMPLOSION:SMOKEY GREY | | | | | 80009 | 337-1700-00 |
| -8 | 378-0624-00 | | | 1 | REFLECTOR,LIGHT:SCALE ILLUMINATION | | | | | 80009 | 378-0624-00 |
| -9 | 214-1253-00 | | | 1 | SPR HSG,SC LAMP:2.420 INCH L | | | | | 80009 | 214-1253-00 |
| -10 | 358-0378-00 | | | 1 | BUSHING,SLEEVE:0.131 ID X 0.125 L | | | | | 80009 | 358-0378-00 |
| -11 | 366-1391-02 | | | 1 | KNOB:GY,0.081 ID,0.28 OD,0.32 L | | | | | 80009 | 366-1391-02 |
| | 213-0140-00 | | | 1 | .SETSCREW:2-56 X 0.94 INCH,HEX SOC ST | | | | | 70276 | ORD BY DESCR |
| -12 | 366-1077-00 | | | 1 | KNOB:GRAY | | | | | 80009 | 366-1077-00 |
| | 213-0153-00 | | | 1 | .SETSCREW:5-40 X 0.125,STL BK OXD,HEX | | | | | 000CY | ORD BY DESCR |
| -13 | 366-1059-00 | | | 1 | PUSH BUTTON:GRAY | | | | | 80009 | 366-1059-00 |
| -14 | 366-1215-00 | | | 1 | KNOB:GRAY | | | | | 80009 | 366-1215-00 |
| | 213-0153-00 | | | 1 | .SETSCREW:5-40 X 0.125,STL BK OXD,HEX | | | | | 000CY | ORD BY DESCR |
| -15 | 366-1402-02 | | | 2 | PUSH BUTTON:LEFT | | | | | 80009 | 366-1402-02 |
| -16 | 366-1402-03 | | | 1 | PUSH BUTTON:ALT | | | | | 80009 | 366-1402-03 |
| -17 | 366-1402-04 | | | 1 | PUSH BUTTON:ADD | | | | | 80009 | 366-1402-04 |
| -18 | 366-1257-31 | | | 1 | PUSH BUTTON:SIL GRAY,CHOP | | | | | 80009 | 366-1257-31 |
| -19 | 366-1402-06 | | | 2 | PUSH BUTTON:RIGHT | | | | | 80009 | 366-1402-06 |
| -20 | 366-1402-07 | | | 1 | PUSH BUTTON:VERT MODE | | | | | 80009 | 366-1402-07 |
| -21 | 426-0681-00 | | | 8 | FR,PUSH BUTTON: | | | | | 80009 | 426-0681-00 |
| -22 | 136-0387-01 | | | 1 | JACK,TIP:BLACK | | | | | 71279 | 450-4252-01-0310 |
| -23 | 136-0387-00 | | | 3 | JACK,TIP:GRAY | | | | | 71279 | 450-4352-01-0318 |
| -24 | 358-0216-00 | | | 1 | BUSHING,PLASTIC:0.257 ID X 0.412 INCH OD | | | | | 80009 | 358-0216-00 |
| -25 | 333-1587-00 | B010100 | B037999 | 1 | PANEL,FRONT: | | | | | 80009 | 333-1587-00 |
| | 333-1587-01 | B038000 | | 1 | PANEL,FRONT: | | | | | 80009 | 333-1587-01 |
| -26 | 386-2269-00 | | | 1 | SUBPANEL,FRONT:CENTER ***** (ATTACHING PARTS)***** | | | | | 80009 | 386-2269-00 |
| -27 | 211-0559-00 | | | 4 | SCREW,MACHINE:6-32 X 0.375" 100 DEG,FLH ST ***** (END ATTACHING PARTS)***** | | | | | 83385 | ORD BY DESCR |
| -28 | 136-0445-00 | | | 1 | LAMPHOLDER ASSY:3 SUBMIN GROOVE BASE ***** (ATTACHING PARTS)***** | | | | | 71744 | 4609-005 |
| -29 | 211-0501-00 | | | 2 | SCREW,MACHINE:6-32 X 0.125 INCH,PNH STL ***** (END ATTACHING PARTS)***** | | | | | 83385 | ORD BY DESCR |
| -30 | 385-0079-00 | | | 2 | SPACER,POST:0.375 L W/6-32 THD THRU.AL ***** (ATTACHING PARTS)***** | | | | | 80009 | 385-0079-00 |
| | 211-0541-00 | | | 2 | SCREW,MACHINE:6-32 X 0.25" 100 DEG,FLH STL ***** (END ATTACHING PARTS)***** | | | | | 83385 | ORD BY DESCR |
| | 200-0103-00 | B061463 | | 1 | NUT,PLAIN,KNURL:0.25-28 X 0.375" OD,BRASS | | | | | 80009 | 200-0103-00 |
| | 355-0131-00 | B061463 | | 1 | STUD,BDG POST:GROUND ***** (ATTACHING PARTS)***** | | | | | 80009 | 355-0131-00 |
| | 212-0023-00 | B061463 | | 1 | SCREW,MACHINE:8-32 X 0.375,PNH,STL,CD PL | | | | | 83385 | ORD BY DESCR |
| | 210-0008-00 | B061463 | | 1 | WASHER,LOCK:INTL,0.02 THK ***** (END ATTACHING PARTS)***** | | | | | 78189 | 1208-00-00-0541C |
| -31 | 407-0915-00 | | | 1 | BRACKET,ANGLE:ALUMINUM ***** (ATTACHING PARTS)***** | | | | | 80009 | 407-0915-00 |
| | 211-0541-00 | | | 2 | SCREW,MACHINE:6-32 X 0.25" 100 DEG,FLH STL ***** (END ATTACHING PARTS)***** | | | | | 83385 | ORD BY DESCR |

Replaceable Mechanical Parts—7603/R7603 Service

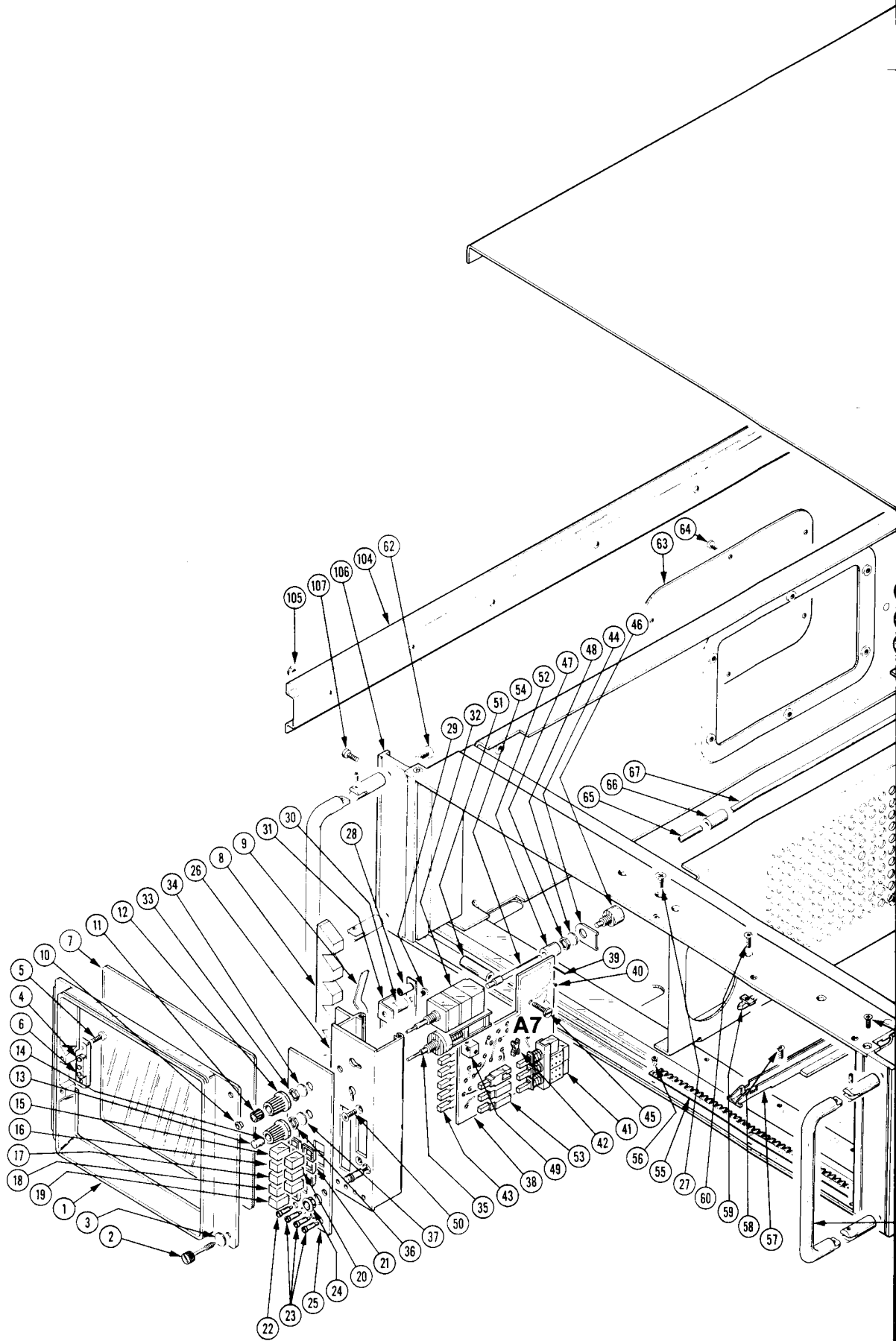
| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | 1 2 3 4 5 | Name & Description | Mfr Code | Mfr Part Number |
|------------------------|-----------------------|------------------|---------|-----|-----------|--|-------------|-----------------|
| | | Eff | Dscont | | | | | |
| 3-32 | ----- | | | 2 | | RESISTOR,VAR:(SEE R102A REPL) ***** (ATTACHING PARTS)***** | | |
| -33 | 210-0583-00 | | | 2 | | NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS | 73743 | 2X20317-402 |
| -34 | 210-0940-00 | | | 2 | | WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL ***** (END ATTACHING PARTS)***** | 79807 | ORD BY DESCR |
| -35 | ----- | | | - | | RESISTOR,VAR:(SEE R1095,S1030 REPL) ***** (ATTACHING PARTS)***** | | |
| -36 | 210-0583-00 | | | 1 | | NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS | 73743 | 2X20317-402 |
| -37 | 210-0940-00 | | | 1 | | WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL ***** (END ATTACHING PARTS)***** | 79807 | ORD BY DESCR |
| -38 | ----- | | | 1 | | CKT BOARD ASSY:VERT MODE & CAL(SEE A7 REPL) | | |
| -39 | 131-0608-00 | | | 46 | | .TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD | 22526 | 48283-036 |
| -40 | 136-0252-04 | B010100 | B122799 | 12 | | .SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS | 22526 | 75060-007 |
| | 136-0350-00 | B122800 | B341999 | 4 | | .SOCKET,PLUG-IN:3 PIN,LOW PROFILE | 80009 | 136-0350-00 |
| | 136-0252-07 | B342000 | | 12 | | .SOCKET,PIN CONN:W/O DIMPLE | 22526 | 75060-012 |
| -41 | 260-1379-00 | | | 1 | | .SWITCH,PUSH:TRIG SOURCE ***** (ATTACHING PARTS)***** | 59821 | 2KBC120000595 |
| -42 | 361-0411-00 | | | 4 | | .SPACER,PUSH SW:0.13 W X 0.375 INCH L,PLST ***** (END ATTACHING PARTS)***** | 71590 | J64285-00 |
| -43 | 260-1378-00 | | | 1 | | .SWITCH,PUSH:VERT MODE ***** (ATTACHING PARTS)***** | 59821 | 2KBC140000608 |
| | 361-0411-00 | | | 3 | | .SPACER,PUSH SW:0.13 W X 0.375 INCH L,PLST ***** (END ATTACHING PARTS)***** | 71590 | J64285-00 |
| -44 | 386-2285-00 | | | 1 | | .PL,VAR RES MTG:CIRCUIT BOARD | 80009 | 386-2285-00 |
| | 352-0161-00 | | | 1 | | .HLDR,TERM CONN:3 WIRE,BLACK,0.1 SPACING | 80009 | 352-0161-00 |
| | 131-0707-00 | | | 2 | | .CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD | 22526 | 47439 |
| | 131-0993-00 | | | 1 | | .BUS,CONDUCTOR:2 WIRE BLACK ***** (ATTACHING PARTS FOR CKT BD)***** | 00779 | 850100-01 |
| | 211-0008-00 | | | 2 | | SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ | 83385 | ORD BY DESCR |
| -45 | 211-0040-00 | | | 1 | | SCREW,MACHINE:4-40 X 0.25",BDGH PLSTC ***** (END ATTACHING PARTS)***** | 26365 | ORD BY DESCR |
| -46 | ----- | | | 1 | | RESISTOR,VAR:(SEE R1045 REPL) ***** (ATTACHING PARTS)***** | | |
| -47 | 210-0583-00 | | | 1 | | NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS | 73743 | 2X20317-402 |
| -48 | 210-0940-00 | | | 1 | | WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL ***** (END ATTACHING PARTS)***** | 79807 | ORD BY DESCR |
| | 439-0448-00 | B346721 | | 1 | | CRT MATERIAL:LEAD FOIL ADHESIVE TAPE | 53387 | 3M421 |
| -49 | 220-0455-00 | | | 2 | | NUT,BLOCK:0.281"SQ,THREE 4-40 THRU TH ***** (ATTACHING PARTS)***** | 80009 | 220-0455-00 |
| -50 | 211-0101-00 | | | 2 | | SCREW,MACHINE:4-40 X 0.25,FLH,100 DEG,STL ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -51 | 361-0137-00 | | | 1 | | POST,ELEC-MECH:1.345 INCH,W/4-40 THREAD ***** (ATTACHING PARTS)***** | 80009 | 361-0137-00 |
| | 211-0008-00 | | | 1 | | SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -52 | 376-0029-00 | B010100 | B039999 | 1 | | CPLG,SHAFT,RGD:0.128 ID X 0.312 OD X 0.5"L | 80009 | 376-0029-00 |
| -53 | 384-1136-00 | | | 3 | | EXTENSION SHAFT:0.95 INCH LONG | 80009 | 384-1136-00 |
| -54 | 384-1112-01 | B010100 | B092114 | 1 | | EXTENSION SHAFT:1.910 INCH L,EPOXY GLASS | 80009 | 384-1112-01 |
| -55 | 348-0274-01 | B010100 | B092114 | 2 | | SHLD GSKT,ELEK:FINGER TYPE,7.872 | 80009 | 348-0274-01 |
| | 348-0354-00 | B091125 | B345563 | 2 | | SHLD GSKT,ELEC:8.10 INCH LONG | 80009 | 348-0354-00 |
| | 348-0625-00 | B345564 | | 2 | | SHLD GSKT,ELEK:8.1 L ***** (ATTACHING PARTS)***** | 80009 | 348-0625-00 |
| -56 | 210-0632-00 | B010100 | B092114 | 6 | | EYELET,METALLIC:0.089 OD X 0.125"LONG,BRS ***** (END ATTACHING PARTS)***** | 01881 | 3168 |
| -57 | 351-0295-02 | | | 3 | | GUIDE,SLIDE:PLUG-IN,LWR ***** (ATTACHING PARTS)***** | 80009 | 351-0295-02 |
| -58 | 211-0105-00 | | | 3 | | SCREW,MACHINE:4-40 X 0.188,100 DEG,FLH ST | 83385 | ORD BY DESCR |
| | 213-0088-00 | | | 3 | | SCR,TPG,THD CTG:4-24 X 0.25 INCH,PNH STL ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -59 | 351-0305-01 | | | 3 | | GUIDE,PLUG-IN:UPPER ***** (ATTACHING PARTS)***** | 80009 | 351-0305-01 |
| -60 | 211-0105-00 | | | 3 | | SCREW,MACHINE:4-40 X 0.188,100 DEG,FLH ST ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |

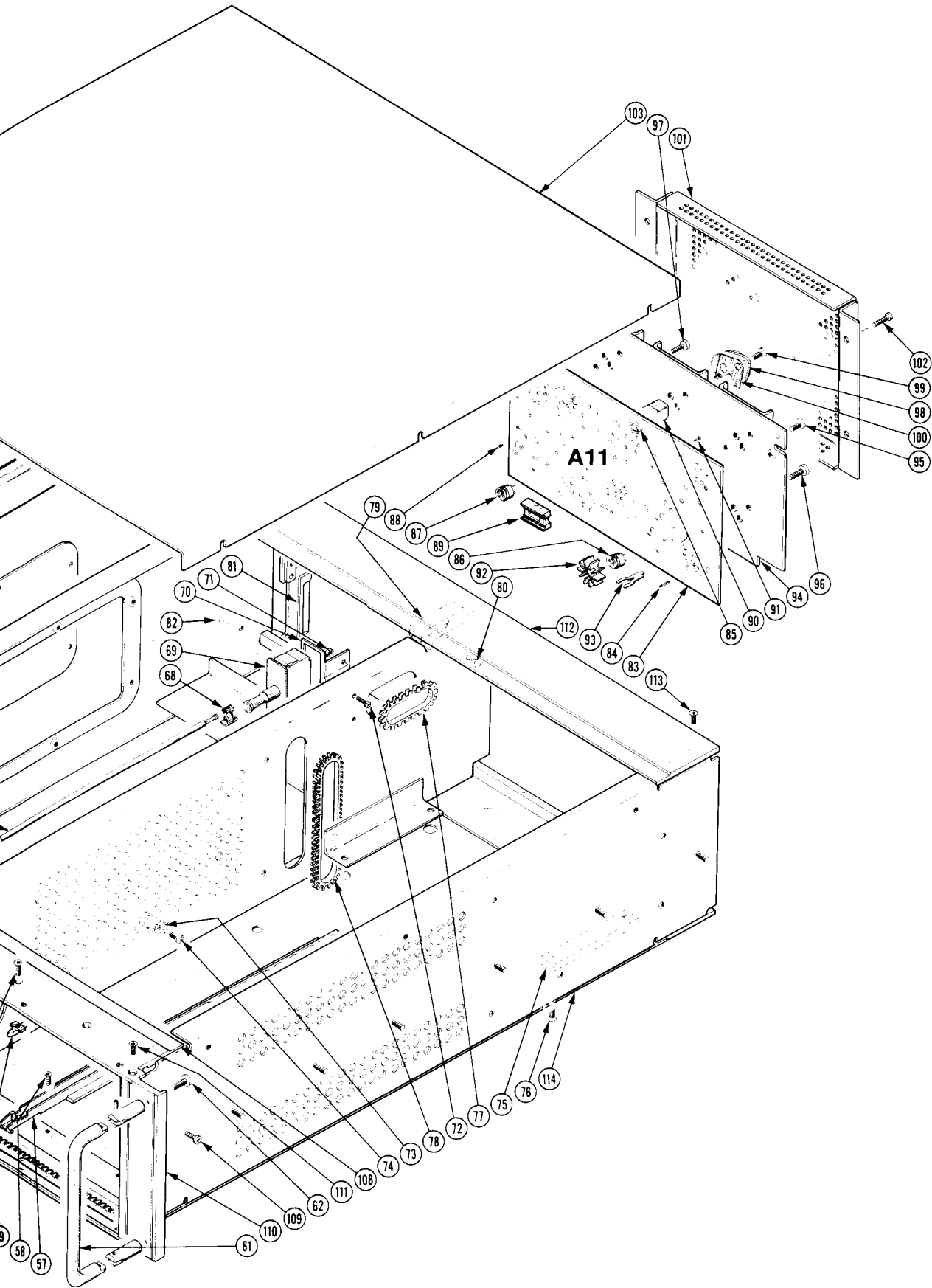
Replaceable Mechanical Parts—7603/R7603 Service

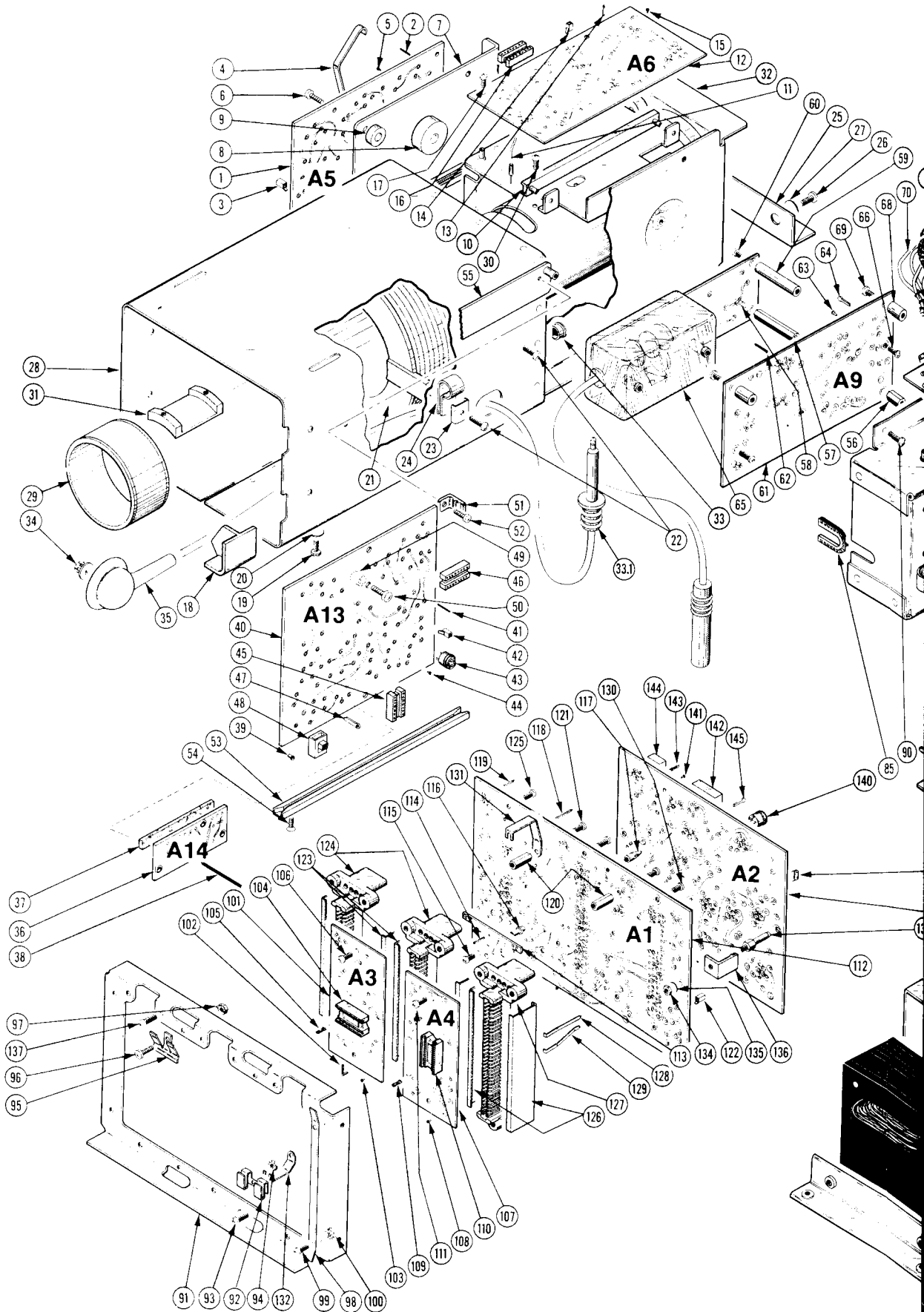
| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | 1 2 3 4 5 | Name & Description | Mfr Code | Mfr Part Number |
|------------------------|-----------------------|------------------|---------|-----|-----------|--|-------------|-----------------|
| | | Eff | Dscont | | | | | |
| 3-61 | 367-0138-00 | B010100 | B372299 | 2 | | HANDLE,BOW:U SHAPED | 06540 | 14053-A-1032-1B |
| | 367-0022-00 | B372300 | | 2 | | HANDLE,BOW:1.5 X 4.5 INCH ***** (ATTACHING PARTS) ***** | 88245 | 15986 |
| -62 | 212-0518-00 | | | 4 | | SCREW,MACHINE:10-32 X 0.312,PNH,STL,CD PL ***** (END ATTACHING PARTS) ***** | 83385 | ORD BY DESCR |
| -63 | 200-1259-00 | | | 1 | | COVER,ACCESS:6.1 X 4.0,AL ***** (ATTACHING PARTS) ***** | 80009 | 200-1259-00 |
| -64 | 211-0008-00 | | | 6 | | SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ ***** (END ATTACHING PARTS) ***** | 83385 | ORD BY DESCR |
| -65 | 384-1081-00 | | | 1 | | EXTENSION SHAFT:W/KNOB | 80009 | 384-1081-00 |
| -66 | 376-0053-00 | | | 1 | | CPLG.SHAFT,RGD:0.128 ID X 0.312 OD | 80009 | 376-0053-00 |
| -67 | 384-1107-00 | | | 1 | | EXTENSION SHAFT:7.07 L X 0.125 OD AL | 80009 | 384-1107-00 |
| -68 | 376-0127-00 | | | 1 | | COUPLER,SHAFT:PLASTIC | 80009 | 376-0127-00 |
| -69 | ----- | | | 1 | | SWITCH,PUH-PUL:(SEE S1001 REPL) | | |
| -70 | 407-0895-00 | B010100 | B316499 | 1 | | BRACKET,ELEC SW:ALUMINUM | 80009 | 407-0895-00 |
| | 407-0895-01 | B316500 | | 1 | | BRACKET,ELEC SW:ALUMINUM ***** (ATTACHING PARTS) ***** | 80009 | 407-0895-01 |
| -71 | 210-0586-00 | | | 2 | | NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL | 78189 | 211-041800-00 |
| -72 | 211-0008-00 | | | 2 | | SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ ***** (END ATTACHING PARTS) ***** | 83385 | ORD BY DESCR |
| -73 | 351-0312-00 | | | 1 | | GUIDE,SHAFT:0.312 OD X 0.52,NYLON ***** (ATTACHING PARTS) ***** | 80009 | 351-0312-00 |
| -74 | 213-0124-00 | | | 1 | | SCR,TPG,THD FOR:6-20 X 0.250 INCH,PNH STL ***** (END ATTACHING PARTS) ***** | 83385 | ORD BY DESCR |
| -75 | 386-2054-00 | | | 1 | | SPRT,PWR SUPPLY: ***** (ATTACHING PARTS) ***** | 80009 | 386-2054-00 |
| -76 | 211-0101-00 | | | 1 | | SCREW,MACHINE:4-40 X 0.25,FLH,100 DEG,STL ***** (END ATTACHING PARTS) ***** | 83385 | ORD BY DESCR |
| -77 | 255-0334-00 | | | FT | | PLASTIC CHANNEL:12.75 X 0.175 X 0.155,NYL | 11897 | 122-37-2500 |
| -78 | 255-0334-00 | | | FT | | PLASTIC CHANNEL:12.75 X 0.175 X 0.155,NYL | 11897 | 122-37-2500 |
| -79 | 220-0614-00 | | | 1 | | NUT,BLOCK:0.375 X 1.25 X 0.347,(2)6-3 ***** (ATTACHING PARTS) ***** | 80009 | 220-0614-00 |
| -80 | 211-0507-00 | | | 2 | | SCREW,MACHINE:6-32 X 0.312,PNH STL,CD PL ***** (END ATTACHING PARTS) ***** | 83385 | ORD BY DESCR |
| -81 | 407-1145-02 | | | 1 | | BRACKET,HEAT SK:RIGHT,DELIN ***** (ATTACHING PARTS) ***** | 80009 | 407-1145-02 |
| -82 | 211-0504-00 | | | 2 | | SCREW,MACHINE:6-32 X 0.250,PNH STL,CD PL ***** (END ATTACHING PARTS) ***** | 83385 | ORD BY DESCR |
| -83 | ----- | | | 1 | | CKT BOARD ASSY:REGULATOR(SEE A11 REPL) | | |
| -84 | 131-0608-00 | | | 47 | | .TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD | 22526 | 48283-036 |
| -85 | 131-0847-00 | B010100 | B369019 | 12 | | .TERMINAL STUD:6-32 X 0.435 INCH LONG | 80009 | 131-0847-00 |
| | 166-0032-00 | B369020 | | 12 | | .SPACER,SLEEVE:0.18 ID X 0.313 INCH LONG | 80009 | 166-0032-00 |
| -86 | 136-0183-00 | | | 3 | | .SOCKET,PLUG-IN:3 PIN,ROUND | 80009 | 136-0183-00 |
| -87 | 136-0235-00 | | | 3 | | .SOCKET,PLUG-IN:6 CONTACT,ROUND | 71785 | 133-96-12-062 |
| -88 | 136-0252-04 | B010100 | B122799 | 45 | | .SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS | 22526 | 75060-007 |
| | 136-0252-04 | B122800 | | 18 | | .SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS | 22526 | 75060-007 |
| | 136-0350-00 | B122800 | B343770 | 9 | | .SOCKET,PLUG-IN:3 PIN,LOW PROFILE | 80009 | 136-0350-00 |
| | 136-0252-07 | B343771 | | 27 | | .SOCKET,PIN CONN:W/O DIMPLE | 22526 | 75060-012 |
| -89 | 136-0269-02 | | | 1 | | .SKT,PL-IN ELEK:MICROCIRCUIT,14 DIP | 09922 | DILB149P-108 |
| -90 | 136-0361-00 | | | 6 | | .SPACER,XSTR: | 80009 | 136-0361-00 |
| -91 | 136-0384-00 | | | 12 | | .SOCKET,PIN TERM:FOR 0.04 DIAMETER PIN | 00779 | 52120 |
| -92 | 214-1291-00 | | | 3 | | .HEAT SINK,ELEC:XSTR,0.72 OD X 0.375"H | 05820 | 207SB |
| -93 | 344-0154-00 | | | 2 | | .CLIP,ELECTRICAL:FUSE,CKT BD MT | 80009 | 344-0154-00 |
| -94 | 214-0973-00 | B373031 | | 1 | | .HEAT SINK,ELEC:0.28 X 0.18 OVAL X 0.187"H | 80009 | 214-0973-00 |
| | 441-1060-01 | | | 1 | | CHAS,ELEC EQPT:MAIN ***** (ATTACHING PARTS) ***** | 80009 | 441-1060-01 |
| -95 | 211-0538-00 | | | 1 | | SCREW,MACHINE:6-32 X 0.312" 100 DEG,FLH | 83385 | ORD BY DESCR |
| -96 | 211-0541-00 | | | 2 | | SCREW,MACHINE:6-32 X 0.25" 100 DEG,FLH STL | 83385 | ORD BY DESCR |
| -97 | 213-0034-00 | | | 2 | | SCR,TPG,THD CTG:4-40 X 0.188 INCH,PNH STL ***** (END ATTACHING PARTS) ***** | T0858 | ORD BY DESCR |
| -98 | ----- | | | 6 | | TRANSISTOR: ***** (ATTACHING PARTS) ***** | | |
| -99 | 211-0511-00 | B010100 | B369019 | 12 | | SCREW,MACHINE:6-32 X 0.500,PNH,STL,CD PL | 83385 | ORD BY DESCR |
| | 211-0145-00 | B369020 | | 12 | | SCREW,MACHINE:4-40 X 1 INCH,PNH BRS | 83385 | ORD BY DESCR |
| | 200-0237-04 | B358735 | | 1 | | COVER,FUSE HLDR:PLASTIC,SAFETY CONTROLLED | 80009 | 200-0237-04 |
| -100 | 386-0978-00 | | | 6 | | INSULATOR,PLATE:TRANSISTOR,MICA ***** (END ATTACHING PARTS) ***** | 80009 | 386-0978-00 |

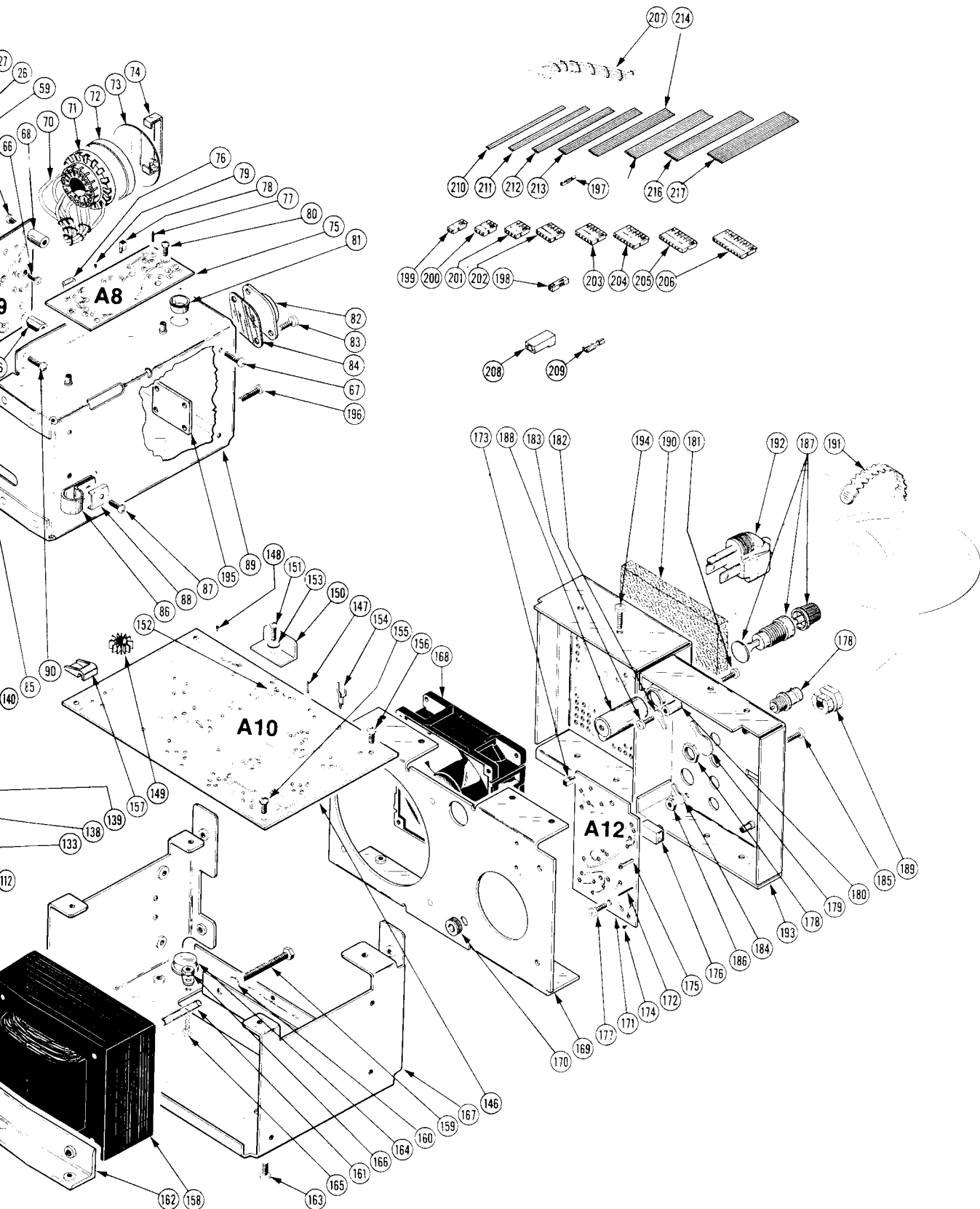
Replaceable Mechanical Parts—7603/R7603 Service

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | 1 2 3 4 5 | Name & Description | Mfr | |
|------------------------|-----------------------|------------------|---------|-----|-----------|--|-------|-----------------|
| | | Eff | Dscont | | | | Code | Mfr Part Number |
| 3-101 | 337-1731-00 | | | 1 | | SHIELD,ELEC:REGULATOR ***** (ATTACHING PARTS) ***** | 80009 | 337-1731-00 |
| -102 | 211-0516-00 | | | 4 | | SCREW,MACHINE:6-32 X 0.875,PNH STL,CD PL ***** (END ATTACHING PARTS) ***** | 83385 | ORD BY DESCR |
| -103 | 390-0229-00 | | | 1 | | COVER,SCOPE:TOP | 80009 | 390-0229-00 |
| -104 | 351-0313-00 | | | 1 | | GUIDE,RACKMOUNT:19.218 INCH LONG,PAIR ***** (ATTACHING PARTS) ***** | 06666 | ORD BY DESCR |
| -105 | 210-0458-00 | | | 11 | | NUT,PL,ASSEM WA:8-32 X 0.344,STL,CD PL ***** (END ATTACHING PARTS) ***** | 78189 | 511-081800-00 |
| | 129-0441-00 | B060000 | | 2 | | POST,ELEC-MECH:0.125 OD X 5.045 INCH LONG ***** (ATTACHING PARTS) ***** | 80009 | 129-0441-00 |
| | 211-0087-01 | B060000 | | 4 | | SCREW,MACHINE:2-56 X 0.188,FLH 82 DEG,STL ***** (END ATTACHING PARTS) ***** | 83385 | ORD BY DESCR |
| -106 | 407-0969-01 | B343853 | | 1 | | BRACKET,ANGLE:RACKMOUNT,LEFT,ALUMINUM ***** (ATTACHING PARTS) ***** | 80009 | 407-0969-01 |
| -107 | 211-0503-00 | B343853 | | 2 | | SCREW,MACHINE:6-32 X 0.188 INCH,PNH STL ***** (END ATTACHING PARTS) ***** | 83385 | ORD BY DESCR |
| -108 | 426-0973-03 | B343853 | | 1 | | FRAME SECT,CAB.:UPPER FRONT ***** (ATTACHING PARTS) ***** | 80009 | 426-0973-03 |
| -109 | 211-0502-00 | B343853 | | 3 | | SCREW,MACHINE:6-32 X 0.188,FLH,100 DEG,ST | 83385 | ORD BY DESCR |
| | 210-1083-00 | | | 1 | | WASHER,SPR TNSN:0.161 ID X 0.006 THK,0.25 | 78189 | 3502-08-14 |
| | ----- | | | - | | (ADD AS NEEDED) ***** (END ATTACHING PARTS) ***** | | |
| -110 | 407-0968-01 | B343853 | | 1 | | BRACKET,ANGLE:RACKMOUNT,RIGHT,ALUMINUM ***** (ATTACHING PARTS) ***** | 80009 | 407-0968-01 |
| -111 | 211-0501-00 | B343853 | | 2 | | SCREW,MACHINE:6-32 X 0.125 INCH,PNH STL ***** (END ATTACHING PARTS) ***** | 83385 | ORD BY DESCR |
| -112 | 426-0804-01 | B343853 | | 1 | | FRAME SECT,CAB.:TOP REAR ***** (ATTACHING PARTS) ***** | 80009 | 426-0804-01 |
| -113 | 211-0502-00 | B343853 | | 6 | | SCREW,MACHINE:6-32 X 0.188,FLH,100 DEG,ST ***** (END ATTACHING PARTS) ***** | 83385 | ORD BY DESCR |
| -114 | 437-0126-00 | B010100 | B059999 | 1 | | CABINET,SCOPE: | 80009 | 437-0126-00 |
| | 437-0143-00 | B060000 | B092114 | 1 | | CABINET,SCOPE: | 80009 | 437-0143-00 |
| | 437-0143-01 | B092115 | B343852 | 1 | | CABINET,SCOPE: | 80009 | 437-0143-01 |
| | 437-0143-04 | B343853 | | 1 | | CAB.,ELEC EQPT: | 80009 | 437-0143-04 |
| | 129-0441-00 | B060000 | | 2 | | POST,ELEC-MECH:0.125 OD X 5.045 INCH LONG ***** (ATTACHING PARTS) ***** | 80009 | 129-0441-00 |
| | 211-0087-01 | B060000 | | 4 | | SCREW,MACHINE:2-56 X 0.188,FLH 82 DEG,STL ***** (END ATTACHING PARTS) ***** | 83385 | ORD BY DESCR |









Replaceable Mechanical Parts—7603/R7603 Service

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | Name & Description | | | | | Mfr Code | Mfr Part Number |
|------------------|--------------------|------------------|---------|-----|--|---|---|---|---|----------|-----------------|
| | | Eff | Dscont | | 1 | 2 | 3 | 4 | 5 | | |
| 4-1 | ----- | | | 1 | CKT BOARD ASSY:VERTICAL AMPL(SEE A5 REPL) | | | | | | |
| -2 | 131-0589-00 | | | 7 | .TERMINAL,PIN:0.46 L X 0.025 SQ | | | | | 22526 | 48283-029 |
| -3 | 131-1003-00 | | | 1 | .CONN,RCPT,ELEC:CKT BD MT,3 PRONG | | | | | 80009 | 131-1003-00 |
| -4 | 131-1303-00 | | | 1 | .CONTACT,ELEC:IC GROUND | | | | | 000FR | MG-100 |
| -5 | 136-0252-07 | | | 9 | .SOCKET,PIN CONN:W/O DIMPLE | | | | | 22526 | 75060-012 |
| | 136-0252-01 | | | 19 | .CONTACT,ELEC:0.178 INCH LONG | | | | | 00779 | 1-332095-2 |
| | 346-0171-00 | B343400 | | 1 | STRAP,GROUNDING:2.0 L,COPPER ***** (ATTACHING PARTS)***** | | | | | 80009 | 346-0171-00 |
| -6 | 211-0014-00 | | | 2 | SCREW,MACHINE:4-40 X 0.50 INCH,PNH STL | | | | | 83385 | ORD BY DESCR |
| | 211-0008-00 | | | 1 | SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ ***** (END ATTACHING PARTS)***** | | | | | 83385 | ORD BY DESCR |
| -7 | 214-1652-00 | | | 1 | HEAT SINK,ELEC:VERT CKT BOARD,AL | | | | | 80009 | 214-1652-00 |
| -8 | 214-1757-00 | | | 1 | HEAT SINK,ELEC:1.0 DIA X 0.27 THICK | | | | | 80009 | 214-1757-00 |
| -9 | 361-0477-00 | | | 2 | SPACER,SLEEVE:0.25 L X 0.238 ID | | | | | 80009 | 361-0477-00 |
| -10 | 351-0087-00 | | | 2 | GUIDE,CKT BOARD:4.75 INCH LONG,PLASTIC | | | | | 80009 | 351-0087-00 |
| -11 | 195-0085-00 | | | 1 | LEAD SET,ELEC:CRT DEFLECTION | | | | | 80009 | 195-0085-00 |
| | 131-0865-00 | | | 4 | CONTACT,ELEC:0.450 INCH L | | | | | 80009 | 131-0865-00 |
| -12 | ----- | | | 1 | CKT BOARD ASSY:HORIZONTAL AMPL(SEE A6 REPL) | | | | | | |
| -13 | 131-0608-00 | | | 17 | .TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD | | | | | 22526 | 48283-036 |
| -14 | 131-1003-00 | | | 2 | .CONN,RCPT,ELEC:CKT BD MT,3 PRONG | | | | | 80009 | 131-1003-00 |
| -15 | 136-0252-04 | B010100 | B122799 | 25 | .SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS | | | | | 22526 | 75060-007 |
| | 136-0252-07 | B342000 | | 24 | .SOCKET,PIN CONN:W/O DIMPLE | | | | | 22526 | 75060-012 |
| | 136-0365-00 | B122800 | B341999 | 6 | .SKT,PL-IN ELEK:TRANSISTOR,3 CONTACT | | | | | 80009 | 136-0365-00 |
| | 136-0350-00 | B122800 | B341999 | 2 | .SOCKET,PLUG-IN:3 PIN,LOW PROFILE | | | | | 80009 | 136-0350-00 |
| | 136-0252-01 | | | 2 | CONTACT,ELEC:0.178 INCH LONG | | | | | 00779 | 1-332095-2 |
| -16 | 136-0260-02 | | | 1 | .SKT,PL-IN ELEK:MICROCIRCUIT,16 DIP,LOW CL | | | | | 09922 | DILB16P-108T |
| | 129-0075-00 | B030000 | B060000 | 1 | .INSULATOR,STDF:0.312 OD X 0.128 OD X 0.76 | | | | | 80009 | 129-0075-00 |
| | 361-0007-00 | B030000 | B060000 | 1 | .SPACER,SLEEVE:0.250 INCH DIA,PLASTIC ***** (ATTACHING PARTS FOR CKT BD)***** | | | | | 80009 | 361-0007-00 |
| -17 | 211-0008-00 | | | 2 | SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ ***** (END ATTACHING PARTS)***** | | | | | 83385 | ORD BY DESCR |
| -18 | 386-1952-00 | | | 4 | SUPPORT,CRT:FRONT ***** (ATTACHING PARTS)***** | | | | | 80009 | 386-1952-00 |
| -19 | 211-0603-00 | | | 4 | SCREW,MACHINE:6-32 X 0.312 INCH,HEX HD ST | | | | | 83385 | ORD BY DESCR |
| -20 | 210-0803-00 | | | 4 | WASHER,FLAT:0.15 ID X 0.032 THK,STL CD ***** (END ATTACHING PARTS)***** | | | | | 12327 | ORD BY DESCR |
| -21 | 119-0288-02 | | | 1 | DELAY LINE,ELEC:148NS,100 OHM,W/BEAM ROTR ***** (ATTACHING PARTS)***** | | | | | 80009 | 119-0288-02 |
| -22 | 213-0034-00 | | | 2 | SCR,TPG,THD CTG:4-40 X 0.188 INCH,PNH STL | | | | | T0858 | ORD BY DESCR |
| -23 | 210-0863-00 | | | 1 | WSHR,LOOP CLAMP:0.187 ID U/W 0.5 W CLP,STL ***** (END ATTACHING PARTS)***** | | | | | 95987 | C191 |
| -24 | 343-0013-00 | | | 1 | CLAMP,LOOP:0.375 ID,PLASTIC | | | | | 95987 | 3-8-6B |
| -25 | 407-0970-00 | | | 1 | BRACKET,ANGLE:ALUMINUM ***** (ATTACHING PARTS)***** | | | | | 80009 | 407-0970-00 |
| | 211-0507-00 | | | 2 | SCREW,MACHINE:6-32 X 0.312,PNH STL,CD PL | | | | | 83385 | ORD BY DESCR |
| | 210-0457-00 | | | 2 | NUT,PL,ASSEM WA:6-32 X 0.312,STL CD PL ***** (END ATTACHING PARTS)***** | | | | | 83385 | ORD BY DESCR |
| | 348-0340-00 | B346721 | | 1 | SHLD,GSKT,ELEC:0.125 X 0.125 FT L,FOAM | | | | | 07700 | 85-10168 |
| | 337-1432-04 | | | 1 | SHIELD,CRT:W/CHAS & COIL ***** (ATTACHING PARTS)***** | | | | | 80009 | 337-1432-04 |
| -26 | 211-0510-00 | | | 2 | SCREW,MACHINE:6-32 X 0.375,PNH,STL,CD PL | | | | | 83385 | ORD BY DESCR |
| -27 | 210-0949-00 | | | 2 | WASHER,FLAT:0.141 ID X 0.50 INCH OD,BRS ***** (END ATTACHING PARTS)***** | | | | | 12327 | ORD BY DESCR |
| -28 | 337-1432-00 | | | 1 | SHIELD,CRT: | | | | | 80009 | 337-1432-00 |
| -29 | ----- | | | 1 | .COIL:(SEE L1098 REPL) ***** (ATTACHING PARTS)***** | | | | | | |
| -30 | 213-0138-00 | | | 2 | .SCR,TPG,TF:4-24 X 0.188 INCH,PNH STL ***** (END ATTACHING PARTS)***** | | | | | 83385 | ORD BY DESCR |
| -31 | 343-0217-00 | | | 1 | .CLAMP,COIL:Y-AXIS | | | | | 80009 | 343-0217-00 |
| | 252-0562-00 | | | FT | .PLASTIC EXTR:0.100 X 0.12,POLYETHYLENE | | | | | T0608 | ORD BY DESCR |
| -32 | 441-1124-00 | | | 1 | .CHAS ASSY,SCOPE: ***** (ATTACHING PARTS)***** | | | | | 80009 | 441-1124-00 |
| | 210-0781-00 | B010100 | B139999 | 2 | .RIVET,BLIND:0.125 L X 0.156 OD,AL | | | | | 83385 | ORD BY DESCR |
| | 211-0590-00 | B140000 | | 2 | SCREW,MACHINE:6-32 X 0.250,PNH,BRS,CD PL | | | | | 83385 | ORD BY DESCR |
| | 210-0457-00 | B140000 | | 2 | .NUT,PL,ASSEM WA:6-32 X 0.312,STL CD PL ***** (END ATTACHING PARTS)***** | | | | | 83385 | ORD BY DESCR |

Replaceable Mechanical Parts—7603/R7603 Service

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Qty | 1 2 3 4 5 | Name & Description | Mfr Code | Mfr Part Number |
|------------------|--------------------|----------------------|---------|-----|-----------|---|----------|------------------|
| 4-33 | 348-0056-00 | | | 2 | | GROMMET, PLASTIC: 0.375 INCH DIA | 80009 | 348-0056-00 |
| | 348-0070-01 | B193960 | | 1 | | PAD, CUSHIONING: 2.03 X 0.69 X 0.18 SI RBR | 80009 | 348-0070-01 |
| -33.1 | 131-1093-00 | | | 1 | | LEAD, ELECTRICAL: ANODE | 80009 | 131-1093-00 |
| -34 | 131-0026-00 | | | 1 | | .BUTTON, PLUG: 0.578 OD X 0.125 THK STL CD | 83058 | SS-48149 |
| -35 | 200-0541-00 | | | 1 | | .RTNR, AIR FILTER: 0.594 X 4.562 X 5.625, AL | 80009 | 200-0541-00 |
| | 672-0572-00 | B220000 | | 1 | | CKT BOARD ASSY: READOUT PROTECTION #1 | 80009 | 672-0572-00 |
| -36 | ----- | B220000 | | 1 | | .CKT BOARD ASSY: PROTECTION (SEE A14 REPL) | | |
| -37 | 253-0162-00 | B220000 | B342019 | FT | | ..TAPE, PRESS SENS: POLYURETHANE SPONGE | 04963 | 4116 TYPE A |
| | 253-0160-00 | B342020 | | 1 | | ..TAPE, PRESS SENS: ADHESIVE, 2.124 FT LONG | 04963 | 4116 TYPE A |
| -38 | 131-0589-00 | B220000 | | 20 | | ..TERMINAL, PIN: 0.46 L X 0.025 SQ | 22526 | 48283-029 |
| -39 | 210-0702-00 | B220000 | | 2 | | ..EYELET, METALLIC: 0.047 OD X 0.125 INCH LO | 07707 | S6127 |
| -40 | ----- | | | 1 | | .CKT BOARD ASSY: READOUT (SEE A13 REPL) | | |
| -41 | 131-0608-00 | | | 42 | | ..TERMINAL, PIN: 0.365 L X 0.025 PH BRZ GOLD | 22526 | 48283-036 |
| -42 | 131-1003-00 | | | 6 | | ..CONN, RCPT, ELEC: CKT BD MT, 3 PRONG | 80009 | 131-1003-00 |
| -43 | 136-0235-00 | | | 1 | | ..SOCKET, PLUG-IN: 6 CONTACT, ROUND | 71785 | 133-96-12-062 |
| -44 | 136-0252-07 | | | 42 | | ..SOCKET, PIN CONN: W/O DIMPLE | 22526 | 75060-012 |
| | 136-0252-01 | | | 14 | | ..CONTACT, ELEC: 0.178 INCH LONG | 00779 | 1-332095-2 |
| -45 | 136-0260-02 | B010100 | B372599 | 14 | | ..SKT, PL-IN ELEK: MICRO CIRCUIT, 16 DIP, LOW CL | 09922 | DILB16P-108T |
| | 136-0729-00 | B372600 | | 14 | | ..SKT, PL-IN ELEK: MICROCKT, 16 CONTACT | 09922 | DILB16P-108T |
| -46 | 136-0269-02 | B010100 | B372599 | 3 | | ..SKT, PL-IN ELEK: MICRO CIRCUIT, 14 DIP | 09922 | DILB149P-108 |
| | 136-0728-00 | B372600 | | 3 | | ..SKT, PL-IN ELEK: MICROCKT, 14 CONTACT | 09922 | DILB14P-108 |
| -47 | 214-0579-00 | B010100 | B219999 | 21 | | ..TERM, TEST POINT: BRS CD PL | 80009 | 214-0579-00 |
| | 214-0579-00 | B220000 | | 20 | | ..TERM, TEST POINT: BRS CD PL | 80009 | 214-0579-00 |
| -48 | 260-0723-00 | | | 1 | | ..SWITCH, SLIDE: DPDT, 0.5A, 125VAC | 79727 | GF126-0028 |
| -49 | 361-0527-00 | | | 1 | | ..SPACER, CKT CARD: 0.188 OD X 0.13 INCH LON | 80009 | 361-0527-00 |
| | 211-0205-00 | | | 1 | | ..SCREW MACHINE: RDH SST(ATTACHING PARTS FOR CKT BD)..... | 80009 | 211-0205-00 |
| -50 | 211-0205-00 | | | 1 | | ..SCREW MACHINE: RDH SST(END ATTACHING PARTS)..... | 80009 | 211-0205-00 |
| -51 | 344-0133-00 | | | 2 | | CLIP, SPR, TNSN: CIRCUIT CARD MOUNTING(ATTACHING PARTS)..... | 80009 | 344-0133-00 |
| -52 | 213-0088-00 | | | 2 | | SCR, TPG, THD CTG: 4-24 X 0.25 INCH, PNH STL(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |
| -53 | 351-0179-00 | | | 1 | | GUIDE, CKT CARD: 6.75 INCH LONG, PLASTIC(ATTACHING PARTS)..... | 80009 | 351-0179-00 |
| -54 | 211-0101-00 | | | 2 | | SCREW, MACHINE: 4-40 X 0.25, FLH, 100 DEG, STL(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |
| -55 | 441-1048-00 | | | 1 | | CHASSIS SCOPE: LOGIC(ATTACHING PARTS)..... | 80009 | 441-1048-00 |
| | 211-0008-00 | B010100 | B341829 | 2 | | SCREW, MACHINE: 4-40 X 0.250, PNH, STL, POZ(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |
| | 211-0193-00 | B341830 | | 2 | | SCREW, MACHINE: 1-72 X 0.125 INCH, PNH STL | 83385 | ORD BY DESCR |
| | 210-0004-00 | B341830 | | 2 | | WASHER, LOCK: #4 INTL, 0.015 THK, STL CD PL | 000BK | ORD BY DESCR |
| | 210-0586-00 | B341830 | | 2 | | NUT, PL, ASSEM WA: 4-40 X 0.25, STL CD PL | 78189 | 211-041800-00 |
| -56 | 129-0098-00 | | | 1 | | POST, ELEC-MECH: 0.250 HEX, X0.406 INCH L, BRS | 80009 | 129-0098-00 |
| -57 | 129-0305-00 | B010100 | B029999 | 1 | | SPACER, POST: 1.265 L, W/4-40 THD(ATTACHING PARTS)..... | 80009 | 129-0305-00 |
| -58 | 211-0008-00 | | | 1 | | SCREW, MACHINE: 4-40 X 0.250, PNH, STL, POZ(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |
| -59 | 129-0304-00 | B010100 | B029999 | 1 | | INSULATOR, STDF: 0.725 OD X 1.23 INCH LONG(ATTACHING PARTS)..... | 80009 | 129-0304-00 |
| -60 | 211-0008-00 | | | 1 | | SCREW, MACHINE: 4-40 X 0.250, PNH, STL, POZ(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |
| -61 | ----- | | | 1 | | CKT BOARD ASSY: HIGH VOLTAGE (SEE A9 REPL) | | |
| -62 | 131-0589-00 | | | 5 | | .TERMINAL, PIN: 0.46 L X 0.025 SQ | 22526 | 48283-029 |
| | 131-0608-00 | | | 17 | | .TERMINAL, PIN: 0.365 L X 0.025 PH BRZ GOLD | 22526 | 48283-036 |
| -63 | 136-0252-07 | | | 9 | | .SOCKET, PIN CONN: W/O DIMPLE | 22526 | 75060-012 |
| -64 | 214-0579-00 | B010100 | B329999 | 1 | | .TERM, TEST POINT: BRS CD PL | 80009 | 214-0579-00 |
| | 214-0579-00 | B330000 | | 2 | | .TERM, TEST POINT: BRS CD PL | 80009 | 214-0579-00 |
| -65 | 152-0495-00 | | | 1 | | .SEMICOND DVC, DI: V MULTR, 6KV IN, 12KV OUT(ATTACHING PARTS)..... | 52306 | CMX294 |
| -66 | 211-0008-00 | B010100 | B229999 | 3 | | ..SCREW, MACHINE: 4-40 X 0.250, PNH, STL, POZ | 83385 | ORD BY DESCR |
| | 210-0008-00 | B230000 | | 3 | | ..WASHER, LOCK: INTL, 0.02 THK(END ATTACHING PARTS)..... | 78189 | 1208-00-00-0541C |

Replaceable Mechanical Parts—7603/R7603 Service

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | 1 | 2 | 3 | 4 | 5 | Name & Description | Mfr Code | Mfr Part Number | |
|------------------|--------------------|------------------|---------|-----|---|---|---|---|---|---|---------------------------------------|-----------------|------------|
| | | Eff | Dscont | | | | | | | | | | |
| 4- | 119-0286-00 | B010100 | B029999 | 1 | | | | | | .MULTIPLIER,HV:4 X 12KVDC OUT | 80009 | 119-0286-00 | |
| | 119-0401-00 | B030000 | | 1 | | | | | | .MULTIPLIER,HV:4 X 12VDC OUT | 80009 | 119-0401-00 | |
| | 388-2029-00 | B010100 | B029999 | 1 | | | | | | .CIRCUIT BOARD:TRANSFORMER.MTG(ATTACHING PARTS)..... | 80009 | 388-2029-00 | |
| | 211-0040-00 | B010100 | B029999 | 1 | | | | | | .SCREW,MACHINE:4-40 X 0.25",BDGH PLSTC(END ATTACHING PARTS)..... | 26365 | ORD BY DESCR | |
| | 166-0292-00 | | | | 2 | | | | | .SPACER,SLEEVE:PLSTC,0.155 DIA X 0.065"L(ATTACHING PARTS)..... | 80009 | 166-0292-00 | |
| -67 | 211-0008-00 | | | 3 | | | | | | .SCREW,MACHINE:4-40 X 0.250.PNH,STL,POZ(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR | |
| | 129-0236-00 | B234533 | | 1 | | | | | | .SPACER,POST:0.188 HEX X 0.375 INCH LONG(ATTACHING PARTS)..... | 06540 | 9726-A-0440 | |
| | 211-0008-00 | B234533 | | 1 | | | | | | .SCREW,MACHINE:4-40 X 0.250.PNH,STL,POZ | 83385 | ORD BY DESCR | |
| | 210-0004-00 | B234533 | | 1 | | | | | | .WASHER,LOCK:#4 INTL,0.015 THK,STL CD PL(END ATTACHING PARTS)..... | 000BK | ORD BY DESCR | |
| -68 | 129-0143-00 | | | 3 | | | | | | INSULATOR,STDF:0.312 OD X 0.406" L,NYLON(ATTACHING PARTS)..... | 80009 | 129-0143-00 | |
| -69 | 211-0008-00 | | | 1 | | | | | | SCREW,MACHINE:4-40 X 0.250.PNH,STL,POZ(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR | |
| | 343-0004-00 | B375765 | | 1 | | | | | | CLAMP,LOOP:0.312ID,PLSTC(ATTACHING PARTS)..... | 95987 | 5-16-6B | |
| | 211-0511-00 | B375765 | | 1 | | | | | | SCREW,MACHINE:6-32 X 0.500.PNH,STL,CD PL | 83385 | ORD BY DESCR | |
| | 210-0803-00 | B375765 | | 1 | | | | | | WASHER,FLAT:0.15 ID X 0.032 THK,STL CD(END ATTACHING PARTS)..... | 12327 | ORD BY DESCR | |
| -70 | 136-0505-00 | B010100 | B149999 | 1 | | | | | | SKT,PL-IN ELEK:ELCTR N TUBE,14 CONT W/LEADS | 80009 | 136-0505-00 | |
| | 136-0505-01 | B150000 | | 1 | | | | | | SKT,PL-IN ELEK:W/6 PIN CONNECTOR | 80009 | 136-0505-01 | |
| -71 | 136-0304-02 | B010100 | B340949 | 1 | | | | | | .SOCKET,PLUG-IN:CR T,14 PIN SOCKET,W/PINS | 80009 | 136-0304-02 | |
| | 136-0304-03 | B340950 | | 1 | | | | | | .SKT,PL-IN ELEK:ELECTRON TUBE,14 CONTACT | 80009 | 136-0304-03 | |
| -72 | 200-0917-01 | | | 1 | | | | | | .COV,CR T SKT:2.052 OD X 0.291 H,PLASTIC | 80009 | 200-0917-01 | |
| -73 | 367-0117-00 | | | 1 | | | | | | .PULL,SOCKET:CR T,PLASTIC | 80009 | 367-0117-00 | |
| -74 | 343-0235-00 | | | 1 | | | | | | .CLAMP,CR T SKT:DEL RIN | 80009 | 343-0235-00 | |
| | 131-0621-00 | | | 5 | | | | | | .CONNECTOR,TERM:22-26 AWG,BRS & CU BE GOLD | 22526 | 46231 | |
| | 131-0707-00 | | | 4 | | | | | | .CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD | 22526 | 47439 | |
| | 352-0162-00 | | | 1 | | | | | | .HLDR,TERM CONN:4 WIRE BLACK | 80009 | 352-0162-00 | |
| | 352-0201-00 | B010100 | B149999 | 1 | | | | | | .CONN BODY,PL,EL:5 WIRE BLACK | 80009 | 352-0201-00 | |
| | 352-0202-00 | B150000 | | 1 | | | | | | .HLDR,TERM CONN:6 WIRE BLACK | 80009 | 352-0202-00 | |
| | 343-0549-00 | | | 4 | | | | | | STRAP,TIEDOWN:0.091 W X 4.0 L,ZYTEL | 06383 | PLT1M | |
| | 346-0189-00 | | | 1 | | | | | | .STRAP,TIEDOWN,E:8.5 L,NYLON W/MARKER | 59730 | TY53M | |
| | -75 | ----- | | | 1 | | | | | | CKT BOARD ASSY:Z AXIS(SEE A8 REPL) | | |
| | -76 | 131-0566-00 | | | 1 | | | | | | .BUS CONDUCTOR:DUMMY RES,2.375,22 AWG | 57668 | JWW-0200E0 |
| -77 | 131-0608-00 | | | 36 | | | | | | .TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD | 22526 | 48283-036 | |
| -78 | 131-1003-00 | | | 1 | | | | | | .CONN,RCPT,ELEC:CKT BD MT,3 PRONG | 80009 | 131-1003-00 | |
| -79 | 136-0252-04 | B010100 | B341999 | 33 | | | | | | .SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS | 22526 | 75060-007 | |
| | 136-0252-07 | B342000 | | 27 | | | | | | .SOCKET,PIN CONN:W/O DIMPLE | 22526 | 75060-012 | |
| | 136-0252-01 | | | 1 | | | | | | .CONTACT,ELEC:0.178 INCH LONG(ATTACHING PARTS FOR CKT BD)..... | 00779 | 1-332095-2 | |
| -80 | 211-0008-00 | | | 3 | | | | | | SCREW,MACHINE:4-40 X 0.250.PNH,STL,POZ(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR | |
| -81 | 348-0063-00 | | | 1 | | | | | | GROMMET,PLASTIC:0.50 INCH DIA | 80009 | 348-0063-00 | |
| -82 | ----- | | | 2 | | | | | | TRANSISTOR:(ATTACHING PARTS)..... | | | |
| -83 | 213-0146-00 | | | 8 | | | | | | SCR,TPG,THD FOR:6-20 X 0.313 INCH.PNH STL | 83385 | ORD BY DESCR | |
| -84 | 386-0978-00 | | | 4 | | | | | | INSULATOR,PLATE:TRANSISTOR,MICA(END ATTACHING PARTS)..... | 80009 | 386-0978-00 | |
| -85 | 255-0334-00 | B010100 | B040974 | FT | | | | | | PLASTIC CHANNEL:12.75 X 0.175 X 0.155,NYL | 11897 | 122-37-2500 | |
| | 255-0334-00 | B040975 | B051189 | FT | | | | | | PLASTIC CHANNEL:12.75 X 0.175 X 0.155,NYL | 11897 | 122-37-2500 | |
| | 348-0012-00 | B040975 | | 1 | | | | | | GROMMET,RUBBER:0.625 INCH DIA | 72653 | 1043-1M | |
| | 348-0085-00 | B051190 | B239999 | 1 | | | | | | GROMMET,PLASTIC:GRAY,U-SHAPED,0.48 ID | 80009 | 348-0085-00 | |
| | 358-0166-00 | B240000 | | 1 | | | | | | GROMMET,PLASTIC:BLACK | 80009 | 358-0166-00 | |
| -86 | 348-0006-00 | | | 1 | | | | | | GROMMET,RUBBER:0.562 ID X 0.875 INCH OD(ATTACHING PARTS)..... | 70485 | 1720 | |
| -87 | 211-0510-00 | | | 1 | | | | | | SCREW,MACHINE:6-32 X 0.375.PNH,STL,CD PL | 83385 | ORD BY DESCR | |
| -88 | 210-0863-00 | | | 1 | | | | | | WSHR,LOOP CLAMP:0.187 ID U/W 0.5 W CLP,STL | 95987 | C191 | |
| | 214-2736-00 | B341500 | | 3 | | | | | | PLUG,HOLE:0.312 DIA,PLASTIC(END ATTACHING PARTS)..... | 28520 | DP3122613 | |

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| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | 1 | 2 | 3 | 4 | 5 | Name & Description | Mfr Code | Mfr Part Number |
|------------------|--------------------|------------------|---------|-----|---|---|---|---|---|---|----------|-----------------|
| | | Eff | Dscont | | | | | | | | | |
| 4-89 | 337-1538-01 | B010100 | B341499 | 1 | | | | | | SHIELD,ELEC:HIGH VOLTAGE | 80009 | 337-1538-01 |
| | 337-1538-02 | B341500 | | 1 | | | | | | SHIELD,ELEC:HIGH VOLTAGE ***** (ATTACHING PARTS)***** | 80009 | 337-1538-02 |
| -90 | 211-0504-00 | | | 3 | | | | | | SCREW,MACHINE:6-32 X 0.250,PNH,STL,CD PL ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -91 | 407-0973-00 | | | 1 | | | | | | BRACKET,CONN:ALUMINUM ***** (ATTACHING PARTS)***** | 80009 | 407-0973-00 |
| | 211-0507-00 | | | 4 | | | | | | SCREW,MACHINE:6-32 X 0.312,PNH,STL,CD PL ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -92 | 131-0930-00 | | | 2 | | | | | | CONTACT,ELEC:PLUG-IN GROUND ***** (ATTACHING PARTS)***** | 80009 | 131-0930-00 |
| -93 | 211-0008-00 | | | 1 | | | | | | SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ | 83385 | ORD BY DESCR |
| -94 | 210-0586-00 | | | 1 | | | | | | NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL ***** (END ATTACHING PARTS)***** | 78189 | 211-041800-00 |
| -95 | 131-0799-00 | | | 2 | | | | | | CONTACT,ELEC:PLUG-IN GROUND ***** (ATTACHING PARTS)***** | 80009 | 131-0799-00 |
| -96 | 211-0008-00 | | | 4 | | | | | | SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ | 83385 | ORD BY DESCR |
| -97 | 210-0586-00 | | | 4 | | | | | | NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL ***** (END ATTACHING PARTS)***** | 78189 | 211-041800-00 |
| -98 | 131-0800-00 | B010100 | B373030 | 2 | | | | | | CONTACT,ELEC:PLUG-IN GROUND | 80009 | 131-0800-00 |
| | 131-0800-03 | B373031 | | 2 | | | | | | CONTACT,ELEC:PLUG-IN GND,BE NI HT TR ***** (ATTACHING PARTS)***** | 80009 | 131-0800-03 |
| -99 | 211-0008-00 | | | 4 | | | | | | SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ | 83385 | ORD BY DESCR |
| -100 | 210-0586-00 | | | 4 | | | | | | NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL ***** (END ATTACHING PARTS)***** | 78189 | 211-041800-00 |
| -101 | ----- | | | 1 | | | | | | CKT BOARD ASSY:TRIGGER SEL(SEE A3 REPL) | | |
| -102 | 131-0589-00 | | | 4 | | | | | | .TERMINAL,PIN:0.46 L X 0.025 SQ | 22526 | 48283-029 |
| -103 | 136-0252-01 | B010100 | B122799 | 15 | | | | | | .CONTACT,ELEC:0.178 INCH LONG | 00779 | 1-332095-2 |
| | 136-0350-00 | B122800 | B343343 | 5 | | | | | | .SOCKET,PLUG-IN:3 PIN,LOW PROFILE | 80009 | 136-0350-00 |
| | 136-0252-07 | B343344 | | 15 | | | | | | .SOCKET,PIN CONN:W/O DIMPLE | 22526 | 75060-012 |
| -104 | 136-0260-02 | B010100 | B372599 | 1 | | | | | | .SKT,PL-IN ELEK:MICROCIRCUIT,16 DIP,LOW CL | 09922 | DILB16P-108T |
| | 136-0729-00 | B372600 | | 1 | | | | | | .SKT,PL-IN ELEK:MICROCKT,16 CONTACT | 09922 | DILB16P-108T |
| -105 | 136-0263-03 | | | 16 | | | | | | .SOCKET,PIN TERM:U/W 0.025 SQUARE PIN ***** (ATTACHING PARTS FOR CKT BD)***** | 00779 | 85864-2 |
| -106 | 211-0008-00 | | | 2 | | | | | | SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -107 | ----- | | | 1 | | | | | | CKT BOARD ASSY:VERT INTERFACE(SEE A4 REPL) | | |
| -108 | 136-0252-07 | | | 21 | | | | | | .SOCKET,PIN CONN:W/O DIMPLE | 22526 | 75060-012 |
| -109 | 136-0263-03 | | | 16 | | | | | | .SOCKET,PIN TERM:U/W 0.025 SQUARE PIN | 00779 | 85864-2 |
| -110 | 136-0260-02 | | | 1 | | | | | | .SKT,PL-IN ELEK:MICROCIRCUIT,16 DIP,LOW CL ***** (ATTACHING PARTS FOR CKT BD)***** | 09922 | DILB16P-108T |
| -111 | 211-0008-00 | | | 2 | | | | | | SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -112 | ----- | | | 1 | | | | | | CKT BOARD ASSY:MAIN INTERFACE(SEE A1 REPL) | | |
| -113 | 670-1374-00 | | | 1 | | | | | | .CKT BOARD ASSY:VERTICAL INTERCONNECT | 80009 | 670-1374-00 |
| -114 | 131-0787-00 | | | 8 | | | | | | .TERMINAL,PIN:0.64L X 0.025 SQ ***** (ATTACHING PARTS FOR CKT BD)***** | 22526 | 47359-000 |
| -115 | 211-0008-00 | | | 2 | | | | | | .SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ | 83385 | ORD BY DESCR |
| -116 | 351-0213-00 | | | 2 | | | | | | .POST,CKT BD MTG:0.285 L X 0.219 OD,BRS ***** (END ATTACHING PARTS)***** | 80009 | 351-0213-00 |
| -117 | 386-1558-00 | | | 2 | | | | | | .SPACER,CKT BD:0.335 H,ACETAL | 80009 | 386-1558-00 |
| | 131-0590-00 | | | 32 | | | | | | .CONTACT,ELEC:0.71 INCH LONG | 22526 | 47351 |
| -118 | 131-0592-00 | | | 26 | | | | | | .CONTACT,ELEC:0.885 INCH LONG | 22526 | 47353 |
| -119 | 131-0608-00 | | | 74 | | | | | | .TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD | 22526 | 48283-036 |
| | 136-0252-07 | | | 24 | | | | | | .SOCKET,PIN CONN:W/O DIMPLE | 22526 | 75060-012 |
| -120 | 129-0308-00 | | | 4 | | | | | | .POST,ELEC-MECH:HEX,.025 X 0.465 INCH LON ***** (ATTACHING PARTS)***** | 80009 | 129-0308-00 |
| -121 | 211-0008-00 | | | 16 | | | | | | .SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ | 83385 | ORD BY DESCR |
| | 210-0803-00 | B060000 | | 16 | | | | | | .WASHER,FLAT:0.15 ID X 0.032 THK,STL CD ***** (END ATTACHING PARTS)***** | 12327 | ORD BY DESCR |
| -122 | 131-1003-00 | | | 2 | | | | | | .CONN,RCPT,ELEC:CKT BD MT,3 PRONG | 80009 | 131-1003-00 |
| | 131-0767-02 | B010100 | B039999 | 2 | | | | | | .CONNECTOR,RCPT,76 CONTACT | 80009 | 131-0767-02 |
| | 131-0767-08 | B040000 | | 2 | | | | | | .CONNECTOR,RCPT,PLUG-IN CKT BD,70 CONTACT | 80009 | 131-0767-08 |
| -123 | 200-0950-00 | | | 2 | | | | | | .COVER,ELEC CONN:PLASTIC | 80009 | 200-0950-00 |

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| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | 1 2 3 4 5 | Name & Description | Mfr Code | Mfr Part Number |
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| | | Eff | Dscont | | | | | |
| 4-124 | 204-0365-00 | B010100 | B338899 | 1 | | ..BODY,CONNECTOR:PLUG-IN CIRCUIT CARD | 80009 | 204-0365-00 |
| | 204-0365-02 | B338900 | | 1 | | ..BODY,CONNECTOR:PLUG-IN CIRCUIT CARD | 80009 | 204-0365-02 |
| | 131-0726-00 | B010100 | B039999 | 36 | | ..CONTACT,ELEC:STRAIGHT | 80009 | 131-0726-00 |
| | 131-0726-00 | B040000 | | 33 | | ..CONTACT,ELEC:STRAIGHT | 80009 | 131-0726-00 |
| | 131-0727-00 | B010100 | B039999 | 36 | | ..CONTACT,ELEC:OFFSET | 80009 | 131-0727-00 |
| | 131-0727-00 | B040000 | | 33 | | ..CONTACT,ELEC:OFFSET | 80009 | 131-0727-00 |
| | 131-0899-00 | | | 4 | | ..CONTACT,ELEC:0.048 X 0.006 INCH THK(ATTACHING PARTS)..... | 80009 | 131-0899-00 |
| -125 | 213-0232-00 | | | 24 | | ..SCR,TPG,THD FOR:2-32 X 0.312 INCH,PNH STL(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |
| | 131-0767-00 | B010100 | B039999 | 1 | | ..CONNECTOR,RCPT,:76 CONTACT | 80009 | 131-0767-00 |
| | 131-0767-07 | B040000 | | 1 | | ..CONNECTOR,RCPT,:PLUG-IN CKT BD,70 CONTACT | 80009 | 131-0767-07 |
| -126 | 200-0950-00 | | | 2 | | ..COVER,ELEC CONN:PLASTIC | 80009 | 200-0950-00 |
| -127 | 204-0365-02 | | | 1 | | ..BODY,CONNECTOR:PLUG-IN CIRCUIT CARD | 80009 | 204-0365-02 |
| -128 | 131-0726-00 | B010100 | B039999 | 38 | | ..CONTACT,ELEC:STRAIGHT | 80009 | 131-0726-00 |
| | 131-0726-00 | B040000 | | 35 | | ..CONTACT,ELEC:STRAIGHT | 80009 | 131-0726-00 |
| -129 | 131-0727-00 | B010100 | B039999 | 38 | | ..CONTACT,ELEC:OFFSET | 80009 | 131-0727-00 |
| | 131-0727-00 | B040000 | | 35 | | ..CONTACT,ELEC:OFFSET(ATTACHING PARTS)..... | 80009 | 131-0727-00 |
| -130 | 213-0232-00 | | | 2 | | ..SCR,TPG,THD FOR:2-32 X 0.312 INCH,PNH STL | 83385 | ORD BY DESCR |
| | 210-0906-00 | | | 1 | | ..WASHER,NONMETAL:FIBER,0.125 ID X 0.203"OD(END ATTACHING PARTS)..... | 86928 | ORD BY DESCR |
| -131 | 131-0804-00 | | | 1 | | ..LINK,TERM,CONNE:J-SHAPE | 80009 | 131-0804-00 |
| -132 | 131-0805-00 | | | 2 | | ..LINK,TERM,CONNE:J-SHAPE,0.90X0.82 X 0.312 | 80009 | 131-0805-00 |
| -133 | 214-1568-00 | | | 2 | | ..PIN,GUIDE:0.119 DIA X 1.035 W/0.25 HE(ATTACHING PARTS)..... | 80009 | 214-1568-00 |
| -134 | 210-0406-00 | | | 4 | | ..NUT,PLAIN,HEX:4-40 X 0.188,BRS,CD PL | 73743 | 12161-50 |
| -135 | 210-0054-00 | | | 4 | | ..WASHER,LOCK:#4 SPLIT,0.025 THK STL CD P(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |
| -136 | 344-0147-00 | | | 2 | | ..CLIP,SPR,TNSN:CIRCUIT CARD MOUNTING(ATTACHING PARTS FOR CKT BD)..... | 80009 | 344-0147-00 |
| -137 | 213-0034-00 | B010100 | B338899 | 9 | | SCR,TPG,THD CTG:4-40 X 0.188 INCH,PNH STL | T0858 | ORD BY DESCR |
| | 213-0263-00 | B338900 | B343843 | 9 | | SCREW,TPG,TF:4-24 X 0.375 INCH,PNH STL | 83385 | ORD BY DESCR |
| | 213-0119-00 | B343844 | | 9 | | SCR,TPG,THD FOR:4-24 X 0.375 INCH,PNH STL(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |
| -138 | ----- | | | 1 | | CKT BOARD ASSY:LOGIC(SEE A2 REPL) | | |
| -139 | 131-0566-00 | | | 1 | | ..BUS CONDUCTOR:DUMMY RES,2.375,22 AWG | 57668 | JWW-0200E0 |
| -140 | 136-0235-00 | | | 1 | | ..SOCKET,PLUG-IN:6 CONTACT,ROUND | 71785 | 133-96-12-062 |
| -141 | 136-0252-04 | B010100 | B122799 | 24 | | ..SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS | 22526 | 75060-007 |
| | 136-0350-00 | B122800 | B343343 | 8 | | ..SOCKET,PLUG-IN:3 PIN,LOW PROFILE | 80009 | 136-0350-00 |
| | 136-0252-07 | B343344 | | 24 | | ..SOCKET,PIN CONN:W/O DIMPLE | 22526 | 75060-012 |
| -142 | 136-0260-02 | B010100 | B372599 | 1 | | ..SKT,PL-IN ELEK:MICROCIRCUIT,16 DIP,LOW CL | 09922 | DILB16P-108T |
| | 136-0729-00 | B372600 | | 1 | | ..SKT,PL-IN ELEK:MICROCKT,16 CONTACT | 09922 | DILB16P-108T |
| -143 | 136-0263-03 | | | 33 | | ..SOCKET,PIN TERM:U/W 0.025 SQUARE PIN | 00779 | 85864-2 |
| -144 | 136-0269-02 | B010100 | B372599 | 3 | | ..SKT,PL-IN ELEK:MICROCIRCUIT,14 DIP | 09922 | DILB149P-108 |
| | 136-0728-00 | B372600 | | 3 | | ..SKT,PL-IN ELEK:MICROCKT,14 CONTACT | 09922 | DILB14P-108 |
| -145 | 214-0579-00 | | | 4 | | ..TERM,TEST POINT:BRS CD PL | 80009 | 214-0579-00 |
| -146 | ----- | | | 1 | | CKT BOARD ASSY:RECTIFIER(SEE A10 REPL) | | |
| -147 | 131-0608-00 | | | 28 | | ..TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD | 22526 | 48283-036 |
| -148 | 136-0252-04 | B010100 | B122799 | 6 | | ..SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS | 22526 | 75060-007 |
| | 136-0350-00 | B122800 | B343343 | 2 | | ..SOCKET,PLUG-IN:3 PIN,LOW PROFILE | 80009 | 136-0350-00 |
| | 136-0252-07 | B343344 | | 6 | | ..SOCKET,PIN CONN:W/O DIMPLE | 22526 | 75060-012 |
| -149 | 214-1292-00 | | | 2 | | HEAT SINK,ELEC:TRANSISTOR | 05820 | 205SB |
| | 136-0350-00 | | | 2 | | ..SOCKET,PLUG-IN:3 PIN,LOW PROFILE | 80009 | 136-0350-00 |
| -150 | 214-1731-00 | | | 1 | | HEAT SINK,ELEC:TRANSISTOR(ATTACHING PARTS)..... | 80009 | 214-1731-00 |
| -151 | 211-0012-00 | | | 1 | | ..SCREW,MACHINE:4-40 X 0.375,PNH STL CD PL | 83385 | ORD BY DESCR |
| -152 | 210-0586-00 | | | 1 | | ..NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL | 78189 | 211-041800-00 |
| -153 | 210-0935-00 | | | 1 | | ..WASHER,NONMETAL:FIBER,0.14 ID X 0.375"OD(END ATTACHING PARTS)..... | 74921 | ORD BY DESCR |
| | 131-0566-00 | B150000 | | 1 | | ..BUS CONDUCTOR:DUMMY RES,2.375,22 AWG | 57668 | JWW-0200E0 |
| -154 | 344-0154-00 | | | 4 | | ..CLIP,ELECTRICAL:FUSE,CKT BD MT(ATTACHING PARTS FOR CKT BD)..... | 80009 | 344-0154-00 |
| | 211-0507-00 | | | 3 | | SCREW,MACHINE:6-32 X 0.312,PNH STL,CD PL | 83385 | ORD BY DESCR |
| -156 | 211-0511-00 | | | 1 | | SCREW,MACHINE:6-32 X 0.500,PNH,STL,CD PL | 83385 | ORD BY DESCR |
| | 211-0008-00 | B030000 | | 1 | | SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR |

Replaceable Mechanical Parts—7603/R7603 Service

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Qty | 1 2 3 4 5 | Name & Description | Mfr Code | Mfr Part Number |
|------------------|--------------------|----------------------|---------|-----|-----------|--|----------|------------------|
| 4-157 | 343-0081-00 | B010100 | B357055 | 1 | | STRAP,RETAINING: | 95987 | 3/16-H |
| | 343-0004-00 | B357056 | | 1 | | CLAMP,LOOP:0.312ID,PLSTC | 95987 | 5-16-6B |
| | 210-0863-00 | B357056 | | 1 | | WSHR,LOOP CLAMP:0.187 ID U/W 0.5 W CLP,STL | 95987 | C191 |
| -158 | ----- | | | 1 | | TRANSFORMER:(SEE T801 REPL) ***** (ATTACHING PARTS)***** | | |
| -159 | 212-0522-00 | | | 2 | | SCREW,MACHINE:10-32 X 2.50",HEX HD STL | 83385 | ORD BY DESCR |
| -160 | 210-0812-00 | | | 2 | | WASHER,NONMETAL:#10,FIBER | 86445 | ORD BY DESCR |
| -161 | 166-0457-00 | | | 2 | | INSUL SLVG,ELEC:0.19 ID X 1.875"LONG MYLAR ***** (END ATTACHING PARTS)***** | 80009 | 166-0457-00 |
| -162 | 407-0921-00 | | | 1 | | BRACKET,XFMR:ALUMINUM ***** (ATTACHING PARTS)***** | 80009 | 407-0921-00 |
| -163 | 212-0023-00 | | | 2 | | SCREW,MACHINE:8-32 X 0.375,PNH,STL,CD PL | 83385 | ORD BY DESCR |
| | 210-0804-00 | B031009 | | 2 | | WASHER,FLAT:0.17 ID X 0.375 INCH OD,STL ***** (END ATTACHING PARTS)***** | 12327 | ORD BY DESCR |
| -164 | ----- | | | 1 | | SW,THERMOSTATIC: ***** (ATTACHING PARTS)***** | | |
| -165 | 211-0008-00 | | | 2 | | SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ | 83385 | ORD BY DESCR |
| -166 | 210-0586-00 | | | 2 | | NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL ***** (END ATTACHING PARTS)***** | 78189 | 211-041800-00 |
| -167 | 441-0993-01 | B010100 | B357055 | 1 | | CHASSIS,SCOPE:POWER SUPPLY | 80009 | 441-0993-01 |
| | 441-0993-04 | B357056 | | 1 | | CHASSIS,SCOPE:POWER SUPPLY ***** (ATTACHING PARTS)***** | 80009 | 441-0993-04 |
| | 212-0004-00 | | | 5 | | SCREW,MACHINE:8-32 X 0.312 INCH,PNH STL ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -168 | ----- | | | 1 | | FAN,VENTILATING:(SEE B1001 REPL) ***** (ATTACHING PARTS)***** | | |
| | 210-0457-00 | | | 4 | | NUT,PL,ASSEM WA:6-32 X 0.312,STL CD PL ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -169 | 386-2410-00 | B010100 | B061272 | 1 | | SUBPANEL,REAR: | 80009 | 386-2410-00 |
| | 386-2410-01 | B061273 | B357055 | 1 | | SUBPANEL,REAR: | 80009 | 386-2410-01 |
| | 386-2410-02 | B357056 | | 1 | | SUBPANEL,REAR: ***** (ATTACHING PARTS)***** | 80009 | 386-2410-02 |
| | 211-0504-00 | | | 4 | | SCREW,MACHINE:6-32 X 0.250,PNH STL,CD PL ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -170 | 348-0004-00 | | | 1 | | GROMMET,RUBBER:0.281 ID X 0.563 INCH OD | 70485 | 763 |
| -171 | ----- | | | 1 | | CKT BOARD ASSY:SIGNALS OUT(SEE A12 REPL) | | |
| -172 | 131-0608-00 | | | 11 | | .TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD | 22526 | 48283-036 |
| -173 | 131-1003-00 | | | 2 | | .CONN,RCPT,ELEC:CKT BD MT,3 PRONG | 80009 | 131-1003-00 |
| -174 | 136-0252-04 | B010100 | B122799 | 27 | | .SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS | 22526 | 75060-007 |
| | 136-0350-00 | B122800 | B343343 | 9 | | .SOCKET,PLUG-IN:3 PIN,LOW PROFILE | 80009 | 136-0350-00 |
| | 136-0252-07 | B343344 | | 27 | | .SOCKET,PIN CONN:W/O DIMPLE | 22526 | 75060-012 |
| | 136-0252-01 | | | 2 | | .CONTACT,ELEC:0.178 INCH LONG | 00779 | 1-332095-2 |
| -175 | 214-0579-00 | | | 1 | | .TERM,TEST POINT:BRS CD PL | 80009 | 214-0579-00 |
| -176 | 260-0984-00 | | | 1 | | .SWITCH,SLIDE:DP3T,0.5A,125V ***** (ATTACHING PARTS FOR CKT BD)***** | 79727 | G-128-S-0012 |
| -177 | 211-0008-00 | | | 2 | | SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -178 | 131-0955-00 | | | 6 | | CONN,RCPT,ELEC:BNC,FEMALE | 13511 | 31-279 |
| -179 | 210-0255-00 | | | 1 | | TERMINAL,LUG:0.391 ID,LOCKING,BRS CD PL | 80009 | 210-0255-00 |
| -180 | 385-0100-00 | | | 1 | | SPACER,POST:0.5 L W/6-32 THD THRU,NYLON ***** (ATTACHING PARTS)***** | 80009 | 385-0100-00 |
| -181 | 211-0504-00 | | | 1 | | SCREW,MACHINE:6-32 X 0.250,PNH STL,CD PL ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -182 | 210-0202-00 | | | 1 | | TERMINAL,LUG:0.146 ID,LOCKING,BRZ,TIN PL ***** (ATTACHING PARTS)***** | 78189 | 2104-06-00-2520N |
| -183 | 210-0504-00 | | | 1 | | NUT,PLAIN,HEX.:0-8 X 0.156 INCH,BRS ***** (END ATTACHING PARTS)***** | 73743 | 3004-402 |
| | 385-0149-00 | B010100 | B341886 | 1 | | SPACER,POST:0.625 L W/4-40 THD EA END,N | 80009 | 385-0149-00 |
| -184 | 210-0202-00 | B010100 | B219999 | 1 | | TERMINAL,LUG:0.146 ID,LOCKING,BRZ,TIN PL | 78189 | 2104-06-00-2520N |
| | 210-0202-00 | B220000 | | 2 | | TERMINAL,LUG:0.146 ID,LOCKING,BRZ,TIN PL ***** (ATTACHING PARTS)***** | 78189 | 2104-06-00-2520N |
| -185 | 211-0504-00 | B010100 | B219999 | 1 | | SCREW,MACHINE:6-32 X 0.250,PNH STL,CD PL | 83385 | ORD BY DESCR |
| | 211-0507-00 | B220000 | B357055 | 1 | | SCREW,MACHINE:6-32 X 0.312,PNH STL,CD PL | 83385 | ORD BY DESCR |
| | 211-0578-00 | B357056 | | 1 | | SCREW,MACHINE:6-32 X 0.438 1INCH,PNH STL | 83385 | ORD BY DESCR |
| -186 | 210-0407-00 | B010100 | B219999 | 1 | | NUT,PLAIN,HEX.:6-32 X 0.25 INCH,BRS | 73743 | 3038-0228-402 |
| | 210-0407-00 | B220000 | B357055 | 2 | | NUT,PLAIN,HEX.:6-32 X 0.25 INCH,BRS | 73743 | 3038-0228-402 |
| | 210-0407-00 | B357056 | | 3 | | NUT,PLAIN,HEX.:6-32 X 0.25 INCH,BRS ***** (END ATTACHING PARTS)***** | 73743 | 3038-0228-402 |

Replaceable Mechanical Parts—7603/R7603 Service

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | 1 | 2 | 3 | 4 | 5 | Name & Description | Mfr Code | Mfr Part Number |
|------------------|--------------------|------------------|---------|-----|---|---|---|---|---|--|----------|------------------|
| | | Eff | Dscont | | | | | | | | | |
| 4-187 | 352-0076-00 | B010100 | B357055 | 1 | | | | | | FUSEHOLDER:W/HARDWARE | 75915 | 342012-L |
| | 204-0833-00 | B357056 | | 1 | | | | | | BODY,FUSEHOLDER:3AG & 5 X 20MM FUSES | S3629 | 031.1653(MDLFEU) |
| | 200-2264-00 | B357056 | | 1 | | | | | | CAP.,FUSEHOLDER:3AG FUSES | S3629 | FEK 031 1666 |
| | 210-1039-00 | B357056 | | 1 | | | | | | WASHER,LOCK:INT.0.521 ID X 0.625 INCH O | 24931 | ORD BY DESCR |
| -188 | 200-1388-00 | B010100 | B234589 | 1 | | | | | | COVER,FUSE LEAD: | 80009 | 200-1388-00 |
| | 200-1388-01 | B234590 | B357055 | 1 | | | | | | COVER,FUSE: | 80009 | 200-1388-01 |
| | 200-0237-04 | B358735 | | 1 | | | | | | COVER,FUSE HLDR:PLASTIC,SAFETY CONTROLLED | 80009 | 200-0237-04 |
| -189 | 358-0025-00 | B010100 | B061272 | 1 | | | | | | BSHG,STRAIN RLF: | 28520 | SR-6P-4 |
| | 358-0161-00 | B061273 | B057355 | 1 | | | | | | BSHG,STRAIN RLF:U/W 0.29 DIA CA.STRAIGHT | 28520 | 1147 SR-5P-4 |
| -190 | 378-0041-01 | | | 1 | | | | | | FILTER ELEM,AIR: | 80009 | 378-0041-01 |
| -191 | 346-0077-00 | B010100 | B357055 | 1 | | | | | | STRAP,TIEDOWN E:6.225 INCH L | 80009 | 346-0077-00 |
| | 162-0512-00 | B254860 | | FT | | | | | | INSUL SLVG,ELEC:0.106 ID,POLYEST/FIBERGLAS | 91094 | F5B1041 |
| -192 | 161-0033-09 | B010100 | B357055 | 1 | | | | | | CABLE ASSY,PWR,:3 WIRE,92 INCH LONG | 16428 | CH8393 |
| | 161-0066-00 | B357056 | | 1 | | | | | | CABLE ASSY,PWR,:3.18 AWG.115V.98.0 L | T1372 | ORD BY DESCR |
| | 131-1084-00 | B357056 | | 1 | | | | | | CONNECTOR,RCPT,:3 BLADE,6A,250V ***** (ATTACHING PARTS) ***** | 82389 | EAC-302 |
| | 210-0586-00 | B357056 | | 2 | | | | | | NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL | 78189 | 211-041800-00 |
| | 210-0012-00 | B357056 | | 2 | | | | | | WASHER,LOCK:INTL.0.384 ID,INTL.0.022 TH ***** (END ATTACHING PARTS) ***** | 78189 | 1220-02-00-0541C |
| | 334-3379-01 | B357056 | | 1 | | | | | | MARKER,IDENT:MARKED GROUND SYMBOL | 80009 | 334-3379-01 |
| | 198-2439-01 | B357056 | B375699 | 1 | | | | | | WIRE SET,ELEC: | 80009 | 198-2439-01 |
| | 175-5391-01 | B375700 | | 1 | | | | | | CABLE ASSY,RF:50 OHM COAX,17.5 L,9-0 | 80009 | 175-5391-01 |
| | 175-5392-00 | B375700 | | 1 | | | | | | .CABLE ASSY,RF:50 OHM COAX,3.5 L,9-2 | 80009 | 175-5392-00 |
| | 175-5393-00 | B375700 | | 1 | | | | | | .CABLE ASSY,RF:50 OHM COAX,3.5 L,9-3 | 80009 | 175-5393-00 |
| | 175-5394-00 | B375700 | | 1 | | | | | | .CABLE ASSY,RF:50 OHM COAX,3.5 L,9-1 | 80009 | 175-5394-00 |
| | 175-5430-00 | B375700 | | 1 | | | | | | .CA ASSY,SP,ELEC:2.26 AWG,24.0 L,RIBBON | 80009 | 175-5430-00 |
| | 195-0974-00 | B375700 | | 1 | | | | | | LEAD,ELECTRICAL:18 AWG,12.0 L,8-0 | 80009 | 195-0974-00 |
| | 195-5155-00 | B375700 | | 1 | | | | | | LEAD,ELEC:18 AWG,9.0 L,0-N | 80009 | 195-5155-00 |
| | 195-5156-00 | B375700 | | 1 | | | | | | LEAD,ELECTRICAL:18 AWG,9.0 L,8-9 | 80009 | 195-5156-00 |
| | 195-5157-00 | B375700 | | 1 | | | | | | LEAD,ELECTRICAL:18 AWG,24.0 L,5-4 | 80009 | 195-5157-00 |
| | 195-5158-00 | B375700 | | 1 | | | | | | LEAD,ELECTRICAL:18 AWG,6.0 L,8-0 | 80009 | 195-5158-00 |
| | 195-7987-00 | B375700 | | 1 | | | | | | LEAD,ELECTRICAL:18 AWG,3.5 L,5-4 | 80009 | 195-7987-00 |
| | 358-0607-00 | B357056 | | 1 | | | | | | BUSHING,SLEEVE:0.125 ID X 0.3125 L,NYLON | 28520 | 2000 |
| -193 | 386-2401-00 | B010100 | B061272 | 1 | | | | | | PANEL,REAR: | 80009 | 386-2401-00 |
| | 386-2401-02 | B061273 | B357055 | 1 | | | | | | PANEL,REAR: | 80009 | 386-2401-02 |
| | 386-2401-03 | B357056 | B368899 | 1 | | | | | | PANEL,REAR: | 80009 | 386-2401-03 |
| | 386-2401-04 | B368900 | B371741 | 1 | | | | | | PANEL,REAR: | 80009 | 386-2401-04 |
| | 386-2401-05 | B371742 | | 1 | | | | | | PANEL,REAR: ***** (ATTACHING PARTS) ***** | 80009 | 386-2401-05 |
| -194 | 211-0008-00 | B010100 | B061272 | 8 | | | | | | SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ | 83385 | ORD BY DESCR |
| | 211-0101-00 | B061273 | | 8 | | | | | | SCREW,MACHINE:4-40 X 0.25,FLH,100 DEG STL ***** (END ATTACHING PARTS) ***** | 83385 | ORD BY DESCR |
| -195 | 136-0280-00 | | | 2 | | | | | | SOCKET,PLUG-IN:TRANSISTOR,3 CONTACT ***** (ATTACHING PARTS) ***** | 97913 | LST 2202-2 |
| -196 | 211-0101-00 | | | 2 | | | | | | SCREW,MACHINE:4-40 X 0.25,FLH,100 DEG STL ***** (END ATTACHING PARTS) ***** | 83385 | ORD BY DESCR |
| -197 | 131-0707-00 | | | 260 | | | | | | CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD | 22526 | 47439 |
| | 131-0708-00 | | | 10 | | | | | | CONTACT,ELEC:0.48"L,28-32 AWG WIRE | 22526 | 47437 |
| -198 | 352-0171-00 | | | 3 | | | | | | HLDR,TERM CONN:1 WIRE,BLACK | 80009 | 352-0171-00 |
| -199 | 352-0169-01 | | | 1 | | | | | | HLDR,TERM CONN:2 WIRE,BROWN | 80009 | 352-0169-01 |
| | 352-0169-04 | | | 1 | | | | | | HLDR,TERM CONN:2 WIRE,YELLOW | 80009 | 352-0169-04 |
| | 352-0169-05 | | | 2 | | | | | | HLDR,TERM CONN:2 WIRE,GREEN | 80009 | 352-0169-05 |
| | 352-0169-08 | | | 2 | | | | | | HLDR,TERM CONN:2 WIRE,GRAY | 80009 | 352-0169-08 |
| | 352-0169-09 | | | 1 | | | | | | HLDR,TERM CONN:2 WIRE,WHITE | 80009 | 352-0169-09 |
| | 352-0161-00 | | | 2 | | | | | | HLDR,TERM CONN:3 WIRE,BLACK,0.1 SPACING | 80009 | 352-0161-00 |
| | 352-0169-02 | | | 1 | | | | | | HLDR,TERM CONN:2 WIRE,RED | 80009 | 352-0169-02 |
| | 352-0161-03 | | | 1 | | | | | | CONN BODY,PL,EL:3 WIRE ORANGE | 80009 | 352-0161-03 |
| -201 | 352-0169-08 | | | 1 | | | | | | HLDR,TERM CONN:2 WIRE,GRAY | 80009 | 352-0169-08 |
| | 352-0162-00 | | | 5 | | | | | | HLDR,TERM CONN:4 WIRE BLACK | 80009 | 352-0162-00 |
| -202 | 352-0162-05 | | | 1 | | | | | | HLDR,TERM CONN:4 WIRE,GREEN | 80009 | 352-0162-05 |
| | 352-0163-00 | | | 3 | | | | | | HLDR,TERM CONN:5 WIRE BLACK,0.1 SPACING | 80009 | 352-0163-00 |
| -202 | 352-0163-06 | | | 2 | | | | | | HLDR,TERM CONN:5 WIRE,BLUE | 80009 | 352-0163-06 |
| | 352-0163-08 | | | 2 | | | | | | HLDR,TERM CONN:5 WIRE,GRAY | 80009 | 352-0163-08 |

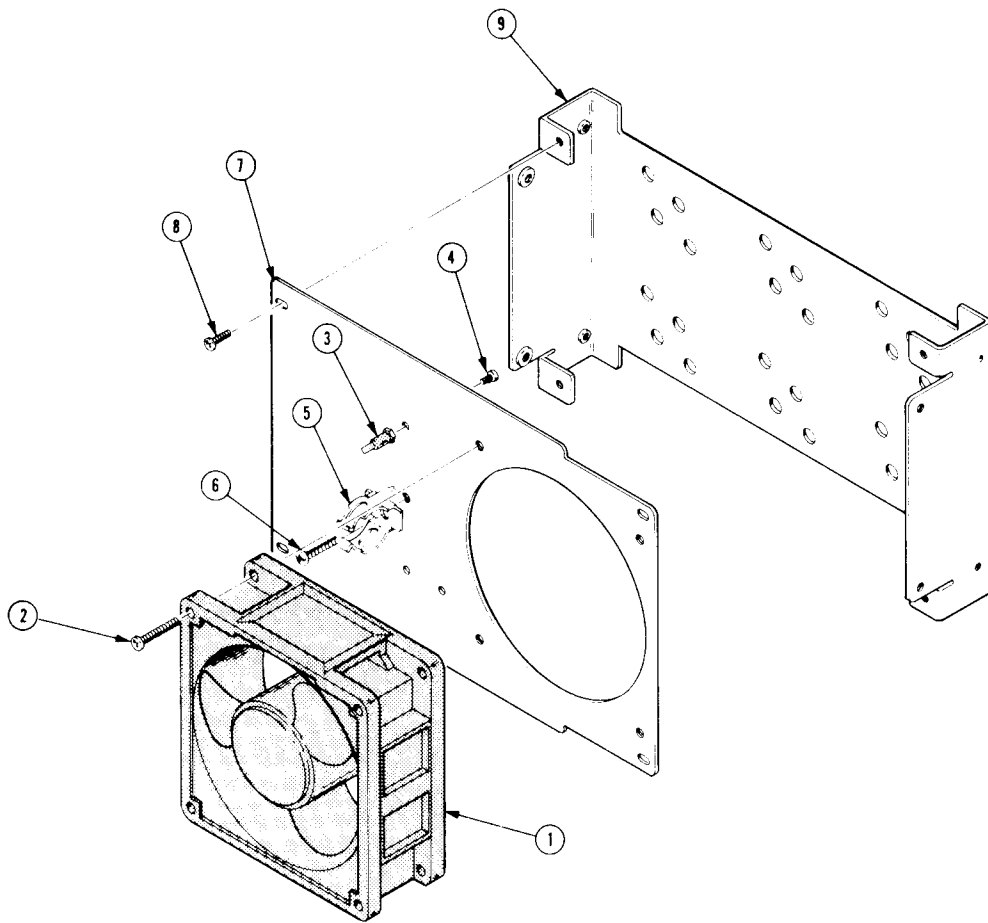
Replaceable Mechanical Parts—7603/R7603 Service

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | 1 2 3 4 5 | Name & Description | Mfr | |
|------------------------|-----------------------|------------------|---------|-----|-----------|--|-------|-----------------|
| | | Eff | Dscont | | | | Code | Mfr Part Number |
| 4-203 | 352-0164-01 | | | 4 | | HLDR,TERM CONN:6 WIRE,BROWN | 80009 | 352-0164-01 |
| -204 | 352-0165-00 | | | 2 | | HLDR,TERM CONN:7 WIRE,BLACK | 80009 | 352-0165-00 |
| -205 | 352-0166-00 | | | 6 | | HLDR,TERM CONN:8 WIRE,BLACK | 80009 | 352-0166-00 |
| | 352-0166-01 | | | 2 | | HLDR,TERM CONN:8 WIRE,BROWN | 80009 | 352-0166-01 |
| | 352-0166-02 | | | 3 | | HLDR,TERM CONN:8 WIRE,RED | 80009 | 352-0166-02 |
| | 352-0166-03 | | | 2 | | HLDR,TERM CONN:8 WIRE,ORANGE | 80009 | 352-0166-03 |
| -206 | 352-0168-00 | | | 2 | | HLDR,TERM CONN:10 WIRE,BLACK | 80009 | 352-0168-00 |
| | 352-0168-05 | | | 2 | | HLDR,TERM CONN:10 WIRE,GREEN | 80009 | 352-0168-05 |
| -207 | 179-1825-00 | B010100 | B375699 | 1 | | WIRING HARNESS:VERTICAL SIGNAL | 80009 | 179-1825-00 |
| | 179-1825-01 | B375700 | | 1 | | WIRING HARNESS:VERTICAL SIGNAL | 80009 | 179-1825-01 |
| | 131-0707-00 | | | 4 | | .CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD | 22526 | 47439 |
| | 352-0162-09 | B010100 | B375699 | 1 | | .HLDR,TERM CONN:4 WIRE,WHITE | 80009 | 352-0162-09 |
| | 204-0736-00 | B375700 | | 1 | | .CONN BODY,PLUG:4 CONTACTS,SGL ROW,LKG CLI | 00779 | 1-87175-0 |
| | 343-0549-00 | | | 3 | | .STRAP,TIEDOWN:0.091 W X 4.0 L,ZYTEL | 06383 | PLT1M |
| | 346-0187-00 | | | 1 | | .STRAP,TIEDOWN,E:4.375 L,NYLON W/MARKER | 59730 | TY51M |
| | 179-1826-00 | B010100 | B375699 | 1 | | WIRING HARNESS,:SWEEP GATE | 80009 | 179-1826-00 |
| | 179-1826-01 | B375700 | | 1 | | WIRING HARNESS:SWEEP GATE | 80009 | 179-1826-01 |
| | 131-0707-00 | | | 16 | | .CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD | 22526 | 47439 |
| | 352-0166-03 | B010100 | B375699 | 2 | | .HLDR,TERM CONN:8 WIRE,ORANGE | 80009 | 352-0166-03 |
| | 204-0738-00 | B375700 | | 2 | | .CONN BODY,PLUG:8 CONTACTS,SGL ROW,LKG CLI | 00779 | 1-87175-7 |
| | 343-0549-00 | | | 3 | | .STRAP,TIEDOWN:0.091 W X 4.0 L,ZYTEL | 06383 | PLT1M |
| | 346-0187-00 | | | 1 | | .STRAP,TIEDOWN,E:4.375 L,NYLON W/MARKER | 59730 | TY51M |
| | 179-1827-00 | | | 1 | | WIRING HARNESS:RESET | 80009 | 179-1827-00 |
| | 131-0707-00 | | | 4 | | .CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD | 22526 | 47439 |
| | 352-0162-05 | | | 1 | | .HLDR,TERM CONN:4 WIRE,GREEN | 80009 | 352-0162-05 |
| | 346-0187-00 | | | 1 | | .STRAP,TIEDOWN,E:4.375 L,NYLON W/MARKER | 59730 | TY51M |
| | 175-5391-01 | B375700 | | 1 | | CABLE ASSY,RF:50 OHM COAX,17.5 L,9-0 | 80009 | 175-5391-01 |
| | 175-5392-00 | B375700 | | 1 | | CABLE ASSY,RF:50 OHM COAX,3.5 L,9-2 | 80009 | 175-5392-00 |
| | 175-5393-00 | B375700 | | 1 | | CABLE ASSY,RF:50 OHM COAX,3.5 L,9-3 | 80009 | 175-5393-00 |
| | 175-5394-00 | B375700 | | 1 | | CABLE ASSY,RF:50 OHM COAX,3.5 L,9-1 | 80009 | 175-5394-00 |
| | 175-5430-00 | B375700 | | 1 | | CA ASSY,SP,ELEC:2.26 AWG,24.0 L,RIBBON | 80009 | 175-5430-00 |
| | 195-0974-00 | B375700 | | 1 | | LEAD,ELECTRICAL:18 AWG,12.0 L,8-0 | 80009 | 195-0974-00 |
| | 195-5155-00 | B375700 | | 1 | | LEAD,ELEC:18 AWG,9.0 L,0-N | 80009 | 195-5155-00 |
| | 195-5156-00 | B375700 | | 1 | | LEAD,ELECTRICAL:18 AWG,9.0 L,8-9 | 80009 | 195-5156-00 |
| | 195-5157-00 | B375700 | | 1 | | LEAD,ELECTRICAL:18 AWG,24.0 L,5-4 | 80009 | 195-5157-00 |
| | 195-5158-00 | B375700 | | 1 | | LEAD,ELECTRICAL:18 AWG,6.0 L,8-0 | 80009 | 195-5158-00 |
| | 195-7987-00 | B375700 | | 1 | | LEAD,ELECTRICAL:18 AWG,3.5 L,5-4 | 80009 | 195-7987-00 |
| | 179-1637-00 | B010100 | B357055 | 1 | | WIRING HARNESS,:POWER | 80009 | 179-1637-00 |
| | 195-0213-00 | B357056 | | 1 | | WIRE SET,ELEC: | 80009 | 195-0213-00 |
| -208 | 200-1075-00 | | | 4 | | .COVER,TERM:QUICK DISCONNECT | 00779 | 1-480435-0 |
| -209 | 131-0861-00 | | | 4 | | .TERM,QIK DISC:16-20 AWG,0.22 W X 0.02 THK | 00779 | 42617-2 |
| -210 | 175-0825-00 | | | FT | | WIRE,ELECTRICAL:2 WIRE RIBBON | 80009 | 175-0825-00 |
| -211 | 175-0826-00 | | | FT | | WIRE,ELECTRICAL:3 WIRE RIBBON | 80009 | 175-0826-00 |
| -212 | 175-0827-00 | | | FT | | CABLE,SP,ELEC:4,26 AWG,STRD.PVC JKT,RBN | 08261 | SS04267(1061)0C |
| -213 | 175-0828-00 | | | FT | | WIRE,ELECTRICAL:5 WIRE RIBBON | 08261 | SS-0526-710610C |
| -214 | 175-0829-00 | | | FT | | WIRE,ELECTRICAL:6 WIRE RIBBON | 08261 | SS-0626-710610C |
| -215 | 175-0830-00 | | | FT | | WIRE,ELECTRICAL:7 WIRE RIBBON | 08261 | SS-0726-710610C |
| -216 | 175-0831-00 | | | FT | | WIRE,ELECTRICAL:8 WIRE RIBBON | 08261 | SS-0826-710610C |
| | 175-0857-00 | | | FT | | WIRE,ELECTRICAL:8 WIRE RIBBON | 08261 | SS-0822-7(1061) |
| -217 | 175-0855-00 | | | FT | | WIRE,ELECTRICAL:10 WIRE RIBBON | 08261 | SS-1022(1061)0C |

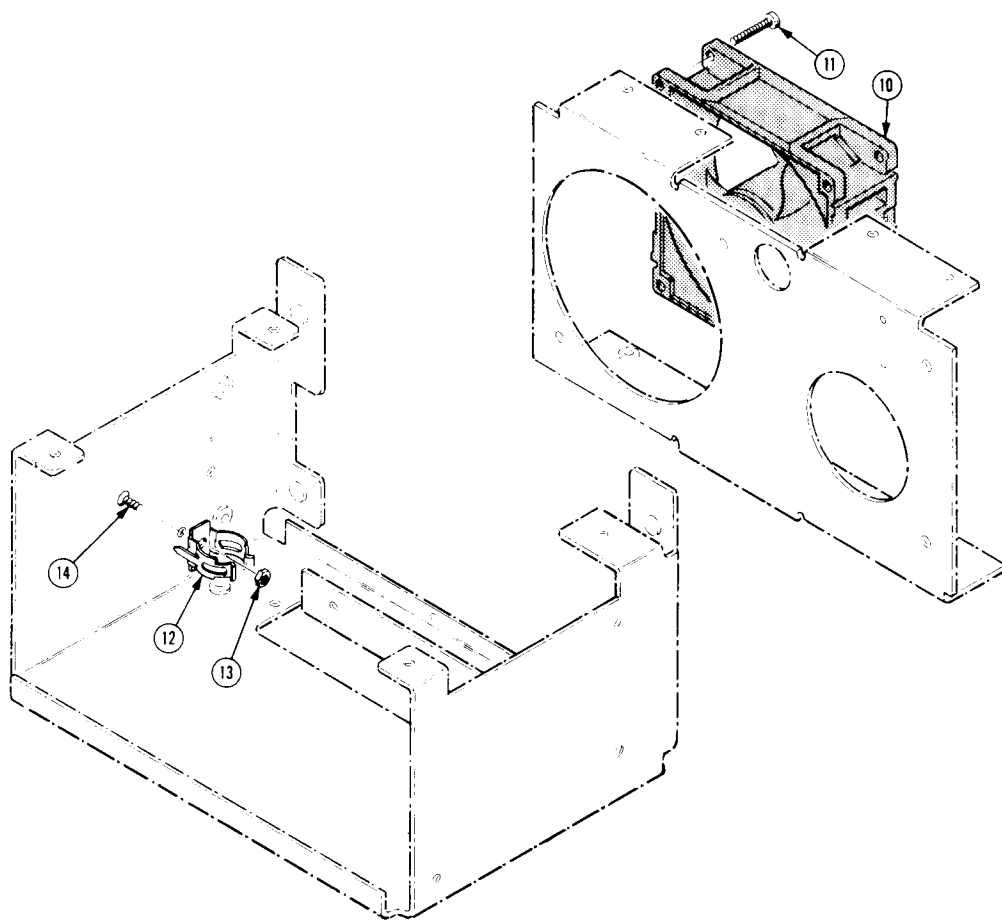
Replaceable Mechanical Parts—7603/R7603 Service

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Qty | 1 | 2 | 3 | 4 | 5 | Name & Description | Mfr Code | Mfr Part Number |
|------------------|--------------------|----------------------|--------|-----|---|---|---|---|---|---|----------|------------------|
| 7603 OPTION 05 | | | | | | | | | | | | |
| 5-1 | ----- | | | 1 | | | | | | FAN,TUBEAXIAL:(SEE B1001 REPL) ***** (ATTACHING PARTS)***** | | |
| -2 | 211-0530-00 | | | 4 | | | | | | SCREW,MACHINE:6-32 X 1.750,PNH STL CD PL ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -3 | 131-0761-00 | | | 3 | | | | | | TERMINAL STUD:SCREW MTG,FLAT TAB ***** (ATTACHING PARTS)***** | 71279 | 572-4897-01-0516 |
| -4 | 211-0504-00 | | | 1 | | | | | | SCREW,MACHINE:6-32 X 0.250,PNH STL CD PL ***** (ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -5 | 344-0116-00 | | | 1 | | | | | | RTNR,CAPACITOR:CAPACITOR MTG ***** (ATTACHING PARTS)***** | 90201 | TH-17 |
| -6 | 211-0008-00 | | | 1 | | | | | | SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -7 | 378-0050-00 | | | 1 | | | | | | BAFFLE,AIR: ***** (ATTACHING PARTS)***** | 80009 | 378-0050-00 |
| -8 | 211-0507-00 | | | 4 | | | | | | SCREW,MACHINE:6-32 X 0.312,PNH STL CD PL ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -9 | 441-1201-00 | | | 1 | | | | | | CHASSIS,SCOPE:REGULATOR | 80009 | 441-1201-00 |
| R7603 OPTION 05 | | | | | | | | | | | | |
| -10 | ----- | | | 1 | | | | | | FAN,TUBEAXIAL:(SEE B1001)REPL ***** (ATTACHING PARTS)***** | | |
| -11 | 211-0530-00 | | | 4 | | | | | | SCREW,MACHINE:6-32 X 1.750,PNH STL CD PL ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |
| -12 | 344-0116-00 | | | 1 | | | | | | RTNR,CAPACITOR:CAPACITOR MTG ***** (ATTACHING PARTS)***** | 90201 | TH-17 |
| -13 | 210-0407-00 | | | 1 | | | | | | NUT,PLAIN,HEX.:6-32 X 0.25 INCH,BRS | 73743 | 3038-0228-402 |
| -14 | 211-0541-00 | | | 1 | | | | | | SCREW,MACHINE:6-32 X 0.25"100 DEG.FLH STL ***** (END ATTACHING PARTS)***** | 83385 | ORD BY DESCR |

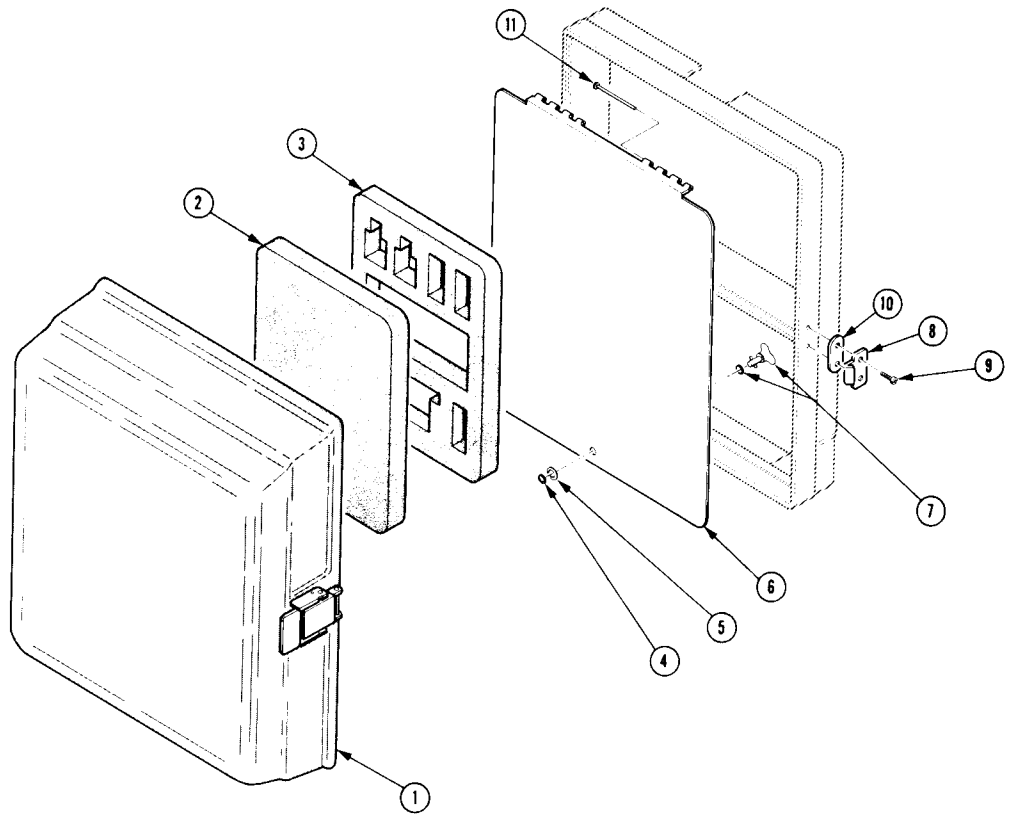
7603 OPTION 5



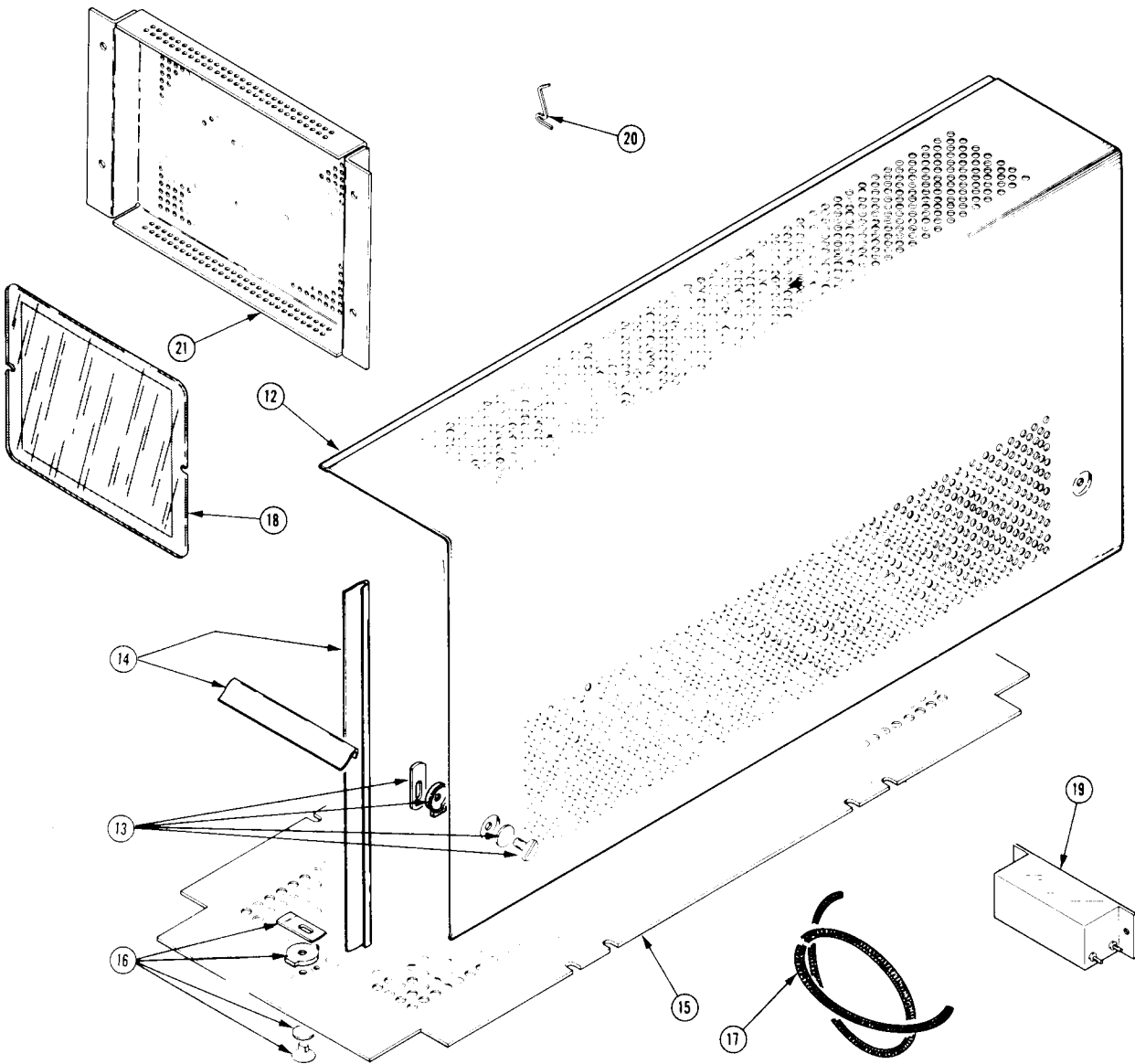
R7603 OPTION 5



OPTION 8



OPTION 3

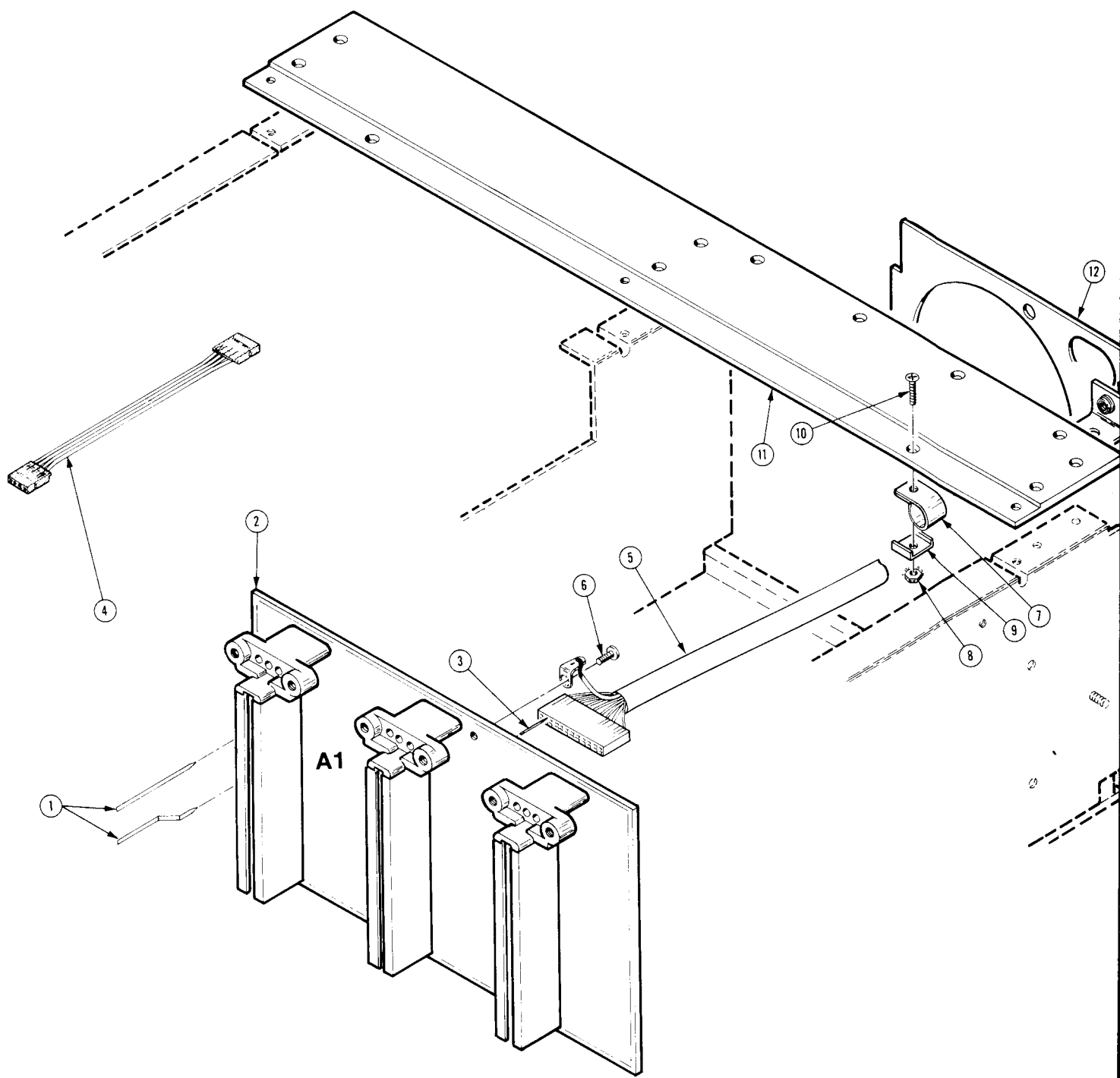


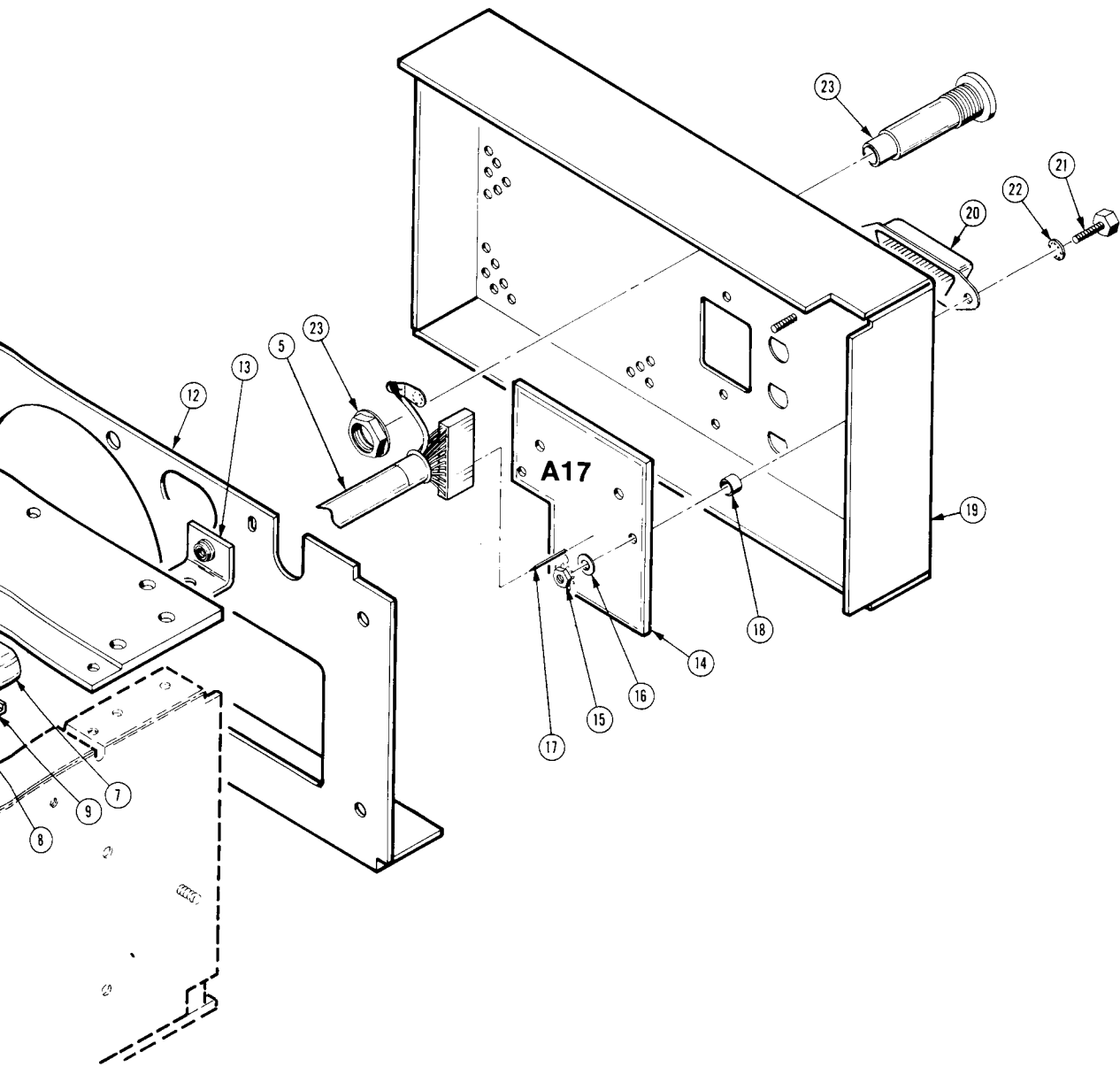
Replaceable Mechanical Parts—7603/R7603 Service

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | 1 2 3 4 5 | Name & Description | Mfr | | |
|------------------------|-----------------------|------------------|---------|-----|-----------|---|-------|-----------------|--|
| | | Eff | Dscont | | | | Code | Mfr Part Number | |
| OPTION 08 | | | | | | | | | |
| 6-1 | 200-1360-03 | | | 1 | | COVER,SCOPE:FRONT W/TRAY PAINTED BLUE | 80009 | 200-1360-03 | |
| -2 | 348-0321-00 | | | 1 | | .PAD CUSHIONING:6.5 X 4.9 POLYESTOR FOAM | 80009 | 348-0321-00 | |
| -3 | 352-0327-00 | | | 1 | | .HOLDER,ACCESS:PROBE,BLACK POLYETHYLENE | 80009 | 352-0327-00 | |
| -4 | 210-0907-00 | | | 1 | | .WASHER,RING:0.25 INCH OD | 71286 | 5S3-1 | |
| -5 | 210-1105-00 | | | 1 | | .WASHER,FLAT:0.188 ID X 0.375 OD,NYLON | 86445 | ORD BY DESCR | |
| -6 | 200-1372-01 | | | 1 | | .LID,SCOPE COVER:AL,PAINTED BLUE | 80009 | 200-1372-01 | |
| -7 | 214-0122-00 | | | 1 | | .STUD,TURNLOCK:0.25 TURN,WING HEAD | 71286 | 5S10-8 | |
| -8 | 105-0390-00 | | | 2 | | .CATCH,CLAMPING:FOR FRONT COVE(ATTACHING PARTS)..... | 98003 | SC-B-83314 | |
| -9 | 213-0119-00 | | | 4 | | .SCR,TPG,THD FOR:4-24 X 0.375 INCH,PNH STL(END ATTACHING PARTS)..... | 83385 | ORD BY DESCR | |
| -10 | 361-0480-00 | | | 2 | | .SPACER,LATCH:ACC COVER | 80009 | 361-0480-00 | |
| -11 | 214-0756-00 | | | 2 | | .PIN,SHLDR,HD:0.095-0.17 DIA X 1.785,ACET | 80009 | 214-0756-00 | |
| OPTION 03 | | | | | | | | | |
| -12 | 390-0297-00 | B010100 | B369011 | 2 | | COVER,SCOPE:LEFT & RIGHT SIDE | 80009 | 390-0297-00 | |
| | 390-0851-00 | B369012 | | 1 | | CABINET SIDE:LEFT | 80009 | 390-0851-00 | |
| | 390-0852-00 | B369012 | | 1 | | CABINET SIDE:RIGHT | 80009 | 390-0852-00 | |
| -13 | 214-0816-00 | | | 6 | | .FASTENER,PAWL: | 80009 | 214-0816-00 | |
| -14 | 348-0274-00 | | | 4 | | .SHLD,GSKT,ELEK:FINGER TYPE,24.0 L | 30817 | 97-555CDC | |
| -15 | 390-0355-00 | B010100 | B369011 | 1 | | COVER,SCOPE:BOTTOM | 80009 | 390-0355-00 | |
| | 390-0850-00 | B369012 | | 1 | | CABINET BOTTOM: | 80009 | 390-0850-00 | |
| -16 | 214-0816-00 | | | 2 | | .FASTENER,PAWL: | 80009 | 214-0816-00 | |
| -17 | 348-0340-00 | | | FT | | SHLD,GSKT,ELEC:0.125 X 0.125 FT L,FOAM | 07700 | 85-10168 | |
| -18 | 378-0696-00 | | | 1 | | FILTER,LT,CRT:AMBER | 80009 | 378-0696-00 | |
| -19 | ----- | | | 1 | | FILTER,RFI:(SEE FL1000 REPL) | | | |
| -20 | 131-1266-00 | | | 1 | | CONTACT,ELEC:GROUND SPRING | 80009 | 131-1266-00 | |
| -21 | 337-1726-00 | B010100 | B368864 | 1 | | SHIELD ELEC:REGULATOR | 80009 | 337-1726-00 | |
| | 352-0084-02 | | | 1 | | LAMPHOLDER:T-2 OR SMALLER UNBASED LAMP | 80009 | 352-0084-02 | |

Replaceable Mechanical Parts—7603/R7603 Service

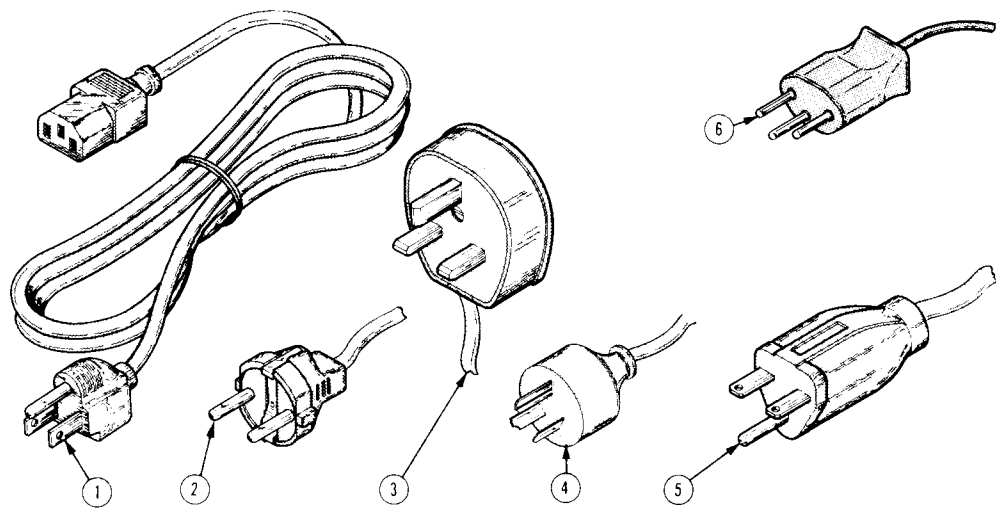
| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | 1 2 3 4 5 | Name & Description | Mfr Code | Mfr Part Number |
|------------------------|-----------------------|------------------|--------|-----|-----------|--|-------------|------------------|
| | | Eff | Dscont | | | | | |
| 7-1 | 131-2158-01 | | | 1 | | CONTACT,ELEC:CKT BD CONN,PH BRZ GOLD PL | 80009 | 131-2158-01 |
| -2 | ----- | | | 1 | | CKT BOARD ASSY:INTERFACE(SEE A1 REPL) | | |
| -3 | 131-0608-00 | | | 110 | | .TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD | 22526 | 48283-036 |
| -4 | 198-4911-00 | | | 1 | | WIRE SET,ELEC: | 80009 | 198-4911-00 |
| | 175-7377-00 | | | 1 | | .CABLE ASSY,RF:50 OHM COAX,15.0 L,9-2 | 80009 | 175-7377-00 |
| | 175-7378-00 | | | 1 | | .CABLE ASSY,RF:50 OHM COAX,15.0 L,9-5 | 80009 | 175-7378-00 |
| | 352-0162-00 | | | 2 | | .HLDR,TERM CONN:4 WIRE BLACK | 80009 | 352-0162-00 |
| -5 | 175-7367-00 | | | 1 | | CABLE ASSY,SP.ELEC:13.0 INCH LONG *****ATTACHING PARTS***** | 80009 | 175-7367-00 |
| -6 | 211-0008-00 | | | 1 | | SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ *****END ATTACHING PARTS***** | 83385 | ORD BY DESCR |
| | ----- | | | - | | CABLE ASSY INCLUDES: | | |
| | 210-0201-00 | | | 2 | | .TERMINAL,LUG:0.12 ID,LOCKING,BRZ TIN PL | 86928 | ORD BY DESCR |
| | 352-0428-00 | | | 2 | | .CONN BODY,PLUG:2/12 FEM CONT | 22526 | 65043-070 |
| -7 | 343-0013-00 | | | 1 | | CLAMP,LOOP:0.375 ID,PLASTIC *****ATTACHING PARTS***** | 95987 | 3-8-6B |
| -8 | 210-0586-00 | | | 1 | | NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL | 78189 | 211-041800-00 |
| -9 | 210-0863-00 | | | 1 | | WSHR,LOOP CLAMP:0.187 ID U/W 0.5 W CLP,STL | 95987 | C191 |
| -10 | 211-0025-00 | | | 1 | | SCREW,MACHINE:4-40 X 0.375 100 DEG,FLH ST *****END ATTACHING PARTS***** | 83385 | ORD BY DESCR |
| -11 | 426-0804-02 | | | 1 | | FRAME SECT,CAB:TOP REAR | 80009 | 426-0804-02 |
| -12 | 386-2410-03 | | | 1 | | SUBPANEL,REAR: | 80009 | 386-2410-03 |
| -13 | 214-1731-02 | | | 1 | | HEAT SINK,XSTR: | 80009 | 214-1731-02 |
| -14 | ----- | | | 1 | | CKT BOARD ASSY:GPIB(SEE A17 REPL) *****ATTACHING PARTS***** | | |
| -15 | 210-0586-00 | | | 3 | | NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL | 78189 | 211-041800-00 |
| -16 | 210-0994-00 | | | 3 | | WASHER,FLAT:0.125 ID X 0.25" OD,STL *****END ATTACHING PARTS***** | 86928 | 5702-201-20 |
| | ----- | | | - | | .CKT BOARD ASSY INCLUDES: | | |
| -17 | 131-0608-00 | | | 24 | | .TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD | 22526 | 48283-036 |
| -18 | 166-0024-00 | | | 3 | | SPACER,SLEEVE:0.133 ID X 0.125 INCH L,BRS | 76854 | 3-5116-314 |
| -19 | 386-2401-06 | | | 1 | | PANEL,REAR: | 80009 | 386-2401-06 |
| -20 | 131-2203-01 | | | 1 | | CONN,RCPT,ELEC:CKT BD,24 CONT,FEMALE *****ATTACHING PARTS***** | 71785 | 57-20240-11 |
| -21 | 129-0922-00 | | | 2 | | SPACER,POST:0.71,W/6-32 THD ONE END,AL | 80009 | 129-0922-00 |
| -22 | 210-0008-00 | | | 2 | | WASHER,LOCK:INTL,0.02 THK *****END ATTACHING PARTS***** | 78189 | 1208-00-00-0541C |
| -23 | 204-0832-00 | | | 1 | | BODY,FUSEHOLDER:3AG,5 X 20MM FUSES | S3629 | 031.1673(MDLFEU) |
| | | | | | | STANDARD ACCESSORIES | | |
| | 020-0903-00 | | | 1 | | ACCESSORY KIT: | 80009 | 020-0903-00 |

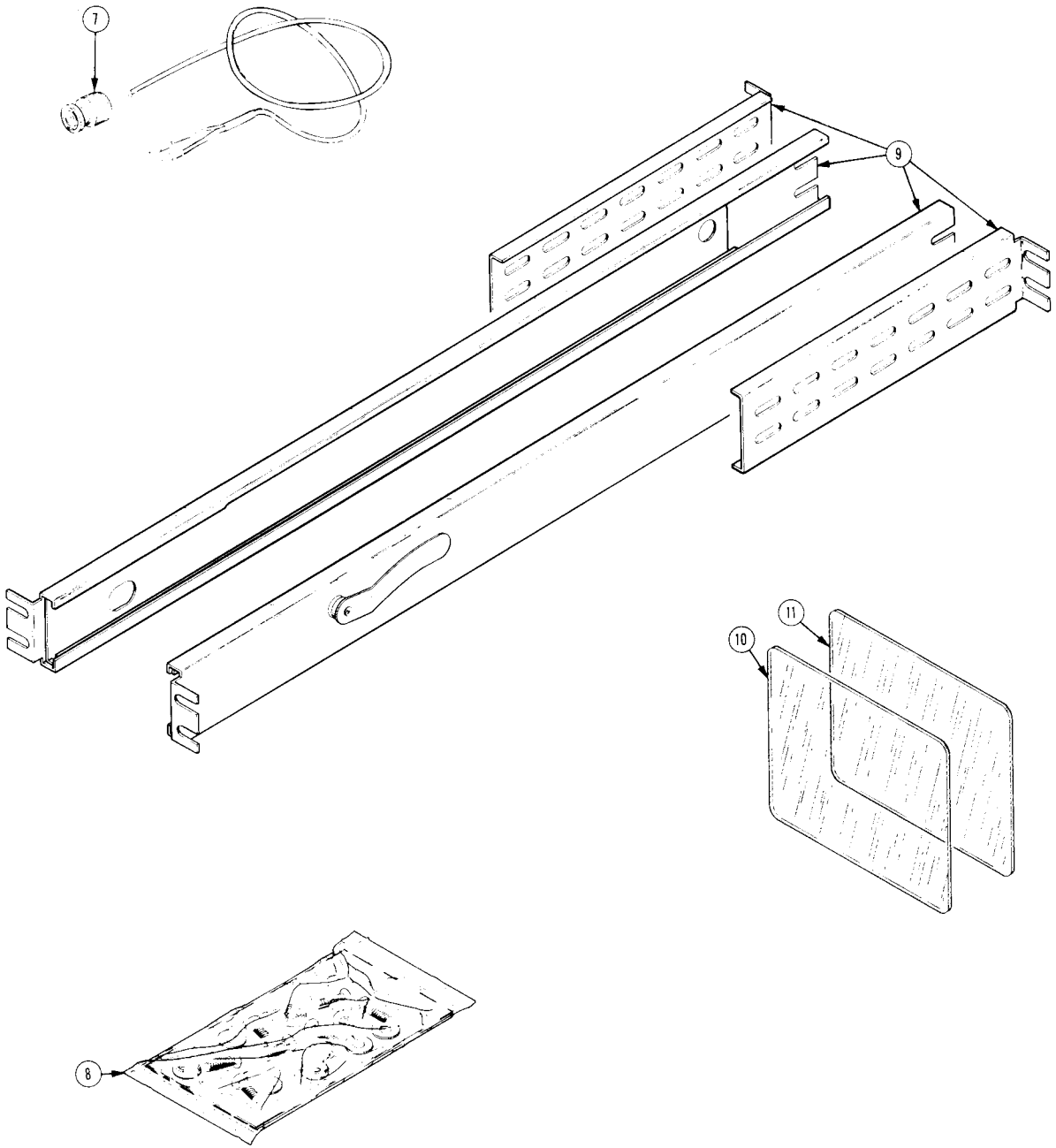




Replaceable Mechanical Parts—7603/R7603 Service

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | 1 2 3 4 5 | | | | | Name & Description | Mfr Code | Mfr Part Number |
|------------------------|-----------------------|------------------|---------|-----|-----------|--|--|--|--|---|-------------|------------------|
| | | Eff | Dscont | | | | | | | | | |
| STANDARD ACCESSORIES | | | | | | | | | | | | |
| 8-1 | 161-0066-00 | | | 1 | | | | | | CABLE ASSY,PWR:,3,18 AWG,115V,96.0 L | T1372 | ORD BY DESCR |
| -2 | 161-0066-09 | | | 1 | | | | | | CABLE ASSY,PWR:3,0.75MM SQ,220V,99.0 L | S3109 | VIIGSOP0-H05VVF3 |
| | ----- | | | - | | | | | | (OPTION A1 ONLY) | | |
| -3 | 161-0066-10 | | | 1 | | | | | | CABLE ASSY,PWR:3,0.75MM SQ,240V,96.0 L | S3109 | ORD BY DESCR |
| | ----- | | | - | | | | | | (OPTION A2 ONLY) | | |
| -4 | 161-0066-11 | | | 1 | | | | | | CABLE ASSY,PWR:3,0.75MM,240V,96.0L | S3109 | SAA/3-003CCFC3X0 |
| | ----- | | | - | | | | | | (OPTION A3 ONLY) | | |
| -5 | 161-0066-12 | | | 1 | | | | | | CABLE ASSY,PWR:3,18 AWG,240V,96.0 L | T1105 | ORD BY DESCR |
| | ----- | | | - | | | | | | (OPTION A4 ONLY) | | |
| -6 | 161-0154-00 | | | 1 | | | | | | CABLE ASSY,PWR:3,0.75MM SQ,240V,6A 2.5M L | 000JA | A25SW |
| | ----- | | | - | | | | | | (OPTION A5 ONLY) | | |
| -7 | 175-1178-00 | | | 1 | | | | | | CABLE ASSY,RF:50 OHM COAX,20.0 L | 80009 | 175-1178-00 |
| -8 | 016-0099-00 | | | 1 | | | | | | HDW KIT,ELEK EQ:RACKMOUNT HDW | 80009 | 016-0099-00 |
| | | | | | | | | | | (R7603 ONLY) | | |
| -9 | 351-0314-00 | B010100 | B357337 | 1 | | | | | | SLIDE,DWR,EXT:22.0 X 1.69,PAIR | 80009 | 351-0314-00 |
| | | | | | | | | | | (R7603 ONLY) | | |
| | 351-0314-01 | B357338 | | 1 | | | | | | SLIDE,DWR,EXT:W/CLOSED MOUNTING SLOTS | 80009 | 351-0314-01 |
| | | | | | | | | | | (R7603 ONLY) | | |
| -10 | 337-1700-01 | | | 1 | | | | | | SHIELD,ELEC:BLUE | 80009 | 337-1700-01 |
| -11 | 337-1700-04 | | | 1 | | | | | | SHLD,IMPLOSION:CLEAR | 80009 | 337-1700-04 |
| | 070-1429-00 | | | 1 | | | | | | MANUAL,TECH:SERVICE | 80009 | 070-1429-00 |
| | 070-1310-00 | | | 1 | | | | | | MANUAL,TECH:OPERATORS | 80009 | 070-1310-00 |





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.

GUERNSEY TYPE - GENERAL

All Mainframes supplied with an Option A - 2 Power Cord have a 5 Amp Fuse (Part Number 159-0093-00) fitted in the Plug.

4022/982

GUERNSEY TYPE 7613 OPTION A-2
GUERNSEY TYPE 7623A OPTION A-2
GUERNSEY TYPE 7704A OPTION A-2

PARTS LIST CHANGE

CHANGE TO:-

161-0104-07

Power Cord A-2

4034/1082

GUERNSEY TYPE 7613 OPTION A-1
GUERNSEY TYPE 7623A OPTION A-1
GUERNSEY TYPE 7704A OPTION A-1

PARTS LIST CHANGE

CHANGE TO:-

161-0104-06

Power Cord A-1

4044/1182

GUERNSEY TYPE 7603 - TENTATIVE S/N 106001
R7603 - TENTATIVE S/N 106001

ELECTRICAL PARTS LIST CHANGE

ADD:-

C2128 283-0204-00 Capacitor, 0.01uF

CHANGE TO:-

R2128 311-0609-00 Potentiometer, 2K

Note: Add capacitor in parallel with R2128

4367/984

GUERNSEY TYPE 7603 - TENTATIVE S/N 106001
R7603 - TENTATIVE S/N 106001

ELECTRICAL PARTS LIST CHANGE

CHANGE TO:-

R519 321-0105-00 Resistor, 121 Ohm

4233/1283

GUERNSEY TYPE 7603/R7603

S/N 100192 2457/973

Change to:-

| | | |
|------|-------------|----------------------|
| R465 | 311-0635-00 | Potentiometer 1K Ohm |
| R466 | 315-0271-00 | Resistor, 270 Ohm |

S/N 100372 2605/374

Change to:-

| | | |
|-------|-------------|-------------------------|
| Q1061 | 151-0190-02 | Transistor, Silicon NPN |
| Q1066 | 151-0190-02 | Transistor, Silicon NPN |

S/N 100442 2687/674

Change to:-

| | | |
|------|-------------|---------------------|
| R645 | 321-0262-00 | Resistor, 5.23K Ohm |
|------|-------------|---------------------|

S/N 100662 2820/1274

Change to:-

| | | |
|------|-------------|------------------|
| R134 | 315-0102-00 | Resistor, 1K Ohm |
|------|-------------|------------------|

S/N 101272 3175/1076

Change to:-

| | | |
|---------------------------|-------------|--------------------------|
| CR2235 thru CR2266 inc | 152-0141-02 | Semicond Device, Silicon |
|---------------------------|-------------|--------------------------|

S/N 101342 3207/1276

Change to:-

| | | |
|------|-------------|----------------------|
| C615 | 281-0510-00 | Capacitor, 22pF 500V |
|------|-------------|----------------------|

S/N 103450 3826/980

Add:-

| | | |
|-----|-------------|------------------------|
| C42 | 283-0003-00 | Capacitor, 0.01uF 150V |
|-----|-------------|------------------------|

Note:

Add capacitor between Pin 1 of Pin 13 and Pin 3 of Pin 12 on the Main Interface

S/N 105094 3900/781

Add:-

| | | |
|-------|-------------|-----------------|
| C2283 | 283-0251-00 | Capacitor, 87pF |
|-------|-------------|-----------------|

Note:

Add capacitor from Pin 12 (ground) to Pin 13 on U2284 on the Readout ECB

S/N 105724 4013/882

Change to:-

| | | |
|------|-------------|------------------------|
| C923 | 283-0180-00 | Capacitor, 5600pF 200V |
| R923 | 315-0512-00 | Resistor, 5.1K |

S/N 105874 4045/1182

Change to:-

| | | |
|------|-------------|-------------------|
| R937 | 321-0153-00 | Resistor, 383 Ohm |
|------|-------------|-------------------|

GUERNSEY TYPE 7603 - Tentative Serial Number 106136
7613 101301
7623A 100811

ELECTRICAL PARTS LIST CHANGE

CHANGE TO:-

F805 131-0566-00 Dummy resistor

4386/1184
