Service Manual

Tektronix

2212
Digital Storage & Analog Oscilloscope

070-8439-01

Please check for CHANGE INFORMATION at the rear of this manual.

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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 letter in the serial number 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, U.S.A.
J300000	Sony / Tektronix, Japan
H700000	Tektronix Holland, N.V., Heerenveen, The Netherlands
HK00000	Tektronix, Inc., Hong Kong

Instruments manufactured for Tektronix by external vendors outside the United States are assigned a two digit alpha code to identify the country of manufacture (e.g., J3 for Japan, HK for Hong Kong, IL for Israel, etc.).

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

Printed and produced in The Netherlands.

WARRANTY

Tektronix warrants that this product will be free from defects in materials and workmanship for a period of three (3) years from the date of shipment. If any such product proves defective during this warranty period, Tektronix, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

In order to obtain service under this warranty, Customer must notify Tektronix of the defect before the expiration of the warranty period and make suitable arrangements for the performance of the service. Customer shall be responsible for packaging and shipping of the defective product to the service center designated by Tektronix, with shipping charges prepaid. Tektronix shall pay for the return of the product to Customer if shipment is to a location within the country in which the Tektronix service center is located. Customer shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. Tektronix shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than Tektronix representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; or c) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

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Safety Summary

Please take a moment to review these safety precautions. They are provided for your protection and to prevent damage to the 2212 Oscilloscope. This safety information applies to all operators and service personnel.

Symbols and Terms

These two terms appear in manuals:

- 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.

These two terms appear 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.

This symbol appears in manuals:

Static-Sensitive Devices

These symbols appear on equipment:

DANGER
High Voltage

Protective
ground (earth)
terminal

ATTENTION
Refer to
manual

Specific Precautions

Observe all of the following precautions to ensure your personal safety and to prevent damage to either the 2212 Oscilloscope or equipment connected to it.

Do Not Perform Service While 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 or components while power is on. Disconnect power before removing protective panels, soldering, or replacing components.

Power Source

The 2212 Oscilloscope is intended to operate from a power source that will not apply more than 250 V rms between the supply conductors or between either supply conductor and ground. A protective ground connection, through the grounding conductor in the power cord, is essential for safe system operation.

Grounding the Oscilloscope

The 2212 Oscilloscope is grounded through the power cord. To avoid electric shock, plug the power cord into a properly wired receptacle where earth ground has been verified by a qualified service person. Do this before making connections to the input or output terminals of the 2212 Oscilloscope.

Without the protective ground connection, all parts of the 2212 Oscilloscope are potential shock hazards. This includes knobs and controls that may appear to be insulators.

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.

Use the Proper Fuse

To avoid fire 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 Remove Covers or Panels

To avoid personal injury, do not operate the 2212 Oscilloscope without the panels or covers.

Do Not Operate in Explosive Atmospheres

The 2212 Oscilloscope provides no explosion protection from static discharges or arcing components. Do not operate the 2212 Oscilloscope in an atmosphere of explosive gasses.

Electric Overload

Never apply a voltage to a connector on the 2212 Oscilloscope that is outside the range specified for that connector.

Product Description

This subsection begins with a general description of the traits of the 2212 oscilloscope. Three subsections follow, one for each of the three classes of characteristics: *nominal traits, warranted characteristics,* and *typical characteristics.*

User Interface

This oscilloscope uses the front-panel buttons and knobs to control its many functions. The front-panel controls are grouped according to function: vertical, horizontal, trigger, cursor, setup, and storage. The controls just to the right of the crt screen are called the display group. Within each group, the functions are set directly by their own front-panel knob.

When Option 10 (GPIB) and/or Option 12 (RS-232-C) are included most functions of the oscilloscope can be operated externally by a controller (PC).

Indicators

Several on-screen readouts help you keep track of the settings for various functions, such as vertical and horizontal scale and trigger level. There are also crt readouts to display the results of measurements, using cursors.

Signal Acquisition System

In (Digital) Storage mode, the signal acquisition system provides two vertical channels with calibrated vertical scale factors from 20 mV thru 50 V with a 10X probe (P6109), and 2 mV thru 5 V per division with a 1X probe P6101A (optional). Both channels can be acquired simultaneously. The vertical channels have a bandwidth of ± 10 MHz in Store mode.

Each of the two channels can be displayed, scaled and vertically positioned and have their vertical coupling specified. Channel 2 can also be inverted.

Besides the two channels, up to two stored waveforms are available for display.

With the VARiable VOLTS/DIV gain control (VAR) you can increase the deflection factor to overlap the next VOLTS/DIV setting.

You can select the following display modes:

CH 1, ADD, ALT, CHOP, X-Y or CH 2.

- In CH 1 or CH 2 mode, only the signal applied to the CH 1 OR X input connector or to the CH 2 OR Y input connector is displayed on the crt screen.
- In ALTernate mode, the display switches between CH 1 and CH 2 at the end of each sweep, showing the signals applied to each channel alternately.
- In CHOPped mode, the display switches between CH 1 and CH 2 at a rate of ±500 kHz as the sweep is occurring to display both channels simultaneously on the crt.
- In ADDed mode, the signals applied to the CH 1 OR X input connector and the CH 2 OR Y input connector are algebraically added.
- In the X–Y Store mode, the acquisition and the sampling rate are set by the SEC/DIV switch and/or the EXT CLOCK. The signal connected to the CH 1 OR X connector is switched to the horizontal deflection and the signal connected to the CH 2 OR Y connector to the vertical deflection.

If the ADD, ALT or CHOP mode is selected in Store mode, the signals applied to the vertical input connectors are acquired similtaneously. However, if the vertical mode is in ALT and the trigger source is in VERT MODE, CH 1 and CH 2 will be digitized alternately.

Vertical Non-Storage Deflection System

In Non-Storage (Analog) mode, the vertical deflection system provides two vertical channels with calibrated vertical scale factors from 20 mV to 50 V with a 10X probe (P6109), and 2 mV to 5 V per division with a 1X probe P6101A (optional). Both channels can be displayed simultaneously.

Each of the two channels can be displayed, scaled and vertically positioned and have their vertical coupling specified. Channel 2 can also be inverted.

The vertical channels have a bandwidth of 60 MHz in the 5 mV/DIV thru 5 V/DIV position. In the 2 mV/DIV position the bandwidth is reduced to approximately 10 MHz.

Independent bandwidth limiting (to ±10 MHz) for each channel is also possible with the BW Limit switched on. You can limit one channel's bandwidth to ±10 MHz without affecting the bandwidth of the other channel.

With the VARiable VOLTS/DIV gain control (VAR), you can increase the deflection factor to overlap the next VOLTS/DIV setting. You can select the following display modes:

CH 1, ADD, ALT, CHOP, X-Y and CH 2.

- In CH 1 or CH 2 mode, only the signal applied to the CH 1 OR X input connector or to the CH 2 OR Y input connector is displayed on the crt screen.
- In ALTernate mode, the display switches between CH 1 and CH 2 at the end of each sweep, showing the signals applied to each channel alternately.
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- In the ADDed mode, the signals applied to the CH 1 OR X input connector and the CH 2 OR Y input connector are algebraically added.
- In X-Y mode, the signal connected to the CH 1 OR X connector is switched to the horizontal deflection and the signal connected to the CH 2 OR Y connector to the vertical deflection.

Horizontal Display System

The 2212 has two different horizontal display systems :

- Horizontal Non-Storage Display System
- Horizontal Storage Display System

You can horizontally position the waveform with the horizontal POSITION knob.

The X1, X10, X50 magnifier switch magnifies the horizontal display 10 or 50 times around the center vertical graticule line.

Horizontal Non-Storage Display System

In Non-Store mode, the 2212 provides a calibrated sweep speed range from 0.5 s per division to 0.05 µs per division. You can use the variable timing control (VAR) to increase the non-store sweep time per division by a factor of up to 2.5 times the calibrated time per division, as selected with the SEC/DIV switch.

You can use the Alternate Magnifier feature (ALT MAGN) to display the magnified and unmagnified sweep alternately on the crt screen in Non-Store mode. You can reposition the unmagnified sweep vertically with the Trace Separation control (TR SEP) in the ALT MAGN mode.

Horizontal Storage Display System

In Store mode, the 2212 provides a calibrated sweep speed range from 50 s to 20 µs per division. The SEC/DIV switch setting determines the acquisition and display modes, sets the sampling rate and establishes the time scale factor of the displayed waveform.

The maximum sampling rate is 20 megasamples per second (20 Ms/s) with a stored record length per waveform of 4096 points for single-channel and dual-channel acquisitions. All 4k points are visible on screen at one time.

One waveform set (CH 1 and CH 2), 4k record length each, can be stored in the reference memory as a refernce waveform, giving a total 8k record length. Previous stored data in the reference memory is overwritten. A reference waveform may be recalled for display and comparison with the current acquisition waveform.

The storage system has two acquisition modes, selected by the SEC/DIV switch setting:

- **RECORD** mode. The SEC/DIV must be set to 0.2 SEC/DIV or faster. A full record is acquired before the acquired data is displayed on the crt screen. All triggering modes are selectable.

- **ROLL** mode. The SEC/DIV must be set to 0.1 SEC/DIV or slower. Every new acquired data point is displayed immediately to the right side of the crt screen and the complete display is shifted one position to the left. Triggering is disabled, except in SGL SWEEP (single sweep) mode. "ROLL" is displayed in the crt readout.

With the 2212 in X-Y Store mode, the SEC/DIV and /or the EXT CLOCK INPUT determine the sample rate. The External Clock Input (EXT CLK)provides input for external clock signals to the storage circuit when the SEC/DIV switch is in one of the two EXT CLK positions (RECORD or ROLL).

Triggering System

The triggering system provides triggering from the channel 1 and/or channel 2 signals or from the external trigger input
(EXT INPUT OR Z). Types of trigger signals recognized include:

- **Internal** : This type of triggering is fully configurable for LEVEL, SOURCE, MODE, COUPLING, and SLOPE.

- **External** : This triggering source is configurable for SLOPE, LEVEL, MODE, and COUPLING like the internal sources.

You can choose the pre-trigger point within the acquired waveform record by selecting the amount of pre-trigger (25% or 75%)with the PRETRIG switch.

The hold-off time can be adjusted with the trigger HOLD OFF control.

The EXT OR Z input, at the bottom of the TRIGGER section, can be used to apply either an external trigger signal to the trigger circuit or an external Z-axis (display intensity) control signal to the Z-axis circuit.

Setup

The setup function allows you to automatically setup the instrument with the push of a single button (AUTO). The SET UP feature is intended to automatically set the vertical, horizontal, triggering and display controls, to display an unknown waveform on the crt screen with an optimized front panel set-up.

With the SAVE and RECALL function, you can respectively save the current front panel set-up in the memory, or recall the last stored front panel set-up from that memory.

With the SAVE and RECALL button pressed simultaneously, the MENU screen is called.

Cursor

Once you have set up to make your measurements, the cursor feature can help you make those measurements quickly.

Two types of cursor are provided for making measurements on the displayed waveforms:

- They appear as horizontal dotted lines on the screen with delta-voltage measurements.
- They appear as vertical dotted lines with delta-time and frequency measurements.

The cursor controls allow you to make delta-voltage (ΔV), delta-time (ΔT), and frequency (1/ΔT) measurements using the cursors on the display.

You can select two cursor modes:

- **TRACK** mode. Both cursors are dashed. Rotating the cursor POSITION causes both cursors to move.
- **DELTA** mode. The delta cusor is dashed, and the reference cursor is dotted. Rotating the cursor POSITION causes the delta cursor to move and the reference cursor is fixed.

Storage and I/O

In STORE mode, signals supplied to the vertical inputs are acquired by the digital storage circuit and displayed on the crt screen.

You may store an acquired and displayed waveform in the reference memory pushing the SAVE button, and recall it pressing the RECALL button.

The HOLD switch is a function that stops the acquisition when pressed.

Another standard feature of the 2212 is the Print Screen (PRNSCR). function. This feature allows you to output waveforms and other on-screen information to a Centronics ® compatible printer/plotter, providing hardcopies without requiring you to put the oscilloscope in a system controller environment. The hardcopies obtained are based on what is displayed at the time PRNSCR is invoked.

A menu to setup the communication interface can be selected by pressing SAVE and RECALL simultaneously. The parameters for the menu can be selected with the TOGGLE CURSOR switch and the cursor POSITION control.

The 2212 oscilloscope with Option 10 (GPIB) an/or Option 12 (RS-232-C) is fully controllable and capable of sending and receiving waveforms over the GPIB interface (IEEE 488.2 1987 standard). This optional feature makes the 2212 ideal for making automated measurements in a production or research environment that calls for repetitive data taking

Display

The display functions of the 2212 include the crt screen and the display controls located just to the right of the crt screen.

The screen display shows you signal traces, the crt readouts associated with them, and menu items.

The 2212 displays crt readouts along the top row and the bottom row of the screen

The INTENSITY control is used to adjust brightness of the trace or the readout intensity.

The FOCUS control is used to adjust for a well defined display.

Pushing the BEAMFIND switch helps you find off-screen signals quickly.

NOTE
The display controls affect the display only.

Nominal Traits

This subsection contains a collection of tables that list the various *nominal traits* that describe the 2212 Analog & Digital Storage Oscilloscope. Included are electrical and mechanical traits.

Nominal traits are described using simple statements of fact such as "Two full featured" for the trait "Input Channels of", rather than in terms of limits that are performance requirements.

Table 1-1: Nominal Traits – Vertical System

Name	Description
Analog Input Channels, number of	Two, full-featured (CH 1 and CH 2)
Digitizers, Number of	Two, both identical
Digitized bits, Number of	8-bits, 25 levels per division,10.24 divisions of dynamic range
Input Coupling	DC, AC, or GND
Maximum Input Voltage, Probe Tip to Common	400 V (DC + peak AC) or 800 V AC p-p at 10 kHz or less; derate with increased frequency according to Figure 1-1
Range, Sensitivity, CH 1 and CH 2	2 mV to 5 V in a 1-2-5 settings sequence
Analog Banbdwidth(–3 dB)	60 MHz at 5 mV/DIV thru 5 V/DIV and 10 MHz at 2 mV/DIV
Useful Storage Performance[1]	$\frac{20}{\text{SEC/DIV Setting}}$ or 10 MHz, whichever is less

[1] **Useful Storage performance is defined as the frequency where there are 2 samples per sinewave signal period at the maximum sampling rate. At SEC/DIV setting faster than 20 µs/division the bandwidth is limited to 10 MHz.**

Table 1-2: Nominal Traits– Horizontal System

Name	Description
Non-Store Range, Seconds/Division	0.5 s to 50 ns per division in a 1-2-5 settings sequence
Magnification Factor	X10 and X50 the SEC/DIV setting
Store Range, Seconds/ Division	50 s to 20 µs per division
Record Length	4096 data points; 400 points per division across the graticule area
Digital Sample Rate	$\frac{400}{\text{SEC/DIV Setting}}$ Samples per second

Table 1-3: Nominal Traits –Triggering System

Name	Description
Trigger Source	CH 1, CH 2, Vert. Mode, Line, External, and External/10
Trigger Mode	P-P Auto, Normal, Single Sweep, TV Line and TV field
Trigger Coupling	Noise Rejection, Low Frequency Rejection, High Frequency Rejection, AC, and DC
External Trigger Maximum	400 V (DC + Peak AC) or 800 V p-p AC at Input Voltage 10 kHz or less (see Figure 1-1)

Table 1-4: Nominal Traits – Display System

Name	Description
Waveform Display Graticule	Single graticule:Display area of 8 divisions high by 10 divisions wide,where divisions are 1x1 cm

Table 1-5: Nominal Traits – Interfaces, Output Ports, and Power Fuse

Name	Description
Interface, Parallel	IBM ® PC compatible Parallel Printer/Plotter Interface for Centronics ® compatible printers/plotters
Interface, Serial (RS-232-C) (Optional)	Conforms to EIA Standard RS-232-C
Interface, GPIB (Optional)	GPIB Interface complies with IEEE 488.2 1987
Fuse Rating	Either of two fuses may be used: 0.5 A 250 V, slow blow for 190-250 VAC, or 1.0 A, 250 V, slow blow for 95 - 128 VAC

Table 1-5a: Nominal Traits – 2212 Option 1M (Long Record Length) Characteristics

Name	Description	
Record Length	Selectable 4096, 8192, 16384, 32768, 65536, or 131072 Data Points; 400 points per division across the graticule area are visible	
Reference Memory	One waveform set (CH 1 + CH2) can be stored as a reference waveform	
Magnification factor	x1, x10, x50, and FIT TO SCREEN setting	
Cursor Resolution		
Time Difference Accuracy	**Display**	**Resolution**
	Non Store	100 steps/division
	Store FIT TO SCREEN	400 steps/division
	Store x1	400 steps/division
	Store x10	40 steps/division
	Store x50	8 steps/division

Table 1-6: Nominal Traits – Mechanical

Name	Description
Cooling Method	Forced-air ciculation with no air filter
Construction Material	Aluminum chassis. Plastic-laminate front and rear panel
Finish	Tek blue structure paint on aluminum cabinet
Weight with power cord	± 9.5 kg
Domestic Shipping Weight	± 12 kg
Overall Dimensions	Height ± 138 mm Width ± 380 mm (with carrying handle) Width ± 327 mm (without carrying handle) Depth ± 445 mm Depth ± 515 mm (with handle extended)

Warranted Characteristics

This subsection list the various *warranted characteristics* that describe the 2212 Analog & Digital Storage Oscilloscope. Included are electrical and environmental characteristics.

Warranted characteristics are described in terms of quantifiable performance limits which are warranted.

NOTE

In these tables, those warranted characteristics that are checked in the Performance Verification procedure, appear in ***boldface type*** *under the column* ***Name****.*

In the *Name* column a distinction is made between operational modes:

- With comment Store means the characteristic is valid only if the instrument is in Store mode.
- With comment Non-Store means the characteristic is valid only if the instrument is in Non-Store mode.
- No comment means the characteristic is valid with the instrument in Store mode as well as in Non-Store mode.

Environmental characteristics are given in Table 1-15. This instrument meets the requirements of MIL-T-28800D for Type lll, Class 5 equipment, except where noted otherwise.

Performance Conditions

The following electrical characteristics (Table 6-7 thru Table 1-15) are valid when the instrument has been adjusted at an ambient temperature between +20 °C and +30 °C, has had a warm-up period of at least 20 minutes, and is operating at an ambient temperature between 0 °C and +40 °C (unless otherwise stated).

Table 1-7: Warranted Characteristics – Vertical System

Name	Description	
DC Accuracy	±3%	
Input Impedance	1 MΩ ± 2% parallel with 20 pF +2.0 pF/–4 pF	
Trace Shift with VOLTS/ DIV Switch Rotation	**VARiable Setting**	**Trace Shift**
	VARiable Control Off	1.0 division or less
	VARiable control set to minimum sensitivity	1.0 division or less
	CH 2 Switched to CH 2 INVert	1.5 division or less
Cross Talk (Channel Isolation)	≥ 100:1 at 10 MHz for any two channels having equal Volts/Division and Coupling settings.	
Bandwidth (Non-Store) (-3 dB)	**VOLTS/DIV Setting**	**Bandwidth**
	5 mV/DIV to 5 V/DIV	DC to at least 60 MHz (5 °C to +35 °C ambient)
		DC to at least 48 MHz (0 °C to +40 °C ambient)
	2 mV/DIV	DC to at least 10 MHz (0 °C to +40 °C ambient)
AC Coupled Lower Cutoff Frequency	10 Hz or less at –3 dB	

Table 1-8: Warranted Characteristics – Horizontal System

Name	Description	
Timebase Accuracy [a] (Non-Store)	**Magnifier Setting**	**Measurement Accuracy**
	X1 (+15 °C to +35 °C)	±3%
	X10 Magn (+15 °C to +35 °C)	±4%
	X50 Magn (+15 °C to +35 °C)	±5%
	X1 (+0 °C to +40 °C)	±4%
	X10 Magn (+0 °C to +40 °C)	±5%
	X50 Magn (+0 °C to +40 °C)	±8% [c]
Sweep Linearity [a] (Non-Store)	**Magnifier Setting**	**Measurement Accuracy**
	X1	5%
	X10	8%
	X50	9%
Displayed Trace Length (Non-Store)	≥10 Divisions	
Storage Sweep Resolution	400 Dots per Division	
Differential Accuracy [b]	Graticule indication of time cursor difference is within ±2% of readout value	
EXT CLK Maximum Input Voltage	(DC + peak AC) 25 V or 25 V p-p AC at 100 kHz or less (See Figure 1-1)	
Input Impedance	1 MΩ ± 10 % parallel 25 pF ± 2.5 pF	

[a] **Sweep accuracy and Sweep Linearity applies over the center eight divisions. Exclude the first 50 ns of the sweep for X10 magnified sweeps and the first 100 ns for X50 magnified sweep. Exclude beyond the 10th division of the unmagnified sweep.**

[b] **Measured over center eight divisions.**

[c] **Max. 10 nsec/div**

Table 1-9: Warranted Characteristics – Triggering System

Name	Description	
Sensitivity [a], with Coupling DC	**Source**	**Accuracy**
	Internal	0.35 division from DC to 5 MHz, increasing to 1.2 division at 60 MHz
	External [b]	40 mV p-p from DC to 5 MHz, increasing to 150 mV p-p at 60 MHz
Sensitivity [a], with Coupling AC	**Source**	**Accuracy**
	Internal	0.35 division from 50 Hz to 5 MHz, increasing to 1.2 division at 60 MHz
	External [b]	40 mV p-p from 50 Hz to 5 MHz, increasing to 150 mV p-p at 60 MHz
Sensitivity [a], with Coupling NOISE REJ	**Source**	**Accuracy**
	Internal	1.4 division from DC to 5 MHz, increasing to2.2 division at 60 MHz
	External [b]	160 mV p-p from DC to 5 MHz, increasing to 600 mV p-p at 60 MHz
Sensitivity [a], with Coupling LF REJ	**Source**	**Accuracy**
	Internal	0.35 division from 50 kHz to 5 MHz, increasing to 1.2 division at 60 MHz
	External [b]	40 mV p-p from 50 kHz to 5 MHz, increasing to 150 mV p-p at 60 MHz

[a] Trigger sensitivity is defined as the minimum peak-to-peak sine-wave signal amplitude required to show the test signal with horizontal jitter of less than 3% of one period (p-p viewed over two seconds),with trigger LEVEL control set at midrange level, but not at control extremes.

[b] External trigger signal from a 50 Ω source driving a 50 Ω coaxial cable terminated in 50 Ω at the input connector.

Table 1-9: Warranted Characteristics – Triggering System (cont.)

Name	Description	
Sensitivity [a], with Coupling HF REJ	**Source**	**Accuracy**
	Internal	0.35 division from DC to 20 kHz
	External [b]	40 mV p-p from DC to 20 kHz
Sensitivity [a], with TV Trigger Mode	**Source**	**Accuracy**
	TV Line Internal	1.0 division
	TV Field Internal	1.0 division of Composite Sync
EXT Trigger Input	**Measurement**	**Limit**
	Maximum Input Voltage	400 V (DC + peak AC) or 800 V AC p-p at 10 kHz or less (See Figure1-2)
	Input Impedance	1 MΩ ±10% parallel to 20 pF ±2.5 pF
Trigger LEVEL Control Range (P-P AUTO, NORM,and SGL SWP Mode)	**Measurement**	**Range**
	INT	May be set to any voltage level of the waveform that can bedisplayed
	EXT, DC	At least ±1.2 V, 2.4 V p-p
	EXT:10, DC	At least ±12 V, 24 V p-p

[a] Trigger sensitivity is defined as the minimum peak-to-peak sine-wave signal amplitude required to show the test signal with horizontal jitter of less than 3% of one period (p-p viewed over two seconds),with trigger LEVEL control set at midrange level, but not at control extremes.

[b] External trigger signal from a 50 Ω source driving a 50 Ω coaxial cable terminated in 50 Ω at the input connector.

Table 1-9: Warranted Characteristics – Triggering System (cont.)

Name	Description	
Trigger COUPLING (–3 dB points)	**Measurement**	**Accuracy**
	NOISE REJection	DC to Full Bandwidth
	AC Coupled Lower –3 dB point	10 Hz or less (Internal Source) 20 Hz or less (External Source)
	LF REJ Lower –3 dB point	30 kHz ± 25%
	HF REJ Upper –3 dB Point	30 kHz ± 25%
	DC Coupled	DC to Full Bandwidth
Video Triggering (Option 05 only)		
Input Sensitivity	One division signal display	
Max. Lines per frame	>1200	
Max. Line frequency	> 50 kHz	
Clamp range	5 Div.	
Clamp accuracy	Better than 0.4 Div.	

- **Trigger sensitivity is defined as the minimum peak-to-peak sine-wave signal amplitude required to show the test signal with horizontal jitter of less than 3% of one period (p-p viewed over two seconds),with trigger LEVEL control set at midrange level, but not at control extremes.**

[b] **External trigger signal from a 50 Ω source driving a 50 Ω coaxial cable terminated in 50 Ω at the input connector.**

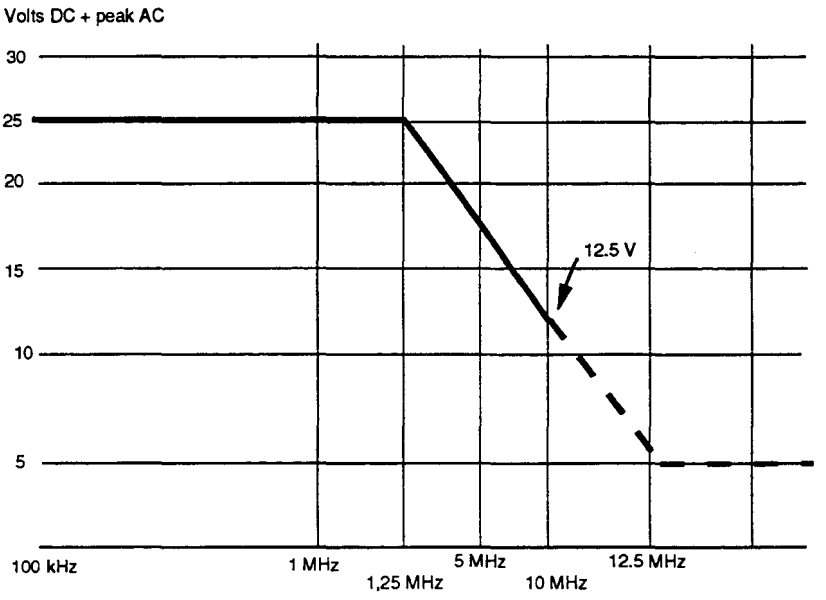


Figure 1-1: Maximum Input Voltage Versus Frequency Derating Curve for the EXT CLK Connector

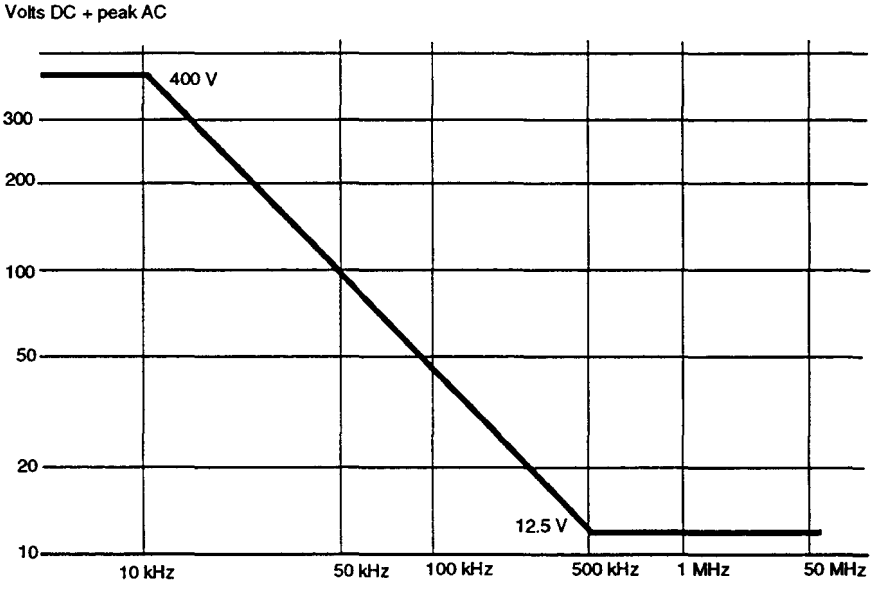


Figure 1-2: Maximum Voltage Versus Frequency Derating Curve for the CH1 OR X, CH 2 OR Y, and EXT OR Z Connectors

Table 1-10: Warranted Characteristics – Digital Storage System

Name	Description
Position Registration	Switching from Non-Store to Store the trace shift must be within ±0.5 division at graticule center, with VOLTS/DIV switch settings from 2 mV/DIV to 5 V/DIV
Differential Accuracy [a]	Graticule indication of time cursor difference is within ±2% of readout value

[a] Measured over center eight divisions

Table 1-11: Warranted Characteristics – Readout Display System

Name	Description	
Trigger Level Readout Accuracy [a]	Within ± (0.3 division + 5% of reading)	
Voltage Difference Readout Readout Accuracy [b]	± (3% of reading + 2% of one vertical division + high frequency display errors) of the ΔV Readout value	
Time Difference Readout Accuracy Non-Store Mode [c] (15 °C to 35 °C)	**Magnifier Setting**	**Accuracy**
	X1	± 4%of reading + (2% of one horizontal division)
	X10 Magn	± 5% of reading + (2% of one horizontal division)
	X50 Magn	± 6% of reading + (2% of one horizontal division)
Time Difference Readout Accuracy Non-Store Mode [c] (0 °C to 40 °C)	**Magnifier Setting**	**Accuracy**
	X1	± 5% of reading + (2% of one horizontal division)
	X10 Magn	± 6% of reading + (2% of one horizontal division)
	X50 Magn	± 9% of reading + (2% of one horizontal division)
Time Difference Readout Accuracy Store Mode [c] from 0 °C to 40 °C	± 0.1% of reading +	(2% of one horizontal division)
Cursor Resolution Voltage Difference Accuracy	100 steps per division	

Table 1-11: Warranted Characteristics – Readout Display System (cont.)

Name	Description	
Cursor Resolution Time Difference Accuracy	**Display**	**Resolution**
	Non-Store	100 steps per division
	Store X1	400 steps per division
	Store X10 Magn	40 steps per division
	Store X50 Magn	8 steps per division

[a] With less than 8 division vertical input signal, and Trigger Mode NORM, Source CH 1 or CH 2, Coupling DC, Vert. Channels DC)

[b] Measured over the center six divisions.

[c] Measured over the center eight divisions.

Table 1-12: Warranted Characteristics – X-Y Display System

Name	Description	
X-Y Accuracy (Non-Store)	**Measurement**	**Accuracy**
	X-Axis Deflection Factor [a]	Within ±5%
	Y-Axis Deflection Factors [a]	Same accuracy as vertical deflection system
X-Y Bandwidth (Non-Store)	**Measurement**	**Bandwidth**
	Bandwidth X-Axis [b] (-3 dB)	DC to at least 2MHz
	Bandwidth Y-Axis [b] (-3 dB)	Same as vertical deflection system
X-Y Accuracy (Store)		
X-Axis and Y-Axis	Same accuracy as digital storage vertical deflection system	
Phase Difference between X-Axis and Y-Axis Amplifiers (Non-Store) [c]	Maximum ± 3 deg from dc to 150 kHz	

[a] Measured with a dc-coupled, five-division reference signal

[b] Measured with a five-division reference signal

[c] Vertical Input Coupling set to DC

Table 1-13: Warranted Characteristics – Probe Adjust Output

Name	Description	
PROBE ADJUST Accuracy	**Measurement**	**Accuracy**
	Output Voltage	0.5 V ± 5%
	Repetition Rate	1 kHz ± 20%

Table 1-14: Warranted Characteristics – Power Requirements

Name	Description	
Line Voltage Ranges	95 VAC to 128 VAC or 190-250 VAC (depending on Line Voltage Setting) [a]	
Line Frequency Range	48 Hz to 440 Hz	
Max. Power Consumption	85 Watts (95 VA)	
Line Fuse	**Line Voltage Range**	**Fuse**
	95-128 VAC Range	1 A , slow blow , 230 V
	190-250 VAC Range	0.5 A , slow blow , 230 V

[a] To change the Line Voltage Range inside the instrument, a qualified technician must be consulted to change the fuse and the power setting.

Table 1-15: Warranted Characteristics – Environmental, Safety and Reliability

Name	Description	
Environmental Requirements	The instrument will meet the following MIL-T-28800D requirements for Type III, Class 5, Style D equipment, except where noted otherwise	
Temperature	**Measurement Type**	**Range**
	Operating [a]	0 °C to +40 °C (+32 to +104 deg F)
	Non-operating [a]	–55 °C to +75 °C (–67 to +167 deg F).
Altitude	**Measurement Type**	**Range**
	Operating (15,000 feet) [b]	To 4,570 metres
	Non-operating (50,000 feet) [b]	To 15,240 metres
Humidity	**Measurement Type**	**Range**
	Operating and non-operating [c] relative humidity.	95%, –5% to +0%
	Operating [c] for all modes of operation.	+30 °C to +40 °C
	Non-operating [c]	+30 °C to +60 °C
EMC (Electromagnetic Compatibility)	Meets radiated and conducted emission requirements per VDE 0871, Class B. Plus FCC section 15, subpart J, class A. [d] Alsomeets IEC 801, EN50082-1, EN50081-1. In case of ESD and EFT tests, a temporarily degradation of the performance may occur. No change of actual operating state or stored data occurs.	
Electrostatic Discharge	Conforms to Tektronix Standard 062-2862-00. (Withstands discharge of up to 20 kV) [e]	

Table 1-15: Warranted Characteristics – Environmental, Safety and Reliability (cont.)

Name	Description
Vibration (Operating)	Meets requirements of MIL-T-28800D, para 4.5.5.3.1. [i]
Shock (Non-operating)	Meets requirements of MIL-T-28800D, para 4.5.5.4.1, except limited to 30 g. [g]
Bench Handling Test	Meets requirements of MIL-T-28800D, para 4.5.5.4.3. [h]

[a] Tested to MIL-T-28800D, para 4.5.5.1.3 and 4.5.5.1.4, except that in par 4.5.5.1.3, steps 4 and 5 (10 °C operating test) are performed before step 2 (–55 °C non-operating test).
Equipment shall remain off upon return to room ambient temperature during step 6. Excessive condensation shall be removed before operating during step 7.

[b] Maximum operating temperature decreases 1 °C per 1000 feet above 5,000 feet.

[c] 5 cycles (120 hours) referenced toMIL-T 28800D para 4.5.5.1.2.2 for type III, Class 5 instruments.

[d] To meet EMI regulations and specifications, use the specified shielded cable and metal connector housing with the housing grounded to the cable shield on the Parallel Printer/Plotter connector.

[e] Test performed with probe containing 500 pF capacitor with 1 kΩ resistance charged to the test voltage.

[f] 15 minutes along each of three major axes at a total displacement of 0.015 inch p-p (2.4 g at 55 Hz) with frequency varied from 10 Hz to 55 Hz to 10 Hz in one minutes sweeps. Hold for 10 minutes at 55 Hz in each of the three major axes. All major resonances must be above 55 Hz.

[g] 30 g, half-sine, 11 ms duration, three shocks per axis each direction, for a total of 18 shocks.

[h] Edge lifted four inches and allowed to free fall onto a solid wooden bench surface.

Typical Characteristics

This subsection contains tables that list the various *typical characteristics* that describe the 2212 Analog & Digital Storage Oscilloscope.

Typical characteristics are described in terms of typical or average performance. Typical characteristics are not warranted.

This subsection contains only typical characteristics.

In the *Name* column a distinction is made between operational modes:

- With comment Store means the characteristic is valid only if the instrument is in Storage mode.
- With comment Non-Store means the characteristic is valid only if the instrument is in Non-Storage mode.
- No comment means the characteristic is valid with the instrument in Store mode as well as in Non-Store mode.

Table 1-16: Typical Characteristics – Vertical System

Name	Description	
Range of VAR control	Range is sufficient to overlap the next VOLT/DIV step in the range	
Chopped Switching Rate	500 kHz ± 30%	
Position Control Range	± 10.5 Divisions from graticule center	
CMRR Non-Store (Common Mode Rejection Ratio)	≥ 10: 1 at 20 MHz [a]	
CMRR (Store)	**VOLTS/DIV Setting**	**Ratio** [a]
	5 mV/DIV to 5V/DIV	10:1 at 10 MHz
	2 mV/DIV	10:1 at 1 MHz
Step Response (Non-Store) [b]	**VOLTS/DIV Setting**	**Rise Time**
	5 mV/DIV to 5 V /DIV	5.8 ns or less. (5 °C to +35 °C)
	5 mV/DIV to 5 V /DIV	7.0 ns or less. (0 °C to +40 °C)
Aberrations (Non-Store)	**VOLTS/DIV Setting**	**Aberrations** [c]
	5 mV/DIV	6% or less
	10 mV/DIV to 0. 2 V/DIV	4% or less
	0.5 V /DIV	6% or less
	1 V/DIV to 5 V /DIV	12% or less
Step Response (Store) [d]	**Measurement Type**	**Risetime**
	Rise Time	35 ns

Table 1-16: Typical Characteristics – Vertical System (cont.)

Name	Description	
Aberrations (Store)	**VOLTS/DIV Setting**	**Abberrations** [c]
	5 mV/DIV	6% or less
	10 mV/DIV to 0. 2 V/DIV	4% or less
	0.5 V/DIV	6% or less
	1 V/DIV to 5 V per division	12% or less
Bandwidth Limit (Non-Store)	Independant switchable for each Channel –3dB at ≥10 MHz and ≤15 MHz Mutial (from CH1 to CH2) detoriation of bandwidth is <20%	
Bandwidth (Store)	**VOLTS/DIV Setting**	**Bandwidth**
	2 mV/DIV to 5 V /DIV	DC to 10 MHz ±10%
Useful Storage Performance [e] EXT CLK (External Clock)	$\frac{EXT}{20}$ Hz	
Vertical Storage Resolution	8–bit (1part in 256) [f]	

[a] Checked at 5 mV/DIV for common mode signals of six divisions or less with the VAR and POSITION control adjusted for the best CMRR at 50 kHz.

[b] Risetime is calculated from this formula: Rise Time = $\frac{0.35}{\text{Bandwidth (–3 dB)}}$ s

[c] Measured with a five-division reference signal, centred vertically, from a 50 Ω source driving a 50 Ω coaxial cable terminated in 50 Ω at the input connector with the VAR in calibrated position.

[d] Useful storage Risetime = $\frac{\text{SEC/DIV x 1.6}}{400}$ s

[e] Useful storage performance is defined as the frequency where there are 2 samples per sine wave signal period at the maximum sampling rate. This yields a maximum amplitude uncertainty of 5% (Maximum sampling rate is 20 MHz).

[f] Display waveforms are calibrated for 25 points per division.

Table 1-17: Typical Characteristics – Horizontal System

Name	Description		
TRace SEPeration Control Range.	0 to –4 divisions.		
Range of SEC/DIV VARiable Control	At least 2.5 : 1.		
Horizontal POSITION Control Range	Start of the trace can be positioned beyond the right of the center vertical graticule line, and the start of the 10-th division beyond the left of the center vertical graticule line.		
Displayed Trace Length	Greater than 10 divisions.		
EXT CLK Input Frequency	**Mode**	**Frequency**	
	RECORD	DC to 10 MHz.	
	ROLL	DC to 4 kHz.	
EXT CLK Digital Sample Rate	Equal to the input frequency		
EXT CLK Pulse Width	**Mode**	**Low (min.)**	**High (min.)**
	RECORD	50 ns	50 ns
	ROLL	50 µs	125 ns
EXT CLK Logic Thresholds	**Low**	**High**	
	0.7 V	2.1 V	

Table 1-18: Typical Characteristics – Triggering System

Name	Description
P-P AUTO Lowest Usable Frequency	20 Hz
Acqusition Window Trigger Point Selection (Store)	25% or 75% (as selected) of the waveform displayed is prior to the trigger event.

Table 1-19: Typical Characteristics – Z–Axis System

Name	Description	
Sensitivity	5-V causes noticeable modulation *	
Usable Frequency Range	DC to 5 MHz	
EXT Input OR Z Input	**Measurement Type**	**Limit**
	Maximum Input Voltage	400 V (DC + peak AC) or 800 V AC p-p at 10 kHz or less (See Figure 1-1)
	Input Impedance	1 MΩ ±10% parallel to 20 pF ±2.5 pF

* Positive going input decreases the intensity

Using this Manual

This section contains information needed to properly use this manual to service the 2212 Digital& Analog Oscilloscope, as well as general information critical to safe and effective servicing of this oscilloscope.

Before Servicing

This manual is for servicing the 2212 Analog & Digital Storage Oscilloscope. To prevent injury to yourself or damage to the oscilloscope, do the following before you attempt service.

- Be sure you are a qualified service person;
- Read the Safety Summary found at the beginning of this manual.

When using this manual for servicing, be sure to heed all warnings, cautions and notes

Manual Structure

This manual is divided into sections, such as *Specification, Theory of Operation,* etc. Further, it is divided in subsections, such as *Brief Procedures, Warranted Characteristics,* etc.

Be sure to read the introductions to procedures in the sections, because they provide information needed to do the service correctly and efficiently.

The following is a brief description of each manual section.

- *Specification* – contains a product description of the 2212 Analog & Digital Storage Oscilloscope and tables of the characteristics and descriptions that apply to it.
- *Operating Information* – is this section. It includes a description of how this manual is structured, as well as general information to safely power up and service this oscilloscope.
- *Theory of Operation* – contains circuit descriptions that support general service and fault isolation.
- *Performance Verification* – contains a collection of procedures for confirming that this oscilloscope functions properly and meets the warranted limits.
- *Adjustment Procedures* – contains a collection of procedures for adjusting this oscilloscope to meet warranted limits.

- *Maintenance* – contains information and procedures for doing preventive and corrective maintenance of this oscilloscope. Instructions for cleaning, removal and installation of boards, and for fault isolation on boards are found here.
- *Options* – contains information on servicing any of the factory installed options that may be present in your oscilloscope.
- *Electrical Replaceable Parts* – contains a list of replaceable electrical parts on the boards of your oscilloscope, their descriptions and their Tektronix part numbers.
- *Diagrams* – contains a block diagram and diagrams of the circuitry on the boards of your 2212 oscilloscope including component look-up tables.
- *Replaceable Parts* – Includes a table of the replaceable mechanical parts, their descriptions and their Tektronix part numbers.

Tektronix Service

Tektronix provides service to cover repair under warranty as well as other services that may provide a cost-effective answer to your service needs.

Whether providing warranty repair service or any of the other services listed below, Tektronix service technicians, trained on Tektronix products, are best equipped to service your 2212 oscilloscope. Tektronix technicians are appraised of the latest information and improvements to the product as well as the latest new options to the product.

Warranty Repair Service

Tektronix warrants this product for three years from the date of purchase, excluding probes for which is the warranty one year. (The warranty appears on the back of the title page in this manual.) Tektronix technicians provide warranty service at most Tektronix service locations worldwide. Your Tektronix product catalog lists all service locations worldwide.

Repair or Calibration Service

The following services may be purchased to tailor repair and/or calibration of your requirements.

At - Depot Service – Tektronix offers several standard priced adjustment (calibration) and repair services:

- A single repair and/or adjustment.
- Calibrations using equipment and procedures that meet the traceability standards specific to the local area.
- Annual maintenance agreements that provide for either calibration and repair only of the oscilloscope.

Of these services, the annual maintenance agreement offers a particularly cost-effective approach to service for many owners of the 2212 Oscilloscope. Such agreements can be purchased to span several years.

On-Site Service – The annual maintenance agreement can be purchased with on-site service, with repair and calibration done at your facility. This service reduces the time your oscilloscope is out of service when calibration or repair is required.

For More Information – Contact your local Tektronix service center or sales engineer for more information on any of the repair or adjustment services just described.

Finding Other Information

The 2212 Analog & Digital Oscilloscope comes with the following manuals:

2212 User Manual (Tektronix part number 070-8438-xx) contains information that shows you how to operate the 2212 oscilloscope and in depth discussion of how to more completely use its features. Applications are also discussed.

2212 Quick Reference (Tektronix part number 070-8592-xx) contains a brief overview of the oscilloscope operation.

2212 Programmer Manual (Tektronix part number 070-8440-xx) contains information for programmed operation via the GPIB interface and/or RS-232-C interface. Included is a complete command set, set up information and programming examples.

Supplying Operating Power

Read all information and heed all warnings in this subsection before connecting the 2212 Oscilloscope to a power source.

WARNING

AC POWER SOURCE AND CONNECTION – The 2212 operates from a single-phase power source. It has a three -wire power cord and two-pole three-terminal grounding type plug. The voltage to ground (earth) from either pole of the power source must not exceed the maximum rated operating voltage, 250 volts.

Before making connection to the power source, be sure the 2212 has a suitable two pole, three-terminal grounding-type plug.

WARNING

The power input plug must be inserted only in a mating receptacle with a grounding contact where earth ground has been verified by a qualified service person. Do not defeat the grounding connection. Any interruption of the grounding connection can create an electric shock hazard.

For electric shock protection, the grounding connection must be made before making connection to the instruments input or output terminals.

Power Cord Information

A power cord with appropriate plug configuration is supplied with each 2212 Oscilloscope. Table 2-1 gives the color coding of the conductors in the power cord. If you require a power cord other than the one supplied, refer to *Table 2-2: Power Cord and Plug Identification*

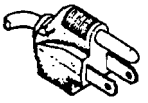
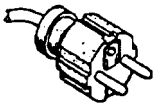
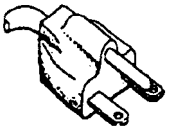
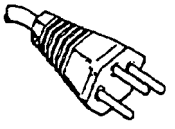
Table 2-1: Power Cord Conductor Identification

Conductor	Color	Alternate Color
Ungrounded (Line)	Brown	Black
Grounded (Neutral)	Light Blue	White
Grounded (Earthing)	Green/yellow	Green

Operating Voltage

This oscilloscope operates with a line voltage between 95-128 VAC and an instrument line fuse of 1.0 A Slow Blow, or 190-250 VAC and an instrument line fuse of 0.5 A Slow Blow, depending on the power-strap setting inside the oscilloscope.

Table 2-2: Power Cord and Plug Identification

Plug Configuration	Usage (Maximum Rating)	Reference Standards & Certification	Option #
	North America 125 V/6 A	ANSI C73.11 [1] NEMA 5-15-P [2] IEC 83 [3] UL [10] CSA [11]	Standard
	Europe 220 V/16 A	IEC 83 [3] CEE (7), II, IV, VII [4] VDE [8] SEMKO [9]	A1
	United Kingdom 240 V/13 A	IEC 83 [3] BSI 1363 [5]	A2
	Australia 240 V/10 A	AS C112 [6] ETSA1 [2]	A3
	North America 240 V/15 A	ANSI C73.11 [1] NEMA 5-15-P [2] IEC 83 [3] UL [10] CSA [11]	A4
	Switzerland 220 V/10 A	SEV [7]	A5

Reference Standard Abbreviations:

[1] ANSI	–	American National Standards Institute
[2] NEMA	–	National Electrical Manufacturer's Association
[3] IEC	–	International Electrotechnical Commission
[4] CEE	–	International Commission on Rules for the Approval of Electric Equipment
[5] BSI	–	British Standard Institute
[6] AS	–	Standards Association of Australia
[7] SEV	–	Schweizerischer Elektrotechnischer Verein
[8] VDE	–	Verband Deutscher Elektrotechniker
[9] SEMKO	–	Swedish Institute for Testing and Approval of Electrical Equipment
[10] UL	–	Underwriters Laboratories Inc.
[11] CSA	–	Canadian Standards Association
[12] ETSA	–	Electricity Trust of South Australia

Operating Environment

The following environmental requirements are provided to ensure proper operation and long instrument life.

Operating Temperature

The 2212 Oscilloscope can be operated where the ambient air temperature is between 0 ° and 40 °C and can be stored in ambient temperatures from –55 °C to +75 °C. After storage at temperatures outside the operating limits, allow the instrument to stabilize at a safe operating temperature before applying power.

Ventilation Requirements

The 2212 Oscilloscope is cooled by air drawn in and exhausted through its cabinet holes. Leave at least 2 cm space around the instrument for cooling. Before turning on the power, verify that the spaces around the air intake holes on the bottom, the top and sides are free of any obstruction to airflow.

CAUTION

If airflow is restricted, the 2212 Oscilloscope's power supply may be damaged and shut down.

Overview

The content of the *Theory of Operation* may also be used as a troubleshooting aid to help determine the need for repair or readjustment.
This subsection contains a description of:

- Logic Conventions
- Overview of the circuits and their functions on the board assemblies

Logic Conventions

The 2212 Oscilloscope contains a lot of logic circuits. This manual refers to these circuits with standard logic symbols and terms. Unless otherwise stated all logic functions are described using positive -logic convention: the more positive of the two levels is high (1) state, and the more negative level is the low (0) state. Signal states may also be described as "true" meaning their active state or "false" meaning their non-active state. The specific voltages that constitute a high or low state vary among the electronic devices.

Active-low signals are indicated by an underscore and a zero (_0) following the signal name (RESET_0). Signal names are considered to be either active-high, active-low, or have both active-high and active-low states.

Overview of the Circuits

This circuit overview describes the basic functions per board assembly of each functional circuit.

Main Board (A10)

The following circuits are located on the main board:

- Vertical Preamplifier circuit with the vertical signal input, the attenuator circuit and the preamplifier circuit.
- Vertical position circuit and the delay line driver circuit.
- Vertical output amplifier circuit
- Trigger circuit
- Sweep logic circuit
- Timebase circuit
- Horizontal magnifier circuit and readout mux
- Horizontal output amplifier circuit
- Mainboard interface circuit
- Mainboard power distribution
- Z-axis input amplifier
- Non-volatile memory circuit

Power Board (A11)

- Power supply circuit
- Z-axis output amplifier
- High voltage and CRT circuit

Front Board (A12)

- Front-switches circuit
- Front-LED's circuit

Daculator Piggy Back Board (A14)

- Control voltage circuits

Processor board (A15)

- Acquisition circuit
- Clock and timebase circuit
- Processor and memory circuit
- Display system circuit
- Power distribution circuits on the A15 processor board
- Communication circuits

Serial Interface Board (A16) (Optional)

- RS-232-C serial interface circuit

General Purpose Interface Bus (GPIB) Board (A17) (Optional)

- GPIB interface circuit

Video Board (A25) (Optional)

- Block Diagram Video Option
- TV Power circuit
- TV Analog circuit
- TV Digital Cicuit

Processor board Option 1M (A20) (Optional)

- Acquisition circuit
- Acquisition Counters circuit
- Clock and timebase circuit
- Processor and memory circuit
- Display system circuit
- Processor board power
- Processor board power
- Communication circuits

Block Diagram

This subsection contains a description of the simplified 2212 blockdiagram (Figure 3-1).

In the 2212 oscilloscope the following main parts can be distinguished:

- Vertical Amplifiers
- Trigger and Horizontal Amplifiers
- Digital Storage
- Front panel and System Control
- High and Low Voltage Power Supply
- Z-axis

Vertical Amplifiers

The vertical amplifier has two input channels. They consist of a programmable attenuator, a FET input buffer and a pre-amplifier circuit.
The pre-amplifier contains a digitally controlled gain switching circuit and a vertical enable input. The overall gain of the pre-amplifier can be controlled with a dc voltage. The output signals of pre-amplifiers of CH1 and CH2 are differential signal currents, that are summed in the input stage of the delay line driver. The pre-amplifier provides also a trigger signal and a vertical signal for the digital storage circuit. Attenuation, gain and mode of the pre-amplifier circuits are controlled by the system control circuit. Control data is loaded in a shift register chain and applied to the appropriate inputs of the pre-amplifiers. The vertical positioning signals and vertical readout data are through the vertical position control circuit applied to the delay line driver. The delay line driver amplifies the signal to a level sufficient to drive the vertical output amplifier.

Trigger and Horizontal Amplifiers

The trigger circuit receives input signals from the CH1 and CH2 pre-amplifiers, from the EXT trigger input and from a line source.
Source selection is performed with digital control signals. The output signal from the trigger circuit is connected to thesweep logic and sweep generator circuit.
The sweep logic determines the mode of operation of the sweep generator. The mode of operation and the sweep speed are controlled by the system processor. The sweep logic also generates hold off signals to allow the sweep generator and horizontal amplifier circuits to stabilize after sweep return.

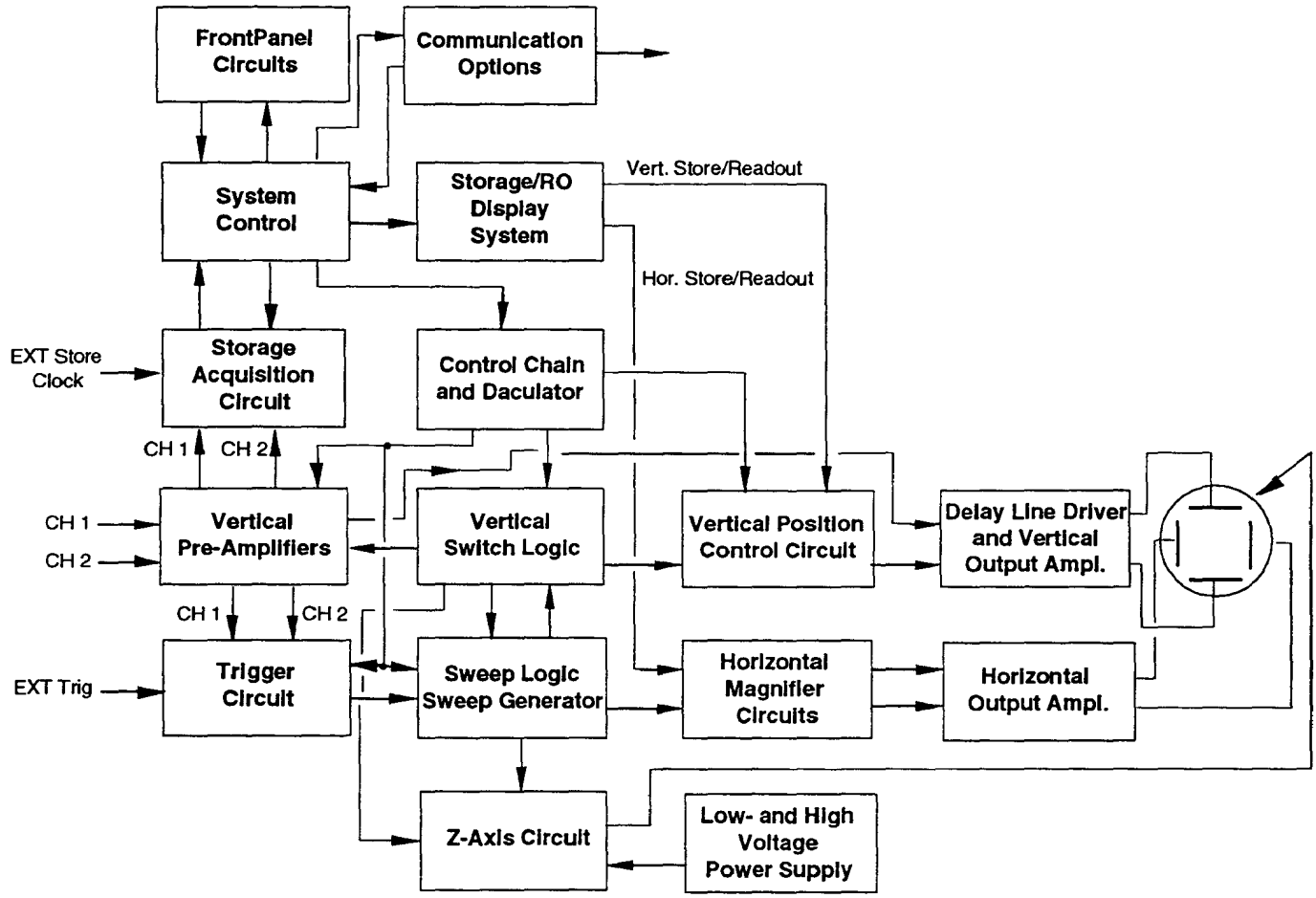


Figure 3-1: Simplified 2212 Block Diagram

Digital Storage

The digital storage circuit consists of an acquisition circuit and display circuit. The acquisition circuit digitizes the vertical signals received from the storage pick off amplifiers and stores them in memory. The display circuit converts the stored data along with readout information to vertical and horizontal deflection signals.

Front Panel and System Control

The front panel circuit together with the system control circuit controls the operation of the oscilloscope. A micro processor in the front panel circuit reads the closure of bush button and rotational switches and the wiper position of potentiometers. The front panel processor communicates the changes in front panel settings to the system processor and activates the front panel LED's as indicated by the system processor. The system processor processes the information received from the front panel processor and generates the correct command data strings to control the circuit throughout the 2212.

High and Low Voltage Power Supply

The high and low voltage power supply generates the necessary positive and negative voltages, and the high voltage in one switched anode power supply stage. The galvanic isolation from the main input accomplished with a toroid mains transformer, a rectifier bridge and a switch mode pre-regulator circuit. The post acceleration voltage is achieved in a multiplication stage.

Z-axis

The Z-axis circuit controls the brightness and focus of the CRT. During the retrace the display is blanked. The sweep gate signal received from the sweep generator circuit acts as unblanking signal. The amplitude of the unblanking signal is controlled by the intensity control on the front panel and grid bias adjustment.

Vertical System

This section describes the vertical preamplifier circuit (diagram 1), the delay line driver circuit (diagram 2), the vertical output amplifier circuit (diagram 3), the vertical position logic and the vertical switch logic (part of diagram 8). Diagrams are located in section 9 *Diagrams*. See also the block diagram (Figure 3-2) for an overview of the Vertical System.

Vertical Pre-Amplifier

The CH 1 and CH 2 pre-amplifier circuits are identical except for the invert switch in the CH 2 pre-amplifier circuit. Therefore, the CH 1 pre-amplifier is described only. The pre-amplifier circuit can be split up in four main parts:

- Attenuator circuit
- Input buffer circuit
- Pre-amplifier circuit
- Storage pick off amplifiers

The functions of each of these parts of the circuit will be described below.

Attenuator Circuit

The attenuator of the 2212 is of a programmable type. The attenuation factor and coupling mode are set by control lines CH1 CTR 0... 3.

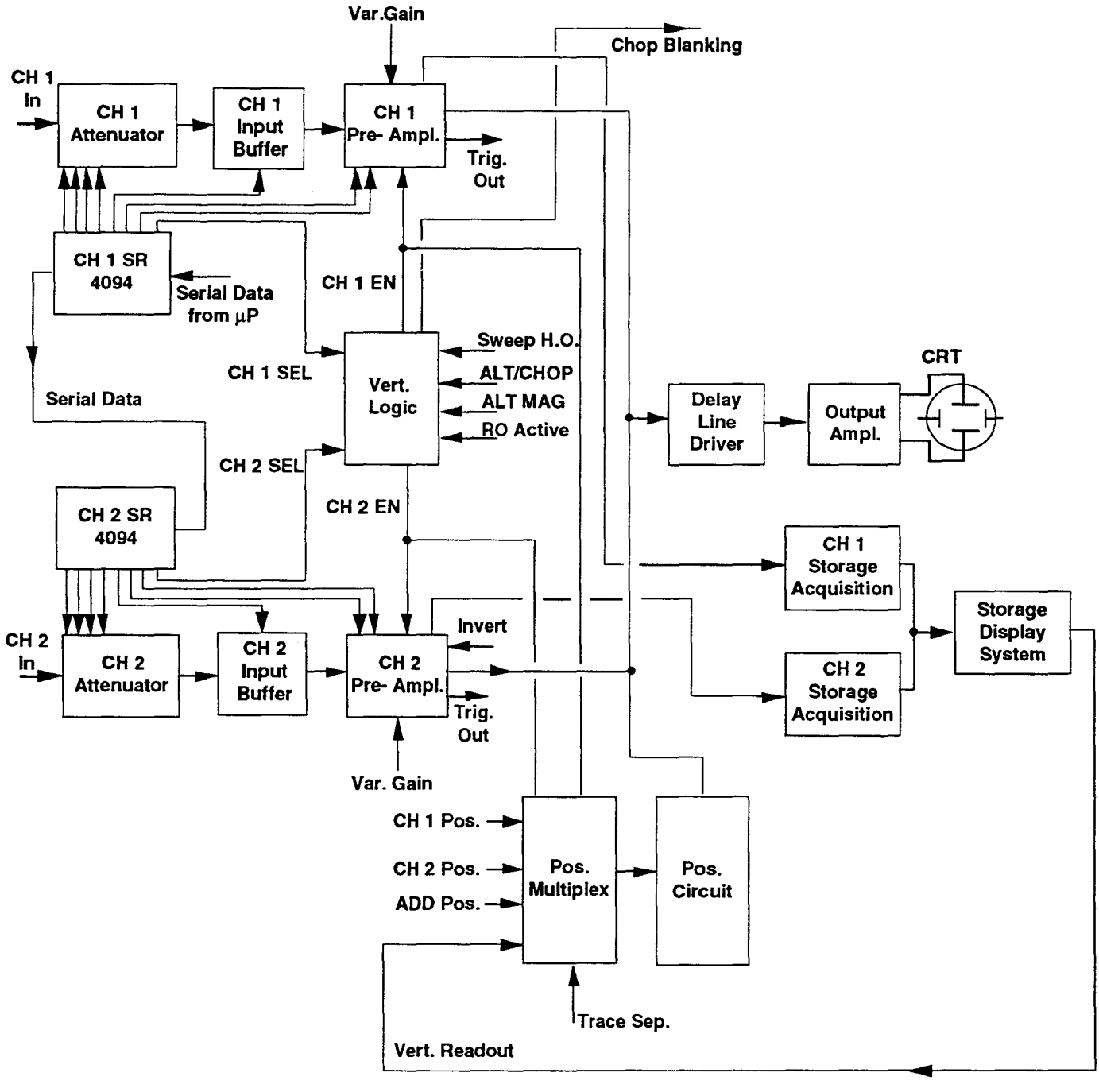


Figure 3-2: 2212 Vertical System Block Diagram

Table 3-1 shows the relation between the logic level on the control lines and the attenuation factor.

Table 3-1: Attenuation Factors vs. Logic Levels

V/DIV Setting	Attenuation Ratio	x2 Amplifier	Pre-Amp Setting	Control Line No. 7 6 5 4 3 2 1 0
2 mV *	x1	ON	2 mV	x 0 0 0 0 0 1 x
5 mV	x1	OFF	2 mV	x 0 0 1 0 0 1 x
10 mV	x1	OFF	5 mV	x 0 1 1 0 0 1 x
20 mV	x1	OFF	10 mV	x 1 0 1 0 0 1 x
50 mV	x10	OFF	2 mV	x 0 0 1 1 0 1 x
0.1 V	x10	OFF	5 mV	x 0 1 1 1 0 1 x
0.2 V	x10	OFF	10 mV	x 1 0 1 1 0 1 x
0.5 V	x100	OFF	2 mV	x 0 0 1 0 1 1 x
1 V	x100	OFF	5 mV	x 0 1 1 0 1 1 x
2 V	x100	OFF	10 mV	x 1 0 1 0 1 1 x
5 V	x1000	OFF	2 mV	x 0 0 1 1 1 1 x
GND	x	x	x	x x x x x x 0 x
INVERT	x	x	x	1 x x x x x x x
AC COU.	x	x	x	x x x x x x x 0
DC COU.	x	x	x	x x x x x x x 1

* **Reduced Bandwidth to 10 MHz**

The output of the attenuator is connected to the vertical input buffer Q100. The buffer circuit provides a very high impedance to the attenuator circuit resulting in accurate attenuation factors.
The output impedance of the buffer circuit is relatively low, which is necessary to drive the pre-amplifier circuit.
The input buffer is protected for high amplitude input signals by a high value resistor and protection diodes. The resistor (475 kΩ) limits the current in overload situations through the protection diode CR101 or the FET Q100.
The output signal of the input buffer is connected to either the 2 mV amplifier or the pre-amplifier circuit.

Pre-amplifier circuit U101 converts the single side input voltage to a differential output current. This circuit provides logic controlled gain switching (see Table 3-1). The overall gain can be controlled by a dc voltage ranged between +2.5 V and −2.5 V and applied to the VAR input. The gain ratio between these two levels is at least 2.5:1. The VAR input is used to calibrate the vertical sensitivity. The output current of the pre-amplifier is connected to the summing point of the delay line driver.

The 2mV range is achieved through an extra amplifier stage U100. The input signal is amplified to the level required by the pre-amplifier chip. The 2mV amplifier U100 is operated via relay K100 and reduces the bandwidth to ±10 MHz.

Vertical channel selection is accomplished with logic signal CH1 EN on the VENABLE input of the pre-amplifier chip U101.

Differential ground referenced trigger output signals are available on U101. The + output provides the signal for the digital storage circuit and the – output signal is applied to the trigger circuit.

Storage Pick-off Amplifier U102

The trigger output of the pre-amplifier is about 60 mV P-P per division. This amplitude is insufficient to drive the a/d converter located on the processor board (A15). The input sensitivity of the a/d converter is ± 200 mV/division. The storage pick off circuit amplifies this signal to the required level. In digital store mode a vertical range of 10.24 divisions is represented by voltage range of +1 V to –1 V at the input of the a/d converter. Positioning of the vertical signal in store mode is accomplished via the storage pick off amplifier U102.
The amplitude of the output signal of the storage pick off amplifier is limited to about +1.2 V and - 1.2 V to prevent overloading of the a/d converter.

DC Balance

The input buffer Q100 and the 2mV amplifier exhibit a dc offset voltage which causes the trace to shift when the vertical amplifier is switched to a different VOLTS/DIV setting. The offset depends on the specific characteristics of the components used. The offset can be compensated with an internal calibration routine which automatically minimizes the trace shift. The compensation voltage ranges between +2.5 V and – 2.5 V.
Transistor Q103 provides level shifting and converts the C1 BAL voltage to a small offset voltage for Q100A. Q100A has been biased more negatively than Q100B to be able to compensate positive and negative offsets.

Probe Coding

Resistor R111 provides + 5 Volts to the probe coding ring on the BNC input connector. With a suitable probe connected to the input BNC connector the + 5 Volt will be divided by R111 and the internal probe coding resistor of the probe. The resulting voltage depends on the attenuation factor of the probe. This voltage is measured and the deflection factor displayed by the CRT read out is corrected.

Delay Line Driver (2)

The delay line driver circuit converts signal currents from the pre-amplifiers and position control circuits to voltage levels to drive the delay line and the vertical output amplifier.

The emitters of transistors Q202 and Q203 create the low impedance summing point of the signal currents from the preamplifier and the position control circuit. In the collector circuit of Q202 and Q203 a clamp circuit limits the drive voltages to the output amplifiers.
Op-amp U201A and transistor Q210 ensure the average voltage at the output of the delay line drivers to be at zero volts.
Op-amp U201B compensates long term drift of the readout display in case the trace is set to one of the extreme positions.
Transistor Q211 , CR204 and CR205 provide vertical beam limit when Q211 is conducting.
The vertical bandwidth can be reduced by activating Q214 and /or Q215. Diode bridge CR270 to CR273 will then conduct and connect C270 and C271 in series across the pre-amplifier output.

The position control circuit converts vertical positioning currents, vertical readout and vertical storage display information into the appropriate current levels to the delay line driver.

Vertical Output Amplifier (3)

The vertical output amplifier consists of an input stage and a cascode output stage.

The input stage contains the necessary adjustments to compensate high frequency and delay-line roll off and to compensate the low- frequency response. R340 is adjusted to minimize read out jitter. Variable capacitance diodes CR308 and CR309 minimize high frequency roll off at elevated temperatures.

Vertical Position Logic (Part of (8))

The input voltages for the vertical position logic are generated by the daculator circuit and based on data provided by the front panel processor. Selection of the positioning voltage is made by the vertical switch logic circuit U810. Possible selections are: CH 1, CH 2, CH 1 + CH 2, CH 1 + Trace Sep, CH 2 + Trace Sep, CH 1 + CH 2 +Trace Sep, and Read Out/Storage.

Vertical Switch Logic (Part of ◇8◇)

The vertical switch logic consists of :

- Shift register U805
- Switch logic circuit U810
- Chop oscillator circuit U809A , B and C

Vertical and horizontal mode signals are provided by the system processor via U805, the hold off pulse and the chop oscillator clock signal to the input of the switch logic circuit U810. Output signals are CH1 enable (CH1EN) and CH 2 enable (CH2EN). These signals enable the pre-amplifiers and determine which vertical position signal is connected via muliplexer U811 to the position control circuit.

In vertical alternate mode the hold off pulse acts as clock pulse to a divide by two circuit. In horizontal ALT MAG mode and vertical alternate mode the hold off pulse is connected to a divide by four circuit.

Horizontal System and Z-Axis Circuit

This subsection describes the trigger circuit (diagram 4), the timebase (diagram 5b), the sweep logic (diagram 5a), the horizontal magnifiers and readout mux (diagram 6), the horizontal output amplifier (diagram 7) and the Z-axis circuit (diagram 12) on the A10 board assembly. Diagrams are located in Section 9: *Diagrams*. For an overview of the Horizontal system and the Z-axis circuitry, see the block diagrams in Figure 3-3 and Figure 3-4.

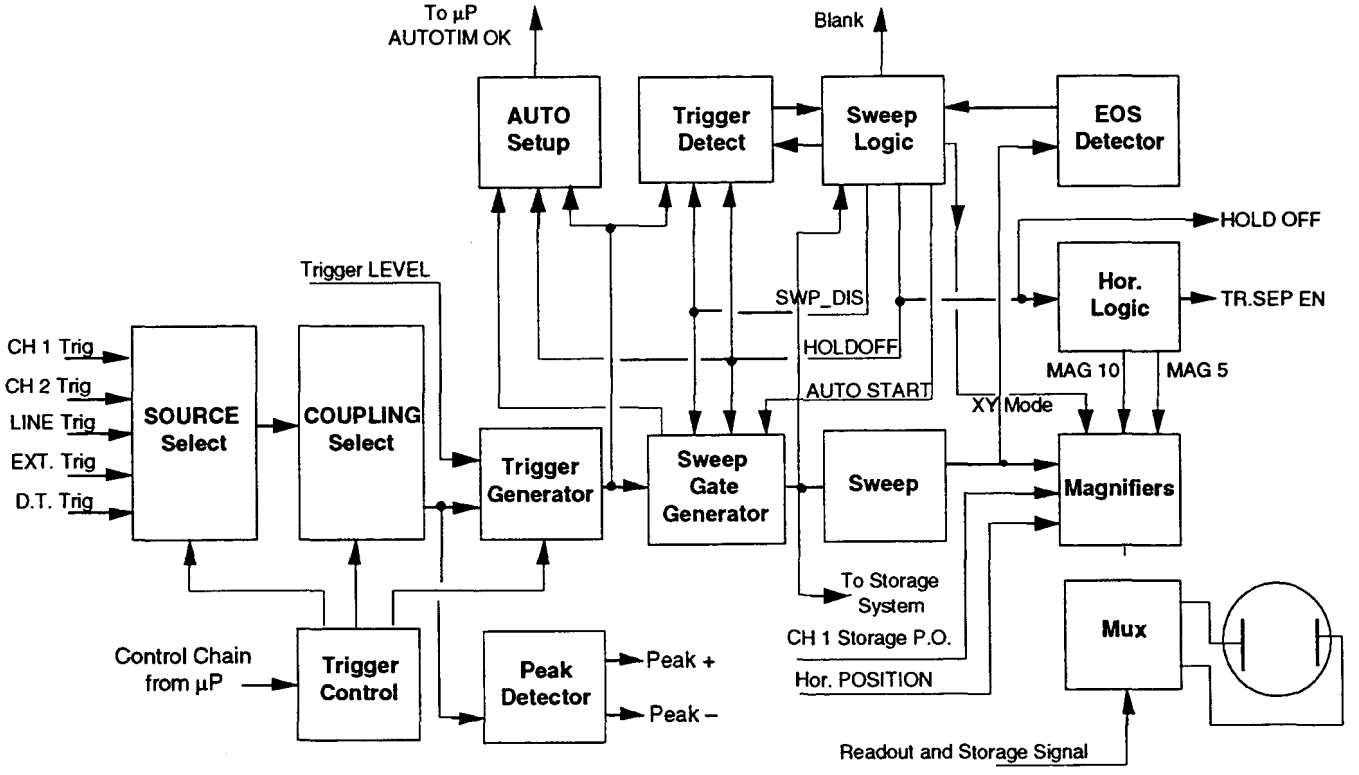


Figure 3-3: 2212 Horizontal System Block Diagram

Trigger Circuit

The kernel of the trigger circuit is U400. This integrated circuit includes two multiplexers, a comparator with schmitt trigger inputs and a control unit.

The control unit U400A receives control data from the data chain U800 and vertical logic U810 (diagram 8) and controls the trigger circuit. The trigger circuit is designed with two registers, one is latched with signal STB, the other is transparent. The transparent register controls multiplexer 1, U400B. This multiplexer performs the trigger source selection. CH1, CH2, line, external, DT_Trig. The latter is a trigger signal generated by the system processor. The latched register controls multiplexer 2, U400C. This multiplexer is used for trigger coupling selection (DC, AC, Low Frequency Reject, High Frequency Reject, TV Field). When TV Field trigger mode is selected on the front panel, the instrument operates in peak-peak auto mode (P-P AUTO), combined with the TV sync. separator selected for trigger coupling. The trigger signal is passed on to comparator U400D, also controlled by U400A. U400D has a slope control for positive and negative slope triggering and a hysteresis control. In Noise Reject coupling, the hysteresis is increased by a factor of 4. U400D compares the trigger signal with the trigger level and generates the trigger pulses on ECL level. The trigger pulses are passed on to the sweep logic. The trigger signal is also passed on to the PEAK+ and PEAK– detectors. The outputs of these detectors have an offset of 2.5 V and range from 0 to +5 V. The output signals are processed by the main processor. The calibration of the trigger circuit is performed in the software.

Sweep Logic Circuit

The sweep logic is mainly inside PAL U500. PAL U500 contains logic for X-Y-mode, single sweep mode, normal mode and P-P Auto with the auto baseline logic.

Trigger pulses from diagram 4 are clocked into U502B. If sweep is not disabled, the flip flop is set to '1' and the sweep gate becomes active, starting the sweep in diagram 5B. When in auto mode and no trigger pulses are generated, U500 sets U502B with the AUTOSTRT signal. U502A and U504A are the trigger detector circuits.

U504 is a re-triggerable one-shot. As long as trigger pulses are produced, the ATIME signal stays active high and the TRIGD_0 signal stays low. At the end of the sweep, EOS becomes active high and U500 generates the HOSTART (hold off start) pulse.

The HOSTART pulse starts the hold off generator (U504B). The hold off pulse resets the sweep gate and the trigger detect circuit U502. The hold off pulse is also used as a clock signal for the horizontal and vertical logic, U501 and U810. During hold off and in single sweep, but before SS-RESET, SWPDIS_0 is active low. This prevents U502A and-B to be set, so no sweep is started and no trigger pulses are detected. When a new code is loaded into the serial data chain, the CHAIN_LD pulse will activate U500 to generate a HOSTART pulse, terminating the current sweep and starting a new one with the new scope settings.

PAL U501 contains the horizontal logic. It is a state machine that controls the horizontal magnifier (diagram 6) to switch between 1x gain, 10x gain and 50x gain. The hold off pulse is the clock signal for this state machine. Some gates inside U501 are used to decode TIME6 and TIME7. These bits are part of the control byte that sets the sweep speed. The decode logic selects the proper capacitor for the hold off generator to obtain the correct hold off time for each sweep speed.

Auto Cal and AUTO Setup

In calibration mode, the sweep length is set to exactly 10 divisions and appropriate time markers are applied to the scope. The first time marker triggers a sweep. A second time marker is detected by U503B. After EOS, U503A samples the status of U503B and generates the AUTOTIMOK signal. The system processor reads AUTOTIMOK and controls the sweep speed (VARTIM in diagram 5B) The sweep speed is adjusted so a 10 division sweep fits exactly within two time markers. In auto set up the same circuit is used with the normal sweep length >10 divisions to make an estimation of the input signal frequency. In this way the proper sweep speed can be selected for that signal.

Timebase Generator

The timebase generator consists basically of a capacitor (C554, C555, C556, C557) and a current source (Q551 and U552A) that charges that capacitor . Q552 and Q553 switch on the desired capacitor in a 1 to 100 sequence. Multiplexer U550 controls the current source in a 1 to 10 sequence, U551 controls the current source in a 1, 2, 5 sequence. So there is a 3 dimensional switching matrix to obtain all the possible sweep speeds. The matrix is controlled by the code byte from the serial data chain TIMCTR[0..5]. TIMCTR[6..7] are used as TIME6 and TIME7 for the hold off time setting. (See Sweep Logic diagram 5A). There is some redundancy in the matrix, some sweep speeds can be obtained in more then one way. The system processor is programmed to select the most accurate ones. With the VARTIM signal, the current source and as a result the sweep speed can be controlled continuously.

This signal is used for sweep calibration and for variable sweep. When SWPGT goes low, U554A, -B and -D are on. The timing capacitor is discharged to a level of about -2.5 V. When SWPGT goes high, U554C turns on and U554A, -B and -D turn off. The current from Q551 charges the timing capacitor and the sweep runs.

SWPSTRT is a signal from the daculator and is programmed according to the diode curve of Q554B and the selected current. This compensates for the voltage across U554B to achieve a sweep that always starts at the same level. The buffered sweep is passed on to the end of sweep comparator and the horizontal magnifier.

In X-Y mode the sweep does not run. Q561 switches XAXIS from the CH1 storage pick off to the horizontal magnifier.

Horizontal Magnifiers and Readout MUX

The horizontal magnifier consists of four stages.

- The single ended to paraphase signal splitter, Q601 and Q602.
- The 1x / 5x magnifier, U601A -B, controlled by U606A -B. R620 is adjusted for the 1x gain, R627 for the 5x gain and R610 for an offset 0 between 1x and 5x gain.
- The 1x / 10x magnifier, U603 and U604, controlled by U606C -D. R647 is adjusted for the 10x gain.
- The read out multiplexer U602, U601E and U604E, controlled by U605.

The multiplexer switches between the analog signal from the sweep and the signal from the D/A converters on the processor board. This may be the horizontal read out signal or the horizontal signal of the stored waveform. When beamfind is selected, U602E is switched on and current for the horizontal output amplifier is drained by U602E, causing the output signal to clip on a level within the CRT screen boundaries.

Z-Axis Circuit

The main power supply delivers voltages to the CRT, minus 2 kV for the cathode, 10 kV for the acceleration anode, heater voltage (floating at the cathode level), 100 VAC for the dc-restorers and an adjustable focus voltage. The Z-axis circuit has two analog inputs.

1. TR_INT for the waveform intensity and
2. RO_INT for the readout intensity.

The waveform intensity is switched on and off by a combination of four signals: BLANK, CHPBLNK, TRBLNK and STORE_XY_0.
The MAG10 signal increases the intensity a little when the horizontal magnifier is switched on.
The readout intensity is switched on and off by the ROBLNK signal.
EXTZ modulates the waveform intensity. EXTZ is enabled by a combination of two signals, the EXTZEN_0 and TRBLNK signals, so EXTZ only controls the waveform intensity.
The complete Z-axis input signal can be overruled by the BFND_0 signal so the user will have a visible trace or spot anyhow if beamfind is active.

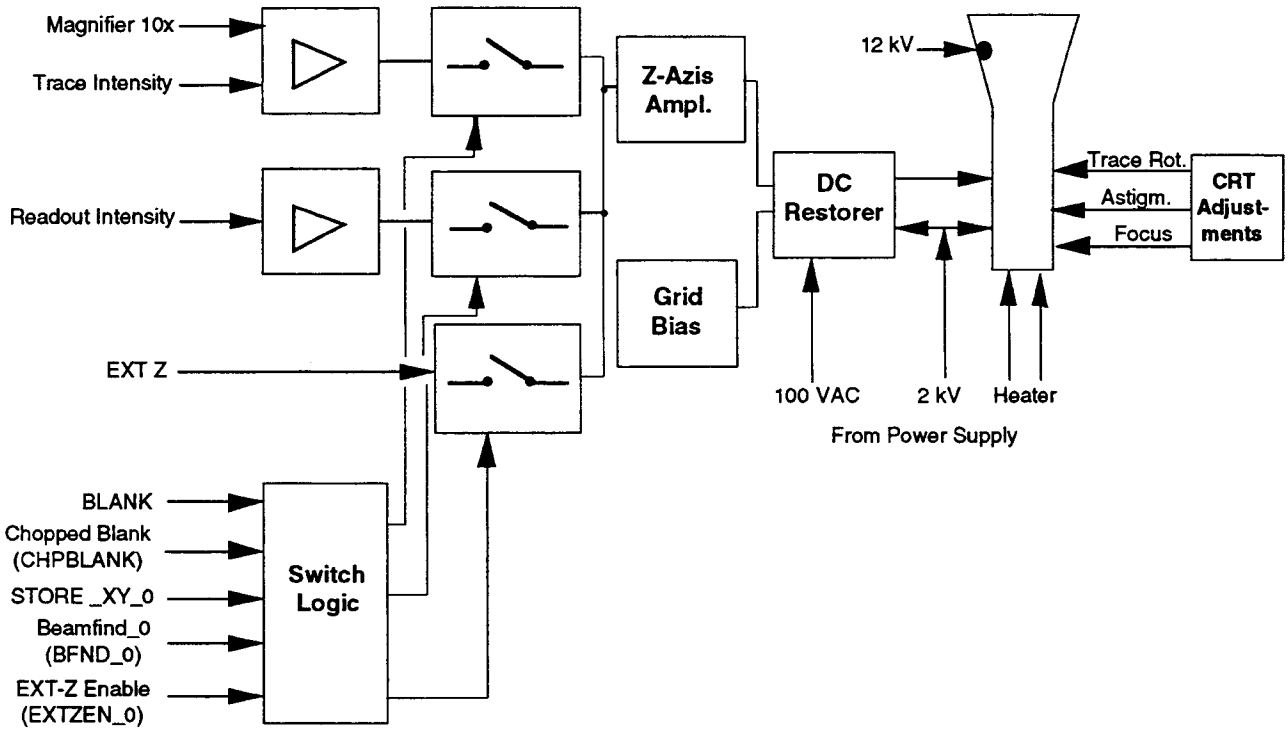


Figure 3-4: 2212 Z-Axis Block Diagram

The Z-axis signal from the input circuit is passed on to the Z-axis amplifier, Q1210, Q1211, Q1212. The output of the amplifier is combined with the grid bias voltage from R1234 in the DC restorer circuit. The voltage difference between grid bias and the Z-axis are level shifted to the cathode voltage. The voltage between grid bias and Z-axis equals the voltage between CRT cathode and control grid. The CRT grid is more negative than the cathode. This controls the beam current through the CRT. Trace rotation, geometry and astigmatism are factory adjusted.

Serial Data Chain (Part of 8 10)

The 2212 is fully microprocessor controlled. To prevent digital noise, glitches and other polluted signals that can disturb the sensitive circuitry of the scope, the microprocessor controls the analog section of the scope by way of a serial data chain.

There is no system bus activity or other microprocessor activity on the mainboard of the 2212 oscilloscope. Six bytes are required to set up the analog part of the scope.

Byte 1. U800 contains the control byte for the trigger source- coupling- and slope selection.
Byte 2. U801 contains the controlbyte for the trigger mode that sets the sweep logic.
Byte 3. U802 contains the controlbyte for the sweep speed.
Byte 4. U803 contains the controlbyte for the CH 1 sensitivity.
Byte 5. U804 contains the controlbyte for the CH 2 sensitivity.
Byte 6. U805 contains the controlbyte for the vertical mode selection.

The six single shift registers are cascaded to one 48 bit long shift register, called the data chain. When new data must be shifted into the chain, the microprocessor places bit by bit on the serial data line (SER_DATA) and shifts it into the chain with the serial clock signal (SER_CLK). The shift registers are not transparent, so a bit that is moving through the chain does not affect the outputs. When the 48 bits word is loaded, a strobe pulse (CHAIN_LD) clocks all bits in parallel to their outputs. If one bit of the chain has to be changed, a complete new 48 bits wide word must be loaded into the chain.

Daculator Circuit 10

The 2212 scope has a 16 channel DAC, called the daculator. The outputs of this DAC are used to control and calibrate the scope. The individual outputs are discussed in other parts of the circuit description. The daculator is loaded the same way as the serial data chain with a 16 bits wide word.
12 Bits for the DAC and 4 bits to address the output channel.
The daculator uses the same serial data line (SER_DATA) and the same clock signal (SER_CLK) and has its own strobe pulse, (DACU_LD). So all the code information is loaded into both shift registers, the serial data chain and the daculator. The CHAIN_LD and the DACU_LD pulse however determine which circuit actually accepts the data.
The daculator is completed with some peripheral circuitry to improve the performance. An external reference is used to have a better accuracy and lower drift. An RC filter and a buffer circuit at each output are provided to reduce digital noise and increase the output drive.

Digital Circuitry

This section contains the descriptions of the circuitry on the A15 processor board and the A12 frontboard. The A15 board assembly contains the following circuitry :

- Main microprocessor (Diagram 18)
- Digital acquisition (diagram 16 and 17)
- Digital display circuitry (readout, cursors and waveform display) (diagram 19)
- Parallel interface circuitry (diagram 21)
- Communication options (diagram 22 and 23)

Power connections of the IC's on the A15 board are located on diagram 20A and 20B. The A12 board assembly contains the following circuitry:

- Front panel switches (diagram 14)
- Front panel LED's (diagram 15)

Diagrams are located in section 9: *Diagrams*. See also the block diagrams in this section for an overview of the circuits concerned.

Microprocessor Circuit

The core of the digital system is a 68070 microprocessor, which basically is a 68000 derivative with build-in peripherals. Of these internal functions the following are used in the 2212:

- The two channel DMA controller used in the display and acquisition systems.
- The UART for serial communication (optional).
- I^2C bus for communication with EEROM on the analog mainboard A10.
- Timer for several timing tasks.

The 68070 processor (U1801 diagram 18) has a 16 bits databus (PROD [0....15]) and a 23 bits address bus (PROA [1....23]).
Because it uses a 16 bits wide databus, the least significant address line is A1.

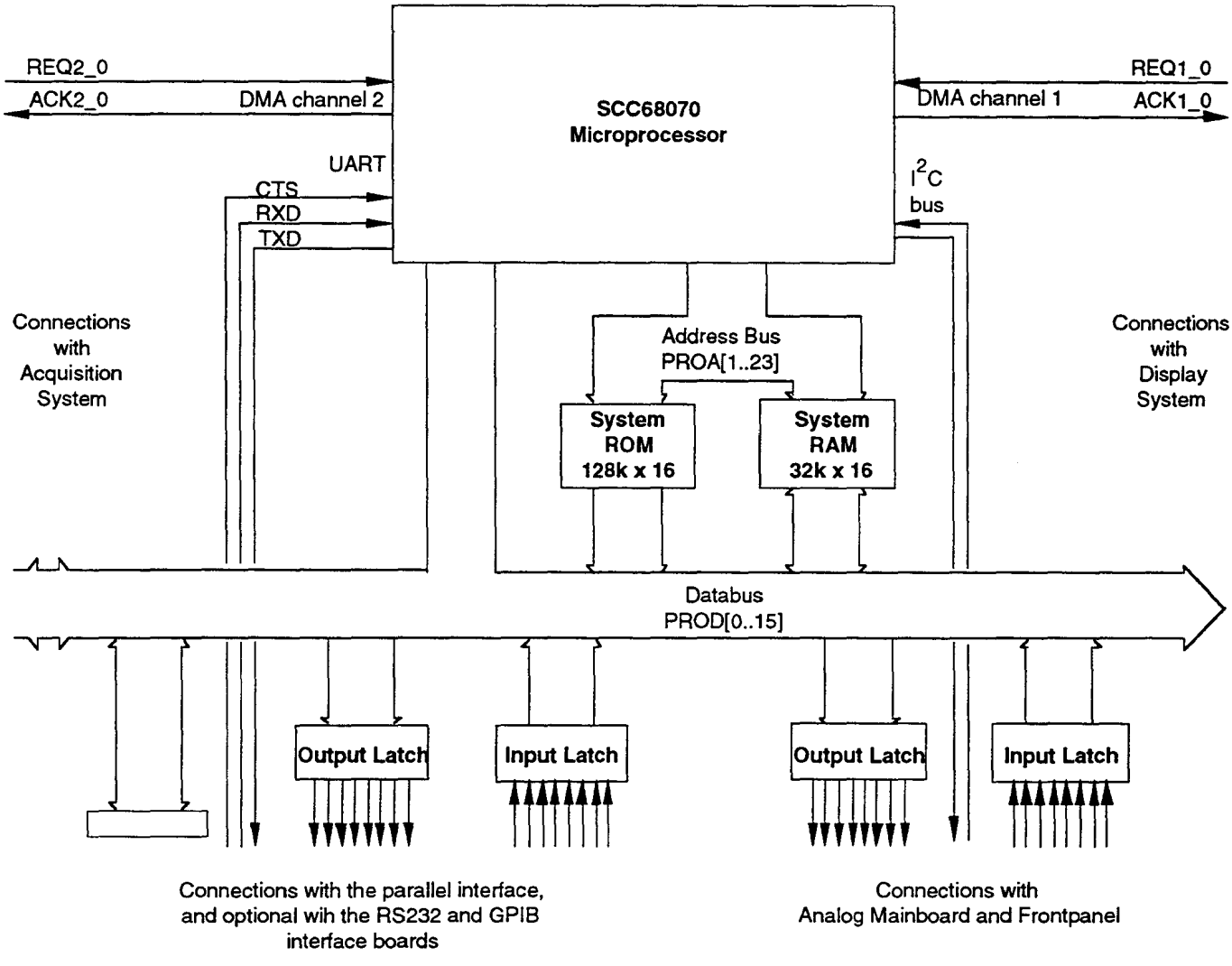


Figure 3-5: 68070 Micro Processor Block Diagram

The 68070 processor is capable of performing byte wide operations which is done with the UDS_0 and LDS_0 lines selecting the upper or lower part of the databus separately when needed.
Address decoding is done by IC's U1810, U1811 and U1812. The lower half of the 16 MByte addressing range is divided in 8 parts of 1 MByte. U1810 decodes these 8 memory banks unconditionally, U1811 decodes as additional condition that the upper part of the databus is selected and U1812 decodes the lower databus operations.

8 Bit wide devices are used as processor memory: the static RAM's U1804 and U1805 and the ROM's U1806 and U1807.
In the standard version, RAM's of 32k x 8 and ROM's of 128k x 8 are used.
Parts of the databus are buffered by U1850 and U2103 (diagram 21).
To generate a timing signal for operating these bus-buffers (BUFGATE_0), and for generation of waitstates (DTACK_0, U1801 pin 24), the circuitry drawn below U1812 is added.

All memory operations are performed with no waitstates, except for the timing of the TMS 9914A GPIB chip, which requires an additional waitstate (68 nsec).
The crystal determining the processor speed is Y1800 (29.4912 MHz). This makes the microprocessor clock (CLKOUT pin 29) run at 14.7456 MHz. This frequency is fed to the counter U1840 which divides this frequency down to 4.9152 MHz. This signal (XCKI) is fed back to the 68070 to generate proper UART timing and to the display system as signal CLK5M.
The 24C04 EEROM U1800 which is connected with the 68070 through an I^2C bus contains the calibration values of the instrument and the menu settings. The device is placed on the A10 board to keep the calibration data with the analog circuitry. Activity at the I2C bus can only be seen at power up, when the contents of the EEROM are copied into RAM, or when settings are saved (at menu exit etc.).

The +5VD supply voltage is monitored by U1802 to generate proper RESET_0 timing. The level of the RESET_0 line can be monitored by watching DS2100 (diagram 21); when this LED is lit, a reset is generated.

Input-Output operation with other circuitry is done with latches, connected straight to the databus and memory mapped in the 68070 memory map.

U1830 enables the microprocessor to read settings from the analog mainboard A10 and the front panel board A12.
Through U1860 the microprocessor can control both boards. The A10 analog board has two major control mechanisms, which are both driven by the 68070 microprocessor on A15: the daculator and the shift register chain. They are both controlled serially, and use the same clock and data lines (SER_CLK and SER_DATA). Two separate load pulses at the end of a transfer determine which devices are addressed (CHAIN_LD and DACU_LD). Updates of the daculator can be expected when an analog control setting is changed. A CHAIN_LD pulse can be seen when sensitivity settings etc. are changed that need update of relays- or trigger settings.

Communication with the front panel processor is done through a bidirectional synchronous exchange of 8 bytes. The clock (FP_CLCK) is generated by the 68070 processor. Data is sent from A10 to the front panel board through the FP_SDI line, while simultaneously 8 bits from the front panel are transmitted to the 68070 processor across the FP_SD0 line. This transfer basically occurs every two milliseconds.

Display System

The display system is designed to write readout data and acquisition waveforms on the CRT. The output signals are :

- The analog horizontal and vertical deflection (ROHOR and ROVERT).
- The digital signals ROBLNK and TRBLNK for blanking the readout and trace signals.
- ROA_0 for indicating "readout active".
- REFSEP indicating that a reference waveform is being displayed and the reference separation needs to be switched on.

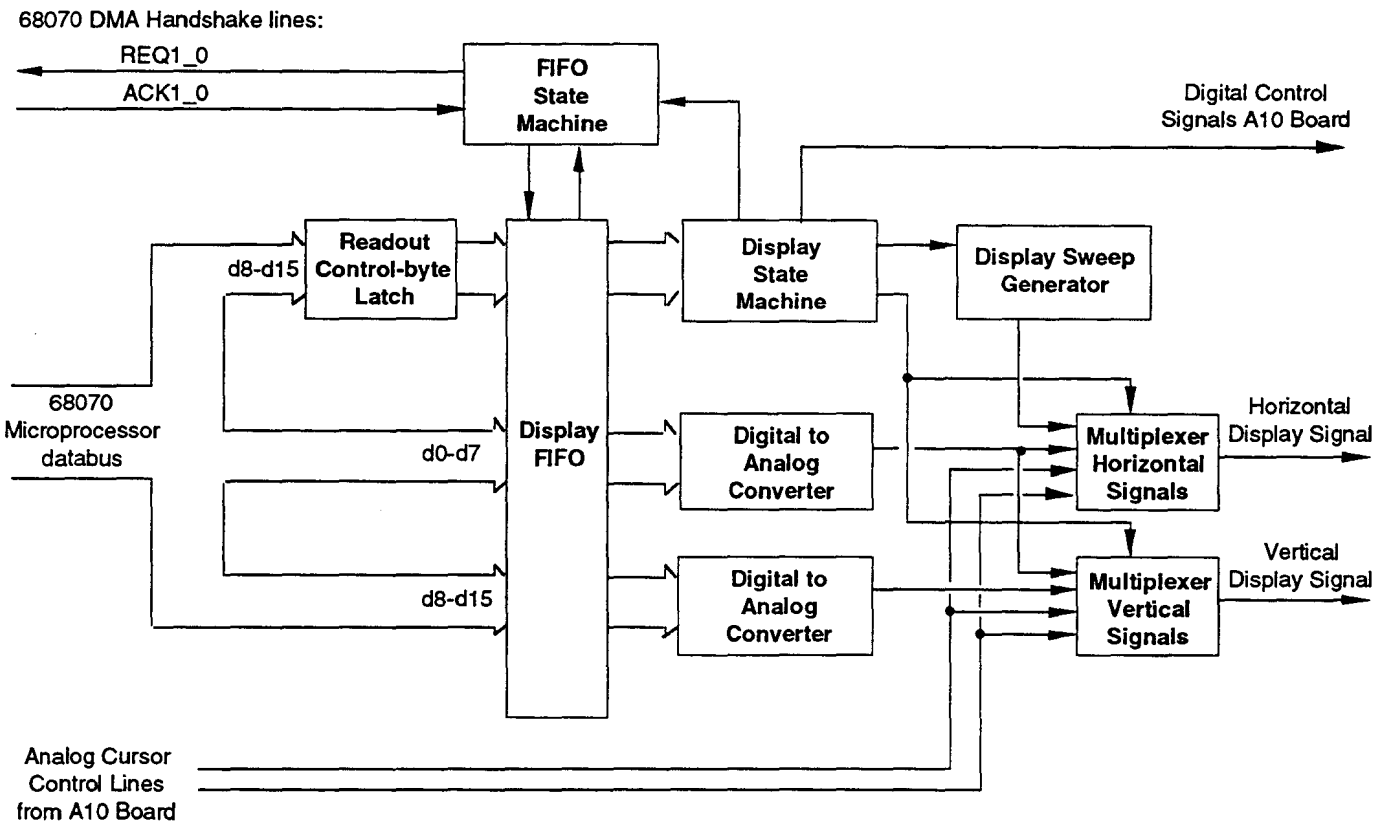


Figure 3-6: 2212 Display System Block Diagram

The data needed for writing the data to the screen is all directly read from the 68070 microprocessor memory using DMA (Direct Memory Access). To perform this task, the highest priority DMA channel of the internal DMA controller is used (in burst mode). To get a constant flow of display data, the display system is coupled to the microprocessor bus through a first-in/first-out buffer (FIFO) with a depth of 16 words (U1900 - U1905).

The 16 bits of data from the databus are directed to the DAC's U1922 and U1923, to generate analog signals. In this way readout positioning can be performed with a resolution of 256 x 256 pixels. To get the full performance needed to get all the features generating the 2212 display, the display system is made "programmable" by adding a readout controlbyte (RC0 - RC7 from U1906). This byte is fed into the FIFO's synchronously with the display data and can be set by the microprocessor to select the type of display function needed.
The main functionality of the display system is determined by the 22V10 PAL U1925 in combination with counter U1932.
The PAL, also controlled by the readout controlbyte, determines the timing of the display process and generates the digital signals needed for the analog mainboard (clocked by the CLK5M timing signal).
In combination with the 74HC592 counter U1932, longer timing periods can be generated. In this way magnification of waveforms can be performed by stretching the display time of one acquisition-dot, times ten or times fifty.
The following analog circuitry is added to get more resolution than the 256 positions provided by the 8 bit DAC's:

- An analog sweep generator for displaying the 4096 position waveforms horizontally (U1600A and C1903). Displaying readout data will automatically reset the sweep generator.

- A "dwell" control is provided to stop the waveform during display when a trigger point is written or a store mode time cursor.

- Two 12 bits daculator outputs REFCUR and DELTACUR for the positioning of the voltage and time cursors in analog mode and the voltage cursors in store mode.

The analog multiplexers U1930 and U1931 (also controlled by the readout controlbyte), determine which signal is routed to the analog outputs ROHOR and ROVERT.

Readout control bytes are used as stated in Table 3-2.

Table 3-2: Readout Control Table

RC7	RC6	RC5	RC4	RC3	RC2	RC1	RC0	Hex Value	Display Function
0	0	0	1	0	0	1	0	12	screen based voltage cursor1, burst mode
0	0	0	1	0	0	1	1	13	screen based voltage cursor 2, burst mode
0	0	0	1	1	0	1	0	1a	screen based voltage cursor1, chop mode
0	0	0	1	1	0	1	1	1b	screen based voltage cursor 2, chop mode
0	0	1	0	0	0	0	0	20	screen based time cursor1, burst mode (blanked)
0	0	1	0	0	0	1	0	22	screen based time cursor1, burst mode
0	0	1	0	0	0	1	1	23	screen based time cursor 2, burst mode
0	0	1	0	1	0	1	0	2a	screen based time cursor1, chop mode
0	0	1	0	1	0	1	1	2b	screen based time cursor 2, chop mode
0	0	1	1	0	0	0	0	30	burst mode blanked readout (blanked)
0	0	1	1	0	0	1	0	32	burst mode readout
0	0	1	1	0	1	0	0	34	burst mode readout XY waveform display
0	0	1	1	0	1	1	0	36	burst mode readout XY reference display
0	0	1	1	1	0	0	0	38	chop mode readout slow chop rate
0	0	1	1	1	0	0	1	39	chop mode readout almost slow chop rate
0	0	1	1	1	0	1	0	3A	chop mode readout almost fast chop rate
0	0	1	1	1	0	1	1	3B	chop mode readout fast chop rate
1	0	0	0	0	0	0	0	80	waveform based time cursor
1	0	0	0	1	0	0	0	88	long trigger point channel 1 refer. waveform
1	0	0	1	1	0	0	0	98	long trigger point channel 1 stored waveform
1	0	1	0	1	0	0	0	A8	long trigger point channel 2 refer. waveform
1	0	1	1	1	0	0	0	B8	long trigger point channel 2 stored waveform
1	1	0	0	0	0	0	0	c0	channel 1 reference waveform blanked (unmagnified)
1	1	0	0	0	0	1	1	c3	channel 1 reference waveform (x50 magnified)
1	1	0	0	0	1	0	0	c4	channel 1 reference waveform (not magnified)
1	1	0	0	1	1	0	1	cd	channel 1 reference waveform (x10 magnified)
1	1	0	1	0	0	0	0	d0	channel 1 stored waveform blanked (unmagnified)
1	1	0	1	0	0	1	1	d3	channel 1 stored waveform (x50 magnified)
1	1	0	1	0	1	0	0	d4	channel 1 stored waveform (not magnified)
1	1	0	1	1	1	0	1	dd	channel 1 stored waveform (x10 magnified)
1	1	1	0	0	0	0	0	e0	channel 2 reference waveform blanked (unmagnified)
1	1	1	0	0	0	1	1	e3	channel 2 reference waveform (x50 magnified)
1	1	1	0	0	1	0	0	e4	channel 2 reference waveform (not magnified)
1	1	1	0	1	1	0	1	ed	channel 2 reference waveform (x10 magnified)
1	1	1	1	0	0	0	0	f0	channel 2 stored waveform blanked (unmagnified)
1	1	1	1	0	0	1	1	f3	channel 2 stored waveform (x50 magnified)
1	1	1	1	0	1	0	0	f4	channel 2 stored waveform (not magnified)
1	1	1	1	1	1	0	1	fd	channel 2 stored waveform (x10 magnified)

The 16V8 PAL U1909 in combination with counter U1908 and flip-flop's U1907 performs the FIFO "bookkeeping". It requests DMA's from the 68070 by driving REQ1_0 low until it reaches the "almost full" condition. This results in a maximum number of words in the FIFO of 15 (for safety purposes). The condition "FULL" (pin 14) should therefore never occur (this output is added for debugging purposes only).
The output "EMPTY" is used by the 68070 to be able to check if a display frame is completely finished.

Data is basically written on the CRT on a 50 Hz rate. One display cycle starts with a pulse on the FIFORST line to make sure the hardware is reset. After that, the first readout controlbyte is written in latch U1906 and the first DMA transfer is started. As soon as the first DMA burst is fully accepted by the FIFO's, an internal interrupt will automatically set the next readout control byte and start the following DMA transfer, etc.. After having sent all DMA transfers of one display frame, the processor will synchronize with the next 20 ms pulse.

Acquisition System

( and )

The Acquisition Data Path

A/D Converters

Digitizing the input signals is done by the analog-to-digital converters U1601 and U1602. Each channel has its own converter. The A/D converters are high speed flash converters producing an 8-bit digital word which represents the magnitude of the analog input signal (pin 14). Conversion takes place on the falling edge of CLK (CONVCLK). The range of the analog input signal is +1 V to -1 V producing byte values of 11111111 to respectively 00000000 .
Conversions are continuously taking place at the CONVCLK rate. When the fastest range available in STORE mode (20 µsec/div) is selected, CONVCLK runs at 20 MHz. On all other SEC/DIV settings, the A/D clock runs at 8 MHz (see Timebase Table 3-3).

Reference Voltage

The sensitivity of the a/d converters is determined by a stable +1 V and -1 V (applied to pins 24 and 23 respectively) voltage source. The analog +5 V supply (+5VA1) supplies an input of 5 V to the inverting operational amplifier U1600B. Resistors R1604 and R1603 set the gain, giving an output of -1 V at the emitter of Q1601. This transistor provides the current necessary to drive the reference chain.

The +1 V is generated in a similar fashion by unity-gain inverting amplifier U1600C. The gain is set by the resistors R1601 and R1602 with Q1600 providing the current source requirements. Capacitors C1600 and C1603 limit the bandwidth of the amplifiers for stability reasons.

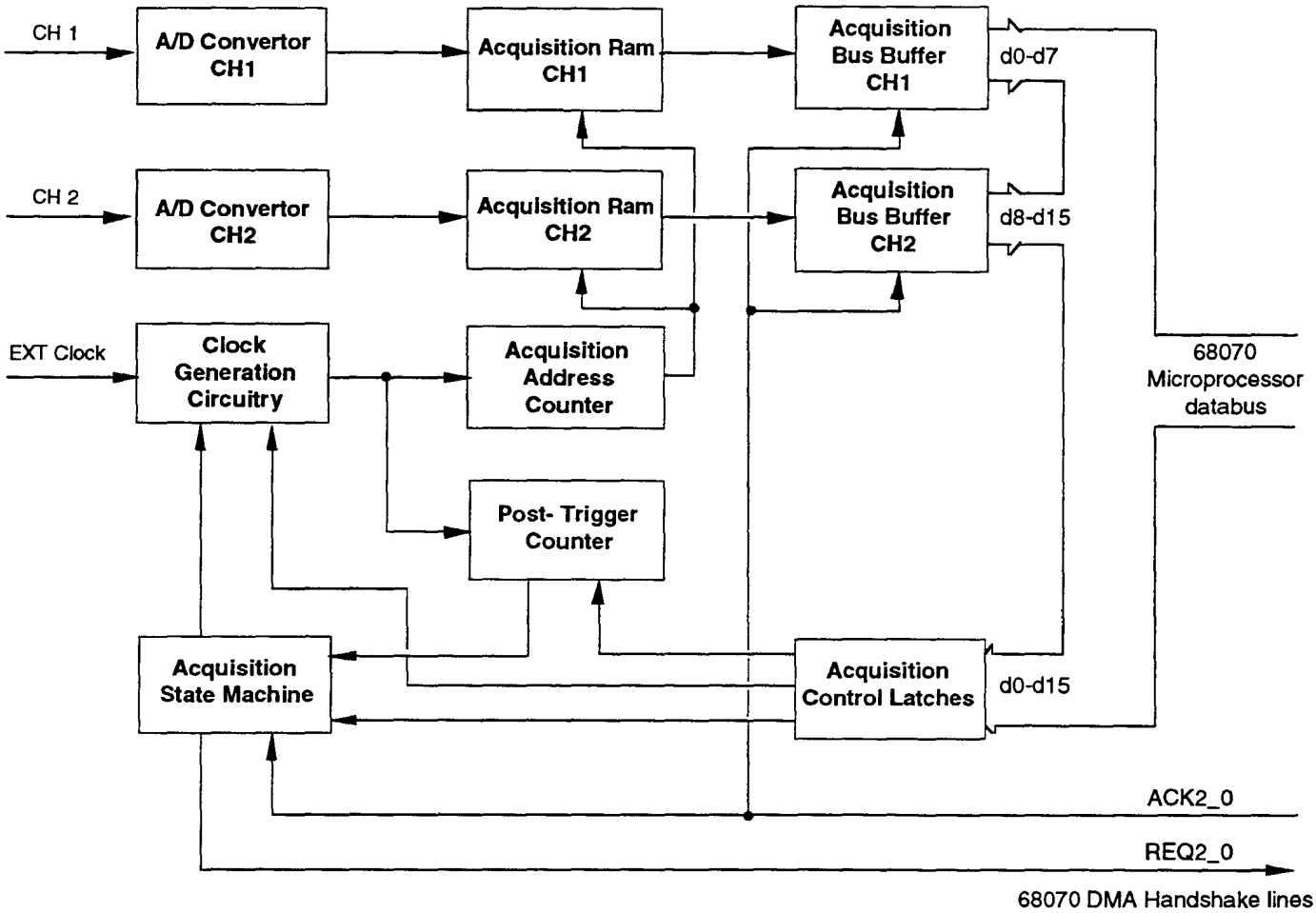


Figure 3-7: 2212 Acquisition Block Diagram

Digital Acquisition Data Path

Output data from the channel A/D converters is latched into data latches U1603 and U1604 at the SAVCLK_0 rate. That rate is determined by the 68070 microprocessor through the control latches U1705 and U1706 (see Timebase Table 3-3). The output enables for the two data latches are controlled by the 16V8 PAL U1610 (SLCLKENA). The data latches are disabled during a transfer of data from the acquisition RAM's to the microprocessor.

Record Mode Acquisition

Acquiring Record Mode Data

The 12 address lines (ACQA0 - ACQA11) of the acquisition RAM's U1605 and U1606 are driven by the address counters U1615, U1616 and U1617, which are clocked by RECCLK. The WRCLK_0 and RECCLK signals are both at the same rate as SAVCLK_0.
For each SAVCLK_0, a new address is generated for the next acquisition. Before every acquisition, the address counter is pre-loaded with a value which is 25 or 75% of the record length determined by the SPT signal (U1705 pt2). As soon as the acquisition RAM has been filled with enough data, the PREFUL signal is generated from flip-flop U1621. The state machine U1610 and U1611 will then activate TRIGENA, enabling the trigger signal from the A10 board. When a trigger occurs through this SWPGT_0 line, flip-flop U1718 will be set and make the TRIGD line "1".
Immediately the RCENA signal will be set high to enable the post trigger counter U1618, U1619 and U1620, which was pre-loaded also.
When the post trigger data is acquired, this counter will generate EOR (End Of Record) through U1621 pt5. EOR will immediately stop RECCLK, and therefore the acquisition, at the AND gate U1622B.

Record Mode Data Transfer to 68070.

The state machine U1610 and U1611 will request for DMA as soon as EOR is detected by pulsing the DMASET_0 line low, and in that way activating the REQ2_0 line. Also the output enables of U1603 and U1604 will be made inactive to free the ACQD[0..15] acquisition databus. The 68070 microprocessor will then start a DMA-in transfer from acquisition RAM to system memory in cycle-stealing mode (one word at a time).

Handshaking is done by ACK2_0 and REQ2_0 microprocessor lines, and the ACK2_0 line also controls the output enable of the latches U1607 and U1608 which connect it to the microprocessor databus.
Note, that because of a 16 bit wide bus is used, channel 1 and channel 2 data is simultaneously transferred as two bytes in a 16 bits word. Because the acquisition was stopped immediately after EOR, the address on ACQA[0-11] is automatically the first position in the record that is acquired in the acquisition RAM. The software will determine the length of the DMA transfer (= record length). The speed of the transfer is limited by the state machine using a 500 kHz clock.
After the DMA transfer the microprocessor will reset the acquisition logic through pulsing ACQRST_0 low, and start the procedure all over again.
The connection of the acquisition data to the system memory, has been designed in such a way that acquisition records can be written to the display hardware without software modification, thus enabling fast acquisition update rates.

Roll Mode Acquisition

Acquiring Roll Mode Data

The roll mode acquisition is created in a different way. Basically, always at a 4 kHz rate, single acquisitions are taken and transferred immediately to the microprocessor. The software will then determine the roll mode acquisition speed and will take care of the way the roll mode is displayed. The control of this process is again done by the state machine U1610 and U1611.
Like all other acquisition timing, also the 4 kHz frequency of SAVCLK is generated by the programmable counters U1710, U1711, U1712 and U1713.
The relation between the outputs of the microprocessor controlled latches U1705 and U1706 and the timing is described in the Timebase Table (see Table 3-3).

Table 3-3: Timebase Table

SEC/ DIV	DEC4_0	DEC3_0	DEC2_0	DEC1B_0	DEC1A_0	S0	S1	ROLL	CONV CLK	SAV CLK
20 µs	1	0	0	1	1	1	0	0	20 MHz	20 MHz
50 µs	1	0	0	1	1	0	1	0	8 MHz	8 MHz
0.1 ms	1	1	1	0	1	1	1	0	8 MHz	4 MHz
0.2 ms	1	1	1	1	0	1	1	0	8 MHz	2 MHz
0.5 ms	1	1	1	0	0	1	1	0	8 MHz	800 kHz
1 ms	1	1	0	0	1	1	1	0	8 MHz	400 kHz
2 ms	1	1	0	1	0	1	1	0	8 MHz	200 kHz
5 ms	1	1	0	0	0	1	1	0	8 MHz	80 kHz
10 ms	1	0	0	0	1	1	1	0	8 MHz	40 kHz
20 ms	1	0	0	1	0	1	1	0	8 MHz	20 kHz
50 ms	1	0	0	0	0	1	1	0	8 MHz	8 kHz
0.1 s	0	0	0	0	1	1	1	1	8 MHz	4 kHz
0.2 s	0	0	0	0	1	1	1	1	8 MHz	4 kHz
0.5 s	0	0	0	0	1	1	1	1	8 MHz	4 kHz
1 s	0	0	0	0	1	1	1	1	8 MHz	4 kHz
2 s	0	0	0	0	1	1	1	1	8 MHz	4 kHz
5 s	0	0	0	0	1	1	1	1	8 MHz	4 kHz
10 s	0	0	0	0	1	1	1	1	8 MHz	4 kHz
20 s	0	0	0	0	1	1	1	1	8 MHz	4 kHz
50 s	0	0	0	0	1	1	1	1	8 MHz	4 kHz
EXT REC	x	x	x	x	x	0	0	0	EXT	EXT
EXT ROL	x	x	x	x	x	0	0	1	EXT	EXT

Switching the different timing signals is performed by multiplexer U1714. The ROLLCLK signal which is monitored by the statemachine, is derived from SAVCLK through the mono stable multivibrator U1701B.
The acquisition ram is not used in roll mode; the data from latches U1603 and U1604 is transferred directly to the microprocessor through the bus connection U1606 and U1608 while the outputs of the acquisition RAM's are disabled.

Roll Mode Data Transfer to 68070.

The DMA transfer consists of single word (two bytes) cycle stealing DMA transfers every 200 microseconds.
The hardware protocol is basically the same as in record mode.

Like indicated in the timebase table, external clocking of the acquisition speed is also possible. The EXT CLK input on J1700 is converted to the TTL level EXTCLOCK signal by the circuitry around Q1700 and Q1701 and U1700. In roll mode the maximum frequency is limited to a little over 4 kHz by the mono stable multivibrator U1701A.

Diagnostic LED's

The LED's DS2100, DS2101 and DS2102 are added for debugging purposes only. DS2100 should only be illuminated during power up when the RESET_0 line is active. During normal operation the DS2101 LED will blink with a cycle time of exactly 1 second, indicating that the operating system software is active. The DS2102 LED should blink at a much slower rate (period time 5 to 25 seconds) indicating that the separate tasks in the software are all active.

Parallel Interface

The parallel interface is completely software driven through latches which are connected to the processor bus. The interface lines are basically a Centronics type implementation.

Serial Interface Board A16 (optional)

The serial interface has two major components: a 5 Volt to +/– 10 Volt converter U2201 and the RS232 driver receiver IC U2200.
The TXD, RXD and CTS lines which are available at the connector J1504 at A15 are UART lines of the 68070. DSR, DTR and RTS are connected to the 68070 through latches (diagram 21).
The presence of the serial interface option board can be detected by the microprocessor by monitoring the SERINST line.

GPIB Interface Board A17 (optional)

The GPIB board contains a TMS9914A GPIB communication chip (U2300), which is connected to the lower half of the databus BUFD[0..7], and the address lines PROA[1..3] of the 68070. Combined with the chip select line GPIBL it is therefore memory mapped in the odd hexadecimal addresses 300001-30000F. The clocking of the TMS9914A is done with the CLK5M clock. Pin 39 of the TMS9914A is wired to the trigger circuitry of the A10 board to enable triggering of the instrument on GPIB interface messages. U2301 and U2302 are standard GPIB driver-receiver chips.
The presence of the GPIB interface option board can be detected by the microprocessor by monitoring the GPIBINST line.

Front Panel Controls (14 and 15)

The front panel is the operator's interface for controlling the user selectable oscilloscope functions. Along with the crt, it provides visual feedback to the user about the present operating state of the instrument.

The front panel micro controller U1401 and the main processor on the storage board communicate using a three wire interface;

- Clock signal (FP_CLCK)
- Data input (into the front panel) line (FP_SDI)
- Data output line (FP_SDO)

The 68HC05P7 micro controller has a synchronous serial in- and output port (SIOP), therefore communication needs a minimum software overhead.

The clock signal is supplied by the 68070 main processor on the processor board (A15), with a maximum of 500 kHz, so micro controller U1401 is operated in slave mode. In eight clock pulses one byte is transferred to and from the front panel micro controller. Every two milli seconds the main processor polls the communication channel. This means that within 2ms U1401 must be ready to put data into the SIOP. Therefore in the main program of U1401 tasks are split up in parts. Between each part a synchronisation byte is send so there is always communication between the processors.

Front Panel Switches

The front-panel switches S1400 to S1465 (38pcs) are arranged in a seven-row by eight-column matrix (see diagram 14).
When scanning, micro controller U1401 sequentially sets each row line in the LO state via U1402. When a switch is closed, it pulls down a column line, which will be read by the micro controller. The intersection of the selected row and the pulled down column uniquely identifies the switch that is closed. Since switches S1400, S1401 and S1402 are not momentary switches they are isolated from the column lines by diodes CR1400 to CR1411.

Front Panel Potentiometers

The position of the wipers of the seven Front-Panel potentiometers R1410 through R1415B are digitized by the 10-bit a/d converter U1401, which has a serial interface with the micro controller. Beside these potentiometers also the CH1 and CH 2 probe coding circuits (diagram 1) and the plus and minus peak detectors (diagram 4) are read. Hold-off potentiometer R1416 is not digitized, but is directly connected to the circuits involved.

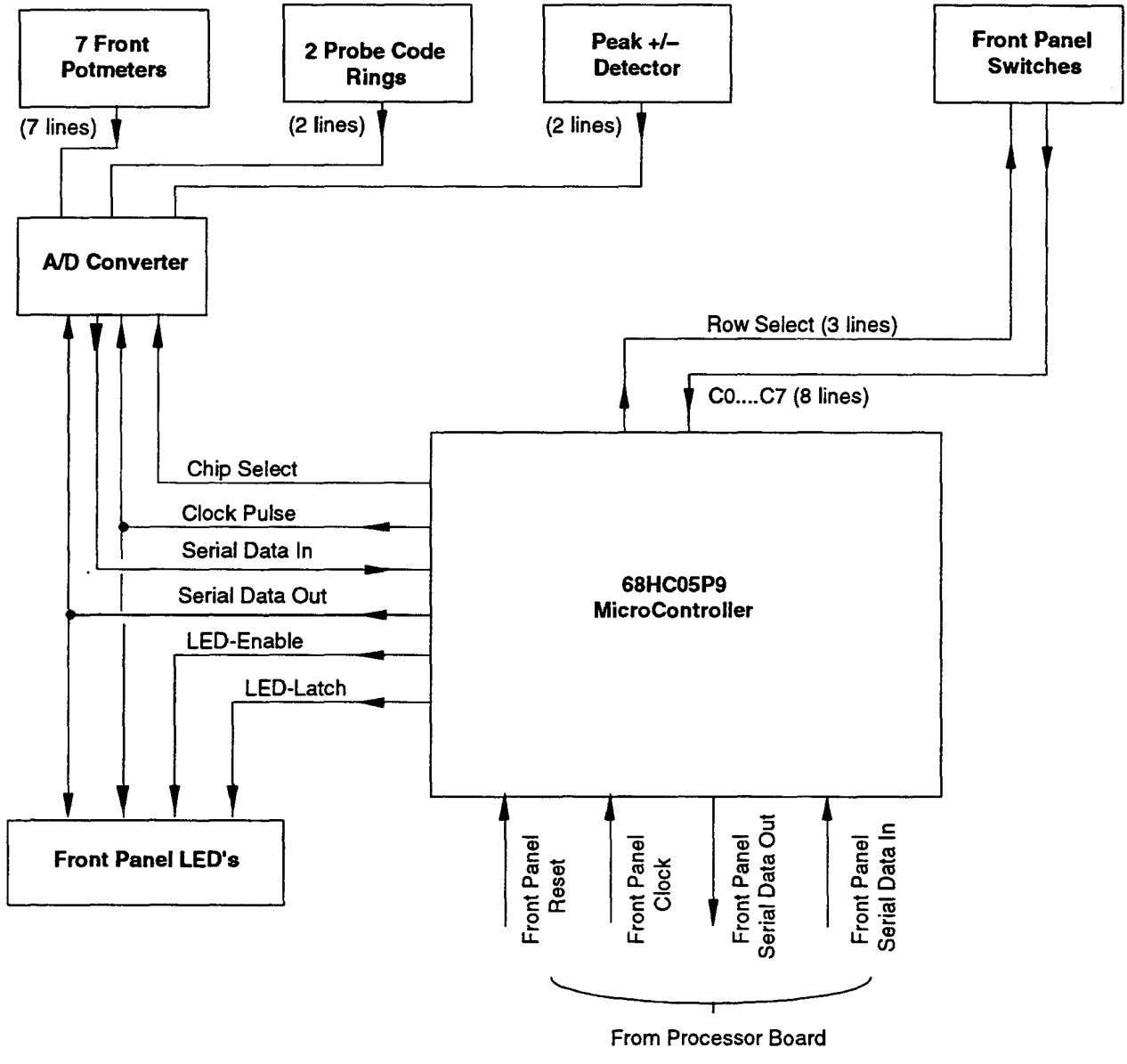


Figure 3-8: 2212 Front Panel Block Diagram

Front Panel LED's

LEDs are used to provide visual feedback to the operator about the oscilloscope status and operating mode by backlighting the front-panel nomenclature (see diagram 15). A 56-bit status word, defining the diodes to be illuminated, is generated by the processor and then serially clocked into the seven LED-status registers, U1500 through U1506.

Power Supply

This section describes the power supply circuit (diagram 13 and part of 12). Diagrams are located in section 9 *Diagrams*.
The Power Supply circuitry converts the ac-power-line voltage into all the voltages required by the instrument. It comprises:

- Mains Input Transformer
- Pre-regulator
- Series Pass
- Inverter
- DC Outputs and High Voltage

Mains Input

The power switch (J1101) connects the ac-power line to the primary winding of the toroidal wound input transformer (T1301) via fuse F1301, filter components L1301, L1302, C1301, C1302, C1303, and the voltage selector connectors J1107 and J1108. The secondary output is protected for overvoltage by varistor RV1301, filtered by capacitor C1307 and rectified and smoothed by CR1301, CR1302, CR1303, CR1304 and C1306. With an ac-input voltage of 220V the voltage across C1306 is approximately 70V .

Additional components on the mains input circuit produce a line sync signal for the Trigger circuit. Transistor Q1301 is a floating differential amplifier with a dc-bias network comprising R1302, R1305 and R1303. Resistors R1301 and R1304 apply a small line-frequency signal from the secondary of T1301 to the base-emitter junction of Q1301. The resultant collector current of Q1301 is a line-frequency, sine-wave signal that is fed via connector J1102-1 to the Main Board (A10).

Preregulator

The 70V power supply from the rectifier bridge is applied to the preregulator circuit formed by U1310, Q1310 and associated components.
Zener diodes VR1310, VR1311 and R1326 reduce the incoming voltage for pre-regulator U1310.
The pre-regulator oscillates at a nominal 39kHz, as determined by timing components R1320 and C1316. The square-wave output is level-shifted by Q1312, and fed to the Darlington-pair circuit formed by Q1311 and power transistor Q1310. When Q1310 is conducting, current ramps up through L1380.

When Q1310 is off, the current ramps down while flowing in through the freewheel diode CR1310. Preregulator U1310 varies the duty cycle of conduction of Q1310, so that the voltage on filter capacitor C1311 is a nominal 37V.

The network of R1310, R1316, R1317, R1319 and CR1311 monitors the voltage across Q1314, and if that voltage is lower than the nominal 1.4V, U1310 increases the voltage across C1311 until Q1314 has the correct voltage.
If Q1314 is open circuited, CR1311 clamps the lower supply voltage to 31V. If Q1314 is short circuited, the ratio of R1316 and R1317 across R1319 together with R1310 is so that the maximum voltage across C1311 is 41V. So the preregulator supplies a sensible output under all conditions of the circuitry that it drives except during an overload condition. In this situation, the voltage developed across the current-sense resistor R1322 reaches the offset voltage developed by R1321 and R1315 and U1310 current limits the output.

Series Pass

The function of the series pass transistor Q1314 is to reject ripple current having a frequency of twice the power-line frequency. The nominal dc voltage across it is only 1.4V. Base current is supplied to Q1314 via R1323, CR1313 and CR1312 in the absence of drive from Q1320 when the instrument is first turned on. Transistor Q1314 is driven by both halves of U1311 through Q1320. The output at pin 7 serves to reject hum on the 37V supply by comparing the output of potential divider R1330 and R1331 with the voltage across reference diode VR1330. The output at pin 1 of U1311 slightly varies the value of the reference as seen at pin 6 via attenuator resistors R1334 and R1335. This variation maintains the –8.6V supply at the value set by the –8.6V set potentiometer R1337.

Inverter

Inverter oscillator U1350 is driven via Q1313, R1341, Q1315, Q1316, R1346, C1363 and R1372 at the same frequency as U1310.
The outputs of U1350 are two non-overlapping complementary square-wave signals to Q1350 and Q1353. These transistors are in feedback loops, one of which is formed by the filter R1361, CR1350, reservoir capacitor C1356 and level shifter VR1351. The feedback is such that the base of Q1351 is adjusted to drive Q1352 sufficiently hard that the emitter swings to within 3V of ground, but not hard enough to saturate it. The output voltages of transformer T1350 secondary windings are full-wave rectified. The 100V supply is derived from an auto-transformer winding in series with the primary winding. Resistors R1368 and R1369 feed a sample of the 37V supply voltage into the error amplifier connected to pins 1 and 2 of U1350. If the 37V supply should go high, U1350 will shut down.

DC Outputs

The low-voltage power supply circuitry on the secondary windings of T1350 consists of rectifier and filter components only. All the regulation is done by the preregulator and inverter control circuitry in the primary side of this transformer. Both half-wave and full-wave rectifiers are used, and either simple capacitor or capacitive-input pi-filter circuits are used. Rectifier and filter type used for each of the secondary supplies depends on the load requirements.

Drive voltage to the fan motor is obtained from between the -5.1V and +5.1V supplies. A separate pick-off on the 37V supply provides for a stable 15V supply, via voltage regulator U1390.

Separate windings on the transformer supply the cathode voltage to the crt and the ac-drive voltage to the grid bias dc restorer. High voltage multiplier U1201 uses the 2kV winding of T1350 to generate 12kV for the crt anode. An internal half-wave rectifier diode in the multiplier produces –2kV for the crt cathode. The –2kV supply is filtered by a low-pass filter formed by C1230, R1228, C1231, R1229 and C1232. Neon lamp DS1200 protects against excessive voltage between the heater and crt cathode by conducting if the voltage difference exceeds approximately 75V.
Focus voltage is also developed from the –2kV supply by a voltage divider formed by R1240, R1246, Focus potentiometer R1247, R1245, R1244, R1243, R1242 and R1241.

Video Option (Option 05)

This subsection describes the optional TV. sync.separator analog part (Section 9: Diagram 26) and the digital part (Section 9: Diagram 27).

Block Diagram

For an overview of the complete sync. separator, see the block diagram in Figure 9-9 in Section 9: *Diagrams*.
In the center of the block diagram is the video control register located. This register receives control data from the 2212 main processor and passes it on to the various functional blocks on the video board (A25).

From Composite Video to TTL Composite Sync (Diagram 26)

The input signal from the 2212 trigger circuit is called TRIG_SIG.
The input stage (U2601, Q2601, Q2602, Q2603, Q2604) is an amplifier with controlled gain. The gain control signal is generated by the SYNC TIP CLAMP (Q2610, U2609).

The input stage also has a polarity switch function. The polarity of the output signal of this stage is controlled by the setting in the MENU. It must be a negative sync at this point. This feature adapts the circuitry for positive- or negative-sync TV. systems.

The second stage is a fixed gain amplifier (U2608).
The gain is very high (almost a comparator) that outputs the horizontal sync pulses of the input video signal, together with some rudimentary video signal. The offset control signal is generated by the TRIGGER BACKPORCH CLAMP (Q2611, U2610).

From the fixed gain amplifier the signal runs to the sync pickoff comparator (Q2612, Q2613). The output signal of the sync pickoff comparator is a clean, TTL compatible composite sync signal with positive going sync pulses (COMPSYNC_0). These pulses are used in the digital part of the video option.

The COMPSYNC and the COMPSYNC_0 signals are used to create sampling pulses for the TRIGGER BACKPORCH CLAMP and the SYNC TIP CLAMP.
The COMPSYNC signal samples the output of the fixed gain amplifier during the sync pulse and controls the gain of the input stage to obtain a signal with constant amplitude.

The COMPSYNC_0 signal samples the output of the fixed gain amplifier after the sync pulse during black level and controls the offset of the fixed gain amplifier.

CH2 AC Clamp (Diagram 26)

After the sync pulse, during black level, U2605 samples the offset of the input signal. U2605D/Q2605 form a sample and hold amplifier circuit. The output of this sample and hold amplifier is an amplified, calibrated signal and further passed on to the CH2 position control circuit. An composite video input signal that is polluted by tilt or hum from a power line (50 or 60 Hz) will be displayed stable on the screen.

From Composite Sync to Trigger Signal (Diagram 27)

(See Timing Diagram Figure 3-9).
The composite sync signal is used to synchronize a PLL (U2705) via C2711 and a pulse stretcher (Q2702, Q2703 and U2715). The PLL runs at twice the frequency of the horizontal sync pulses in the composite sync signal (2XH_0).
U2704B divides 2XH_0 to HORIZCLK_0 for the PLL and HCLK.
U2704A creates DLY'DCLK which has a delay of 90 degrees from HCLK.

If TV_EN_0 is valid, ALL_LINES is valid, and UNLOCKED is not valid (so U2704A is running), then the combinatorial logic inside U2708 creates a trigger pulse on every line sync pulse. The pulses are created from the output of the pulse stretcher (CMPSS).

Some video systems have no line sync pulses during vertical sync. In those systems, the HCLK is used to create the trigger pulse, during vertical sync, after a small delay. The delay is necessary to prevent trigger jitter. The HCLK is not as stable as the CMPSS signal.

U2701A retrieves the VERT sync signal from the composite sync signal. U2701 detects if the TV system under test is interlaced or not. If the system is interlaced, U2703A generates a FIELD pulse during field 1. If the system is not interlaced, U2702B generates a FIELD pulse at the beginning of each field.

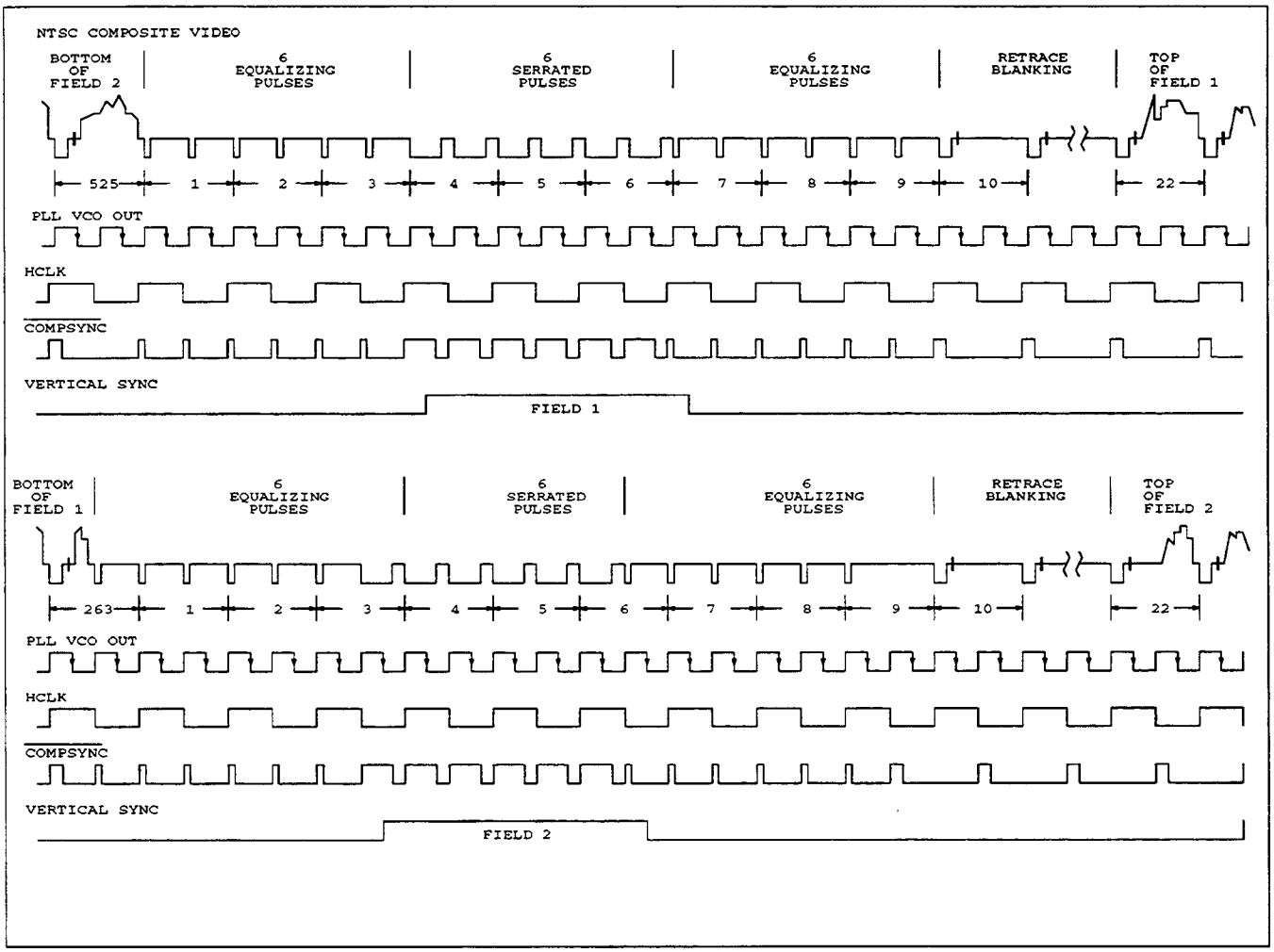


Figure 3-9: Timing Diagram from Composite Sync to Trigger Signal

U2703B preloads the line selector counter (U2709, U2710, U2711) with the value as written in the control register (U2706, U2707) by the main controller. The preload value reflects the line number that is selected to trigger on. The line selector counts up, clocked by HORIZCLK_0 and produces a RCO.

If TV_EN_0 is valid, ALL_LINES is not valid, UNLOCKED is not valid, and RCO is valid, then the combinatorial logic inside U2708 creates a trigger pulse from CMPSS (or HCLK after a small delay).

Counting the Number of Lines in a Video System (Diagram 27)

Besides the combinatorial logic, U2708 also contains a state machine. With STRTCNT, the main controller initiates the state machine. The statemachine resets the line counter (U2712), sets U2713 and U2714 in parallel load mode and waits for the next field pulse. The HCLK pulses are passed on to U2712 (HCNT) until the next field pulse. Then the counting process stops, and the VALID signal asserts.

The last bit in the shift register U2714 is transparent, so the processor can poll VALID at U2714 pin 9 (CHAIN_RET). The controller sets STRTCNT to 0 to tell the state machine that the result will be retrieved. U2713 and U2714 are set in serial shift mode and the processor clocks the result to the processor board.

Long Record Option (Option 1M)

The features of the 2212 Option 1M are:

- Extended and programmable recordlength: 4K, 8K, 16K, 32K, 64K or 128K.
- More flexible programmable trigger positioning: 0-100%.
- Extended software features : Fit To Screen magnifier, Time Positioning.

In a 2212 Option 1M, the Processor board A15 is replaced by a Processor board A20. The front panel overlay has also been modified. Some of the 2212 functions have been changed and/or new features are added.
A 2212 Option 1M instrument can be recognized by the "CURSOR/TIME" text above the upper right side area and the "FIT TO SCREEN" magnifier setting in the horizontal section (see also the 2212 Option 1M User Manual).
The specific Option 1M circuit diagrams are numbered 16A, 16B, 17, 18, 19, 20 and 21 in combination with the text "Option 1M". These diagrams are printed in this manual in the *Diagram* section, following the diagrams of the standard 2212.

Microprocessor Circuit

Changes that have been made compared to the standard version of the 2212, are:

- The 68070 microprocessor is running at 34.575 MHz, instead of the 29.4912 MHz used in the standard version. A separate clock IC (U1841) now generates a 4.9152 MHz clock signal needed for the internal UART and the display system.
- Two Pseudo Static RAM's of 512K x 8 each are added to the system memory (U1808 and 1809) to provide sufficient memory for 128K waveforms.
  The refresh requirements of these RAM's are guaranteed by continuously transferring waveform DMA data to the display system. This is also done when the oscilloscope is in the non-store mode (see the Display System explanation).
- The input latch U1830 on A15, is replaced by two input multiplexers U1830 and U1831, which provide additional inputs for monitoring the status of the digital acquisition system.

NOTE

The firmware of the standard 2212 board (A15) and the option 1M board (A20) are not compatible in any way, and have therefore different Tektronix partnumbers.

Display System

Changes in the display system are limited to the area of the 22V10 U1925 and 16V8 U1909. The internal programming of both chips is modified, and some outputs of U1925 have pullup resistors.
U1925 has been programmed to accept a new readout control word that could be added to Table 3-2: Hex value D0 (page 3-24). When this readout control word is sent to the display system, combined with waveform data, this waveform will be accepted at the normal speed (one point per µsec) but will not be shown on the display. In this way the refresh of the pseudo static RAM can be performed at all times.

Acquisition System

The functionality of the acquisition system has been changed in the following area's:

- Acquisition RAM's U1605 and U1606 have been replaced by 128K x 8 types to enable 128K recordlength.
- The address counter (U1615, U1616, U1617 and U1640) is made fully presettable by the local shiftregister U1630, U1631 and U1632 to achieve programmable pre-triggering.
- The control lines RL0 - RL2 connected to the 16V8 PAL's U1640 and U1641 determine the record-length. Table 3-4 indicates the relation between record- length and the control lines.

Table 3-4
Acquisition Chain Record-Length Programming Table

Record Length	RL2	RL1	RL0
4k	0	0	1
8k	0	1	0
16k	0	1	1
32k	0	0	0
64k	1	0	0
128k	1	1	1

The counting of the pre- and post-trigger period differs from the standard 2212. The post-trigger counter (U1618, U1619, U1620 and U1641) is always started at maximum count value. During the pre-trigger period the post-trigger counter counts at the same rate as the address counter. As soon as the pre-trigger period has expired (signaled by "PREFUL"), the post-trigger counter stops. As a result, the post-trigger counter is automatically at the post-trigger value. When a trigger occurs, the post-trigger counter will determine the post-trigger period. Output "TC" and indirectly "EOR" indicate that the acquisition is completed .

The DMA (Direct Memory Access) process of transferring acquisition data to the microprocessor has basically remained the same. Because the internal DMA controller of the 68070 has a maximum transfer count of 64K –1, the transfer of large datablocks for record-lengths of 64K and up, is performed in blocks of 32K. Therefore, the transfer is done in burst mode. The REQ2_0 input of the 68070 is made level sensitive instead of edge sensitive. Changing from edge sensitivity to level sensitivity required some minor changes in the DMA handshake circuitry (see Diagram 16A).

Brief Procedures

This subsection contains a collection of procedures for checking that the 2212 Analog & Digital Storage Oscilloscope performs as warranted.

The performance checks described are:

- Vertical Checks
- Horizontal Checks
- Triggering Checks
- Probe Adjust check
- X-Y Display Checks

These performance check procedures are used to verify the instrument's performance requirements statements listed in Section 1, subsection *Warranted Characteristics*. The performance checks may also be used as an acceptance test or as a preliminary troubleshooting aid to help determine the need for repair or readjustment.

Conventions

Throughout the test procedures the following conventions apply:

- Each test procedure uses the following general format:

  Title of Test

  Equipment Required

  Initial Control Settings

  Procedure Steps

- Where instructed to use a front-panel button or knob or verify a readout or status message, the name of the button or knob appears in boldface type: "Rotate the Vertical **POSITION** knob to ...", etc.

Initial Setup Procedure

This procedure sets the front-panel controls for the tests that follow.

Procedure

Step 1. Plug the female connector of the power cord in the power cord receptacle of the 2212 and the male connector to the AC power source.

Step 2. Connect the test equipment, as indicated in the Equipment Required list, to the 2212 oscilloscope.

Step 3. Press the **POWER** button to on.

Step 4. Set the front-panel controls as indicated in the Initial Control Settings list.

Test Equipment Required

The test equipment listed in Table 4-1 is a complete list of the equipment required to accomplish the Performance Checks in this section. Test equipment specifications described are the minimum necessary to provide accurate results.

Detailed operating instructions of the test equipment is not given in this procedure. If more operating information is required, refer to the appropriate test equipment instruction manual.

When you use equipment other than that recommended, you may have to change the control settings of the test setup. If the exact example equipment in Table 4-1 is not available,use the minimum specification column to determine if any other available test equipment might suffice to perform the check or adjustment.

Table 4-1: Test Equipment Required

Item and Description	Minimum Specification	Use	Example of Test Equipment
1. Calibration Generator	Standard-amplitude signal levels: 5 mV to 50 V. Accuracy: ±0.3 %. – High-amplitude signal levels: 1 V to 60 V. Repetition rate: 1 kHz. – Fast rise signal level: 1 V. Repetition rate: 1 MHz. Risetime: 1 ns or less. Flatness: ±0.5%.	Signal source for gain and transient response checks and adjustments	Tektronix PG 506A Calibration Generator [a]
2. Leveled Sine-Wave amplitude Generator	Frequency: 250 kHz to above 60 MHz. Output:: variable from 10 mV to 5V p-p. Output impedance: 50 Ω. Reference frequency: 50 kHz. Amplitude accuracy: constant within 3% of reference frequency as output frequency changes.	Vertical, horizontal, and triggering checks and adjustments. Display adjustments and Z-Axis check	Tektronix SG503 Leveled Sine-Wave Generator [a]
3. Time-Mark Generator	Marker outputs: 10 ns to 0.5 s. Marker accuracy: ±0.1 %. Trigger output: 1 ms to 0.1 µs, time-coincident with markers.	Horizontal checks and adjustments. Display adjustment	Tektronix TG501 Time-Mark Generator [a]
4. Low-Frequency Sine-Wave Generator	Range 10 Hz to 500 kHz.Output amplitude: 300 mV. Output impedance: 600 Ω. Reference frequency: constant within 0.3 dB of reference frequency as output frequency changes.	Low-Frequency trigger checks	Tektronix SG502 Oscillato [a]
5. Pulse Generator	Repetition rate: 1 kHz. Output amplitude: 5 V.	Signal source for Storage and external clock checks	Tektronix PG501 Pulse Generator [a]

Table 4-1 (cont.)
Test Equipment Required

Item and Description	Minimum Specification	Use	Example of Test Equipment
6. TV Signal Generator	Provide Composite TV Video and Line Sync Signals	Check TV Trigger circuit Test Signal Generator	Tektronix TSG-100
7. Coaxial Cable (2x)	Impedance: 50 Ω. Length: 42 in. Connectors: BNC.	Signal interconnection	Tektronix Part Number 012-0057-01
8. Dual Input Coupler	Connectors: BNC. Female-to-dual-BNC male	Signal interconnection	Tektronix Part Number 067-0525-02
9. Precision Coaxial Cable	Impedance: 50 Ω. Length: 42 in. Connectors: BNC	Vertical Bandwidth	Tektronix Part Number 012-0482-00
10. T-Connector	Connector: BNC	Signal interconnection	Tektronix Part Number 103-0030-00
11. Termination	Impedance: 50 Ω. Connectors: BNC	Signal Termination	Tektronix Part Number 011-0049-01
12.Termination	Impedance: 600 Ω. Connectors: BNC.	Signal Termination	Tektronix Part Number 011-0092-00
13. 10X Attenuator	Ratio: 10X. Impedance: 50 Ω. Connectors: BNC	Vertical compensation and triggering checks	Tektronix Part Number 011-0059-02
14. Adapter male-to-tip plug	Connectors: BNC	Signal interconnection	Tektronix Part Number 175-1178-00
15. Interface Cable		Signal interconnection	Tektronix Part Number 012-1214-00
16. Centronics Compatible Printer/Plotter		Parallel Interface Check	

* Requires a TM 500-Series Power Module.

Preparation

The Performance Verification Procedure is divided in subsections to let you check individual sections of the instrument, when it is not necessary to do a complete performance check.

It is not necessary to remove the instrument cover to accomplish any subsection in the Performance Verification Procedure, since all checks are made using operator-accessable front-and-rear-panel controls and connectors.

The most accurate display adjustments are made with a stable, well-focused, low-intensity display. Unless otherwise noted, adjust the INTENSITY, FOCUS and Trigger LEVEL controls as needed to view the display.

An Equipment-Required block at the beginning of each subsection lists only the test equipment necessary to do the checks in that subsection.

Also at the beginning of each subsection is a list of all the front-panel control settings required to prepare the instrument for performing the first step of the subsection. Do each of the steps within a particular subsection completely, to ensure the correct control settings for steps that follow.

Limits and Tolerances

Limits and tolerances given in this procedure are valid for an instrument that is operating in an ambient temperature between +20 °C and +30 °C. The instrument also must have had at least a 20-minute warm-up period.

All tolerances specified are for the instrument only and do not include test-equipment error.

Index to Performance Tests

Vertical Checks

Horizontal Checks

Triggering Checks

Probe Adjust Check

X-Y Display Checks

Performance Tests

This subsection contains a collection of tests for checking that the 2212 Analog & Digital Storage Oscilloscope performs as warranted.

The performance tests described are:

- Vertical Checks
- Horizontal Checks
- Triggering Checks
- Probe Adjust check
- X-Y Display Checks

These performance tests are used to verify the instrument's performance requirements statements listed in Section 1, subsection *Warranted Characteristics*. The performance checks may also be used as an acceptance test or as a preliminary troubleshooting aid to help determine the need for repair or readjustment.

Vertical Checks

These procedures check those characteristics for the vertical display system that are listed under *Warranted Characteristics* in *Section 1: Specifications.* You should set up the test equipment as shown at the start of the procedure list. Changes to the test set-up will be indicated in the procedures, if necessary.

Equipment Required (see Table B1):

Calibration Generator (Item 1)
Leveled Sine-Wave Generator (Item 2)
50 Ω BNC Coaxial Cable (Item 7)
Dual Input Coupler (Item 8)
50 Ω BNC Termination (Item 11)
10X BNC Attenuator (Item 13)
BNC Male-to-Tip Plug (Item 14)

Initial Control Settings

Vertical (CH 1 and CH 2)

POSITION	Midrange (CH1 and CH2)
MODE	CH 1
VOLTS/DIV	2 mV (CH1 and CH2)
VARiable	Off (CH1 and CH2)
AC-GND-DC	DC (CH1 and CH2)

Horizontal

POSITION	Midrange
MODE ALT MAGN	Off
SEC/DIV	0.5 ms
VARiable	Off
X1, X10, X50 Magnifier	X1

Trigger

HOLDOFF	MIN
LEVEL	Midrange
SLOPE	Positive Going
MODE	P-P AUTO
SOURCE	VERTical MODE
COUPLING	DC

Procedure Steps

Step 1. Check Deflection Accuracy

a. Connect a 10 mV standard-amplitude signal from the calibration generator via a 50 Ω BNC coaxial cable to the **CH 1 OR X** input connector.

b. CHECK – Deflection accuracy is within the limits given in Table 4-2 for each CH 1 VOLTS/DIV switch setting and corresponding standard-amplitude signal.

Table 4-2: Deflection Accuracy Limits

VOLTS/DIV switch setting	STANDARD amplitude signal	ACCURACY limits (divisions)
2 mV	10 m V	4.85 to 5.15
5 mV	2 0 mV	3.88 to 4.12
10 mV	50 mV	4.85 to 5.15
20 mV	0.1 V	4.85 to 5.15
50 mV	0.2 V	3.88 to 4.12
0.1 V	0.5 V	4.85 to 5.15
0.2 V	1 V	4.85 to 5.15
0.5 V	2 V	3.88 to 4.12
1V	5 V	4.85 to 5.15
2 V	10 V	4.85 to 5.15
5 V	20 V	3.88 to 4.12

Step 2. Check Trace Shift

a. Set CH 1 **VOLTS/DIV** switch to 2 mV/division.

b. Rotate the **VOLTS/DIV** switch through the range.

c. CHECK – The trace shift should be ≤ 0.25 division.

d. Set the **VAR** to the minumum sensitivity, and rotate the **VOLTS/DIV** switch through the range.

e. CHECK – The trace shift should be ≤ 1.0 division.

f. Move the cable from the **CH 1 OR X** input connector to the **CH 2 OR Y** input connector. Toggle the **MODE** switch to CH 2.

g. Repeat part b through f using the CH 2 controls.

h. Push the CH 2 **INV**ert switch to the INV position.

j. CHECK – The trace shift should be ≤ 1.5 division.

Step 3. Check Non-Store (Analog) Bandwidth

a. SET:
VOLTS/DIV (CH 1 and CH 2) ... 5 mV
Vertical MODE ..... CH 1
SEC/DIV ..... 10 µs

b. Connect the leveled sine-wave generator output via a 50 Ω BNC coaxial cable and a 50 Ω BNC termination to the **CH 1 OR X** input connector.

c. Set the generator to produce a 50 kHz, six-division display.

d. Increase the signal frequency until a 4.2 division display is obtained.

e. Check that the frequency is greater than 60 MHz.

f. Repeat parts b through e for all **VOLTS/DIV** settings from 10 mV through 1 V.

NOTE

For the 1 V /DIV settings, use a five division signal frequency reference; use 3.5 divisions peak to peak as the –3 dB reference point of the bandwidth.

g. Toggle the vertical **MODE** switch to CH 2. Connect the leveled sine-wave generator output via a 50 Ω BNC coaxial cable and a 50 Ω BNC termination to the **CH 2 OR Y** input connector.

h. Repeat part b through e for CH 2 using the CH 2 controls.

i. SET:
VOLTS/DIV CH 1 ..... 2 mV
Vertical MODE ..... CH 1
SEC/DIV ..... 10 µs

j. Set the leveled sinewave generator to produce a 50 kHz, six division display.

k. Increase the signal frequency until a 4.2 division display is obtained.

l. Check that the frequency is ≥10 MHz and ≤15 MHz.

m. Repeat part i through l for CH 2 using the CH 2 controls.

n. Disconnect test equipment from the instrument.

Step 4. Check (Digital) Store Bandwidth

a. SET:

STORAGE ON	ON
VOLTS/DIV (CH 1 and CH 2)	2 mV
Vertical MODE	CH 1
SEC/DIV	20 µs

b. Connect the leveled sine-wave generator output via a 50 Ω BNC coaxial cable and a 50 Ω BNC termination to the **CH 1 OR X** input connector.

c. Set the generator to produce a 50 kHz, six-division display.

d. Increase the signal frequency until a 4.2 division display is obtained.

e. Check that the frequency is ≥ 10 MHz.

f. Repeat parts b through e for all **VOLTS/DIV** settings from 10 mV through 1 V.

NOTE

For the 1 V /DIV settings, use a five division signal frequency reference; use 3.5 divisions peak to peak as the –3 dB reference point of the bandwidth.

g. Toggle the vertical **MODE** switch to CH 2. Connect the leveled sine-wave generator output via a 50 Ω BNC coaxial cable and a 50 Ω BNC termination to the **CH 2 OR Y** input connector.

h. Repeat part b through e for CH 2 using the CH 2 controls.

Horizontal Checks

These procedures check those characteristics for the horizontal display system that are listed under *Warranted Characteristics* in *Section 1: Specifications*. You should set up the test equipment as shown at the start of the procedure list. Changes to the test set-up will be indicated in the procedures, if necessary.

Equipment Required (See Table 4-1)

Calibration Generator (Item 1)
Leveled Sine-Wave Generator (Item 2)
Time-Mark Generator (Item 3)
50 Ω Coaxial Cable (Item 7)
50 Ω BNC Termination (Item 11)

Initial Control Settings

Vertical (CH 1 and CH 2)

POSITION	Midrange
MODE	CH 1
VOLTS/DIV	0.5 V
VARiable	Off
AC-GND-DC	DC

Horizontal

POSITION	Midrange
MODE ALT MAGN	Off
SEC/DIV	0.05 µs
VARiable	Off
X1, X10, X50 Magnifier	X1

Trigger

HOLDOFF	MIN
LEVEL	Midrange
SLOPE	Positive Going
MODE	P-P AUTO
SOURCE	VERTical MODE
COUPLING	AC

Procedure Steps

Step 1. Check Non Store Timing Accuracy

a. Connect 50 ns time markers from the time-mark generator via a 50 Ω BNC coaxial cable and a 50 Ω termination to the **CH 1 OR X** input connector.

b. Adjust the Trigger LEVEL control for a stable, triggered display.

c. Use the Horizontal **POSITION** control to align the second time marker with the second vertical graticule line.

d. CHECK – Timing accuracy is within 3 % (0.24 division at the tenth vertical graticule line), and the linearity is within 5% (0.10 division over any two of the center eight divisions).

NOTE

For checking the timing accuracy of the SEC/DIV switch setting from 50 ms to 0.5 s, watch the time marker tips only at the second and tenth vertical graticule lines while adjusting the Horizontal POSITION control to line up the time markers.

e. Repeat parts b through d for the remaining **SEC/DIV** and time mark generator setting combinations as shown in Table 4-3.

NOTE

In X50 magnification in all "2" decade switch settings, the associated time marker settings give only five markers per ten divisions instead of ten with the "1" and "5" decade switch settings. When checking the "2" ranges, position the time markers on the second and ninth vertical graticule lines.

f. SET:
SEC/DIV ..... 0.1 µs
Horizontal Magnify X10

g. Select 10 ns time markers from the time-marker generator.

h. Use the Horizontal **POSITION** control to align the first time marker that is 50 ns beyond the start of the sweep with the second vertical graticule line.

i. CHECK – Timing accuracy is within 4 % (0.32 division at the tenth vertical graticule line), and the linearity is within 7% (0.14 division over any two of the center eight divisions). Exclude any portion of the sweep past the 50th magnified division.

j. Repeat parts h and i for the remaining **SEC/DIV** and time mark generator setting combinations as shown in Table 4-3.

k. SET:
SEC/DIV ..... 0.5 µs
Horizontal Magnify X50

l. Select 10 ns time markers from the time-marker generator.

m. Use the Horizontal **POSITION** control to align the first time marker that is 100 ns beyond the start of the sweep with the second vertical graticule line.

n. CHECK – Timing accuracy is within 5 % (0.40 division at the tenth vertical graticule line), and the linearity is within 9% (0.18 division over any two of the center eight divisions). Exclude any portion of the sweep past the 100th magnified division.

o. Repeat parts m and n for the remaining **SEC/DIV** and time mark generator setting combinations as shown in Table 4-3.

Step 2. Check Sweep Length

a. SET:
SEC/DIV ..... 0.1 ms
Horizontal Magnify X1

b. Select 0.1 ms time markers from the time-mark generator.

c. Position the start of the sweep at the first vertical graticule line using the Horizontal POSITION control.

d. CHECK – That the sweep length is ≥ 10 divisions.

Table 4-3: Settings for Timing Accuracy Checks

SEC/DIV Switch Setting	Time-Mark Generator Setting		
	X1 (Normal)	X10 Magnify	X50 Magnify
0.05µs	50 ns	5 ns	≈1 ns
0.1 µs	0.1 µs	10 ns	≈2 ns
0.2 µs	0.2 µs	20 ns	≈4 ns
0.5 µs	0.5 µs	50 ns	10 ns
1 µs	1 µs	0.1 µs	20 ns
2 µs	2 µs	0.2 µs	0.04 µs
5 µs	5 µs	0.5 µs	0.1 µs
10 µs	10 µs	1 µs	0.2 µs
20 µs	20 µs	2 µs	0.4 µs
50 µs	50 µs	5 µs	1 µs
0.1 ms	0.1 ms	10 µs	2 µs
0.2 ms	0.2 ms	20 µs	4 µs
0.5 ms	0.5 ms	50 µs	10 µs
1 ms	1 ms	0.1 ms	20 µs
2 ms	2 ms	0.2 ms	0.04 ms
5 ms	5 ms	0.5 ms	0.1 ms
10 ms	10 ms	1 ms	0.2 ms
20 ms	20 ms	2 ms	0.4 ms
50 ms	50 ms	5 ms	1 ms
0.1 s	0.1 s	10 ms	2 ms
0.2 s	0.2 s	20 ms	4 ms
0.5 s	0.5 s	50 ms	10 ms

Triggering Checks

The Triggering Checks procedures check those characteristics that relate to the trigger system and that are listed under *Warranted Characteristics* in *Section 1: Specifications.* You should set up the test equipment as shown at the start of the procedure list. Changes to the test setup will be indicated in the procedures, if necessary.

Equipment Required (See Table 4-1)

Calibration Generator (Item 1)
Leveled Sine-Wave Generator (Item 2)
Low-Frequency Sine-Wave Generator (Item 4)
TV Signal Generator (Item 6)
Dual-Input Coupler (Item 8)
50 Ω Coaxial Cable (Item 7)
50 Ω BNC Termination (Item 11)
600 Ω BNC Termination (Item 12)

Initial Control Settings

Vertical

POSITION	Midrange
MODE	CH 1
CH 1 VOLTS/DIV	0.1 V
CH 2 VOLTS/DIV	1 V
VARiable	Off
AC-GND-DC (CH 1 and CH 2)	DC

Horizontal

POSITION	Midrange
MODE ALT MAGN	Off
SEC/DIV	0.2 µs
VARiable	Off
X1, X10, X50 Magnifier	X1

Trigger

HOLDOFF	MIN
LEVEL	Midrange
SLOPE	Positive Going
MODE	P-P AUTO
SOURCE	VERTical MODE
COUPLING	DC

Procedure Steps

Step 1. Check 500 Hz Trigger Sensitivity

a. Connect the low-frequency sine-wave generator output via a 50 Ω BNC coaxial cable and a 50 Ω termination to the **CH 1 OR X** input connector.

b. Set the low-frequency sine-wave generator to produce a 3.5-division display at an output frequency of 500 Hz.

c. Set the CH 1 **VOLTS/DIV** switch to 1 V/DIV.

d. CHECK – That a stable display can be obtained by adjusting the Trigger **LEVEL** control for each switch combination given in Table 4-4 with **DC**, **HF REJ**, and **AC** Trigger COUPLING; and that the display will not trigger with **NOISE REJ** or **LF REJ** Trigger COUPLING. Ensure that the TRIG'D light comes on when triggered.

e. Disconnect the test equipment from the instrument and set the CH 1 **VOLTS/DIV** switch to .1 V.

Table 4-4: Switch Combinations for Triggering Checks

Trigger MODE	Trigger SLOPE
P-P AUTO	Positive Slope
P-P AUTO	Negative Slope
NORM	Positive Slope
NORM	Negative Slope

Step 2. Check 500 kHz Trigger Sensitivity

a. Connect the leveled sine-wave generator output via a 50 Ω BNC coaxial cable and a 50 Ω termination to the **CH 1 OR X** input connector. Set the **SEC/DIV** to 2 µs.

b. Set the leveled sine-wave generator to produce a 3.5-division display at an output frequency of 500 kHz.

c. Set the CH 1 **VOLTS/DIV** switch to 1 V.

d. CHECK – That a stable display can be obtained by adjusting the Trigger **LEVEL** control for each switch combination given in Table 4-4 with **DC**, **LF REJ** and **AC** Trigger COUPLING; and that the display will not trigger with **NOISE REJ** or **HF REJ** Trigger COUPLING. Ensure that the TRIG'D light comes on when triggered.

Step 3. Check 5 MHz Trigger Sensitivity

a. Connect the leveled sine-wave generator output via a 50 Ω BNC coaxial cable and a 50 Ω termination to the **CH 1 OR X** input connector. Set the **SEC/DIV** to 0.2 µs.

b. Set the leveled sine-wave generator to produce a 3.5-division display at an output frequency of 5 MHz at **0.1 V/DIV**.

c. Set the CH 1 **VOLTS/DIV** switch to 1 V.

d. CHECK – That a stable display can be obtained by adjusting the Trigger **LEVEL** control for each switch combination given in Table 4-4 with **DC**, **LF REJ** and **AC** Trigger COUPLING; and that the display will not trigger with **NOISE REJ** or **HF REJ** Trigger COUPLING. Ensure that the TRIG'D light comes on when triggered.

Step 4. Check 50 MHz Trigger Sensitivity

a. Set the leveled sine-wave generator to produce a one-division display at an output frequency of 50 MHz.

b. CHECK – That a stable display can be obtained by adjusting the Trigger **LEVEL** control for each switch combination given in Table 4-4 with **DC**, **LF REJ**, and **AC** Trigger COUPLING; and that the display will not trigger with **NOISE REJ** or **HF REJ** Trigger COUPLING. Ensure that the TRIG'D light comes on when triggered.

c. Disconnect the test equipment from the instrument.

Step 5. Check External Trigger Range

a. SET:
VOLTS/DIV (CH 1)..... 0.5 V
SEC/DIV ..... 20 µs
Trigger COUPLING..... AC
Trigger SLOPE ..... Positive Going

b. Connect the leveled sine-wave generator output via a 50 Ω BNC coaxial cable, a 50 Ω termination and a dual-input coupler, to the **CH 1 OR X** and the **EXT INPUT OR Z** input connectors.

c. Set the leveled sine-wave generator to produce a five-division display at an output frequency of 50 kHz.

d. Position the waveform equally around the center horizontal graticule line.

e. SET:
Trigger MODE..... NORM
Trigger SOURCE..... EXT

f. CHECK – That the display is not triggered at either extreme of rotation of the Trigger **LEVEL** control.

g. Toggle the Trigger **COUPLING** switch to **DC.**

h. Repeat part f.

i. Toggle the Trigger **SOURCE** switch to **EXT : 10.**

j. CHECK – That the display can be triggered at about the midrange of the Trigger **LEVEL** control.

k. Push the Trigger **SLOPE** switch to the negative going slope and repeat part j.

l. Disconnect the test equipment from the instrument.

Step 6. TV Field Trigger Sensitivity

a. SET:
Vertical MODE..... CH 2
VOLTS/DIV (CH 2)..... 1 V
SEC/DIV ..... 0.2 ms
Trigger SLOPE ..... Negative Going
Trigger MODE..... TV FIELD

b. Connect the TV signal generator video output to the **CH 2 OR Y** input connector via a 50 Ω BNC coaxial cable.

c. Press the lower part of the **VAR**iable VOLTS/DIV control for a one-division composite sync signal display.

d. CHECK – That a stable display is obtained.

e. SET:
CH 2 INVert ..... INV
Trigger SLOPE ..... Positive Going

f. CHECK – That a stable display is obtained.

Step 7. Check Trigger Readout

a. SET:
Vertical MODE..... CH 1
VOLTS/DIV (CH 1)..... 0.1 V
AC-GND-DC (CH 1) ..... DC
SEC/DIV ..... 20 µs
Trigger MODE..... P-P AUTO
Trigger SOURCE..... CH 1
Trigger COUPLING..... DC
Readout (RO) ..... On

b. Connect the leveled sine-wave generator output via a 50 Ω BNC coaxial cable and a 50 Ω termination to the **CH 1 OR X** input connector.

c. Set the leveled sine-wave generator to produce a eight-division display at an output frequency of 50 kHz.

d. Position the waveform displayed equally around the center horizontal graticule line. Toggle the Trigger **MODE** switch to NORM.

e. Adjust the Vertical **POSITION** control so that the sweep starts equally around the center horizontal graticule line when switching between the positive and the negative going slope.

f. Press the Trigger **SLOPE** switch to the positive going slope.

g. Adjust the Trigger **LEVEL** control so that the start of the sweep is aligned with the center horizontal graticule line.

h. CHECK – That the trigger readout is 0.00 V ±0.03 V.

i. Adjust the Trigger **LEVEL** control so that the sweep starts one division above the center horizontal graticule line.

j. CHECK – That the trigger readout is 0.10 V ±0.03 V.

k. Adjust the Trigger **LEVEL** control so that the sweep starts two divisions above the center horizontal graticule line and check that the trigger readout is 0.20 V ±0.03 V. For three divisions it is 0.30 V ± 0.03 V.

l. Adjust the Trigger **LEVEL** control so that the sweep starts one division below the center horizontal graticule line and check that the trigger readout is – 0.10 V ±0.03 V. For two divisions it is – 0.20 V± 0.03 V and for three divisions – 0.30 V ± 0.03 V.

m. Disconnect the test equipment from the instrument.

Step 8. LINE Trigger Function Check

a. SET:
CH 2 VOLTS/DIV0.1 V (without 10X probe attached)
CH 2 AC-GND-DC ..... DC
SEC/DIV ..... 5 ms
Trigger MODE ..... P-P AUTO
Trigger SOURCE ..... LINE
Trigger COUPLING ..... DC
X1, X10, X50 Magnify X1
ALT MAGN switch ..... Off

b. Connect a 10X probe to the **CH 2 OR Y** input connector.

c. Attach a length of wire of two inches long to the probe tip. Hold the wire near the middle portion of the instrument power cord.

d. CHECK – That the display can be triggered on positive-going and negative-going slopes.

e. Disconnect the test set up from the instrument.

Probe Adjust Check

The Probe Adjust procedure checks those characteristics that are listed under *Warranted Characteristics* in *Section 1: Specifications.* You should set up the test equipment as shown at the start of the procedure list. Changes to the test set-up will be indicated in the procedures, if necessary.

Equipment Required (See Table 4-1)

10X Probe (Provided with the instrument)

Initial Control Settings

Vertical

POSITION	Midrange
MODE	CH 1
CH 1 VOLTS/DIV	1 V
VARiable	Off
AC-GND-DC (CH 1 and CH 2)	DC

Horizontal

POSITION	Midrange
MODE ALT MAGN	Off
SEC/DIV	20 µs
VARiable	Off
X1, X10, X50 Magnifier	X1

Trigger

HOLDOFF	MIN
LEVEL	Midrange
SLOPE	Positive Going
MODE	P-P AUTO
COUPLING	DC

Procedure Steps

Step 1.Check Probe Adjust Operation

a. SET:
VOLTS/DIV (CH 1)..... 10 mV
SEC/DIV ..... 0.5 ms
Trigger SOURCE..... CH 1

b. Connect the 10X probe to the **CH 1 OR X** input connector and clip the probe tip to the **PROBE ADJUST** connector on the front panel.

c. If necessary, adjust the probe compensation for a flat-topped squarewave display.

d. CHECK – That the display amplitude is between 4.75 to 5.25 divisions.

X-Y Display Checks

The X-Y Display Check procedures check those characteristics that relate to the X-Y Display system and that are listed under *Warranted Characteristics* in *Section 1: Specifications.* You should set up the test equipment as shown at the start of the procedure list. Changes to the test set-up will be indicated in the procedures, if necessary.

Equipment Required (See Table 4-1)

Calibration Generator (Item 1)
Leveled Sine-Wave Generator (Item 2)
50 Ω BNC Coaxial Cable (Item 7)
50 Ω BNC Termination (Item 11)

Initial Control Settings

Vertical

POSITION (CH 1 and CH 2)	Midrange
MODE	X-Y
CH 1 VOLTS/DIV	10 mV
CH 2 VOLTS/DIV	1 V
VARiable	Off
AC-GND-DC (CH 1 and CH 2)	DC

Horizontal

POSITION	Midrange
MODE ALT MAGN	Off
SEC/DIV	0.5 ms
VARiable	Off
X1, X10, X50 Magnifier	X1

Trigger

HOLDOFF	MIN
LEVEL	Midrange
SLOPE	Positive Going
MODE	P-P AUTO
SOURCE	VERTical MODE
COUPLING	DC

Storage

STORE ON	Off
PRETRIG	75%
HOLD	Off

Procedure Steps

Step 1. Check X-Axis Gain

a. SET:
VOLTS/DIV (CH 1 and CH 2) ..... 10 mV
Vertical MODE ..... X-Y

b. Connect a 50 mV standard amplitude signal from the calibration generator via a 50 Ω BNC coaxial cable to the **CH 1 OR X** input connector.

c. CHECK – That the display is between 4.85 and 5.15 divisions.

d. Disconnect the test equipment from the instrument.

Step 2. Check X-Axis Bandwidth

a. SET:
VOLTS/DIV (CH 1 and CH 2) ... 50 mV

b. Connect the leveled sine-wave generator output via a 50 Ω BNC coaxial cable and a 50 Ω BNC termination to the **CH 1 OR X** input connector.

c. Set the generator to produce an eight-division horizontal display at an output frequency of 50 kHz.

d. Increase the generator output frequency until the X-Axis (horizontal) deflection amplitude is 5.7 divisions.

e. CHECK – That the generators frequency is 2 MHz or more.

Video Triggering Checks (Option 05 only)

The Video Triggering Checks procedures check those characteristics that relate to the video trigger system and that are listed under *Warranted Characteristics* in *Section 1: Specifications*. You should set up the test equipment as shown at the start of the procedure list. Changes to the test set-up will be indicated in the procedures, if necessary.

Equipment Required (See Table 4-1):

Video Generator (Item 6)
50 Ω BNC Coaxial Cable (Item 7)
50 Ω BNC Termination (Item 11)

Parameters used in this section are based on NTSC and PAL systems, being the worlds most widely used systems.
Notation used: 525 (NTSC) I 625 (PAL).
Option 5 however will work on a variety of standard and non-standard video systems.

Initial Control Settings

Vertical

POSITION (CH 1 and CH 2) .....Midrange
MODE CH2
CH 2 VOLTS/DIV .....0.2 V
VARiable .....Off
AC-GND-DC .....DC

Horizontal

POSITION .....Midrange
MODE ALT MAGN. .....Off
SEC/DIV .....5 ms
VARiable .....Off
X1,X10,X50 Magnifier X1

Trigger

HOLDOFF .....MIN
LEVEL .....Midrange
SLOPE .....Positive Going (Field 1)
MODE .....TV Field
SOURCE .....CH 2

Storage

STORE ON .....Off

Procedure Steps

Step 1. Make Menu Settings.

a. Press: **SAVE** and **RECALL** for the MENU page.

b. Select **T.V.**

c. Set:

count per ..... FIELD (NTSC) | FRAME (PAL)
offset ..... -3 (NTSC) | 0 (PAL)
sync polarity ..... POS
tv syst display ..... ON
ch2 clamp ..... ON

d. Press: **SAVE** and **RECALL** to exit the MENU.

Step 2. Connect a composite video signal from TSG-100 or equivalent to **CH 2 OR Y** input.

Step 3. Check system test and field triggering.

a. Check for a stable display starting with the vertical sync. pulse of Field 1.

Check CRT Readout for TV Field1:

525 int (NTSC) | 625 int (PAL)

Check that the TRIG'D LED is on.

Check that the Positive SLOPE LED is on.

b. Press: **SLOPE**

Check for a stable display starting with the vertical sync. pulse of Field 2.

Check that the Negative SLOPE LED is on

Step 4. Check line triggering.

a. Select: **TV lines**
Set: **TIME/DIV** 20 µS
Press: **SLOPE** to select Field 1

b. Rotate: **LEVEL** to select a specific line from the frame.
Select: Line 17 from Field 1.

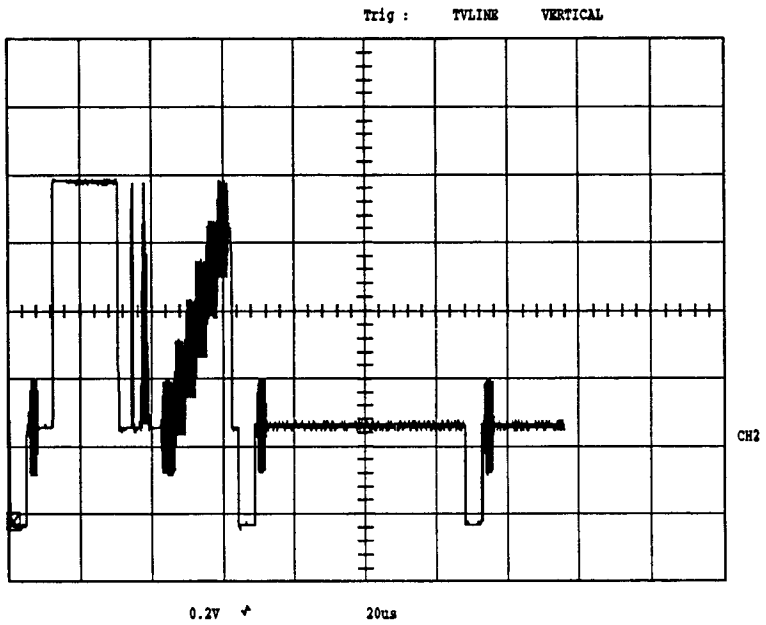


Figure 4-1: TV Line 17 of Field 1 in the NTSC system

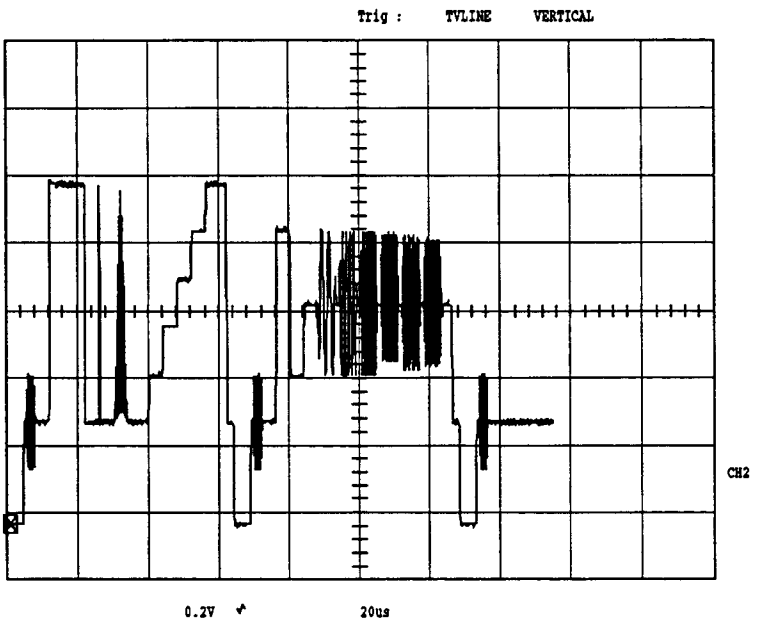


Figure 4-2: TV Line 17 of Field 1 in the PAL system

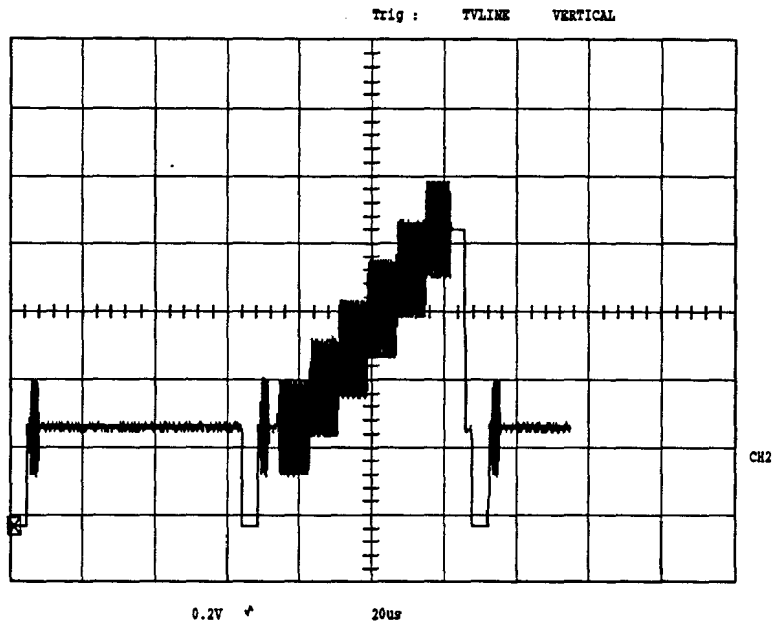


Figure 4-3: TV Line 17 of Field 2 in the NTSC system

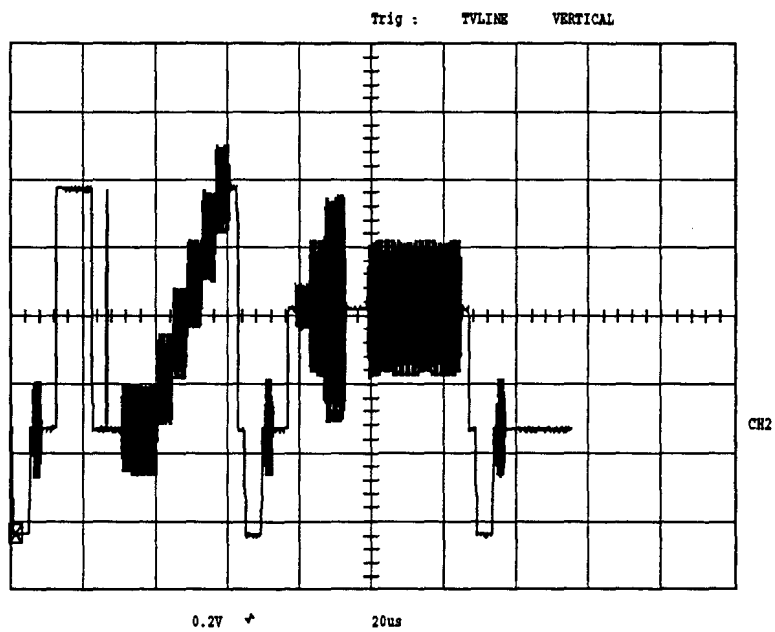


Figure 4-4: TV Line 17 of Field 2 in the PAL system

c. Check: Readout for TVL 17 F1.

d. Set: Trace **INTENSITY** to maximum for a viewable display.

Check for a display like Figure 4-1 (NTSC) | Figure 4-2 (PAL).

Press: **SLOPE** to select Field 2.

Check that the Negative SLOPE LED is on.

Readout: TVL 17 F2 (NTSC) | 330 F2 (PAL)

Check for a display like Figure 4-3 (NTSC) | Figure 4-4 (PAL)

e. Rotate: **LEVEL** fully ccw.

Check that the CRT Readout displays: TVL ALL, a bright display, and triggered on all lines with the vertical sync.pulses running across the display.

f. Rotate: **LEVEL** slowly through its range.

Check that ALL LINES and line 1 (NTSC) | 314 (PAL) till line 262 (NTSC) | 625 (PAL) can be selected.

g. Press: **SLOPE** to select field 1.

Rotate: **LEVEL** slowly through its range.

Check that ALL LINES and line 1 till line 263 (NTSC) | 313 (PAL) can be selected.

Step 5. Check CH 2 AC clamp

a. Set: Trigger **MODE** ..... P-P AUTO
CH 2 **INPUT** Coupling ..... GND
VOLTS/DIV ..... 0.1 V

b. Rotate: CH 2 **POSITION** so the trace is situated on the graticule center.

c. Set: CH 2 Input Coupling to **AC**.

Set: Trigger **MODE** to TV LINES

Set: Trigger **LEVEL** to ALL LINES

Select: A flat field from the TSG-100

Check: CRT Readout for CH 2: "0.1V~C"

Check that the black level of the signal is at the graticule center.

d. Change the input signal from 0% to 100% flatfield and check for a trace shift < 0.4 div.

Step 6. Trigger sensitivity

a. Set: CH 2 **VOLTS/DIV** to 0.2 V

Select: 100% color bars from the TSG-100.

Adjust: CH 2 **VAR**iable for a display of four divisions composite video signal, including sync.pulses and chrominance signal.

b. Set: CH 2 **VOLTS/DIV** to >1 V

c. Check for a stable triggered display.

Brief Procedures

This subsection contains a collection of procedures for adjusting the 2212 Analog & Digital Storage Oscilloscope to meet the Performance Requirements.

Adjustments described are:

- Power supply and CRT Adjustments
- Vertical Adjustments
- Horizontal Adjustments
- Trigger Adjustments
- Cursors Adjustments

Adjustments contained in this section should only be performed after checks from Section 4 *(Performance Check Procedure*) have indicated a need for readjustment, or after instrument repair.
Once an adjustment has been made, use the *Performance Check Procedure* to check the performance of the instrument.

Initial Setup Procedure

This procedure sets the front-panel controls for the tests that follow.

Procedure

Step1. Plug the female connector of the power cord in the power cord receptacle of the 2212 and the male connector to the AC power source.

Step 2. Use the test equipment, as indicated in the Equipment Required list, to the 2212 oscilloscope.

Step 2. Press the POWER button to on.

Step 3. Set the front-panel controls as indicated in the Initial Control Settings list.

Test Equipment Required

The test equipment listed in Table 5-1 is a complete list of the equipment required to accomplish the adjustments in this section. Test equipment specifications described are the minimum necessary to provide accurate results.

Detailed operating instructions of the test equipment is not given in this procedure. If more operating information is required, refer to the appropriate test equipment instruction manual.

When you use equipment other than that recommended, you may have to change the control settings of the test setup. If the exact example equipment in Table 5-1 is not available, use the minimum specification column to determine if any other available test equipment might suffice to perform the check or adjustment.

Table 5-1: Test Equipment Required

Item and Description	Minimum Specification	Use	Example of Test Equipment
1. Calibration Generator	Standard-amplitude signal levels: 5 mV to 50 V. Accuracy: ± 0.3 %. – High-amplitude signal levels: 1 V to 60 V. Repetition rate: 1 kHz. – Fast rise signal level: 1 V. Repetition rate: 1 MHz. Risetime: 1 ns or less. Flatness: ±0.5%.	Signal source for gain and transient response checks and adjustments	Tektronix PG 506A Calibration Generator [a]
2. Leveled Sine-Wave amplitude Generator	Frequency: 250 kHz to more than 60 MHz. Output:: variable from 10 mV to 5V p-p. Output impedance: 50 Ω. Reference frequency: 50 kHz. Amplitude accuracy: constant within 3% of reference frequency as output frequency changes.	Vertical, horizontal, and triggering checks and adjustments. Display adjustments and Z-Axis check	Tektronix SG503 Leveled Sine-Wave Generator [a]
3. Time-Mark Generator	Marker outputs: 10 ns to 0.5 s. Marker accuracy: ±0.1 %. Trigger output: 1 ms to 0.1 µs, time-coincident with markers.	Horizontal checks and adjustments. Display adjustment	Tektronix TG501 Time-Mark Generator [a]
4. Low-Frequency Sine-Wave Generator	Range 10 Hz to 500 kHz. Output amplitude: 300 mV. Output impedance: 600 Ω. Reference frequency: constant within 0.3 dB of reference frequency as output frequency changes.	Low-Frequency trigger checks	Tektronix SG502 Oscillator [a]
5. Pulse Generator	Repetition rate: 1 kHz. Output amplitude: 5 V.	Signal source for Storage and external clock checks	Tektronix PG501 Pulse Generator [a]

Table 5-1 (cont.)
Test Equipment Required

Item and Description	Minimum Specification	Use	Example of Test Equipment
6. TV Signal Generator	Provide Composite Video and Line Sync Signals	Check TV Trigger circuit Test Signal Generator	Tektronix TSG-100
7. Coaxial Cable (2x)	Impedance: 50 Ω. Length: 42 in. Connectors: BNC.	Signal interconnection	Tektronix Part Number 012-0057-01
8. Dual Input Coupler	Connectors: BNC. Female-to-dual-BNC male	Signal interconnection	Tektronix Part Number 067-0525-02
9. Precision Coaxial Cable	Impedance: 50 Ω. Length: 42 in. Connectors: BNC	Vertical Bandwidth	Tektronix Part Number 012-0482-00
10. T-Connector	Connector: BNC	Signal interconnection	Tektronix Part Number 103-0030-00
11. Termination	Impedance: 50 Ω. Connectors: BNC	Signal Termination	Tektronix Part Number 011-0049-01
12. Termination	Impedance: 600 Ω. Connectors: BNC.	Signal Termination	Tektronix Part Number 011-0092-00
13. 10X Attenuator	Ratio: 10X. Impedance: 50 Ω. Connectors: BNC	Vertical compensation and triggering checks	Tektronix Part Number 011-0059-02
14. Adapter male-to-tip plug	Connectors: BNC	Signal interconnection	Tektronix Part Number 175-1178-00
15. Interface Cable		Signal interconnection	Tektronix Part Number 012-1214-00
16. Centronics Compatible Printer/Plotter		Parallel Interface Check	Tektronix HC200 Printer/ HC100 Option 2 Plotter

Table 5-1 (cont.)
Test Equipment Required

Item and Description	Minimum Specification	Use	Example of Test Equipment
17. DC Calibrator	10 V ± 0.3 %	Trigger Adjustment	Tektronix PG 506A Calibration Generator [a]
18. Digital Multi-Meter	0-100 VDC ± 0.15 %	Power Supply Adjustment	Tektronix DM 511 Dig. Multi Meter [a]
19. 10x Probe	Provided with the instrument	Vertical Adjustment	Tektronix 10x Probe P6109

[a] Requires a TM 500-Series Power Module.

Preparation

The calibration Procedure is divided in subsections to let you adjust individual sections of the instrument.

Several adjustments are performed by internal calibration routines of the instrument. To get the instrument in this calibration mode, the CAL jumper located at the A15 board should be placed in the CAL position. It is also possible to enter the instrument calibration mode by using the GPIB interface.

The most accurate display adjustments are made with a stable, well-focused, low-intensity display. Unless otherwise noted, adjust the INTENSITY, FOCUS and Trigger LEVEL controls as needed to view the display.

An Equipment-Required block at the beginning of each subsection lists only the test equipment necessary to do the adjustment in that subsection.

Also at the beginning of each subsection is a list of all the front-panel control settings required to prepare the instrument for performing the first step of the subsection. Do each of the steps within a particular subsection completely, to ensure the correct control settings for steps that follow.

Limits and Tolerances

The limits and tolerances given in this procedure are valid for an instrument that is operating at an ambient temperature between +20 °C and +30 °C. The instrument also must have had at least a 20-minutes warm-up period. All tolerances specified are for the instrument only and do not include test-equipment error.

Index Calibration Procedures

Adjustment Procedures

This subsection contains a collection of adjustment procedures for the 2212 Analog & Digital Storage Oscilloscope to meet the Performance Requirements.

The adjustments described are:

- Power supply and CRT Adjustments
- Vertical Adjustments
- Horizontal Adjustments
- Trigger Adjustments
- Cursors Adjustments

Adjustments contained in this section should only be performed after checks from Section 4 *(Performance Check Procedure*) have indicated a need for readjustment, or after instrument repair.
Once an adjustment has been made, use the *Performance Check Procedure* to check the performance of the instrument.

Power Supply and CRT Display Adjustments

Set up the test equipment as mentioned at the start of the procedure list. Changes to the test set-up will be indicated in the procedures, if necessary.

Equipment Required (see Table 5-1) :

SG502 (item 4)
BNC cable (item 7)
Digital Multi Meter (item 18)

Initial Control Settings

Vertical (CH 1 and CH 2)

POSITION	Midrange (CH1 and CH2)
MODE	CH 1
VOLTS/DIV	2 mV (CH1 and CH2)
VARiable	Off (CH1 and CH2)
AC-GND-DC	DC (CH1 and CH2)

Horizontal

POSITION	Midrange
MODE ALT MAGN	Off
SEC/DIV	50 ms
VARiable	Off
Magnifier	X1

Trigger

HOLDOFF	MIN
LEVEL	Midrange
SLOPE	Positive Going
MODE	P-P AUTO
SOURCE	Vertical MODE
COUPLING	DC

Storage

Storage ON/OFF	ON

Check/adjust Power Supply DC levels (R1337)

Procedure

NOTE

Review the information at the beginning of the Adjustment Procedure before starting this step.

a. Connect the digital voltmeter low lead to chassis ground and connect the volts lead to the – 8.6 V supply (A10 board)

b. Check volt meter reading is – 8.56 V to – 8.64 V. If the reading is within these limits, skip to part d.

c. Adjust the – 8.6 Adj. potentiometer meter (R1330) for a voltmeter reading of – 8.60 V.

d. Check voltage levels of the remaining power supplies listed in Table 5-2 are within the specified limits.

Table 5-2: Power Supply Limits

Power Supply	Reading (Volts)	Board Location or Test Point
– 8.6 V	– 8.56 V to – 8.64 V	TP: – 8.6 V
– 5.0 V An	– 4.85 V to – 5.15 V	pin 5 U151
+5.0 V An	+4.85 V to +5.15 V	TP: – 5.0
+5.1 V Dig	+4.95 V to +5.25 V	C964
+7.5 V	+7.27 V to +7.73 V	pin 3 U151
+8.6 V	+8.53 V to +8.87 V	TP: 8.6 V
+15 V	+14.55 V to +15.45 V	TP: 15 V
+38 V	+35.9 V to +38.1 V	TP: 38 V
+95 V	+85.5 V to +104.5 V	TP: 100 V

e. Disconnect the test equipment from the instrument.

Adjust Readout Jitter (R340)

Procedure:

a. SET:
VOLTS/DIV ..... 10 mV
Vertical Coupling..... AC
SEC/DIV..... 5 ms.
Storage ON/OFF ..... OFF

b. Connect the low frequency Sine-Wave generator output via a 50 Ω BNC cable to CH1 OR X input connector.

c. Set the generator to produce a ten-division signal at an output - frequency of 200 Hz.

d. Position the waveform equally around the center horizontal graticule line.

e. Adjust R340 for minimum read out jitter.

f. Disconnect the test equipment from the instrument.

CRT Display Adjustment (R1251, R1255, R1234, R686, R221, R1257, R1926 and R1930)

The following adjustments must be performed to adjust the CRT display:

- Grid Bias (R1234)
- Astigmatism (R1255)
- Trace Rotation Control (R1257)
- Geometry (R1251)
- Display System (dac cal) (R221, R686, R1926, and R1930)

Calibration via the Calibration Routine in the 2212

a. Place: CAL jumper in CAL position, and wait for the Calibration MENU on the SCREEN.

b. Select: DISPLAY to GO.

c. Adjust: R1251, R1255, R1234, R686, R221, R1257, R1926 and R1930 by following the instructions on the CRT screen.

d. Remove: CAL jumper to enter normal scope operation.

Vertical Adjustments

Equipment Required

PG506A (item 1)
10X Probe (Provided with instrument)
BNC to TIP (item 14)
BNC cables (item 9)
10 X attenuator (item 13)

Initial Control Settings

Vertical (CH 1 and CH 2)

POSITION	Midrange (CH1 and CH2)
MODE	CH 1
VOLTS/DIV	5 mV (CH1 and CH2)
VARiable	Off (CH1 and CH2)
AC-GND-DC	DC (CH1 and CH2)

Horizontal

POSITION	Midrange
MODE ALT MAGN	Off
SEC/DIV	0.2 ms
VARiable	Off
Magnifier	X1

Trigger

HOLDOFF	MIN
LEVEL	Midrange
SLOPE	Positive going
MODE	P-P AUTO
SOURCE	Vertical MODE
COUPLING	DC

Storage

Storage ON/Off	Off

Cursors

Cursor ON/Off	Off

Adjust Balance

Procedure

Calibration via the Calibration Routine in the 2212

a. Place: CAL jumper in CAL position, and wait for the Calibration MENU on the CRT screen.

b. Select: BALANCE to GO.

c. Wait until Routine is ready (may be ± one minute).

d. Remove: CAL jumper to enter normal scope operation.

Adjust Vertical Gain (R135, R185, R207, R209, and R1930)

Procedure

Calibration via the Calibration Routine in the 2212

a. Place: CAL jumper in CAL position, and wait for the Calibration MENU on the CRT screen.

b. Select: VERTICAL to GO.

c. Adjust: R135, R185, R207, R209, and R1930 by following the instructions on the CRT screen.

d. Remove: CAL Jumper to enter normal scope operation.

Adjust Attenuator Compensation (AT100, AT150)

Procedure

a. Set to Initial Control Settings

b. Connect the high-amplitude square-wave output from the calibration generator via a probe tip-to-BNC adapter and the 10X probe to the CH 1 OR X input connector.
If necessary, use a 50 Ω BNC attenuator.

c. Set the generator for a 1 kHz, five-division display and compensate the probe using the probe compensation adjustment (see the probe instruction manual)

d. Replace the probe and probe-tip-to-BNC adaptor with a 50 Ω BNC cable and a 50 Ω termination.

e. Set CH1 VOLTS/DIV to 50 mV

f. Set the generator to produce a five-division display.

g. Adjust : Trimmer C1 for a flat response with the square-wave signal (See Figure 5-1 for location of the trimmers).

h. Replace the 50 Ω BNC coaxial cable and the 50 Ω BNC termination with the probe and a probe-tip-to-BNC adapter.

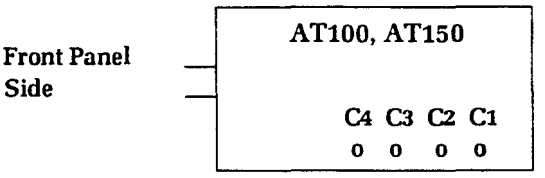


Figure 5-1: Attenuator Trimmer Layout

i. Set the pulse generator to produce a five-division square wave.

j. Adjust-Trimmer C2 for a flat response on the square wave.

k. Replace the probe and probe-tip-to-BNC adaptor with a 50 Ω BNC cable and a 50 Ω termination.

l. Set the CH 1 VOLTS/DIV switch to 0.5 V.

m. Repeat parts f through j except adjust 'C3' and 'C4' trimmers in part g and j respectively.

n. Set the Vertical MODE switch to CH 2.

o. Repeat parts b through m for CH2 attenuators.

p. Disconnect the test equipment from the instrument.

Adjust High Frequency Compensation (R304, R305, R341, and C304)

Procedure

a. Set:
SEC/DIV ..... 0.2 µs
CH1 VOLTS/DIV ..... 10 mV

b. Connect the positive-going fast-rise square wave output from the calibration generator via a 50 Ω BNC coaxial cable, a 10X BNC attenuator, and a 50 Ω termination to the CH 1 OR X input connector.

c. Set the pulse generator to produce a 1 MHz, five-division display.

d. Set the top of the displayed waveform to the center horizontal graticule line using CH 1 POSITION control.

e. Adjust : Compensation (R304, R305, R341 and C304) for a response as flat as possible. Repeat adjustments until no further improvements are noted.

f. Set: CH 1 VOLTS/DIV to 5 mV.

g. Set the pulse generator for a five-division signal.

h. Check for aberrations less than ±6% (0.3 division).

i. Set: CH 1 VOLTS/DIV to 10 mV.
j. Set the pulse generator for a five-division signal.

k. Check for aberrations of ±4% (0.2 division) or less.

l. Repeat part k for each CH 1 VOLTS/DIV switch setting from 20 mV through 0.2 V. Adjust the pulse generator output and add or remove the 10X BNC attenuator as necessary to maintain a five-division display at each VOLTS/DIV switch setting.

NOTE

Some generators do not produce enough signal amplitude to test above 0.2 volts/div. Omit steps m through q, if necessary.

m. Set : CH 1 VOLTS/DIV to 0.5 V.

n. Check for aberrations of ±6% (0.3 division) or less.

o. Set : CH 1 VOLTS/DIV to 1 V.

p. Check for aberration of ±12% (0.6 division) or less.

q. Repeat part p for 2 V and 5V CH 1 VOLTS/DIV switch settings.

r. Move the cable from the CH 1 OR X input connector to the CH 2 OR Y input connector. Set the Vertical MODE switch to CH 2.

s. Repeat part f through q for CH 2.

t. Disconnect the test equipment from the instrument.

Trigger Adjustments

Equipment Required

SG502 (item 4)
PG506A DC generator (item 17)
BNC cables (item 7)

Initial Control Settings

Calibration MODE

Adjust Trigger

Procedure

Calibration via the Calibration Routine in the 2212

a. Place: CAL jumper in CAL position, and wait for the Calibration MENU on the CRT screen.

b. Select: TRIGGER to GO.

c. Adjust: Trigger by following the instructions at the screen.

d. Remove: CAL jumper to enter normal scope operation.

Horizontal Adjustments

Equipment required

TG501 (item 3)
Cable 50 Ω (item 7)
50 Ω BNC Termination (item 11)

Initial control settings

Vertical (CH1 and CH2)

VOLTS/DIV	0.5 V
VARiable	Off
AC-GND-DC	DC
MODE	CH1
POSITION	Midrange

Horizontal

POSITION	Midrange
MODE ALT MAG	ON
SEC/DIV	1 ms
VARiable	Off
X1, X10, X50 Mag.	X10

Trigger

HOLDOFF	MIN
LEVEL	Midrange
SLOPE	Positive going
MODE	P-P AUTO
SOURCE	Vertical MODE
COUPLING	DC

Storage

STORAGE ON/Off	Off

Cursors

CURSOR ON/Off	Off

Adjust Horizontal Magnifier Compensation (R671, R610)

Procedure

a. Set: to Initial Control Settings

b. Connect 1 ms time markers from the time-mark generator via a 50 Ω BNC coaxial cable and a 50 Ω BNC termination to CH 1 OR X input connector.

c. Position with the Horizontal POSITION Control the first time marker of the unmagnified sweep at the first time marker of the magnified sweep.

d. Adjust: X10 Mag Registration (R671) to bring both first markers to center vertical graticule line.

e. Set the Horizontal MAG to X50.

f. Adjust: X50 Mag Registration (R610) to bring the first time marker of the magnified sweep to the center vertical graticule line.

g. Disconnect the test equipment from the instrument.

Adjust Timing

Procedure

Calibration via the Calibration Routine in the 2212

a. Place: CAL jumper in CAL position, and wait for the Calibration MENU on the CRT screen

b. Select: HORIZONTAL to GO.

c. Adjust: Timing by following the instructions at the screen.

d. Remove: CAL jumper to enter normal scope operation.

Adjust Magnifier Gain (R647, R627)

Procedure

a. Set:
SEC/DIV..... 1 ms
MAG ..... X10.

b. Connect 0.1 ms time markers from the time-mark generator via a 50 Ω BNC coaxial cable and a 50 Ω BNC termination to CH 1 OR X input connector.

c. Adjust: X10 Mag gain (R647) for 1 marker per division.

d. Set: HORIZONTAL MODE to MAG X50

e. Adjust: X50 Mag gain (R627) for 5 divisions between the magnified markers.

Adjust High Speed Timing (C710, C760)

Procedure

a. Set:

CH1 VOLTS/DIV	0.1 V,
AC-GND-DC	AC
SEC/DIV	50 ns
Horizontal MAG	X10
Trigger SOURCE	EXT.

b. Connect 10 ns time markers from the time-mark generator via a 50 Ω BNC coaxial cable and a 50 Ω BNC termination to CH 1 OR X input connector.

c. Connect the time marker trigger out via a 50 Ω BNC coaxial cable and a 50 Ω BNC terminator to the EXT OR Z input connector.

d. Adjust Trigger LEVEL control so that the markers are stable triggered.

e. Adjust: 5 ns Linearity (C710) and 5 ns Timing (C760) for two divisions between each marker.

f. Disconnect the test equipment from the instrument.

Cursors Adjustments

Equipment Required

None

Initial Control Settings

Calibration MODE

Adjust Cursors

Procedure

Calibration via the Calibration Routine in the 2212

a. Place: CAL jumper in CAL position, and wait for the Calibration MENU on the CRT screen.

b. Select: CURSORS to GO.

c. Adjust: Cursors by following the instructions at the screen.

d. Remove: CAL jumper to enter normal scope operation.

Position Adjustments

Equipment Required

TG501 (Item 3)
Cable 50 Ω (Item 7)
50 Ω BNC Termination (Item 11)

Initial Control Settings

Calibration MODE

Adjust Position

Procedure

Calibration via the Calibration Routine in the 2212

a. Place: CAL jumper in CAL position, and wait for the Calibration MENU on the CRT screen.

b. Select: POSITION to GO.

c. Adjust: POSITION by following the instructions at the screen.

d. Remove: CAL jumper to enter normal scope operation.

Video Triggering Checks and Adjustments (Option 05 only)

Video Triggering Checks and Adjustment procedures check and adjust those characteristics that relate to the video trigger system. Use the test equipment as shown at the start of the procedure list. Changes to the test set-up will be indicated in the procedures, if necessary.

Equipment Required (See Table 5-1):

Video Generator (Item 6)
50 Ω BNC Coaxial Cable (Item 7)
50 Ω BNC Termination (Item 11)

Parameters used in this section are based on NTSC and PAL systems, being the worlds most widely used systems.
Notation used: 525 (NTSC) I 625 (PAL).
Option 5 however, will work on a variety of standard and non-standard video systems.

Initial Control Settings

Vertical

POSITION (CH 1 and CH 2) ..... Midrange
MODE CH2
CH 2 VOLTS/DIV ..... 0.2 V
VARiable ..... Off
AC-GND-DC ..... DC

Horizontal

POSITION ..... Midrange
MODE ALT MAGN. ..... Off
SEC/DIV ..... 5 ms
VARiable ..... Off
X1,X10,X50 Magnifier X1

Trigger

HOLDOFF ..... MIN
LEVEL ..... Midrange
SLOPE ..... Positive Going (Field 1)
MODE ..... TV Field
SOURCE ..... CH 2

Storage

STORE ON ..... Off

Procedure Steps

Step 1. Make Menu Settings.

a. Press: **SAVE** and **RECALL** for the MENU page.

b. Select **T.V.**

c. Set:

count per ..... FIELD (NTSC) I FRAME (PAL)
offset ..... -3 (NTSC) I 0 (PAL)
sync polarity ..... POS
tv syst display ..... ON
ch2 clamp ..... ON

d. Press: **SAVE** and **RECALL** to exit the MENU.

Step 2. Connect a composite video signal from TSG-100 or equivalent to **CH 2 OR Y** input.

Step 3. Check system-test and field triggering.

a. Check for a stable display starting with the vertical sync. pulse of Field 1.

Check CRT Readout for TV Field1:

525 int (NTSC) I 625 int (PAL)

Check that the TRIG'D LED is on.

Check that the Positive SLOPE LED is on.

b. Press: **SLOPE**

Check for a stable display starting with the vertical sync. pulse of Field 2.

Check that the Negative SLOPE LED is on

Step 4. Check line triggering.

a. Select: **TV lines**
Set: **TIME/DIV** 20 µS
Press: **SLOPE** to select Field 1

b. Rotate: **LEVEL** to select a specific line from the frame.
Select: Line 17 from Field 1.

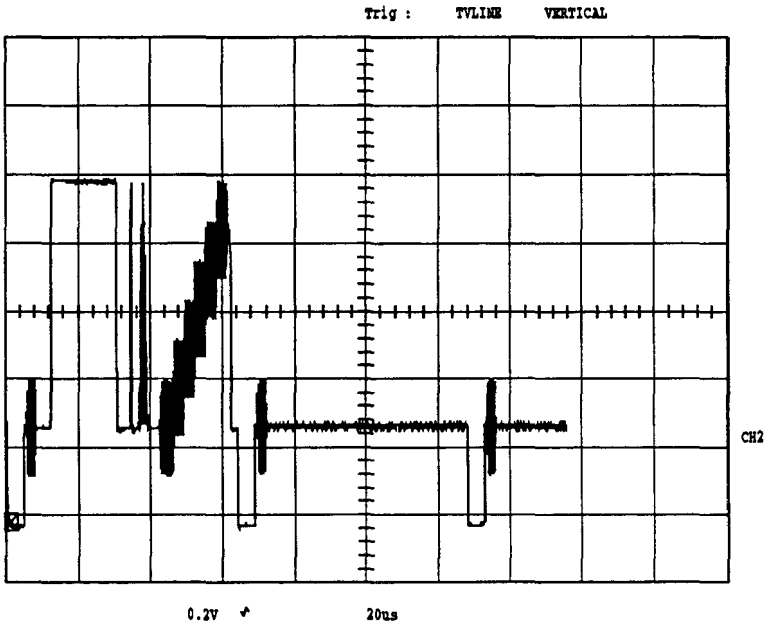


Figure 5-2: TV Line 17 of Field 1 in the NTSC system

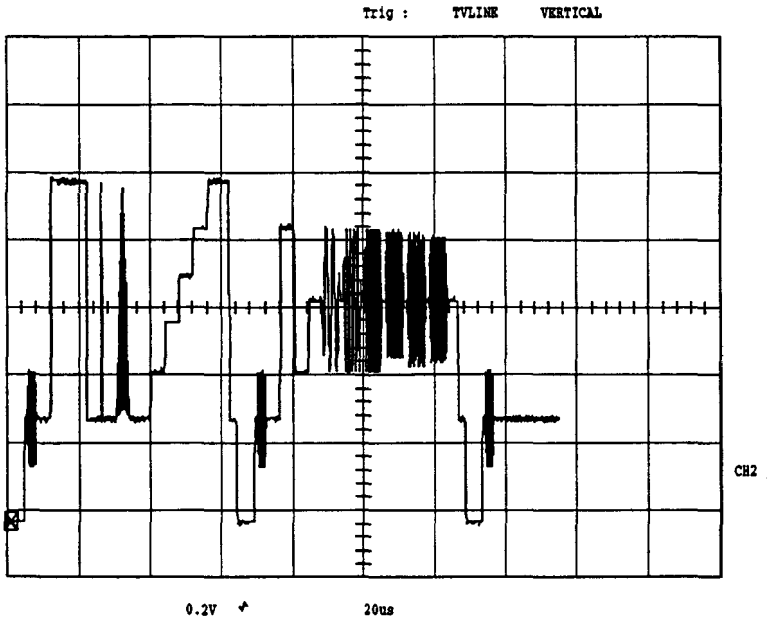


Figure 5-3: TV Line 17 of Field 1 in the PAL system

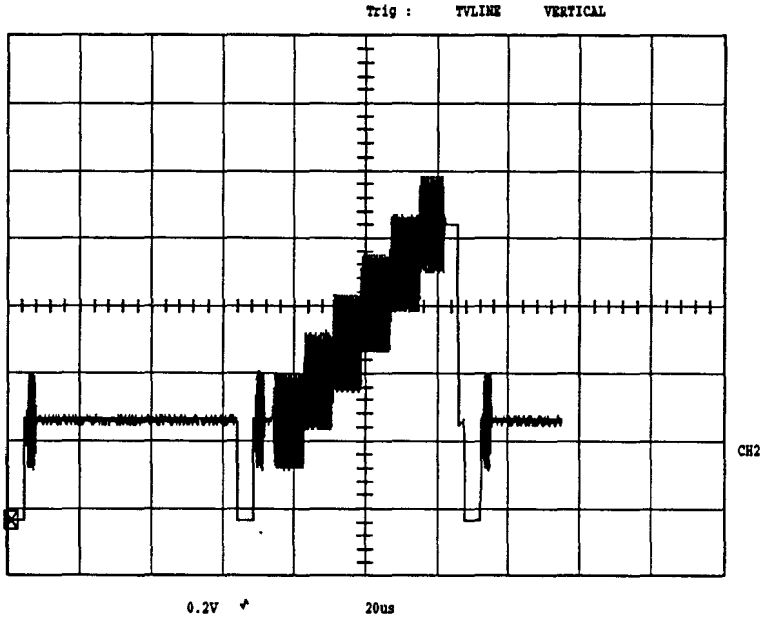


Figure 5-4: TV Line 17 of Field 2 in the NTSC system

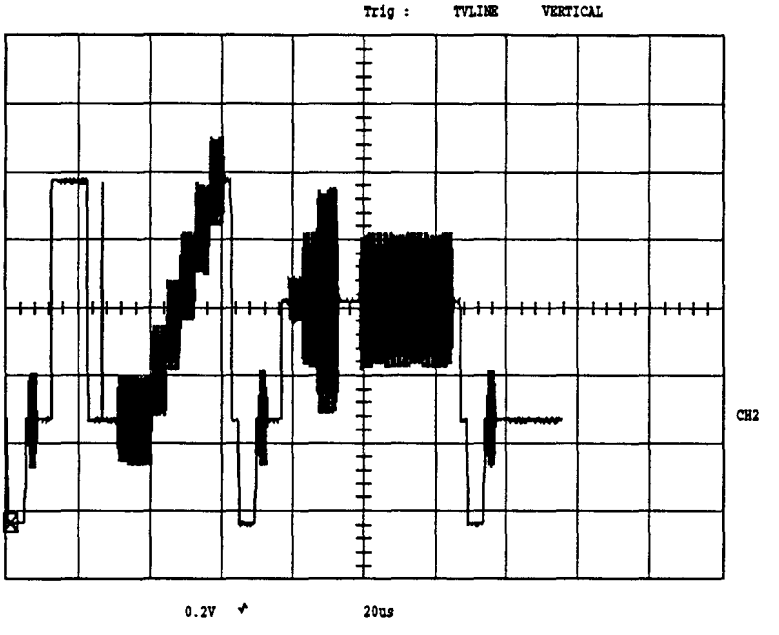


Figure 5-5 TV Line 17 of Field 2 in the PAL system

c. Check: CRT Readout for TVL 17 F1.

d. Set: Trace **INTENSITY** to maximum for a viewable display.

Check for a display like Figure 5-2 (NTSC)I Figure 5-3 (PAL).

Press: **SLOPE** to select Field 2.

Check that the Negative SLOPE LED is on

Readout: TVL 17 F2 (NTSC) I 330 F2 (PAL)

Check for a display like Figure 5-4 (NTSC) I Figure5-5 (PAL)

e. Rotate: **LEVEL** fully ccw.

Check that the CRT Readout displays: TVL ALL, a bright display and triggered on all lines with the vertical sync.pulses running across the display.

f. Rotate: **LEVEL** slowly through its range.

Check that ALL LINES and line 1 (NTSC) I314 (PAL) till line 262 (NTSC) I 625 (PAL) can be selected.

g. Press: **SLOPE** to select field 1.

Rotate: **LEVEL** slowly through its range.

Check that ALL LINES and line 1 till line 263 (NTSC) I 313 (PAL) can be selected.

Step 5. Adjust CH 2 AC clamp (see Figure 5-6)

a. Set:
Trigger **MODE** ..... P-P AUTO
CH 2 **INPUT** Coupling ..... GND
VOLTS/DIV ..... 0.1 V
LEVEL ..... CCW

b. Rotate: CH 2 **POSITION** so the trace is situated on the graticule center.

c. Set: CH 2 Input Coupling to **AC.**

Set: Trigger **MODE** to TV LINES

d. Select: A flat field from the TSG-100

Check: CRT Readout for CH 2: "0.1V~C"

Adjust: CLAMP OFFSET so that the black levelof the signal is at the graticule center.

e. Change the input signal from minimum to maximum picture level.

Adjust: CLAMP GAIN so that the black level of the signal is at the graticule center.

Repeat point d. and e. if necessary.

f. Set: Store **MODE** to ON.
Change input signal to maximum picture level.

Adjust: ST. CLAMP GAIN so that the black level is at the graticule center.

Set: Store **MODE** to Off.

NOTE

During point c. to f. of the clamp adjustment, CH 2 POSITION control must NOT be changed!

Step 6. Trigger sensitivity

a. Set: CH 2 **VOLTS/DIV** to 0.2 V

Select: 100% color bars from the TSG-100.

Adjust: CH 2 **VAR**iable for a display of four divisions composite video signal, including sync.pulses and chrominance signal.

b. Set: CH 2 **VOLTS/DIV** to >1 V

c. Check for a stable triggered display.

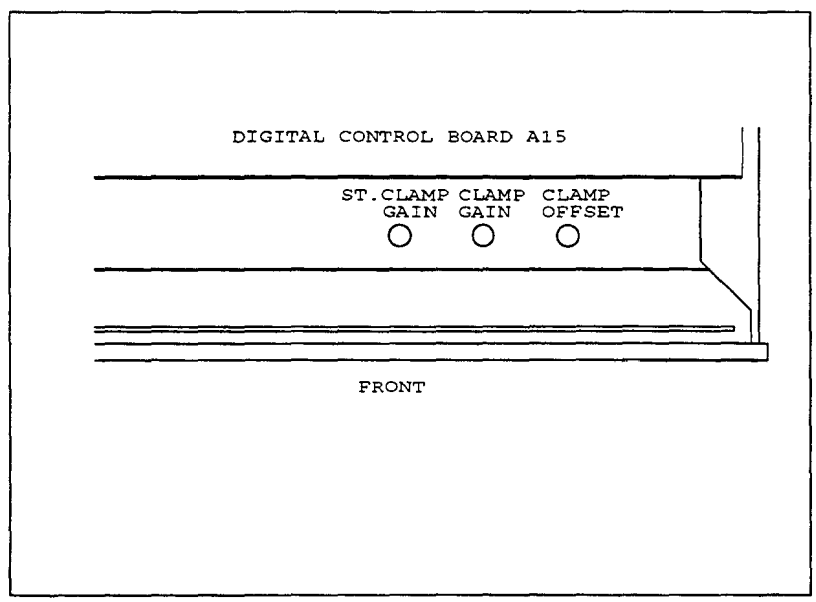


Figure 5-6: Location of Video Controls

Maintenance Information

This section contains the information needed to do periodic and corrective maintenance on the 2212 Oscilloscope.
Specifically, the following subsections are included:

- **Maintenance information** - This subsection. It includes this introduction plus general information on preventing damage to circuits when doing maintenance.
- **Inspection and Cleaning** - Information and procedures for inspecting the oscilloscope and cleaning its external and internal modules.
- **Removal and Installation Procedures** - Procedures for the removal and replacement of boards.

Supplementary Information

The following sections contain information/procedures related to doing maintenance.

- Section 2, *Operating Information*, covers instructions useful when operating the oscilloscope in order to troubleshoot it.
- Section 3, *Theory of Operation*, contains a circuit description.
- Section 4, *Performance Verification*, contains procedures that may be useful in isolating problems to boards by testing the oscilloscope performance.
- Section 5, *Adjustment Procedures*, contains a procedure for adjusting the internal circuits of the oscilloscope.
- Section 9, *Diagrams*, contains diagrams, board layouts and component location tables of the schematics used in the 2212 Oscilloscope
- Section 10, *Replaceable Parts*, lists all field replaceable parts by part number.

Preventing ESD

CAUTION

Static discharge can damage any semiconductor component in this oscilloscope.

Precautions

When performing any service which requires internal access to the oscilloscope, adhere to the following precautions to avoid damaging internal components due to electrostatic discharge (ESD).

1. Minimize handling of static-sensitive parts.
2. Transport and store static-sensitive parts in their static protected containers or on a metal rail. Label any package that contains static-sensitive parts.
3. Discharge the static voltage from your body by wearing a grounded antistatic wrist strap while handling these parts. Do service of static-sensitive parts only at a static-free work station.
4. Nothing capable of generating or holding a static charge should be allowed on the work station surface.
5. Handle circuit boards by the edges where possible.
6. Do not slide boards over any surface.
7. Avoid handling boards in areas that have a floor or work-surface covering capable of generating a static charge.

Susceptibility to ESD

Table 6-1 lists the relative susceptibility of various classes of semiconductors. Static voltages of 1 kV to 30 kV are common in unprotected environments.

Table 6-1: Relative Susceptibility to Static-Discharge Damage

Semiconductor Classes	Relative Susceptibility Levels [1]
MOS or CMOS microcircuits or discrete circuits, or linear microcircuits with MOS inputs (most sensitive)	1
ECL	2
Schottky signal diodes	3
Schottky TTL	4
High-Frequency bipolar transistors	5
JFET	6
Linear microcircuits	7
Low-power Schottky TTL	8
TTL (least sensitive)	9

[1] Voltage equivalent for levels (voltage discharged from a 100 pF capacitor through resistance of 100 ohms):

1 = 100 to 500 V
2 = 200 to 500 V
3 = 250 V
4 = 500 V
5 = 400 to 600 V
6 = 600 to 800 V
7 = 400 to 1000 V (est.)
8 = 900 V
9 = 1200 V

Inspection and Cleaning

Inspection and Cleaning describes how to inspect for dirt and damage on, and how to clean the exterior and interior of the 2212 Oscilloscope. Inspection and cleaning are done as preventive maintenance. Preventive maintenance, when done regularly, may prevent oscilloscope malfunction and enhance its reliability.

Preventive maintenance consists of visually inspecting and cleaning the oscilloscope and using general care when operating it.

How often to do maintenance depends on the severity of the environment in which the oscilloscope is used. A proper time to perform preventive maintenance is just before oscilloscope adjustment.

General Care

The cabinet helps keep dust out of the oscilloscope and should normally be in place when operating the oscilloscope.

Inspection and Cleaning Procedures

Inspect and clean the oscilloscope as often as operating conditions require. The collection of dirt on components inside can cause the 2212 Oscilloscope to be overheated and breakdown. (Dirt acts as an insulting blanket, preventing efficient heat dissipation.) Dirt also provides an electrical conduction path that could cause an oscilloscope failure, especially under high-humidity conditions.

CAUTION

Avoid the use of chemical agents which might damage the plastics used in this oscilloscope. Use only deionized water when cleaning the front-panel buttons. Use a 75% isopropyl alcohol solution as a cleaner and rinse with deionized water. Before using any other type of cleaner, consult your Tektronix Service Centre or representative.

Inspection - Exterior

Inspect the outside of the oscilloscope for damage, wear, and missing parts, using Table 6-2 as a guide. Oscilloscopes that appear to have been dropped or otherwise abused should be checked thoroughly to verify correct operations and performance. Repair defects that could cause personal injury or lead to further damage to the oscilloscope immediately.

Table 6-2: External Inspection Check List

Item	Inspect for	Repair Action
Cabinet and front panel	Cracks, scratches, deformations or damaged hardware.	Replace defective part.
Front-panel knobs	Missing, damaged, or loose knobs.	Repair or replace missing or defective knobs.
Connectors	Broken shells, cracked insulation and deformed contacts. Dirt in connectors.	Replace defective parts. Clear or wash out dirt.
Carrying handle, bail, cabinet feet	Correct operation.	Replace defective part.
Accessories	Missing items or parts of items, bent pins, broken and damaged connectors.	Replace damaged or missing items, frayed cables items, frayed cables and defective boards.

Cleaning Procedure - Exterior

CAUTION

To prevent getting moisture inside the oscilloscope during external cleaning, use only enough liquid to dampen the cloth or applicator.

1. Remove loose dust on the outside of the oscilloscope with a lint free cloth.
2. Remove remaining dirt with a lint free cloth dampened in a general purpose detergent-and-water solution. Do not use abrasive cleaners.
3. Clean the light filter protecting the CRT screen with a lint-free cloth dampened with either isopropyl alcohol or, preferably, a gentle, general purpose detergent-and-water solution.

Inspection - Interior

To access the inside of the oscilloscope or inspection and cleaning, refer to the *Removal and Installation Procedures* in this section.

Inspect the internal portions of the oscilloscope for damage and wear, using Table 6-3 as a guide. Defects found should be repaired immediately.

If any electrical part or board is replaced adjust the oscilloscope if necessary.

CAUTION

To prevent damage from electrical arcing, ensure that circuit boards and components are dry before applying power to the oscilloscope.

Table 6-3: Internal Inspection Check List

Item	Inspect for	Repair Action
Circuit Boards	Loose, broken or corroded solder connections. Burned circuit boards. Burned, broken or cracked circuit-run plating	Remove failed board and replace with a fresh board.
Resistors	Burned, cracked, broken, blistered condition	Replace failed part and replace with a fresh part.
Solder connections	Cold solder or rosing joints	Resolder joint and clean with isopropyl alcohol.
Capacitors	Damaged or leaking cases. Corroded solder on leads or terminals	Remove damaged parts and replace with new parts
Semiconductors	Loosely inserted in sockets. Distorted pins.	Firmly seat loose semiconductors. Remove devices that have distorted pins. Carefully straighten pins (as required to fit the socket), using long-nose pliers, an re-insert firmly. Ensure that straightening action does not crack pins, causing them to break off.
Wiring and cables	Loose plugs or connectors. Burned, broken, or frayed wiring.	Firmly seat connectors. Repair or replace boards with defective wires or cables.
Chassis	Dents, deformations, and damaged hardware.	Straighten, repair, or replace defective hardware.

Cleaning Procedure - Interior

1. Blow off dust with dry, low-pressure, deionized air (approximately 0.6 Bar).

2. Remove any remaining dust with a lint free cloth dampened in isopropyl alcohol (75% solution) and rinse with a warm deionized water. (A cotton-tipped applicator is useful for cleaning in narrow spaces and on circuit boards).

If, after doing steps 1 and 2, a board is clean upon inspection, skip the remaining steps.

3. If steps 1 and 2 do not remove all the dust or dirt, the oscilloscope may be spray washed using a solution of 75% isopropyl alcohol by doing steps 4 through 8.

4. Gain access to the parts to be cleaned by removing easily accessible shields and panels (see "Removal and Installation Procedures").

5. Spray wash dirty parts with the isopropyl alcohol and wait 60 seconds for the majority of the alcohol to evaporate.

6. Use hot (50 to 60 °C) deionized water to thoroughly rinse them.

7. Dry all parts with low-pressure, deionized air.

8. Dry all components and assemblies in an oven or drying compartment using low-temperature (50 to 65 °C) circulating air.

Lubrication

There is no periodic lubrication required for this oscilloscope.

Removal and Installation Procedures

This section contains procedures for removal and installation of mechanical and electrical parts of the 2212 Oscilloscope. The exploded view drawings in Section10, *Replaceable Mechanical Parts* are very helpful during the removal and reinstallation of individual sub-assembly components. Circuit board and component locations are shown in Section 9, *Diagrams.*

Procedures for Installation and Removal

Cabinet

WARNING

To avoid electric shock, disconnect the instrument from the ac-power input source before removing or replacing any component or assembly.

To remove the instrument cabinet, perform the following procedure:

Step 1. Disconnect the power cord from the instrument. For instruments with a power-cord securing clamp, remove the screw holding the power-cord securing clamp before disconnecting the power cord.

Step2. Remove two screws from the rear panel (located in the power cord retainers) and remove the rear panel from the instrument.

Step 3. Remove the four ground springs fitted between the chassis and the cabinet.

Step 4. Remove two screws, one from the left-rear side and one from the right side of the cabinet.

Step 5. Pull the front panel and attached chassis forward and out of the cabinet

Step 6. To reinstall the cabinet, perform the reverse of the preceding steps Ensure that the cabinet is flush with the rear of the chassis and the cabinet and rear-panel holes are aligned with the screw holes in the chassis frame. Ensure that the four ground springs are in the correct locations.

Step 7. Reconnect the power cord.

Storage Board

The storage board can be removed and reinstalled as follows:

Step 1. Remove the cabinet as described in the "Cabinet" procedure.

Step 2. Disconnect four flat cables (five or six cables for instruments with Option 10 and/or 12 installed).

Step 3. Remove three screws from the right side of the board.

Step 4. Remove two screws from the PARALLEL I/O PORT connector.

Step 5. Move the board forward and slightly to the right. Raise the left side of the board and take it out of the chassis.

Step 6 . To operate the instrument with the storage board in removed position, the board can be placed on top of the instrument by placing it in two retainers. First, place the retainers in the slots at the top edge of the central chassis. Connect the three flat cables from the main board and the front-panel board. Replace the flat cable from the power supply board with a longer type.

Step 7. To reinstall the storage board reverse the above procedure, being carefully checking the orientation of the cables. Make sure to fasten first the parallel i/o connector, before fastening the board holding screws.

Power Supply Board

The power supply board can be removed and reinstalled as follows:

Step 1. Remove the cabinet as described in the "Cabinet" procedure.

Step 2. Remove the storage board as described in the "Storage Board" procedure.

Step 3. Disconnect the flat cable (4 leads) at the left side of the power supply board from the connector at the rear of the main board and pull it through the hole in the main chassis.

Step 4. Disconnect the high voltage cable (4 leads) at the left side of the power supply board from the connector and pull it through the hole in the chassis to the left side of the central chassis.

Step 5. Disconnect the transformer cable (7 leads) at the rear of the board from the connector.

Step 6. Disconnect the flat cable (20 leads) at the right side of the board from the connector.

Step 7. Disconnect the fan cable (2 leads) at the front of the board from the connector.

Step 8. Pull the focus potentiometer shaft at the left side of the board forward and remove it from the instrument.

Step 9. Put the power-on extension shaft into the power-on position. Then disconnect the shaft by pulling it forward.

Step 10. Disconnect the CRT anode lead.

WARNING

The CRT anode lead retains a high voltage charge after the instrument is turned off. To avoid electrical shock, disconnect the CRT anode lead from the multiplier and immediate ground the lead to the main chassis. Take care that the anode lead is kept away from cables and components until it is discharged.

Step 11. Remove two screws holding the ac- power input connector to the chassis.

Step 12. Remove five screws holding the board to the main chassis.

Step 13. Move the board forward and remove it from the chassis.

Step 14. To reinstall the power supply board reverse the above procedure, being careful to check the orientation of the cables. Make sure to fasten the ac-power input connector, before fastening the board holding screws.

GPIB Board (Option 10 only)

The GPIB option board can be removed and reinstalled as follows:

Step 1. Remove the cabinet as described in the "Cabinet"procedure.

Step 2. Remove the storage board as described in the "Storage board" procedure.

Step 3. Remove two screws holding the GPIB board to the chassis.

Step 4. Remove the board from the chassis.

Step 5. To reinstall the GPIB board reverse the above procedure.

RS-232-C Board (Option 12 only)

The RS-232-C option board can be removed and reinstalled as follows:

Step 1. Remove the cabinet as described in the "Cabinet" procedure.

Step 2. Remove the storage board as described in the "Storage board" procedure.

Step 3. Remove two screws holding the RS-232-C board to the chassis.

Step 4. Remove the board from the chassis.

Step 5. To reinstall the RS-232-C board reverse the above procedure.

Main Board

The main board can be removed and reinstalled as follows:

Step 1. Remove the cabinet as described in the "Cabinet"procedure.

Step 2. Disconnect the flat cable (4 leads) at the rear of the main board.

Step 3. Disconnect the high voltage cable (6 leads) at the rear of the main board.

Step 4. Disconnect the trace rotation cable (2 leads) at the front of the main board.

Step 5. Disconnect two flat-cables at the left side of the storage board and pull them through the holes on the left side of the central chassis.

Step 6. Disconnect the four deflection plate wires from the CRT.

Step 7. Remove two screws holding the left side chassis bracket to the front and rear panel chassis parts. The bracket remains mounted to the main board.

Step 8. Remove seven screws holding the main board to the chassis.

Step 9. Lift the rear of the main board and remove it from the chassis.

Step 10. To reinstall the main board reverse the above procedure, being careful to check the orientation of the cables.

Cathode-Ray Tube

WARNING

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

The CRT can be removed and reinstalled as follows:

Step 1. Remove the cabinet as described in the "Cabinet" procedure.

Step 2. Remove the storage board as described in the "Storage Board" procedure.

Step 3. Disconnect the CRT anode lead and pull the lead through the hole to left side of the central chassis.

WARNING

The CRT anode lead retains a high voltage charge after the instrument is turned off. To avoid electrical shock, disconnect the CRT anode lead from the multiplier and immediate ground the lead to the main chassis. Take care that the anode lead is kept away from cables components until it is discharged.

Step 4. Disconnect the four leads from the deflection plates at the CRT.

Step 5. Remove two screws from the bezel at the front of the instrument.

Step 6. Pull the CRT forward together with the shield and remove it from thechassis.

Step 7. To reinstall the CRT reverse the above procedure, being careful to check the shield positioning slot is in the correct (left side) location. The deflection plate leads color code should be in ascending order from bottom-right to top-left.

Front Panel Board

Step 1. Remove the cabinet as described in the "Cabinet" procedure.

Step 2. Remove the storage board as described in the "Storage Board" procedure.

Step 3. Remove the screw at the top-right holding the right chassis bracket to the front panel chassis.

Step 4. Pull the focus potentiometer extension shaft forward and remove it from the instrument.

Step 5. Remove six screws holding the front panel board to the front panel.

Step 6. Remove the knob from the cursor POSITION potentiometer.

Step 7. Pull the two VOLTS/DIV and one SEC/DIV knob forward and remove them from the shaft.

Step 8. Pull the six potentiometer knobs forward, by placing a soft screwdriver between the front panel and the knob, and remove from the front panel. (Take care not to damage the front panel)

Step 9. Lift the front panel board a little, move it backward and remove it from the chassis.

Step 10. To reinstall the front-panel board reverse the above procedure. Make sure that all push-button knobs are perpendicular to the board before placing the board back into the chassis. When trying to get the push-buttons through their respective holes guide the knobs with a sharp pin from front through the panel and work from the bottom row up to the top row. Make sure to mount first the potentiometer knobs, (for correct alignment of the board), before fastening the screws.

Front Panel Assembly

The front panel assembly can be removed and reinstalled as follows:

Step 1. Remove the cabinet as described in the "Cabinet" procedure.

Step 2. Remove the CRT as described in the "Cathode-Ray Tube" procedure.

Step 3. Pull the focus potentiometer extension shaft forward and remove it from the instrument.

Step 4. Remove the screw from the rear of the top-right corner of the bezel, holding the front panel chassis to the main chassis.

Step 5. Remove three screws holding the front panel chassis to the rest of the chassis.

Step 6. Pull the front panel assembly forward.

Step 7. To reinstall the front panel assembly reverse the above procedure, be careful to check that the flat cable is on the right side of the center chassis part and that front panel chassis is mounted inside the main chassis and chassis brackets.

Transformer

The transformer can be removed and reinstalled as follows:

Step 1. Remove the cabinet as described in the "Cabinet" procedure.

Step 2. Remove the storage board as described in the "Storage Board" procedure.

Step 3. Remove the main board as described in the "Main Board" procedure.

Step 4. Disconnect the connector from the power supply board.

Step 5. Remove the screw from the bottom of the transformer.

Step 6. Remove the transformer from the chassis.

Step 7. To reinstall the transformer reverse the above procedure, being careful to check the orientation of the transformer cable.

Fan Motor

The fan can be removed and reinstalled as follows:

Step 1. Remove the cabinet as described in the "Cabinet" procedure.

Step 2. Remove the storage board as described in the "Storage Board" procedure.

Step 3. Disconnect the fan cable (2 leads) from the power supply board and pull the cable through the hole to the left side of the central chassis.

Step 4. Remove the top screw holding the fan to the central chassis.

Step 5. Loosen the bottom screw holding the fan to the central chassis.

Step 6. Move the fan up and remove it from the chassis.

Step 7. To reinstall the fan reverse the above procedure. For easier access to the bottom screw it is necessary to remove the CRT (see the "Cathode-Ray Tube" procedure).

Power-On Extension Shaft

The power-on extension shaft can be removed and reinstalled as follows:

Step 1. Remove the cabinet as described in the "Cabinet" procedure.

Step 2. Remove the storage board as described in the "Storage Board" procedure.

Step 3. Remove the fan as described in the section entitled "Fan".

Step 4. Put the power-on extension shaft into the power-on position. Then disconnect the shaft by pulling it forward.

Step 5. Move the rear of the shaft through the hole of the central chassis, lift it up and remove it from the chassis with a little turning.

Step 6. To reinstall the power-on extension shaft reverse the above procedure.

Options and Accessories

This section describes the various options as well as the standard and optional accessories that are available for the 2212 Oscilloscope.

- Options
- Standard Accessories
- Optional Accessories

You can obtain additional information about instrument options, option availability, and other accessories by consulting the current Tektronix Product Catalog, or by contacting your local Tektronix Field Office or representative.

Options

Options A1 – A5 International Power Cords

Instruments are shipped with a detachable power-cord configuration ordered by the customer. Table 7-1 identifies the Tektronix part numbers for the available power cords and fuses.

Table 7-1: Power Cord Options

Option	Description	Tektronix Part Number
Standard		
(North American)	120 V, 60 Hz, 74 in.	161-0230-01
Fuse	1.0 A, 250 V, Slow	159-0019-00
Option A1		
(Universal Euro)	220 V, 50 Hz, 2.5 m	161-0104-06
Fuse	0.5 A, 250 V, Slow	159-0032-00
Option A2		
(United Kingdom)	240 V, 50 Hz, 2.5 m	161-0104-07
Fuse	0.5 A, 250 V, Slow	159-0032-00
Option A3		
(Australian)	240 V, 50 Hz, 2.5 m	161-0104-05
Fuse	0.5 A, 250 V, Slow	159-0032-00
Option A4		
(North American)	220 V, 50 Hz, 2.5 m	161-0104-08
Fuse	0.5 A, 250 V, Slow	159-0032-00
Option A5		
(Switzerland)	220 V, 50 Hz, 2.5 m	161-0167-00
Fuse	0.5 A, 250 V, Slow	159-0032-00

Warranty -Plus Service Options

The following options add to the services available with the standard warranty. (The standard warranty appears on the backside of the title page in this manual.)

- **Option M2**: When Option M2 is ordered, Tektronix provides five years of warranty/remedial service.
- **Option M8**: When Option M8 is ordered, Tektronix provides four calibrations and four performance verifications, one for each in the second through the fifth years of service.

Option 3R – Rackmounted Instrument

When ordered with Option 3R, the oscilloscope is shipped in a configuration that permits easy installation into a 19-inch-wide, electronic equipment rack. All hardware is supplied for mounting the instrument into the rack. Complete rack-mounting instructions are provided in a separate document (Tektronix part number 070-8650-00). These instructions also contain the procedures for converting a standard instrument into the Option 3R configuration by using the separately ordered rack-mounting conversion kit.

Option 10 (GPIB) – Option 10 provides a GPIB (General Purpose Interface Bus) communication interface. The interface implemented conforms to the specifications contained in *IEEE Standard Digital Interface for Programmable Instrumentation (ANSI/IEEE Std 488.2-1987).* It also complies with a Tektronix Standard relating to GPIB Codes, Formats, Conventions and Features 4-91. Operating information for the Option 10 GPIB interface is given in the *2212 Programmer Manual,* delivered with Option 10.

Option 12 (RS-232-C) – Option 12 provides an RS-232-C serial communications interface. The interface implemented conforms to RS-232-C specifications. The option provides DTE capability to hook up a printer, plotter, personal computer, or modem that may be encountered. Operating information for the Option 12 RS-232-C interface is given in the *2212 Programmer Manual,* delivered with Option 12.

Option 02 – With this option, Tektronix ships a front panel cover and accessories pouch with the instrument.

Option 05 – Video Option aids in examining composite video signals. All basic functions remain the same, but the menu is changed and a TV page is added. Features of this option include a sync separator, back-porch clamp circuitry, and TV coupling modes.

Option 1K – With this option, a Tektronix K212 Portable Instrument Cart is shipped with the instrument.

Option 1M – This option provides a maximum record length of 128K data points per acquisition (128K per channel).

Option 1T – With this option, Tektronix ships a Carrying Case with the instrument.

Option 23 – With this option, Tektronix ships additional two P6129B 1x /10x Readout Passive Voltage Probes with the instrument.

Standard Accessories

The following standard accessories are shipped with each 2212 (see Table 7-2).

Table 7-2: Standard Accessories

Qty	Description	Tektronix Part Number
2	10x Passive Probe	P6109B
1	Power Cord and Fuse	As Ordered
1	Loop Clamp	343-0003-00
1	Flat Washer	210-0803-00
1	Self-Tapping Screw	213-0882-00
1	User Manual	070-8438-00
1	Quick Reference	070-8592-00

Optional Accessories

The following optional accessories (see Table 7-3 through Table 7-9), are recommended for use with the 2212.

Table 7-3: Instrument Enhancements

Accessory	Tek Part Number
Front-panel Protective Cover	200-3397-00
Accessory Pouch	016-0677-02
Front-panel Protective Cover and Accessory Pouch	020-1514-00
Carrying Case	016-0792-01
CRT Light Filter, Clear	337-2775-01
Portable Instrument Cart	K212
25-Pin PC to Centronics Cable	012-1214-00
RS-232-C Cable	012-1423-00
Gender Changer	131-4923-00
GPIB Cable (1 meter)	012-0991-01
GPIB Cable (2 meter)	012-0991-00
2212 Service Manual	070-8439-00
2212 Programmer Manual	070-8440-00

Table 7-4: Viewing Hoods

Accessory	Tektronix Part Number
Collapsible	016-0592-00
Polarized	016-0180-00
Binocular	016-0566-00

Table 7-5: Fuses

Accessory	Tektronix Part Number
Fuse, 1.0 A, 250 V, 3AG, Slow	159-0019-00
Fuse, 0.5 A, 250 V, 3AG, Slow	159-0032-00

Table 7-6: Voltage Probes

Accessory	Tektronix Part Number
Differential 1X/10X Probe	P6046
Active Probe, 10X FET	P6202A
Active Probe Power Supply (for P6202A)	1101A
1X Probe	P6101B
10X Probe (1.5 m)	P6109 Opt 01
10XProbe	P6109B
10X Environmental	P6008
1X-10X Selectable	P6129B
100X High Voltage	P6009
1000X High Voltage	P6015
Ground Isolation Monitor	A6901
Isolator (for multiple independently referenced differential measurements)	A6902B

Table 7-7: Current Probes

Accessory	Tektronix Part Number
Low-Current (0.5 A) Probe	P6021
Low-Current (0.2 A) Probe	P6022
Current-Probe Amplifier (for P6021/P6022)	134
High-Current Probe (20 A)	A6302
High-Current Probe (100 A)	A6303
Current Probe Amplifier (for A6202/A6203)	AM503
A TM500/TM5000 Power Module for AM503	TM50xx

Table 7-8: Oscilloscope Cameras

Accessory	Tektronix Part Number
Low Cost Camera (with portables hood)	C-9 Option 20
Low Cost Camera with Flash Unit	C-9 Option 1F
Low Cost Camera with Autofilm Motorized Back	C-9 Option 1A
High-Performance Camera	C30BP Option 01

Table 7-9: Printers/Plotters

Accessory	Tektronix Part Number
Printer	HC200
Plotter	HC100 Opt. 02

Replaceable Electrical Parts

This section contains a list of the electrical parts that are replaceable for the 2212. Use this list to identify and order replacement parts.

Parts Ordering Information

Replacement parts are available from or through your local Tektronix, Inc. service center 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. Therefore, when ordering parts, it is important to include the following information in your order:

- Tektronix part number
- Instrument type or model number
- Instrument serial number
- Instrument modification number, if applicable.

If a part you order has been replaced with a different or improved part your local Tektronix service center or representative will contact you concerning any change in its part number.

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

List of Assemblies

A list of assemblies can be found at the beginning of the Electrical Parts List. The assemblies are listed in numerical order. When the complete component number of a part is known, this list will identify the assembly in which the part is located.

Cross Index- Mfr. Code Number to Manufacturer

The Manufacturer Code Number to Manufacturer index for the Electrical Parts List is located immediately after these pages. The Cross Index provides codes, names and addresses of manufacturers of components listed in the Electrical Parts List.

Abbreviations

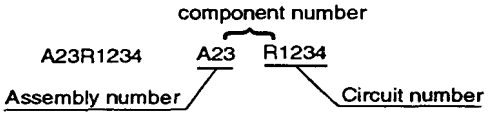
Abbreviations are conform to American National Standard Y1.1

Electrical Parts List

Component Number
(Column one of the Electrical Part List)

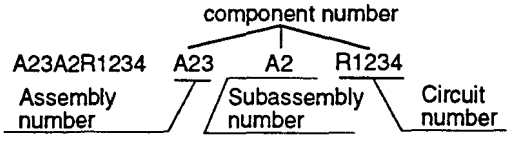
A numbering system has been used to identify assemblies, subassemblies and parts. Examples of this numbering system and typical expansions are illustrated by the following:

Example a :



Read : Resistor 1234 of Assembly 23

Example b:



Read : Resistor 1234 of Subassembly 2 of Assembly 23

Only the circuit number will appear on the diagrams and circuit board illustrations. Each diagram and circuit board illustration is clearly marked with the assembly number. Assembly numbers are also marked on the mechanical exploded views located in the Mechanical Parts List. The component number is obtained by adding the assembly number prefix to the circuit number.

The Electrical Parts List is divided and arranged by assemblies in numerical sequence (e.g., assembly A10 with its subassemblies and parts, precedes assembly A11 with its subassemblies and parts).

Chassis-mounted parts have no assembly number prefix and are located at the end of the Electrical Parts List.

Tektronix Part No.
(Column two of the Electrical Parts List)

Indicates part number to be used when ordering replacement part from Tektronix.

Serial/Model No.
(Column three and four of the Electrical Parts List)

Column three (3) indicates the serial number at which the part was first used. Column four (4) indicates the part number at which the part was removed. No serial number entered indicates the part is good for all serial numbers.

Name & Description
(Column five of the Electrical Parts List)

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.

Mfr. Code
(Column six of the Electrical Parts List)

Indicates the code number of the actual manufacturer of the part. (Code to name and address cross reference can be found immediately after this page.)

Mfr. Part Number
(Column seven of the Electrical Parts List)

Indicates actual manufacturers part number

Cross Index - Mfr. Code Number to Manufacturer

Mfr.	Manufacturer	Address	City, State Zip Code
D5243	ROEDERSTEIN E SPEZIALFABRIK FUER KONDENSATOREN GMBN	LUDMILLASTRASSE 23-25	8300 LANDSHUT GERMANY
K5856	RCA LTD BEECH HOUSE 373-399 LONDON ROAD	CAMBERLEY	SURREY ENGLAND
K7068	SILICONIX LTD MORRISTON	SWANSEA WALES	
K8788	PIHER INTERNATIONAL LTD	HORTON ROAD WEST DRAYTON	MIDDLESEX ENGLAND
K8996	MULLARD LIMITED	MULLARD HOUSE TORRINGTON PLACE	LONDON WC1E 7HD ENGLAND
22929	DALE ELECTRONICS CORP FREQUENCY CONTROL GROUP	1155 W 23RD ST	TEMPE AZ 85282-1822
S0319	MITSUBISHI ELECTRIC CORP	2-2-3 MARUNOUCHI CHIYODA-KU	TOKYO JAPAN
S3629	SCHURTER AG H C/O PANEL COMPONENTS CORP	2015 SECOND STREET	BERKELEY CA 94170
TK0AY	JAPAN SOLDERLESS TERMINAL MFG CO LTD 1-4-1 HIGASH I-MACHI	SHINSENRI TOYONAKA-CITY	OSAKA JAPAN
TK0DY	A F BULGIN & CO LTD	BYE PASS ROAD BARKING	ESSEX ENGLAND
TK0ED	COMPONENTS BUREAU UNIT 4	135 DITTON WAY	CAMBRIDGE ENGLAND
TK0GS	CLARE		HOLLAND
TK00A	G ENGLISH ELECTRONICS LTD	34 BOWATER ROAD	LONDON SE18 5TF ENGLAND
TK0213	TOPTRON CORP		TOKYO JAPAN
TK0515	EVOX-RIFA INC	100 TRI-STATE INTERNATIONAL SUITE 290	LINCOLNSHIRE IL 60015
TK1146	MITSUBISHI ELECTRIC CORP	1230 OAKMEAD PARKWAY	SUNNYVALE CA 94086
TK1727	PHILIPS NEDERLAND BV AFD ELONCO	POSTBUS 90050	5600 PB EINDHOVEN THE NETHERLANDS
TK1743	UNITRODE (UK) LTD	6 CRESSWELL PARK BLACKHEATH	LONDON SE 3 9RD ENGLAND
TK1864	INTERFET CORP	322 GOLD ST	GARLAND TX 75042
TK1935	ACCRA-FAB INC	11007 NE 37TH CIRCLE	VANCOUVER WA 98682

Cross Index - Mfr. Code Number to Manufacturer (cont.)

Mfr.	Manufacturer	Address	City, State Zip Code
TK2424	CHAMPION TECHNOLOGIES	2553 N EDGINGTON ST	FRANKLIN PARK IL 60131
0CVK3	ALLEGRO MICROSYSTEMS INC INTEGRATED CIRCUITS DIV	115 NE CUTOFF	WORCHESTER MA 01606
0JR03	ZMAN MAGNETICS INC	7633 S 180th	KENT WA 98032
0JR04	TOSHIBA AMERICA INC ELECTRONICS COMPONENTS DIV BUSINESS SECTOR	2692 DOW AVE	TUSTIN CA 92680
0J9R5	MARCON AMERICA CORP	3 PEARL COURT	ALLENDALE NJ 07401
00779	AMP INC	2800 FULLING MILL PO BOX 3608	HARRISBURG PA 17105
00815	NEL FREQUENCY CONTROLS INC	357 BELOIT ST	BURLINGTON WI 53105-2053
01121	ALLEN-BRADLEY CO	1201 S 2ND ST	MILWAUKEE WI 53204-2410
01295	TEXAS INSTRUMENTS INC SEMICONDUCTOR GROUP	13500 N CENTRAL EXPY PO BOX 655012	DALLAS TX 75265
04222	AVX CERAMICS DIV OF AVX CORP	19TH AVE SOUTH P O BOX 867	MYRTLE BEACH SC 29577
04713	MOTOROLA INC SEMICONDUCTOR PRODUCTS SECTOR	5005 E MCDOWELL RD	PHOENIX AZ 85008-4229
06001	GENERAL ELECTRIC CO ELECTRONIC CAPACITOR PRODUCT SECTION	P O BOX 1388	COLUMBIA SC 29202
07716	TRW INC TRW IRC FIXED RESISTORS/BURLINGTON	2850 MT PLEASANT AVE	BURLINGTON IA 52601
1W344	UNITED CHEMI-CON INC	9801 W HIGGINS SUITE 430	ROSEMONT IL 60018-4704
11236	CTS CORP BERNE DIV THICK FILM PRODUCTS GROUP	406 PARR ROAD	BERNE IN 46711-9506
12954	MICROSEMI CORP - SCOTTSDALE	8700 E THOMAS RD P O BOX 1390	SCOTTSDALE AZ 85252
14552	MICROSEMI CORP	2830 S FAIRVIEW ST	SANTA ANA CA 92704-5948
18324	SIGNETICS CORP MILITARY PRODUCTS DIV	4130 S MARKET COURT	SACRAMENTO CA 95834-1222
18796	MURATA ERIE NORTH AMERICAN INC STATE COLLEGE OPERATIONS	1900 W COLLEGE AVE	STATE COLLEGE PA 16801-2723
19396	ILLINOIS TOOL WORKS INC PAKTRON DIV	1205 MCCONVILLE RD PO BOX 4539	LYNCHBURG VA 24502-4535

Cross Index - Mfr. Code Number to Manufacturer (cont.)

Mfr.	Manufacturer	Address	City, State Zip Code
19701	PHILIPS COMPONENTS DISCRETE PRODUCTS DIV RESISTIVE PRODUCTS FACILITY AIRPORT ROAD	PO BOX 760	MINERAL WELLS TX 76067-0760
22526	DU PONT E I DE NEMOURS AND CO INC	515 FISHING CREEK RD	NEW CUMBERLAND PA 17070-3007
22929	DALE ELECTRONICS CORP FREQUENCY CONTROL GROUP	1155 W 23RD ST	TEMPE AZ 85282-1822
24165	SPRAGUE ELECTRIC CO	267 LOWELL ROAD	HUDSON NH 03051
24355	ANALOG DEVICES INC	RT 1 INDUSTRIAL PK PO BOX 9106	NORWOOD MA 02062
24546	BRADFORD ELECTRONICS	550 HIGH ST	BRADFORD PA 16701-3737
25403	PHILIPS COMPONENTS DISCRETE PRODUCTS DIV DISCRETE SEMICONDUCTOR GROUP	GEORGE WASHINGTON HWY	SMITHFIELD RI 02917
27014	NATIONAL SEMICONDUCTOR CORP	2900 SEMICONDUCTOR DR	SANTA CLARA CA 95051-0606
27264	MOLEX INC	2222 WELLINGTON COURT	LISLE IL 60532-1613
31433	KEMET ELECTRONICS CORP NATIONAL SALES HEADQUARTERS	PO BOX 5928	GREENVILLE SC 29606
31918	ITT SCHADOW INC	8081 WALLACE RD	EDEN PRAIRIE MN 55344-2224
33095	SPECTRUM CONTROL INC	2185 W WEIGHT ST	ERIE PA 16505
34371	HARRIS CORP 200 PALM BAY BLVD HARRIS SEMICONDUCTOR PRODUCTS GROUP	MELBOURNE FL 32919 PO BOX 883	
50088	SGS-THOMSON MICROELECTRONICS INC	1310 ELECTRONICS DR	CARROLLTON TX 75006-6905
50434	HEWLETT-PACKARD CO OPTOELECTRONICS DIV	370 W TRIMBLE RD	SAN JOSE CA 95131
51406	MURATA ERIE NORTH AMERICA INC HEADQUARTERS AND GEORGIA OPERATIONS	2200 LAKE PARK DR	SMYRNA GA 30080
52763	STETCO INC	3344 SCHIERHORN	FRANKLIN PARK IL 60131
54583	TDK ELECTRONICS CORP	12 HARBOR PARK DR	PORT WASHINGTON NY 11550
55680	NICHICON /AMERICA/ CORP	927 E STATE PKY	SCHAUMBURG IL 60195-4526
57027	INTERNATIONAL RESISTIVE PRODUCTS INC	4222 S TAPLES	CORPUS CHRISTI TX 78411-2702
57668	ROHM CORP	8 WHATNEY PO BOX 19515	IRVINE CA 92713
58050	TEKA PRODUCTS INC	45 SALEM ST	PROVIDENCE RI 02907
60395	XICOR INC	851 BUCKEYE CT	MILPITAS CA 95035-7408
60705	CERA-MITE CORPORATION	1327 6TH AVE	GRAFTON WI 53024-1831
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077-0001
84411	AMERICAN SHIZUKI CORP OGALLALA OPERATIONS	301 WEST O ST	OGALLALA NE 69153-1844
91637	DALE ELECTRONICS INC	2064 12TH AVE PO BOX 609	COLUMBUS NE 68601-3632
96733	SFE TECHNOLOGIES	1501 FIRST ST	SAN FERNANDO CA 91340-2707

Replaceable Board Assembly List

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A10	671-2427-00		700300	Main Board	80009	671242700
A10	671-2427-01	700301	700500	Main Board	80009	671242700
A10	671-2427-02	700501		Main Board	80009	671242700
A10	671-2427-03	702800		Main Board	80009	671242703
A11	671-2426-00			Power Board	80009	671242600
A12	671-2428-00		700300	Front Board	80009	671242800
A12	671-2428-01	700301		Front Board	80009	671242801
A14	119-5031-00			Daculator Piggy Back Board	80009	119503100
A15	671-2429-01			Processor Board	80009	671242901
A15	671-2429-03		702799	Processor Board	80009	671242903
A15	671-2429-04	702800		Processor Board	80009	671242904
A16	671-2430-00			RS-232-C Serial Interface Board	80009	671243000
A17	671-2431-00			GPIB Interface Board	80009	671243100
A20	671-2912-00			Processor Board (Option 1M only)	80009	671291200
A25	671-2793-00			Circuit Bd Assy: Video (Option 05 only)	80009	671279300

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
				Replaceable Part List per Board Assembly		
A10	671-2427-00		700300	Main Board	80009	671242700
A10	671-2427-01	700301	700500	Main Board	80009	671242701
A10	671-2427-02	700501	702799	Main Board	80009	671242702
A10	671-2427-03	702800		Main Board	80009	671242703
A10AT100	119-4445-00			CKT BD SUBASSY:ATTENUATOR,ELEC, PROGRAMMABLE,APR3051-Y0001	80009	119444500
A10AT150	119-4445-00			CKT BD SUBASSY:ATTENUATOR,ELEC, PROGRAMMABLE,APR3051-Y0001	80009	119444500
A10C100	283-0000-00			CAP,FXD,CER DI:0.001UF,+100-0%,500V	51406	DD06450Y5U102P5
A10C102	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C103	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C104	281-0774-00			CAP,FXD,CER DI:0.022MFD,20%,100V	04222	SA101E223MAA
A10C105	281-0774-00			CAP,FXD,CER DI:0.022MFD,20%,100V	04222	SA101E223MAA
A10C106	281-0865-00			CAP,FXD,CER DI:1000PF,5%,100V	04222	SA201A102JAA
A10C107	290-0973-01			CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	0J9R5	CEUSM1V101
A10C108	290-0973-01			CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	0J9R5	CEUSM1V101
A10C110	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C111	281-0757-00			CAP,FXD,CER DI:10PF,20%,100V TUBULAR,MI	04222	SA102A100MAA
A10C112	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C113	281-0774-00			CAP,FXD,CER DI:0.022MFD,20%,100V	04222	SA101E223MAA
A10C114	281-0774-00			CAP,FXD,CER DI:0.022MFD,20%,100V	04222	SA101E223MAA
A10C129	281-0904-00			CAP,FXD,CER DI:12PF,10%	04222	SA102A12OJAA
A10C130	290-0768-00			CAP,FXD,ELCTLT:10UF,20%,100V	80009	290076800
A10C131	281-0810-00			CAP,FXD,CER DI:5.6PF,10%	04222	SA102A5R6JAA
A10C132	281-0925-00			CAP,FXD,CER DI:0.22UF,20%,50V	04222	SA105E224MAA
A10C134	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C135	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C136	281-0759-00			AP,FXD,CER DI:22PF,10%,100V	04222	SA102A220KAA
A10C137	290-0187-00			CAP,FXD,ELCTLT:4.7UF,20%,35V	12954	ST513B475M035N
A10C138	290-0187-00			CAP,FXD,ELCTLT:4.7UF,20%,35V	12954	ST513B475M035N
A10C139	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C140	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C142	281-0816-00			CAP,FXD,CER DI: 82PF,5%,100V	04222	SA102A820JAA
A10C150	283-0000-00			CAP,FXD,CER DI:0.001UF,+100-0%,500V	51406	DD06450Y5U102P5
A10C152	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C153	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C154	281-0774-00			CAP,FXD,CER DI:0.022MFD,20%,100V	04222	SA101E223MAA
A10C155	281-0774-00			CAP,FXD,CER DI:0.022MFD,20%,100V	04222	SA101E223MAA
A10C156	281-0865-00			CAP,FXD,CER DI:1000PF,5%,100V	04222	SA201A102JAA
A10C157	290-0973-01			CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	0J9R5	CEUSM1V101
A10C159	290-0973-01			CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	0J9R5	CEUSM1V101
A10C160	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C161	281-0757-00			CAP,FXD,CER DI:10PF,20%,100V TUBULAR,MI	04222	SA102A100MAA
A10C162	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C163	281-0774-00			CAP,FXD,CER DI:0.022MFD,20%,100V	04222	SA101E223MAA
A10C164	281-0774-00			CAP,FXD,CER DI:0.022MFD,20%,100V	04222	SA101E223MAA
A10C165	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C179	281-0904-00			CAP,FXD,CER DI:12PF,10%	04222	SA102A12OJAA
A10C180	290-0768-00			CAP,FXD,ELCTLT:10UF,20%,100V	80009	290076800
A10C181	281-0810-00			CAP,FXD,CER DI:5.6PF,10%	04222	SA102A5R6JAA
A10C183	281-0925-00			CAP,FXD,CER DI:0.22UF,20%,50V	04222	SA105E224MAA
A10C184	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C185	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A10C186	281-0759-00			CAP,FXD,CER DI:22PF,10%,100V	04222	SA102A220KAA
A10C187	290-0187-00			CAP,FXD,ELCTLT:4.7UF,20%,35V	12954	ST513B475M035N
A10C188	290-0187-00			CAP,FXD,ELCTLT:4.7UF,20%,35V	12954	ST513B475M035N
A10C189	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C190	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C192	281-0816-00			CAP,FXD,CER DI:82PF,5%,100V	04222	SA102A820JAA
A10C195	290-0963-00			CAP,FXD,ELCTLT:220UF,+50-20%,25WVDC	1W344	SME35VB221M10X1
A10C202	281-0758-00			CAP,FXD,CER DI:15PF,20%,100V	04222	SA102A150MAA
A10C270	281-0861-00			CAP,FXD,CER DI:270PF,5%,50V	04222	SA101A271JAA
A10C271	281-0861-00			CAP,FXD,CER DI:270PF,5%,50V	04222	SA101A271JAA
A10C274	281-0861-00			CAP,FXD,CER DI:270PF,5%,50V	04222	SA101A271JAA
A10C275	281-0861-00			CAP,FXD,CER DI:270PF,5%,50V	04222	SA101A271JAA
A10C281	281-0765-00			CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A10C282	281-0765-00			CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A10C283	281-0777-00			CAP,FXD,CER DI:51PF,5%,100V	04222	SA102A510JAA
A10C284	281-0777-00			CAP,FXD,CER DI:51PF,5%,100V	04222	SA102A510JAA
A10C290	290-0973-00			CAP,FXD,ELCTLT:100UF,20%,25VDC	0J9R5	CEUSM1E101
A10C291	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C300	281-0865-00			CAP,FXD,CER DI:1000PF,5%,100V	04222	SA201A102JAA
A10C301	281-0776-00			CAP,FXD,CER DI:120PF,5%,100V	04222	SA102A121JAA
A10C302	281-0777-00			CAP,FXD,CER DI:51PF,5%,100V	04222	SA102A510JAA
A10C303	281-0936-00			CAP,FXD,CER DI:39PF,5%,100V	04222	SA102A390JAA
A10C304	281-0167-00			CAP,VAR,CER DI:9-45PF,200V	33095	53-717-001 D9-4
A10C305	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C318	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C322	281-0903-00			CAP,FXD,CER DI:3.9PF,100V	04222	SA102A3R9DAA
A10C336	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C337	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	TK1743	CGB101KEN
A10C338	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	TK1743	CGB101KEN
A10C341	281-0904-00			CAP,FXD,CER DI:12PF,10%	04222	SA102A12OJAA
A10C342	281-0707-01			CAP,FXD,CER DI:15000PF,20%,100V	04222	MA201C153MAA
A10C402	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V,, TUBULAR,MI	TK1743	CGB103KEX
A10C403	290-0183-00			CAP,FXD,ELCTLT:1UF,10%,35V	12954	AT513A105K035N
A10C404	281-0820-00			CAP,FXD,CER DI:680 PF,10%,50V	04222	SA101C681KAA
A10C405	281-0820-00			CAP,FXD,CER DI:680 PF,10%,50V	04222	SA101C681KAA
A10C406	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V,, TUBULAR,MI	TK1743	CGB103KEX
A10C407	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V,, TUBULAR,M	TK1743	CGB103KEX
A10C408	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	TK1743	CGB101KEN
A10C410	281-0761-00			CAP,FXD,CER DI:27PF,5%,100V	04222	SA102A270JAA
A10C411	290-0846-00			CAP,FXD,ELCTLT:47UF,+75-20%,35V	0J9R5	CEUSM1J470
A10C412	290-0768-00			CAP,FXD,ELCTLT:10UF,20%,100V	80009	290076800
A10C413	290-0846-00			CAP,FXD,ELCTLT:47UF,+75-20%,35V	0J9R5	CEUSM1J470
A10C414	290-0768-00			CAP,FXD,ELCTLT:10UF,20%,100V	80009	290076800
A10C415	281-0563-00			CAP,FXD,CER DI:0.47UF,20%,50V	0422	SA305E474MAA
A10C416	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C420	283-1054-00			CAP,FXD,CERAMIC:MLC,5.6PF,+/-0.25PF,500V	80009	283105400
A10C421	283-1054-00			CAP,FXD,CERAMIC:MLC,5.6PF,+/-0.25PF,500V	80009	283105400
A10C422	281-0786-00			CAP,FXD,CER DI:150PF,10%,100V	04222	SA101A151KAA

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A10C423	283-0000-00			CAP,FXD,CER DI:0.001UF,+100-0%,500V	51406	DD06450Y5U102P5
A10C424	281-0759-00			CAP,FXD,CER DI:22PF,10%,100V	04222	SA102A220KAA
A10C425	283-1054-00			CAP,FXD,CERAMIC:MLC,5.6PF,+/-0.25PF,500V	80009	283105400
A10C427	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C428	281-0865-00			CAP,FXD,CER DI:1000PF,5%,100V	04222	SA201A102JAA
A10C429	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C430	281-0765-00			CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A10C431	281-0765-00			CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A10C432	281-0765-00			CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A10C433	281-0765-00			CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A10C434	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C435	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C436	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C437	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C438	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C439	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C440	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C441	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C442	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C452	290-0768-00			CAP,FXD,ELCTLT:10UF,20%,100V	80009	290076800
A10C453	290-0768-00			CAP,FXD,ELCTLT:10UF,20%,100V	80009	290076800
A10C454	281-0904-00			CAP,FXD,CER DI:12PF,5%,100V	04222	SA102A120JAA
A10C500	290-0183-00			CAP,FXD,ELCTLT:1UF,10%,35V	24165	173D105X9035V
A10C501	281-0909-00			CAP,FXD,CER DI:0.022UF,20%,50V	04222	SA105C223MAA
A10C502	281-0909-00			CAP,FXD,CER DI:0.022UF,20%,50V	04222	SA105C223MAA
A10C503	281-0909-00			CAP,FXD,CER DI:0.022UF,20%,50V	04222	SA105C223MAA
A10C504	290-0264-00			CAP,FXD,ELCTLT:0.22UF,10%,35V	24165	173D224X9035U
A10C505	281-0909-00			CAP,FXD,CER DI:0.022UF,20%,50V	04222	SA105C223MAA
A10C506	290-0183-00			CAP,FXD,ELCTLT:1UF,10%,35V	12954	AT513A105K035N
A10C507	281-0823-00			CAP,FXD,CER DI:470PF,10%,50V	04222	SA101A471KAA
A10C508	281-0761-00			CAP,FXD,CER DI:27PF,5%,100V	04222	SA102A270JAA
A10C509	281-0814-00			CAP,FXD,CER D:I00PF,10%,100V	04222	SA101A101KAA
A10C550	281-0925-01			CAP,FXD,:CERAMIC,MLC;0.22UF,20%,50V, Z5U.0.170 X 0.120	04222	SA115E224MAA
A10C551	281-0925-01			CAP,FXD,:CERAMIC,MLC;0.22UF,20%,50V, Z5U.0.170 X 0.120	04222	SA115E224MAA
A10C552	281-0909-00			CAP,FXD,CER DI:0.022UF,20%,50V	04222	SA105C223MAA
A10C553	281-0909-00			CAP,FXD,CER DI:0.022UF,20%,50V	04222	SA105C223MAA
A10C554	285-1408-00			CAP,FXD,MTLZD:10UF,1%,250V,AXIAL,TUB,MI	TK0ED	ORDER BY DESC
A10C555	285-1409-00			CAP,FXD,MTLZD:1UF,1%,160V,AXIAL,TUB,MI	TK0ED	ORDER BY DESC
A10C556	281-0761-00			CAP,FXD,CER DI:27PF,5%,100V	04222	SA102A270JAA
A10C557	281-0777-00			CAP,FXD,CER DI:51PF,5%,100V	04222	SA102A510JAA
A10C558	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C559	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C562	290-0187-00			CAP,FXD,ELCTLT:4.7UF,20%,35V	12954	ST513B475M035N
A10C563	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	TK1743	CGB101KEN
A10C564	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C602	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C603	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C604	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C605	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C606	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA

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A10C607	290-0768-00			CAP,FXD,ELCTLT:10UF,20%,100V	80009	290076800
A10C608	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V,, TUBULAR,MI	TK1743	CGB103KEX
A10C611	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C612	281-0786-00			CAP,FXD,CER DI:150PF,10%,100V	04222	SA101A151KAA
A10C613	290-0768-00			CAP,FXD,ELCTLT:10UF,20%,100V	80009	290076800
A10C701	281-0771-00			CAP,FXD,CER DI:2200PF,20%,200V	04222	SA102C222MAA
A10C702	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C710	281-0214-00			CAP,VAR,CER DI:0.6-3PF,400V	52763	313613-140
A10C720	285-1101-00			CAP,FXD,PLASTIC:0.022UF,10%,200V	19396	223K02PT485
A10C721	281-0771-00			CAP,FXD,CER DI:2200PF,20%,200V	04222	SA102C222MAA
A10C760	281-0214-00			CAP,VAR,CER DI:0.6-3PF,400V	52763	313613-140
A10C770	285-1101-00			CAP,FXD,PLASTIC:0.022UF,10%,200V	19396	223K02PT485
A10C771	281-0771-00			CAP,FXD,CER DI:2200PF,20%,200V	04222	SA102C222MAA
A10C800	281-0767-00			CAP,FXD,CER DI:330PF,20%,100V	04222	SA102C331MAA
A10C802	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C803	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C804	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C810	290-0973-01			CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	0J9R5	CEUSM1V101
A10C901	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C902	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C903	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C904	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C905	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C906	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C907	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C908	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C910	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C911	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C950	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C951	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C952	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C953	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C954	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C955	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C956	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C957	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C958	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C959	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C960	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C961	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C962	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C963	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C964	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C965	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C966	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C967	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C969	290-0973-01			CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	0J9R5	CEUSM1V101
A10C970	290-0973-01			CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	0J9R5	CEUSM1V101
A10C980	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V,, TUBULAR,MI	TK1743	CGB103KEX
A10C990	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA

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A10C991	290-0973-01			CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	0J9R5	CEUSM1V101
A10C992	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C993	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C994	290-0973-01			CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	0J9R5	CEUSM1V101
A10C995	290-0973-01			CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	0J9R5	CEUSM1V101
A10C996	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C1200	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C1201	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C1220	281-0772-00			CAP,FXD,CER DI:4700PF,10%,100V	04222	SA101C472KAA
A10C1221	281-0768-00			CAP,FXD,CER DI:470PF,20%,100V	04222	SA101A471KAA
A10C1222	281-0783-00			CAP,FXD,CER DI:0.1 UF 20%,100V	04222	SA301E104MAA
A10C1223	281-0783-00			CAP,FXD,CER DI:0.1 UF 20%,100V	04222	SA301E104MAA
A10C1224	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C1225	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C1226	281-0783-00			CAP,FXD,CER DI:0.1 UF 20%,100V	04222	SA301E104MAA
A10C1227	281-0767-00			CAP,FXD,CER DI:330PF,20%,100V	04222	SA102C331MAA
A10C1233	283-0279-00			CAP,FXD,CER DI:0.001UF,20%,3000V	18796	DHR12Y5S102M3KV
A10C1234	283-0105-00			CAP,FXD,CER DI:0.01UF,+80-20%,2000V	60705	564CBA202IP203Z
A10C1236	281-0783-00			CAP,FXD,CER DI:0.1 UF 20%,100V	04222	SA301E104MAA
A10C1237	281-0783-00			CAP,FXD,CER DI:0.1 UF 20%,100V	04222	SA301E104MAA
A10C1238	281-0783-00			CAP,FXD,CER DI:0.1 UF 20%,100V	04222	SA301E104MAA
A10C1239	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A10C1240	281-0538-00			CAP,FXD,CER DI:1PF,20%,500V	54583	DA12COG2H010M
A10CR100	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR101	152-0323-01			SEMICOND DVC,DI:SW,SI,50V,25PA AT 20V,20PF,DO-35	14552	MT5127
A10CR150	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR151	152-0323-01			SEMICOND DVC,DI:SW,SI,50V,25PA AT 20V, 20PF,DO-35	14552	MT5127
A10CR152	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR153	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR154	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR155	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR204	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR205	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR211	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR270	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR271	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR272	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR273	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR275	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR276	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR277	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR278	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR283	152-0322-00			DIODE,SIG:SCHTKY,;15V,1.2PF,0.410MV VF @ 1MA	50434	5082-2672-T25
A10CR284	152-0322-00			DIODE,SIG:SCHTKY,;15V,1.2PF,0.410MV VF @ 1MA	50434	5082-2672-T25
A10CR308	152-0422-00			DIODE,SIG:,VVC;25V,7.7PF	04713	SMV1264RL
A10CR309	152-0422-00			DIODE,SIG:,VVC;25V,7.7PF	04713	SMV1264RL
A10CR400	152-0323-01			SEMICOND DVC,DI:SW,SI,50V,25PA AT 20V,20PF,DO-35	14552	MT5127

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A10CR402	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR403	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR404	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR500	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR501	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR601	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR602	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR603	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR604	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR605	152-0322-00			DIODE,SIG:SCHTKY,;15V,1.2PF,0.410MV VF @ 1MA	50434	5082-2672-T25
A10CR606	152-0322-00			DIODE,SIG:SCHTKY,;15V,1.2PF,0.410MV VF @ 1MA	50434	5082-2672-T25
A10CR607	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR608	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR609	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR610	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR611	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR701	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR751	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR920	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR921	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR922	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR923	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR924	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR1200	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR1201	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR1202	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR1203	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR1204	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR1205	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR1206	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR1207	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR1208	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR1209	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR1210	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR1211	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR1212	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR1216	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR1220	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR1221	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A10CR1222	152-0242-00			DIODE,SIG:,;225V,200MA	14552	MT5129
A10CR1223	152-0242-00			DIODE,SIG:,;225V,200MA	14552	MT5129
A10CR1224	152-0242-00			DIODE,SIG:,;225V,200MA	14552	MT5129
A10CR1225	152-0242-00			DIODE,SIG:,;225V,200MA	14552	MT5129
A10DS1201	150-0035-00			LAMP,GLOW:90V MAX,0.3MA,AID-T,WIRE LD	TK0213	JH005/3011JA
A10DS1202	150-0035-00			LAMP,GLOW:90V MAX,0.3MA,AID-T,WIRE LD	TK0213	JH005/3011JA
A10J400	131-3378-00			CONN,RF JACK:BNC,;50 OHM,FEMALE,RTANG, PCB/REAR PNL,0.5-28 THD,0.625 H X 0.187 TAIL,W/O	00779	227677-1
A10J904	131-3464-00			CONTACT,ELEC:BRASS	TK1935	ORDER BY DESC

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A10J1001	131-5502-00			CONN,RCPT,ELEC:,;MINI,PCB,PRESSFIT,FEM, STR20 POS,DIM:24,13 X 27,4MM,H=4MM, TIN PLATEULE28476	80009	131550200
A10J1003	131-5511-00			CONN,HDR:PCB,;MALE,STR,1 X 8,0.156 CTR, 0.045 SQ,TIN	80009	131551100
A10J1006	131-5510-00			CONN,HSG:PCO,PRESSFIT,FEMALE,STR, 4 POS,DIM3,81X7,1MM,4MM H,TIN PLATE, ULE28476	80009	131551000
A10J1007	131-1857-00			CONN,HDR:PCB,;MALE,STR,1 X 36, 0.1 CTR,0.230	58050	082-3644-SS10
A10J1008	131-1857-00	702800		.333 INTCON SYST MTSST 36P	58050	082-3644-SS10
A10J1009	131-1857-00	702800		.333 INTCON SYST MTSST 36P	58050	082-3644-SS10
A10J1010	131-1857-00	702800		.333 INTCON SYST MTSST 36P	58050	082-3644-SS10
A10K100	148-0213-00			RELAY,ARM:2 FORM C,3V,22,5 OHMS	TK0GS	LM44B00
A10K150	148-0213-00			RELAY,ARM:2 FORM C,3V,22,5 OHMS	TK0GS	LM44B00
A10K400	148-0213-00			RELAY,ARM:2 FORM C,3V,22,5 OHMS	TK0GS	LM44B00
A10L110	108-1375-00			COIL,RF:FXD,82UH,1A	TK00A	RL-1218-820K-1A
A10L320	276-0528-00			SHLD BEAD,ELEK:FERRAMIC	0JR03	276-0528-00
A10L321	276-0528-00			SHLD BEAD,ELEK:FERRAMIC	0JR03	276-0528-00
A10L800	120-1631-00			COIL,RF:FXD,210UH	TK00A	ORDER BY DESC
A10LR334	108-0777-00			COIL,RF:FIXED,93NH,15%	0JR03	108-0777-00
A10LR335	108-0777-00			COIL,RF:FIXED,93NH,15%	0JR03	108-0777-00
A10P1010A	131-0993-00	702800		CON JUMPER	80009	131099300
A10P1010B	131-0993-00	702800		CON JUMPER	80009	131099300
A10Q100	151-1235-00			TRANSISTOR,SIG:JFET,N-CH;DUAL HYBRID	K7068	2N5911
A10Q101	151-0216-00			TRANSISTOR,SIG:BIPOLAR,PNP;25V,100MA, 170MHZ,AMPLIFIER	04713	MPS6523
A10Q101	151-0216-04		702799	TRANSISTOR,SIG:BIPOLAR,PNP;25V,100MA, 170MHZ,AMPLIFIER	80009	151021604
A10Q101	151-0276-01	702800		TRA PNP 2N5087	80009	151027601
A10Q102	151-0190-00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA, 300MHZ,AMPLIFIER	04713	2N3904
A10Q103	151-0188-00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA, 250MHZ,AMPLIFIER	04713	2N3906
A10Q104	151-0190-00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA, 300MHZ,AMPLIFIER	04713	2N3904
A10Q105	151-0188-00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA, 250MHZ,AMPLIFIER	04713	2N3906
A10Q150	151-1235-00			TRANSISTOR,SIG:JFET,N-CH;DUAL HYBRID	K7068	2N5911
A10Q151	151-0216-00			TRANSISTOR,SIG:BIPOLAR,PNP;25V,100MA, 170MHZ,AMPLIFIER	04713	MPS6523
A10Q151	151-0216-04		702799	TRANSISTOR,SIG:BIPOLAR,PNP;25V,100MA, 170MHZ,AMPLIFIER	80009	151021604
A10Q101	151-0276-01	702800		TRA PNP 2N5087	80009	151027601
A10Q152	151-0190-00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA, 300MHZ,AMPLIFIER	04713	2N3904
A10Q153	151-0188-00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA, 250MHZ,AMPLIFIER	04713	2N3906
A10Q154	151-0190-00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA, 300MHZ,AMPLIFIER	04713	2N3904
A10Q155	151-0188-00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA, 250MHZ,AMPLIFIER	04713	2N3906
A10Q200	151-0192-00			TRANSISTOR,SIG:BIPOLAR,NPN;25V,100MA, 200MHZ,AMPLIFIER	04713	SPS8801
A10Q201	151-0192-00			TRANSISTOR,SIG:BIPOLAR,NPN;25V,100MA, 200MHZ,AMPLIFIER	04713	SPS8801

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A10Q202	151-0221-00			TRANSISTOR,SIG:BIPOLAR,PNP;12V,80MA, SWITCHING	04713	MPS4258(EL8345)
A10Q203	151-0221-00			TRANSISTOR,SIG:BIPOLAR,PNP;12V,80MA, SWITCHING	04713	MPS4258(EL8345)
A10Q206	151-0711-00			TRANSISTOR,SIG:BIPOLAR,NPN;25V,50MA, 650MHZ AMPLIFIER	04713	MPSH10
A10Q207	151-0711-00			TRANSISTOR,SIG:BIPOLAR,NPN;25V,50MA, 650MHZ AMPLIFIER	04713	MPSH10
A10Q208	151-0221-00			TRANSISTOR,SIG:BIPOLAR,PNP;12V,80MA, SWITCHING	04713	MPS4258(EL8345)
A10Q209	151-0221-00			TRANSISTOR,SIG:BIPOLAR,PNP;12V,80MA, SWITCHING	04713	MPS4258(EL8345)
A10Q210	151-0188-00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA, 250MHZ,AMPLIFIER	04713	2N3906
A10Q211	151-0190-00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA, 300MHZ,AMPLIFIER	04713	2N3904
A10Q214	151-0190-00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA, 300MHZ,AMPLIFIER	04713	2N3904
A10Q215	151-0190-00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA, 300MHZ,AMPLIFIER	04713	2N3904
A10Q320	151-0271-00			TRANSISTOR,SIG:BIPOLAR,PNP;15V,30MA ,2.0GHZ,AMPLIFIER	04713	MPSH69
A10Q321	151-0271-00			TRANSISTOR,SIG:BIPOLAR,PNP;15V,30MA, 2.0GHZ, AMPLIFIER	04713	MPSH69
A10Q322	151-0752-00			TRANSISTOR,SIG:BIPOLAR,NPN;15V,75MA, 4.0GHZ, AMPLIFIER,PHILIPS ONLY	25403	BFR96
A10Q323	151-0752-00			TRANSISTOR,SIG:BIPOLAR,NPN;15V,75MA,4 .0GHZ, AMPLIFIER,PHILIPS ONLY	25403	BFR96
A10Q324	151-0451-00			TRANSISTOR:NPN,SI,TO-39	04713	SRF503
A10Q325	151-0451-00			TRANSISTOR:NPN,SI,TO-39	04713	SRF503
A10Q400	151-0216-00			TRANSISTOR,SIG:BIPOLAR,PNP;25V,100MA, 170MHZ,AMPLIFIER	04713	MPS6523
A10Q400	151-0216-04		702799	TRANSISTOR,SIG:BIPOLAR,PNP;25V,100MA, 170MHZ,AMPLIFIER	80009	151021604
A10Q400	151-0276-01	702800		TRA PNP 2N5087	80009	151027601
A10Q401	151-1042-00			TRANSISTOR,SIG:JFET,N-CH;6V,10-15MA, 4.5MS,IDSS(1-2)<0.5MA,AMPLIFIER	04713	SPF627M2
A10Q402	151-1042-00			TRANSISTOR,SIG:JFET,N-CH;6V,10-15MA, 4.5MSIDSS(1-2)<0.5MA,AMPLIFIER	04713	SPF627M2
A10Q500	151-0188-00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA, 250MHZ,AMPLIFIER	04713	2N3906
A10Q501	151-0188-00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA, 250MHZ,AMPLIFIER	04713	2N3906
A10Q502	151-0190-00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA, 300MHZ,AMPLIFIER	04713	2N3904
A10Q503	151-0188-00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA, 250MHZ,AMPLIFIER	04713	2N3906
A10Q504	151-0188-00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA, 250MHZ,AMPLIFIER	04713	2N3906
A10Q505	151-0188-00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA, 250MHZ,AMPLIFIER	04713	2N3906
A10Q506	151-0188-00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA, 250MHZ,AMPLIFIER	04713	2N3906
A10Q507	151-0711-00			TRANSISTOR,SIG:BIPOLAR,NPN;25V,50MA, 650MHZ AMPLIFIER	04713	MPSH10
A10Q508	151-0711-00			TRANSISTOR,SIG:BIPOLAR,NPN;25V,50MA, 650MHZ AMPLIFIER	04713	MPSH10
A10Q509	151-0711-00			TRANSISTOR,SIG:BIPOLAR,NPN;25V,50MA, 650MHZ AMPLIFIER	04713	MPSH10

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A10Q550	151-0254-00			TRANSISTOR,SIG:BIPOLAR,NPN;30V,500MA, 125MHZ,AMPLIFIER,DARLINGTON	0JR04	MPS-A14
A10Q551	151-0276-01			TRANSISTOR,SIG:BIPOLAR,PNP;50V,50MA, 40MHZ,AMPLIFIER	04713	2N5087RLRP
A10Q552	151-0711-00			TRANSISTOR,SIG:BIPOLAR,NPN;25V,50MA, 650MHZ AMPLIFIER	04713	MPSH10
A10Q553	151-0711-00			TRANSISTOR,SIG:BIPOLAR,NPN;25V,50MA, 650MHZ AMPLIFIER	04713	MPSH10
A10Q554	151-1042-00			TRANSISTOR,SIG:JFET,N-CH;6V,10-15MA, 4.5MS, IDSS(1-2)<0.5MA,AMPLIFIER	04713	SPF627M2
A10Q555	151-1042-00			TRANSISTOR,SIG:JFET,N-CH;6V,10-15MA, 4.5MS,IDSS(1-2)<0.5MA,AMPLIFIER	04713	SPF627M2
A10Q556	151-0188-00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA, 250MHZ,AMPLIFIER	04713	2N3906
A10Q557	151-0188-00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA, 250MHZ,AMPLIFIER	04713	2N3906
A10Q558	151-0190-00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA, 300MHZ,AMPLIFIER	04713	2N3904
A10Q559	151-0190-00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA, 300MHZ,AMPLIFIER	04713	2N3904
A10Q561	151-1025-00			TRANSISTOR,SIG:JFET,N-CH;6V,15MA,4.5MS, AMPLIFIER	TK1864	SNJ3014
A10Q562	151-0192-00			TRANSISTOR,SIG:BIPOLAR,NPN;25V,100MA, 200MHZ,AMPLIFIER	04713	SPS8801
A10Q601	151-0712-00			TRANSISTOR,SIG:BIPOLAR,PNP;20V,50MA, 600MHZ AMPLIFIER	04713	MPSH81
A10Q602	151-0712-00			TRANSISTOR,SIG:BIPOLAR,PNP;20V,50MA, 600MHz AMPLIFIER	04713	MPSH81
A10Q700	151-0188-00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA, 250MHZ,AMPLIFIER	04713	2N3906
A10Q710	151-0347-00			TRANSISTOR,SIG:BIPOLAR,NPN;160V,600MA, 100MHZ,AMPLIFIER	0JR04	2N5551
A10Q720	151-0350-00			TRANSISTOR,SIG:BIPOLAR,PNP;150V,600MA, 100MHZ,AMPLIFIER	0JR04	TO BE ASSIGNED
A10Q750	151-0190-00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA, 300MHZ,AMPLIFIER	04713	2N3904
A10Q760	151-0347-00			TRANSISTOR,SIG:BIPOLAR,NPN;160V,600MA, 100MHZ,AMPLIFIER	0JR04	2N5551
A10Q770	151-0350-00			TRANSISTOR,SIG:BIPOLAR,PNP;150V,600MA, 100MHZ,AMPLIFIER	0JR04	TO BE ASSIGNED
A10Q900	151-0390-00			TRANSISTOR:DARLINGTON,NPN,SI	04713	MPS-U45
A10Q901	151-0391-00			TRANSISTOR:DARLINGTON,PNP,SI	04713	MPS-U95
A10Q902	151-0190-00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA, 300MHZ,AMPLIFIER	04713	2N3904
A10Q1200	151-0190-00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA, 300MHZ,AMPLIFIER	04713	2N3904
A10Q1201	151-0190-00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA, 300MHZ,AMPLIFIER	04713	2N3904
A10Q1210	151-0199-00			TRANSISTOR,SIG:BIPOLAR,PNP;12V,80MA, SWITCHING	04713	MPS3640
A10Q1211	151-0350-00			TRANSISTOR,SIG:BIPOLAR,PNP;150V,600MA, 100MHZ,AMPLIFIER	0JR04	TO BE ASSIGNED
A10Q1212	151-0347-00			TRANSISTOR,SIG:BIPOLAR,NPN;160V,600MA, 100MHZ,AMPLIFIER	0JR04	2N5551
A10R100	322-0481-01			RES,FXD,FILM:1M OHM, 0.5%,0.25W,TC=T0MI	19701	5043RD1M00D
A10R101	321-0450-00			RES,FXD,FILM:475K OHM,1%,0.125W,TC=T0	91637	CMF55116G47502F
A10R102	321-0066-00			RES,FXD,FILM:47.5 OHM,0.5%,0.125W,TC=T0MI	91637	CMF55116G47R50F

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A10R103	321-0259-00			RES,FXD,FILM:4.87K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G48700F
A10R104	321-0385-00			RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10002F
A10R105	321-0115-00			RES,FXD,FILM:154 OHM,1%,0.125W,TC=T0	91637	CMF55116G154ROF
A10R106	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A10R107	321-0115-00			RES,FXD,FILM:154 OHM,1%,0.125W,TC=T0	91637	CMF55116G154ROF
A10R108	321-0031-00			RES,FXD,FILM:20.5 OHM,1%,0.125W,TC=T0	57668	CRB14 FXE 20.5
A10R109	321-0031-00			RES,FXD,FILM:20.5 OHM,1%,0.125W,TC=T0	57668	CRB14 FXE 20.5
A10R110	321-0051-00			RES,FXD,FILM:33.2 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G33R20F
A10R111	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R112	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A10R120	321-0258-00			RES,FXD,FILM:4.75K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G47500F
A10R121	321-0281-00			RES,FXD,FILM:8.25K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G82500F
A10R122	321-0189-00			RES,FXD,FILM:909 OHM,1%,0.125W,TC=T0	91637	CMF55116G909ROF
A10R123	321-0189-00			RES,FXD,FILM:909 OHM,1%,0.125W,TC=T0	91637	CMF55116G909ROF
A10R124	321-0383-00			RES,FXD,FILM:95.3K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G95301F
A10R125	321-0085-00			RES,FXD,FILM:75 OHM,1%,0.125W,TC=T0	91637	CMF55116G75ROOF
A10R126	321-0171-00			RES,FXD,FILM:590 OHM,1%,0.125W,TC=T0	91637	CMF55116G590ROF
A10R127	321-0247-00			RES,FXD,FILM:3.65K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G36500F
A10R130	321-0159-00			RES,FXD,FILM:442 OHM,1%,0.125W,TC=T0	91637	CMF55116G442R0F
A10R131	321-0159-00			RES,FXD,FILM:442 OHM,1%,0.125W,TC=T0	91637	CMF55116G442R0F
A10R132	321-0189-00			RES,FXD,FILM:909 OHM,1%,0.125W,TC=T0	91637	CMF55116G909ROF
A10R133	321-0097-00			RES,FXD,FILM:100OHM,1%,0.125W,TC=T0	91637	CMF55116G100ROF
A10R134	321-0189-00			RES,FXD,FILM:909 OHM,1%,0.125W,TC=T0	91637	CMF55116G909ROF
A10R135	311-2352-00			RES,VAR,NONWW:TRMR,220 OHM,0.5W	K8788	TC10-LV 2.5-220
A10R136	321-0235-00			RES,FXD,FILM:2.74K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G27400F
A10R137	321-0306-00			RES,FXD,FILM:15.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G15001F
A10R138	321-0237-00			RES,FXD,FILM:2.87K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G28700F
A10R139	321-0237-00			RES,FXD,FILM:2.87K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G28700F
A10R140	321-0241-00			RES,FXD,FILM:3.16K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G31600F
A10R141	321-0213-00			RES,FXD,FILM:1.62K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G16200F
A10R142	321-0159-00			RES,FXD,FILM:442 OHM,1%,0.125W,TC=T0	91637	CMF55116G442R0F
A10R143	321-0149-00			RES,FXD,FILM:348 OHM,1%,0.125W,TC=T0	91637	CMF55116G348R0F
A10R144	321-0197-00			RES,FXD,FILM:1.10K OHM,1%,0.125W,TC=T0	91637	CMF55116G11000F
A10R147	321-0277-00			RES,FXD,FILM:7.50K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G75000F
A10R148	321-0277-00			RES,FXD,FILM:7.50K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G75000F
A10R150	322-0481-01			RES,FXD,FILM:1M OHM, 0.5%,0.25W,TC=T0MI	19701	5043RD1M00D
A10R151	321-0450-00			RES,FXD,FILM:475K OHM,1%,0.125W,TC=T0	91637	CMF55116G47502F
A10R152	321-0066-00			RES,FXD,FILM:47.5 OHM,0.5%,0.125W,TC=T0MI	91637	CMF55116G47R50F
A10R153	321-0259-00			RES,FXD,FILM:4.87K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G48700F
A10R154	321-0385-00			RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10002F
A10R155	321-0115-00			RES,FXD,FILM:154 OHM,1%,0.125W,TC=T0	91637	CMF55116G154ROF
A10R156	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A10R157	321-0115-00			RES,FXD,FILM:154 OHM,1%,0.125W,TC=T0	91637	CMF55116G154ROF
A10R158	321-0031-00			RES,FXD,FILM:20.5 OHM,1%,0.125W,TC=T0	57668	CRB14 FXE 20.5
A10R159	321-0031-00			RES,FXD,FILM:20.5 OHM,1%,0.125W,TC=T0	57668	CRB14 FXE 20.5
A10R160	321-0051-00			RES,FXD,FILM:33.2 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G33R20F
A10R161	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R162	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A10R170	321-0258-00			RES,FXD,FILM:4.75K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G47500F
A10R171	321-0281-00			RES,FXD,FILM:8.25K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G82500F
A10R172	321-0189-00			RES,FXD,FILM:909 OHM,1%,0.125W,TC=T0	91637	CMF55116G909ROF
A10R173	321-0189-00			RES,FXD,FILM:909 OHM,1%,0.125W,TC=T0	91637	CMF55116G909ROF

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A10R174	321-0383-00			RES,FXD,FILM:95.3K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G95301F
A10R175	321-0085-00			RES,FXD,FILM:75 OHM,1%,0.125W,TC=T0	91637	CMF55116G75ROOF
A10R176	321-0171-00			RES,FXD,FILM:590 OHM,1%,0.125W,TC=T0	91637	CMF55116G590ROF
A10R177	321-0247-00			RES,FXD,FILM:3.65K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G36500F
A10R180	321-0159-00			RES,FXD,FILM:442 OHM,1%,0.125W,TC=T0	91637	CMF55116G442R0F
A10R181	321-0159-00			RES,FXD,FILM:442 OHM,1%,0.125W,TC=T0	91637	CMF55116G442R0F
A10R182	321-0189-00			RES,FXD,FILM:909 OHM,1%,0.125W,TC=T0	91637	CMF55116G909ROF
A10R183	321-0097-00			RES,FXD,FILM:100OHM,1%,0.125W,TC=T0	91637	CMF55116G100ROF
A10R184	321-0189-00			RES,FXD,FILM:909 OHM,1%,0.125W,TC=T0	91637	CMF55116G909ROF
A10R185	311-2352-00			RES,VAR,NONWW:TRMR,220 OHM,0.5W	K8788	TC10-LV 2.5-220
A10R186	321-0235-00			RES,FXD,FILM:2.74K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G27400F
A10R187	321-0306-00			RES,FXD,FILM:15.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G15001F
A10R188	321-0237-00			RES,FXD,FILM:2.87K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G28700F
A10R189	321-0237-00			RES,FXD,FILM:2.87K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G28700F
A10R190	321-0241-00			RES,FXD,FILM:3.16K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G31600F
A10R191	321-0213-00			RES,FXD,FILM:1.62K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G16200F
A10R192	321-0159-00			RES,FXD,FILM:442 OHM,1%,0.125W,TC=T0	91637	CMF55116G442R0F
A10R193	321-0149-00			RES,FXD,FILM:348 OHM,1%,0.125W,TC=T0	91637	CMF55116G348R0F
A10R194	321-0197-00			RES,FXD,FILM:1.10K OHM,1%,0.125W,TC=T0	91637	CMF55116G11000F
A10R195	321-0419-00			RES,FXD,FILM:226K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G22602F
A10R196	321-0419-00			RES,FXD,FILM:226K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G22602F
A10R197	321-0277-00			RES,FXD,FILM:7.50K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G75000F
A10R198	321-0277-00			RES,FXD,FILM:7.50K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G75000F
A10R199	321-0263-00	702800		RES FXD,FILM 5.36KOHM, 1%,0.125W,TC=T0MI	91637	CMF55116G53600F
A10R200	321-0089-00			RES,FXD,FILM:82.5 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G82R50F
A10R201	321-0089-00			RES,FXD,FILM:82.5 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G82R50F
A10R202	321-0089-00			RES,FXD,FILM:82.5 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G82R50F
A10R203	321-0089-00			RES,FXD,FILM:82.5 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G82R50F
A10R204	321-0105-00			RES,FXD,FILM:121 OHM 1%,0.125W,TC=T0	91637	CMF55116G121R0F
A10R205	321-0105-00			RES,FXD,FILM:121 OHM 1%,0.125W,TC=T0	91637	CMF55116G121R0F
A10R206	321-0073-00			RES,FXD,FILM:56.2 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G56R20F
A10R207	311-2352-00			RES,VAR,NONWW:TRMR,220 OHM,0.5W	K8788	TC10-LV 2.5-220
A10R208	321-0073-00			RES,FXD,FILM:56.2 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G56R20F
A10R209	311-2352-00			RES,VAR,NONWW:TRMR,220 OHM,0.5W	K8788	TC10-LV 2.5-220
A10R210	321-0356-00			RES,FXD,FILM:49.9K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G49901F
A10R211	321-0089-00			RES,FXD,FILM:82.5 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G82R50F
A10R212	321-0089-00			RES,FXD,FILM:82.5 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G82R50F
A10R213	321-0356-00			RES,FXD,FILM:49.9K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G49901F
A10R214	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100ROF
A10R215	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R216	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R217	321-0123-00			RES,FXD,FILM:187 OHM,1%,0.125W, TC=T0MI	91637	CMF55116G187R0F
A10R218	321-0123-00			RES,FXD,FILM:187 OHM,1%,0.125W, TC=T0MI	91637	CMF55116G187R0F
A10R219	321-0145-00			RES,FXD,FILM:316 OHM,1%,0.125W,TC=T0	91637	CMF55116G392R0F
A10R220	321-0375-00			RES,FXD,FILM:78.7K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G78701F
A10R221	311-2364-00			RES,VAR,NONWW:TRMR,4.7K OHM,0.5W	K8788	TC10-LV10-4K7/A
A10R222	321-0222-00			RES,FXD,FILM:2.00K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20000F
A10R223	321-0227-00			RES,FXD,FILM:2.26K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G22600F
A10R224	321-0227-00			RES,FXD,FILM:2.26K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G22600F
A10R225	321-0239-00			RES,FXD,FILM:3.01K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G30100F
A10R227	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100ROF
A10R228	321-0105-00			RES,FXD,FILM:121 OHM 1%,0.125W,TC=T0	91637	CMF55116G121R0F
A10R229	321-0105-00			RES,FXD,FILM:121 OHM 1%,0.125W,TC=T0	91637	CMF55116G121R0F

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A10R230	321-0229-00			RES,FXD,FILM:2.37K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G23700F
A10R231	321-0180-00			RES,FXD,FILM:732 OHM,1%,0.125W,TC=T0	91637	CMF55116G732R0F
A10R232	321-0136-00			RES,FXD,FILM:255 OHM,1%,0.125W,TC=T0	91637	CMF55116G255R0F
A10R233	321-0136-00			RES,FXD,FILM:255 OHM,1%,0.125W,TC=T0	91637	CMF55116G255R0F
A10R239	321-0159-00			RES,FXD,FILM:442 OHM,1%,0.125W,TC=T0	91637	CMF55116G442R0F
A10R240	321-0159-00			RES,FXD,FILM:442 OHM,1%,0.125W,TC=T0	91637	CMF55116G442R0F
A10R241	321-0139-00			RES,FXD,FILM:274 OHM,1%,0.125W,TC=T0	91637	CMF55116G274R0F
A10R242	321-0139-00			RES,FXD,FILM:274 OHM,1%,0.125W,TC=T0	91637	CMF55116G274R0F
A10R243	321-0089-00			RES,FXD,FILM:82.5 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G82R50F
A10R244	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100ROF
A10R245	321-0089-00			RES,FXD,FILM:82.5 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G82R50F
A10R246	321-0089-00			RES,FXD,FILM:82.5 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G82R50F
A10R247	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100ROF
A10R250	321-0134-00			RES,FXD,FILM:243 OHM,1%,0.125W,TC=T0	91637	CMF55116G243R0F
A10R251	321-0318-00			RES,FXD,FILM:20.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20001F
A10R252	321-0318-00			RES,FXD,FILM:20.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20001F
A10R253	321-0177-00			RES,FXD,FILM:681 OHM,1%,0.125W,TC=T0	91637	CMF55116G681R0F
A10R254	321-0089-00			RES,FXD,FILM:82.5 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G82R50F
A10R255	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100ROF
A10R256	321-0185-00			RES,FXD,FILM:825 OHM,1%,0.125W,TC=T0	91637	CMF55116G825R0F
A10R257	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A10R258	321-0383-00			RES,FXD,FILM:95.3K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G95301F
A10R260	321-0067-00			RES,FXD,FILM:48.7 OHM,0.5%,0.125W,TC=T0 MI	91637	CMF55116G48R70F
A10R261	321-0067-00			RES,FXD,FILM:48.7 OHM,0.5%,0.125W,TC=T0 MI	91637	CMF55116G48R70F
A10R270	321-0307-00			RES,FXD,FILM:15.4K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G15401F
A10R271	321-0307-00			RES,FXD,FILM:15.4K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G15401F
A10R272	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A10R273	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A10R274	321-0185-00			RES,FXD,FILM:825 OHM,1%,0.125W,TC=T0	91637	CMF55116G825R0F
A10R275	321-0185-00			RES,FXD,FILM:825 OHM,1%,0.125W,TC=T0	91637	CMF55116G825R0F
A10R276	321-0185-00			RES,FXD,FILM:825 OHM,1%,0.125W,TC=T0	91637	CMF55116G825R0F
A10R277	321-0185-00			RES,FXD,FILM:825 OHM,1%,0.125W,TC=T0	91637	CMF55116G825R0F
A10R281	321-0143-00			RES,FXD,FILM:301 OHM,1%,0.125W,TC=T0	91637	CMF55116G301R0F
A10R282	321-0143-00			RES,FXD,FILM:301 OHM,1%,0.125W,TC=T0	91637	CMF55116G301R0F
A10R283	321-0111-00			RES,FXD,FILM:140 OHM,1%,0.125W,TC=T0	91637	CMF55116G140R0F
A10R284	321-0111-00			RES,FXD,FILM:140 OHM,1%,0.125W,TC=T0	91637	CMF55116G140R0F
A10R285	321-0383-00			RES,FXD,FILM:95.3K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G95301F
A10R290	321-0447-00			RES,FXD,FILM:442K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G44202F
A10R291	321-0385-00			RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10002F
A10R292	321-0435-00			RES,FXD,FILM:332K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G33202F
A10R293	321-0383-00			RES,FXD,FILM:95.3K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G95301F
A10R294	321-0361-00			RES,FXD,FILM:56.2K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G56201F
A10R300	321-0173-00			RES,FXD,FILM:619 OHM,1%,0.125W,TC=T0	91637	CMF55116G619R0F
A10R301	321-0173-00			RES,FXD,FILM:619 OHM,1%,0.125W,TC=T0	91637	CMF55116G619R0F
A10R302	321-0331-00			RES,FXD,FILM:27.4K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G27401F
A10R303	321-0241-00			RES,FXD,FILM:3.16K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G31600F
A10R304	311-2441-00			RES,VAR,NONWW:TRMR,2K2,0.5W,LIN, ERMETTOP ADJUST	80009	311244100
A10R305	311-2365-00			RES,VAR,NONWW:TRMR,470 OHM,0.75W	K8788	TC10-LV10-470K/
A10R306	321-0055-00			RES,FXD,FILM:36.5 OHM,0.5%,0.125W,TC=T0MI	91637	CMF55116G36R50F
A10R307	321-0055-00			RES,FXD,FILM:36.5 OHM,0.5%,0.125W,TC=T0MI	91637	CMF55116G36R50F
A10R308	321-0185-00			RES,FXD,FILM:825 OHM,1%,0.125W,TC=T0	91637	CMF55116G825R0F
A10R309	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100ROF

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A10R310	321-0321-00			RES,FXD,FILM:21.5K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G21501F
A10R311	321-0089-00			RES,FXD,FILM:82.5 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G82R50F
A10R312	321-0089-00			RES,FXD,FILM:82.5 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G82R50F
A10R313	321-0067-00			RES,FXD,FILM:48.7 OHM,0.5%,0.125W,TC=T0MI	91637	CMF55116G48R70F
A10R314	321-0067-00			RES,FXD,FILM:48.7 OHM,0.5%,0.125W,TC=T0 MI	91637	CMF55116G48R70F
A10R315	321-0107-00			RES,FXD,FILM:127 OHM,1%,0.125W,TC=T0	91637	CMF55116G127R0F
A10R316	321-0107-00			RES,FXD,FILM:127 OHM,1%,0.125W,TC=T0	91637	CMF55116G127R0F
A10R317	321-0061-00			RES,FXD,FILM:42.2 OHM,0.5%,0.125W,TC=T0 MI	91637	CMF55116G42R20F
A10R320	321-0073-00			RES,FXD,FILM:56.2 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G56R20F
A10R321	321-0073-00			RES,FXD,FILM:56.2 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G56R20F
A10R322	321-0111-00			RES,FXD,FILM:140 OHM,1%,0.125W,TC=T0	91637	CMF55116G140R0F
A10R324	321-0067-00			RES,FXD,FILM:48.7 OHM,0.5%,0.125W,TC=T0 MI	91637	CMF55116G48R70F
A10R325	321-0067-00			RES,FXD,FILM:48.7 OHM,0.5%,0.125W,TC=T0 MI	91637	CMF55116G48R70F
A10R331	325-0480-00			RES,FXD,FILM:150 OHM,1%,1W,AXIAL LEAD	80009	325048000
A10R332	325-0480-00			RES,FXD,FILM:150 OHM,1%,1W,AXIAL LEAD	80009	325048000
A10R336	321-0129-00			RES,FXD,FILM:215 OHM,1%,0.125W,TC=T0	91637	CMF55116G215R0F
A10R337	325-0480-00			RES,FXD,FILM:150 OHM,1%,1W,AXIAL LEAD	80009	325048000
A10R338	325-0480-00			RES,FXD,FILM:150 OHM,1%,1W,AXIAL LEAD	80009	325048000
A10R339	321-0129-00			RES,FXD,FILM:215 OHM,1%,0.125W,TC=T0	91637	CMF55116G215R0F
A10R340	311-2355-00			RES,VAR,NONWW:TRMR,100 OHM,20%,0.5W	K8788	TC10-LV10-100R/
A10R341	311-2352-00			RES,VAR,NONWW:TRMR,220 OHM,0.5W	K8788	TC10-LV 2.5-220
A10R342	321-0321-00			RES,FXD,FILM:21.5K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G21501F
A10R350	321-0001-00			RES,FXD,FILM:10 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10R00F
A10R351	321-0001-00			RES,FXD,FILM:10 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10R00F
A10R400	321-0085-00			RES,FXD,FILM:75 OHM,1%,0.125W,TC=T0	91637	CMF55116G75ROOF
A10R401	321-0139-00			RES,FXD,FILM:274 OHM,1%,0.125W,TC=T0	91637	CMF55116G274R0F
A10R403	321-0279-00			RES,FXD,FILM:7.87K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G78700F
A10R404	321-0279-00			RES,FXD,FILM:7.87K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G78700F
A10R405	321-0279-00			RES,FXD,FILM:7.87K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G78700F
A10R406	321-0279-00			RES,FXD,FILM:7.87K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G78700F
A10R407	321-0250-00			RES,FXD,FILM:3.92K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G39200F
A10R408	321-0279-00			RES,FXD,FILM:7.87K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G78700F
A10R409	321-0250-00			RES,FXD,FILM:3.92K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G39200F
A10R410	321-0085-00			RES,FXD,FILM:75 OHM,1%,0.125W,TC=T0	91637	CMF55116G75ROOF
A10R411	321-0139-00			RES,FXD,FILM:274 OHM,1%,0.125W,TC=T0	91637	CMF55116G274R0F
A10R412	321-0239-00			RES,FXD,FILM:3.01K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G30100F
A10R413	321-0143-00			RES,FXD,FILM:301 OHM,1%,0.125W,TC=T0	91637	CMF55116G301R0F
A10R414	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100ROF
A10R415	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100ROF
A10R417	321-0231-00			RES,FXD,FILM:2.49K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G2490OF
A10R420	321-0221-00			RES,FXD,FILM:1.96K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G19600F
A10R421	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R422	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R424	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R425	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R426	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100ROF
A10R427	321-0115-00			RES,FXD,FILM:154 OHM,1%,0.125W,TC=T0	91637	CMF55116G154ROF
A10R428	321-0155-00			RES,FXD,FILM:402 OHM,1%,0.125W,TC=T0	91637	CMF55116G402R0F
A10R431	321-0385-00			RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10002F
A10R432	322-0621-01			RES,FXD,FILM:900K OHM,0.5%,0.25W,TC=T0MI	19701	5043RD900K0D
A10R433	321-0031-00			RES,FXD,FILM:20.5 OHM,1%,0.125W,TC=T0	57668	CRB14 FXE 20.5

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A10R434	321-0450-00			RES,FXD,FILM:475K OHM,1%,0.125W,TC=T0	91637	CMF55116G47502F
A10R435	321-0031-00			RES,FXD,FILM:20.5 OHM,1%,0.125W,TC=T0	57668	CRB14 FXE 20.5
A10R436	321-0031-00			RES,FXD,FILM:20.5 OHM,1%,0.125W,TC=T0	57668	CRB14 FXE 20.5
A10R437	321-0231-00			RES,FXD,FILM:2.49K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G24900F
A10R438	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R440	321-0259-00			RES,FXD,FILM:4.87K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G48700F
A10R441	321-0165-00			RES,FXD,FILM:511 OHM,1%,0.125W,TC=T0	91637	CMF55116G511R0F
A10R442	321-0165-00			RES,FXD,FILM:511 OHM,1%,0.125W,TC=T0	91637	CMF55116G511R0F
A10R443	321-0165-00			RES,FXD,FILM:511 OHM,1%,0.125W,TC=T0	91637	CMF55116G511R0F
A10R444	321-0165-00			RES,FXD,FILM:511 OHM,1%,0.125W,TC=T0	91637	CMF55116G511R0F
A10R445	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A10R450	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100ROF
A10R451	321-0318-00			RES,FXD,FILM:20.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20001F
A10R452	321-0001-00			RES,FXD,FILM:10 OHM,1%,0.125W,TC=T0	91637	CMF55116G10R00F
A10R454	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R455	321-0415-00			RES,FXD,FILM:205K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20502F
A10R456	321-0415-00			RES,FXD,FILM:205K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20502F
A10R457	321-0259-00			RES,FXD,FILM:4.87K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G48700F
A10R458	321-0357-00			RES,FXD,FILM:51.1K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G51101F
A10R459	321-0305-00			RES,FXD,FILM:14.7K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G 14701
A10R471	321-0318-00			RES,FXD,FILM:20.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20001F
A10R472	321-0001-00			RES,FXD,FILM:10 OHM,1%,0.125W,TC=T0	91637	CMF55116G10R00F
A10R474	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R475	321-0415-00			RES,FXD,FILM:205K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20502F
A10R476	321-0415-00			RES,FXD,FILM:205K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20502F
A10R477	321-0259-00			RES,FXD,FILM:4.87K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G48700F
A10R478	321-0357-00			RES,FXD,FILM:51.1K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G51101F
A10R479	321-0305-00			RES,FXD,FILM:14.7K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G 14701
A10R480	317-0470-00			RES,FXD,CMPSN:47 OHM,5%,0.125W	TK1727	SFR16 2322-180-
A10R500	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R501	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R502	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R503	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R504	321-0130-00			RES,FXD,FILM:221 OHM,1%,0.125W,TC=T0	91637	CMF55116G221R0F
A10R505	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A10R506	321-0339-00			RES,FXD,FILM:33.2K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G33201F
A10R507	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A10R508	321-0373-00			RES,FXD,FILM:75.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G75001F
A10R509	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A10R510	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R511	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R512	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R513	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R514	321-0141-00			RES,FXD,FILM:287 OHM,1%,0.125W,TC=T0	91637	CMF55116G287ROF
A10R515	321-0091-00			RES,FXD,FILM:86.6 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G86R60F
A10R516	321-0141-00			RES,FXD,FILM:287 OHM,1%,0.125W,TC=T0	91637	CMF55116G287ROF
A10R517	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R518	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R519	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A10R520	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R521	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R522	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R523	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R524	321-0130-00			RES,FXD,FILM:221 OHM,1%,0.125W,TC=T0	91637	CMF55116G221R0F
A10R525	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R526	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R527	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R528	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R529	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R530	321-0204-00			RES,FXD,FILM:1.30K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G13000F
A10R531	321-0204-00			RES,FXD,FILM:1.30K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G13000F
A10R532	321-0204-00			RES,FXD,FILM:1.30K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G13000F
A10R533	321-0263-00			RES,FXD,FILM:5.36K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G53600F
A10R534	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R535	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R536	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R539	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R540	321-0393-00			RES,FXD,FILM:121K OHM,1%,0.125W,TC=T0	91637	CMF55116G12102F
A10R549	321-0222-00			RES,FXD,FILM:2.00K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20000F
A10R550	321-0318-00			RES,FXD,FILM:20.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20001F
A10R551	321-0414-00			RES,FXD,FILM:200K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20002F
A10R552	321-0481-00			RES,FXD,FILM:1M OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10003F
A10R553	321-0481-00			RES,FXD,FILM:1M OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10003F
A10R554	321-0222-00			RES,FXD,FILM:2.00K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20000F
A10R555	321-0239-00			RES,FXD,FILM:3.01K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G30100F
A10R556	321-0260-00			RES,FXD,FILM:4.99K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G49900F
A10R557	321-0260-00			RES,FXD,FILM:4.99K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G49900F
A10R558	321-0285-00			RES,FXD,FILM:9.09K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G90900F
A10R560	321-0227-00			RES,FXD,FILM:2.26K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G22600F
A10R561	321-0260-00			RES,FXD,FILM:4.99K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G49900F
A10R562	321-0260-00			RES,FXD,FILM:4.99K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G49900F
A10R563	321-0262-00			RES,FXD,FILM:5.23K OHM,1,0.125W,TC=T0MI	91637	CMF55116G52300F
A10R564	321-0182-00		702799	RES,FXD,FILM:768 OHM,1%,0.125W,TC=T0	91637	CMF55116G768R0F
A10R564	321-0173-00	702800		RES FXD, FILM619 OHM,1%,0.125W,TC=T0	91637	CMF55116G619R0F
A10R565	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A10R566	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A10R567	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A10R568	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A10R569	321-0262-00			RES,FXD,FILM:5.23K OHM,1,0.125W,TC=T0MI	91637	CMF55116G52300F
A10R570	321-0204-00			RES,FXD,FILM:1.30K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G13000F
A10R571	321-0204-00			RES,FXD,FILM:1.30K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G13000F
A10R572	321-0031-00			RES,FXD,FILM:20.5 OHM,1%,0.125W,TC=T0	57668	CRB14 FXE 20.5
A10R573	321-0031-00			RES,FXD,FILM:20.5 OHM,1%,0.125W,TC=T0	57668	CRB14 FXE 20.5
A10R574	321-0031-00			RES,FXD,FILM:20.5 OHM,1%,0.125W,TC=T0	57668	CRB14 FXE 20.5
A10R575	321-0250-00			RES,FXD,FILM:3.92K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G39200F
A10R576	321-0229-00			RES,FXD,FILM:2.37K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G23700F
A10R577	321-0155-00			RES,FXD,FILM:402 OHM,1%,0.125W,TC=T0	91637	CMF55116G402R0F
A10R578	321-0263-00			RES,FXD,FILM:5.36K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G53600F
A10R579	321-0201-00			RES,FXD,FILM:1.21K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G12100F
A10R580	321-0247-00			RES,FXD,FILM:3.65K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G36500F

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A10R581	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R582	321-0155-00			RES,FXD,FILM:402 OHM,1%,0.125W,TC=T0	91637	CMF55116G402R0F
A10R583	321-0281-00			RES,FXD,FILM:8.25K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G82500F
A10R584	321-0260-00			RES,FXD,FILM:4.99K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G49900F
A10R587	321-0277-00			RES,FXD,FILM:7.50K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G75000F
A10R588	321-0309-00			RES,FXD,FILM:16.2K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G16201F
A10R589	321-0309-00			RES,FXD,FILM:16.2K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G16201F
A10R590	321-0385-00			RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10002F
A10R591	321-0335-00			RES,FXD,FILM:30.1K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G30101F
A10R592	321-0205-00			RES,FXD,FILM:1.33K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G13300F
A10R593	321-0275-00			RES,FXD,FILM:7.15K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G71500F
A10R597	321-0348-00			RES,FXD,FILM:41.2K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G41201F
A10R598	321-0260-00			RES,FXD,FILM:4.99K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G49900F
A10R599	321-0260-00			RES,FXD,FILM:4.99K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G49900F
A10R601	321-0231-00			RES,FXD,FILM:2.49K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G24900F
A10R602	321-0249-00			RES,FXD,FILM:3.83K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G38300F
A10R603	321-0210-00			RES,FXD,FILM:1.50K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G15000F
A10R604	321-0177-00			RES,FXD,FILM:681 OHM,1%,0.125W,TC=T0	91637	CMF55116G681R0F
A10R605	321-0177-00			RES,FXD,FILM:681 OHM,1%,0.125W,TC=T0	91637	CMF55116G681R0F
A10R606	321-0177-00			RES,FXD,FILM:681 OHM,1%,0.125W,TC=T0	91637	CMF55116G681R0F
A10R607	321-0210-00			RES,FXD,FILM:1.50K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G15000F
A10R608	321-0235-00			RES,FXD,FILM:2.74K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G27400F
A10R610	311-2365-00		702799	RES,VAR,NONWW:TRMR,470 OHM,0.75W	K8788	TC10-LV10-470K/
A10R610	311-2342-00	702800		RES VAR, NONWW:TRMR,220 OHM,0.75W	K8788	TC10-LV10-220K/
A10R620	311-2365-00			RES,VAR,NONWW:TRMR,470 OHM,0.75W	K8788	TC10-LV10-470K/
A10R621	321-0216-00			RES,FXD,FILM:1.74K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G17400F
A10R622	321-0216-00			RES,FXD,FILM:1.74K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G17400F
A10R623	321-0183-00			RES,FXD,FILM:787 OHM,1%,0.125W,TC=T0	91637	CMF55116G787R0F
A10R624	321-0163-00			RES,FXD,FILM:487 OHM,1%,0.125W,TC=T0	91637	CMF55116G487R0F
A10R625	321-0191-00			RES,FXD,FILM:953 OHM,1%,0.125W,TC=T0	91637	CMF55116G953R0F
A10R626	321-0191-00			RES,FXD,FILM:953 OHM,1%,0.125W,TC=T0	91637	CMF55116G953R0F
A10R627	311-2355-00			RES,VAR,NONWW:TRMR,100 OHM,20%,0.5W	K8788	TC10-LV10-100R/
A10R628	321-0069-00			RES,FXD,FILM:51.1 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G51R10F
A10R629	321-0171-00		702799	RES,FXD,FILM:590 OHM,1%,0.125W,TC=T0	91637	CMF55116G590ROF
A10R629	321-0179-00	702800		RES FXD, FILM:715OHM,1%,0.125W,TC=T0	91637	CMF55116G715ROF
A10R630	321-0171-00			RES,FXD,FILM:590 OHM,1%,0.125W,TC=T0	91637	CMF55116G590ROF
A10R630	321-0179-00	702800	702799	RES FXD, FILM:715OHM,1%,0.125W,TC=T0	91637	CMF55116G715ROF
A10R631	321-0367-00			RES,FXD,FILM:64.9K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G64901F
A10R632	321-0299-00			RES,FXD,FILM:12.7K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G12701F
A10R641	321-0225-00			RES,FXD,FILM:2.15K OHM,1%,0.125W,TC=T0,MI	91637	CMF55116G21500F
A10R642	321-0225-00			RES,FXD,FILM:2.15K OHM,1%,0.125W,TC=T0,MI	91637	CMF55116G21500F
A10R643	321-0229-00			RES,FXD,FILM:2.37K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G23700F
A10R644	321-0229-00			RES,FXD,FILM:2.37K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G23700F
A10R645	321-0210-00			RES,FXD,FILM:1.50K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G15000F
A10R646	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100ROF
A10R647	311-2355-00			RES,VAR,NONWW:TRMR,100 OHM,20%,0.5W	K8788	TC10-LV10-100R/
A10R648	321-0178-00			RES,FXD,FILM:698 OHM,1%,0.125W,TC=T0	91637	CMF55116G698R0F
A10R649	321-0178-00			RES,FXD,FILM:698 OHM,1%,0.125W,TC=T0	91637	CMF55116G698R0F
A10R651	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R652	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R653	321-0221-00			RES,FXD,FILM:1.96K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G19600F
A10R654	321-0245-00			RES,FXD,FILM:3.48K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G34800F
A10R655	321-0123-00			RES,FXD,FILM:187 OHM,1%,0.125W, TC=T0MI	91637	CMF55116G187R0F
A10R657	321-0123-00			RES,FXD,FILM:187 OHM,1%,0.125W, TC=T0MI	91637	CMF55116G187R0F
A10R658	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100ROF

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A10R659	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100ROF
A10R661	321-0242-00			RES,FXD,FILM:3.24K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G32400F
A10R662	321-0242-00			RES,FXD,FILM:3.24K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G32400F
A10R663	321-0225-00			RES,FXD,FILM:2.15K OHM,1%,0.125W,TC=T0,MI	91637	CMF55116G21500F
A10R664	321-0225-00			RES,FXD,FILM:2.15K OHM,1%,0.125W,TC=T0,MI	91637	CMF55116G21500F
A10R671	311-2361-00			RES,VAR,NONWW:TRMR,10K OHM,0.5W	K8788	TC10-LV10-10K/A
A10R672	321-0318-00		702799	RES,FXD,FILM:20.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20001F
A10R672	321-0347-00	702800		RES FXD,FILM:402K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G40202F
A10R673	321-0189-00			RES,FXD,FILM:909 OHM,1%,0.125W,TC=T0	91637	CMF55116G909ROF
A10R674	321-0212-00			RES,FXD,FILM:1.58K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G15800F
A10R675	321-0177-00			RES,FXD,FILM:681 OHM,1%,0.125W,TC=T0	91637	CMF55116G681R0F
A10R676	321-0240-00			RES,FXD,FILM:3.09K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G30900F
A10R681	321-0246-00			RES,FXD,FILM:3.57K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G35700F
A10R682	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100ROF
A10R683	321-0246-00			RES,FXD,FILM:3.57K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G35700F
A10R684	321-0173-00			RES,FXD,FILM:619 OHM,1%,0.125W,TC=T0	91637	CMF55116G619R0F
A10R685	321-0318-00		702799	RES,FXD,FILM:20.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20001F
A10R685	321-0347-00	702800		RES FXD,FILM:402K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G40202F
A10R686	311-2361-00			RES,VAR,NONWW:TRMR,10K OHM,0.5W	K8788	TC10-LV10-10K/A
A10R687	321-0217-00			RES,FXD,FILM:1.78K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G178OOF
A10R688	321-0103-00			RES,FXD,FILM:115 OHM,1%,0.125W,TC=T0	91637	CMF55116G115R0F
A10R690	321-0259-00			RES,FXD,FILM:4.87K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G48700F
A10R691	321-0242-00			RES,FXD,FILM:3.24K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G32400F
A10R692	321-0249-00			RES,FXD,FILM:3.83K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G38300F
A10R693	321-0239-00			RES,FXD,FILM:3.01K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G30100F
A10R695	321-0069-00			RES,FXD,FILM:51.1 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G51R10F
A10R697	321-0253-00			RES,FXD,FILM:4.22K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G42200F
A10R698	321-0254-00			RES,FXD,FILM:4.32K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G43200F
A10R699	321-0385-00			RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10002F
A10R700	321-0068-00			RES,FXD,FILM:49.9 OHM,0.1%,0.125W,TC=T0 MI	91637	CMF55116G49R90F
A10R704	321-0223-00			RES,FXD,FILM:2.05K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20500F
A10R710	323-0310-00			RES,FXD,FILM:16.5K OHM,1%,0.5W,TC=T0	91637	CMF65116G16501F
A10R711	321-0068-00			RES,FXD,FILM:49.9 OHM,0.1%,0.125W,TC=T0 MI	91637	CMF55116G49R90F
A10R720	321-0325-00			RES,FXD,FILM:23.7K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G23701F
A10R721	321-0182-00			RES,FXD,FILM:768 OHM,1%,0.125W,TC=T0	91637	CMF55116G768R0F
A10R722	321-0205-00			RES,FXD,FILM:1.33K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G13300F
A10R723	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100ROF
A10R724	321-0068-00			RES,FXD,FILM:49.9 OHM,0.1%,0.125W,TC=T0 MI	91637	CMF55116G49R90F
A10R730	321-0263-00			RES,FXD,FILM:5.36K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G53600F
A10R731	321-0361-00			RES,FXD,FILM:56.2K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G56201F
A10R750	321-0068-00			RES,FXD,FILM:49.9 OHM,0.1%,0.125W,TC=T0 MI	91637	CMF55116G49R90F
A10R760	323-0310-00			RES,FXD,FILM:16.5K OHM,1%,0.5W,TC=T0	91637	CMF65116G16501F
A10R761	321-0158-00			RES,FXD,FILM:432 OHM,1%,0.125W,TC=T0	91637	CMF55116G432R0F
A10R770	321-0325-00			RES,FXD,FILM:23.7K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G23701F
A10R771	321-0201-00			RES,FXD,FILM:1.21K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G12100F
A10R772	321-0205-00			RES,FXD,FILM:1.33K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G13300F
A10R773	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100ROF
A10R774	321-0068-00			RES,FXD,FILM:49.9 OHM,0.1%,0.125W,TC=T0 MI	91637	CMF55116G49R90F
A10R800	321-0452-00			RES,FXD,FILM:499K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G49902F
A10R801	321-0227-00			RES,FXD,FILM:2.26K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G22600F
A10R802	321-0227-00			RES,FXD,FILM:2.26K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G22600F
A10R803	321-0227-00			RES,FXD,FILM:2.26K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G22600F

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A10R804	321-0183-00			RES,FXD,FILM:787 OHM,1%,0.125W,TC=T0	91637	CMF55116G787R0F
A10R805	321-0183-00			RES,FXD,FILM:787 OHM,1%,0.125W,TC=T0	91637	CMF55116G787R0F
A10R806	321-0183-00			RES,FXD,FILM:787 OHM,1%,0.125W,TC=T0	91637	CMF55116G787R0F
A10R807	321-0183-00			RES,FXD,FILM:787 OHM,1%,0.125W,TC=T0	91637	CMF55116G787R0F
A10R808	321-0183-00			RES,FXD,FILM:787 OHM,1%,0.125W,TC=T0	91637	CMF55116G787R0F
A10R810	321-0183-00			RES,FXD,FILM:787 OHM,1%,0.125W,TC=T0	91637	CMF55116G787R0F
A10R811	321-0183-00			RES,FXD,FILM:787 OHM,1%,0.125W,TC=T0	91637	CMF55116G787R0F
A10R812	321-0183-00			RES,FXD,FILM:787 OHM,1%,0.125W,TC=T0	91637	CMF55116G787R0F
A10R820	321-0276-00			RES,FXD,FILM:7.32K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G73200F
A10R821	321-0275-00			RES,FXD,FILM:7.15K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G71500F
A10R822	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A10R823	321-0223-00			RES,FXD,FILM:2.05K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20500F
A10R824	321-0223-00			RES,FXD,FILM:2.05K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20500F
A10R825	321-0231-07			RES,FXD,FILM:2.49K OHM,0.1%,0.125W,TC=T0MI	91637	CMF55116C24900F
A10R826	321-0231-07			RES,FXD,FILM:2.49K OHM,0.1%,0.125W,TC=T0MI	91637	CMF55116C24900F
A10R827	321-0223-00			RES,FXD,FILM:2.05K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20500F
A10R828	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R829	321-0227-00			RES,FXD,FILM:2.26K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G22600F
A10R830	321-0223-00			RES,FXD,FILM:2.05K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20500F
A10R831	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R832	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R833	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R834	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R835	321-0163-00			RES,FXD,FILM:487 OHM,1%,0.125W,TC=T0	91637	CMF55116G487R0F
A10R836	321-0163-00			RES,FXD,FILM:487 OHM,1%,0.125W,TC=T0	91637	CMF55116G487R0F
A10R837	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R838	321-1780-00			RES,FXD,FILM:4.87 OHM,1%,0.125W, TC=100PPM,XIAL LEAD	80009	321178000
A10R840	321-0227-00			RES,FXD,FILM:2.26K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G22600F
A10R900	321-0231-00			RES,FXD,FILM:2.49K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G24900F
A10R901	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100ROF
A10R902	321-0260-00			RES,FXD,FILM:4.99K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G49900F
A10R903	321-0260-00			RES,FXD,FILM:4.99K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G49900F
A10R904	321-0223-00			RES,FXD,FILM:2.05K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20500F
A10R905	321-0239-00			RES,FXD,FILM:3.01K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G30100F
A10R906	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100ROF
A10R907	321-0277-00			RES,FXD,FILM:7.50K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G75000F
A10R908	321-0260-00			RES,FXD,FILM:4.99K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G49900F
A10R909	321-0259-00			RES,FXD,FILM:4.87K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G48700F
A10R910	321-0245-00			RES,FXD,FILM:3.48K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G34800F
A10R911	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100ROF
A10R912	321-0073-00			RES,FXD,FILM:56.2 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G56R20F
A10R913	321-0073-00			RES,FXD,FILM:56.2 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G56R20F
A10R914	321-0073-00			RES,FXD,FILM:56.2 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G56R20F
A10R915	321-0073-00			RES,FXD,FILM:56.2 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G56R20F
A10R920	321-0385-00			RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10002F
A10R921	321-0435-00			RES,FXD,FILM:332K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G33202F
A10R922	321-0385-00			RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10002F
A10R923	321-0218-00			RES,FXD,FILM:1.82K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G18200F
A10R924	321-0318-00			RES,FXD,FILM:20.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20001F
A10R925	321-0205-00			RES,FXD,FILM:1.33K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G13300F
A10R1200	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F

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A10R1201	321-0231-00			RES,FXD,FILM:2.49K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G24900F
A10R1202	321-0260-00			RES,FXD,FILM:4.99K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G49900F
A10R1203	321-0260-00			RES,FXD,FILM:4.99K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G49900F
A10R1204	321-0341-00			RES,FXD,FILM:34.8K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G34801F
A10R1205	321-0354-00			RES,FXD,FILM:47.5K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G47501F
A10R1206	321-0306-00			RES,FXD,FILM:15.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G15001F
A10R1207	321-0279-00			RES,FXD,FILM:7.87K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G78700F
A10R1208	321-0277-00			RES,FXD,FILM:7.50K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G75000F
A10R1209	321-0339-00			RES,FXD,FILM:33.2K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G33201F
A10R1210	321-0260-00			RES,FXD,FILM:4.99K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G49900F
A10R1211	321-0341-00			RES,FXD,FILM:34.8K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G34801F
A10R1212	321-0306-00			RES,FXD,FILM:15.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G15001F
A10R1213	321-0279-00			RES,FXD,FILM:7.87K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G78700F
A10R1214	321-0277-00			RES,FXD,FILM:7.50K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G75000F
A10R1215	321-0261-00			RES,FXD,FILM:5.11K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G51100F
A10R1216	321-0261-00			RES,FXD,FILM:5.11K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G51100F
A10R1217	321-0306-00			RES,FXD,FILM:15.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G15001F
A10R1218	321-0306-00			RES,FXD,FILM:15.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G15001F
A10R1219	321-0231-00			RES,FXD,FILM:2.49K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G24900F
A10R1220	321-0258-00			RES,FXD,FILM:4.75K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G47500F
A10R1221	321-0385-00			RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10002F
A10R1222	321-0123-00			RES,FXD,FILM:187 OHM,1%,0.125W, TC=T0MI	91637	CMF55116G187R0F
A10R1223	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R1224	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R1225	321-0322-00			RES,FXD,FILM:22.1K OHM,1%,0.125W,TC=TO,MI	91637	CMF55116G22101F
A10R1226	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A10R1227	321-0385-00			RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10002F
A10R1230	321-0258-00			RES,FXD,FILM:4.75K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G47500F
A10R1231	321-0163-00			RES,FXD,FILM:487 OHM,1%,0.125W,TC=T0	91637	CMF55116G487R0F
A10R1232	315-0625-00			RES,FXD,FILM:6.2M OHM,5%,0.25W	TK1727	SFR25 2322-181-
A10R1233	321-0134-00			RES,FXD,FILM:243 OHM,1%,0.125W,TC=T0	91637	CMF55116G243R0F
A10R1234	311-2367-00			RES,VAR,NONWW:TRMR,22K OHM,0.5W	K8788	TC10-LV10-22K/A
A10R1235	321-0318-00			RES,FXD,FILM:20.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20001F
A10R1236	321-0169-00			RES,FXD,FILM:562 OHM,1%,0.125W,TC=T0	91637	CMF55116G562R0F
A10R1237	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100ROF
A10R1250	321-0123-00			RES,FXD,FILM:187 OHM,1%,0.125W, TC=T0MI	91637	CMF55116G187R0F
A10R1251	311-2358-00			RES,VAR,NONWW:TRMR,100K OHM,0.5W	K8788	TC10-LV10-100K/
A10R1252	321-0385-00			RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10002F
A10R1253	321-0385-00			RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10002F
A10R1254	321-0385-00			RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10002F
A10R1255	311-2358-00			RES,VAR,NONWW:TRMR,100K OHM,0.5W	K8788	TC10-LV10-100K/
A10R1257	311-2364-00			RES,VAR,NONWW:TRMR,4.7K OHM,0.5W	K8788	TC10-LV10-4K7/A
A10R1258	321-0126-00			RES,FXD,FILM:200 OHM,1%,0.125W,TC=T0	91637	CMF55116G200ROF
A10R1259	321-0283-00			RES,FXD,FILM:8.66K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G86600F
A10R1260	321-0335-00			RES,FXD,FILM:30.1K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G30101F
A10R1801	321-0066-00			RES,FXD,FILM:47.5 OHM,0.5%,0.125W,TC=T0 MI	91637	CMF55116G47R50F
A10R1802	321-0257-00			RES,FXD,FILM:4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400F
A10R1803	321-0257-00			RES,FXD,FILM:4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400F
A10R1806	321-0066-00			RES,FXD,FILM:47.5 OHM,0.5%,0.125W,TC=T0 MI	91637	CMF55116G47R50F

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A10RT308	307-0125-00			RES,THERMAL:500 OHM,10%,NTC	91637	C133
A10RT309	307-0181-00			RES,THERMAL:100K OHM,10%,NTC	91637	C716
A10U100	156-4260-00			IC,LINEAR:BIPOLAR,OP-AMP,AD829JN,DIP08.3	80009	156426000
A10U101	234-0238-20			QUICK CHIP:VERTICAL PREAMP,PACKAGE I	80009	234023820
A10U102	156-4258-00			IC,LINEAR:BIPOLAR,OP-AMP,AD848JN,DIP08.03	80009	156425800
A10U151	234-0238-20			QUICK CHIP:VERTICAL PREAMP,PACKAGE I	80009	234023820
A10U152	156-4258-00			IC,LINEAR:BIPOLAR,OP-AMP,AD848JN,DIP08.03	80009	156425800
A10U160	156-4260-00			IC,LINEAR:BIPOLAR,OP-AMP,AD829JN,DIP08.3	80009	156426000
A10U200	156-2956-00			MICROCKT,LINEAR:DUAL,INDEP PIFF AMPL3054, IP14,PLASTIC PKG	K5856	CA 3054
A10U201	156-1191-00			IC,LINEAR:BIFET,OP-AMP;DUAL	01295	TL072CP
A10U400	234-0239-31			QUICK CHIP:TRIGGER CIRCUIT,28PLCC W/AU LEA	80009	234023931
A10U401	156-0158-00			IC,LINEAR:BIPOLAR,OP-AMP;DUAL	04713	MC1458P1
A10U402	156-0158-00			IC,LINEAR:BIPOLAR,OP-AMP;DUAL	04713	MC1458P1
A10U406	156-0048-00			MICROCKT,LINEAR:5 XSTR ARRAY	04713	MC3346P
A10U407	156-3963-00			MICROCKT,DGTL:MPQ3906,DIP16	04713	MPQ3906
A10U500	160-9138-00			IC,DIGITAL:CMOS,PAL18P8ALPC,PRGM,DIP20.3	80009	160913800
A10U501	160-9139-00			IC,DIGITAL:CMOS,PAL16R4A2CN,PRGM,DIP20.3	80009	160913900
A10U502	156-1639-00			IC,DIGITAL:ECL,FLIP FLOP;DUAL MASTER-SLAVE	04713	MC10H131(P OR L
A10U503	156-1639-00			IC,DIGITAL:ECL,FLIP FLOP;DUAL MASTER-SLAVE	04713	MC10H131(P OR L
A10U504	156-1152-01			IC,DIGITAL:CMOS,MULTIVIBRATOR; DUAL PRECISION RETRIG/RESETTABLE MONOSTABLE	04713	MC14538BCP
A10U550	156-0514-00			IC,MISC:CMOS,ANALOG MUX;DUAL 4 CHANNEL	04713	MC14052BCP
A10U551	156-0514-00			IC,MISC:CMOS,ANALOG MUX;DUAL 4 CHANNEL	04713	MC14052BCP
A10U552	156-1191-00			IC,LINEAR:BIFET,OP-AMP;DUAL	01295	TL072CP
A10U553	156-0158-00			IC,LINEAR:BIPOLAR,OP-AMP;DUAL	04713	MC1458P1
A10U554	156-0048-00			MICROCKT,LINEAR:5 XSTR ARRAY	04713	MC3346P
A10U555	156-0153-00			IC,DIGITAL:TTL,BUFFER; HEX INV BUFFER/DRIVER,OC	18324	N7406N
A10U601	156-0259-00			MICROCKT,LINEAR:5-XSTR,ALL INDEPENDENT CA3083,MI	0CVK3	ULN2083A
A10U602	156-0048-00			MICROCKT,LINEAR:5 XSTR ARRAY	04713	MC3346P
A10U603	156-0048-00			MICROCKT,LINEAR:5 XSTR ARRAY	04713	MC3346P
A10U604	156-0259-00			MICROCKT,LINEAR:5-XSTR, ALL INDEPENDENT CA3083,MI	0CVK3	ULN2083A
A10U605	156-2571-00			IC,MISC:HCMOS,ANALOG MUX;TRIPLE SPDT	04713	MC74HC4053N/J
A10U606	156-0411-00			IC,LINEAR:BIPOLAR,COMPARATOR;QUAD, SINGLE SUPPLY,300NS	04713	LM339N
A10U800	156-0796-00			IC,DIGITAL:CMOS,SHIFT REGISTER; 8-STAGE SHIFT/STORE, 3-STATE	04713	MC14094BCP
A10U801	156-0796-00			IC,DIGITAL:CMOS,SHIFT REGISTER; 8-STAGE SHIFT/STORE, 3-STATE	04713	MC14094BCP
A10U802	156-0796-00			IC,DIGITAL:CMOS,SHIFT REGISTER; 8-STAGE SHIFT/STORE, 3-STATE	04713	MC14094BCP
A10U803	156-0796-00			IC,DIGITAL:CMOS,SHIFT REGISTER; 8-STAGE SHIFT/STORE, 3-STATE	04713	MC14094BCP
A10U804	156-0796-00			IC,DIGITAL:CMOS,SHIFT REGISTER; 8-STAGE SHIFT/STORE, 3-STATE	04713	MC14094BCP

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A10U805	156-0796-00			IC,DIGITAL:CMOS,SHIFT REGISTER; 8-STAGE SHIFT/STORE, 3-STATE	04713	MC14094BCP
A10U809	156-0721-00			IC,DIGITAL:LSTTL,GATES;QUAD 2-INPUT NAND, /SCHMITT TRIGGER	0129	SN74LS132N
A10U810	160-9141-00			IC,DIGITAL:CMOS,PAL16R4A2CN,PRGM,DIP20.3	80009	160914100
A10U811	156-2605-00			IC,MISC:HCMOS,ANALOG MUX;8 CHANNEL	04713	MC74HC4051N/J
A10U900	156-0158-00			IC,LINEAR:BIPOLAR,OP-AMP;DUAL	04713	MC1458P1
A10U901	156-0158-00			IC,LINEAR:BIPOLAR,OP-AMP;DUAL	04713	MC1458P1
A10U902	156-0853-00			IC,LINEAR:BIPOLAR,OP-AMP;DUAL, SINGLE SUPPLY	04713	LM358N
A10U1200	156-0158-00			IC,LINEAR:BIPOLAR,OP-AMP;DUAL	04713	MC1458P1
A10U1800	156-4220-00			IC,MEMORY:CMOS,EEPROM,512 X 8, SERIAL; X24C04P,DIP8.3	60395	X24C04P
A10VR107	152-0227-00			DIODE,ZENER:,;6.2V,5%,0.4W	04713	1N753RL L
A10VR109	152-0227-00			DIODE,ZENER:,;6.2V,5%,0.4W	04713	1N753RL L
A10VR110	152-0306-00			SEMICOND DVC,DI:ZEN,SI,9.1V,5%,0.4W DO-71N960B,MI	04713	1N960BRL
A10VR157	152-0227-00			DIODE,ZENER:,;6.2V,5%,0.4W	04713	1N753RL L
A10VR159	152-0227-00			DIODE,ZENER:,;6.2V,5%,0.4W	04713	1N753RL L
A10VR160	152-0306-00			SEMICOND DVC,DI:ZEN,SI,9.1V,5%,0.4W DO-71N960B,MI	04713	1N960BRL
A10VR550	152-0306-00			SEMICOND DVC,DI:ZEN,SI,9.1V,5%,0.4W DO-71N960B,MI	04713	1N960BRL
A10VR551	152-0306-00			SEMICOND DVC,DI:ZEN,SI,9.1V,5%,0.4W DO-71N960B,MI	04713	1N960BRL
A10VR552	152-0306-00			SEMICOND DVC,DI:ZEN,SI,9.1V,5%,0.4W DO-71N960B,MI	04713	1N960BRL
A10VR601	152-0306-00			SEMICOND DVC,DI:ZEN,SI,9.1V,5%,0.4W, DO-71N960B,MI	04713	1N960BRL
A10VR701	152-0243-00			DIODE,ZENER:,;15V,5%,0.4W	04713	SZ13203 (1N965B
A10W200	119-2611-00			DELAY LINE,ELEC:ASSEMBLY	80009	119261100
A10W201	119-2611-00			DELAY LINE,ELEC:ASSEMBLY	80009	119261100
A10W400	131-0566-00			BUS,CONDUCTOR:DUMMY RES, 0.094 OD X 0.225L	24546	OMA 07
A10W401	131-0566-00			BUS,CONDUCTOR:DUMMY RES, 0.094 OD X 0.225L	24546	OMA 07
A10W901	131-0566-00			BUS,CONDUCTOR:DUMMY RES, 0.094 OD X 0.225L	24546	OMA 07
A10W902	131-0566-00			BUS,CONDUCTOR:DUMMY RES, 0.094 OD X 0.225L	24546	OMA 07
A10W903	131-0566-00			BUS,CONDUCTOR:DUMMY RES, 0.094 OD X 0.225L	24546	OMA 07
A10W904	131-0566-00			BUS,CONDUCTOR:DUMMY RES, 0.094 OD X 0.225L	24546	OMA 07
A10W905	131-0566-00			BUS,CONDUCTOR:DUMMY RES ,0.094 OD X 0.225L	24546	OMA 07
A10W906	131-0566-00			BUS,CONDUCTOR:DUMMY RES, 0.094 OD X 0.225L	24546	OMA 07
A10W907	131-0566-00			BUS,CONDUCTOR:DUMMY RES, 0.094 OD X 0.225L	24546	OMA 07
A10W908	131-0566-00			BUS,CONDUCTOR:DUMMY RES, 0.094 OD X 0.225L	24546	OMA 07
A10W1000	174-2784-00			CA ASSY,SP,ELEC:RIBBON,20 WAY ,28 AWG,300VUL STYLE 2651/20367;MAIN FRON	80009	174278400

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A10W1002	174-2784-00			CA ASSY,SP,ELEC:RIBBON,20 WAY, 28 AWG,300VUL STYLE 2651/20367;MAIN FRON	80009	174278400
A10W1004	196-3379-00			LEAD SET,ELEC:STR.26 AWG.300V,WHIT	80009	196337900
A10W1005	196-3379-00			LEAD SET,ELEC:STR.26 AWG.300V,WH	80009	196337900

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A11	671-2426-00			CIRCUIT BD ASSY:POWER	80009	671242600
A11C1230	283-0105-00			CAP,FXD,CER DI:0.01UF,+80-20%,2000V	60705	564CBA202IP203Z
A11C1231	283-0105-00			CAP,FXD,CER DI:0.01UF,+80-20%,2000V	60705	564CBA202IP203Z
A11C1232	283-0105-00			CAP,FXD,CER DI:0.01UF,+80-20%,2000V	60705	564CBA202IP203Z
A11C1235	283-0279-00			CAP,FXD,CER DI:0.001UF,20%,3000V	18796	DHR12Y5S102M3KV
A11C1301	285-1192-00			CAP,FXD,PPR DI:0.0022 UF,20%,250VAC	TK0515	PME271Y422
A11C1302	285-1192-00			CAP,FXD,PPR DI:0.0022 UF,20%,250VAC	TK0515	PME271Y422
A11C1303	285-1252-00			CAP,FXD,PLASTIC:0.15UF,10%,250VAC	D5243	F1772-415-2000
A11C1304	281-0815-00			CAP,FXD,CER DI:0.027UF,20%,50V	04222	SA205C273MAA
A11C1305	281-0563-00			CAP,FXD,CER DI:0.47UF,20%,50V	04222	SA305E474MAA
A11C1306	290-1158-00			CAP,FXD,ELCTLT:2200UF,20%,100V	TK0ED	ORDER BY DESC
A11C1307	285-0555-00			CAP,FXD,PLASTIC:0.1UF,20%,100V	84411	TEK376 .10 20 1
A11C1310	290-0768-00			CAP,FXD,ELCTLT:10UF,+50-20%,100WVDC	0J9R5	CEBSM2D100M
A11C1311	290-1144-00			CAP,FXD,ELCTLT:4.7UF,20%,100V	0J9R5	CEUSM2A4R7T12
A11C1312	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A11C1313	281-0767-00			CAP,FXD,CER DI:330PF,20%,100V	04222	SA102C331MAA
A11C1314	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V,,TUBULAR,MI	TK1743	CGB103KEX
A11C1315	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A11C1316	281-0865-00			CAP,FXD,CER DI:1000PF,5%,100V	04222	SA201A102JAA
A11C1330	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A11C1331	281-0767-00			CAP,FXD,CER DI:330PF,20%,100V	04222	SA102C331MAA
A11C1332	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A11C1350	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A11C1351	290-0922-00			CAP,FXD,ELCTLT:1000UF,20%,50V	1W344	SM50VB102Q16X31
A11C1353	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A11C1354	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A11C1355	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A11C1356	290-1153-00			CAP,FXD,ELCTLT:47UF,+50-10%,10V	1W344	SME10T47RM5X12L
A11C1357	281-0765-00			CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A11C1358	281-0865-00			CAP,FXD,CER DI:1000PF,5%,100V	04222	SA201A102JAA
A11C1359	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A11C1360	290-1153-00			CAP,FXD,ELCTLT:47UF,+50-10%,10V	1W344	SME10T47RM5X12L
A11C1361	281-0765-00			CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A11C1362	281-0865-00			CAP,FXD,CER DI:1000PF,5%,100V	04222	SA201A102JAA
A11C1363	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A11C1370	290-1159-00			CAP,FXD,ELCTLT:1000UF,20%,16V	TK0ED	TWSS
A11C1371	290-1159-00			CAP,FXD,ELCTLT:1000UF,20%,16V	TK0ED	TWSS
A11C1372	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A11C1373	290-1159-00			CAP,FXD,ELCTLT:1000UF,20%,16V	TK0ED	TWSS
A11C1374	290-1159-00			CAP,FXD,ELCTLT:1000UF,20%,16V	TK0ED	TWSS
A11C1375	290-0947-00			CAP,FXD,ELCTLT:33UF,+50-10%,160V W/SLEEVELUMINUM	0J9R5	CEUSM2C330-Q
A11C1376	290-1159-00			CAP,FXD,ELCTLT:1000UF,20%,16V	TK0ED	TWSS
A11C1377	290-1159-00			CAP,FXD,ELCTLT:1000UF,20%,16V	TK0ED	TWSS
A11C1378	290-1159-00			CAP,FXD,ELCTLT:1000UF,20%,16V	TK0ED	TWSS
A11C1379	290-1159-00			CAP,FXD,ELCTLT:1000UF,20%,16V	TK0ED	TWSS
A11C1380	290-0831-00			CAP,FXD,ELCTLT:470UF,+50-20%,50V	1W344	KMC100VB471M18X
A11C1390	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A11C1391	290-1150-00			CAP,FXD,ELCTLT:15UF,+50%-10%,16WVDC	K8996	030-25159
A11CR1301	152-1098-00			SEMICOND DVC,DI:POWER RECTIFIER	80009	152109800
A11CR1302	152-1098-00			SEMICOND DVC,DI:POWER RECTIFIER	80009	152109800
A11CR1303	152-1098-00			SEMICOND DVC,DI:POWER RECTIFIER	80009	152109800

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A11CR1304	152-1098-00			SEMICOND DVC,DI:POWER RECTIFIER	80009	152109800
A11CR1310	152-0808-00			DIODE,RECT:,ULTRA FAST;400V,1.5A,50NS	25403	BYD73G
A11CR1311	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A11CR1312	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A11CR1313	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A11CR1330	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A11CR1350	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A11CR1351	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A11CR1370	152-0582-00			DIODE,RECT:SCHTKY,;20V,3A,.475VF,80A IFSM	04713	1N5820
A11CR1371	152-0601-01			SEMICOND DVC,DI:RECTIFIER,SI,150V,1A,35NS REVERSE ROVERY,DO41 CASE PKG	04713	MUR115RL
A11CR1372	152-0582-00			DIODE,RECT:SCHTKY,;20V,3A,.475VF,80A IFSM	04713	1N5820
A11CR1373	152-0601-01			SEMICOND DVC,DI:RECTIFIER,SI,150V,1A,35NS REVERSE ROVERY,DO41 CASE PKG	04713	MUR115RL
A11CR1374	152-0601-01			SEMICOND DVC,DI:RECTIFIER,SI,150V,1A,35NS REVERSE ROVERY,DO41 CASE PKG	04713	MUR115RL
A11CR1375	152-0601-01			SEMICOND DVC,DI:RECTIFIER,SI,150V,1A,35NS REVERSE ROVERY,DO41 CASE PKG	04713	MUR115RL
A11CR1376	152-0601-01			SEMICOND DVC,DI:RECTIFIER,SI,150V,1A,35NS REVERSE ROVERY,DO41 CASE PKG	04713	MUR115RL
A11CR1377	152-0601-01			SEMICOND DVC,DI:RECTIFIER,SI,150V,1A,35NS REVERSE ROVERY,DO41 CASE PKG	04713	MUR115RL
A11CR1378	152-0601-01			SEMICOND DVC,DI:RECTIFIER,SI,150V,1A,35NS REVERSE ROVERY,DO41 CASE PKG	04713	MUR115RL
A11CR1379	152-0601-01			SEMICOND DVC,DI:RECTIFIER,SI,150V,1A,35NS REVERSE ROVERY,DO41 CASE PKG	04713	MUR115RL
A11DS1200	150-0035-00			LAMP,GLOW:90V MAX,0.3MA,AID-T,WIRE LD	TK0213	JH005/3011JA
A11F1301	159-0019-00			FUSE,CARTRIDGE:3AG,1A,250V,SLOW BLOW	80009	159001900
A11J1101	131-3905-00			CONN,RCPT,ELEC:PWR,250VAC,6A,CKT BD MT	TK0DY	L2157
A11J1102	131-5502-00			CONN,RCPT,ELEC:,;MINI,PCB,PRESSFIT,FEM, STR0 POS,DIM:24,13 X 27,4MM,H=4MM, TIN PLATE,UE28476	80009	131550200
A11J1104	131-1974-00			TERM SET,PIN:5 MALE CONTACT	2726	09-60-1051
A11J1105	131-1857-00			CONN,HDR:PCB,;MALE,STR,1 X 36,0.1 CTR, 0.230	58050	082-3644-SS10
A11J1106	204-1038-00			CONN BODY,PLUG:1 X 8 W/O LOCKING EAR	80009	204103800
A11J1107	204-1038-00			CONN BODY,PLUG:1 X 8 W/O LOCKING EAR	80009	204103800
A11J1108	204-1038-00			CONN BODY,PLUG:1 X 8 W/O LOCKING EAR	80009	204103800
A11L1301	108-1375-00			COIL,RF:FXD,82UH,1A	TK00A	RL-1218-820K-1A
A11L1302	108-1375-00			COIL,RF:FXD,82UH,1A	TK00A	RL-1218-820K-1A
A11L1370	108-1319-00			INDUCTOR,FIXED:33UH,10%,1.8A	54583	TSL1110-330K 1R
A11L1371	108-1446-00			INDUCTOR:FXD,62+/- 10%,5A	80009	108144600
A11L1372	108-1375-00			COIL,RF:FXD,82UH,1A	TK00A	RL-1218-820K-1A
A11L1380	108-1464-00			INDUCTOR,CHOKE:562UH	80009	108146400
A11L1381	108-1375-00			COIL,RF:FXD,82UH,1A	TK00A	RL-1218-820K-1A
A11P1301	131-5512-00			CONN,PLUG ASSY:,FEMALE,3 POS,NYLON, W/2 EA131-4208-00	80009	131551200
A11P1302	131-5512-00			CONN,PLUG ASSY:,FEMALE,3 POS,NYLON, W/2 EA131-4208-00	80009	131551200

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A11Q1301	151-0350-00			TRANSISTOR,SIG:BIPOLAR,PNP;150V,600MA, 100MHZ,AMPLIFIER	0JR04	TO BE ASSIGNED
A11Q1310	151-0482-00			TRANSISTOR:PNP,SI,TO-220	04713	TIP32C
A11Q1311	151-0350-00			TRANSISTOR,SIG:BIPOLAR,PNP;150V,600MA, 100MHZ,AMPLIFIER	0JR04	TO BE ASSIGNED
A11Q1312	151-0347-00			TRANSISTOR,SIG:BIPOLAR,NPN;160V,600MA, 100MHZ,AMPLIFIER	0JR04	2N5551
A11Q1313	151-0188-00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA, 250MHZ,AMPLIFIER	04713	2N3906
A11Q1314	151-0476-00			TRANSISTOR:SELECTED	04713	SJE389
A11Q1315	151-0190-00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA, 300MHZ,AMPLIFIER	04713	2N3904
A11Q1316	151-0188-00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA, 250MHZ,AMPLIFIER	04713	2N3906
A11Q1320	151-0350-00			TRANSISTOR,SIG:BIPOLAR,PNP;150V,600MA, 100MHZ,AMPLIFIER	0JR04	TO BE ASSIGNED
A11Q1350	151-0223-00			TRANSISTOR,SIG:BIPOLAR,NPN;15V,500MA, SWITCHING	04713	MPS2369A
A11Q1351	151-0476-00			TRANSISTOR:NPN,SI,TO-220	04713	TIP31C
A11Q1352	151-0482-00			TRANSISTOR:PNP,SI,TO-220	04713	TIP32C
A11Q1353	151-0223-00			TRANSISTOR,SIG:BIPOLAR,NPN;15V,500MA, SWITCHING	04713	MPS2369A
A11Q1354	151-0476-00			TRANSISTOR:NPN,SI,TO-220	04713	TIP31C
A11Q1355	151-0482-00			TRANSISTOR:PNP,SI,TO-220	04713	TIP32C
A11R1228	321-0305-00			RES,FXD,FILM:14.7K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G 14701
A11R1229	321-0305-00			RES,FXD,FILM:14.7K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G 14701
A11R1240	301-0514-00			RES,FXD,FILM:510K OHM,5%,0.5W	19701	5053CX510K0J
A11R1241	321-0414-00			RES,FXD,FILM:200K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20002F
A11R1242	301-0514-00			RES,FXD,FILM:510K OHM,5%,0.5W	19701	5053CX510K0J
A11R1243	301-0514-00			RES,FXD,FILM:510K OHM,5%,0.5W	19701	5053CX510K0J
A11R1244	301-0514-00			RES,FXD,FILM:510K OHM,5%,0.5W	19701	5053CX510K0J
A11R1245	301-0514-00			RES,FXD,FILM:510K OHM,5%,0.5W	19701	5053CX510K0J
A11R1246	301-0514-00			RES,FXD,FILM:510K OHM,5%,0.5W	19701	5053CX510K0J
A11R1247	311-2497-00			RES,VAR,NONWW:PNL,2.5M,0.75 W,LINEAR	80009	311249700
A11R1256	307-0115-00			RES,FXD,CMPSN:7.5 OHM,5%,0.25W	01121	CB75G5 CARD PAC
A11R1301	321-0481-00			RES,FXD,FILM:1M OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10003F
A11R1302	321-0385-00			RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10002F
A11R1303	315-0473-00			RES,FXD,FILM:47K OHM,5%,0.25W	TK1727	SFR25 2322-181-
A11R1304	321-0959-03			RES,FXD,FILM:24.01K OHM,0.25%,0.125W,T2	07716	CEA 24.01 K OHM
A11R1305	321-0265-00			RES,FXD,FILM:5.62K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G56200F
A11R1306	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A11R1307	315-0473-00			RES,FXD,FILM:47K OHM,5%,0.25W	TK1727	SFR25 2322-181-
A11R1308	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A11R1310	321-0361-00			RES,FXD,FILM:56.2K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G56201F
A11R1311	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A11R1312	321-0318-00			RES,FXD,FILM:20.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20001F
A11R1313	321-0481-00			RES,FXD,FILM:1M OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10003F
A11R1314	315-0752-00			RES,FXD,FILM:7.5K OHM,5%,0.25W	TK1727	SFR25 2322-181-
A11R1315	321-0322-00			RES,FXD,FILM:22.1K OHM,1%,0.125W,TC=TO,MI	91637	CMF55116G22101F

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A11R1316	315-0243-00			RES,FXD,FILM:24K OHM,5%,0.25W	TK1727	SFR25 2322-181-
A11R1317	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A11R1318	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A11R1319	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A11R1320	321-0337-00			RES,FXD,FILM:31.6K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G31601F
A11R1321	321-0208-00			RES,FXD,FILM:1.43K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G14300F
A11R1322	308-0843-00			RES,FXD:0.2 OHM,5%,1/0W	91637	CPF1-R20JT
A11R1323	321-0163-00			RES,FXD,FILM:487 OHM,1%,0.125W,TC=T0	91637	CMF55116G487R0F
A11R1324	315-0162-00			RES,FXD,FILM:1.6K OHM,5%,0.25W	TK1727	SFR25 2322-181-
A11R1325	315-0222-00			RES,FXD,FILM:2.2K OHM,5%,0.25W	TK1727	SFR25 2322-181-
A11R1326	321-0205-00			RES,FXD,FILM:1.33K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G13300F
A11R1327	321-0218-00			RES,FXD,FILM:1.82K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G18200F
A11R1328	321-0068-00			RES,FXD,FILM:49.9 OHM,0.1%,0.125W,TC=T0 MI	91637	CMF55116G49R90F
A11R1330	321-0385-00			RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10002F
A11R1331	321-0318-00			RES,FXD,FILM:20.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20001F
A11R1332	315-0270-00			RES,FXD,FILM:27 OHM,5%,0.25W	TK1727	SFR25 2322-181-
A11R1333	321-0481-00			RES,FXD,FILM:1M OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10003F
A11R1334	315-0204-00			RES,FXD,FILM:200K OHM,5%,0.25W	TK1727	SFR25 2322-181-
A11R1335	315-0273-00			RES,FXD,FILM:27K OHM,5%,0.25W	TK1727	SFR25 2322-181-
A11R1336	321-0322-00			RES,FXD,FILM:22.1K OHM,1%,0.125W,TC=TO,MI	91637	CMF55116G22101F
A11R1337	311-2354-00			RES,VAR,NONWW:TRMR,4.7K OHM,0.5W	K8788	TC10-LH2.5-4K7/
A11R1338	321-0337-00			RES,FXD,FILM:31.6K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G31601F
A11R1339	321-0385-00			RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10002F
A11R1340	321-0163-00			RES,FXD,FILM:487 OHM,1%,0.125W,TC=T0	91637	CMF55116G487R0F
A11R1341	321-0319-00			RES,FXD,FILM:20.5K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20501F
A11R1342	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A11R1343	321-0251-00			RES,FXD,FILM:4.02K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G40200F
A11R1344	321-0245-00			RES,FXD,FILM:3.48K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G34800F
A11R1345	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A11R1346	321-0261-00			RES,FXD,FILM:5.11K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G51100F
A11R1350	315-0243-00			RES,FXD,FILM:24K OHM,5%,0.25W	TK1727	SFR25 2322-181-
A11R1352	315-0392-00			RES,FXD,FILM:3.9K OHM,5%,0.25W	TK1727	SFR25 2322-181-
A11R1354	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A11R1355	321-0385-00			RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10002F
A11R1356	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A11R1357	321-0385-00			RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10002F
A11R1358	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A11R1359	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A11R1360	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A11R1361	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100ROF
A11R1362	321-0163-00			RES,FXD,FILM:487 OHM,1%,0.125W,TC=T0	91637	CMF55116G487R0F
A11R1363	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A11R1364	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A11R1365	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A11R1366	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100ROF
A11R1367	321-0163-00			RES,FXD,FILM:487 OHM,1%,0.125W,TC=T0	91637	CMF55116G487R0F
A11R1368	321-0337-00			RES,FXD,FILM:31.6K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G31601F
A11R1369	321-0253-00			RES,FXD,FILM:4.22K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G42200F

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A11R1370	131-0566-00			BUS,CONDUCTOR:DUMMY RES, 0.094 OD X 0.225L	24546	OMA 07
A11R1371	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A11R1372	321-0261-00			RES,FXD,FILM:5.11K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G51100F
A11R1390	321-0131-00			RES,FXD,FILM:226 OHM,1%,0.125W,TC=T0	91637	CMF55116G226R0F
A11R1391	321-0231-00			RES,FXD,FILM:2.49K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G24900F
A11RV1301	307-1622-00			RES,V SENSITIVE:75VAC-100VDC,METAL OXIDE,RADIAL LEAD,DISK,M DIA, EPOXY COATING	80009	307162200
A11S1301	260-1849-00			SWITCH,PUSH:DPDT,4A,250VAC	31918	NE15/F2U103EE W
A11T1301	120-1928-00			XFMR,TOROIDAL:MAINS	80009	120192800
A11T1350	120-1927-00			XFMR,SWITCHING:HIGH VOLTAGE	80009	120192700
A11U1201	152-1046-00			MODULE,HV:,;4KVAC INPUT,12KVDC ANODE OUT,-2KVDC CATHODE OUT	51406	MSL8524
A11U1310	156-1627-00			IC,LINEAR:BIPOLAR,SW-REGULATOR CONTROLLER;PWM,PUSH-PULLOUTPUTS	01295	TL594CN
A11U1311	156-0853-00			IC,LINEAR:BIPOLAR,OP-AMP;DUAL, SINGLE SUPPLY	04713	LM358N
A11U1350	156-1627-00			IC,LINEAR:BIPOLAR,SW-REGULATOR CONTROLLER;PWM,PUSH-PULLOUTPUTS	01295	TL594CN
A11U1390	156-1161-00			IC,LINEAR:BIPOLAR,VOLTAGE REGULATOR; POSITIVE,ADJUSTABLE,1.5A,4%	04713	LM317T
A11VR1310	152-0147-00			DIODE,ZENER:,;27V,5%,0.4W	04713	SZ50622KRL
A11VR1311	152-0147-00			DIODE,ZENER:,;27V,5%,0.4W	04713	SZ50622KRL
A11VR1330	152-0317-00			DIODE,ZENER:,;6.2V,5%,0.4W	04713	1N825
A11VR1350	152-0243-00			DIODE,ZENER:,;15V,5%,0.4W	04713	SZ13203 (1N965B
A11VR1351	152-0278-00			DIODE,ZENER:,;3V,5%,0.4W	04713	1N4372ARL
A11VR1352	152-0278-00			DIODE,ZENER:,;3V,5%,0.4W	04713	1N4372ARL
A11W1103	174-2785-00			CA ASSY,SP:RIBBON,4 WAY,28 AWG,300V, ULSTYL	8000	174278500

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A12	671--2428-00		700300	Front Board	80009	671242800
A12	671--2428-01	700301		Front Board	80009	671242801
A12C1400	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A12C1401	281-0956-00			CAP,FXD,CER DI:33PF,2%,100V	80009	281095600
A12C1402	281-0956-00			CAP,FXD,CER DI:33PF,2%,100V	80009	281095600
A12C1500	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A12C1501	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A12C1502	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A12CR1400	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A12CR1401	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A12CR1402	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A12CR1403	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A12CR1404	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A12CR1405	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A12CR1406	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A12CR1407	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A12CR1408	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A12CR1409	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A12CR1410	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A12CR1411	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A12DS1400	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1500	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1501	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1502	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1503	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1504	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1505	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1506	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1507	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1510	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1511	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1512	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1513	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1514	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1515	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1516	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1517	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1520	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1521	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1522	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1523	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1524	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1525	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1526	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1527	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1530	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1531	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1532	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1533	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1534	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A12DS1535	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1536	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1537	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1540	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1541	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1542	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1543	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1544	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1545	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1546	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1547	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1550	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1551	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1552	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1553	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1554	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1555	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1556	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1557	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1560	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1561	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1562	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12DS1563	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A12R1400	321-0843-01			RES,FXD,FILM:270 OHM,0.5%,0.125W,TC=T0MI	19701	5033RD270R0D
A12R1401	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A12R1402	307-0446-00			RES NTWK,FXD,FI:10K OHM,20%,(9)RE	11236	750-101-R10K
A12R1403	315-0475-00			RES,FXD,FILM:4.7M OHM,5%,0.25W	TK1727	SFR25 2322-181-
A12R1410	311-2477-00			RES,VAR,NONWW:POT,CARBON TRACK,PP12, 4K7	80009	311247700
A12R1411	311-2477-00			RES,VAR,NONWW:POT,CARBON TRACK,PP12, 4K7	80009	311247700
A12R1412	311-2477-00			RES,VAR,NONWW:POT,CARBON TRACK,PP12, 4K7	80009	311247700
A12R1413	311-2477-00			RES,VAR,NONWW:POT,CARBON TRACK,PP12, 4K7	80009	311247700
A12R1414	311-2477-00			RES,VAR,NONWW:POT,CARBON TRACK,PP12, 4K7	80009	311247700
A12R1415	311-2495-00			RES,VAR:PNL,4.7K,360 DEG	80009	311249500
A12R1416	311-2479-00			RES,VAR,NONWW:POT,CARBON TRACK,PP12, 47K	80009	311247900
A12R1417	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A12R1418	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A12R1500	307-0695-00			RES NTWK,FXD,FI:9,150 OHM,2%,0.2W E	11236	750-101-R150 OH
A12R1510	307-0695-00			RES NTWK,FXD,FI:9,150 OHM,2%,0.2W E	11236	750-101-R150 OH
A12R1520	307-0695-00			RES NTWK,FXD,FI:9,150 OHM,2%,0.2W E	11236	750-101-R150 OH
A12R1530	307-0695-00			RES NTWK,FXD,FI:9,150 OHM,2%,0.2W E	11236	750-101-R150 OH
A12R1540	307-0695-00			RES NTWK,FXD,FI:9,150 OHM,2%,0.2W E	11236	750-101-R150 OH
A12R1550	307-0611-00			RES NTWK,FXD,FI:7,150 OHM,5%,1.125	11236	750-81-R150 OHM
A12S1400	260-2575-00		700300	SWITCH,ROTARY:GRAY CODE,V/DIV,SEC/DIV	80009	260257500
A12S1400	260-2575-01	700301		SWITCH,ROTARY:GRAY CODE,V/DIV,SEC/DIV	80009	260257501
A12S1401	260-2575-00		700300	SWITCH,ROTARY:GRAY CODE,V/DIV,SEC/DIV	80009	260257500
A12S1401	260-2575-01	700301		SWITCH,ROTARY:GRAY CODE,V/DIV,SEC/DIV	80009	260257501
A12S1402	260-2575-00		700300	SWITCH,ROTARY:GRAY CODE,V/DIV,SEC/DIV	80009	260257500
A12S1402	260-2575-01	700301		SWITCH,ROTARY:GRAY CODE,V/DIV,SEC/DIV	80009	260257501
A12S1410	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A12S1411	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1412	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1413	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1414	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1415	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1420	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1421	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1422	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1423	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1424	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1425	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1430	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1431	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1432	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1433	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1434	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1435	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1440	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1441	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1442	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1443	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1444	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1445	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1450	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1451	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1452	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1453	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1454	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1455	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1460	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1461	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A12S1463	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1464	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12S1465	260-2280-00			SW,PUSH BUTTON:MINIATURE MOMENTARY, SPST,NORMALLY OPEN	31918	KSA-0-0-A
A12TP1401	131-1857-00			CONN,HDR:PCB,;MALE,STR,1 X 36,0.1 CTR, 0.230	58050	082-3644-SS10
A12U1400	156-4254-00			IC,LINEAR:INPUT;10 BIT,A/D CONVERTERW/ SERIAL INTERFACE	80009	156425400
A12U1401	160-9140-00			IC,DIGITAL:HCMOS,MICROCONTROLLER, C68HC705P9P,WITH ROM/RAM,DIP28.PRGM	80009	160914000
A12U1402	156-1432-00			IC,DIGITAL:LSTTL,DEMUX/DECODER; DUAL 2-TO-4	01295	SN74LS156N
A12U1500	156-2349-00			IC,DIGITAL:HCMOS,REGISTER;8-BIT SIPO, LATCHED 3-STATE	0JR04	TC74HC595AP
A12U1501	156-2349-00			IC,DIGITAL:HCMOS,REGISTER;8-BIT SIPO, LATCHED 3-STATE	0JR04	TC74HC595AP
A12U1502	156-2349-00			IC,DIGITAL:HCMOS,REGISTER;8-BIT SIPO, LATCHED 3-STATE	0JR04	TC74HC595AP
A12U1503	156-2349-00			IC,DIGITAL:HCMOS,REGISTER;8-BIT SIPO, LATCHED 3-STATE	0JR04	TC74HC595AP
A12U1504	156-2349-00			IC,DIGITAL:HCMOS,REGISTER;8-BIT SIPO, LATCHED 3-STATE	0JR04	TC74HC595AP
A12U1505	156-2349-00			IC,DIGITAL:HCMOS,REGISTER;8-BIT SIPO, LATCHED 3-STATE	0JR04	TC74HC595AP
A12U1506	156-2349-00			IC,DIGITAL:HCMOS,REGISTER;8-BIT SIPO, LATCHED 3-STATE	0JR04	TC74HC595AP
A12W1200	174-2784-00			CA ASSY,SP,ELEC:RIBBON,20 WAY,28 AWG, 300V UL STYLE 2651/20367;MAIN FRON	80009	174278400
A12Y1400	158-0420-00			XTAL UNIT,QTZ:4MHZ,SIZE 11.05 X 4.65MM, TYP	80009	158042000

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A14	119-5031-00			CKT BD SUBASSY:DACULATOR CIRCUIT	80009	119503100
A14C1000	283-5098-00			CAP,FXD,CER DI:0.1UF,50WVDC	04222	W1206Z104Z2B01
A14C1001	283-5098-00			CAP,FXD,CER DI:0.1UF,50WVDC	04222	W1206Z104Z2B01
A14C1002	283-5098-00			CAP,FXD,CER DI:0.1UF,50WVDC	04222	W1206Z104Z2B01
A14C1003	283-5098-00			CAP,FXD,CER DI:0.1UF,50WVDC	04222	W1206Z104Z2B01
A14C1004	283-5098-00			CAP,FXD,CER DI:0.1UF,50WVDC	04222	W1206Z104Z2B01
A14C1005	283-5098-00			CAP,FXD,CER DI:0.1UF,50WVDC	04222	W1206Z104Z2B01
A14C1006	283-5098-00			CAP,FXD,CER DI:0.1UF,50WVDC	04222	W1206Z104Z2B01
A14C1007	283-5098-00			CAP,FXD,CER DI:0.1UF,50WVDC	04222	W1206Z104Z2B01
A14C1008	283-5098-00			CAP,FXD,CER DI:0.1UF,50WVDC	04222	W1206Z104Z2B01
A14C1009	283-5098-00			CAP,FXD,CER DI:0.1UF,50WVDC	04222	W1206Z104Z2B01
A14C1010	283-5098-00			CAP,FXD,CER DI:0.1UF,50WVDC	04222	W1206Z104Z2B01
A14C1011	283-5098-00			CAP,FXD,CER DI:0.1UF,50WVDC	04222	W1206Z104Z2B01
A14C1012	283-5098-00			CAP,FXD,CER DI:0.1UF,50WVDC	04222	W1206Z104Z2B01
A14C1013	283-5098-00			CAP,FXD,CER DI:0.1UF,50WVDC	04222	W1206Z104Z2B01
A14C1014	283-5098-00			CAP,FXD,CER DI:0.1UF,50WVDC	04222	W1206Z104Z2B01
A14C1015	283-5098-00			CAP,FXD,CER DI:0.1UF,50WVDC	04222	W1206Z104Z2B01
A14C1020	283-5098-00			CAP,FXD,CER DI:0.1UF,50WVDC	04222	W1206Z104Z2B01
A14C1021	283-5098-00			CAP,FXD,CER DI:0.1UF,50WVDC	04222	W1206Z104Z2B01
A14J1000	131-1857-00			CONN,HDR:PCB,;MALE,STR,1 X 36,0.1 CTR, 0.230	58050	082-3644-SS10
A14J1001	131-1857-00			CONN,HDR:PCB,;MALE,STR,1 X 36,0.1 CTR, 0.230	58050	082-3644-SS10
A14R1000	321-5018-00			RES,FXD,FILM:1.00K,1%,0.125W	91637	CRCW12061001FT
A14R1001	321-5018-00			RES,FXD,FILM:1.00K,1%,0.125W	91637	CRCW12061001FT
A14R1002	321-5018-00			RES,FXD,FILM:1.00K,1%,0.125W	91637	CRCW12061001FT
A14R1003	321-5018-00			RES,FXD,FILM:1.00K,1%,0.125W	91637	CRCW12061001FT
A14R1004	321-5018-00			RES,FXD,FILM:1.00K,1%,0.125W	91637	CRCW12061001FT
A14R1005	321-5018-00			RES,FXD,FILM:1.00K,1%,0.125W	91637	CRCW12061001FT
A14R1006	321-5018-00			RES,FXD,FILM:1.00K,1%,0.125W	91637	CRCW12061001FT
A14R1007	321-5018-00			RES,FXD,FILM:1.00K,1%,0.125W	91637	CRCW12061001FT
A14R1008	321-5018-00			RES,FXD,FILM:1.00K,1%,0.125W	91637	CRCW12061001FT
A14R1009	321-5018-00			RES,FXD,FILM:1.00K,1%,0.125W	91637	CRCW12061001FT
A14R1010	321-5018-00			RES,FXD,FILM:1.00K,1%,0.125W	91637	CRCW12061001FT
A14R1011	321-5018-00			RES,FXD,FILM:1.00K,1%,0.125W	91637	CRCW12061001FT
A14R1012	321-5018-00			RES,FXD,FILM:1.00K,1%,0.125W	91637	CRCW12061001FT
A14R1013	321-5018-00			RES,FXD,FILM:1.00K,1%,0.125W	91637	CRCW12061001FT
A14R1014	321-5018-00			RES,FXD,FILM:1.00K,1%,0.125W	91637	CRCW12061001FT
A14R1015	321-5018-00			RES,FXD,FILM:1.00K,1%,0.125W	91637	CRCW12061001FT
A14R1016	321-5026-00			RES,FXD,FILM:4.75K,1%,0.125W	91637	CRCW12064751FT
A14R1017	321-5026-00			RES,FXD,FILM:4.75K,1%,0.125W	91637	CRCW12064751FT
A14U1001	156-5588-00			IC,LINEAR:BIPOLAR,VOLTAGE REFERENCE; 2.5V, 1%	04713	MC1403D
A14U1002	156-6224-00			IC,CONVERTER:CMOS,D/A;12 BIT, VOLTAGE OUT,OUTPUTS,SERIAL NPUT,REFERENCE,DACULATOR	80009	156622400
A14U1003	156-5018-00			IC,LINEAR:BIPOLAR,OP-AMP;DUAL ,SINGLE SUPPLY	01295	LM358D

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A15	671-2429-01			Processor Board	80009	671242901
A15	671-2429-03		702799	Processor Board	80009	671242903
A15	671-2429-04	702800		Processor Board	80009	671242904
A15C1600	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C1603	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C1604	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C1605	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C1606	290-1150-00			CAP,FXD,ELCTLT:15UF,+50%-10%,16WVDC	K8996	030-25159
A15C1607	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C1608	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C1609	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C1610	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C1611	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C1700	281-0865-00			CAP,FXD,CER DI:1000PF,5%,100V	04222	SA201A102JAA
A15C1701	281-0893-00			CAP,FXD,CER DI:4.7PF,+/-0.5PF,100VTUBULAR	04222	SA102A4R7DAA
A15C1702	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C1703	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C1706	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C1707	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V,, TUBULAR,MI	TK1743	CGB103KEX
A15C1708	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V, TUBULAR,MI	TK1743	CGB103KEX
A15C1800	281-0811-00			CAP,FXD,CER DI:10PF,10%,100V	04222	SA102A100KAA
A15C1801	281-0759-00			CAP,FXD,CER DI:22PF,10%,100V	04222	SA102A220KAA
A15C1803	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C1804	290-1150-00			CAP,FXD,ELCTLT:15UF,+50%-10%,16WVDC	K8996	030-25159
A15C1900	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C1901	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C1902	290-1150-00			CAP,FXD,ELCTLT:15UF,+50%-10%,16WVDC	K8996	030-25159
A15C1903	285-1408-00			CAP,FXD,MTLZD:10UF,1%,250V,AXIAL,TUB,MI	TK0ED	ORDER BY DESC
A15C1904	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V, TUBULAR,MI	TK1743	CGB103KEX
A15C1920	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C1921	281-0759-00			CAP,FXD,CER DI:22PF,10%,100V	04222	SA102A220KAA
A15C1923	281-0759-00			CAP,FXD,CER DI:22PF,10%,100V	04222	SA102A220KAA
A15C2021	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2022	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2023	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2024	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2025	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2026	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2027	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2028	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2029	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2030	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2031	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2032	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2033	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2034	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2035	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2036	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2037	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2038	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA

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A15C2039	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2040	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2041	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2042	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2043	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2044	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2045	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2046	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2047	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2048	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2049	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2050	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2051	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2052	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2053	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2054	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2055	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2060	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2061	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2062	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2063	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2064	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2065	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2066	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2067	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2068	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2069	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2070	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2071	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2072	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2080	290-1045-00			CAP,FXD,ELCTLT:4.7UF,10%,35V	24165	173D475X9035W
A15C2081	290-1045-00			CAP,FXD,ELCTLT:4.7UF,10%,35V	24165	173D475X9035W
A15C2082	290-1045-00			CAP,FXD,ELCTLT:4.7UF,10%,35V	24165	173D475X9035W
A15C2083	290-1045-00			CAP,FXD,ELCTLT:4.7UF,10%,35V	24165	173D475X9035W
A15C2084	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2085	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2089	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2090	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2091	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2092	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2095	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15C2096	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A15CR1600	152-0581-00			DIODE,RECT:SCHTKY,;20V,1A,.450VF,25A IFSM	04713	1N5817
A15CR1700	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A15CR1701	152-0141-02			DIODE,SIG:,ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A15DS2100	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A15DS2101	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A15DS2102	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587
A15J1500	131-5502-00			CONN,RCPT,ELEC:,;MINI,PCB,PRESSFIT, FEM,STR20 POS,DIM:24,13 X 27,4MM,H=4MM, TIN PLATE,UL E28476	80009	131550200
A15J1501	131-5502-00			CONN,RCPT,ELEC:,;MINI,PCB,PRESSFIT, FEM,STR20 POS,DIM:24,13 X 27,4MM,H=4MM, TIN PLATE,UL E28476	80009	131550200

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A15J1502	131-5502-00			CONN,RCPT,ELEC:,;MINI,PCB,PRESSFIT,FEM ,STR20 POS,DIM:24,13 X 27,4MM,H=4MM, TIN PLATE,UL E28476	80009	131550200
A15J1503	131-5502-00			CONN,RCPT,ELEC:,;MINI,PCB,PRESSFIT, FEM,STR20 POS,DIM:24,13 X 27,4MM,H=4MM ,TIN PLATE,UL E28476	80009	131550200
A15J1504	131-5502-00			CONN,RCPT,ELEC:,;MINI,PCB,PRESSFIT, FEM,STR 20 POS,DIM:24,13 X 27,4MM,H=4MM ,TIN PLATE,UL E28476	80009	131550200
A15J1505	131-5502-00			CONN,RCPT,ELEC:,;MINI,PCB,PRESSFIT, FEM,STR 20 POS,DIM:24,13 X 27,4MM,H=4MM ,TIN PLATE,UL E28476	80009	131550200
A15J1506	131-3396-00			CONN,DSUB:PCB,,;FEMALE,RTANG,25 POS, 0.112 CTR,0.318 MLG X 0.125TAIL,4-40 THD INSERT,BDRETENTION	TK0AY	JBY-25S-1A3F-14
A15J1510	131-5586-00	702800		CONN FEM 6 P	80009	131558600
A15J1511	131-1857-00			CONN,HDR:PCB,;MALE,STR,1 X 36,0.1 CTR, 0.230	58050	082-3644-SS10
A15J1512	131-1857-00	702800		.083 CONN HDR 36 P	58050	082-3644-SS10
A15J1700	131-3378-00			CONN,RF JACK:BNC,;50 OHM,FEMALE, RTANG,PCB/REAR PNL,0.5-28 THD, 0.625 H X 0.187 TAIL,W/O	00779	227677-1
A15P1512	131-0993-00	702800		BUS CONDUCTOR 2P	22526	65474-006
A15Q1600	151-0190-00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA, 300MHZ,AMPLIFIER	04713	2N3904
A15Q1601	151-0188-00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA, 250MHZ,AMPLIFIER	04713	2N3906
A15Q1700	151-1042-00			TRANSISTOR,SIG:JFET,N-CH;6V,10-15MA, 4.5MS,IDSS(1-2)<0.5MA,AMPLIFIER	04713	SPF627M2
A15Q1701	151-1042-00			TRANSISTOR,SIG:JFET,N-CH;6V,10-15MA, 4.5MS,IDSS(1-2)<0.5MA,AMPLIFIER	04713	SPF627M2
A15Q1900	151-0190-00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA, 300MHZ,AMPLIFIER	04713	2N3904
A15R1600	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A15R1601	321-0222-00			RES,FXD,FILM:2.00K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20000F
A15R1602	321-0222-00			RES,FXD,FILM:2.00K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20000F
A15R1603	321-0222-00			RES,FXD,FILM:2.00K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20000F
A15R1604	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001F
A15R1605	321-0215-00			RES,FXD,FILM:1.69K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G16900F
A15R1606	321-0161-00			RES,FXD,FILM:464 OHM,1%,0.125W,TC=T0	91637	CMF55116G464R0F
A15R1607	321-0161-00			RES,FXD,FILM:464 OHM,1%,0.125W,TC=T0	91637	CMF55116G464R0F
A15R1610	321-0161-00			RES,FXD,FILM:464 OHM,1%,0.125W,TC=T0	91637	CMF55116G464R0F
A15R1611	131-0566-00			BUS,CONDUCTOR:DUMMY RES, 0.094 OD X 0.225L	24546	OMA 07
A15R1612	131-0566-00			BUS,CONDUCTOR:DUMMY RES, 0.094 OD X 0.225L	24546	OMA 07
A15R1700	321-0257-00			RES,FXD,FILM:4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400F
A15R1701	321-0481-00			RES,FXD,FILM:1M OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10003F
A15R1702	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100R0F
A15R1703	321-0113-00			RES,FXD,FILM:147 OHM,1%,0.125W,TC=T0	91637	CMF55116G147R0F
A15R1707	321-0325-00			RES,FXD,FILM:23.7K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G23701F
A15R1708	321-0365-00			RES,FXD,FILM:61.9K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G61901F
A15R1710	131-0566-00			BUS,CONDUCTOR:DUMMY RES, 0.094 OD X 0.225L	24546	OMA 07

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A15R1711	131-0566-00			BUS,CONDUCTOR:DUMMY RES, 0.094 OD X 0.225	24546	OMA 07
A15R1712	131-0566-00			BUS,CONDUCTOR:DUMMY RES, 0.094 OD X 0.225L	24546	OMA 07
A15R1713	131-0566-00			BUS,CONDUCTOR:DUMMY RES, 0.094 OD X 0.225L	24546	OMA 07
A15R1714	131-0566-00			BUS,CONDUCTOR:DUMMY RES, 0.094 OD X 0.225L	24546	OMA 07
A15R1715	131-0566-00			BUS,CONDUCTOR:DUMMY RES, 0.094 OD X 0.225L	24546	OMA 07
A15R1800	321-0253-00			RES,FXD,FILM:4.22K OHM,1%,0.125W, TC=T0MI	91637	CMF55116G42200F
A15R1804	307-0445-00			RES NTWK,FXD,FI:4.7K OHM,20%,(9)RE	11236	750-101-R4.7 K
A15R1805	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A15R1807	321-0257-00			RES,FXD,FILM:4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400F
A15R1860	321-0257-00			RES,FXD,FILM:4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400F
A15R1861	321-0257-00			RES,FXD,FILM:4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400F
A15R1862	321-0257-00			RES,FXD,FILM:4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400F
A15R1863	321-0257-00			RES,FXD,FILM:4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400F
A15R1900	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A15R1901	321-1771-07			RES,FXD,FILM:1.24K,0.1%,0.125W,TC=T9	57027	1.24K CM55 T9 .
A15R1902	321-0908-02			RES,FXD,FILM:1.31K OHM,0.5%,0.125W,TC=T2	07716	CEA 1.31 KOHM 0
A15R1903	321-0201-07			RES,FXD,FILM:1.21K OHM,0.1%,0.125W,TC=T9	57027	1.21K CM55 T9.1
A15R1904	321-0843-01			RES,FXD,FILM:270 OHM,0.5%,0.125W,TC=T0MI	19701	5033RD270R0D
A15R1905	321-0606-00			RES,FXD,FILM:203K OHM,0.25%,0.125W,TC=T2	80009	321060600
A15R1906	321-1771-07			RES,FXD,FILM:1.24K,0.1%,0.125W,TC=T9	57027	1.24K CM55 T9 .
A15R1907	321-1771-07			RES,FXD,FILM:1.24K,0.1%,0.125W,TC=T9	57027	1.24K CM55 T9 .
A15R1908	321-1771-07			RES,FXD,FILM:1.24K,0.1%,0.125W,TC=T9	57027	1.24K CM55 T9 .
A15R1909	321-1771-07			RES,FXD,FILM:1.24K,0.1%,0.125W,TC=T9	57027	1.24K CM55 T9 .
A15R1910	321-0161-00			RES,FXD,FILM:464 OHM,1%,0.125W,TC=T0	91637	CMF55116G464R0F
A15R1912	321-0231-07			RES,FXD,FILM:2.49K OHM,0.1%,0.125W,TC=T9	57027	2.49K CM55 T99.
A15R1913	321-0231-07			RES,FXD,FILM:2.49K OHM,0.1%,0.125W,TC=T9	57027	2.49K CM55 T99.
A15R1915	321-0257-00			RES,FXD,FILM:4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400F
A15R1918	321-0231-07			RES,FXD,FILM:2.49K OHM,0.1%,0.125W,TC=T9	57027	2.49K CM55 T99.
A15R1919	321-0231-07			RES,FXD,FILM:2.49K OHM,0.1%,0.125W,TC=T9	57027	2.49K CM55 T99.
A15R1920	321-0231-07			RES,FXD,FILM:2.49K OHM,0.1%,0.125W,TC=T9	57027	2.49K CM55 T99.
A15R1921	321-0231-07			RES,FXD,FILM:2.49K OHM,0.1%,0.125W,TC=T9	57027	2.49K CM55 T99.
A15R1922	321-0231-07			RES,FXD,FILM:2.49K OHM,0.1%,0.125W,TC=T9	57027	2.49K CM55 T99.
A15R1923	321-0231-07			RES,FXD,FILM:2.49K OHM,0.1%,0.125W,TC=T9	57027	2.49K CM55 T99.
A15R1924	321-0161-00			RES,FXD,FILM:464 OHM,1%,0.125W,TC=T0	91637	CMF55116G464R0F
A15R1925	321-0165-00			RES,FXD,FILM:511 OHM,1%,0.125W,TC=T0	91637	CMF55116G511R0F
A15R1926	311-2363-00			RES,VAR,NONWW:TRMR,1K OHM,0.5W	K8788	TC10-LV10-1K/A
A15R1927	321-0235-00			RES,FXD,FILM:2.74K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G27400F
A15R1929	321-0235-00			RES,FXD,FILM:2.74K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G27400F
A15R1930	311-2363-00			RES,VAR,NONWW:TRMR,1K OHM,0.5W	K8788	TC10-LV10-1K/A
A15R1931	321-0257-00			RES,FXD,FILM:4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400F
A15R1932	321-0257-00			RES,FXD,FILM:4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400F
A15R1933	321-0257-00			RES,FXD,FILM:4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400F
A15R1934	321-0257-00			RES,FXD,FILM:4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400F
A15R1935	321-1771-07			RES,FXD,FILM:1.24K,0.1%,0.125W,TC=T9	57027	1.24K CM55 T9 .
A15R1936	321-1771-07			RES,FXD,FILM:1.24K,0.1%,0.125W,TC=T9	57027	1.24K CM55 T9 .

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A15R1940	321-0231-07			RES,FXD,FILM:2.49K OHM,0.1%,0.125W,TC=T9	57027	2.49K CM55 T99.
A15R1941	321-0231-07			RES,FXD,FILM:2.49K OHM,0.1%,0.125W,TC=T9	57027	2.49K CM55 T99.
A15R1942	321-0231-07			RES,FXD,FILM:2.49K OHM,0.1%,0.125W,TC=T9	57027	2.49K CM55 T99.
A15R1943	321-0231-07			RES,FXD,FILM:2.49K OHM,0.1%,0.125W,TC=T9	57027	2.49K CM55 T99.
A15R1950	321-0161-00			RES,FXD,FILM:464 OHM,1%,0.125W,TC=T0	91637	CMF55116G464R0F
A15R1951	321-0161-00			RES,FXD,FILM:464 OHM,1%,0.125W,TC=T0	91637	CMF55116G464R0F
A15R1952	321-0161-00			RES,FXD,FILM:464 OHM,1%,0.125W,TC=T0	91637	CMF55116G464R0F
A15R1953	321-0161-00			RES,FXD,FILM:464 OHM,1%,0.125W,TC=T0	91637	CMF55116G464R0F
A15R2100	131-0566-00			BUS,CONDUCTOR:DUMMY RES	24546	OMA 07
A15R2101	131-0566-00			BUS,CONDUCTOR:DUMMY RES,	24546	OMA 07
A15R2102	131-0566-00			BUS,CONDUCTOR:DUMMY RES	24546	OMA 07
A15R2103	131-0566-00			BUS,CONDUCTOR:DUMMY RES,	24546	OMA 07
A15R2104	131-0566-00			BUS,CONDUCTOR:DUMMY RES	24546	OMA 07
A15R2105	131-0566-00			BUS,CONDUCTOR:DUMMY RES,	24546	OMA 07
A15R2106	131-0566-00			BUS,CONDUCTOR:DUMMY RES	24546	OMA 07
A15R2107	131-0566-00			BUS,CONDUCTOR:DUMMY RES,	24546	OMA 07
A15R2108	131-0566-00			BUS,CONDUCTOR:DUMMY RES,	24546	OMA 07
A15R2109	321-0257-00			RES,FXD,FILM:4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400F
A15R2110	131-0566-00			BUS,CONDUCTOR:DUMMY RES	24546	OMA 07
A15R2111	131-0566-00			BUS,CONDUCTOR:DUMMY RES,	24546	OMA 07
A15R2112	131-0566-00			BUS,CONDUCTOR:DUMMY RES	24546	OMA 07
A15R2113	131-0566-00			BUS,CONDUCTOR:DUMMY RES,	24546	OMA 07
A15R2114	131-0566-00			BUS,CONDUCTOR:DUMMY RES,	24546	OMA 07
A15R2115	131-0566-00			BUS,CONDUCTOR:DUMMY RES	24546	OMA 07
A15R2116	131-0566-00			BUS,CONDUCTOR:DUMMY RES,	24546	OMA 07
A15R2120	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A15R2121	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A15R2122	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F
A15R2123	321-0257-00			RES,FXD,FILM:4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400F
A15R2124	321-0257-00			RES,FXD,FILM:4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400F
A15U1600	156-1200-00			IC,LINEAR:BIFET,OP-AMP;QUAD	01295	TL074CN
A15U1601	156-2800-00			IC,CONVERTER:TTL,A/D;8-BIT,25MSPS,FLASH	04713	MC10319 (P OR L
A15U1602	156-2800-00			IC,CONVERTER:TTL,A/D;8-BIT,25MSPS,FLASH	04713	MC10319 (P OR L
A15U1603	156-1664-00			IC,DIGITAL:ALSTTL,FLIP FLOP;OCTAL D-TYPE, 3-STATE	01295	SN74ALS574BN
A15U1604	156-1664-00			IC,DIGITAL:ALSTTL,FLIP FLOP;OCTAL D-TYPE, 3-STATE	01295	SN74ALS574BN
A15U1605	156-4256-00			IC,MEMORY:CMOS,SRAM;8K X 8 BIT,35NSEC, DIP28.3	80009	156425600
A15U1606	156-4256-00			IC,MEMORY:CMOS,SRAM;8K X 8 BIT,35NSEC, DIP28.3	80009	156425600
A15U1607	156-1858-00			IC,DIGITAL:ALSTTL,LATCH;OCTAL D-TYPE TRANSPARENT, 3-STATE	01295	SN74ALS573CN
A15U1608	156-1858-00			IC,DIGITAL:ALSTTL,LATCH;OCTAL D-TYPE TRANSPARENT, 3-STATE	01295	SN74ALS573CN
A15U1609	156-1704-01			IC,DIGITAL:FTTL,FLIP FLOP;OCTAL D, 3-STATE	18324	N74F374N
A15U1610	160-9142-00			IC,DIGITAL:CMOS,PAL16V8-25QP, PRGM,DIP20.3	80009	160914200
A15U1611	160-9146-00			IC,DIGITAL:CMOS,PAL16V8-25QP, PRGM,DIP20.3	80009	160914600
A15U1612	156-1662-00			IC,DIGITAL:FTTL,MUX;DUAL 4-TO-1 DATA SELECTOR	04713	MC74F153N
A15U1613	156-1611-00			IC,DIGITAL:FTTL,FLIP FLOP;DUAL D-TYPE	04713	MC74F74N
A15U1614	156-1611-00			IC,DIGITAL:FTTL,FLIP FLOP;DUAL D-TYPE	04713	MC74F74N
A15U1615	156-2251-00			IC,DIGITAL:FTTL,COUNTER;SYNCH 4-BIT BINARY	04713	MC74F161AN

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A15U1616	156-2251-00			IC,DIGITAL:FTTL,COUNTER;SYNCH 4-BIT BINARY	04713	MC74F161AN
A15U1617	156-2251-00			IC,DIGITAL:FTTL,COUNTER;SYNCH 4-BIT BINARY	04713	MC74F161AN
A15U1618	156-2251-00			IC,DIGITAL:FTTL,COUNTER;SYNCH 4-BIT BINARY	04713	MC74F161AN
A15U1619	156-2251-00			IC,DIGITAL:FTTL,COUNTER;SYNCH 4-BIT BINARY	04713	MC74F161AN
A15U1620	156-2251-00			IC,DIGITAL:FTTL,COUNTER;SYNCH 4-BIT BINARY	04713	MC74F161AN
A15U1621	156-1611-00			IC,DIGITAL:FTTL,FLIP FLOP;DUAL D-TYPE	04713	MC74F74N
A15U1622	156-1707-00			IC,DIGITAL:FTTL,GATE;QUAD 2-INPUT NAND	04713	MC74F00 (N OR J
A15U1700	156-3692-00			IC,DIGITAL:HCTCMOS,GATE; QUAD 2-INPUT NAND SCHMITT TRIG	80009	156369200
A15U1701	156-1600-00			IC,DIGITAL:LSTTL,MISC;DUAL RETRIG MONOSTABLE MULTIVIBRATOR	01295	SN74LS123(N OR
A15U1702	119-1460-00			OSC,XTAL,CLOCK:40.0MHZ	TK2424	K1100AM 40.0 MH
A15U1703	156-1723-00			IC,DIGITAL:FTTL,GATE;QUAD 2-INPUT AND	04713	MC74F08N
A15U1704	156-1743-00			IC,DIGITAL:FTTL,GATE;QUAD 2-INPUT NOR	04713	MC74F02N
A15U1705	156-0865-00			IC,DIGITAL:LSTTL,FLIP FLOP;OCTAL D-TYPE, CLEAR	01295	SN74LS273N
A15U1706	156-0865-00			IC,DIGITAL:LSTTL,FLIP FLOP;OCTAL D-TYPE CLEAR	01295	SN74LS273N
A15U170	156-1973-00			IC,DIGITAL:FTTL,FLIP FLOP;QUAD D-TYPE	18324	N74F175N
A15U1708	156-2251-00			IC,DIGITAL:FTTL,COUNTER;SYNCH 4-BIT BINARY	04713	MC74F161AN
A15U1709	156-1611-00			IC,DIGITAL:FTTL,FLIP FLOP;DUAL D-TYPE	04713	MC74F74N
A15U1710	156-2333-00			IC,DIGITAL:ALSTTL,COUNTER;SYNCH 4-BIT DECADE	01295	SN74ALS162BN
A15U1711	156-2333-00			IC,DIGITAL:ALSTTL,COUNTER;SYNCH 4-BIT DECADE	01295	SN74ALS162BN
A15U1712	156-2333-00			IC,DIGITAL:ALSTTL,COUNTER;SYNCH 4-BIT DECADE	01295	SN74ALS162BN
A15U1713	156-2333-00			IC,DIGITAL:ALSTTL,COUNTER;SYNCH 4-BIT DECADE	01295	SN74ALS162BN
A15U1714	156-1662-00			IC,DIGITAL:FTTL,MUX;DUAL 4-TO-1 DATA SELECTOR	04713	MC74F153N
A15U1715	156-1611-00			IC,DIGITAL:FTTL,FLIP FLOP;DUAL D-TYPE	04713	MC74F74N
A15U1716	156-2251-00			IC,DIGITAL:FTTL,COUNTER;SYNCH 4-BIT BINARY	04713	MC74F161AN
A15U1718	156-1611-00			IC,DIGITAL:FTTL,FLIP FLOP;DUAL D-TYPE	04713	MC74F74N
A15U1801	156-4259-00			IC,DIGITAL:CMOS,MICROPROCESSOR, SCC68070,16/32 BIT,15MHZ,PLCC84	80009	156425900
A15U1802	156-2396-00			IC,MISC:BIPOLAR,PWR SUPPLY SUPERVISOR; MPU RESET GENERATOR, 5V SUPPLY SENSING	01295	TL7705 ACP
A15U1804	156-3355-00			IC,MEMORY:CMOS,SRAM;32K X 8,85NS,OE	TK1146	M5M5256BP-85
A15U1805	156-3355-00			IC,MEMORY:CMOS,SRAM;32K X 8,85NS,OE	TK1146	M5M5256BP-85
A15U1806	160-9144-00			IC,DIGITAL:CMOS,EPROM,27C010-15FA, PRGMDIP32.6	80009	160914400
A15U1806	160-9144-02		705129	IC,DIG:CMOS,EPR,27C010	80009	160914402
A15U1806	160-9144-03	705130		IC,DIG:CMOS,EPR,27C020	80009	160914403
A15U1807	160-9145-00			IC,DIGITAL:CMOS,EPROM,27C010-15FA, PRGMDIP32.6	80009	160914500
A15U1807	160-9145-02		705129	IC,DIG:CMOS,EPR,27C010	80009	160914502
A15U1807	160-9145-03	705130		IC,DIG:CMOS,EPR,27C020	80009	160914503

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A15U1810	156-1727-00			IC,DIGITAL:FTTL,DEMUX/DECODER; 1-OF-8 DECODER	04713	MC74F138 N
A15U1811	156-1727-00			IC,DIGITAL:FTTL,DEMUX/DECODER; 1-OF-8 DECODER	04713	MC74F138 N
A15U1812	156-1727-00			IC,DIGITAL:FTTL,DEMUX/DECODER; 1-OF-8 DECODER	04713	MC74F138 N
A15U1813	156-1663-00			IC,DIGITAL:FTTL,GATE;TRIPLE 3-INPUT AND	04713	MC74F11N
A15U1814	156-1663-00			IC,DIGITAL:FTTL,GATE;TRIPLE 3-INPUT AND	04713	MC74F11N
A15U1820	156-1611-00			IC,DIGITAL:FTTL,FLIP FLOP;DUAL D-TYP	04713	MC74F74N
A15U1821	156-1724-00			IC,DIGITAL:FTTL,GATES;QUAD 2-INPUT OR	04713	MC74F32N
A15U1830	156-1858-00			IC,DIGITAL:ALSTTL,LATCH;OCTAL D-TYPE TRANSPARENT, 3-STATE	01295	SN74ALS573CN
A15U1840	156-0844-00			IC,DIGITAL:LSTTL,COUNTER;SYNCH 4-BIT BINARY	01295	SN74LS161AN
A15U1850	156-1725-00			IC,DIGITAL:FTTL,BUS TRANSCEIVER;OCTAL, NONINV, 3-STATE	04713	MC74F245 N OR J
A15U1860	156-0865-00			IC,DIGITAL:LSTTL,FLIP FLOP;OCTAL D-TYPE, CLEAR	01295	SN74LS273N
A15U1900	156-3804-00			IC,DIGITAL:HCTCMOS,FIFO;16X4 ASYNCH, REGISTER, 3-STATE	18324	74HCT40105N
A15U1901	156-3804-00			IC,DIGITAL:HCTCMOS,FIFO;16X4 ASYNCH, REGISTER, 3-STATE	18324	74HCT40105N
A15U1902	156-3804-00			IC,DIGITAL:HCTCMOS,FIFO;16X4 ASYNCH, REGISTER, 3-STATE	18324	74HCT40105N
A15U1903	156-3804-00			IC,DIGITAL:HCTCMOS,FIFO;16X4 ASYNCH, REGISTER, 3-STATE	18324	74HCT40105N
A15U1904	156-3804-00			IC,DIGITAL:HCTCMOS,FIFO;16X4 ASYNCH, REGISTER, 3-STATE	18324	74HCT40105N
A15U1905	156-3804-00			IC,DIGITAL:HCTCMOS,FIFO;16X4 ASYNCH, REGISTER, 3-STATE	18324	74HCT40105N
A15U1906	156-0865-00			IC,DIGITAL:LSTTL,FLIP FLOP;OCTAL D-TYPE, CLEAR	01295	SN74LS273N
A15U1907	156-0388-00			IC,DIGITAL:LSTTL,FLIP FLOP;DUAL D W/SET & CLR	01295	SN74LS74AN
A15U1908	156-0412-00			IC,DIGITAL:LSTTL,COUNTER;SYNCH 4-BIT UP/DOWN BINARY	01295	SN74LS193N
A15U1909	160-9147-00			IC,DIGITAL:CMOS,PAL16V8-25QP, PRGM,DIP20.3	80009	160914700
A15U1910	156-1743-00			IC,DIGITAL:FTTL,GATE;QUAD 2-INPUT NOR	04713	MC74F02N
A15U1920	156-0728-00			IC,DIGITAL:LSTTL,GATES;QUAD 2-INPUT AND, OC	01295	SN74LS09N
A15U1921	156-1200-00			IC,LINEAR:BIFET,OP-AMP;QUAD	01295	TL074CN
A15U1922	156-1255-00			IC,CONVERTER:BIPOLAR,D/A;8 BIT, 85NS,CURRENT	24355	DAC08-415P (STD
A15U1923	156-1255-00			IC,CONVERTER:BIPOLAR,D/A;8 BIT, 85NS,CURRENT	24355	DAC08-415P (STD
A15U1924	156-0515-00			IC,MISC:CMOS,ANALOG MUX;TRIPLE SPDT	04713	MC14053BCP
A15U1925	160-9143-00			IC,DIGITAL:CMOS,PAL22V10-25LP,PRGM, DIP24.3	80009	160914300
A15U1926	156-0382-00			IC,DIGITAL:LSTTL,GATE;QUAD 2-INPUT NAND	01295	SN74LS00N
A15U1930	156-2605-00			IC,MISC:HCMOS,ANALOG MUX;8 CHANNEL	04713	MC74HC4051N/J
A15U1931	156-2605-00			IC,MISC:HCMOS,ANALOG MUX;8 CHANNEL	04713	MC74HC4051N/J
A15U1932	156-3800-00			IC,DIGITAL:HCMOS,COUNTER;8-BIT BINARY	0JR04	TC74HC592AP
A15U1933	156-1611-00			IC,DIGITAL:FTTL,FLIP FLOP;DUAL D-TYPE	04713	MC74F74N

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A15U2100	156-0865-00			IC,DIGITAL:LSTTL,FLIP FLOP;OCTAL D-TYPE, CLEAR	01295	SN74LS273N
A15U2101	156-0728-00			IC,DIGITAL:LSTTL,GATES;QUAD 2-INPUT AND, OC	01295	SN74LS09N
A15U2102	156-1858-00			IC,DIGITAL:ALSTTL,LATCH;OCTAL D-TYPE TRANSPARENT, 3-STATE	01295	SN74ALS573CN
A15U2103	156-1725-00			IC,DIGITAL:FTTL,BUS TRANSCEIVER;OCTAL, NONINV, 3-STATE	04713	MC74F245 N OR J
A15U2106	156-0865-0			IC,DIGITAL:LSTTL,FLIP FLOP;OCTAL D-TYPE, CLEAR	01295	SN74LS273N
A15Y1800	158-0223-00			XTAL UNIT,QTZ:29.4912MHZ,0.01%,SERIES	00815	HC-18/U

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A16	671-2430-00			CIRCUIT BD ASSY:RS232 OPT (OPTION 12 ONLY)	80009	671243000
A16C2201	281-0815-00			CAP,FXD,CER DI:0.027UF,20%,50V	04222	SA205C273MAA
A16C2202	281-0815-00			CAP,FXD,CER DI:0.027UF,20%,50V	04222	SA205C273MAA
A16C2203	281-0815-00			CAP,FXD,CER DI:0.027UF,20%,50V	04222	SA205C273MAA
A16C2204	281-0815-00			CAP,FXD,CER DI:0.027UF,20%,50V	04222	SA205C273MAA
A16C2205	281-0815-00			CAP,FXD,CER DI:0.027UF,20%,50V	04222	SA205C273MAA
A16C2206	281-0815-00			CAP,FXD,CER DI:0.027UF,20%,50V	04222	SA205C273MAA
A16C2207	290-1150-00			CAP,FXD,ELCTLT:15UF,+50%-10%,16WVDC	K8996	030-25159
A16C2208	290-1150-00			CAP,FXD,ELCTLT:15UF,+50%-10%,16WVDC	K8996	030-25159
A16C2209	290-1150-00			CAP,FXD,ELCTLT:15UF,+50%-10%,16WVDC	K8996	030-25159
A16C2210	290-1150-00			CAP,FXD,ELCTLT:15UF,+50%-10%,16WVDC	K8996	030-25159
A16C2211	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A16J1601	131-5513-00			CONN,HDR:D-SUB,MALE,25 POS,STR, BRD LOCK,GOLD PLATED	80009	131551300
A16R2201	321-0065-00			RES,FXD,FILM:46.4 OHM,1%,0.125W,TC=T0 MI	91637	CMF55116G46R40F
A16R2202	321-0065-00			RES,FXD,FILM:46.4 OHM,1%,0.125W,TC=T0 MI	91637	CMF55116G46R40F
A16R2203	321-0065-00			RES,FXD,FILM:46.4 OHM,1%,0.125W,TC=T0 MI	91637	CMF55116G46R40F
A16R2204	321-0065-00			RES,FXD,FILM:46.4 OHM,1%,0.125W,TC=T0 MI	91637	CMF55116G46R40F
A16R2205	321-0065-00			RES,FXD,FILM:46.4 OHM,1%,0.125W,TC=T0 MI	91637	CMF55116G46R40F
A16R2206	321-0065-00			RES,FXD,FILM:46.4 OHM,1%,0.125W,TC=T0 MI	91637	CMF55116G46R40F
A16U2200	156-2672-00			IC,DIGITAL:CMOS,TRIPLE RS-232 LINE DRIVER/ RECEIVER,MC145406,DIP16.3,TUBE	80009	156368300
A16U2201	156-3684-00			MICROCKT,DGTL:CMOS,+5 TO +10V VOLTAGE CONVERTER,MAX680,DIP8	80009	156368400
A16W1600	174-2787-00			CA ASSY,SP,ELEC:RIBBON,20 WAY,28 AWG ,300V, UL STYLE 2651/20367;GPIB,RS23	80009	174278700

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A17	671-2431-00			CIRCUIT BD ASSY:GPIB OP (OPTION 10 ONLY)	80009	671243100
A17C2300	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A17C2301	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A17C2302	281-0775-01			CAP,FXD,CER DI:0.1UF,20%,50V	04222	SA105E104MAA
A17J1701	131-4115-00			CONN,RCPT,ELEC:VERT MT,24 PIN, 0.85 CENTERS	00779	554501-2
A17U2300	156-1444-01			IC,PROCESSOR:NMOS,CONTROLLER; GPIB ADAPTER	01295	TMS9914A (NL OR
A17U2301	156-3831-00			MICROCKT,DGTL:ALSTTL, OCTAL GPIB XCVR DATA BUS	80009	156383100
A17U2302	156-3832-00			MICROCKT,DGTL:ALSTTL, OCTAL GPIB XCVR DATA BUS	80009	156383200
A17W1700	174-2787-00			CA ASSY,SP,ELEC:RIBBON,20 WAY, 28 AWG,300V, UL STYLE 2651/20367; GPIB,RS23	80009	174278700

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A20	671-2912-00			Processor Board (Option 1M only)	80009	671291200
A20C1600	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C1603	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C1604	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C1605	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C1606	290-1150-00			CAP,FXD,ELCTLT 15UF,+50%-10%,16WVDC	K8996	030-25159F
A20C1607	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C1608	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C1609	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C1610	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C1611	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C1700	281-0865-00			CAP,FXD,CER DI :1000PF,5%,100V	04222	SA201A102JAA%,
A20C1701	281-0893-00			CAP,FXD,CER DI 4.7PF,+/-0.5PF,100VTUBULAR,MI	04222	SA102A4R7DAA,CE
A20C1702	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C1703	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C1706	281-0775-01			CAP,FXD;CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C1707	281-0773-00			CAP,FXD,CER DI :0.01UF,10%, 100VSAFETY CONTROLLED,TUBULAR,MI	04222	SA101C103KAA
A20C1708	281-0773-00			CAP,FXD,CER DI :0.01UF,10%, 100VSAFETY CONTROLLED,TUBULAR,MI	04222	SA101C103KAA
A20C1800	281-0811-00			CAP,FXD,CER DI :10PF,10%,100V	04222	SA102A100KAA%,1
A20C1801	281-0759-00			CAP,FXD,CER DI :22PF,10%,100V	04222	SA102A220KAA%,1
A20C1803	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C1804	290-1150-00			CAP,FXD,ELCTLT 15UF,+50%-10%,16WVDC	K8996	030-25159F
A20C1900	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C1901	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C1902	290-1150-00			CAP,FXD,ELCTLT 15UF,+50%-10%,16WVDC	K8996	030-25159F
A20C1903	285-1408-00			CAP,FXD,MTLZD 0.01UF,1%,250V,AXIAL,TUBE,MI	TK0ED	ORDER BY DESCR
A20C1904	281-0773-00			CAP,FXD,CER DI :0.01UF,10%, 100VSAFETY CONTROLLED,TUBULAR,MI	04222	SA101C103KAA
A20C1905	290-0246-00			CAP,FXD,ELCTLT :3.3UF,10%,15V	31433	T322B335K015AS,
A20C1920	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C1921	281-0759-00			CAP,FXD,CER DI :22PF,10%,100V	04222	SA102A220KAA%,1
A20C1923	281-0759-00			CAP,FXD,CER DI :22PF,10%,100V	04222	SA102A220KAA%,1
A20C2020	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2021	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2022	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2023	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2024	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2025	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2026	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2027	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2028	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2029	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2030	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2031	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2032	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2033	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2034	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2035	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,

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A20C2036	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2037	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2038	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2039	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2040	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2041	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2042	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2043	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2044	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2045	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2046	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2047	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2048	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2049	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2050	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2051	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2052	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2053	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2054	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2055	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2060	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2061	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2062	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2063	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2064	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2065	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2066	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2067	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2068	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2069	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2070	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2071	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2072	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2080	290-1045-00			CAP,FXD,ELCTLT :4.7UF,10%,35V	24165	173D475X9035W%,
A20C2081	290-1045-00			CAP,FXD,ELCTLT :4.7UF,10%,35V	24165	173D475X9035W%,
A20C2082	290-1045-00			CAP,FXD,ELCTLT :4.7UF,10%,35V	24165	173D475X9035W%,
A20C2083	290-1045-00			CAP,FXD,ELCTLT :4.7UF,10%,35V	24165	173D475X9035W%,
A20C2084	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2085	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2089	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2090	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2091	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2092	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2095	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2096	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2097	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2098	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2099	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2100	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2101	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2102	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2103	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2104	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2105	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,

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A20C2106	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2107	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2108	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2109	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20C2110	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A20CR1600	152-0581-00			DIODE,RECT:SCHTKY,;20V,1A, .450VF,25A IFSM;1N5817	04713	1N5817:
A20CR1700	152-0141-02			DIODE,SIG:,ULTRA FAST;40V, 150MA,4NS,2PF;1N4152,DO-35,T&R	27014	FDH9427
A20CR1701	152-0141-02			DIODE,SIG:,ULTRA FAST;40V, 150MA,4NS,2PF;1N4152,DO-35,T&R	27014	FDH9427
A20DS2100	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587DI:
A20DS2101	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587DI:
A20DS2102	150-1160-00			LT EMITTING DIO:GREEN	50434	QLMP 1587DI:
A20J1500	131-5502-00			CONN,RCPT,ELEC ,;MINI,PCB,PRESSFIT,FEM,STR20 POS, DIM:24,13 X 27,4MM,H=4MM, TIN PLATE,ULE28476	80009	131550200
A20J1501	131-5502-00			CONN,RCPT,ELEC ,;MINI,PCB,PRESSFIT,FEM,STR20 POS, DIM:24,13 X 27,4MM,H=4MM, TIN PLATE,ULE28476	80009	131550200
A20J1502	131-5502-00			CONN,RCPT,ELEC ,;MINI,PCB,PRESSFIT,FEM,STR20 POS, DIM:24,13 X 27,4MM,H=4MM, TIN PLATE,ULE28476	80009	131550200
A20J1503	131-5502-00			CONN,RCPT,ELEC ,;MINI,PCB,PRESSFIT,FEM,STR20 POS, DIM:24,13 X 27,4MM,H=4MM, TIN PLATE,ULE28476	80009	131550200
A20J1504	131-5502-00			CONN,RCPT,ELEC ,;MINI,PCB,PRESSFIT,FEM,STR20 POS, DIM:24,13 X 27,4MM,H=4MM, TIN PLATE,ULE28476	80009	131550200
A20J1505	131-5502-00			CONN,RCPT,ELEC ,;MINI,PCB,PRESSFIT,FEM,STR20 POS, DIM:24,13 X 27,4MM,H=4MM, TIN PLATE,ULE28476	80009	131550200
A20J1506	131-3396-00			CONN,DSUB PCB,,;FEMALE,RTANG,25 POS,0.11 2 CTR,0.318 MLG X 0.125 TAIL,4 -40 THD INSERT,BD RETENTION;,,	22526	71562-325
A20J1510	131-5586-00			CONN,MINI PCB,FEM,RECT,2 X 3 POS,0.05 X 0.05 CTR,TIN PLATE,DIM 0.25 X 0.2 X 0.157 H,ULE28476	80009	131558600
A20J1511	131-1857-00			CONN,HDR PCB,;MALE,STR,1 X 36,0.1 CTR, 0.230 MLG X 0.100 TAIL,GOLD;,,	58050	082-3644-SS10NN,
A20J1512	131-1857-00			CONN,HDR PCB,;MALE,STR,1 X 36,0.1 CTR, 0.230 MLG X 0.100 TAIL,GOLD;,,	58050	082-3644-SS10NN,
A20J1700	131-3378-00			CONN,RF JACK:BNC,;50 OHM, FEMALE,RTANG,PCB/REAR PNL, 0.5-28 THD,0.625 H X 0.187 TAIL, W/O MTG FLANGE,W/MTG POSTS, METAL BODY;	00779	227677-1:

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A20Q1600	151-0190-09			TRANSISTOR,SIG BIPOLAR,NPN;40V,200MA,300MHZ, AMPLIFIER;2N3904,TO-92 EBC,T&A	04713	2N3904RLRA
A20Q1601	151-0188-05			TRANSISTOR,SIG BIPOLAR,PNP;40V,200MA,250MHZ, AMPLIFIER;2N3906,TO-92 EBC,T&A	04713	2N3906 RLRASTOR
A20Q1700	151-1042-00			TRANSISTOR,SIG JFET,N-CH;6V,10-15MA,4.5MS, IDSS(1-2)<0.5MA,AMPLIFIER; PN4416_SPECIAL,SDG,MATCHED PAIR	04713	SPF627M2NS
A20Q1701	151-1042-00			TRANSISTOR,SIG JFET,N-CH;6V,10-15MA,4.5MS, IDSS(1-2)<0.5MA,AMPLIFIER; PN4416_SPECIAL,SDG,MATCHED PAIR	04713	SPF627M2NS
A20Q1900	151-0190-09			TRANSISTOR,SIG BIPOLAR,NPN;40V,200MA,300MHZ, AMPLIFIER;2N3904,TO-92 EBC,T&A	04713	2N3904RLRA
A20R1600	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F,
A20R1601	321-0222-00			RES,FXD,FILM 2.00K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20000FFI
A20R1602	321-0222-00			RES,FXD,FILM 2.00K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20000FFI
A20R1603	321-0222-00			RES,FXD,FILM 2.00K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G20000FFI
A20R1604	321-0289-00			RES,FXD,FILM 10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001FFI
A20R1605	321-0215-00			RES,FXD,FILM 1.69K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G16900FFI
A20R1606	321-0161-00			RES,FXD,FILM 464 OHM,1%,0.125W,TC=T0	91637	CMF55116G464R0FFI
A20R1607	321-0161-00			RES,FXD,FILM 464 OHM,1%,0.125W,TC=T0	91637	CMF55116G464R0FFI
A20R1610	321-0161-00			RES,FXD,FILM 464 OHM,1%,0.125W,TC=T0	91637	CMF55116G464R0FFI
A20R1630	321-0161-00			RES,FXD,FILM 464 OHM,1%,0.125W,TC=T0	91637	CMF55116G464R0FFI
A20R1700	321-0257-00			RES,FXD,FILM 4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400FFI
A20R1701	321-0481-00			RES,FXD,FILM:1M OHM,1%,0.125W, TC=T0MISAFETY CONTROLLED	91637	CMF55116G10003F.125
A20R1702	321-0097-00			RES,FXD,FILM 100 OHM,1%,0.125W,TC=T0MI	91637	CMF55116G100R0FFI
A20R1703	321-0113-00			RES,FXD,FILM 147 OHM,1%,0.125W,TC=T0	91637	CMF55116G147R0FFI
A20R1707	321-0325-00			RES,FXD,FILM 23.7K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G23701FFI
A20R1708	321-0365-00			RES,FXD,FILM 61.9K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G61901FFI
A20R1710	321-0257-00			RES,FXD,FILM 4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400FFI
A20R1711	321-0257-00			RES,FXD,FILM 4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400FFI
A20R1712	321-0257-00			RES,FXD,FILM 4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400FFI
A20R1800	321-0253-00			RES,FXD,FILM 4.22K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G42200FFI
A20R1804	307-0445-00			RES,NTWK:THICK FILM;(9) 4.7K OHM, 2%,0.2W EACH,TC=100 PPM;SIP10, PIN 1 COMMON	91637	MSP10A-01-472G-D03

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A20R1805	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F,
A20R1807	321-0257-00			RES,FXD,FILM 4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400FFI
A20R1860	321-0257-00			RES,FXD,FILM 4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400FFI
A20R1861	321-0257-00			RES,FXD,FILM 4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400FFI
A20R1862	321-0257-00			RES,FXD,FILM 4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400FFI
A20R1863	321-0257-00			RES,FXD,FILM 4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400FFI
A20R1900	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F,
A20R1901	321-1771-07			RES,FXD,FILM 1.24K,0.1%,0.125W,TC=T9	91637	CMF55-116-C12400B
A20R1902	321-0908-02			RES,FXD,FILM 1.31K OHM,0.5%,0.125W,TC=T2	91637	CMF110216D13100DI
A20R1903	321-0201-07			RES,FXD,FILM 1.21K OHM,0.1%,0.125W,TC=T9	57027	1.21K CM55 T9.1%I
A20R1904	321-0843-01			RES,FXD,FILM 270 OHM,0.5%,0.125W,TC=T0MI	91637	CMF55116G270R0DFI
A20R1905	321-0606-00			RES,FXD,FILM 203K OHM,0.25%,0.125W,TC=T2	80009	DALE GMBHS,F
A20R1906	321-1771-07			RES,FXD,FILM 1.24K,0.1%,0.125W,TC=T9	91637	CMF55-116-C12400B
A20R1907	321-1771-07			RES,FXD,FILM 1.24K,0.1%,0.125W,TC=T9	91637	CMF55-116-C12400B
A20R1908	321-1771-07			RES,FXD,FILM 1.24K,0.1%,0.125W,TC=T9	91637	CMF55-116-C12400B
A20R1909	321-1771-07			RES,FXD,FILM 1.24K,0.1%,0.125W,TC=T9	91637	CMF55-116-C12400B
A20R1910	321-0161-00			RES,FXD,FILM 464 OHM,1%,0.125W,TC=T0	91637	CMF55116G464R0FFI
A20R1912	321-0231-07			RES,FXD,FILM 2.49K OHM,0.1%,0.125W,TC=T9	57027	RC55-D-2K49-B-RFI
A20R1913	321-0231-07			RES,FXD,FILM 2.49K OHM,0.1%,0.125W,TC=T9	57027	RC55-D-2K49-B-RFI
A20R1915	321-0257-00			RES,FXD,FILM 4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400FFI
A20R1918	321-0231-07			RES,FXD,FILM 2.49K OHM,0.1%,0.125W,TC=T9	57027	RC55-D-2K49-B-RFI
A20R1919	321-0231-07			RES,FXD,FILM 2.49K OHM,0.1%,0.125W,TC=T9	57027	RC55-D-2K49-B-RFI
A20R1920	321-0231-07			RES,FXD,FILM 2.49K OHM,0.1%,0.125W,TC=T9	57027	RC55-D-2K49-B-RFI
A20R1921	321-0231-07			RES,FXD,FILM 2.49K OHM,0.1%,0.125W,TC=T9	57027	RC55-D-2K49-B-RFI
A20R1922	321-0231-07			RES,FXD,FILM 2.49K OHM,0.1%,0.125W,TC=T9	57027	RC55-D-2K49-B-RFI
A20R1923	321-0231-07			RES,FXD,FILM 2.49K OHM,0.1%,0.125W,TC=T9	57027	RC55-D-2K49-B-RFI
A20R1925	321-0165-00			RES,FXD,FILM 511 OHM,1%,0.125W,TC=T0	91637	CMF55116G511R0FFI
A20R1926	311-2363-00			RES,VAR,NONWW:TRMR,1K OHM,0.5W	K8788	TC10-LV10-1K/A
A20R1927	321-0235-00			RES,FXD,FILM 2.74K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G27400FFI
A20R1929	321-0235-00			RES,FXD,FILM 2.74K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G27400FFI

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A20R1930	311-2363-00			RES,VAR,NONWW:TRMR,1K OHM,0.5W	K8788	TC10-LV10-1K/A
A20R1931	321-0257-00			RES,FXD,FILM 4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400FFI
A20R1932	321-0257-00			RES,FXD,FILM 4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400FFI
A20R1933	321-0257-00			RES,FXD,FILM 4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400FFI
A20R1934	321-0257-00			RES,FXD,FILM 4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400FFI
A20R1935	321-1771-07			RES,FXD,FILM 1.24K,0.1%,0.125W,TC=T9	91637	CMF55-116-C12400B
A20R1936	321-1771-07			RES,FXD,FILM 1.24K,0.1%,0.125W,TC=T9	91637	CMF55-116-C12400B
A20R1940	321-0231-07			RES,FXD,FILM 2.49K OHM,0.1%,0.125W,TC=T9	57027	RC55-D-2K49-B-RFI
A20R1941	321-0231-07			RES,FXD,FILM 2.49K OHM,0.1%,0.125W,TC=T9	57027	RC55-D-2K49-B-RFI
A20R1942	321-0231-07			RES,FXD,FILM 2.49K OHM,0.1%,0.125W,TC=T9	57027	RC55-D-2K49-B-RFI
A20R1943	321-0231-07			RES,FXD,FILM 2.49K OHM,0.1%,0.125W,TC=T9	57027	RC55-D-2K49-B-RFI
A20R1950	321-0161-00			RES,FXD,FILM 464 OHM,1%,0.125W,TC=T0	91637	CMF55116G464R0FFI
A20R1951	321-0161-00			RES,FXD,FILM 464 OHM,1%,0.125W,TC=T0	91637	CMF55116G464R0FFI
A20R1952	321-0161-00			RES,FXD,FILM 464 OHM,1%,0.125W,TC=T0	91637	CMF55116G464R0FFI
A20R1953	321-0161-00			RES,FXD,FILM 464 OHM,1%,0.125W,TC=T0	91637	CMF55116G464R0FFI
A20R1960	321-0289-00			RES,FXD,FILM 10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001FFI
A20R1961	321-0289-00			RES,FXD,FILM 10.0K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G10001FFI
A20R2109	321-0257-00			RES,FXD,FILM 4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400FFI
A20R2120	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F,
A20R2121	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F,
A20R2122	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	91637	CMF55116G10000F,
A20R2123	321-0257-00			RES,FXD,FILM 4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400FFI
A20R2124	321-0257-00			RES,FXD,FILM 4.64K OHM,1%,0.125W,TC=T0MI	91637	CMF55116G46400FFI
A20U1600	156-1200-00			IC,LINEAR:BIFET,OP-AMP;QUAD; TL074CN/LF347N/MC34004P,DIP14.3	01295	TL074CNIFET
A20U1601	156-2800-00			IC,CONVERTER BIPOLAR,A/D;8-BIT,25MSPS, FLASH,1W;MC10319,DIP24.6	04713	MC10319 (P OR L)T
A20U1602	156-2800-00			IC,CONVERTER BIPOLAR,A/D;8-BIT,25MSPS, FLASH,1W;MC10319,DIP24.6	04713	MC10319 (P OR L)T
A20U1603	156-1664-00			IC,DIGITAL:ALSTTL,FLIP FLOP; OCTAL D-TYPE, 3-STATE;74ALS574, DIP20.3,TUBE	01295	SN74ALS574BN,FLI
A20U1604	156-1664-00			IC,DIGITAL:ALSTTL,FLIP FLOP; OCTAL D-TYPE, 3-STATE;74ALS574, DIP20.3,TUBE	01295	SN74ALS574BN,FLI

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A20U1605	156-4367-00			IC,MEMORY:CMOS,SRAM,128K X 8, 35NS,OE,KM681001,DIP32.4	80009	156436700
A20U1606	156-4367-00			IC,MEMORY:CMOS,SRAM,128K X 8, 35NS,OE,KM681001,DIP32.4	80009	156436700,
A20U1607	156-1858-00			IC,DIGITAL ALSTTL,LATCH;OCTAL D-TYPE TRAN SPARENT, 3-STATE;74ALS573,DIP2 0.3,TUBE	01295	SN74ALS573CNDI
A20U1608	156-1858-00			IC,DIGITAL ALSTTL,LATCH;OCTAL D-TYPE TRAN SPARENT, 3-STATE;74ALS573,DIP2 0.3,TUBE	01295	SN74ALS573CNDI
A20U1609	156-1704-01			IC,DIGITAL:FTTL,FLIP FLOP; OCTAL D, 3-STATE;74F374,DIP20.3, TUBE,SELECTED VENDOR	18324	N74F374N
A20U1610	160-9618-00			IC,DIGITAL:CMOS,EEPLD,16V8, 25NS,45MA,PRGM 156-3582-00, 16V8-25QP,DIP20.3	80009	160961800
A20U1611	160-9621-00			IC,DIGITAL:CMOS,EEPLD,16V8, 25NS,45MA,PRGM 156-3582-00, 16V8-25QP,DIP20.3	80009	160962100
A20U1612	156-1662-00			IC,DIGITAL FTTL,MUX;DUAL 4-TO-1 DATA SELE CTOR;74F153,DIP16.3,TUBE	04713	MC74F153N
A20U1613	156-1611-00			IC,DIGITAL:FTTL,FLIP FLOP; DUAL D-TYPE;74F74,DIP14.3,TUBE	04713	MC74F74N
A20U1614	156-1611-00			IC,DIGITAL:FTTL,FLIP FLOP; DUAL D-TYPE;74F74,DIP14.3,TUBE	04713	MC74F74N
A20U1615	156-2251-00			IC,DIGITAL FTTL,COUNTER;SYNCH 4-BIT BINAR Y, WITH /MR;74F161,DIP16.3,TUBE	04713	MC74F161ANC,DI
A20U1616	156-2251-00			IC,DIGITAL FTTL,COUNTER;SYNCH 4-BIT BINAR Y, WITH /MR;74F161,DIP16.3,TUBE	04713	MC74F161ANC,DI
A20U1617	156-2251-00			IC,DIGITAL FTTL,COUNTER;SYNCH 4-BIT BINAR Y, WITH /MR;74F161,DIP16.3,TUBE	04713	MC74F161ANC,DI
A20U1618	156-2251-00			IC,DIGITAL FTTL,COUNTER;SYNCH 4-BIT BINAR Y, WITH /MR;74F161,DIP16.3,TUB E	04713	MC74F161ANC,DI
A20U1619	156-2251-00			IC,DIGITAL FTTL,COUNTER;SYNCH 4-BIT BINAR Y, WITH /MR;74F161,DIP16.3,TUBE	04713	MC74F161ANC,DI
A20U1620	156-2251-00			IC,DIGITAL FTTL,COUNTER;SYNCH 4-BIT BINAR Y, WITH /MR;74F161,DIP16.3,TUBE	04713	MC74F161ANC,DI
A20U1621	156-1611-00			IC,DIGITAL:FTTL,FLIP FLOP; DUAL D-TYPE;74F74,DIP14.3,TUBE	04713	MC74F74N
A20U1622	156-1707-00			IC,DIGITAL FTTL,GATE;QUAD 2-INPUT NAND;74 F00,DIP14.3,TUBE	04713	MC74F00 (N OR J)TAL
A20U1630	156-0796-00			IC,DIGITAL:CMOS,SHIFT REGISTER; 8-STAGE SHIFT/STORE, 3-STATE; 4094,DIP16.3,TUBE	04713	MC14094BCPIFT
A20U1631	156-0796-00			IC,DIGITAL:CMOS,SHIFT REGISTER; 8-STAGE SHIFT/STORE, 3-STATE; 4094,DIP16.3,TUBE	04713	MC14094BCPIFT
A20U1632	156-0796-00			IC,DIGITAL:CMOS,SHIFT REGISTER; 8-STAGE SHIFT/STORE, 3-STATE; 4094,DIP16.3,TUBE	04713	MC14094BCPIFT

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A20U1640	160-9619-00			IC,DIGITAL:CMOS,EEPLD,16V8, 25NS,45MA,PRGM 156-3582-00, 16V8-25QP,DIP20.3	80009	160961900
A20U1641	160-9620-00			IC,DIGITAL:CMOS,EEPLD,16V8, 25NS,45MA,PRGM 156-3582-00, 16V8-25QP,DIP20.3	80009	160962000
A20U1700	156-3692-00			IC,DIGITAL HCTCMOS,GATE;QUAD 2-INPUT NAND SCHMITT TRIG;74HCT132,DIP14.3 ,** DUPLICATE OF 156-3655-00 **	80009	156369200
A20U1701	156-1600-00			IC,DIGITAL LSTTL,MISC;DUAL RETRIG MONOSTA BLE MULTIVIBRATOR;74LS123,DIP1 6.3,TUBE	04713	SN74LS123(N OR J)AL
A20U1702	119-1460-00			OSC,XTAL,CLOCK :40.0MHZ	61429	F1100H-40MHZ0.0M
A20U1703	156-1723-00			IC,DIGITAL FTTL,GATE;QUAD 2-INPUT AND;74F 08,DIP14.3,TUBE	04713	MC74F08N
A20U1704	156-1743-00			IC,DIGITAL FTTL,GATE;QUAD 2-INPUT NOR;74F 02,DIP14.3,TUBE	04713	MC74F02N
A20U1705	156-0865-00			IC,DIGITAL LSTTL,FLIP FLOP;OCTAL D-TYPE, CLEAR;74LS273,DIP20.3,TUBE	04713	SN74LS273NC,DI
A20U1706	156-0865-00			IC,DIGITAL LSTTL,FLIP FLOP;OCTAL D-TYPE, CLEAR;74LS273,DIP20.3,TUBE	04713	SN74LS273NC,DI
A20U1707	156-1973-00			IC,DIGITAL:FTTL,FLIP FLOP; QUAD D-TYPE, WITH /MR, Q&/Q; 74F175,DIP16.3,TUBE	27014	74F175PC
A20U1708	156-2251-00			IC,DIGITAL FTTL,COUNTER;SYNCH 4-BIT BINAR Y, WITH /MR;74F161,DIP16.3,TUBE	04713	MC74F161ANC,DI
A20U1709	156-1611-00			IC,DIGITAL:FTTL,FLIP FLOP; DUAL D-TYPE;74F74,DIP14.3,TUBE	04713	MC74F74N
A20U1710	156-2333-00			IC,DIGITAL:ALSTTL,COUNTER; SYNCH 4-BIT DECADE;74ALS162, DIP16.3,NOTFOR NEW DESIGN	01295	SN74ALS162BNT
A20U1711	156-2333-00			IC,DIGITAL:ALSTTL,COUNTER; SYNCH 4-BIT DECADE;74ALS162, DIP16.3,NOTFOR NEW DESIGN	01295	SN74ALS162BNT
A20U1712	156-2333-00			IC,DIGITAL:ALSTTL,COUNTER; SYNCH 4-BIT DECADE;74ALS162, DIP16.3,NOTFOR NEW DESIGN	01295	SN74ALS162BNT
A20U1713	156-2333-00			IC,DIGITAL:ALSTTL,COUNTER; SYNCH 4-BIT DECADE;74ALS162, DIP16.3,NOTFOR NEW DESIGN	01295	SN74ALS162BNT
A20U1714	156-1662-00			IC,DIGITAL FTTL,MUX;DUAL 4-TO-1 DATA SELE CTOR;74F153,DIP16.3,TUBE	04713	MC74F153N
A20U1715	156-1611-00			IC,DIGITAL:FTTL,FLIP FLOP; DUAL D-TYPE;74F74,DIP14.3,TUBE	04713	MC74F74N
A20U1716	156-2251-00			IC,DIGITAL FTTL,COUNTER;SYNCH 4-BIT BINAR Y, WITH /MR;74F161,DIP16.3,TUBE	04713	MC74F161ANC,DI
A20U1718	156-1611-00			IC,DIGITAL:FTTL,FLIP FLOP; DUAL D-TYPE;74F74,DIP14.3,TUBE	04713	MC74F74N

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A20U1801	156-4259-01			IC,DIGITAL:CMOS,MICROPROCESSOR, SCC68070CDA84,17.5MHZ,PLCC84	80009	156425901
A20U1802	156-2396-00			IC,MISC BIPOLAR,PWR SUPPLY SUPERVISOR; MPU RESET GENERATOR,5V SUPPLY SENSING;TL7705ACP,DIP08.3	01295	TL7705 ACP
A20U1804	156-3355-00			IC,MEMORY CMOS,SRAM;32K X 8,85NS,OE;,DIP28.6	S0319	M5M5256BP-85,ME
A20U1805	156-3355-00			IC,MEMORY CMOS,SRAM;32K X 8,85NS,OE;,DIP28.6	S0319	M5M5256BP-85,ME
A20U1808	156-4368-00			IC,MEMORY CMOS,PSRAM,512K X 8,80NS, HM658512,DIP32.6,ADDRESS REFRRESH	80009	156436800
A20U1809	156-4368-00			IC,MEMORY CMOS,PSRAM,512K X 8,80NS, HM658512,DIP32.6,ADDRESS REFRRESH	80009	156436800
A20U1810	156-1727-00			IC,DIGITAL FTTL,DEMUX/DECODER;1-OF-8 DECODER; 74F138,DIP16.3,TUBE	04713	MC74F138 NC,DI
A20U1811	156-1727-00			IC,DIGITAL FTTL,DEMUX/DECODER;1-OF-8 DECODER; 74F138,DIP16.3,TUBE	04713	MC74F138 NC,DI
A20U1812	156-1727-00			IC,DIGITAL FTTL,DEMUX/DECODER;1-OF-8 DECODER; 74F138,DIP16.3,TUBE	04713	MC74F138 NC,DI
A20U1813	156-1663-00			IC,DIGITAL FTTL,GATE;TRIPLE 3-INPUT AND;7 4F11,DIP14.3,TUBE	04713	MC74F11N
A20U1814	156-1663-00			IC,DIGITAL FTTL,GATE;TRIPLE 3-INPUT AND;7 4F11,DIP14.3,TUBE	04713	MC74F11N
A20U1820	156-1973-00			IC,DIGITAL:FTTL,FLIP FLOP; QUAD D-TYPE, WITH /MR, Q&/Q; 74F175,DIP16.3,TUBE	27014	74F175PC
A20U1821	156-1724-00			IC,DIGITAL FTTL,GATES;QUAD 2-INPUT OR;74F 32,DIP14.3,TUBE	04713	MC74F32N
A20U1822	156-1724-00			IC,DIGITAL FTTL,GATES;QUAD 2-INPUT OR;74F 32,DIP14.3,TUBE	04713	MC74F32N
A20U1830	156-2001-00			IC,DIGITAL FTTL,MUX;QUAD 2-TO-1 DATA SELE CTOR, 3-STATE;74F257,DIP16.3,T UBE	04713	MC74F257N
A20U1831	156-2001-00			IC,DIGITAL FTTL,MUX;QUAD 2-TO-1 DATA SELE CTOR, 3-STATE;74F257,DIP16.3,TUBE	04713	MC74F257N
A20U1840	156-0844-00			IC,DIGITAL LSTTL,COUNTER;SYNCH 4-BIT BINARY; 74LS161,DIP16.3,TUBE	04713	SN74LS161AN,DI
A20U1841	119-1680-00			OSCILLATOR,RF:XTAL CLOCK, 4.9152MHZ,0.01% W/TTL OUTPUT	22929	XO-33B 4.9152
A20U1850	156-1725-00			IC,DIGITAL:FTTL,BUS TRANSCEIVER; OCTAL, NONINV, 3-STATE;74F245, DIP20.3,TUBE	04713	MC74F245 N OR JSC
A20U1860	156-0865-00			IC,DIGITAL LSTTL,FLIP FLOP;OCTAL D-TYPE, CLEAR;74LS273,DIP20.3,TUBE	04713	SN74LS273NC,DI

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A20U1900	156-3804-00			IC,DIGITAL HCTCMOS,FIFO;16X4 ASYNCH, REGI STER, 3-STATE;74HCT40105,DIP16 .3,TUBE	18324	74HCT40105N,DI
A20U1901	156-3804-00			IC,DIGITAL HCTCMOS,FIFO;16X4 ASYNCH, REGI STER, 3-STATE;74HCT40105,DIP16 .3,TUBE	18324	74HCT40105N,DI
A20U1902	156-3804-00			IC,DIGITAL HCTCMOS,FIFO;16X4 ASYNCH, REGI STER, 3-STATE;74HCT40105,DIP16 .3,TUBE	18324	74HCT40105N,DI
A20U1903	156-3804-00			IC,DIGITAL HCTCMOS,FIFO;16X4 ASYNCH, REGI STER, 3-STATE;74HCT40105,DIP16 .3,TUBE	18324	74HCT40105N,DI
A20U1904	156-3804-00			IC,DIGITAL HCTCMOS,FIFO;16X4 ASYNCH, REGI STER, 3-STATE;74HCT40105,DIP16 .3,TUBE	18324	74HCT40105N,DI
A20U1905	156-3804-00			IC,DIGITAL HCTCMOS,FIFO;16X4 ASYNCH, REGI STER, 3-STATE;74HCT40105,DIP16 .3,TUBE	18324	74HCT40105N,DI
A20U1906	156-0865-00			IC,DIGITAL LSTTL,FLIP FLOP;OCTAL D-TYPE, CLEAR;74LS273,DIP20.3,TUBE	04713	SN74LS273NC,DI
A20U1907	156-0388-00			IC,DIGITAL LSTTL,FLIP FLOP;DUAL D W/SET & CLR;74LS74,DIP14.3,TUBE	04713	SN74LS74ANC,DI
A20U1908	156-0412-00			IC,DIGITAL:LSTTL,COUNTER; SYNCH 4-BIT UP/DOWN BINARY; 74LS193,DIP16.3,TUBE	04713	SN74LS193NSTTL
A20U1909	160-9622-00			IC,DIGITAL:CMOS,EEPLD,16V8, 25NS,45MA,PRGM 156-3582-00, 16V8-25QP,DIP20.3	80009	160962200
A20U1910	156-1743-00			IC,DIGITAL FTTL,GATE;QUAD 2-INPUT NOR;74F 02,DIP14.3,TUBE	04713	MC74F02N
A20U1920	156-0728-00			IC,DIGITAL LSTTL,GATES;QUAD 2-INPUT AND, OC;74LS09,DIP14.3,TUBE	04713	SN74LS09N
A20U1921	156-1200-00			IC,LINEAR:BIFET,OP-AMP;QUAD; TL074CN/LF347N/MC34004P,DIP14.3	01295	TL074CNIFET
A20U1922	156-1255-00			IC,CONVERTER BIPOLAR,D/A;8 BIT,85NS,CURRENT OUT,MULTIPLYING;DAC08HP,DIP16 .3	24355	DAC08HP
A20U1923	156-1255-00			IC,CONVERTER BIPOLAR,D/A;8 BIT,85NS,CURRENT OUT,MULTIPLYING;DAC08HP,DIP16 .3	24355	DAC08HP
A20U1924	156-0515-00			IC,MISC CMOS,ANALOG MUX;TRIPLE SPDT;CD 4053,DIP16.3	04713	MC14053BCP
A20U1925	160-9617-00			IC,DIGITAL:CMOS,EEPLD,22V10, 25NS,90MA,PRGM 156-3784-00, 22V10B-25LP,DIP24.3	80009	160961700
A20U1926	156-0382-00			IC,DIGITAL LSTTL,GATE;QUAD 2-INPUT NAND;7 4LS00,DIP14.3,TUBE	04713	SN74LS00N

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A20U1930	156-2605-00			IC,MISC HCMOS,ANALOG MUX;8 CHANNEL, 125 OHM,-/+6V;74HC4051,DIP16.3	04713	MC74HC4051N/JC,MI
A20U1931	156-2605-00			IC,MISC HCMOS,ANALOG MUX;8 CHANNEL, 125 OHM,-/+6V;74HC4051,DIP16.3	04713	MC74HC4051N/JC,MI
A20U1932	156-3800-00			IC,DIGITAL:HCMOS,COUNTER; 8-BIT BINARY;74HC592,DIP16.3	0JR04	TC74HC592APMOS
A20U1933	156-1611-00			IC,DIGITAL:FTTL,FLIP FLOP; DUAL D-TYPE;74F74,DIP14.3,TUBE	04713	MC74F74N
A20U2100	156-0865-00			IC,DIGITAL LSTTL,FLIP FLOP;OCTAL D-TYPE, CLEAR;74LS273,DIP20.3,TUBE	04713	SN74LS273NC,DI
A20U2101	156-0728-00			IC,DIGITAL LSTTL,GATES;QUAD 2-INPUT AND, OC;74LS09,DIP14.3,TUBE	04713	SN74LS09N
A20U2102	156-1858-00			IC,DIGITAL ALSTTL,LATCH;OCTAL D-TYPE TRAN SPARENT, 3-STATE;74ALS573,DIP2 0.3,TUBE	01295	SN74ALS573CNDI
A20U2103	156-1725-00			IC,DIGITAL:FTTL,BUS TRANSCEIVER; OCTAL, NONINV, 3-STATE;74F245, DIP20.3,TUBE	04713	MC74F245 N OR JSC
A20U2106	156-0865-00			IC,DIGITAL LSTTL,FLIP FLOP;OCTAL D-TYPE, CLEAR;74LS273,DIP20.3,TUBE	04713	SN74LS273NC,DI
A20Y1800	158-0437-00			XTAL,QUARTZ:34.5750MHZ,0.01%,HC49U	80009	159043700

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A25	671-2793-00			Circuit Bd Assy: Video (Option 05 only)	80009	671279300
A25C2501	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A25C2502	290-0973-01			CAP,FXD,ELCTLT :100UF,20%,25VDC	55680	UVX1E101MPA1TA5VDC
A25C2503	290-0973-01			CAP,FXD,ELCTLT :100UF,20%,25VDC	55680	UVX1E101MPA1TA5VDC
A25C2504	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A25C2505	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A25C2507	281-0925-00			CAP,FXD,CERAMIC MLC;0.22UF,20%,50V,Z5U,0.290 X 0.150;AXIAL,T&R	04222	TW513BZ224MTCE
A25C2508	281-0925-00			CAP,FXD,CERAMIC MLC;0.22UF,20%,50V,Z5U,0.290 X 0.150;AXIAL,T&R	04222	TW513BZ224MTCE
A25C2509	281-0925-00			CAP,FXD,CERAMIC MLC;0.22UF,20%,50V,Z5U,0.290 X 0.150;AXIAL,T&R	04222	TW513BZ224MTCE
A25C2510	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A25C2511	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A25C2512	281-0925-00			CAP,FXD,CERAMIC MLC;0.22UF,20%,50V,Z5U,0.290 X 0.150;AXIAL,T&R	04222	TW513BZ224MTCE
A25C2513	281-0925-00			CAP,FXD,CERAMIC MLC;0.22UF,20%,50V,Z5U,0.290 X 0.150;AXIAL,T&R	04222	TW513BZ224MTCE
A25C2514	281-0925-00			CAP,FXD,CERAMIC MLC;0.22UF,20%,50V,Z5U,0.290 X 0.150;AXIAL,T&R	04222	TW513BZ224MTCE
A25C2515	281-0925-00			CAP,FXD,CERAMIC MLC;0.22UF,20%,50V,Z5U,0.290 X 0.150;AXIAL,T&R	04222	TW513BZ224MTCE
A25C2520	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A25C2602	290-0973-01			CAP,FXD,ELCTLT :100UF,20%,25VDC	55680	UVX1E101MPA1TA5VDC
A25C2603	290-0973-01			CAP,FXD,ELCTLT :100UF,20%,25VDC	55680	UVX1E101MPA1TA5VDC
A25C2604	290-0973-01			CAP,FXD,ELCTLT :100UF,20%,25VDC	55680	UVX1E101MPA1TA5VDC
A25C2605	281-0863-00			CAP,FXD,CER DI :240PF,5%,100V	04222	SA101A241JAA%,1
A25C2606	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A25C2607	281-0786-00			CAP,FXD,CER DI :150PF,10%,100V	04222	SA101A151KAA%,
A25C2608	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A25C2609	281-0770-00			CAP,FXD,CER DI :1000PF,20%,100V	04222	SA101C102MAA%
A25C2611	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A25C2612	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A25C2613	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A25C2614	281-0788-00			CAP,FXD,CER DI :470PF,10%,100V	04222	SA102C471KAA%,
A25C2615	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A25C2616	281-0814-00			CAP,FXD,CER DI :100 PF,10%,100V	04222	SA102A101KAA%
A25C2618	281-0775-01			CAP,FXD,CER DI :0.1UF,20%,50V	04222	SA105E104MAA0%,
A25C2619	281-0785-00			CAP,FXD,CER DI :68PF,10%,100V	04222	SA102A680KAA%,1
A25C2701	281-0770-00			CAP,FXD,CER DI :1000PF,20%,100V	04222	SA101C102MAA%
A25C2702	281-0826-00			CAP,FXD,CER DI :2200PF,10%,100V	04222	SA101C222KAA%
A25C2703	290-0183-00			CAP,FXD,ELCTLT :1UF,10%,35V	12954	T322B105K035AS,35
A25C2704	281-0814-00			CAP,FXD,CER DI :100 PF,10%,100V	04222	SA102A101KAA%
A25C2705	281-0773-00			CAP,FXD,CER DI :0.01UF,10%, 100VSAFETY CONTROLLED,TUBULAR,MI	04222	SA101C103KAA
A25C2706	281-0861-00			CAP,FXD,CER DI :270PF,5%,50V	04222	SA101A271JAA5%,5
A25C2707	281-0813-00			CAP,FXD,CER DI :0.047UF,20%,50V	04222	SA105E473MAA0
A25C2708	281-0770-00			CAP,FXD,CER DI :1000PF,20%,100V	04222	SA101C102MAA%

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A25C2709	281-0820-00			CAP,FXD,CER DI :680 PF,10%,50V	04222	SA101C681KAA0%
A25C2710	281-0770-00			CAP,FXD,CER DI :1000PF,20%,100V	04222	SA101C102MAA%
A25C2711	281-0863-00			CAP,FXD,CER DI :240PF,5%,100V	04222	SA101A241JAA%,1
A25C2720	290-0183-00			CAP,FXD,ELCTLT :1UF,10%,35V	12954	T322B105K035AS,35
A25CR2601	152-0141-02			DIODE,SIG:,ULTRA FAST;40V, 150MA,4NS,2PF;1N4152,DO-35,T&R	12969	FDH9427
A25CR2602	152-0141-02			DIODE,SIG:,ULTRA FAST;40V, 150MA,4NS,2PF;1N4152,DO-35,T&R	12969	FDH9427
A25CR2603	152-0141-02			DIODE,SIG:,ULTRA FAST;40V, 150MA,4NS,2PF;1N4152,DO-35,T&R	12969	FDH9427
A25CR2604	152-0141-02			DIODE,SIG:,ULTRA FAST;40V, 150MA,4NS,2PF;1N4152,DO-35,T&R	12969	FDH9427
A25CR2605	152-0141-02			DIODE,SIG:,ULTRA FAST;40V, 150MA,4NS,2PF;1N4152,DO-35,T&R	12969	FDH9427
A25CR2606	152-0141-02			DIODE,SIG:,ULTRA FAST;40V, 150MA,4NS,2PF;1N4152,DO-35,T&R	12969	FDH9427
A25CR2607	152-0141-02			DIODE,SIG:,ULTRA FAST;40V, 150MA,4NS,2PF;1N4152,DO-35,T&R	12969	FDH9427
A25CR2608	152-0141-02			DIODE,SIG:,ULTRA FAST;40V, 150MA,4NS,2PF;1N4152,DO-35,T&R	12969	FDH9427
A25CR2609	152-0141-02			DIODE,SIG:,ULTRA FAST;40V, 150MA,4NS,2PF;1N4152,DO-35,T&R	12969	FDH9427
A25CR2701	152-0141-02			DIODE,SIG:,ULTRA FAST;40V, 150MA,4NS,2PF;1N4152,DO-35,T&R	12969	FDH9427
A25CR2702	152-0141-02			DIODE,SIG:,ULTRA FAST;40V, 150MA,4NS,2PF;1N4152,DO-35,T&R	12969	FDH9427
A25CR2703	152-0141-02			DIODE,SIG:,ULTRA FAST;40V, 150MA,4NS,2PF;1N4152,DO-35,T&R	12969	FDH9427
A25CR2704	152-0141-02			DIODE,SIG:,ULTRA FAST;40V, 150MA,4NS,2PF;1N4152,DO-35,T&R	12969	FDH9427
A25CR2705	152-0141-02			DIODE,SIG:,ULTRA FAST;40V, 150MA,4NS,2PF;1N4152,DO-35,T&R	12969	FDH9427
A25CR2706	152-0141-02			DIODE,SIG:,ULTRA FAST;40V, 150MA,4NS,2PF;1N4152,DO-35,T&R	12969	FDH9427
A25CR2707	152-0951-00			DIODE,SIG SCHTKY,;60V,2.25PF;1N6263,DO-35,T&R	04713	1N6263
A25CR2708	152-0141-02			DIODE,SIG:,ULTRA FAST;40V, 150MA,4NS,2PF;1N4152,DO-35,T&R	12969	FDH9427
A25CR2709	152-0141-02			DIODE,SIG:,ULTRA FAST;40V, 150MA,4NS,2PF;1N4152,DO-35,T&R	12969	FDH9427
A25CR2710	152-0141-02			DIODE,SIG:,ULTRA FAST;40V, 150MA,4NS,2PF;1N4152,DO-35,T&R	12969	FDH9427
A25J2502	131-1857-00			CONN,HDR PCB,;MALE,STR,1 X 36,0.1 CTR, 0.230 MLG X 0.100 TAIL,GOLD;,,	00779	082-3644-SS10NN,
A25J2503	131-1857-00			CONN,HDR PCB,;MALE,STR,1 X 36,0.1 CTR, 0.230 MLG X 0.100 TAIL,GOLD;,,	00779	082-3644-SS10NN,
A25Q2601	151-0188-00			TRANSISTOR,SIG BIPOLAR,PNP;40V,200MA,250MHZ, AMPLIFIER;2N3906,TO-92 EBC	04713	2N3906RANS
A25Q2602	151-1025-00			TRANSISTOR,SIG JFET,N-CH;6V,15MA,4.5MS,AMPLIFIER; J304,TO-92,SDG	04713	PN4416RANS
A25Q2603	151-0190-00			TRANSISTOR,SIG BIPOLAR,NPN;40V,200MA,300MHZ, AMPLIFIER;2N3904,TO-92 EBC	15818	2N3904RANS

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A25Q2604	151-0190-00			TRANSISTOR,SIG BIPOLAR,NPN;40V,200MA,300MHZ, AMPLIFIER;2N3904,TO-92 EBC	15818	2N3904RANS
A25Q2605	151-1025-00			TRANSISTOR,SIG JFET,N-CH;6V,15MA,4.5MS,AMPLIFIER; J304,TO-92,SDG	04713	PN4416RANS
A25Q2606	151-1025-00			TRANSISTOR,SIG JFET,N-CH;6V,15MA,4.5MS,AMPLIFIER; J304,TO-92,SDG	04713	PN4416RANS
A25Q2607	151-0188-00			TRANSISTOR,SIG BIPOLAR,PNP;40V,200MA,250MHZ, AMPLIFIER;2N3906,TO-92 EBC	04713	2N3906RANS
A25Q2608	151-0190-00			TRANSISTOR,SIG BIPOLAR,NPN;40V,200MA,300MHZ, AMPLIFIER;2N3904,TO-92 EBC	15818	2N3904RANS
A25Q2609	151-0188-00			TRANSISTOR,SIG BIPOLAR,PNP;40V,200MA,250MHZ, AMPLIFIER;2N3906,TO-92 EBC	04713	2N3906RANS
A25Q2610	151-0188-00			TRANSISTOR,SIG BIPOLAR,PNP;40V,200MA,250MHZ, AMPLIFIER;2N3906,TO-92 EBC	04713	2N3906RANS
A25Q2611	151-0190-00			TRANSISTOR,SIG BIPOLAR,NPN;40V,200MA,300MHZ, AMPLIFIER;2N3904,TO-92 EBC	15818	2N3904RANS
A25Q2612	151-0188-00			TRANSISTOR,SIG BIPOLAR,PNP;40V,200MA,250MHZ, AMPLIFIER;2N3906,TO-92 EBC	04713	2N3906RANS
A25Q2613	151-0188-00			TRANSISTOR,SIG BIPOLAR,PNP;40V,200MA,250MHZ, AMPLIFIER;2N3906,TO-92 EBC	04713	2N3906RANS
A25Q2701	151-0188-00			TRANSISTOR,SIG BIPOLAR,PNP;40V,200MA,250MHZ, AMPLIFIER;2N3906,TO-92 EBC	04713	2N3906RANS
A25Q2702	151-0190-00			TRANSISTOR,SIG BIPOLAR,NPN;40V,200MA,300MHZ, AMPLIFIER;2N3904,TO-92 EBC	15818	2N3904RANS
A25Q2703	151-0190-00			TRANSISTOR,SIG BIPOLAR,NPN;40V,200MA,300MHZ, AMPLIFIER;2N3904,TO-92 EBC	15818	2N3904RANS
A25R2501	321-0097-00			RES,FXD,FILM 100 OHM,1%,0.125W,TC=T0MI	07716	CMF55116G100ROFFI
A25R2601	321-0155-00			RES,FXD,FILM 402 OHM,1%,0.125W,TC=T0	07716	CMF55116G402R0FFI
A25R2602	321-0185-00			RES,FXD,FILM 825 OHM,1%,0.125W,TC=T0	57027	CMF55116G825R0FFI
A25R2603	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	07716	CMF55116G10000F,
A25R2604	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	07716	CMF55116G10000F,
A25R2605	321-0223-00			RES,FXD,FILM 2.05K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G20500FFI
A25R2606	321-0065-00			RES,FXD,FILM 46.4 OHM,1%,0.125W,TC=T0 MI	01121	CMF55116G46R40FFI
A25R2607	321-0097-00			RES,FXD,FILM 100 OHM,1%,0.125W,TC=T0MI	07716	CMF55116G100ROFFI
A25R2608	321-0217-00			RES,FXD,FILM 1.78K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G178OOFFI
A25R2609	321-0267-00			RES,FXD,FILM 5.90K OHM,1%,0.125W,TC=T0MI	57027	CMF55116G59000FFI

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A25R2610	321-0105-00			RES,FXD,FILM 121 OHM 1%,0.125W,TC=T0	01121	CMF55116G121R0FFI
A25R2611	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	07716	CMF55116G10000F,
A25R2612	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	07716	CMF55116G10000F,
A25R2613	321-0309-00			RES,FXD,FILM 16.2K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G16201FFI
A25R2614	321-0225-00			RES,FXD,FILM:2.15K OHM,1%, 0.125W,TC=T0SAFETY CONTROLLED,MI	07716	CMF55116G21500FHM,
A25R2615	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	07716	CMF55116G10000F,
A25R2616	321-0443-00			RES,FXD,FILM 402K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G40202FFI
A25R2617	321-0289-00			RES,FXD,FILM 10.0K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G10001FFI
A25R2618	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	07716	CMF55116G10000F,
A25R2619	321-0217-00			RES,FXD,FILM 1.78K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G178OOFFI
A25R2620	321-0217-00			RES,FXD,FILM 1.78K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G178OOFFI
A25R2621	321-0165-00			RES,FXD,FILM 511 OHM,1%,0.125W,TC=T0	01121	CMF55116G511R0FFI
A25R2622	321-0097-00			RES,FXD,FILM 100 OHM,1%,0.125W,TC=T0MI	07716	CMF55116G100ROFFI
A25R2623	321-0319-00			RES,FXD,FILM 20.5K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G20501FFI
A25R2624	321-0361-00			RES,FXD,FILM 56.2K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G56201FFI
A25R2625	321-0289-00			RES,FXD,FILM 10.0K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G10001FFI
A25R2626	321-0173-00			RES,FXD,FILM 619 OHM,1%,0.125W,TC=T0	07716	CMF55116G619R0FFI
A25R2627	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	07716	CMF55116G10000F,
A25R2628	321-0253-00			RES,FXD,FILM 4.22K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G42200FFI
A25R2629	321-0223-00			RES,FXD,FILM 2.05K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G20500FFI
A25R2630	311-2361-00			RES,VAR,NONWW:TRMR,10K OHM,0.5W	K8996	TC10-LV10-10K/A,0.
A25R2631	321-0273-00			RES,FXD,FILM 6.81K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G68100FFI
A25R2632	321-0164-00			RES,FXD,FILM 499 OHM,1%,0.125W,TC=T0	01121	CMF55116G499R0FFI
A25R2636	321-0261-00			RES,FXD,FILM 5.11K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G51100FFI
A25R2637	321-0261-00			RES,FXD,FILM 5.11K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G51100FFI
A25R2638	321-0097-00			RES,FXD,FILM 100 OHM,1%,0.125W,TC=T0MI	07716	CMF55116G100ROFFI
A25R2639	311-2361-00			RES,VAR,NONWW:TRMR,10K OHM,0.5W	K8996	TC10-LV10-10K/A,0.
A25R2640	321-0235-00			RES,FXD,FILM 2.74K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G27400FFI
A25R2641	321-0139-00			RES,FXD,FILM 274 OHM,1%,0.125W,TC=T0	01121	CMF55116G274R0FFI
A25R2642	321-0139-00			RES,FXD,FILM 274 OHM,1%,0.125W,TC=T0	01121	CMF55116G274R0FFI
A25R2643	321-0347-00			RES,FXD,FILM 40.2K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G40201FFI
A25R2644	311-2361-00			RES,VAR,NONWW:TRMR,10K OHM,0.5W	K8996	TC10-LV10-10K/A,0.

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A25R2645	321-0481-00			RES,FXD,FILM:1M OHM,1%,0.125W, TC=T0MISAFETY CONTROLLED	07716	CMF55116G10003F.125
A25R2646	321-0229-00			RES,FXD,FILM 2.37K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G23700FFI
A25R2647	321-0225-00			RES,FXD,FILM:2.15K OHM,1%, 0.125W,TC=T0SAFETY CONTROLLED,MI	07716	CMF55116G21500FHM,
A25R2648	321-0159-00			RES,FXD,FILM 442 OHM,1%,0.125W,TC=T0	07716	CMF55116G442R0FFI
A25R2649	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	07716	CMF55116G10000F,
A25R2650	321-0249-00			RES,FXD,FILM 3.83K OHM,1%,0.125W,TC=T0MI	19701	CMF55116G38300FFI
A25R2651	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	07716	CMF55116G10000F,
A25R2652	321-0417-00			RES,FXD,FILM 215K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G21502FFI
A25R2653	321-0289-00			RES,FXD,FILM 10.0K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G10001FFI
A25R2654	321-0155-00			RES,FXD,FILM 402 OHM,1%,0.125W,TC=T0	07716	CMF55116G402R0FFI
A25R2655	321-0181-00			RES,FXD,FILM 750 OHM,1%,0.125W,TC=T0	07716	CMF55116G750R0FFI
A25R2656	321-0361-00			RES,FXD,FILM 56.2K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G56201FFI
A25R2657	321-0315-00			RES,FXD,FILM 18.7K OHM,1%,0.125W,TC=T0MI	01121	CMF55-116-G18701F
A25R2658	321-0273-00			RES,FXD,FILM 6.81K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G68100FFI
A25R2659	321-0239-00			RES,FXD,FILM 3.01K OHM,1%,0.125W,TC=T0MI	19701	CMF55116G30100FFI
A25R2660	321-0273-00			RES,FXD,FILM 6.81K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G68100FFI
A25R2661	321-0299-00			RES,FXD,FILM 12.7K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G12701FFI
A25R2662	321-0219-00			RES,FXD,FILM 1.87K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G18700FFI
A25R2664	321-0345-00			RES,FXD,FILM 38.3K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G38301FFI
A25R2665	321-0161-00			RES,FXD,FILM 464 OHM,1%,0.125W,TC=T0	07716	CMF55116G464R0FFI
A25R2666	321-0189-00			RES,FXD,FILM 909 OHM,1%,0.125W,TC=T0	01121	CMF55116G909R0FFI
A25R2667	321-0481-00			RES,FXD,FILM:1M OHM,1%,0.125W, TC=T0MISAFETY CONTROLLED	07716	CMF55116G10003F.125
A25R2668	321-0481-00			RES,FXD,FILM:1M OHM,1%,0.125W, TC=T0MISAFETY CONTROLLED	07716	CMF55116G10003F.125
A25R2669	321-0481-00			RES,FXD,FILM:1M OHM,1%,0.125W, TC=T0MISAFETY CONTROLLED	07716	CMF55116G10003F.125
A25R2701	321-0289-00			RES,FXD,FILM 10.0K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G10001FFI
A25R2702	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	07716	CMF55116G10000F,
A25R2703	321-0289-00			RES,FXD,FILM 10.0K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G10001FFI
A25R2704	321-0385-00			RES,FXD,FILM 100K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G10002FFI
A25R2705	321-0385-00			RES,FXD,FILM 100K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G10002FFI
A25R2706	321-0235-00			RES,FXD,FILM 2.74K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G27400FFI

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A25R2707	321-0473-00			RES,FXD,FILM 825K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G82502FFI
A25R2708	321-0223-00			RES,FXD,FILM 2.05K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G20500FFI
A25R2709	321-0289-00			RES,FXD,FILM 10.0K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G10001FFI
A25R2710	321-0297-00			RES,FXD,FILM 12.1K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G12101FFI
A25R2711	321-0454-00			RES,FXD,FILM 523K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G52302FFI
A25R2712	321-0379-00			RES,FXD,FILM 86.6K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G86601FFI
A25R2713	321-0369-00			RES,FXD,FILM 68.1K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G68101FFI
A25R2714	321-0361-00			RES,FXD,FILM 56.2K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G56201FFI
A25R2715	321-0385-00			RES,FXD,FILM 100K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G10002FFI
A25R2716	321-0297-00			RES,FXD,FILM 12.1K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G12101FFI
A25R2717	321-0227-00			RES,FXD,FILM 2.26K OHM,1%,0.125W,TC=T0MI	19701	CMF55116G22600FFI
A25R2718	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	07716	CMF55116G10000F,
A25R2719	321-0317-00			RES,FXD,FILM 19.6K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G19601FFI
A25R2720	321-0289-00			RES,FXD,FILM 10.0K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G10001FFI
A25R2721	321-0289-00			RES,FXD,FILM 10.0K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G10001FFI
A25R2722	321-0289-00			RES,FXD,FILM 10.0K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G10001FFI
A25R2723	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	07716	CMF55116G10000F,
A25R2724	321-0235-00			RES,FXD,FILM 2.74K OHM,1%,0.125W,TC=T0MI	01121	CMF55116G27400FFI
A25R2725	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	07716	CMF55116G10000F,
A25R2726	321-0197-00			RES,FXD,FILM 1.10K OHM,1%,0.125W,TC=T0MI	07716	CMF55116G11000FFI
A25U2601	156-1349-00			IC,LINEAR BIPOLAR,AMPLIFIER;DUAL INDEPEN DENT DIFFERENTIAL AMPLIFIER;CA 3054,DIP14.3	49671	CA3054-98
A25U2602	156-1200-00			IC,LINEAR:BIFET,OP-AMP;QUAD; TL074CN/LF347N/MC34004P,DIP14.3	01295	TL074CNIFET
A25U2605	156-1200-00			IC,LINEAR:BIFET,OP-AMP;QUAD; TL074CN/LF347N/MC34004P,DIP14.3	01295	TL074CNIFET
A25U2608	156-0048-00			IC,LINEAR BIPOLAR,TRANSISTOR ARRAY;(5),N PN,(1)DIFF PAIR,(3)IND,15V,50M A,300MHZ,AMPLIFIER;CA3046/MC33 46,DIP14.3	34371	MC3346P
A25U2609	156-0912-00			IC,LINEAR:BIPOLAR,OP-AMP; TRANSCONDUCTANCE;CA3080E,DIP08.3	27014	LM3080N :
A25U2610	156-0912-00			IC,LINEAR:BIPOLAR,OP-AMP; TRANSCONDUCTANCE;CA3080E,DIP08.3	27014	LM3080N :
A25U2611	156-1631-00			IC,LINEAR BIPOLAR,VOLTAGE REGULATOR;SHUN T,ADJUSTABLE,100MA;TL431CLP,TO-92	01295	TL431C-LP

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A25U2701	156-0366-00			IC,DIGITAL:CMOS,FLIP FLOP; DUAL D-TYPE;4013B,DIP14.3,TUBE	04713	MC14013BCPOS,
A25U2702	156-1152-01			IC,DIGITAL CMOS,MULTIVIBRATOR;DUAL PRECIS ION RETRIG/RESETTABLE MONOSTAB LE;4538B,DIP16.3	TK00J	MC14538BCPC,DI
A25U2703	156-0366-00			IC,DIGITAL:CMOS,FLIP FLOP; DUAL D-TYPE;4013B,DIP14.3,TUBE	04713	MC14013BCPOS,
A25U2704	156-0366-00			IC,DIGITAL:CMOS,FLIP FLOP; DUAL D-TYPE;4013B,DIP14.3,TUBE	04713	MC14013BCPOS,
A25U2705	156-0704-00			IC,MISC:CMOS,PLL;LOW SPEED; MC14046BCP,DIP16.3	04713	MC14046BCPS,
A25U2706	156-0796-00			IC,DIGITAL:CMOS,SHIFT REGISTER; 8-STAGE SHIFT/STORE, 3-STATE; 4094,DIP16.3,TUBE	04713	MC14094BCPIFT
A25U2707	156-0796-00			IC,DIGITAL:CMOS,SHIFT REGISTER; 8-STAGE SHIFT/STORE, 3-STATE; 4094,DIP16.3,TUBE	04713	MC14094BCPIFT
A25U2709	156-0844-00			IC,DIGITAL LSTTL,COUNTER;SYNCH 4-BIT BINARY; 74LS161,DIP16.3,TUBE	01295	SN74LS161AN,DI
A25U2710	156-0844-00			IC,DIGITAL LSTTL,COUNTER;SYNCH 4-BIT BINARY; 74LS161,DIP16.3,TUBE	01295	SN74LS161AN,DI
A25U2711	156-0844-00			IC,DIGITAL LSTTL,COUNTER;SYNCH 4-BIT BINARY; 74LS161,DIP16.3,TUBE	01295	SN74LS161AN,DI
A25U2712	156-0545-00			IC,DIGITAL CMOS,COUNTER;12-BIT BINARY;404 0B,DIP16.3,TUBE	04713	MC14040BCPC,DI
A25U2713	156-0789-00			IC,DIGITAL LSTTL,SHIFT REGISTER;8-BIT PISO; 74LS165,DIP16.3,TUBE	01295	SN74LS165NC,DI
A25U2714	156-0789-00			IC,DIGITAL LSTTL,SHIFT REGISTER;8-BIT PISO; 74LS165,DIP16.3,TUBE	01295	SN74LS165NC,DI
A25U2715	156-0575-00			IC,DIGITAL CMOS,GATE;TRIPLE 3-INPUT NOR;4 025B,DIP14.3,TUBE	27014	MC14025BCPC,DI
----------	174-3054-00			POWER,20 X 28 AWG,17.72 L,FLAT CABLE	80009	174305400
----------	174-3055-00			DATA INT CONNECT,6 X 28 AWG,14.17 L, FLAT CABLE	80009	174305500
----------	196-3406-00			50 OHM COAX,3 EA,17.72 L &2 EA,11.81 L	80009	196340600
----------	407-4242-00			BRACKET,CHAS, 2212 OPT 05,ALUMINUM	80009	407424200