Instruction Manual

Tektronix

1720SCH-Series
Vectorscope/SCH Monitor
S/N B040000 & Above

070-8341-04

Warning
The servicing instructions are for use by qualified personnel only. To avoid personal injury, do not perform any servicing unless you are qualified to do so. Refer to all safety summaries prior to performing service.

CE

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General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. To avoid potential hazards, use this product only as specified.

Only qualified personnel should perform service procedures.

To Avoid Fire or Personal Injury

Use Proper Power Cord. Use only the power cord specified for this product and certified for the country of use.

Connect and Disconnect Properly. Do not connect or disconnect probes or test leads while they are connected to a voltage source.

Ground the Product. This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded.

Observe All Terminal Ratings. To avoid fire or shock hazard, observe all ratings and markings on the product. Consult the product manual for further ratings information before making connections to the product.

Do not apply a potential to any terminal, including the common terminal, that exceeds the maximum rating of that terminal.

Do Not Operate Without Covers. Do not operate this product with covers or panels removed.

Avoid Exposed Circuitry. Do not touch exposed connections and components when power is present.

Do Not Operate With Suspected Failures. If you suspect there is damage to this product, have it inspected by qualified service personnel.

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in an Explosive Atmosphere.

Keep Product Surfaces Clean and Dry.

Provide Proper Ventilation. Refer to the manual's installation instructions for details on installing the product so it has proper ventilation.

Symbols and Terms

Terms in this Manual. These terms may appear in this manual:

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

CAUTION. *Caution statements identify conditions or practices that could result in damage to this product or other property.*

Terms on the Product. These terms may appear on the product:

DANGER indicates an injury hazard immediately accessible as you read the marking.

WARNING indicates an injury hazard not immediately accessible as you read the marking.

CAUTION indicates a hazard to property including the product.

Symbols on the Product. The following symbols may appear on the product:

(Cut safety symbols that do not pertain to this product)

Preface

This manual documents the TEKTRONIX 1720SCH Vectorscope/SCH Monitor. Information that applies to all instruments in the series refers to the 1720SCH–Series. Information that applies only to specific instruments within the series refers to the model numbers of those instruments (i.e. 1720SCH or 1721SCH).

The information in this manual is intended for instrument operators and service technicians. Operators are assumed to be familiar with basic television terms and measurements. Qualified service technicians are also assumed to be familiar with television terms and measurements, and to have moderate experience with analog and logic circuits.

The manual is divided into two parts: Operators Information and Service Information. The Operators Information is useful to both operators and service technicians. The Service Information is intended only for service technicians

Operators Part

The Operators part includes Sections 1 & 2

Section 1, Introduction, includes a general description of the instrument followed by the Specifications. The Specifications include references to the corresponding Performance check steps.

Section 2, Operating Information, familiarizes the user with the front- and rear-panel controls, connectors, and indicators; includes an operator's checkout procedure; and includes other operator familiarization information

Service Part

The service part contains information required by service technicians to install, calibrate, maintain, and troubleshoot the instrument. This is included in the remaining sections of the manual.

Section 3, Installation, includes electrical and mechanical installation information. The electrical installation information includes adjustments and operational changes available with the instrument. The mechanical installation information includes rackmounting, custom installation, and portable use.

Section 4, Theory of Operation, provides an overall block diagram description and detailed circuit descriptions. Read the block diagram description for an overview of the instrument. The detailed circuit descriptions should be used with the block diagram and schematic diagrams in the foldout pages for specific information about the individual circuits.

Section 5, Checks and Adjustments, includes the Performance Check Procedure and the Adjustment Procedure. The Performance Check Procedure is used to verify that the instrument's performance is within its specifications, and the Adjustment Procedure is used to adjust the instrument to meet its specifications.

The procedures are preceded by a list of recommended test equipment. Each procedure has a short form listing of the individual steps.

Section 6, Maintenance, includes preventive, troubleshooting, and corrective information.

Section 7, Options, documents instrument options. The information in this section summarizes the options. Additional details are included in appropriate places throughout the manual.

Section 8, Replaceable Electrical Parts, includes order information and part numbers for all replaceable electrical parts.

Section 9, Diagrams, contains servicing illustrations. These include adjustment locations, circuit board part locations, a block diagram, schematic diagrams, and waveforms. Parts locating tables are included that cross-reference the circuit board illustrations and the schematic diagrams.

Section 10, Replaceable Mechanical Parts, includes ordering information and part numbers for all replaceable mechanical parts. This parts list is referenced to an exploded view mechanical drawing. Also included are lists of accessories and optional accessories.

Introduction

Introduction

The TEKTRONIX 1720SCH-Series is an 8-1/2-inch wide by 5-1/4-inch high Vectorscope, weighing 8-1/2 pounds. The product offers the vector and audio features of the 1720-Series vectorscope, plus SCH phase error measurement capabilities.

Two versions are available: 1720SCH-System M, NTSC, and 1721SCH-System I, B, etc., PAL. They are powered only from an ac source. The crt occupies approximately two-thirds of the front-panel area, with the control panel taking up the remainder of the space. Operation is controlled by a microprocessor that polls the front-panel switches and remote ground closures. Front-panel switches are of the momentary touch type with lighted functional indicators. Some of the switches are also used to select special functions, which are accessed by holding the switches in until the microprocessor recognizes the request.

The signal is displayed on a bright crt capable of displaying one line per frame. It is of the mesh type, for better geometry, and uses an internal graticule to reduce parallax. Variable graticule scale illumination provides even lighting over the usable graticule area to improve measurement accuracy and display picture quality. A white phosphor crt tube is available as an option.

Composite video signals for channel A and B, as well as the external reference signal input, are brought in through high impedance bridging loop-throughs, in order to protect the integrity of the signal paths. The input switching allows for the display of CH-A, CH-B, or both. Synchronization can be either internal or external.

The graphic display of subcarrier to horizontal phase (SCH) allows the operator to measure SCH phase errors (in degrees) directly off the vectorscope graticule. The operator has a choice between absolute and relative modes. The relative mode allows comparison of the color framing between the observed signal and an external reference signal.

The operator can select the vector display, XY display, or both. The XY display, with accompanying graticule scale, allows this vectorscope to be used for stereo audio monitoring. In addition to the usual Color Bar amplitude and phase relationships, the vector display can also be used to make differential gain and phase measurements. The 1721SCH has the +V display that is used to check PAL system color encoders. Full 360° phase shift and a test circle are also included in these vectorscopes.

Stereo audio input for XY display is balanced line through the rear-panel REMOTE connector.

When interconnected with a 1730-Series waveform monitor, the 1720SCH-Series reacts to the waveform monitor's Store and Recall commands through the

AUXILIARY function. This provides for storing up to four front-panel setups, which are recalled when the waveform monitor Recall button is pressed or a valid 1730-Series remote ground closure occurs. The AUXILIARY function can also utilize the blanking strobe from the waveform monitor to unblank the vectorscope crt for a line select display.

Accessories

Standard Accessories

All accessories needed for installation and day-to-day operation are shipped with the 1720SCH-Series. A list of these accessories follows. Part numbers are listed at the end of the Replaceable Mechanical Parts List.

1 1720SCH-Series instruction manual.

1 Power cable assembly.

1 Replacement cartridge fuse (3AG 2A, 250V, fast-blow).

3 Replacement scale illumination bulbs (Tektronix P/N 150-0168-00 or ANSI #73).

1 Auxiliary control cable, for use with a 1730-Series waveform monitor.

Optional Accessories

There are a number of accessories that can be purchased from Tektronix, Inc., to be used with a 1720SCH-Series vectorscope. A partial list follows. Part numbers are listed at the end of the Replaceable Mechanical Parts List.

Camera, C9 (Option 20)

Viewing Hood

Front-Panel Cover

Field-Installable Upgrades

1700F00, Plain Cabinet (painted silver gray)

1700F02, Portable Cabinet (painted silver gray)

1700F05, Side-by-Side Rack Adapter

1700F06, Blank Half-Rack-Width Panel

1700F07, Rack Drawer

Options

CRT Options

Standard instruments are shipped with a P31 (green) phosphor crt installed. Option 74 instruments are shipped with a P4 (white) phosphor crt installed.

Power Cord Options

Any of the power cord options described in Section 7 can be ordered for the 1720SCH-Series. If no power cord option is ordered, instruments are shipped with a North American 125 V power cord and one replacement fuse.

Safety Information

1720SCH-Series instruments should be powered by an ac 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 by way of the grounding conductor is essential for safe operation.

The 1720SCH-Series was tested for compliance in a cabinet. To ensure continued compliance, the instrument must be enclosed in a 1700F00, 1700F02, 1700F05, or equivalent. Dimensional cabinet drawings are provided in Section 3.

The 1720SCH-Series is designed and tested in accordance with the following industry safety standards:

UL12441980 Standard for Electrical and Electronic Measuring and Testing Equipment.

FM.3820 Approval Standard for Electrical Utilization Equipment, Class Number 3820.

ANSI C39.5 Safety Requirements for Electrical and Electronic Measuring and Controlling Instrumentation, 1974.

CSA C22.2, No. 231

IEC 348, Second Edition Safety Standard for Electronic Measuring Apparatus.

Specification

The performance requirements listed here apply over an ambient operating temperature range of 0° to 50°C and are valid only when the instrument is calibrated at 25° ±5°C, following a minimum warm-up period of 20 minutes.

Table 1–1: Input

Characteristic	Performance Requirements	Supplemental Information	Check Step
Return Loss (75 Ω)	At least 40 dB from 50 kHz to 6 MHz.	Loop-through terminated in 75 Ω. Input in use or not in use, instrument power on or off, all deflection factor settings.	19
Video Inputs (CH-A, CH-B)			
EXT REF			
Crosstalk between Channels		Greater than 70 dB of isolation between channels. Measured at F_{SC} between Channel A, Channel B, and EXT REF.	
Loop-Through Isolation		Greater than 70 dB of isolation between loop-throughs. Measured at F_{SC} between Channel A, Channel B, and EXT REF.	
Input Requirements	Stable display with Composite video, or black burst with 286 mV (NTSC), 300 mV (PAL) burst 6 dB.		3
DC Input Impedance (Untermi-nated)	Greater than 15 kΩ.		
EXT REF Input		Composite video.	
Absolute Maximum Input Voltage		±12 VDC plus peak AC.	
Maximum Operating Input Voltage		Peak AC + DC should be within ±5 V for proper operation.	

Table 1–2: SCH Mode

Characteristic	Performance Requirements	Supplemental Information	Check Step
Subcarrier to Horiz Phase Accuracy	±3°	Factory set with a digital generator.	16
SCH Acquisition Time	≤1 second.	Lock-in time, free run to stable SCH display.	
AFC FAST Loop Bandwidth		Both the sync-locked loop and the burst loop have the same bandwidth.	
AFC SLOW Loop Bandwidth		Both the sync-locked loop and the burst loop have the same bandwidth.	

Table 1–2: SCH Mode (Cont.)

Characteristic	Performance Requirements	Supplemental Information	Check Step
SCH Dot Phase Jitter		Checked with a TEKTRONIX TSG170A or TSG271.	
AFC FAST		Typically 5°.	
AFC SLOW		1°.	
SCH Dot Phase Change	2°	With video amplitude change of ±6 dB.	15

Table 1–3: Vector Mode

Characteristic	Performance Requirements	Supplemental Information	Check Step
Chrominance Processing Characteristics			
Nominal Subcarrier Frequency (F_{SC})			
NTSC		3.579545 MHz.	
PAL		4.43361875 MHz.	
Chrominance Bandwidth			4
Upper –3 dB Point	F_{SC} +500 kHz, ±100 kHz.		
Lower –3 dB Point	F_{SC} –500 kHz, ±100 kHz.		
PAL/+V		PAL or +V display as selected by front-panel button. When +V is selected, V axis is inverted at a 1/2 line rate to produce a single vector display of a PAL input signal.	
Display			5
Vector Phase Accuracy	±1.25°	Measured with color bar signal.	
Vector Gain Accuracy		Typically ±2.5%.	
Quadrature Phasing		Typically ±0.5°.	
Auto Phase Lock			
Accuracy	±5°	Measured with burst at Compass Rose.	
Lock-in time	<1.5 Second		

Table 1–3: Vector Mode (Cont.)

Characteristic	Performance Requirements	Supplemental Information	Check Step
Subcarrier Regenerator		Subcarrier Regenerator free runs in absence of appropriate signal. Reference can be burst of either displayed signal or external reference signal.	
Pull-In Range		PAL units are tested to 10 Hz, but will typically lock to 50 Hz.	6
NTSC	±50 Hz of F_{SC}.		
PAL	±10 Hz of F_{SC}.		
Pull-In Time		Within 1 second, with subcarrier frequency within 50 Hz (10 Hz for PAL) of F_{SC}.	
Phase Shift with Subcarrier Frequency Change			7
NTSC	±2° from F_{SC} to (F_{SC} +50 Hz), or F_{SC} to (F_{SC}–50 Hz).		
PAL	±2° from F_{SC} to (F_{SC} +10 Hz), or F_{SC} to (F_{SC} –10 Hz).		
Phase Shift with Burst Amplitude Change	±2° from nominal burst amplitude to 6 dB.	Internal or External burst reference.	6
Phase Shift with Input Channel Change	±0.5°.	With EXT REF selected.	7
Phase Shift with VAR GAIN Control	±1° as gain is varied from 3 dB to –6 dB.		
PHASE Control Range		360° continuous rotation.	
Burst Jitter	1° or less.	With 140 IRE (1V) composite video input. INT or EXT referenced.	7
Display Characteristics		Measured with 140 IRE (1V) linearity signal (5 step, 10 step, or Ramp) with 40 IRE (300 mV) of subcarrier.	8
Differential Phase	±1°.		
Differential Gain	±1%.		
Position Control Range			9
HORIZONTAL	At least 1/4″ (6 mm) from center.		
VERTICAL	At least 1/4″ (6 mm) from center.		
Clamp Stability	1/64″ (0.4 mm) or less.	Center Spot Movement with Rotation of PHASE Control.	
Variable GAIN Range	+14 dB to –6 dB of 75% color bar preset gain.	+5 to –1/2 amplitude.	10

Table 1–4: XY Mode

Characteristic	Performance Requirements	Supplemental Information	Check Step
Input		DC Coupled differential inputs through rear-panel REMOTE connector.	
Input Amplitude	2 to 9 Vp-p.	Adjustable full scale deflection 0dBm to +12 dBm for 600 Ω system. Factory set to 0 dBm.	
Maximum Input Voltage	+ or –15 V peak signal plus DC.		13
Frequency Response	DC to greater than 500 kHz.	3 dB point.	13
High Gain Mode	DC to greater than 100 kHz.	3 dB point. Not a differential input, minus inputs must be grounded.	13
X and Y Input Phase Matching	Less than a trace width of separation at 20 kHz.	Single-ended. Phase matching may be improved, above 20 kHz, by adjusting C484.	12

Table 1–5: CRT Display

Characteristic	Performance Requirements	Supplemental Information	Check Step
CRT Viewing Area		80 × 100 mm.	
Accelerating Potential		15.75 kV.	
Trace Rotation Range	Greater than ±1° from horizontal.	Total adjustment range is typically 8°.	11
Graticule		Internal Vector, variable SCALE illumination.	

Table 1–6: Power Source

Characteristic	Performance Requirements	Supplemental Information	Check Step
Mains Voltage Ranges	90–250 V.	Continuous range from 90 to 250 VAC.	2
Mains Frequency Range	48 Hz to 66 Hz.		
Power Consumption		35 Watts (119.4 BTU/HR) maximum.	

Table 1–7: Environmental Characteristics

Characteristic	Supplemental Information
Temperature	
Non-Operating	–55° C to +75° C
Operating	0° C to +50° C.
Altitude	
Non-Operating	To 50,000 feet.
Operating	To 15,000 feet.
Vibration – Operating	15 minutes each axis at 0.015 inch, frequency varied from 10–55–10 Hz in 1-minute cycles with instrument secured to vibration platform. Ten minutes each axis at any resonant point or at 55 Hz if no resonant point is found.
Shock – Non-Operating	30g's, 1/2 sine, 11ms duration, 3 shocks per surface (18 total).
Transportation	Qualified under NTSA (National Safe Transit Association) preshipment test procedures, Project 1A–B–1.
Humidity	Will operate at 95% relative humidity for up to five days . Do not operate with visible moisture on the circuit boards.

Table 1–8: Certifications and Compliances

Category	Standards or Description
EC Declaration of Conformity – EMC	Meets intent of Directive 89/336/EEC for Electromagnetic Compatibility. Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Union: EN 50082-1 Immunity: IEC 801-2 Electrostatic Discharge Immunity IEC 801-3 RF Electromagnetic Field Immunity IEC 801-4 Electrical Fast Transient/Burst Immunity
Australia/New Zealand Declaration of Conformity – EMC	Complies with EMC provision of Radiocommunications Act per the following standard(s): AN/NZS 2064.1/2 Industrial, Scientific, and Medical Equipment: 1992 AN/NZS 3548 Information Technology Equipment: 1995
EMC Compliance	Meets the intent of Directive 89/336/EEC for Electromagnetic Compatibility when it is used with the product(s) stated in the specifications table. Refer to the EMC specification published for the stated products. May not meet the intent of the directive if used with other products.
FCC Compliance	Emissions comply with FCC Code of Federal Regulations 47, Part 15, Subpart B, Class A Limits.
EC Declaration of Conformity – Low Voltage	Compliance was demonstrated to the following specification as listed in the Official Journal of the European Union: Low Voltage Directive 73/23/EEC, amended by 93/69/EEC EN 61010-1:1993 Safety requirements for electrical equipment for measurement control and laboratory use.

Table 1–8: Certifications and Compliances (Cont.)

Category	Standards or Description
U.S. Nationally Recognized Testing Laboratory Listing	UL1244 Standard for electrical and electronic measuring and testing equipment.
Canadian Certification	CAN/CSA C22.2 No. 231 Safety requirements for electrical and electronic measuring and test equipment.
Additional Compliance	ANSI/ISA S82.01:1994 Safety standard for electrical and electronic test, measuring, controlling, and related equipment. IEC61010-1 Safety requirements for electrical equipment for measurement, control, and laboratory use.
Safety Certification of Plug-in or VXI Modules	The safety certification is valid only when installed in an appropriately approved (a USA NRTL or a Canada Certified Organization) mainframe.
Installation (Overvoltage) Category	Terminals on this product may have different installation (overvoltage) category designations. The installation categories are: CAT III Distribution-level mains (usually permanently connected). Equipment at this level is typically in a fixed industrial location. CAT II Local-level mains (wall sockets). Equipment at this level includes appliances, portable tools, and similar products. Equipment is usually cord-connected. CAT I Secondary (signal level) or battery operated circuits of electronic equipment.
Pollution Degree	A measure of the contaminates that could occur in the environment around and within a product. Typically the internal environment inside a product is considered to be the same as the external. Products should be used only in the environment for which they are rated. Pollution Degree 1 No pollution or only dry, nonconductive pollution occurs. Products in this category are generally encapsulated, hermetically sealed, or located in clean rooms. Pollution Degree 2 Normally only dry, nonconductive pollution occurs. Occasionally a temporary conductivity that is caused by condensation must be expected. This location is a typical office/home environment. Temporary condensation occurs only when the product is out of service. Pollution Degree 3 Conductive pollution, or dry, nonconductive pollution that becomes conductive due to condensation. These are sheltered locations where neither temperature nor humidity is controlled. The area is protected from direct sunshine, rain, or direct wind. Pollution Degree 4 Pollution that generates persistent conductivity through conductive dust, rain, or snow. Typical outdoor locations.

Table 1–9: Physical Characteristics

Characteristic	Supplemental Information
Dimensions	
Height	5 1/4 inches (133.4 mm).

Table 1–9: Physical Characteristics (Cont.)

Characteristic	Supplemental Information
Width	8 1/2 inches (215.9 mm).
Length	18 1/8 inches (460.4 mm).
Weight	8.5 lbs (3.8 kg).

Operating Instructions

Operating Instructions

These instructions provide information about the front-panel controls, rear-panel connectors, the Operator's Familiarization/Checkout Procedures, and discussions about vector, audio, and SCH phase measurements using the 1720SCH-Series.

Front-panel Controls And Indicators

The front-panel controls and indicators consist of momentary contact push-button switches, variable controls, and switch selections. See Figure 2–1 for the control locations.

Figure 2–1: 1720SCH-Series Vectorscope

Outlined functions are accessed by holding the switch down for approximately one second. The previous operating mode is restored when the switch is pushed again (momentarily) to exit the held function.

INPUT

1. MODE

The MODE switch toggles between the vector and XY displays. These two functions have lighted nomenclature and indicators.

Press and hold this switch for a display of both vector and XY modes. In this mode both the VECT and XY nomenclature and indicators light to show that the 1720SCH-Series has been switched to this mode of operation.

2. REF

The REF switch toggles between INT and EXT sync references. These two functions have lighted nomenclature and indicators.

TEST

Press and hold the REF switch for an unlocked display of subcarrier and to enable the V-axis switcher, if a signal containing a subcarrier reference signal is applied to the selected input. TEST nomenclature, framed by a blue box, lights when the 1720SCH-Series is switched to this mode.

3. CH-A and CH-B INPUT

The CH-A/CH-B switch toggles the input between Channel A and Channel B display. Nomenclature and indicators light to show which channel is selected for display.

Press and hold this switch to display both CH-A and CH-B Inputs. This display requires an external sync reference. Both the CH-A and CH-B indicators light when the 1720SCH-Series has been switched to this dual input mode.

While in the BOTH mode, the PHASE control can be set to rotate the phase of both channels together (factory set), or rotate each channel individually. To change the setting, turn the instrument power off and then power up while holding the AFC FAST/SLOW switch until the LED indicators light. If the instrument is powered down and back up again without holding the AFC FAST/SLOW switch, no change will occur in the previously described state. If individual channel rotation is selected, the channel currently selected for phase rotation toggles between CH-A and CH-B with a momentary push of the switch, and is designated by a flashing indicator. To exit the BOTH mode, momentarily push the INPUT switch if PHASE control is set to rotate both channels together; push and hold the INPUT switch if PHASE control is set to rotate each channel individually.

GAIN

4. VARIABLE

The VARIABLE switch toggles between VARIABLE gain ON and off. The VARIABLE control adjusts amplifier input gain so that any input signal between 0.5 V and 2.0 Vp-p can be displayed. The control has no detent; its action is continuous. Nomenclature and indicators light (red) to indicate that the display gain is uncalibrated.

5. BARS

This switch toggles between correct gain for displaying 75% and 100% amplitude color bar signals, using a single set of vector targets. Burst targets for both 75% and 100% amplitude color bars are on the graticule. Nomenclature and indicators light to show the switch selection.

PHASE

6. SCH

The SCH switch toggles the SCH display on/off. The SCH display is a graphic representation of SCH phase, with a choice of one dot (relative) or two dot (absolute) indication for correct color framing.

PAL/+V (PAL Only)

The SCH switch on 1721SCH instruments also selects PAL (+V and –V) or +V (+V only) for phase displays. The +V display, selected by pushing and holding the switch, overlays +V with –V, on the +V Axis, to allow alternate line comparisons. Both +V and SCH can be selected at the same time.

7. AUTO

The AUTO switch, when pushed, returns the burst vector(s) to their target(s). AUTO is disabled when +V is selected.

8. PHASE Control

The PHASE control is continuously variable, with a 360° range to set the phase of the decoder reference.

Holding the AFC FAST/SLOW switch at instrument power up affects the status of the PHASE control. Details are given in the preceding CH-A and CH-B INPUT description.

DISPLAY

9. FOCUS

This 270° rotation potentiometer adjusts for display definition.

10. SCALE

This 270° rotation potentiometer controls the level of graticule illumination.

11. INTENS

This 270° rotation potentiometer controls display brightness.

Miscellaneous

12. AFC FAST / SLOW

This switch toggles between FAST and SLOW. The fast mode allows display of jittery signals, and the slow mode is for display of normal video signals.

Holding the AFC FAST/SLOW switch at instrument power up affects the status of the PHASE control. Details are given in the preceding CH-A and CH-B INPUT description.

13. AUXILIARY

This switch toggles between AUXILIARY and independent operation. In the AUXILIARY mode, a Line Strobe (to blank the 1720SCH-Series CRT, for line selection) and data to actuate the front-panel setup is accepted from a companion 1730Series instrument. Nomenclature and indicator light to show that the instrument is under AUXILIARY control.

Press and hold the AUX switch to turn off all front-panel indicator lights.

14. POWER

Switches the instrument between powered up and standby states. Portions of the power supply circuit board still have mains potential on them. A mechanical indicator in the center of the switch shows the status of the POWER switch.

WARNING. *Mains power is still applied to the 1720SCH-Series power supply circuit board, regardless of POWER switch state. To totally remove shock hazard it is necessary to unplug the instrument and wait for capacitors to discharge.*

15. ROTATE

This 270° rotation screwdriver adjustment aligns the display with the graticule.

16. GAIN CAL

This 270° rotation screwdriver adjustment sets the amplifier gains in the Vector Mode.

17. VERT POS

This 270° screwdriver adjustment provides limited vertical positioning of the display.

18. HORIZ POS

This 270° screwdriver adjustment provides limited horizontal positioning of the display.

Rear-panel Connectors

SIGNAL INPUT, POWER INPUT, AUXILIARY CONTROL IN, XY INPUT, and DEMOD OUT are all located on the 1720SCH-Series rear panel. Because of the similarity of the 1730-Series to the 1720SCH-Series rear panel, the word VECTORSCOPE appears at the top of the panel. See Figure 2–2 for locations of rear-panel connectors .

Figure 2–2: 1720SCH-Series rear panel

Power Input

1. AC POWER

A standard AC plug receptacle for the 120 or 220 VAC power mains. The plug is compatible with any of the power cord options available for the 1720SCH-Series.

2. DEMOD OUT

A 75 Ω output of the demodulated R-Y signal that can be fed into a companion 1730-Series to provide a horizontal sweep of demodulated video.

3. AUXILIARY

A 9-pin connector used to interface with the 1730-Series instrument. Auxiliary control consists of a signal line (Line Strobe) and a serial interface. The serial interface allows the 1720SCH-Series to operate in conjunction with the 1730-Series Store/Recall function.

Subminiature D-Type Connectors

4. XY INPUT

A 15-pin connector that is used for the differential input of a stereo audio signal to be displayed in the XY mode. One set of inputs can be configured for high gain single-ended input. Internal jumpers must be repositioned for this type of input. See Section 3 (Installation) for more information.

5. EXT REF INPUT

A bridging loop-through input (compensated for 75 Ω) for synchronizing signals. The input signal may be Black Burst or composite video. External reference is selected by the front-panel REF switch.

BNC Connectors

6. CH-A and CH-B INPUTS

These bridging loop-through inputs for composite video signals are compensated for 75 Ω. The input signal for display is selected by the front-panel INPUT switch.

Miscellaneous

7. AC FUSE

A holder for an F-type cartridge fuse which is the instrument AC mains supply fuse.

Using The 1720SCH-Series In Auxiliary Mode

When the serial interface AUXILIARY cable (between the 1720SCH-Series and a 1730-Series) is connected, the 1720SCH-Series can be operated in the AUXILIARY mode. The 1720SCH-Series AUXILIARY mode allows the Input and Reference switching to follow the similar switches on the waveform monitor. For example, when the 1730-Series INPUT switch is changed from CH-A to CH-B, the 1720SCH-Series INPUT switch will also change to CH-B. Even though the vectorscope switching (INPUT and REF) follows the waveform monitor, the vectorscope INPUT and REF switches remain active so that they can be changed without changing the waveform monitor switching. The following functions can be controlled by the 1730-Series in AUXILIARY mode: INPUT switching, REFERENCE switching, LINE SELECT,and STORE and RECALL

INPUT Switching

INPUT switching allows the 1730-Series to select any of the three (CH-A, CH-B, or BOTH) input selections when AUXILIARY is ON. Note that the 1720SCH-Series INPUT switch can be used independently, even though the instrument is in the AUXILIARY mode.

REF Switching

REF switching allows the 1730-Series to select either INT or EXT reference. It will not switch to TEST when the 1730-Series is switched to CAL. Reference will automatically be switched to EXT if the INPUT is switched to BOTH (from either the waveform monitor or the vectorscope). If the 1720SCH-Series REF switch is in TEST, the 1730-Series switching will not take it out of that mode.

LINE SELECT

The 1720SCH-Series normal operation is full field. When it is used in AUXILIARY, the 1730-Series LINE SELECT switching controls the display on the vectorscope. It should be noted that the 1720SCH-Series has no line selection capability when it is not connected to a 1730-Series waveform monitor.

STORE

***NOTE**. Use caution to retain desired 1730-Series stored configurations. Read the STORE and RECALL SETUP instructions in Section2 of the 1730-Series instruction manual before proceeding.*

The current state of the front panel can be stored, in AUXILIARY mode, by executing the 1730-Series STORE command. When the 1730-Series STORE button is pushed, the 1720SCH-Series front-panel indicators will blink to acknowledge that the command was received. The current front-panel configuration will now be stored in the 1720SCH-Series NOVRAM as soon as one of the 1730-Series RECALL buttons is pushed.

Note that the indicators also blink when the 1720SCH-Series is not in AUXILIARY; however, the front-panel configuration is not stored and the 1720SCH-Series front panel will not change when that stored function (on the 1730-Series) is recalled.

RECALL

When the 1720SCH-Series is in the AUXILIARY mode and contains stored front-panel configurations, it reacts to 1730-Series recalls. When one of these RECALL buttons is pushed, the stored front-panel configurations of both instruments will be recalled. All front-panel controls remain active during AUXILIARY mode, and can be used to make changes in current front-panel configurations.

During AUXILIARY operation, the 1720SCH-Series front-panel indicators continue to accurately display its current status.

Operator's Checkout Procedure

The following procedure is provided for operator familiarization and as a quick check of basic instrument operation. Since instrument functions (not measurement quantities or specifications) are checked in this procedure, a minimum amount of test equipment is required. All checks are made with the cabinet on and all internal jumpers in the factory-set position. Drawings shown in this procedure are representative of actual displays obtained on 1720SCH-Series monitors.

If performing the Operator's Checkout Procedure reveals improper operation or instrument malfunction, first check the operation of associated equipment. If associated equipment is performing properly and the 1720SCH-Series is not, refer the 1720SCH-Series Waveform Monitor to qualified service personnel for repair or adjustment.

When a complete check of the instrument performance to specifications is desired, refer to the Performance Check in Section 5. (Performance Check should only be performed by qualified service personnel.)

This procedure requires a source of composite video and composite sync signals. A TEKTRONIX 1410-Series television test signal generator mainframe with Sync, Color Bar, and Linearity modules was used in preparing this procedure.

Procedure

1. **Equipment Connection**

   This is the only hook-up required throughout the Operator's Checkout Procedure:

   Connect the Color Bar signal to the CH-A INPUT and terminate the remaining side of the loop-through input with a 75 Ω termination.

Connect the modulated staircase (linearity) signal to the CH-B INPUT, then loop through to the EXT REF and terminate in 75 Ω. See Figure 2–3.

Figure 2–3: Equipment connections for Operators Checkout Procedure

2. **Initial Generator Setup**

   Analog Test Signal Generator

   Test Signals

   Full Field Color Bars

   75% Ampl. 7.5% Setup NTSC

   75% Ampl. 0% Setup PAL

   Modulated Staircase

   (Flat Field, 10 Step)

   Black Burst Signal

   (Sync and Burst only)

   If the XY operation of the 1720SCH-Series is to be checked, an audio signal is required as follows:

   Audio Signal, about 2 V between 1 and 100 kHz.

3. **Apply Power**

   Connect the instrument to a suitable AC power source and push the POWER button. A center dot should appear in the eye of the POWER switch to indicate that it is on.

4. **Initial Front-Panel Setup**

Set the vectorscope as shown in Table 2–1.

Table 2–1: Control Settings for Operator's Checkout Procedure

Control	Setting
POWER	ON
MODE	VECTOR
REF	INT
INPUT	CH-A
VARIABLE	off
BARS	75%
+V	not selected
PHASE	set later
FOCUS	set later
SCALE	counterclockwise
INTENSity	counterclockwise

***NOTE**. Do not set any of the front-panel screw-driver controls until after the instrument warms up (at least 20 minutes).*

5. Obtain Display

Adjust the INTENS and FOCUS controls for the desired brightness and a well-defined vector display. Use the PHASE control to place the vector tips and burst(s) on their targets. See Figure 2–4.

Adjust the SCALE illumination control for the desired brightness. Note that the internal waveform graticule should be illuminated.

Figure 2–4: 1720SCH-Series typical vector display

6. Select Input

Select the ChannelB input for a display of the modulated staircase signal. See Figure 2–5.

Push in and hold the INPUT switch until both the CH-A and CH-B indicators light, and check for a display of both vectors and modulated staircase. See Figure 2–6.

Figure 2–5: Modulated staircase waveform shown on a 1721SCH

Figure 2–6: Color bar and modulated staircase signals simultaneously displayed

Briefly push the INPUT button and check that the CH-A indicator is the only one lit and that only a vector display is present.

7. Select Reference

Connect the Black Burst signal to the EXT REF loop-through input and terminate in 75 Ω. See Figure 2–7.

Figure 2–7: Connections to use Black Burst signal as External Reference

Push the REF button and check that the front-panel EXT indicator lights. Check for a stable display of vectors (CH-A INPUT).

Push and hold the REF button until the front-panel TEST indicator lights. Check for a test circle display. See Figure 2–8.

Leave the 1720SCH-Series REF in TEST.

Figure 2–8: 1720SCH-Series terst circle display

8. Position Center Dot

Use a small screwdriver to adjust the vertical and horizontal positioning controls. Check that there is sufficient range to move the dot through the geographic center of the display (the graticule center target). It should be noted that the amount of adjustment range varies from instrument to instrument.

Adjust the positioning controls to place the center dot at the exact center of the graticule.

9. SCH mode

Connect the Black Burst signal to both CH-A and EXT REF inputs using a dual-input coupler and a 75 Ω in-line terminator.

Select CH A INPUT and EXT REF. Press the SCH button. Look for a display similar to Figures 2–9 and 2–10. (For PAL instruments, note the 25 Hz offset displayed as a solid circle on the compass rose.) One SCH dot is displayed; this is the relative mode. Rotate the PHASE control through its range and check that the burst(s) can be rotated 360°.

Figure 2–9: SCH display on a 1720SCH, with EXT REF selected

Figure 2–10: SCH display on a 1721SCH, with EXT REF selected

Select INT REF and look for a display with two SCH dots, one at 0° and one at 180°. This is the absolute mode, used for correct color framing.

10. Auto Zero

Connect a 75% Color Bar signal to the CH A input and terminate the loop-through in 75 Ω.

Select VECTOR mode, 75% BARS. Use the PHASE control to position the burst to the 0° mark (for PAL, use either burst). Press AUTO and see that the burst(s) return to the burst reference mark(s).

11. Set Gain

With the test circle displayed, use a screwdriver to adjust the GAIN CAL fully clockwise and check that the outer circle is outside of the outer (Red and Cyan) graticule targets.

Set the GAIN CAL fully counterclockwise and check that the outer circle is inside of the outer (Red or Cyan) graticule targets.

Set the GAIN CAL so that the outer circle passes through the outer (Red and Cyan) graticule targets.

12. Variable

With the test circle displayed, push the VARIABLE push button and check that the VARIABLE ON indicator lights.

Rotate the VARIABLE control fully clockwise and check that the display increases in size.

Rotate the VARIABLE control fully counterclockwise and check that the outer circle is inside the outer (Red and Cyan) targets.

Push the VARIABLE push button and check that the test circle is on the outer targets and that the front-panel VARIABLE ON indicator is off.

13. Check the Rotation of the Display

Variations in the earth's magnetic field may make adjustment of the ROTATE control necessary at installation time or whenever the instrument is moved.

Connect the audio signal, through the XY INPUT connector on the rear panel, to the +X input (pin3). Set the 1720SCH-Series MODE to XY. Set up the audio signal amplitude for a horizontal trace that is long enough to reach across the graticule compass rose.

Check that the sweep is a straight line parallel to the horizontal axis. If not, adjust the ROTATE adjustment until the sweep is parallel to the horizontal axis.

14. Check XY Mode

Connect the audio signal to both pins3 and 7 of the rear-panel XY INPUT. Set the 1720SCH-Series MODE to XY. Adjust the audio signal amplitude to place the diagonal trace on the 45° graticule line. Adjust audio signal amplitude so that the ends of the trace fall on the target (+) marks.

15. Check Dual Mode

Select INPUTA. With the color bar composite video signal connected to the CH-A INPUT and the audio signal connected to the XY INPUT (pins 3 and 7) push and hold the MODE push button until both VECT and XY are lit. Check for a display of both vectors and the XY lissajous.

Measurement Applications

The 1720SCH-Series is unique in that it is a vectorscope capable of making both chrominance and XY measurements. The information that follows is intended to guide both new and experienced users through simple and complex measurement techniques. The information is divided by major topics, which are then subdivided into specific measurements.

Color Measurements

In color television, the visual sensation of color is described in terms of three qualities: luminance, hue, and saturation.

Luminance. Luminance is brightness as perceived by the eye. As the eye is most sensitive to green and least to blue light of equal energy, green is a bright color and blue is a dark color as conveyed by the luminance signal to monochrome TV receivers.

Chrominance. Chrominance is measured in terms of hue and amplitude. Hue is the attribute of color perception that determines whether the color is red, blue, green, etc. White, black, and gray are not considered hues. Hue is presented on the vectorscope CRT as a phase angle and not in terms of wavelength. For example, red, having a wavelength of 610 millimicrons, is indicated as 104° on the standard color phase vector diagram when the burst is at 180° for NTSC or 135° for PAL. The standard color phase vector diagram is shown in Figure 2–11 for NTSC and Figure 2–12 for PAL.

Figure 2–11: NTSC standard color phase Vector diagram

Figure 2–12: PAL standard color phase Vector diagram

Saturation is the degree to which a color (or hue) is diluted by white light in order to distinguish between vivid and weak shades of the same hue. For example, vivid red is highly saturated and pastel red has little saturation. Because saturation is a product of both luminance and chrominance amplitudes, and a vectorscope can only measure chrominance amplitude, the radial distance from the center to the end of the color vector is chrominance amplitude. If burst vector amplitude corresponds to the 75% amplitude marking (see Figure 2–13 for

NTSC and Figure 2–14 for PAL), the colors represented by the vectors when they are within the targets are of 75% amplitude.

Figure 2–13: 1720SCH 75% amplitude burst targets

Figure 2–14: 1721SCH 75% amplitude burst targets

If burst vector amplitude corresponds to the 100% marking and the chrominance vectors are within the target, the color amplitude is 100%.

Encoding. The hue and color amplitude information in the color television system is carried on a single subcarrier frequency: 3.579545 MHz for NTSC and 4.43361875 MHz for PAL. These signals, in modulated subcarrier form, are called chrominance. The hue information is carried by the subcarrier phase; the color amplitude information is carried by means of amplitude modulation with the subcarrier suppressed. A subcarrier which supplies phase information is

required for demodulation. No picture chrominance signals are present during the horizontal blanking interval and a sample of the subcarrier, used by decoders for a reference (called burst), is provided within this interval.

Decoding. To recover the hue information, phase demodulators are employed in the vectorscope. The phase reference is the color subcarrier, which is regenerated by an oscillator in the instrument. The oscillator is locked in both phase and frequency to the incoming color burst signal. The vectorscope displays the relative phase and amplitude of the chrominance signal on polar coordinates. To identify these coordinates, the vector graticule (see Figure 2–13 for NTSC and Figure 2–14 for PAL) has points that correspond to the proper phase and amplitude of the three primary colors and their complements, which are related to the 180° burst vector for NTSC and the 135° burst vector for PAL. The coordinates for the primary colors (red, blue, and green) and their complements (cyan, yellow, and magenta), when the burst vector is at 225° for PAL, are identified with lower case abbreviations.

Any errors in the color encoding, video tape recording, or transmission processes which change these phase or amplitude relationships causes color errors on the television receiver picture. The polar-coordinate display, such as that obtained on the 1720SCH-Series, has proven to be the best method for portraying these errors.

SCH Phase. The relationship of the color subcarrier to the horizontal or line sync is referred to as SCH phase; the relationship of both horizontal (line) sync and subcarrier to the vertical or field sync is referred to as color framing. Color frame errors can be caused by either a horizontal shift, when syncs are out of alignment (blanking width error) or by a 180° burst phase error (hue error). The absolute SCH mode (with internal reference selected) is used for detecting color frame errors.

Functional Use Of The Vector Graticule

Measurement of Color Bars

The polar display permits measurements of hue in terms of the relative phase of the chrominance signal with respect to the color burst. Relative amplitude of chrominance to burst is expressed in terms of the displacement from center (radial dimension of amplitude) towards the color point which corresponds to 75% (or 100%) amplitude for the color being measured.

On the 1720SCH-Series graticule, each chrominance vector terminates in a system of graticule targets in the form of two boxes (a small box inside a large box). See Figure 2–15. The dimensions of the large boxes represent ±10° centered on the exact chrominance phase, and ±20% of chrominance amplitude

centered around 100% of standard amplitude. The dimensions of the smaller boxes represent ±2.5° and ±2.5 IRE.

Figure 2–15: Fine detail of the 1720SCH and 1721SCH magenta targets

On the 1721SCH graticule, each chrominance vector related to the +V burst terminates in targets that are in the shape of two boxes (a small box inside a large box). See Figure 2–15. The large box represents ±10° centered on the exact chrominance phase and ±20% of chrominance amplitude centered around 100% standard amplitude. The dimensions of the inner target represent ±3° and ±5% of chrominance amplitude; the vectors associated with the –V burst terminate in the smaller targets.

On the 1720SCH, the small marks at intervals along the I and Q axes denote the amplitudes of the chrominance components (see Figure 2–16). On the 1721SCH, the small marks at intervals along the U and V axes denote the amplitudes of the U and V chrominance components (see Figure 2–17).

Figure 2–16: 1721SCH U and V axis amplitudes vs. color vector target relationships

Figure 2–17: 1720SCH I and Q axis amplitudes vs. color vector target relationships

The horizontal and vertical axes of the vector graticule contain markings for checking Vector Mode bandwidth. A subcarrier frequency sine wave whose amplitude places it on the outer compass rose is used as a reference. When the frequency is changed the diameter of the circle should reduce. At a point equal to 70% of full amplitude (3 dB), there are gaps in the horizontal and vertical axes.

This calibration aid makes it possible to check the –3 dB points of the demodulator output amplifiers.

Differential Gain and Phase Measurements

The two major distortions that affect the signal are differential gain and differential phase. They are chrominance non-linearities caused by luminance amplitude variations. Both can be measured on the vectorscope. Differential gain is a change in color subcarrier amplitude due to a change in the luminance signal while the hue of the original signal is held constant. In the reproduced picture, saturation will be distorted in the areas between the light and dark portions of the scene. Differential phase is a phase change of the chrominance signal, caused by a change in the luminance signal, while the original chrominance signal amplitude is held constant. In the reproduced picture, the hue will vary with the scene brightness. Differential gain and differential phase may occur separately or together.

Differential gain (dG) and differential phase (d) measurements can be made using the graticule markings located at the outer edge of the B-Y axis (1720SCH) or –U axis (1721SCH). See Figure 2–18 for a differential gain measurement illustration and Figure 2–19 for a differential phase measurement illustration.

Figure 2–18: Approximately 10° differential Phase (dP) displayed on a 1720SCH

Figure 2–19: Approximately 10% differential Gain (dG) displayed on a 1721SCH

High Resolution Differential Phase Measurement. The DEMOD OUT from the 1720SCH-Series can be used to drive one of the inputs to a 1730-Series Waveform Monitor for improved measurement resolution. This measurement requires a modulated ramp or staircase signal with the 1720SCH-Series gain normalized so the chrominance amplitude is on the compass rose.

The 1730-Series must have the DC REST OFF and the VERTICAL GAIN at X5. Once these conditions are set up, using 1LINE SWEEP makes each major vertical division of the 1730-Series graticule equal to 2°, when referenced to the sweep origin.

X Y Measurements

Any oscilloscope, including vectorscopes that have identical X and Y amplifiers, can be used to make accurate stereo audio phase measurements. When identical signals of equal amplitude are input, the resultant display will be a lissajous pattern, whose opening is relative to the phase error between the signals. If there is no phase error between signals, the display will be a diagonal line, at a 45° angle. When the signals are not equal in phase, the pattern will have its axis on the diagonal but be displayed as an ellipse. As long as the amplitude of the signals remains the same, the amount of opening in the ellipse (up to 90°) is a relative measure of the phase difference. At 90° the display is a circle; errors greater than 90° cause the axis to rotate by 90°.

Making Stereo Audio Phase Measurements

The graticule for the 1720SCH-Series has scales for measurement of stereo audio phase. The dashed diagonal line is the measurement axis for errors less than 90°, it is terminated in amplitude targets that correspond to the length of X and Y

axes. The boxes, surrounding the cross hairs, are equal to amplitude errors of 1/2 and 1 dB, respectively.

The upper half of the Y axis has markings, in 10° increments, for measurement of the elliptical waveform that occurs when there is a phase error. Both the X and Y axes have –3 dB markings making it easy to check the bandpass of the amplifiers. The 3 dB points are minor breaks in the line about 30% of the distance from the graticule circle to the graticule center.

In order to make this type of measurement it is essential that the input signal amplitudes be equalized. This is easily accomplished by applying only one signal at a time and adjusting its gain to correspond to the appropriate axis (horizontal to the X axis and vertical to the Y axis).

Once both signal gains are normalized they can be displayed in the XY Mode and the relative stereo phase measured.

Looking at Incidental Carrier Phase Modulation

The high gain X and Y inputs of the 1720SCH-Series can be used to look at ICPM (Incidental Carrier Phase Modulation). ICPM is a change in carrier phase with a signal level change. It will show up as apparent differences between measurements made in synchronous and envelope detection modes. On home receivers, with envelope detectors, the picture will be unaffected if the visual transmitter has been adjusted using envelope detection when there is appreciable ICPM. However, ICPM can show up in the home receivers audio as inter-carrier buzz.

ICPM can be looked at by applying the Video and Quadrature Outputs from a demodulator to the 1720SCH-Series X and Y Inputs. The Quadrature Output drives the high gain X Input and the Video Output drives the high gain Y Input. The resulting display will be vertical when ICPM is minimum, and tilted when ICPM is present.

***NOTE**. This is not a definitive measurement, but does provide a way of determining if ICPM is present in the signal.*

WARNING

The following servicing instructions are for use only by qualified personnel. To avoid injury, do not perform any servicing other than that stated in the operating instructions unless you are qualified to do so. Refer to all Safety Summaries before performing any service.

Service Safety Summary

Only qualified personnel should perform service procedures. Read this *Service Safety Summary* and the *General Safety Summary* before performing any service procedures.

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

Disconnect Power. To avoid electric shock, switch off the instrument power, then disconnect the power cord from the mains power.

Use Care When Servicing With Power On. Dangerous voltages or currents may exist in this product. Disconnect power, remove battery (if applicable), and disconnect test leads before removing protective panels, soldering, or replacing components.

To avoid electric shock, do not touch exposed connections.

Installation

Installation

Packaging

The shipping carton and pads provide protection for the instrument during transit, and should be retained in case subsequent shipment becomes necessary. Refer to Section 6 for packaging instructions.

Electrical Installation

Power Source

This instrument is designed to operate from a single-phase power source with one current-carrying conductor at or near earth-ground (the neutral conductor). Only the Line conductor is fused for over-current protection. Systems that have both current-carrying conductors live with respect to ground (such as phase-to-phase in multiphase systems) are not recommended as power sources.

Mains Frequency and Voltage Ranges

All members of the 1700-Series instrument line operate over a frequency range of 48 to 66 Hz, at any mains voltage between 90 VAC and 250 VAC. These newer versions of the 1700-Series instruments *do not* require any internal changes to select their operating voltage range.

Operating Options

The 1720SCH-Series provides operating flexibility through internal jumper selections. Table 3–1 describes the choices, and indicates the factory preset conditions. If any of these jumpers are placed in the optional position, be sure that all personnel are aware of the changes. See Figure 3–1 for location of the internal plug jumpers.

Figure 3–1: Plug jumper locations

Table 3–1: Internal Jumper Selection

Jumper	Name	Position	Function
A3J1	Sound In Sync	1–2†	Normal
		2–3	Sound In Sync
A3J3	Operating Standard	1–2*	NTSC
		2–3*	PAL
A3J5	Operating Standard	1–2*	NTSC
		2–3*	PAL
A3J6	Y Input High Gain	1–2	Single-ended high gain mode
		2–3†	Balanced 600 Ω Input
A3J7	X Input High Gain	1–2	Single-ended high gain mode
		2–3†	Balanced 600 Ω Input
A3J8	Center Dot Blanking	No Jumper †	Normal Blanking
		Jumper Installed	Blanking Disabled
A3J14	CW Subcarrier	1–2 †	Normal (SCH Board Installed)
		2–3	CW Subcarrier (Only if SCH board not Installed)
A3J17	EXT SYNC REF	1–2	Switched Ref (Only if SCH Board not Installed)
		2–3†	CH A Input (SCH Board Installed)
A3A1J100	Light Enable	1–2†	Lights Enabled
		2–3	Lights Disabled
A4J4	Operating Standard	1–2*	PAL
		2–3*	NTSC

† **Factory Preset Condition**

* **1720 is factory set to NTSC**
1721 is factory set to PAL

X Y INPUT Connector

The rear-panel XY INPUT connector is a 15-pin, sub-miniature, D-type connector that provides input to the horizontal and vertical (X and Y) amplifiers. They are balanced (differential), DC-coupled, high impedance (>20 k), un-terminated inputs provided for audio applications. If AC coupling is desired, external capacitors are required. These inputs are factory calibrated for 0 dBm in 600 but can be adjusted for any 600 system between 0 and 12 dBm. See Figure 3–2.

0 dBm is equal to 1 mW or 2.19 V peak-to-peak in 600.
12 dBm is equal to 15.8 mW or 8.72 V peak-to-peak in 600.

Figure 3–2: REMOTE connector (XY Input)

Inputs can be driven single-ended by driving either the + or – X and Y inputs with the opposite polarity inputs grounded.

In addition, a single-ended, high-gain mode is available for other (primarily non-audio) applications. The high-gain mode is accessed by installing plug jumpers on A3J6 and A3J7, applying the signal to the +X and +Y inputs, and grounding the –X and –Y inputs.

AUXILIARY Connector

The rear-panel AUXILIARY connector is a 9-pin, D-type connector. It is used to control the display from a companion 1730-Series Waveform Monitor. Line and Field selection information is provided to the Vectorscope over the bus that is contained in this interface. Table 3–2 and Figure 3–3 show the AUXILIARY connector pin assignments

Table 3–2: AUXILIARY Connector Pin Assignments

Pin #	Use
2, 6	No Connection
1, 3, 4, 5	Ground
7	External Strobe In for Line Select Blanking
8	RXD (Receive Data) 1730-Series communication to the Vectorscope
9	TXD (Transmit Data)Vectorscope communication to 1730 Series

Figure 3–3: AUXILIARY connector

Mechanical Installation

Cabinet Options

All qualification testing for the 1720SCH-Series was performed with a 1700F00 cabinet installed. See Figure 3–4. To guarantee compliance with specifications, the instrument must be operated in a cabinet. The portable cabinet, 1700F02, has a handle, four feet, a flip-up stand, and has different hole sizes and spacing than the 1700F00. See Figure 3–5.

***NOTE**. Cabinet drawings are provided for installation information only, and are not to scale. All dimensions are in inches.*

Figure 3–4: 1700F00 Plain Cabinet

All of the 1700Series metal cabinets, available from Tektronix as Optional Accessories, provide the proper electrical environment for the instrument, supply

adequate shielding, minimize handling damage, and reduce dust accumulation within the instrument.

Figure 3–5: 1700F02 Portable Cabinet

Cabinetizing

WARNING. *Do not attempt to carry a cabinetized instrument without installing the mounting screws. There is nothing to hold the instrument in the cabinet if it is tipped forward.*

The instrument is secured to the cabinet by two 6–32 Pozidrive® screws, located in the upper corners of the rear-panel. See Figure 3–6.

Figure 3–6: Cabinet securing screws

Rack Mounting

The optional 1700F05 Side-by-Side Rack Adapter, shown in Figure 3–7, includes two attached cabinets, and can be used to mount the 1720SCH-Series in a standard 19-inch rack with another half-rack-sized instrument.

Figure 3–7: 1700F05 Rack Adaptor

The rack adapter is adjustable, so the 1720SCH-Series can be more closely aligned with other equipment in the rack.

When only one side of a 1700F05 dual rack adapter is used, the 1700F06 blank panel can be installed in the other half to improve appearance and protect air flow. An alternate to the blank panel is the 1700F07 utility drawer, shown in Figure 3–8. This drawer provides over 1/3 cubic foot of storage for accessories. The drawer kit includes a tray, which is permanently mounted to the 1700F05. The drawer opens and closes readily, unless latched for transport. The drawer can also be removed from the drawer tray by lifting up and out. The rack adapter, blank panel, and utility drawer are available through your local Tektronix field office or representative.

Figure 3–8: 1720SCH-Series and 1700F07 utility drawer

Custom Installation

For applications such as consoles, shown in Figure 3–8, the instrument can be mounted with front molding flush or protruding from the console. In both cases, allow approximately 3inches of rear clearance for BNC and power-cord connections. To mount the 1720SCH-Series safely, attach it to a shelf strong enough to hold its weight, using the four 0.156-inch diameter holes in the bottom of the 1700F00 cabinet.

Figure 3–9: Custom installation

Theory of Operation

Theory of Operation

This section is divided into three parts: a product overview, a block diagram description, and detailed circuit descriptions.

Overview

Refer to Figure 4–1, a simplified block diagram, while reading this general introduction to the 1720SCH-Series.

Figure 4–1: Simple block diagram of a 1720SCH-Series Vectorscope

This special-purpose oscilloscope is designed to display the variations of phase and SCH phase relationship in the NTSC or PAL color television signal. Color signals, input through the rear-panel bridging loop-through connectors, are displayed on the CRT in a Cartesian plot. An added feature makes it possible to compare two-channel audio signals. Audio signals are brought in through the rear-panel XY input connector for an XY display of phases used for stereo encoding of the audio signal.

The graphic SCH display can be set for absolute or relative measurements through the reference switch.

Front-panel mode switching is accomplished by push-button switches whose status is constantly polled by a microprocessor. The microprocessor controls gains and switching functions to make specific measurements.

The composite video signal from the CH-A or CH-B input is first separated into its chrominance and luminance components. The luminance component is used to generate the clamp signals used in the display of the chrominance information and for synchronizing vectorscope operation. The gain of the chrominance signal is adjusted before it is sent to the demodulators for quadrature demodulation. The demodulated output is filtered and clamped at H-sync rate by clamped amplifiers. The output amplifiers match signal impedance and drive the CRT deflection plates.

The chrominance signal provides the internal subcarrier sample to the subcarrier regenerator when INT REF is selected. External reference, when selected, is through the rear-panel bridging loop-through input. The regenerated subcarrier can be phase-shifted by up to 360°, using the front-panel PHASE control. For PAL applications, a 180° flip-flop is employed to reverse the phase of every other line so that the +V and –V signals can be overlayed for phase matching applications.

The rear-panel XY input connector provides an input for audio signals, which can be displayed as XY signals for stereo comparisons. Identical amplifiers provide high input impedance and drive the vertical and horizontal output amplifiers.

If there is no signal, the CRT is blanked to prevent it from being damaged by the non-deflected center dot.

Block Diagram

Refer to the two Block Diagrams in Section 9 while reading this description.

Video Input

Video signals are input through identical input amplifiers to normalize gain and provide impedance matching. An external reference can be used for both

luminance- and chrominance- related functions. If composite video or black burst is used as the external reference, no additional processing is required.

Luminance Processing

The sync signals used by the vectorscope are contained in the luminance information from the video inputs. The composite video signal (through the luminance amplifier) drives a sync separator, whose output drives a Bowes oscillator to regenerate H sync. The H sync generates the sample pulses and clamp signals that activate the burst switches and provide the line-rate control signal for the V-axis switcher.

Microprocessor

The Microprocessor polls the front panel to determine changes in status. Current status is stored in Non-volatile Random Access Memory (NOVRAM), which makes it possible to return to the same front-panel condition should power be interrupted. If the 1720SCH-Series vectorscope is being used as an auxiliary instrument to a 1730-Series waveform monitor, any stored vectorscope front-panel setup data is also in the NOVRAM. Based on the front-panel conditions, the Microcontroller generates controlling signals that are used throughout the vectorscope. The front-panel indicators are driven by the Microcontroller so that they will mirror the current measurement criteria.

Gain Cell

The Gain Cell uses front-panel VAR GAIN and GAIN CAL settings and switching signals from the Microcontroller to adjust the chrominance gain prior to demodulation. Gain Cell chrominance is clamped to ground at sync tip time for a stable reference level.

Chrominance Processing

Chrominance from the incoming video signal, either internal or from the External Reference, is conditioned by the Chrominance Amplifier and applied to the Phase Detector at burst time (Burst Gate signal). The chrominance input to the Lock Detector is delayed by 90°. The chrominance signal is compared to the regenerated subcarrier from the VCXO with the output low-pass filtered and buffered. The Phase Detector is clamped and supplied to the Error Amplifier, which provides an output voltage to correct the VCXO should it be off frequency.

The output of the Lock Detector compares the burst chrominance to 90° phase-shifted subcarrier, with the output low-pass filtered and buffered. The resulting signal is a pulse, when burst is present, that clamps the Phase Detector output. It is also checked for phase lock and, if unlocked, an output is supplied to the Error Amplifier to increase its bandwidth for a faster locking. When the TEST (Cal Mode) is enabled, the Error Amplifier is forced into an unlocked state to provide the test circles.

The regenerated and quadrature phase delayed subcarrier from the VCXO can be phase shifted up to 360° by a digital phase shifter (front-panel PHASE control) whose output is buffered prior to input to the Demodulators.

Sampled output from the R-Y and B-Y and H sync are checked for coincidence, outputting an “In Window” signal, which is fed back to the Microcontroller to establish when burst is correctly placed.

The V-Axis Switcher controls the PAL F_{SC} signal to the carrier input of the R-Y demodulator to ensure the correct phase on alternate lines. When +V display, in PAL, is selected the switcher clamps one R-Y demodulator input to ground to disable alternate line switching of subcarrier.

Demodulators

The 1720SCH-Series employs quadrature demodulation, which consists of delaying the regenerated subcarrier by 90° to the R-Y (U) Demodulator. For PAL signals, an additional 180° phase shift is achieved by switching the regenerated subcarrier to the –input of the demodulator. The incoming chrominance is compared to the regenerated subcarrier and the output is low-pass filtered and amplified. Center Dot clamping is used to keep the effects of chrominance from distorting the display center dot.

Output Amplifiers

The Vertical and Horizontal Deflection Amplifiers do double duty. They are used to output both the vector display and the XY display. The input of the amplifiers is checked for the presence of a signal over a certain amplitude, and the resulting output is one input to the CRT Blanking circuit. X and Y signals are input through balanced amplifiers, that can be converted to single-ended high gain inputs. Input switching is controlled by the Microcontroller and front-panel switching.

CRT Blanking

CRT blanking takes inputs from the front-panel INTENSity control, the Microcontroller, and the Center Dot Comparators to generate the blanking signal. In addition, in the Auxiliary mode of operation, a line select strobe from a companion 1730-Series can drive the blanking amplifier to unblank only the line or lines that are selected with the waveform monitor’s line selector.

Circuit Descriptions

The remainder of the Theory Section is divided by diagram number, and further subdivided into logical circuit blocks. Individual diagrams (Section 9) can be opened out and viewed while studying the corresponding descriptions.

Diagram 1 Input Amplifier

The video signal is brought in through high-impedance bridging loop-through inputs. Gain is normalized by input amplifiers before input to the Gain Cell. The amount of amplification provided by the Gain Cell is controlled by the GAIN CAL setting, the VARIABLE GAIN setting, and the choice of 75% or 100% BARS.

The EXT REF input is also a high impedance bridging loop-through, which is DC coupled to a unity gain operational amplifier.

Input Amplifiers. The CH-A and CH-B input buffers are grounded base amplifiers with 15K input resistors. Channel A and Channel B are nearly identical, and only one can be turned on at once. When Channel A is activated, the signal current from Q90 flows through CR43 into the video input amplifier. When Channel B is activated, Q91 is saturated and CR43 is back-biased, allowing no Channel A signal current to flow into the video input amplifier. Variable resistor R459 and variable capacitor C183 serve to match the phases and gains of Channel A and Channel B.

The external reference input amplifier is nearly identical to the channel inputs and provides a signal to the reference switch. R470 is the input resistor and R463 is the feedback resistor, the combination of which sets the gain to 1.

Gain Cell. The Gain Cell, whose output is chrominance, consists of U41, U40, Q65, and Q64. A band-pass filtered (L11 C160) signal is fed into pin 6 of U41. U41 consists of a current source, differential amplifier pair, and a pair of transistors connected as diodes. U40 consists of four transistors connected in a cross-coupled gain cell arrangement with a transistor used as a heater to keep U40 at the same temperature as U41. The diode-connected pair in U41 is a current-to-voltage converter that drives the gain cell transistors in U41. U44 is the operational amplifier that drives the gain port of the Gain Cell. U38, a microprocessor-controlled switch, enables the VARIABLE GAIN, GAIN CAL, and the 75% or 100% BARS settings.

Diagram 2 Subcarrier Regenerator

The signal from the input amplifiers is amplified and fed to the luminance and chrominance amplifiers. The output of the luminance amplifier drives the sync separator, which generates the H sync used throughout the vectorscope, as well as the back porch sample, which enables the phase lock loop.

Sync Separator. The sync separator detects the sync tip, stretches it (by amplifying it), and generates a clean sync signal. The sync separator responds to pulses up to 1MHz, then rolls off; subcarrier and other high-frequency video, or high-frequency noise at the sync level, do not affect the sweep synchronization. The sync separator consists of a two-stage amplifier and a clamp (or DC restorer).

The clamp receives inputs from three sources:

1. The first stage inverting operational amplifier.
2. The second stage inverter.
3. The sweep generators.

The first and second amplifier/inverter stages feed back sync level information to the clamp. The sweep generator input helps to handle abrupt positive changes in sync tip level.

The first stage of the amplifier (Q86 and Q87) inverts the sync signal and clips it near the sync tip. The gain setting resistors, R438 (Ri) and R454 (Rf), guarantee that the amplifier will have high gain for the sync tip portion of the signal, but clip anything that goes slightly above the sync level.

During sync time, the clamp circuit maintains the output of the first amplifier stage at about +5 V, with the output fed back to the clamp circuit to maintain the proper level.

During non sync times (active video), CR39 and CR40 are both on and shunt Q87. This reduces the gain during active video time and limits the saturation of Q87, letting the transistor respond quickly to the next sync excursion.

Q79, an inverting amplifier, is the second inverter/ amplifier stage. It provides negative-going sync, cleans up any remaining noise or video on the signal, and also provides one level to the clamp circuit.

The clamp circuit consists of Q78 and Q77. Q78 and CR35 are a current switch. When the clipping amplifier is at the sync tip, current flows through Q78 to charge C171. However, at the same time, Q79 pulls down on CR37 to provide a discharge path for C171. These two opposing actions result in an equilibrium voltage on C171. At the end of sync time, Q87 saturates, pulling down on CR35 and shutting Q78 off.

If the incoming sync signal has a positive DC level shift at any time, the sync stripper may not switch on the first sync pulse after the shift.

Source Switching. The sync source switching is done by saturated transistors. A set of NPN transistors (Q75 and Q82) are in series. They both turn on at once to pass the external video signal. Q81 is a PNP transistor that is saturated when internal video is selected as the sync source. Q83 drives these switching transistors from a logic signal developed by the microprocessor. C166 and CR35 serve to equalize the delay in both the internal and external paths so that the measured SCH phase does not change between internal and external sync.

Chroma Amp. The reference signal is high-pass coupled through C101 to drive the chroma amplifier, Q37, Q38, and Q30. Luminance is removed and in normal operation, the chrominance is amplified by about three times.

AUTO ZERO. The RY (V Axis) and BY (U Axis) signals are applied to the inputs of a pair of comparators, U33 and U31. A burst sample, derived directly from the subcarrier regenerator burst detector, gates on the comparators. When RY is 0 and BY is a minus level, the burst is in the correct phase.

Sync-tip clamping is used to provide a common reference level. At sync tip, a pulse turns on Q49 and Q55, grounding the AC-coupled RY and BY inputs to the comparators.

U29B and U29C form a window detector that is centered around burst phase. R282 is the Zero Adjustment. In addition to U29B and U29C, U29D goes high when its minus input goes low. When the burst occurs in the correct phase, there will be a positive pulse output to the controller to signify that burst is correctly phased.

2H Lockout. This circuit provides the horizontal timing signal for the rest of the instrument. The 2H lockout is a freerunning emitter coupled oscillator that runs at a slightly lower frequency than line rate. It is triggered by horizontal sync when a signal is present. During the vertical interval, the horizontal sync comes at twice frequency. Every other pulse is locked out by this oscillator during that time so that its output continues to be locked to horizontal sync.

Diagram 3 Demodulator

The demodulator takes the separated chroma signal and the regenerated subcarrier signal, and multiplies them together to get the X and Y signals that drive the vectorscope deflection amps.

Demodulator. At the heart of the demodulator are U36 and U37, which are driven by the chroma signal and regenerated subcarrier. Regenerated subcarrier is phase-shifted by 90° before it is fed to U37. This causes it to demodulate on a 90° axis from U36. In the +V mode in PAL instruments, the 90° phase-shifted signal is fed to either the plus or minus input of the demodulator at a line rate divided by two. This is done by Q62, Q63, and U25A. In the NTSC instruments, the TEST mode of operation causes this to happen. L9, C148, C149, C144, R360, and R361 cause the 90° phase shift of the regenerated subcarrier.

SCH DOT signal. The SCH DOT signal is a subcarrier rate sine wave that gets demodulated by the demodulators into a single dot on the screen. This signal is fed to the inverted signal port of the demodulators. This SCH signal is time-shared with the chroma signal, so only one can be demodulated at any given time. The SCH circuit board does not output the SCH DOT signal when chroma is being displayed, and during the time that SCH is being displayed, the chroma signal is turned off. This is accomplished by turning off Q60 and turning on shunt transistor Q61. This series-shunt switch combo also serves to turn off the chroma signal when the sync tip clamp centers the dot.

Center Dot Clamp Circuits. The center dot is clamped to a voltage determined by variable resistors R293 (VERT POS CAL) and R377 (HORIZ POS CAL). U43 and U32 are sample amplifiers that sample and hold the signal only during the time that current is driven into their pin 5s. During sync-tip time, the signal to

the demodulators is turned off, and the sample amplifiers sample the signal on the output of the demodulators and feed it to the bias ports of the demodulators, which causes the DC level to be readjusted to the proper level. U28B and Q48 and Q54 provide the pulse (SYNC TIP) which drives these sampled amps.

Demodulator Output Filters and Amplifiers. The demodulated signals are filtered to remove any trace of subcarrier signal. This is done with Sallen and Key-type low-pass filters. Q43 and Q45 form a four-pole filter, as do Q44 and Q47.

The low-passed horizontal and vertical signals are then sent to identical amplifiers. Q50, Q52, and Q56 amplify the vertical signal; Q51, Q53, and Q57 amplify the horizontal signal. The rear panel DEMOD OUT signal is an amplified Y signal, driven by U30.

Diagram 4 Burst Demodulator

The burst demodulator circuitry demodulates burst and sends an error signal to the subcarrier oscillator to synchronize it to the burst signal. The combination of these two circuits is referred to as the subcarrier regenerator. The output of the subcarrier oscillator is referred to as the regenerated subcarrier. These two circuits take the burst signal and fill in all the space in between to produce a perfect sine wave.

X and Y Demodulators. The burst demodulator contains two demodulators: the X demod and the Y demod. The X and Y demodulators multiply the burst signal with the subcarrier oscillator signal to create decoded signals which are used to lock subcarrier to burst. The main demodulator (X demod) feeds the error amplifier. The Y demod generates the burst window signal and helps lock the subcarrier signal into the right quadrant. During a difficult troubleshooting session, the Y demod could be disabled and ignored by shorting across R77 and grounding the base of Q12. The correct output signal from the Y demod is a series of positive-going pulses. The correct signal from the X demod is a series of very small amplitude pulses, denoting little phase difference between the burst signal and the subcarrier signal.

In the PAL system, the X demod must switch the subcarrier by 90° every line. It is done here by switching the subcarrier by 45 every other line. Q27 and Q28 perform this function by shunting the unwanted phase to ground every other line. The +45° phase shift is accomplished by C80 and R183. The –45° phase shift is accomplished by R198 and C75. In the NTSC system, only the +45° phase shift is used, and Q27 remains saturated all the time.

The X demod is operational only during BURST GATE. The BURST GATE signal drives pin 5 of the demodulators. When the burst gate signal is false, no current flows in U23. As a consequence, Q17 and Q18 have no current flow, and the demod output, pin 12, is at +5.1 V due to R126. When the BURST GATE signal is true, the differential output of U23 drives Q17 and Q18 with a differential signal riding on bias currents. This differential signal is inverted by

Q18, adding to the signal out of pin 12. The load resistor, R126, then develops the desired output voltage. C52, L3, and C53 are a low-pass filter which reduces the subcarrier signal on the demodulator output.

U22 is a sampled amplifier which passes signals only during burst-sample time. This windowed signal drives the error amplifier, U21.

The error amplifier is compensated for FAST or SLOW AFC by selecting or deselecting feedback components with CMOS switch U20.

The output from the Y demodulator drives the burst sample generator, the lock detector, and the PAL phase initializer.

Burst Sample Generator. The burst sample generator is a voltage comparator built with discrete parts, Q36, Q29, and Q25. It provides an output when the burst envelope from the Y detector is positive. The burst sample generator provides an output to the AUTO ZERO circuit and an output (through Q19) to U22, the sampled amplifier. Q12, CR8, and CR10 allow burst gate to supply the burst sample current before lock is obtained. Once lock is obtained, Q12 saturates, disconnecting the burst gate signal from Q19.

Lock Detector. The lock detector looks at the average value of the Y demodulator output signal. If the average value is zero or negative, the lock detector output is low, denoting an unlocked or improper lock condition. U18 is a low-pass inverting amplifier which drives U14A, a voltage comparator. When the output of U14A is high, it denotes that the loop is properly locked.

PAL Phase Initializer. The PAL phase initializer periodically outputs a short duration pulse to the preset input of U25B when the lock detector detects an unlock condition (PAL instruments only). This prevents the decoder from staying in an improper lock condition, should that occur.

In an improper lock condition, the lock detector would output a 0 V signal at pin 1 of U14A. Q10 would then turn off, allowing pin 6 of U14 to pull high. With pin 6 high, U14B can trigger on the next negative-going burst pulse from the Y demodulator. The output of U14B is a logic level pulse that resets the phase of U25B. Q6 and Q11 prevent the reset pulse from occurring too often by pulling pin 6 of U14B low as soon as the reset pulse occurs. Once this has happened, it takes a while for C19 to discharge, thus keeping pin 6 of U14B low for a little while.

Diagram 5 Phase Shifter

Subcarrier Oscillator. The subcarrier oscillator is a three-transistor circuit. Q14 is the oscillator transistor. Q21 amplifies the signal from Q14, which drives the tank circuit, consisting of L2 and C57. The amplitude of oscillations is stabilized by Q20, which senses the rectified signal from CR15, and feeds a DC voltage applied to the base of Q20. The frequency of oscillations is governed by the DC

voltage applied to varactor diode CR44, which is effectively in series with the quartz crystal resonator, Y2. The DC voltage to CR44 comes from the error amplifier.

Phase Shifter. The phase shifter is two multipliers, U24 and U27, whose outputs are summed together. If the phase knob were rotated at a constant velocity, the microprocessor would output a sine wave and a cosine wave control voltage to the phase shifter. Upon stopping, the control voltages would freeze at the last sine and cosine voltages, and the phase would stop rotating on the display. Two other voltages come from the subcarrier oscillator. These are sine and cosine signals at the subcarrier frequency. The two multipliers take these four signals, multiply them together, and the output of the multipliers is the desired shifted phase.

Subcarrier Switching. In the PAL system, when SCH phase is being displayed, the reference signal to the demodulators is switched to a 25 Hz offset subcarrier source, so that the SCH dot will remain in one spot on the screen. The source switching circuit, U19, switches the 25 Hz offset signal into the demodulator when SCH phase is being displayed, and back to the regular phase-shifted source otherwise.

Diagram 6 Deflection Amplifier

External X and Y signals are input through the rear-panel sub-miniature D-type XY INPUT connector. Output switching selects either the R-Y (V) and B-Y (U) or XY for amplification and display by the horizontal and vertical deflection amplifiers. Driving signals for the deflection amplifiers are also input, as active driving signals for the center dot comparators, to provide blanking when the CRT beam is not deflected away from center screen.

CRT blanking signals from line select and the microcontroller are combined with the vectorscope H rate sync to provide the blanking signal to the grid circuit.

XY Input Amps. U9 is a quad operational amplifier. U9A and B are balanced differential input amplifiers, intended for audio use. In a 600 system, R41 and R31 can be adjusted to normalize signals from 0 dBm to +12 dBm (2 V p-to-p to 9 V p-to-p). The input impedance is greater than 20k to ground.

P6 and P7 can be installed on J6 and J7 to increase the gain through the plus inputs of the X and Y amplifiers. These inputs are provided for special non-audio applications where a higher gain may be needed.

U9D and C drive the X and Y deflection amplifiers through a microcontroller enabled switch, U35. A small amount of Y signal is fed through R33 to the horizontal deflection amplifier for the orthogonality adjustment.

Deflection Amplifiers. The vertical deflection amplifier consists of Q69 and Q66 (a differential pair). Positioning current is input through Q66 with the signal current input through Q69. Q70 and Q67 are grounded base amplifiers that speed up the amplifiers by minimizing the Miller capacitance on Q69 and Q66. CR33, CR30, CR28, and CR26 prevent Q70 and Q67 from saturating when the amplifier is over-driven by large signals. Q68 and Q71 are the current source for the differential pair. The horizontal deflection amplifier is virtually identical in operation to the vertical deflection amplifier.

The Orthogonality Control, R388, feeds Y signals into the minus input of the horizontal deflection amplifier. Both the vector and XY circuits feed +2% Y signals into the X signal, for use in orthogonality compensation. Adjusting the orthogonality control cancels out some or all of the Y signal in the X amplifier. The effect of this control is to change the deflection angle between the X and Y axis to compensate for CRT geometry.

Center Dot Comparators. U34 is a quad comparator with open collector outputs that are tied together. When both the X and Y signals are close to 0 V (no signal with only a center dot), the output of all the comparators is high.

CRT Blanking. Blanking is mostly controlled by U17, a factory-programmable part. This part receives inputs from the microprocessor, the SCH circuit board, the rear-panel 1730-Series line strobe input for line select operation, NO_SIG from the center dot comparators, H pulse from the 2H lockout circuit, and BLANK_EN from the blanking disable jumper. U17 processes all of the signals on these lines to produce blanking. When the SCH dot is being displayed, the SCH circuit board sends a blanking signal to U17 to blank transitions between displaying the dot and displaying vectors. This blanking input also blanks the wrong dot so that only one dot is displayed when EXT REF is selected.

U17 also switches sync sources 1 or 2 to the 2H lockout circuit, depending on whether the SCH circuit board is installed or not.

Q4 amplifies the strobe pulse from the 1730-Series (input through the rear panel). Q9 and CR7 rectify and amplify the strobe pulse from the 1730-Series and create a logic level signal that is low for line select operation and high for normal operation. This signal is used in the microprocessor and in the focus circuitry.

Diagram 7 Microcontroller

Operation of the 1720SCH-Series is controlled by the microprocessor. It controls switching operation by polling the front-panel switches, or in response to stored/recalled front-panel configurations (Auxiliary Input from a companion 1730-Series).

Output of the optical encoder (PHASE) is decoded, and an 8-bit word, corresponding to the control position, is output to the data bus. A dual digital-to-ana-

log converter decodes 12 bit words from the processor and outputs two DC levels to drive the phase shifter.

In addition, the microprocessor drives the front-panel indicator light-emitting diodes through a light driver.

A Non-Volatile Random Access Memory (NOVRAM) retains the current operating state in the event of power interruption, including operator power down.

Microprocessor. The 1720SCH-Series is controlled by a microprocessor, U2, an 8-bit microcontroller, which contains its own masked ROM. Pins32 through 39 of U2 (AD0-AD7) is a multiplexed address and data bus. U11 de-multiplexes the lower address bus for program code retrieval. U2 controls switching in response to front-panel keyboard action. Front-panel switches are ground closures that are matrixed and polled by Port 1 of U2 (Columns 0–2 and Rows 0–2).

In addition, a serial bus structure is input to U2 through pin10 (RXD) and output through pin 11 (TXD). This is the Auxiliary bus for operation with a companion 1730-Series.

The front-panel LEDs are driven through U10 and U7. The front-panel LEDs light when the light driver outputs are low. Switching control lines are output through U13.

U3 is the NOVRAM used to retain the current front-panel status and the front-panel status for the Stored Recalls (Auxiliary). Data is written in and read out through pins 3 and 4; pin 1 of U2 (Col 0) controls data in and out. Pin 2 of U2 (Col 1) provides the serial clock. Pin 14 (NOVCE) is the chip enable. These three lines (Clock, Read/Write, and Chip Enable) are active when:

1. Power is turned on.
2. Any front-panel switch is pressed.
3. In Auxiliary, when a Store or Recall is requested from the companion 1730-Series.

U4 is the power down detection circuit. It detects the loss of instrument power in time for the NOVRAM (U3) to execute a save operation. When the +5 V supply drops a few hundred millivolts, pin 7 is pulled low, which causes U3 to Store its current status. The front-panel and AUXILIARY (Store/Recall) data is saved in a matter of milliseconds when the power starts to drop below safe operating levels for the NOVRAM. U6 is a three-terminal regulator operating from the +15 V supply that comes onto the circuit board from the Power Supply circuit board. As soon as the +15 V raises enough to provide a +5 V output from U6, U3 recalls the data saved so that it will be available to the microprocessor when all supplies are up to their operating tolerances.

Diagram 8
50% Detector & Blanking

Line Pulses Generator. The line rate pulse generator creates delayed line-rate pulses from SYNC1. It consists of a 2 MHz oscillator and a divide-by-128 counter connected in a phase-locked loop that locks to SYNC1. The SYNC1 signal is composite sync, generated from the signal source being displayed.

U17B turns LOCAL SYNC into a square wave signal to drive the phase detector, consisting of U26 and Q42. The current waveform into pin 5 of U26 is a 2 µs long pulse that coincides with the leading edge of sync when the phase-locked loop is locked. The voltage output of U26 is filtered by the loop filter consisting of C106, C108, and R216. This voltage is buffered by U22A, and used as the frequency control voltage to the 2 MHz oscillator, consisting of several sections of U28 and associated parts. Q40, CR30, and C112 control the frequency of the 2 MHz oscillator. CR30 conducts only during part of each cycle of oscillation. The duration of that conduction affects the length of time per cycle that C112 conducts resonant current, thus affecting the frequency of oscillation. The current in Q40 changes the conduction time in CR30, which changes the frequency of operation. The current in Q40 depends on the buffered voltage at the output of U22A.

U25 outputs back porch and sync tip pulses to drive Q35 and Q34.

U19, the 50% point comparator, is enabled only 1 µs before and after the leading edge of sync to prevent rogue output pulses. This is accomplished with the 2 µs window pulse at pin 5.

VR1 provides –5.2 volt power to U19.

50% Point Detector. The sync pulse is said to happen when the leading edge crosses the halfway voltage point between the sync tip and back porch level of the sync pulse. This voltage level is referred to as the 50% voltage level.

The 50% point detector creates a fast TTL pulse at the time when the leading edge of sync passes the 50% voltage level. This is done using a fast comparator, U19, with the video signal for one input and the 50% voltage level for the other input. The 50% voltage level is generated by two sample-and-holds, with one sampling the video back porch level and the other sampling the video sync tip level. These two voltages are summed with two identical resistors, R194 and R188, creating the 50% voltage level.

Q26 and Q27 form a clipped video amplifier which specifically amplifies the sync portion of the video signal to a more usable amplitude level. Q30 and CR19 limit the amplifier's negative excursions to about –2 volts. R168 and R167 couple the amplifier's output to the 50% point comparator, U19. C80 prevents high frequency noise from disturbing the 50% point comparator.

The sample-and-hold FETs, Q33 and Q32, only conduct when their gate pulses are driven positive. L5 and C94 form a resonant trap to remove the back porch color burst from the back porch sample-and-hold transistor. C92 and C93 store

the sync tip and back porch levels from Q33 and Q32. Buffer amplifiers U22C and U22D have outputs at sync tip and back porch levels, respectively.

R196 and R189 sum the sync tip and back porch levels, creating a 50% level which is used to center the video amplifier's operating point around zero volts. R194 and R188 also sum the sync tip and back porch levels, creating a 50% voltage level. This level is fed to pin 3 of the voltage comparator, U19. The output of U19 is the fast 50% point edge corresponding to the time when sync really happened.

Diagram 9 Reference Sync

Low-Pass Filter and Reference Sync Stripper. Q8 restores the inverted video signal to its non-inverted state. Q6 and Q7 are configured as a low-pass filter to drive a sync separator, U3. The sync separator outputs two signals, COMP SYNC and BURST GATE. BURST GATE is a logic level signal that straddles subcarrier burst time and drives the sync phase detector. COMP SYNC is output at pin 5.

Sync Locked Oscillator. The sync-locked oscillator varies slightly from normal subcarrier frequency due to the PAL and NTSC color system sync-to-subcarrier relationships. U2 is an ECL gate oscillator, with Y1 as the frequency determining device. CR2 tunes the crystal slightly via the control voltage from the phase detector and loop filter. The loop filter consists of C21, C15, and R19. The phase detector is made up of a current mirror pair of transistors (Q4 and Q5) and a transistor array (U4). The oscillator signal drives pins 2 and 4 of U4D, while the sync signal drives pins 6 and 9 of U4B.

To adjust reference SCH phase, U1B (with its adjustment, R5) provides the proper amount of delay for the sync signal. U1A adjusts the delayed sync signal to the proper narrowness for phase detector operation.

Sync Phase Detector. The reference sync phase detector compares the phase of a sync-locked oscillator to the phase of the reference chroma signal. The output signal from this circuit is a logic level 1 or 0 which drives the sync dot generator. This signal is used to synchronize the sync dot generator to the external reference, thus eliminating a 180° ambiguity as to where to display the dot.

U5 is a four-quadrant multiplier that detects the phase relationship between reference chroma and the sync-locked oscillator. Q3 only gates the multiplier on during the time when burst should be present. U6 is a voltage comparator which creates a logic level from the outputs of U5, pins 6 and 12. U15A widens the logic level pulse to about 75 μs for use by the sync dot generator.

Diagram 10 Sch Dot Generator

The 50_EDGE signal from the 50% point detector (on Schematic 8) represents the time when sync occurred. The sync dot generator takes this edge and produces SYNC_DOT, which is a subcarrier rate (FSC) signal that goes to the Decoder to be displayed as the sync dot.

4X Oscillator. A 4X FSC Oscillator is locked to sync. It puts out four phases of FSC via U24A and U24B. These four phases are processed by U23, which makes a decision each line about which phase to feed to the phase detector, and which to output as the sync dot signal (OUTDECOD). The combination of high/low provided by J5 and J6 determines in which quadrant the phase dot will occur. Other inputs to U23 are used to determine which phases to process.

Phase Detector. U20A and B buffer and latch the outputs of U23. U18 is a transistor array used as a phase detector, which compares the phase of the 50% edge to the subcarrier signal from U23. U21A and B are also part of the phase detector circuit. The pulse-width from pin6 of U21 is proportional to the phase relationship between the 50% edge and the output of U23. This signal, together with the OUTPHASE output of U23, are the inputs to the phase detector, U18.

The output from the phase detector drives the loop filter and the error amplifier. The loop filter has two switchable time constants. The fast time constant is used when the loop is obtaining lock, and when FAST AFC is selected via the front panel. Otherwise, the slow loop is used. The slow loop is selected when Q36 is turned on, which connects C102 and R209 to ground. The error amplifier, U27B, is an op amp configured to a gain of four. The output of the op amp is a voltage that sets the capacitance on CR32, the frequency adjusting element in the 4X F_{SC} oscillator, Q36. Y3 is a 4X color burst crystal used as the resonant element in the oscillator.

Lock Detector. U27A is the lock detector. When the phase-locked loop is not locked, the voltage at the collector of Q41 tends to rise to a positive value. The lock detector senses when the voltage gets greater than 9V, and switches the loop filter into the fast mode for a length of time set by C115 and R219, just long enough for the loop to lock.

Phase Shifter. Q28 and Q24 change the logic level F_{SC} signal from U23 into a commutating current signal, suitable for filtering, phase shifting, and sending to the display circuitry on the Main board. R154 adjusts the amplitude of this signal, and Q25 shuts the signal off when SCH phase is not being displayed. C77, L4, and C73 filter the square wave current pulses into a sine wave, which is amplified by Q22.

The phase shifter is a circuit used in calibration. It adjusts the phase of the SCH DOT signal that is sent to the display circuitry on the Main board. L3, C74, and R146 shift the phase by 120°, and it is amplified by Q23. The output of R134

has been phase shifted from the input signal by an amount determined by its adjustment position. The extreme ends of the adjustment select either 120° or 0°. Other positions of R134 will select an infinite range of phases between these two extremes. This signal is amplified by Q20 and sent to the display circuitry.

Coarse phase is adjusted with jumpers J5 and J6, which change the phase in 90° increments.

Diagram 11 25 Hz Offset (PAL Only)

25 Hz Offset Loop (PAL instruments only). In the PAL video system, the subcarrier frequency is offset by 25 Hz from an integer relationship to the sync frequency. A subcarrier signal that is phase locked to sync will be offset in frequency from subcarrier by 25 Hz. In order to counteract this, a 25 Hz offset signal is routed into the other input of the decoder during the time that SCH is being displayed. The 25 Hz offset generator produces this signal.

The 25 Hz offset signal is created by phase-locking an oscillator 25 Hz lower in frequency than subcarrier. This is accomplished by mixing the oscillator signal with subcarrier. If it is 25 Hz lower in frequency, then the output of the mixer will be a 25 Hz signal. This signal is then fed to a phase detector, which has another 25 Hz reference signal, derived from vertical sync (vertical sync divided by two equals 25 Hz). The output of the phase detector is a control voltage that causes the 25 Hz offset oscillator to run at the proper frequency.

The 25 Hz oscillator consists of Q10 and Q13, with Q11 as the amplitude control. Y2 is the frequency control element, with CR31 as a fine-tuning element for voltage controlling the oscillator. Q16 is an emitter follower, and Q17 is a saturating switch to shut off the 25 Hz offset signal when the SCH dot is not being displayed.

The mixer is U7 and associated components. Q14 and Q12 form a low-pass filter to pass subcarrier to the mixer. Subcarrier and the 25 Hz offset signal are input to the mixer, and its output on pins 6 and 12 is a 25 Hz sine wave. U8B turns the sine wave into a square wave to drive the phase detector, U10. The other input to the phase detector is a sync-derived 25 Hz signal from the V sync separator.

Vertical Sync Separator. Composite sync is integrated by U9D with the integrating action produced by C47 and R97. The output is a positive-going ramp in the vertical interval with H-rate pulses riding on the top. These H-rate pulses are produced by C48. CR4 and C34 peak detect these pulses. The peak-detected voltage and the vertical interval signal are then compared with U8A, which outputs two narrow pulses in the vertical interval, which drives on shot U11A. The output of U11A is a vertical rate pulse. By ANDing this signal with H clock, through diodes CR8 and CR7, a 25 Hz pulse is produced to drive the other input to the phase detector.

Error Amplifier. The error amp, U9B, gets its signal from the phase detector, through R111. The loop filter consists of C35, C37, and R78. The output of the error amp is modified by the combination of R54, R65, and CR3. This signal is then fed to the 25 Hz oscillator to control its frequency.

Unlock Detector. The unlock detector, U9C, forces the error amp to its negative rail so that the loop can obtain lock. CR5 and CR6 are normally back-biased, and the output of U9C is normally at the negative rail. During an unlock condition, the output of error amp U9B will rise to the positive rail (about +10 volts). When this happens, the output of U9C will be forced to rise to its positive rail as well, which causes the error amp to go to the negative rail. After the error amp goes to the negative rail, the output of the unlock detector, U9C, goes negative, and CR5 disconnects it from the error amp input, completing the sequence. The error amp now starts the loop's lock sequence from the negative rail, which is the only way lock can be obtained. Thus, when an unlock condition exists, the unlock detector causes the error amp to go to the negative rail temporarily.

Slow AFC Defeat. This circuit (Q19, Q18, and associated components) disables the slow AFC function if the sync-locked loop is not locked. The inputs to this circuit are the LOCK signal from the sync-locked loop, and FAST/SLO from the microprocessor.

Diagram 12 Control Circuit & Front Panel

Blanking signals are input to an intensity switching matrix along with a DC voltage level set by the front-panel INTENSity control. Focus level, for the CRT focus anode, is set by regulating the current through a transistor current source. The amount of focus current through the transistor depends on the setting of the front-panel FOCUS control. The effects of small variations in the magnetic field surrounding the instrument are compensated for by an adjustable magnetic field placed around the CRT bulb. Scale Illumination for the CRT face plate is set by controlling the output amplitude of a triangle generator that drives the scale illumination bulbs.

Switches to select operating modes, controls used with the control circuits, and light emitting diodes (LEDs) to relay status to the operator are contained on the front panel circuit board.

Z-Axis Control. U16 is a transistor array with two of the transistors connected as a differential current switch. The static output current (pin 8) is set by the front-panel INTENSity control using Q7 (in the FOCUS control circuit) as a current source. The blanking signal is input to the switch through pin9. When pin 9 goes high the current output (pin8) is shut off and the Z-axis amplifier (Diagram14) blanks the CRT.

Line Select mode requires an external blanking pulse from a 1730-Series waveform monitor, input through the AUXILIARY connector. The intensity

setting must change to brighten up the selected line(s). This is accomplished by increasing the current through the current source (Q7). U15A is an open-collector dual comparator that goes low when the line select blanking occurs, allowing current in R54 to add to the current in Q7, the current source.

Focus Control. The FOCUS control must also control two different display criteria. In the normal mode of operation, the Focus voltage will be selected by the control setting only, and Q13 is off. When a line select unblanking pulse occurs, U15B turns on, and additional current flows through Q13. R94, the LS Focus adjustment, is adjusted for optimum focus in Line Select at the normal display focus setting.

Trace Rotation. TRACE ROTATION is necessary to compensate for changes in the magnetic field surrounding the 1720SCH-Series. Q1 and Q2 are emitter followers that provide the trace rotation current to a coil located inside the CRT shield, around the tube. Current amplitude and polarity are controlled by the front-panel ROTATE screwdriver adjustment.

Graticule Illumination. U1A is a triangle generator whose output is compared to the front-panel SCALE control output level by U1B (a comparator). The output of U1B is a 6.5kHz square wave, the duty cycle of which is controlled by the front-panel SCALE ILLUM control.

U1B drives saturating switch Q3, which applies the square wave to the graticule lights. L1 and C2 serve as a low-pass filter to keep noise off the +15 V supply.

Switches. The eight push-button switches are matrixed for reading by the microcontroller (Diagram 7). When a push-button is closed a connection is made between one column and one row address for the microprocessor. When one of the “hold for function” switches, such as MODE or INPUT, is pressed and held, the microcontroller reacts differently and outputs appropriate instructions to the 1720SCH-Series control circuits.

Controls. Four of the front-panel controls operate between two voltage levels. INTENS voltage levels are set by the Z-axis control and focus control.

The PHASE control, R100, is an optical encoder converting the position of the control into a digital word to be decoded by the microcontroller (Diagram 7) and converted into voltage levels (sine and cosine) for the phase shifter on Diagram 5.

Indicators. The indicators are light emitting diodes (LEDs) operating between +5 V and a latched TTL low in the microcontroller. There are three banks of LEDs. Each bank has a 100 resistor in series with it (R203, R232, and R235).

The microprocessor outputs a TTL low to complete the circuit and light the appropriate LED.

Diagram 13
Low Voltage Power Supply

The Low Voltage Power Supply converts the mains line voltage (90–250 VAC) to supply the power requirements of the instrument. The voltages supplied by the Low Voltage Power Supply are +40 V, ±15 V, and +5 V.

The Low Voltage Power Supply is called a Flyback Switcher. When switcher mosfet Q9 is turned on, its drain voltage drops to approximately 0 V. The current through the 350 μH primary winding of T3 begins ramping up. The voltages present at all secondaries is such that the rectifier diodes are reverse biased. Energy is being stored in the magnetic field of T3. When Q9 turns off, the drain voltage “flies back” in a positive direction. Current now flows in all of the secondary windings and supplies power.

Line Rectifier and Filter. The input line voltage is filtered by the rear-panel connector to reduce the electrical noise conducted into or out of the instrument. R89 limits the initial charging current through the rectifier diodes and C54.

CR21, CR22, CR23, and CR24 form a bridge rectifier. C54 filters the 110 to 350 VDC rectifier output. L4 filters the switching noise produced by the switcher. R102 reduces the circulating current in the parallel circuit consisting of L4 and C44. DS4, R93, and R94 form a line voltage indicator. R91 and R92 charge C42. C42 provides power to U5 until the primary housekeeping winding provides power through CR17.

Pulse Width Modulator.

U5 is a current-mode pulse width modulator (PWM). A current-mode PWM uses two feedback loops. The inner current-feedback loop directly controls the switcher mosfet peak current. The outer voltage-feedback loop programs the inner loop peak current trip point.

U5 pin 2 is the inverting input of an internal op-amp. The non-inverting input is set to 2.5 V by an internal voltage reference. Current from the peak detector flows through R83 and R79. R84 provides a 100 μA offset. The voltage at U5 pin 1 will vary in order to maintain U5 pin 2 at 2.5 V.

The voltage at U5 pin 1 is modified by an internal circuit and sets the trip point of the internal comparator. U5 pin 3 is the external input to the comparator. R88 and C52, connected to U5 pin 4, set the internal oscillator to 80 kHz.

The circuit works as follows: The oscillator resets the latch and U5 pin 6 goes high, turning the switcher mosfet on. The current through the switcher mosfet increases, causing the voltage across R96 to increase. This voltage is divided by R87 and R101, and is applied to the comparator (pin 3). When the voltage at U5 pin 3 reaches the comparator trip point, the latch toggles and the switcher mosfet is turned off. This process is repeated at an 80 kHz rate.

C58 increases the PWM noise immunity by rolling off the internal op-amp frequency response. R82 holds the switcher mosfet off as the circuit is powering up. R81 slows the turn-on of the switcher mosfet while CR27 speeds up the turn off.

Output Filters. The three output windings supply four output voltages. Each output is rectified by a single diode and filtered by an LC pi filter.

Error Amplifier. The Error Amplifier regulates the +5 V output by feeding an error signal to the Pulse Width Modulator. VR1 is a 2.5 V shunt regulator containing an op-amp and a voltage reference. The +5 V is divided by R69 and R70 to provide 2.5 V to VR1. C40 and R71 determine the gain and frequency response of VR1. C64, CR28, and R85 control overshoot of the +5 V at power up. R98 and CR26 provide a minimum operating current for VR1. R68 decouples C39 from VR1.

Feedback Transformer Driver and Peak Detector. The 80 kHz sawtooth waveform at U3 pin 3 trips comparator U3. U3 pin 1 then feeds a trigger pulse to one-shot U4. U4 pin 13 outputs a 300 nS pulse to the 130 mA current source consisting of Q7 and Q8. When Q8 turns on, T2 pin 2 is pulled down until CR15 (Error Amplifier) is forward biased. The negative going pulse at T2 pin 2 is peak detected by CR16 and C46. The DC voltage present at the anode of CR16 feeds the pulse-width modulator and the Output Under-Voltage Shutdown circuit. CR29 resets T2 between pulses.

Output Under-Voltage Shutdown. If the +5 V is below 4.9 V, the Error Amplifier will cause the Peak Detector output to go below 2.9 V. The output of comparator U3B will pull low and shutdown Pulse Width Modulator U5. C47 and R96 delay the operation of U3B long enough for the power supply to power up. If the +5 V does not reach 4.9 V within 50 ms of power up, U3B will shutdown the switcher. The power supply will then cycle on and off every couple of seconds.

Diagram 14 High Voltage Power Supply

The High Voltage Power Supply generates the heater, cathode, control grid, focus anode, and post accelerating potentials required to display the outputs of the Vertical and Horizontal Output Amplifiers.

HV Osc and Error Amp. The High Voltage Power Supply is generated by a sine-wave oscillator and step-up transformer. Q6 and T1 are the principal elements of an Armstrong oscillator running at about 22 kHz. Error Amplifier

U2 regulates the +100 V output and keeps the High Voltage Power Supply constant under varying load conditions by controlling the base current to Q6. The +100 V output is regulated directly, while the High Voltage Power Supply is indirectly regulated through a current feedback circuit.

R48, C16, R60, and R64 form the High Voltage Power Supply current feedback circuit. As the current from the High Voltage Power Supply is increased, the voltage to the + side of the Error Amplifier (U2) increases, which increases the base drive to Q6, the HV Osc. This current feedback compromises the regulation of the +100 V supply to keep the high voltage constant with varying intensities.

C66 and Q10 are a start delay circuit that holds the Error Amplifier output low, through CR30, until C66 is charged. Delaying the start of the high voltage oscillator allows the Low Voltage Power Supply to start, unencumbered by the load from the high voltage oscillator.

Power Supply Outputs. CR4 is the high voltage rectifier. Filter capacitors C3, C4, and C8 work with CR4 to provide –2530 V to the CRT cathode. U1 is a four-times multiplier providing +11 kV to the CRT anode.

Focus Amplifier. Q1 and Q2 form an operational amplifier that sets the voltage at the bottom of the focus divider. The front-panel FOCUS pot determines the voltage at the bottom of the focus divider. The Center Focus control, R11, is set for optimum beam focus, as viewed on the CRT, with the front-panel FOCUS control set to mid range. Once the Center Focus adjustment has been set, adjusting the front-panel FOCUS control changes the voltage at the bottom end of the divider and, consequently, the voltage on the CRT focus anode.

Grid Drive Circuit. The cathode of the CRT is at a –2530 V potential with the grid coupled to the Z-Axis Amplifier by the grid drive circuit. The grid is approximately 75 V negative with respect to the cathode. The 200 V p-p sine wave present at the cathode of CR8 is input to the Grid Drive circuit where it is clipped for use as CRT control grid bias.

The sine wave from the cathode of CR8 is coupled through R47 to a clipping circuit consisting of CR5 and CR6. Clipping level for the positive excursion of the sine wave is set by the CRT Bias adjustment, R58. The negative clipping level is set by the front-panel INTENSITY control through the Z-Axis Amplifier. The clipped sine wave is coupled through C11 to a rectifier made up of CR1 and CR3. The rectified, clipped sine wave is the CRT control grid bias voltage. C9 couples the blanking signal from the Z-Axis Amplifier to the CRT control grid. DS1, and DS2 limit the CRT grid to cathode voltage at instrument turn on or off. DS3 limits the CRT heater to cathode voltage.

Z-Axis Amplifier.

This is an inverting amplifier with negative feedback. R22 is the feedback resistor while R7, R20, and R33 act to maintain the summing junction at +5 V. Without any Z-Axis input current, the amplifier output is approximately +10 V. Negative Z-Axis input current will cause the output to go positive.

Q5 is a current amplifier feeding the output stage. Q3 and Q4 form a push-pull output stage. Q3 acts as a 2.7 mA constant current pull-up, while Q4 is the pull-down transistor. C6 speeds up the amplifier by coupling AC signals to the base of Q3. CR2 and R41 protect the amplifier during CRT arcing.

CRT The pinout for the CRT is shown in Figure 4–2.

Pin	Description
1	Filament (f)
2	Cathode (k)
3	GRID (g1)
4	FOCUS (g3)
5	ASTIG (g4)
6	GEOM (g5)
7	VERT PLATE (y2)
9	VERT PLATE (y1)
11	HORIZ PLATE (x2)
12	1st ANODE (g2)
13	HORIZ PLATE (x1)
14	Filament (f)

Figure 4–2: Pinout of the CRT Socket

Checks and Adjustments

Checks and Adjustments

This section consists of two separate procedures. First is the Performance Check, used to determine compliance with the Performance Requirements in the Specification. Next is the Adjustment Procedure, used to return the instrument to operation within specifications.

In both procedures, controls and connectors on the 1720SCH-Series front panel and rear panel are fully capitalized (e.g., TWOLINE). Control and connector names on test equipment, as well as internal controls and adjustments for the instrument under test, are initial capitalized (e.g., Time/Div).

Limits, tolerances, and waveforms given in this section are guides to adjustments and checks, and are not instrument specifications unless they are listed as Performance Requirements in the Specification (Section 1).

Recommended Equipment List

The following equipment is recommended for use in the Performance Check and Adjustment Procedures for this instrument. If other equipment is substituted, ensure that the accuracy of the substituted equipment does not compromise the results of a particular procedure step.

Electrical Instruments

1. Test Oscilloscope

Vertical Amplifier: 30 MHz Bandwidth, 1 mV Sensitivity.

Time Base: 10 ns/div to 5 ms/div sweep speeds, triggering to 5 MHz.

For example: a TEKTRONIX 7603 oscilloscope with a 7A13 differential comparator (needed for use with the TEKTRONIX return loss bridge), a 7B53A dual time base, and 10X probes, P6106 (Tektronix Part No. 010-6106-03).

2. Television Signal Generator

Color test signals for the television standard of the monitor to be tested: Color Bar signal, Linearity Staircase and Variable APL, and Black Burst signal.

For example: NTSC TEKTRONIX 1410 with Option AA and Option AB (modified SPG2 and TSG7) and TSG3.

PAL TEKTRONIX 1411 with Option AA and Option AB (modified SPG12 and TSG11) and TSG13.

***NOTE**. The 1410 Series generators with standard SPG and TSG modules can be used, but this will not allow all checks and adjustments to be made.*

The 1410 and 1411 Option AA are mainframes with modified SPG2 and 12 Sync Generators with the added features of Variable Subcarrier Frequency (20 Hz, 50 Hz for the 1410; 5 Hz, 10 Hz for the 1411), Variable Burst Amplitude, Variable Sync Amplitude, and SCH Unlock.

The 1410 and 1411 Option AB are mainframes with modified TSG7 and 11 color bar generators that more accurately control output amplitudes of the standard 75% amplitude bars.

The signal generator mainframes can be ordered with one or both options (AA and AB).

The TSG3 and 13 are modulated staircase generators with Variable APL.

3. Television Signal Generator

Capable of providing an SCH reference. Color test signals for the television standard of the monitor to be tested: Color Bar signal, Linearity Staircase and Variable APL, and Black Burst signal.

For example: NTSC TEKTRONIX TSG 170A.

PAL TEKTRONIX TSG 271.

4. Leveled Sine Wave Generator, 50 kHz to 10 MHz

For example: A TEKTRONIX SG503 leveled sine-wave generator installed in a TEKTRONIX TM500-Series power module. Flatness 1%, 250 kHz to 50 MHz. Flatness can be calibrated (a chart made of variations) with the TEKTRONIX peak-to-peak detector (015-0408-00).

5. Audio Signal Generator, 10 Hz to 250 kHz

For example: A TEKTRONIX SG505 Option 02 oscillator installed in a TEKTRONIX TM500-Series power module.

6. Function Generator, –10 V pulse at 1 kHz

For example: A TEKTRONIX FG501A function generator installed in a TEKTRONIX TM500-Series power supply module.

7. Voltmeter, 0 to >100 VDC; accuracy, 0.1%

For example: A TEKTRONIX DM501A in a TM500-Series power module.

8. Power Module (required for Items 4, 5, 6 and 7)

For powering and housing TEKTRONIX SG503, SG505 Option 02, FG501A, and DM501A.

For example: A TEKTRONIX TM506 power module.

9. Variable Autotransformer

For example: General Radio metered auto transformer W10MT3W. If 220 Volt operation must be checked, a conversion transformer or appropriate 220 V autotransformer is needed.

Auxiliary Equipment

10. Step Attenuator

75 Ω constant impedance attenuator variable from 0 to 40 dB in 1-dB steps.

For example: A Wavetek 75803 step attenuator.

11. Return Loss Bridge

Range, at least 46 dB return loss sensitivity, 50 kHz to 6 MHz.

For example: Tektronix Part No. 015-0149-00.

12. 75 Ω Terminators (three required; two should be feed-through types)

For example: 75 Ω end-line terminator, Tektronix Part No. 011-0102-00.
75 Ω feed-through terminator, Tektronix Part No. 011-0103-02.

13. 75 Ω Coaxial Cable

For example: 42inch RG59U (Tektronix Part No. 012-0159-00).

14. 10X, 75 Ω Attenuator

For example: Tektronix Part No. 011-0061-00.

15. Alligator Clip to BNC Adapter

For example: Tektronix Part No. 013-0076-00.

16. Dual Input Coupler

Matched BNC cable-T for making phase comparisons between two inputs. Matched length of the two arms within 0.1 inch.

For example: Tektronix Part No. 003-0837-00.

17. Precision 50 Ω Coaxial Cable

Tektronix Part No. 012-0482-00 (used with the TEKTRONIX SG503).

18. 50 Ω to 75 Ω Minimum Loss Attenuator

Tektronix Part No. 011-0057-00.

19. XY Input Connector Parade Display Test Connector

15-pin, subminiature D-type connector (for example: Tektronix Part No. 131-0459-00), modified to input the audio signal for XY checks and adjustments. See Figure 5–1.

Figure 5–1: Remote connector modified for XY checks and adjustments

Performance Checks

The short-form procedure is intended for those who are familiar with the complete Performance Check procedure. Step numbers and sub-step designations correlate directly to the steps in the Performance Check Procedure, making it possible to use the short-form procedure as a table of contents for the longer form

Short Form Procedure

1. Preliminary Setup

a. Connect autotransformer.

b. Connect composite color bar signal.

2. Check Power Supply Operation

c. Check for stable operation over line voltage range.

3. Check Synchronization

d. Check for stable display.

4. Check Demodulator Channel Bandwidth

g. Check bandwidth (–3 dB).

5. Check Color Bar Decoding Accuracy

c. Check vector angle and amplitude accuracy.

e. (1721SCH) Check that vectors can be overlayed.

6. Check Subcarrier Regenerator Performance

c. Check lockup.

d. Check frequency stability.

f. Check amplitude stability.

7. Check Phase Accuracy

b. Check CH-A, CH-B phase match.

d. Check EXT REF burst jitter with REF change.

h. Check phase change with Variable Gain change.

8. Check Amplifier Linearity

c. Check differential phase.

e. Check differential gain.

9. Check Chrominance Vector Clamp

b. Check clamp phase stability.

c. Check range of the controls.

10. Check Variable Gain

c. Check that the burst vector can be adjusted to the 75% amplitude target.

e. Check that the burst vector can be adjusted to the compass rose.

11. Check Trace Rotation Range

e. Check trace rotation range.

12. Check XY Input Phase Matching

d. Check separation.

13. Check XY Frequency Response

d. Check X (Horizontal) Amplifier bandwidth.

h. Check Y (Vertical) Amplifier bandwidth.

14. Check Auto Phase

f. Check that 1/2 amplitude burst returns to reference mark when AUTO is pressed.

i. Check that burst increased to compass rose returns to reference mark when AUTO is pressed.

j. Check that burst returns to reference mark after VARIABLE GAIN is turned off and AUTO is pressed.

15. Check SCH Phase with Amplitude Change

f. Check SCH phase accuracy.

16. Check SCH Phase Accuracy

e Check absolute SCH phase.

g. Check relative SCH phase.

17. Check Return Loss

c. Check loop-through return loss with instrument power on and off.

Standard Performance Checks

NOTE. *In this procedure, the 1720SCH-Series will be referred to as the Vectorscope.*

1. Preliminary Setup

a. Connect the 1720SCH-Series AC power cord to the variable autotransformer. Turn on the autotransformer, and set the autotransformer to the local nominal mains voltage (110 V or 220 V).

b. Set the Vectorscope controls as shown in Table 5–1.

c. Connect a Composite Color Bar signal with 100% Peak White Bar and 75% amplitude Color Bars to the CH-B INPUT and terminate the opposite side of the loop-through with a 75 Ω terminator.

Table 5–1: 1720SCH-Series Initial Control Settings

Control	Setting
INPUT	
MODE	VECT
REF	INT
INPUT	CH B
GAIN	
VARIABLE	off
BARS	75%
PHASE	
+V (1721SCH only)	off
DISPLAY	
FOCUS	set later
SCALE	set later
INTENS	set later
AUXILIARY	off

2. Check Power Supply Operation

Requirement: Check AC input range (90–250 V).

a. Turn on the Vectorscope and adjust the controls for a usable display.

b. Vary the autotransformer from low-line to high-line voltage (90 - 132 V for 110 V, or 180 - 250 V for 220 V operation).

c. CHECK for stable instrument operation over the prescribed voltage range.

d. Return the autotransformer to the local nominal mains voltage.

3. Check Synchronization

Requirement: Stable display with Composite Video or Black Burst with 40IRE (300 mV PAL) sync 6 dB.

a. Disconnect the Color Bar signal and loop-through connect the Black Burst to the Vectorscope as shown in Figure 5–2.

Figure 5–2: Equipment connections for checking synchronization

b. Use the Vectorscope PHASE control to place the burst vector tip(s) on the graticule target(s).

c. Remove the 75 Ω terminator from the CH-B loop-through.

d. CHECK for a stable display in both EXT and INT reference modes.

e. Connect three 75 Ω terminators to the CH-B loop-through.

f. CHECK for a stable display in both EXT and INT reference modes.

g. Remove all connections from the Vectorscope.

4. Check Demodulator Channel Band-Width

Requirement: Upper –3 dB point: F_{SC} +(400 kHz to 600 kHz). Lower –3 dB point: F_{SC} –(400 kHz to 600 kHz).

a. Connect the leveled sine-wave generator to the CH-B INPUT and terminate the loop-through in 75 Ω and set the Vectorscope REF to EXT.

b. Adjust the sine-wave generator Frequency to 3.58 MHz (4.43 MHz). Adjust the sine-wave generator Amplitude so that the circle overlays the vector graticule circle (compass rose).

c. Decrease the sine-wave generator Frequency until the perimeter of the circle touches the –3 dB (70%) point gaps on the vertical graticule axis. See Figure 5–3.

Figure 5–3: Using the vector graticule –3 dB markings to measure bandwidth

d. CHECK that the Frequency readout on the sine-wave generator is between 2.98 to 3.18 MHz (3.83 to 4.03 MHz).

e. Repeat parts c. and d. for the horizontal graticule axis.

f. Increase the sine-wave generator Frequency until the perimeter of the circle touches the –3 dB (70%) point gaps on the graticule's vertical axis.

g. CHECK that the Frequency readout on the sine-wave generator is between 3.98 and 4.18MHz (4.83 to 5.03).

h. Repeat parts f. and g. for the graticule's horizontal axis

5. Check Color Bar Decoding Accuracy

Requirement: Vector Phase accuracy within ±1.25°. Vector Gain accuracy typically within ±1.25IRE (±2.5% PAL).

a. Set the Vectorscope REF to INT.

b. Connect the Color Bar signal to the CH-B INPUT and terminate the loop-through in 75 Ω. Adjust the PHASE control to place the vector dots in their graticule targets.

c. CHECK that all of the vectors fall within ±1.25° and ±1.25 IRE (±1.25° and ±2.5%) of the target centers. These specifications represent one-half the dimension from the center cross of a vector target to the edge of the small inner box.

Perform parts d. and e. for the 1721SCH only:

d. Select the +V VECT MODE.

e. CHECK that the burst vectors can be overlaid with the PHASE control.

6. Check Subcarrier Regenerator Performance

Requirement: Pull in range: FSC ±50 Hz (±10 Hz for PAL). Pull in time less than 1 second. Phase shift at these frequency offsets is within ±2°. Phase shift with ±6 dB burst amplitude is within ±2°.

a. Connect the Color Bar signal to the CH-B INPUT. Display the signal in VECT MODE.

b. Change the signal generator's Subcarrier Frequency by ±50 Hz (±10 Hz).

c. CHECK that the Vectorscope locks to the generator within 1 second at these frequencies.

d. CHECK that the Vectorscope display does not change by more than ±2° at these frequencies.

e. Change the 1410-Series MOD AA output to Black Burst.

f. CHECK while varying the Burst Amplitude ±6 dB from the calibrated amplitude, that the Vectorscope burst vector phase does not change by more than ±2°.

7. Check Phase Accuracy

Requirement: Phase shift with signal input channel change less than 0.5°. Phase shift with +3 to –6 dB VAR GAIN change: less than 1°. Burst jitter: less than 0.5°.

a. Connect the Color Bar signal, through a 75 Ω feed-through terminator and a dual-input coupler, to the CH-A and CH-B INPUTs. Connect the Black Burst signal to the EXT REF loop-through and terminate in 75 Ω. Select EXT REF. See Figure 5–4.

Figure 5–4: Signal Connections for Checking CH-A/CH-B Phase Matching

b. CHECK while alternating between CH-A and CH-B INPUTs, that phase match between the two channels is within 0.5°.

c. Remove the Black Burst signal and 75 Ω terminator from the EXT REF INPUT. Move the dual-input coupler from CH-A to the EXT REF. Select CH-B INPUT for display.

d. CHECK while alternating between INT and EXT REF, that there is less than 0.5° burst jitter with either INT or EXT REF.

e. Disconnect the Color Bar signal from the dual-input coupler and apply the Linearity Staircase signal with 40IRE Subcarrier (280 mV PAL).

f. Use the PHASE control to set the Staircase vector dot to the left horizontal graticule line.

g. Enable VARIABLE GAIN.

h. CHECK while rotating the VARIABLE GAIN control to lengthen the staircase vector by one-third (+3 dB) and decrease the vector by one-half (–6 dB), that there is less than 1° phase change over this range.

8. Check Amplifier Linearity

Requirement: Differential Phase: less than 1° for a 10 to 90% APL Linearity Staircase. Differential Gain: less than 1% for a 10 to 90% APL Linearity Staircase.

a. Display the Modulated Staircase in VECT MODE. With the PHASE control, position the vector dot (representing the subcarrier on the staircase) to the burst cross on the graticule's horizontal axis. Use the small dot on the –U axis for PAL.

b. Turn on the VARIABLE switch and use the VARIABLE control to place dots at the outer graticule circle.

c. CHECK that dots are overlayed to 1°.

d. Adjust the VARIABLE control to place the dot (or the largest amplitude step if more than one dot is visible) to the outer graticule circle. Vary the Linearity Signal to select 10 and 90% average picture levels. Readjust the VARIABLE control, if necessary.

e. CHECK that dot is overlayed to 1, at both 10 and 90% average picture levels.

9. Check Chrominance Vector Clamp

Requirement: Clamp stability: 1/64″ (0.4mm) or less center dot movement as the PHASE control is rotated throughout its range. Position Control range: at least 1/4″ (6mm) from the center at either limit.

a. Connect the Color Bar signal to the CH-B INPUT and terminate the loop-through in 75 Ω.

b. CHECK that the center dot of the vector display moves less than 1/64″ (0.4 vmm) as the PHASE control is rotated.

c. CHECK while varying both screwdriver position controls throughout their range, that the range of each control is greater than 1/4″ (6 mm) from center.

d. Return the vector display to the centered position.

e. Remove the connection and terminator from CH-B.

10. Check Variable Gain

Requirement: Input subcarrier signals between –6 dB and +14 dB (between 29.5 IRE and 147 IRE or between 0.210 V and 1.05 V) can be adjusted to the burst amplitude.

a. Connect the Black Burst signal to CH-B and do not terminate the loop-through.

b. Enable the Vectorscope VARIABLE GAIN.

c. CHECK using the Vectorscope VARIABLE GAIN control, that the burst vector can be adjusted to the 75% amplitude target.

d. Terminate the open side of the CH-B INPUT loop-through with three 75 Ω terminators.

e. CHECK using the Vectorscope VARIABLE GAIN, that the burst vector can be adjusted to the compass rose.

f. Disconnect the Black Burst signal and terminators from CH-B.

11. Check Trace Rotation Range

Requirement: Range greater than ±1° from horizontal.

a. Connect the output of the audio signal generator to pin 3 of the Vectorscope rear-panel XY INPUT connector. See Figure 5–5.

Figure 5–5: Rear Panel XY INPUT Connector

b. Adjust the audio signal generator Amplitude for a displayed amplitude, on the horizontal axis, that is greater than the width of the graticule compass rose.

c. If necessary, use a small screwdriver and adjust the Vectorscope vertical positioning control to place the trace on the horizontal axis.

d. Use a small screwdriver to adjust the Vectorscope ROTATE from end to end.

e. CHECK that either end of the trace can be moved more than 1 (one-half minor division on the compass rose) either direction from horizontal.

f. Set the ROTATE control so that the trace is on the horizontal axis.

12. Check XY Input Phase Matching

Requirement: Less than a trace width of separation at 100 kHz.

a. Connect the audio signal generator output to both pins 3 and 7 of the XY input connector. See Figure 5–5.

b. Set the audio signal generator Frequency to 10kHz and adjust its Amplitude so that the trace extends between the targets (+) on the diagonal line.

c. Set the audio signal generator Frequency to 100kHz.

d. CHECK that there is a trace-width or less separation in the diagonal display. See Figure 5–6.

Figure 5–6: Audio Frequency XY Display

13. Check XY Frequency Response

Requirement: The –3 dB point at 500 kHz or greater in standard mode; 100 kHz or more in High Gain mode.

a. Connect the leveled sine-wave generator to pin 3 of the Vectorscope rear-panel XY INPUT connector. See Figure 5–5.

b. Set the leveled sine-wave generator Frequency to 50kHz and set its Amplitude for a display the width of the compass rose.

c. Set the leveled sine-wave generator Frequency to 500kHz.

d. CHECK that the display reaches the –3 dB gaps in the horizontal axis or beyond. See Figure 5–3.

e. Connect the leveled sine-wave generator output to pin 7 of the Vectorscope rear-panel XY INPUT connector.

f. Set the leveled sine-wave generator Frequency to 50 kHz and set its Amplitude for a display the height of the compass rose.

g. Set the leveled sine-wave generator Frequency to 500 kHz.

h. CHECK that the display reaches the –3 dB gaps in the horizontal axis or beyond.

Perform parts i. through p. only if internal jumpers J920 and J921 (Main board) are set to High Gain mode.

i. Connect the audio signal to pin 11 and ground pin 9 of the Vectorscope rear-panel XY INPUT connector. See Figure 5–5.

j. Set the audio signal generator Frequency to approximately 10 kHz and adjust its Amplitude for a display equal to the width of the graticule compass rose.

k. Set the audio signal generator Frequency to 100 kHz.

l. CHECK that the display reaches the –3 dB gaps in the horizontal axis or beyond.

m. Connect the audio signal to pin 15 and ground pin 13 of the Vectorscope rear-panel XY INPUT connector. See Figure 5–5.

n. Set the audio signal generator Frequency to approximately 10 kHz and adjust its Amplitude for a display equal to the height of the graticule compass rose.

o. Set the audio signal generator Frequency to 100 kHz.

p. CHECK that the display reaches the –3 dB gaps in the vertical axis or beyond.

q. Remove all connections from the Vectorscope.

14. Check Auto Phase

Requirement: Auto phase lock accuracy is ±1.5°.

a. Connect a 75% Amplitude Color Bar signal to the CH-A INPUT. Terminate the loop-through in 75 Ω.

b. Set the Vectorscope as follows:

MODE	VECTOR
INPUT	CH-A
REF	INT
BARS	75%

c. Use the PHASE control to position the burst to the 0° mark.

d. Enable the vectorscope VARIABLE GAIN and reduce the burst amplitude to 1/2.

e. Press AUTO.

f. CHECK that the burst returns to the burst reference mark, 1.5%.

g. Use the VARIABLE GAIN to place the burst on the compass rose.

h. Press AUTO.

i. CHECK that the burst returns to the 0° mark, ±1.5°.

j. Turn off the VARIABLE GAIN and press AUTO.

k. CHECK that the burst returns to the 0° mark, ±1.5°.

l. Disconnect the signal generator from the Vectorscope.

15. Check SCH Phase with Amplitude Change

Requirement: SCH dot phase change ≤2° with video amplitude change of ±6 dB.

a. Connect the TSG170A/TSG271 television test signal generator to the variable attenuator. Connect the output of the variable attenuator to the CH-A INPUT on the Vectorscope.

b. Connect the Black signal to the Vectorscope EXT REF INPUT. Terminate the loop-through in 75 Ω.

c. Set the variable attenuator for 0 dB.

d. Select AFC SLOW and SCH.

e. Use the PHASE control to position the burst on the burst reference mark. Note the phase of the SCH dot.

f. Set the variable attenuator for 12 dB.

g. CHECK that the SCH phase dot is ≤2° of the phase noted in part e. of this step.

16. Check SCH Phase Accuracy

Requirement: Subcarrier to Horizontal Phase Accuracy ±3°.

a. Connect the TSG170A/TSG271 television test signal generator to the CH-A INPUT on the Vectorscope. Terminate the loop-through in 75 Ω.

b. Connect the Black signal to the Vectorscope EXT REF INPUT. Terminate the loop-through in 75 Ω.

c. Select AFC SLOW, SCH, and INT REF.

d. Use the PHASE control to position the burst on the burst reference mark.

e. CHECK that the SCH phase is ±3° of 0° on the graticule (absolute SCH phase).

f. Select EXT REF.

g. Use the PHASE control to position the burst on the burst reference mark(s).

h. CHECK that the SCH phase is ±3° of 0° on the graticule (relative SCH phase).

17. Check Return Loss

Requirement: Return loss for each input: at least 40 dB from 50 kHz to 6 MHz (instrument on or off, input in use or not, for any deflection factor setting).

a. Connect the output from the sine-wave generator, through a minimum-loss attenuator, to the input of the return-loss bridge. Set the sine-wave generator to 50 kHz. Connect the output of the bridge to the oscilloscope and set the amplitude of the display to 500 mV p-p with the terminator removed from the unknown arm of the bridge. See Figure 5–7a.

Figure 5–7: Setting up the return loss bridge

b. Change the generator Frequency to 6 MHz. Reconnect the terminator to the unknown arm, set the differential comparator for 1 mV per division, and balance the bridge. See Figure 5–7b. Connect the unknown arm to the Vectorscope INPUT (CH-A, CH-B, or EXT REF) and terminate the loop-through in 75 Ω. See Figure 5–8.

Figure 5–8: Measuring Return Loss of the CH-A Input

c. Check that the return loss of the CH-A, CH-B, and EXT REF INPUTs is better than 40 dB, from 50 kHz to 6 MHz. Make this check (within this frequency range) with the Vectorscope POWER ON and OFF. Using the nomograph supplied with the return-loss bridge, 40 dB converts to 5 mV on the test oscilloscope vertical scale.

This Completes the Performance Check Procedure.

Adjustment Procedure

This procedure is divided into two parts. The first, a short form, is an outline of the standard procedure. The short form can be used as a short cut for those familiar with the instrument calibration, or as an index to the standard procedure.

The components to be adjusted are shown in Figure 5–9, with corresponding step numbers shown in parenthesis near each component.

Allow 20 minutes of warm-up time at normal room temperature (approximately 25°C) before making any adjustments to the instrument.

In this procedure, the 1720SCH-Series will be referred to as the Vectorscope.

Short-form Procedure

1. Preliminary Setup
2. Adjust +5Volts Supply (R99)
3. Adjust CRT Bias (R58)
4. Adjust GEOMETRY (R45), Focus (R11) and Astigmatism (R49)
5. Adjust Trace Rotation
6. Check On-Board Regulated Supplies (U39 and U42)
7. Check Lock-In Range
8. Adjust Center Dot Overlay and Vector Position (R293 and R369)
9. Adjust Quad Phase and +V Bal (C144, R302)
10. Adjust Phase and Gain Match (C183 and R459)
11. Adjust Orthogonality (R388)
12. Adjust X and Y Gains (R41 and R31)
13. Adjust XY Phasing (C152)
14. Adjust Loop Balance (R114)
15. Adjust R-Y and B-Y Gains (R336 and R333)
16. Adjust 100% Gain (R390)
17. Adjust Shifter Quad Phase (C75)
18. Adjust Sync Lock Oscillator (C12)
19. Adjust 25 Hz Offset Subcarrier (R97) PAL only
20. Adjust AUTO Phase (R282)

21. Adjust SCH Phase and Gain (R154 & R134)

22. Adjust Detector Centering (R193)

23. Adjust 50% Sync Detector (R182)

24. Readjust SCH Phase and Gain (R154 & R134)

25. Adjust AFC Slow Phase (R140)

26. Adjust SCH Phase Trip Point (R5)

27. Adjust Line Select Focus (R244 & R94)

Standard Adjustment Procedure

1. Preliminary Setup

a. Connect the 1720SCH-Series AC power cord to the variable autotransformer. Turn on the autotransformer, and set the autotransformer to the local nominal mains voltage (110 V or 220 V).

b. Connect the Black Burst signal to the Vectorscope EXT REF INPUT. Connect the Color Bar signal, through a dual-input coupler and 75 Ω in-line terminator, to the CH-A and CH-B INPUTs. See Figure 5–9.

c. Wire a 15-pin D-type connector according to Figure 5–1 and connect the audio signal generator to the Vectorscope XY INPUT. Set the audio signal generator Frequency to 50 kHz.

d. Set the Vectorscope front-panel controls as shown in Table 5–2.

Table 5–2: 1720SCH-Series Initial Control Settings

Control	Setting
INPUT	
MODE	VECT
REF	INT
A B	A
GAIN	
VARIABLE	off
BARS	75%
PHASE	
+V (1721SCH only)	off
DISPLAY	
FOCUS	as desired
SCALE	as desired

Table 5–2: 1720SCH-Series Initial Control Settings (Cont.)

Control	Setting
INTENS	as desired
AUXILIARY	off
POWER	ON

Figure 5–9: Beginning equipment connections for adjustment procedure

A1 Power Supply Board.

2. Adjust +5 Volts Supply

a. Connect the voltmeter to the +5 V test point (W542). See Figure 5–10.

b. Adjust R99 (+5 V Adj) for +5 volts ±0.01 volts.

3. Adjust CRT Bias

   a. Turn the INTENS control fully counterclockwise, and turn the SCALE off.

   b. Adjust R58 (CRT Bias) so that the display is just extinguished.

Figure 5–10: Adjustment and Test Point Locations for the Main and Power Supply boards

4. Adjust Geometry, Focus, and Astigmatism

a. Adjust R45 (GEOM) for 35V ±1 V at pin 1 of J3.

b. Set the FOCUS control on the front panel so that it is approximately at the center of its rotation.

c. Adjust R11 (CTR Focus) and R49 (Astig) for the most clearly-defined vector display.

5. Adjust Trace Rotation

a. Switch the Vectorscope MODE to XY.

b. Connect the audio signal generator output to the X INPUT (pin 3).

c. Adjust the audio generator Amplitude for a line length equal to the diameter of the compass rose.

d. Adjust the front-panel ROTATE screwdriver adjustment for a level trace across the CRT's X axis.

e. Disconnect the audio generator signal from the Vectorscope.

6. Adjust On-Board Regulated Power Supplies

a. Connect the voltmeter ground lead to one of the rear-panel ground lugs and connect the active lead to pin 3 of U39 (12.00 V). See Figure 5–10.

b. Check that the voltage at U39, pin 3 is between +11.76 and +12.24 volts.

c. Connect the voltmeter active lead to pin 3 of U42. See Figure 5–10.

d. Check that the voltage at U42, pin 3 is between –11.76 and –12.24 volts.

7. Check Lock-In Range

a. Connect the Black Burst signal to the Vectorscope EXT REF INPUT. Connect the Color Bar signal, through a dual-input coupler and 75 Ω in-line terminator, to the CH-A and CH-B INPUTs.

b. Set the Vectorscope INPUT to CH-B, MODE to VECTOR, and REF to INT.

c. Decrease the television signal generator's Subcarrier Frequency by 50 Hz (10 Hz for PAL).

d. Check for a locked display.

e. Increase the generator's Subcarrier Frequency by 50 Hz (10 Hz for PAL), and check for a locked display.

f. Return the generator to Subcarrier Frequency.

8. Adjust Center Dot Overlay and Vector Position

- **a.** Disconnect the television signal generator output from the CH-B INPUT.
- **b.** Adjust the Vectorscope front-panel horizontal and vertical position controls to center the dot at the graticule center mark.
- **c.** Change the Vectorscope MODE to BOTH (VECT & XY).
- **d.** Adjust R293 (Vector Vertical Position) for the best dot overlay.
- **e.** Adjust R377 (Vector Horizontal Position) for the best dot overlay.
- **f.** Change the Vectorscope MODE to VECT.
- **g.** Adjust the Vectorscope horizontal and vertical controls to center the dot at the graticule center mark.

9. Adjust Quad Phase and +V Bal

- **a.** Reconnect the Color Bar signal to both CH-A and CH-B INPUTs.
- **b.** Hold the REF switch in until the TEST indicator lights.
- **c.** Set the front-panel GAIN CAL to midrange.
- **d.** dPosition the center dot directly at graticule center (+).
- **e.** Adjust C144 (Quad Phase) and R302 (+V Bal) for the best overlay of the test circles.
- **f.** Return to INT REF.

10. Adjust Phase and Gain Match

- **a.** Set INPUT to BOTH (hold INPUT switch until both the A and B indicators light).
- **b.** Adjust C183 (ChannelA Input Compensation) and R459 (Gain Match) for the best gain and phase match of the two vector displays.

11. Adjust Orthogonality

- **a.** Switch MODE to XY.
- **b.** Disconnect the audio signal generator output from the X INPUT and connect it to the Y INPUT.
- **c.** Adjust R388 (Vertical Align) for a straight line, parallel to the Y axis.

12. Adjust X and Y Gains

- **a.** Set the Audio Generator to the desired output voltage between 2 V and 9 V (the Vectorscope is shipped at 2.4 V).

b. Adjust R41 for a Y axis display equal to the vertical distance between the centers of the dB boxes.

c. Disconnect the Audio Signal Generator from the Y INPUT and connect it to the X INPUT.

d. Adjust R31 (X Gain) for a display amplitude equal to the horizontal distance between the centers of the dB boxes.

13. Adjust XY Phasing

a. Connect the Audio Signal Generator output to both X and Y INPUTs of the Vectorscope.

b. Set the Audio Signal Generator frequency to 100 kHz.

c. Adjust C152 (VHF Comp) for minimum opening in the diagonal trace.

14. Adjust Loop DC Balance

a. Connect the Black Burst signal to the CH-A INPUT. Terminate the loop through in 75 Ω.

b. Switch INPUT to CH-A and MODE to VECT.

c. Connect a X10 probe from the test oscilloscope to A3TP1.

d. Set the test oscilloscope as follows:

Input	CH 1
Trig	CH 1
Coupling	DC
Volts/Div	200 mV
Time/Div	50 µs

e. Remove A3J5.

f. Use the front-panel position controls to place the burst on the graticule burst reference line.

g. Adjust R114 (Loop Bal) to null the trace on the test oscilloscope.

h. Return A3J5 to the 1–2 position for NTSC or the 2–3 position for PAL.

i. Use the Variable Burst Amplitude control on the test signal generator to decrease the burst amplitude to 1/2 normal amplitude.

j. Use the Vectorscope PHASE and position controls to place the color burst directly on the burst 0° mark.

k. Use the Variable Burst Amplitude control on the test signal generator to increase the burst amplitude by 2 times.

l. Check that there is less than 2° phase shift from 1/2 amplitude to 2 times amplitude.

15. Adjust R-Y and B-Y Gains

a. Check to see that the center dot is directly at graticule center.

b. Connect the Black Burst signal to the Vectorscope EXT REF INPUT. Connect the Color Bar signal, through a dual-input coupler and 75 Ω in-line terminator, to the CH-A and CH-B INPUTs.

c. Select TEST.

d. Adjust R336 (R-Y Gain) to place the outer circle directly over the RED and CYAN (R and CY) targets.

e. Adjust R333 (B-Y Gain) to place the inner bright circle directly through the BLUE and YELLOW (B and Yl) targets.

16. Adjust 100% Gain

a. Select 100% Amplitude Color Bars from the television test signal generator.

b. Push the 100% BARS button on the vectorscope front panel.

c. Adjust R390 (100% Gain) so that the test circle passes through the center of the RED and CYAN targets.

17. Adjust Shifter Quad Phase (NTSC instruments only)

a. Connect a X10 test probe to the end of A3R143 that is closest to the rear of the instrument. Refer to Figure 5–10 for resistor location.

Set the test oscilloscope as follows:

Trig	CH 1
Coupling	AC
Volts/Div	200 mV/div
Mode	Auto
Source	Int
Time/Div	10 µs

b. Set the vectorscope as follows:

MODE	VECTOR
REF	INT
SCH/+V	SCH
AFC	SLOW

c. Press AUTO.

d. Adjust C75 (Shifter Quad Phase) for minimum changes in subcarrier amplitude as the vector rotates.

18. Adjust Sync Lock Oscillator

a. Connect a X10 probe to A4TP1 (shown in Figure 5–11).

Figure 5–11: Adjustment Locations for the A4 SCH Circuit Board

b. Set the test oscilloscope for 2V per Div, DC Coupling, Auto Trigger, and 10 µs per Div.

c. Adjust C12 for a DC level of +8V on the test oscilloscope.

19. Adjust 25 Hz Offset Subcarrier (PAL instruments only)

a. Set the Vectorscope as follows:

MODE	VECTOR
INPUT	CH-A
REF	INT
+V/SCH	SCH
AFC	FAST

b. Connect a X10 probe from CH 1 on the test oscilloscope to A3TP3.

c. Set the test oscilloscope as follows:

Input	Ch 1
Trig	Ch 1
Volts/Div	200 mV
Time/Div	2 ms or 500 µs

d. Adjust R97 (25 Hz Offset Subcarrier) so the two subcarriers displayed on the test oscilloscope are the same amplitude.

e. Disconnect the probe.

20. Adjust AUTO Phase

a. Select 75% Color Bar signal on the television test signal generator.

b. Set the vectorscope as follows:

MODE	VECTOR
INPUT	CH-A
REF	INT
BARS	75%

c. Use the PHASE shift control to position the burst to the burst reference mark(s) on the graticule.

d. Enable the vectorscope VARIABLE GAIN and reduce the burst amplitude to 1/2.

e. Press AUTO.

f. Adjust R282 (Auto Phase) slightly. Press AUTO.

g. Repeat parts e. through f. of this step until the burst remains on the burst reference mark(s).

h. Use the VARIABLE GAIN to place the burst on the compass rose.

i. Press AUTO.

j. Check that the burst returns to the burst reference mark(s), ±1.5°.

k. Turn off the VARIABLE GAIN and press AUTO.

l. Check that the burst returns to the burst reference mark(s), ±1.5°. For NSTC instruments only, disconnect the 1410-Series generator from the vectorscope.

(Perform parts m. through r. for PAL instruments only)

m. Adjust C75 slightly.

n. Press AUTO.

o. Check that the burst returns to the burst reference mark(s), ±1.5°.

p. Adjust C75, pressing AUTO after each adjustment, until the burst will return to the burst reference mark(s).

q. Repeat parts d. through n. of this step until the burst returns to the burst reference mark(s), ±1.5° when the burst is set to the compass rose and when it is set for 1/2 amplitude.

r. Disconnect the 1410-Series generator from the vectorscope.

A4 SCH Board.

21. Adjust SCH Phase and Gain

a. Connect the TSG170A/TSG271 television test signal generator to the CH-A INPUT on the Vectorscope.

b. Connect the Black Burst signal from the TSG170A/TSG271 generator to the Vectorscope EXT REF INPUT. Terminate the loop-through in 75 Ω.

c. Set the Vectorscope as follows:

MODE	VECTOR
INPUT	CH-A
REF	INT
+V/SCH	SCH
AFC	SLOW

d. Use the Vectorscope front-panel controls to place the center dot in the center of the graticule.

e. Use the PHASE shift control to position the burst to the burst reference mark(s) on the graticule.

f. Adjust R154 (Gain) and R134 (Phase) to position the SCH phase dots to the 0° and 180° marks. See Figure 5–11.

22. Adjust Detector Centering

a. Select AFC FAST on the Vectorscope.

b. Adjust R193 (Detector Centering) for the best display of the SCH phase dots.

23. Adjust 50% Sync Detector

a. Connect the variable attenuator to the Vectorscope CH-A INPUT.

b. Select EXT REF.

c. Set the attenuator for 0 dBm.

d. Select AFC SLOW on the Vectorscope.

e. Use the PHASE shift control to position the burst to the burst reference mark on the graticule.

f. Note the phase of the SCH dot.

g. Set the variable attenuator to 6 dBm.

h. Adjust R182 (50% Sync Detector) to return the SCH dot to the phase noted in part f. of this step.

i. Repeat parts c., f., g., and h. of this step until the change when switching from 0 dBm to 6 dBm is ±2° or less.

24. Adjust SCH Phase and Gain

a. Set the Vectorscope REF to INT.

b. Use the PHASE shift control to position the burst to the burst reference mark(s) on the graticule.

c. Use the Vectorscope front-panel controls to place the center dot in the center of the graticule.

d. Adjust R154 (Gain) and R134 (Phase) to position the SCH phase dots to the 0° and 180° marks.

25. Adjust AFC Slow Phase

a. Move A3J5 to the 2–3 position. Set the REF to EXT.

b. Select AFC FAST on the Vectorscope. Note the phase of the SCH dot.

c. Select SLOW AFC.

d. Adjust R140 (Slow AFC Phase) until the phase of the SCH dot does not change when switching between SLOW and FAST AFC.

e. Return J5 to the 1–2 position.

26. Adjust SCH Phase Trip Point

a. Connect the 1410-Series television test signal generator Black Burst signal, through a 75 Ω in-line terminator and dual-input coupler, to the CH-A and EXT REF inputs.

b. Set the Vectorscope as follows:

MODE	VECTOR
INPUT	CH-A
REF	EXT
+V/SCH	SCH
AFC	SLOW

c. Adjust the generator Horizontal Delay control to position the SCH phase dot to the +90° mark.

d. Adjust R5 (SCH Trip Point) so that the SCH phase dot “flips” (changes fields) between 90° and 92° away from 0° SCH. Check this by turning the generator Subcarrier Phase control clockwise.

27. Adjust Line Select Focus

With a 1730-Series Waveform Monitor:

a. Connect an Auxiliary cable between the Vectorscope and a 1730-Series of the same color standard.

b. Loop-through connect the Color Bar signal to both the waveform monitor and the Vectorscope.

c. Set the 1730-Series waveform monitor for Line Select and display one line from the active part of the field (after the vertical interval).

d. Push the Vectorscope AUXILIARY button.

e. Adjust R94 (LS Focus) for the best Vectorscope display.

Without a 1730-Series Waveform Monitor:

a. Connect the output of the function generator to pin 7 of the Vectorscope rear-panel AUXILIARY connector.

b. Set the function generator for a narrow, negative-going, 10 V, 1 kHz pulse.

c. Connect the Color Bar output from the television test signal generator to the Vectorscope and terminate in 75 Ω.

d. Set the Vectorscope for VECT and adjust INTENS and FOCUS for the best display.

e. Push the Vectorscope AUXILIARY button.

f. Adjust R94 (LS Focus) for the best display on the Vectorscope.

This Completes the Adjustment Procedure.

Maintenance

Maintenance

This section contains instructions for preventive maintenance, general troubleshooting, serial port and LED driver diagnostics, and corrective maintenance. If the instrument does not function properly, troubleshooting and corrective measures should be taken immediately to circumvent additional problems.

Preventive Maintenance

Preventive maintenance consists of cleaning, visual inspection, performance checks, and (if needed) readjustment. The preventive maintenance schedule established for the instrument should be based on the amount of use it receives and the environment in which it is operated. Under average conditions, scheduled preventive maintenance should be performed every 2000 hours of operation.

Performance Checks and Readjustments

Instrument performance should be checked after each 2000 hours of operation, or every 12 months if used intermittently. This will help ensure maximum performance and assist in locating defects that may not be apparent during regular operation. The Performance Check Procedure and the Adjustment Procedure are in Section 5.

CAUTION. *Do not allow water to get inside any enclosed assembly or component. Do not clean any plastic materials with benzene, toluene, xylene, acetone, or similar compounds, because they may damage the plastic.*

Cleaning

A 2% RMA flux content solder is recommended for making repairs in this instrument. Cleaning of rosin residue is not recommended. Most cleaning solvents tend to reactivate the rosin and spread it under components where it may cause corrosion under humid conditions. The rosin residue, if left alone, does not exhibit these corrosive properties.

The instrument should be cleaned often enough to prevent dust and dirt from accumulating. Dirt acts as a thermal insulator, preventing effective heat dissipation, and can also provide high-resistance electrical leakage paths between conductors or components in a humid environment.

Exterior. Clean the dust from the outside of the instrument with a soft cloth or small brush. A brush is especially useful for removing dust from around the selector buttons, knobs, and connectors. Hardened dirt may be removed using a

cloth dampened with a mild detergent and water solution. Abrasive cleaners should not be used.

CRT. Clean the face of the CRT with a soft, lint-free cloth dampened in isopropyl alcohol or glass cleaner solution. Abrasive cleaners should not be used.

Interior. Loosen dust with a soft, dry brush and remove it with low-pressure air (high-velocity air can damage some parts). Hardened dirt or grease can be removed with a cotton-tipped applicator dampened with a mild detergent and water solution. Abrasive cleaners should not be used.

If the circuit board assemblies must be removed for cleaning, follow the instructions for removal/ replacement under the heading of Corrective Maintenance.

After cleaning, allow the interior to dry thoroughly before applying power to the instrument.

Visual Inspection

After cleaning, check the instrument carefully for improperly seated transistors or integrated circuits, defective connections, and damaged parts. To prevent additional damage in the case of heat-damaged parts, determine the cause of overheating before replacing the damaged part.

Periodic checks of the transistors and integrated circuits are not recommended. The best measure of performance is the actual operation of the component in the circuit.

Static-Sensitive Components

This instrument contains electrical components that are susceptible to damage from static discharge. Static voltages from 1 kV to 30 kV are common in unprotected environments. Table 6–1 shows the relative static discharge susceptibility of various semiconductor classes.

Observe the following precautions to avoid damage:

1. Minimize handling of static-sensitive components.
2. Transport and store static-sensitive components or assemblies in their original containers, on a metal rail, or on conductive foam. Label any package that contains static-sensitive components or assemblies.

Table 6–1: Static Susceptibility

Relative Susceptibility Levels		Voltage
1	CMOS	100 V – 500 V
2	ECL	200 V – 500 V

Table 6–1: Static Susceptibility (Cont.)

Relative Susceptibility Levels		Voltage
3	Schottky Signal Diodes	250 V
4	Schottky TTL	500 V
5	HF Bipolar Transistors	400 to 600 V
6	JFETS	600 to 800 V
7	Linear μcircuits	400 to 1000 V est.
8	Low Power Schottky TTL	900 V
9	TTL	1200 V

3. Discharge the static voltage from your body by wearing a grounding wrist strap while handling these components. Static-sensitive assemblies or components should be serviced only at a static-free work station by qualified personnel.

4. Nothing capable of generating or holding a static charge should be allowed on the work station surface.

5. Keep component leads shorted together whenever possible.

6. Handle components by the body, never by the leads.

7. Do not slide components over any surface.

8. Avoid handling components in areas that have a floor or work surface covering capable of generating a static charge.

9. Use a soldering iron that is connected to earth ground.

10. Use only wick-type or special antistatic suction desoldering tools.

Troubleshooting

Troubleshooting Aids

Since this manual is also a troubleshooting aid, its organization is described here. This material is general, and does not cover specific cases.

Foldout Pages. The foldout pages at the back of the manual contain block and schematic diagrams, circuit board illustrations, and look-up charts. See Figure 6–1.

Figure 6–1: Using Foldout Pages

Diagrams. Schematic diagrams show the circuit number and electrical value of each component. Symbols used on these diagrams are defined on the first page of Section 9. Circuit boards are indicated by a heavy border.

Signals leaving or entering a schematic diagram are cross-referenced with the connecting schematic number in brackets and the schematic grid location in small print.

Refer to the Replaceable Electrical Parts List for a complete description of each component.

Check the Change Information section in the rear of the manual for corrections and modifications to the instrument and the manual.

Look-Up Charts. Each schematic diagram is assigned an alpha-numeric grid and a look-up chart which lists the grid location of components on that schematic.

Circuit Board Illustrations. Electrical components, connectors, and test points are identified on circuit board illustrations, which are located on the back of the schematic diagrams. Circuit boards are grid numbered, with the lowest number in the upper left corner and the highest number in the lower right.

Assembly and Circuit Numbering. All circuit board assemblies are assigned assembly or "A" numbers. Figure 6–2 shows the assembly numbers and their locations for this instrument.

Figure 6–2: Circuit Board Assembly Locations

***NOTE**. Check parts list before ordering replacement parts; part numbers may have changed or have a different value in an individual instrument.*

Parts Lists

There are two separate parts lists in this manual. The Replaceable Electrical Parts List precedes the schematic diagrams, and the Replaceable Mechanical Parts List follows them.

Replaceable Electrical Parts List. This list is arranged by assembly (as designated in ANSI Standard Y32.16-1975), beginning with the etched circuit board assemblies. These are followed by the individual components, which combine the assembly number with the individual circuit number.

Example: R445 on the Power Supply board (A1) would be shown in the Replaceable Electrical Parts List as A1R445.

Replaceable Mechanical Parts List and Exploded View Drawing. Parts listed in the Replaceable Mechanical Parts List are assigned index numbers which correspond to circled numbers on the exploded view drawing(s).

Accessories List. Standard accessories are illustrated in the exploded view drawing. Part numbers of standard and optional accessories are given at the end of the Replaceable Mechanical Parts List.

Major Assembly Interconnection

Signals and power supply voltages are passed through the instrument using a system of interconnecting cables.

24 & 32 Pin Connectors. The male connectors on the cables fit into the connectors that are mounted on the circuit boards. A triangular symbol identifies pin 1 on both connectors, and the remaining pins are numbered. See Figure 6–4.

Square Pin Connectors. Pin 1 is marked by a triangular symbol on the circuit board and on the connector.

Connectors with Center Polarizers. These polarizers serve as a key for proper mating with the connector on the circuit board. Pin 1 is also marked with a triangular symbol on both connectors.

General Troubleshooting Techniques

1. Be sure the instrument is malfunctioning. See Section 2 to determine whether the instrument is operating properly. Check the operation of front-panel controls, associated equipment, and input signal connections.

CAUTION. *Use extreme care when probing with meter leads or probes, because of the high component density and limited access within the instrument. The inadvertent movement of leads or a probe could cause a short circuit or transient voltages capable of destroying components.*

2. Determine the nature of the problem. Determine whether the instrument is out of calibration or there has been a component failure. Once the type of failure has been determined, identify the functional area most likely at fault.
3. Isolate the problem to a circuit or assembly. Use the block diagram as an aid to signal tracing and circuit isolation.

CAUTION. *Always remove the assembly from the instrument before replacing a soldered-in component. See Corrective Maintenance for the correct procedure.*

4. Visually inspect the suspect assembly for obvious defects. Look for chafed insulation, components that are broken, loose, improperly seated, overheated or burned, etc. Repair or replace all obvious defects. In the case of overheated components, determine and correct the cause of overheating before reapplying power.

5. Use successive electrical checks to locate the source of the problem. The primary tool for problem isolation is the oscilloscope. Use the Performance Check Procedure in Section 5 to determine if a circuit is operating within specifications. It may be necessary to change a calibration adjustment to determine if a circuit is operational. Use caution, since this can destroy instrument calibration. Note the adjustment position before making changes, so that it can be returned to the same position.

6. Determine the extent of the repair. If the necessary repair is complex, it may be advisable to contact your local Tektronix field office or representative before continuing. If the repair is minor, such as replacing a component, see the parts list for replacement information. Removal and replacement procedures for the assemblies can be found under Corrective Maintenance.

Specific Troubleshooting

Procedures

Two areas of the the 1720SCHSeries instrument require specific troubleshooting methods. The power supply can not be worked on safely without using an Isolation Transformer and following a specific troubleshooting procedure.

The Serial Port (Auxiliary Input) and the LED Driver circuits have specific diagnostic routines. These should be followed to isolate problems quickly.

Power Supply

The power supply is of the high-efficiency type and requires a specific troubleshooting procedure and an isolation transformer to avoid personal danger or instrument damage.

The 1720SCH-Series power supply presents special troubleshooting problems, if a fault occurs. Besides having a sizeable area where dangerous potentials can be contacted, the type of circuitry employed can not be troubleshot by conventional means.

WARNING. *Do not attempt to troubleshoot the 1720SCH-Series power supply without reading these instructions.*

Troubleshooting Procedure

***NOTE**. A review of the power supply Theory of Operation is recommended before attempting repairs.*

The equipment needed to troubleshoot the power supply:

- Digital Multimeter (DMM), with a diode check function
- Oscilloscope
- 0 to 20 VDC Variable Power Supply
- Clip Lead – to short across a component
- High Voltage Probe, ≥1 GΩ input resistance

Introduction

The Troubleshooting Procedure for the Power Supply (Assembly A1) is split into two sections, the Low Volts and High Volts Supplies. Start the procedure by determining which section of the power supply the problem is in. Apply AC power and turn on the power supply. From Table 6–2, determine which symptom the power supply exhibits and refer to the corresponding procedure.

Table 6–2: Power Supply Fault Symptoms

Symptom	Procedure
Line fuse open	Rectifier/Switcher Check (Low Volts)
Power Supply cycles OFF/ON	Output Check (Low Volts), or High Voltage Oscillator Check (High Volts)
Does not power up	Control Circuit Check (Low Volts)
+5 V not regulating	Error Amplifier Check (Low Volts)
Improper CRT display	High Volts Supply

Low Volts Supply

***NOTE**. A 20 Ω, 2 watt resistor should be used as a load for the Low Volts Supply. Disconnect J4 and connect the 20Ω resistor between W1 (+5 V) and TP1 (secondary ground).*

1. Preliminary Checks

a. A properly functioning and loaded Low Volts supply will output the voltages listed in Table 6–3. Use the DMM to measure the voltages between TP1 and the voltage test points. If the supply is not regulating properly, continue with the procedure.

Table 6–3: Low Volts Supply Voltages

Test Point	Voltage Range
W1 – (+5 V)	+4.88 to +5.12 V
W4 – (+15 V)	+14.0 to +16.0 V
W3 – (–15 V)	–14.0 to –16.0 V
W2 – (+40 V)	+39.0 to +41.0 V

***NOTE**. The Low Volts power supply troubleshooting is performed without applying AC power.*

b. Disconnect AC power from the instrument. Disconnect the instrument from the Power Supply by removing the jumper from J4.

c. Use the digital multimeter to measure the voltage between TP2 and the tab (drain) of Q9. Be sure the voltage is near 0 V before proceeding.

***CAUTION.** Do not proceed until the drain of Q9 is near 0 V. Dangerous voltage potentials are present in the circuit until the capacitors discharge.*

2. Rectifier/Switcher Check

a. Use the digital multimeter to measure the voltage between TP2 and the tab (drain) of Q9. Be sure the voltage is near 0 V before proceeding.

b. Unsolder and lift one end of R102.

c. With the negative lead of the digital multimeter connected to TP2 and the positive lead connected to the tab of Q9, measure the circuit resistance. A resistance of less than 20K Ω indicates a shorted mosfet (Q9). If the mosfet is shorted, replace it and perform the Control Circuit Check.

d. Using the digital multimeter diode test function, test CR21, CR22, CR23, and CR24 for shorts. Diode replacements must be fast reverse recovery (300 ns) types to reduce conducted noise.

e. Reconnect the lifted end of R102.

3. Output Check

a. Connect the negative output from the 20 VDC Power Supply to TP1. Connect the positive output to W4 (+15 V). The circuit should draw less than 20 mA. Excessive current draw can be caused by CR11 or U2 (High Volts power supply).

b. Connect the negative output from the 20 VDC Power Supply to TP1. Connect the positive output to W2 (+40 V). The circuit should draw less than 20 mA. Excessive current draw can be caused by CR14 or Q6 (High Volts power supply).

c. Connect the positive output from the 20 VDC Power Supply to TP1. Connect the negative output to W3 (–15 V). The circuit should draw less than 20 mA. Excessive current draw can be caused by CR12.

d. Connect the negative output from the 5 VDC Power Supply to TP1. Connect the positive output to W1 (+5 V). The circuit should draw less than 20 mA. Excessive current draw can be caused by CR13 or Q1 and Q2 (High Volts power supply).

4. Control Circuit Check

a. Connect the negative output from the 20 VDC Power Supply to TP2. Connect the positive output to the cathode of CR17. Short C47 with a clip lead. Connect the oscilloscope probe ground to TP2.

b. Table 6–4 lists the signal present in a properly functioning control circuit.

Table 6–4: Control Circuit Test Points

Circuit Location	Signal
U5, pin 1	Approximately 5 VDC
U5, pin 2	Approximately 2 VDC
U5, pin 3	0 V
U5, pin 4	80 kHz triangle wave, 2 V p-p
U5, pin 6	80 kHz square wave, 18 V p-p
U3, pin 1	80 kHz square wave, 5 V p-p
U3, pin 2	2.1 VDC
U3, pin 6	2.9 VDC
U3, pin 7	Approximately 5 VDC
U4, pin 13	80 kHz repetition rate, 300 ns width, approximately 3 V p-p
Q8, collector	80 kHz repetition rate, 400 ns width, switching from 5 V to approximately 2 V

c. Remove the clip lead from across C47.

5. Error Amplifier Check

a. Connect the negative output from the variable DC power supply to TP1. Connect the positive output to W1 (+5 V).

b. Connect the negative output of another variable DC power supply to TP1. Connect the positive output to W4 (+15 V). Set the variable power supply to 20 VDC.

c. Connect the digital multimeter between TP1 and the cathode of CR15.

d. Set the variable DC power supply connected to W1 (+5 V) to 4.8 V. The cathode of CR15 should be approximately 20 V.

e. Set the variable DC power supply connected to W1 (+5 V) to 5.2 V. The cathode of CR15 should be approximately 2 V.

f. If this check did not reveal the cause for the +5 V supply not regulating, refer to the Output Check and the Control Circuit Check.

High Volts Supply

1. Preliminary Checks

a. Table 6–5 lists the High Volts Supply fault symptoms and procedures.

Table 6–5: High Volts Supply Fault Symptoms

Symptom	Procedure
Unable to focus CRT using the front-panel control	Focus Amplifier Check
Unable to adjust CRT intensity using the front-panel control	Z-Axis Amplifier Check Grid Drive Check
No CRT display	High Voltage Oscillator Check CRT Voltage Check

b. Load the Low Volts Supply with the instrument, or with the 20Ω resistor as detailed at the beginning of the Troubleshooting Procedure.

2. Focus Amplifier Check

a. Unsolder and lift one end of R24.

b. Power up the power supply.

c. Using the digital multimeter, measure the voltage between TP1 and the collector of Q1. It should be approximately –140 V.

d. Reconnect the lifted end of R24.

3. Z-Axis Amplifier Check

a. Unsolder and lift one end of R8.

b. Power up the power supply.

c. Using the digital multimeter, measure the voltage between TP1 and the collector of Q4. It should be approximately +10 V.

d. Short together the base and emitter of Q5. The collector of Q4 should be approximately +100 V.

e. Reconnect the lifted end of R8.

4. Grid Drive Check

a. Turn off the power supply. Use the diode check on the digital multimeter to test CR1, CR2, CR3, CR5, and CR6 for shorts.

b. Power up the power supply.

c. Using the digital multimeter, measure the voltage between TP1 and the cathode of CR5. It should vary between approximately +75 and +200 V as R58 (CRT Bias) is adjusted.

d. Connect the oscilloscope probe to the anode of CR5 and the probe ground to TP1. The signal should be a clipped sine wave of +75 to +200 V p-p.

5. High Voltage Oscillator Check

a. Connect the oscilloscope probe to T1 pin 3 (Q6 collector) and the probe ground to TP1. Power up the supply. The signal should be a +60 V p-p, 22 kHz sine wave.

b. Check the voltages listed in Table 6–6 using the digital multimeter:

Table 6–6: High Voltage Oscillator Test Points

Circuit Location	Voltage
T1, pin 4	Approximately +40 V
T1, pin 13	Less than +2 V
U2, pin 2	Approximately +4.8 V
U2, pin 6	+4 to +11 V
CR9, cathode	Approximately +100 V

6. CRT Voltage Check

***NOTE**. High Voltage Probe:*

This check requires a high voltage probe having an input resistance of 1 GΩ or more.

---

a. Connect the high voltage probe ground to TP1.

b. Load the Low Volts supply with the instrument, or with a 20Ω, 2 watt resistor loading the 5 V supply.

c. Power up the power supply.

d. Use the high voltage probe to measure the voltage at the anode of CR4. It should be approximately –2530 V.

e. Measure the voltage at the anode end of CR3. It should be 50–150 V more negative than the reading from the anode of CR4.

Corrective Maintenance

A 2% RMA flux content solder is recommended for making repairs in this instrument. Cleaning of rosin residue is not recommended. Most cleaning solvents tend to reactivate the rosin and spread it under components where it may cause corrosion under humid conditions. The rosin residue, if left alone, does not exhibit these corrosive properties.

***NOTE**. No repair should be attempted during the warranty period.*

Obtaining Replacement Parts

Replacement parts are available through the local Tektronix, Inc., field office or representative. However, many common electronic parts are available through local sources. Using a local source, where possible, will eliminate shipping delays.

Changes to Tektronix instruments are sometimes made to accommodate improved components, as they become available, and to improve circuit performance. Therefore, it is important to include the following information when ordering parts:

1. Part Number

2. Instrument Type or Number

3. Serial Number

4. Modification or Option Number (if applicable)

If an ordered part has been replaced with a new or improved part that is a direct replacement, the new part will be shipped. If the part does not directly replace the old one, the local Tektronix field office or representative will contact the customer. After any repair or modification of the instrument, circuit readjustment may be required.

Mechanical Disassembly/Assembly

Use these instructions for disassembly and reverse them for reassembly, unless otherwise noted.

WARNING. *Before attempting any disassembly/assembly of the instrument, be sure to disconnect the power cord.*

CAUTION. *Do not reinsert screws in the rear panel when the instrument is removed from the cabinet.*

NOTE*. All screws, unless otherwise noted, are TORX® screws and can be removed with a T15 screwdriver tip (Tektronix part number 003-0966-00). The exception is #2 Pozidrive® screws which can be removed with a #1 Pozidrive® tip (003-0443-00). Do not reinsert screws in the rear panel when the instrument is removed from the cabinet.*

Bezel Removal.

1. Remove the two bezel screws. See Figure 6–3.
2. Grasping the bottom of the bezel, pull out and upward. There are two hinges at the top of the bezel that hold it in place; once the bezel is at an approximate 45° angle with the front panel, they will disengage.

Figure 6–3: Bezel Screws

Graticule Light Removal and Replacement.

For graticule light removal and replacement, tweezers with curved, serrated tips are recommended. For example: Miltex PL312, 6-100 (equivalent to PL312) or PL317 (longer than PL312).

CAUTION. *Needle-nosed pliers are not recommended.*

Replacement bulbs are supplied with this instrument as Standard Accessories. Additional bulbs can be purchased from Tektronix (see Replaceable Electrical Parts List) or from local electronics distribution sources.

Procedure:

1. Remove the bezel according to the preceding instructions.
2. To remove a bulb, position the tweezer tips on the thin, flat portion of the bulb (close to the plastic socket). Carefully pull the bulb straight out.

3. To install a bulb, hold it with the tweezers as described in step 2, position it in front of the socket, and push the bulb with your finger until it snaps into place.

CRT Removal.

1. Remove the bezel.

WARNING. *The CRT may retain a dangerous charge. Ground the conductor of the anode to discharge the CRT. Do not allow the conductor to touch your body or any circuitry.*

2. Slide a screwdriver with an insulated handle under the anode cap on the side of the CRT, and ground the anode to the chassis, to discharge the CRT. DO NOT touch the metal shaft of the screwdriver while doing this. Disconnect the anode cap by prying it gently away from the CRT.
3. Disconnect J225 (trace rotation) on the Main board and push the connector through the hole in the board.

WARNING. *The CRT is a high vacuum device and must be handled with care. Safety glasses, gloves, and protective clothing should always be worn when handling CRTs.*

4. The CRT can now be pulled straight out (some pressure may be needed). The CRT shield, along with the grommet around its front and the rubber manchet around its back, should come out with the CRT.

CRT Replacement.

1. If the CRT is to be replaced, remove the metal shield from the neck of the old CRT and place it around the neck of the new CRT, with the WARNING sticker towards the top of the instrument. This should place the opening in the grommet on the front edge of the shield towards the bottom of the instrument. Ensure that the rubber manchet is on the back edge of the shield.
2. Slip the CRT part way back into position and feed the trace rotation wires (and plug) back through the hole in the Main board.

WARNING. *The CRT may retain a dangerous charge. Ground the the anode connector to discharge the CRT. Do not allow the conductor to touch your body or any circuitry.*

3. Use a screwdriver to ground the anode connector on the CRT to the chassis.

4. Slide the CRT into the instrument, guiding the rubber manchet on the end of the shield into the rear CRT support.

5. Align the socket on the A10 CRT Socket board with the pins and key on the CRT. Gently push the CRT and the socket board together until the CRT pins are fully seated in the socket.

6. Replace the trace rotation connector (J225, Main board), and snap the anode lead onto the anode connector on the side of the CRT.

7. Wipe the faceplate of the CRT to remove fingerprints, then replace the bezel. If the fit is too tight to allow the bezel to go into position, or if the CRT has a loose fit after the bezel is completely tightened down, then the rear CRT support must be repositioned.

   To reposition the rear CRT support, loosen the two nuts that hold the support in place. With the CRT and bezel in place, push the support towards the front of the instrument until it is snug against the rubber manchet on the rear of the CRT shield. Tighten the two support nuts.

Rear Panel Removal.

1. Unsolder the wires between the Main board and bnc straps.

2. Remove the five screws that fasten the rear panel to the instrument, as shown in Figure 6–4.

Figure 6–4: Removing the Rear Panel

Front Panel Assembly Removal.

1. Remove the multi-wire connector J154 from the Front Panel assembly.
2. Remove the two screws that fasten the front panel (and attached circuit board) to the instrument. See Figure 6–5 for location.
3. Disconnect the power ON/OFF connector using a #1 Pozidrive tip on the two screws that hold the assembly in place.
4. The front panel and attached circuit board can now be removed by pushing through the hole in the instrument front casing.
5. Separate the circuit board from the front-panel assembly by removing the six knobs from the front panel, then removing the three screws from the circuit board, as shown in Figure 6–5.

Figure 6–5: Removing the Front Panel Board

SCH Board Removal.

1. Remove the three screws near the top of board. These screws hold the board in place.

2. Disconnect the jumper from J3.
3. Raise the SCH board sufficiently to disconnect the ribbon cable connectors from J2.
4. Remove the SCH board.

Main Board Removal and Replacement.

1. Remove the plugs from the following connectors: J154 on the Front Panel board, J4 on the Power Supply board, and J225 on the Main board.
2. Unsolder the following connections: the three bnc connections and the one ground from the rear panel, the two horizontal leads to the CRT (red and green), and the two vertical leads to the CRT (blue and brown).
3. Push the CRT leads and the trace rotation lead through their holes in the Main board.
4. Remove the eight screws that fasten the Main board to the instrument, as shown in Figure 6–6.

Figure 6–6: Removing the Main Board

5. To remove the board, slide it toward the rear panel until the LEDs clear the front instrument casing, then lift out.
6. When replacing the Main board, align the board with the grooves in the front molding. Perform steps1 through 4 above in reverse order.

Power Supply Board Removal.

1. Remove the plug from J4 on the Power Supply board (the connection to the main board).

WARNING. *The CRT may retain a dangerous charge. Ground the conductor of the anode to discharge the CRT. Do not allow the conductor to touch your body or any circuitry.*

2. Remove the anode connection from the CRT and discharge it to ground.
3. Remove the plugs from J1 and J3 (the CRT wires). Remove the plug from J2 (the power switch).
4. Disconnect the AC line filter from the rear panel.
5. Using a #1 Pozidrive tip, disconnect the power ON/OFF switch from the front panel.
6. Remove the seven screws that fasten the Power Supply board to the instrument. See Figure 6–7.

Figure 6–7: Removing the Power Supply Board

7. Remove the board by sliding it forward and lifting it up.

Repackaging

If the instrument is to be shipped to a Tektronix Service Center for service or repair, attach a tag to the instrument showing the following information:

1. Owner (with complete address) and the name of the person at your firm that can be contacted.
2. Instrument serial number and a description of the service required.

Figure 6–8: Repackaging the Instrument

If possible, save and reuse the package in which your instrument was shipped, since this will provide maximum protection. (See Figure 6–8.) If the original package is unfit for use or unavailable, repackage the instrument as follows:

1. Use a shipping carton of corrugated cardboard, with a test strength of at least 275 pounds, and inside dimensions that are at least sixinches greater than the dimensions of the instrument.
2. Surround the instrument with polyethylene sheeting to protect the finish.

3. Cushion the instrument on all sides by tightly packing dunnage or urethane foam between the carton and the instrument. Allow 3inches on all sides for cushioning.
4. Seal the carton with shipping tape or an industrial stapler.

Options

Options

This section describes instrument options and customer-installable field upgrade kits available for the 1720SCH-Series.

Options

CRT Options

The standard instrument is shipped with a P31 (green) phosphor crt installed. If Option 74 is ordered, the instrument is shipped with a P4 (white) phosphor CRT installed. The crt part numbers are given at the end of the Replaceable Electrical Parts List.

Power Cord Options

Any of the following power cord options can be ordered for the 1720SCH-Series. If no power cord option is ordered, instruments are shipped with a North American 125 V locking power cord and one replacement fuse.

Option A1	Universal Europe 220 V/16 A Locking Power Plug (power cord and one replacement fuse)
Option A2	United Kingdom 240 V/15 A Power Plug (power cord and one replacement fuse)
Option A3	Australian 240 V/10 A Power Plug (power cord and one replacement fuse)
Option A4	North American 250 V/18 A Power Plug (power cord and one replacement fuse)
Option A5	Swiss 240 V/6 A Power Plug (power cord and one replacement fuse)

Unless otherwise specified, power cords for use in North America are UL listed and CSA certified. Option cords are approved by at least one test house acceptable in the country to which the product is shipped. Power cord part numbers are shown on the pull-out in Section 10.

Field Upgrade Kits

Cabinets

All of the Safety and EMI tests used to qualify the 1720SCH-Series were performed in a cabinet. There are two optional cabinets and a dual rack adapter available for the installation of these instruments.

For more information, refer to the cabinet installation drawings in Section 3, or contact a Tektronix field office or distributor.

Plain Cabinet (1700F00). This plain, silver-grey cabinet is designed for permanent mounting. The ventilating holes in the top, bottom, and sides of the cabinet allow heat generated within the instrument to dissipate. When mounting, allow air to circulate freely through these holes.

Carrying Case (1700F02). This silver-grey metal cabinet, designed for portable applications, is equipped with feet, flipstand, carrying handle and front cover. The TEKTRONIX BP1 battery pack can easily be mounted to this cabinet to provide a 12 VDC power source for portable operation.

Side-by-Side Rack Adapter (1700F05). This 19-inch rack mounting adapter, which contains two 1700F00 cabinets, accepts two 1700Series instruments side by side.

Blank Panel (1700F06). When only one side of a 1700F05 dual rack adapter is used, this blank panel can be installed in the other half to improve appearance and protect air flow.

Utility Drawer (1700F07). When only one side of a 1700F05 dual rack adapter is used, an alternate to the 1700F06 blank panel is the 1700F07 utility drawer. This drawer provides over 1/3 cubic foot of storage space for accessories. The drawer kit includes a tray, which is permanently mounted to the 1700F05. The drawer opens and closes readily, unless latched for transport. The drawer can also be removed from the drawer tray by lifting up and out.

Ordering

These items can be ordered with the 1720SCHSeries, or purchased through a Tektronix field office or distributor. When ordering, include both the name and number of the field upgrade kits.

Replaceable Electrical Parts

Replaceable Electrical Parts

This section contains a list of the electrical components for the 1720SCH-Series Vectorscope/SCH Monitor. Use this list to identify and order replacement parts.

Parts Ordering Information

Replacement parts are available through your local Tektronix field office or representative.

Changes to Tektronix products are sometimes made to accommodate improved components as they become available and to give you the benefit of the latest improvements. Therefore, when ordering parts, it is important to include the following information in your order:

- Part number
- Instrument type or model number
- Instrument serial number
- Instrument modification number, if applicable

If you order a part that has been replaced with a different or improved part, your local Tektronix field office or representative will contact you concerning any change in part number.

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

Using the Replaceable Electrical Parts List

The tabular information in the Replaceable Electrical Parts List is arranged for quick retrieval. Understanding the structure and features of the list will help you find all of the information you need for ordering replacement parts. The following table describes each column of the electrical parts list.

Parts list column descriptions

Column	Column name	Description
1	Component number	The component number appears on diagrams and circuit board illustrations, located in the diagrams section. Assembly numbers are clearly marked on each diagram and circuit board illustration in the *Diagrams* section, and on the mechanical exploded views in the *Replaceable Mechanical Parts* list section. The component number is obtained by adding the assembly number prefix to the circuit number (see Component Number illustration following this table). The electrical parts list is arranged by assemblies in numerical sequence (A1, with its subassemblies and parts, precedes A2, with its subassemblies and parts). Chassis-mounted parts have no assembly number prefix, and they are located at the end of the electrical parts list.
2	Tektronix part number	Use this part number when ordering replacement parts from Tektronix.
3 and 4	Serial number	Column three indicates the serial number at which the part was first effective. Column four indicates the serial number at which the part was discontinued. No entry indicates the part is good for all serial numbers.
5	Name & description	An item name is separated from the description by a colon (:). Because of space limitations, an item name may sometimes appear as incomplete. Use the U.S. Federal Catalog handbook H6-1 for further item name identification.
6	Mfr. code	This indicates the code number of the actual manufacturer of the part.
7	Mfr. part number	This indicates the actual manufacturer's or vendor's part number.

Abbreviations

Abbreviations conform to American National Standard ANSI Y1.1–1972.

Component Number

Read: Resistor 1234 (of Subassembly 2) of Assembly 23

List of Assemblies

A list of assemblies is located at the beginning of the electrical parts list. The assemblies are listed in numerical order. When a part's complete component number is known, this list will identify the assembly in which the part is located.

Chassis Parts

Chassis-mounted parts and cable assemblies are located at the end of the Replaceable Electrical Parts List.

Mfr. Code to Manufacturer Cross Index

The table titled Manufacturers Cross Index shows codes, names, and addresses of manufacturers or vendors of components listed in the parts list.

Manufacturers cross index

Mfr. code	Manufacturer	Address	City, state, zip code
TK0435	LEWIS SCREW CO	4300 S RACINE AVE	CHICAGO IL 60609–3320
TK0515	EVOX–RIFA INC	100 TRI–STATE INTERNATIONAL SUITE 290	LINCOLNSHIRE IL 60015
TK0891	MICONICS	1 FAIRCHILD AVE	PLAINVIEW NY 11803
TK1155	QUALITY PLSTC INJECTION MOLDING	3910 INDUSTRIAL AVE	COEUR D'ALENE ID 83814
TK1462	YAMAICHI ELECTRONICS CO LTD 2ND FLOOR NEW KYOEI BLDG 17–11	3–CHROME SHIBAURA MINATO–KU	TOKYO JAPAN
TK1617	CRAFT FACTORY PLSTCS	17145 SW ALEXANDER	ALOHA OR 97007
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
TK1913	WIMA THE INTER–TECHNICAL GROUP IND	2269 SAW MILL RIVER ROAD PO BOX 127	ELMSFORD NY 10523
TK1919	AMERICAN KSS INC	2620 AUGUSTINE DR SUITE 100	SANTA CLARA CA 95054
TK1947	NORTHWEST ETCH TECHNOLOGY	2601 S HOOD ST PO BOX 110610	TACOMA, WA 98411–0610
TK2058	TDK CORPORATION OF AMERICA	1600 FEEHANVILLE DRIVE	MOUNT PROSPECT, IL 60056
TK2073	TOKYO AMERICA INC	565 W GULF ROAD	ARLINGTON HEIGHTS IL 60005
TK2469	UNITREK CORPORATION	3000 LEWIS & CLARK WAY SUITE #2	VANCOUVER WA 98601
0GV52	SCHAFFNER EMC INC	9–B FADEM ROAD	SPRINGFIELD, NJ 07081
0H1N5	TOSHIBA MARCON ELECTRONICS AMERICA CORPORATION	998 FIRST EDGE DRIVE	VERNON HILLS IL 60061
0JR03	ZMAN MAGNETICS INC	7633 S 180th	KENT WA 98032
0JR04	TOSHIBA AMERICA INC ELECTRONICS COMPONENTS DIV	9775 TOLEDO WAY	IRVINE CA 92718
0J260	COMTEK MANUFACTURING OF OREGON (METALS)	PO BOX 4200	BEAVERTON OR 97076–4200
0J9R2	HARISON ELECTRIC CO LTD	ASAHIMACHI 5–CHOME IMABARI	EHIME JAPAN
0LUA3	PHILIPS COMPONENTS	100 PROVIDENCE PIKE	SLATERSVILLE, RI 02876
00779	AMP INC	2800 FULLING MILL PO BOX 3608	HARRISBURG PA 17105
01295	TEXAS INSTRUMENTS INC SEMICONDUCTOR GROUP	13500 N CENTRAL EXPY PO BOX 655303	DALLAS TX 75262–5303
04222	AVX/KYOCERA 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
09023	CORNELL–DUBILIER ELECTRONICS DIV FEDERAL PACIFIC ELECTRIC CO	2652 DALRYMPLE ST	SANFORD NC 27330
09969	DALE ELECTRONICS INC	EAST HIGHWAY 50 P O BOX 180	YANKTON SD 57078

Manufacturers cross index (Cont.)

Mfr. code	Manufacturer	Address	City, state, zip code
1CH66	PHILIPS SEMICONDUCTORS	811 E ARQUES AVENUE PO BOX 3409	SUNNYVALE CA 94088–3409
1ES66	MAXIM INTEGRATED PRODUCTS INC	120 SAN GABRIEL DRIVE	SUNNYVALE CA 94086
11236	CTS CORPORATION RESISTOR NETWORKS DIVISION	406 PARR ROAD	BERNE IN 46711–9506
11502	IRC, INC	PO BOX 1860	BOONE NC 28607–1860
12697	CLAROSTAT MFG CO INC	12055 ROJAS DRIVE SUITE K	EL PASO, TX 79936
12969	MICROSEMI CORPORATION WATERTOWN DIVISION	530 PLEASANT STREET	WATERTOWN MA 02172
13103	THERMALLOY CO INC	2021 W VALLEY VIEW LN PO BOX 810839	DALLAS TX 75381
14301	ANDERSON ELECTRONICS INC	PO BOX 89	HOLLIDAYSBURG PA 16648–0089
14552	MICROSEMI CORP	2830 S FAIRVIEW ST	SANTA ANA CA 92704–5948
15454	KETEMA RODAN DIVISION	2900 BLUE STAR STREET	ANAHEIM CA 92806–2591
17856	SILICONIX INC	2201 LAURELWOOD RD	SANTA CLARA CA 95054–1516
18796	MURATA ELECTRONICS NORTH AMERICA INC. STATE COLLEGE OPERATIONS	1900 W COLLEGE AVE	STATE COLLEGE PA 16801–2723
19701	PHILIPS COMPONENTS DISCRETE PRODUCTS DIV RESISTIVE PRODUCTS FACILITY AIRPORT ROAD	PO BOX 760	MINERAL WELLS TX 76067–0760
2K262	BOYD CORP	6136 NE 87th AVE PO BOX 20038	PORTLAND OR 97220
20093	ELECTRICAL INDUSTRIES SUB OF NORTH AMERICAN PHILLIPS CORP	691 CENTRAL AVE	MURRAY HILL NJ 07974–1507
22526	BERG ELECTRONICS INC (DUPONT)	857 OLD TRAIL RD	ETTERS PA 17319
24355	ANALOG DEVICES INC	1 TECHNOLOGY DRIVE	NORWOOD MA 02062
24546	DALE ELECTRONICS A VISHAY INTERTECHNOLOGY INC CO	550 HIGH ST	BRADFORD PA 16701–3737
26364	COMPONENTS CORP	6 KINSEY PLACE	DENVILLE NJ 07834–2611
27014	NATIONAL SEMICONDUCTOR CORP	2900 SEMICONDUCTOR DR	SANTA CLARA CA 95051–0606
31918	ITT CANNON SWITCH PRODUCTS	8081 WALLACE RD	EDEN PRAIRIE MN 55344–8798
32997	BOURNS INC TRIMPOT DIV	1200 COLUMBIA AVE	RIVERSIDE CA 92507–2114
34361	OMRON ELECTRONICS INC.	2105 HAMILTON AVE SUITE 160	SAN JOSE, CA 95125
34371	HARRIS SEMICONDUCTOR SEMICONDUCTOR SECTOR	MS 58–71 PO BOX 883	MELBOURNE, FL 32902–0883

Manufacturers cross index (Cont.)

Mfr. code	Manufacturer	Address	City, state, zip code
48726	UNITRODE INTEGRATED CIRCUITS CORP (UICC)	7 CONTINENTAL BLVD PO BOX 399	MERRIMACK NH 03054–0399
50139	ALLEN–BRADLEY CO ELECTRONIC COMPONENTS	1414 ALLEN BRADLEY DR	EL PASO TX 79936
50434	HEWLETT–PACKARD CO OPTOELECTRONICS DIV	370 W TRIMBLE RD	SAN JOSE CA 95131–1008
50444	HEWLETT–PACKARD CO H P LABORATORIES	1501 PAGE MILL RD	PALO ALTO CA 94304–1126
51406	MURATA ELECTRONICS NORTH AMERICA INC HEADQUARTERS AND GEORGIA OPERATIONS	2200 LAKE PARK DR	SMYRNA GA 30080
52769	SPRAGUE–GOODMAN ELECTRONICS INC	1700 SHAMES DRIVE	WESTBURY, NY 11590
53387	3M COMPANY ELECTRONIC PRODUCTS DIV	3M AUSTIN CENTER	AUSTIN TX 78769–2963
55335	JKL COMPONENTS CORP	13343 PAXTON STREET	PACOIMA CA 91331
55680	NICHICON /AMERICA/ CORP	927 E STATE PKY	SCHAUMBURG IL 60195–4526
56501	THOMAS & BETTS CORP	1555 LYNNFIELD RD	MEMPHIS, TN
56699	PHILIPS COMPONENTS DISCRETE PRODUCTS DIV FILM & ELECTROLYTIC CAP FAC	6071 ST ANDREWS RD	COLUMBIA SC 29212–3198
56845	DALE ELECTRONICS INC	2300 RIVERSIDE BLVD PO BOX 74	NORFOLK NE 68701–2242
57668	ROHM CORPORATION	15375 BARRANCA PARKWAY SUITE B207	IRVINE CA 92718
58050	TEKA PRODUCTS INC	45 SALEM ST	PROVIDENCE RI 02907
59660	TUSONIX INC	7741 N BUSINESS PARK DR PO BOX 37144	TUCSON AZ 85740–7144
60395	XICOR INC	851 BUCKEYE CT	MILPITAS CA 95035–7408
61429	FOX ELECTRONICS DIV OF FOX ELECTRONICS INC	5842 CORPORATION CIRCLE	FOR MEYERS FL 33905
61935	SCHURTER INC	1016 CLEGG COURT	PETALUMA CA 94952–1152
62643	UNITED CHEMICON INC	9801 W HIGGINS ST SUITE 430	ROSEMONT, IL 60018–4771
65654	CHRISTIANA INDUSTRIES CORP	6500 N CLARK ST	CHICAGO IL 62606–4002
66182	INTERFET CORP	332 GOLD STREET	GARLAND TX 75042–6643
71400	BUSSMANN DIV OF COOPER INDUSTRIES INC	114 OLD STATE RD PO BOX 14460	ST LOUIS MO 63178
73743	FISCHER SPECIAL MFG CO	111 INDUSTRIAL RD	COLD SPRING KY 41076–9749
75042	IRC ELECTRONIC COMPONENTS PHILADELPHIA DIV TRW FIXED RESISTORS	401 N BROAD ST	PHILADELPHIA PA 19108–1001
75498	MULTICOMP INC	3005 SW 154TH TERRACE #3	BEAVERTON OR 97006
76493	BELL INDUSTRIES INC JW MILLER DIV	306 E ALONDRA BLVD PO BOX 2859	GARDENA, CA 90247–1059
8X345	NORTHWEST SPRING MFG CO	5858 WILLOW LANE	LAKE OSWEGO, OR 97035

Manufacturers cross index (Cont.)

Mfr. code	Manufacturer	Address	City, state, zip code
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077–0001
83701	ELECTRONIC DEVICES INC	21 GREY OAKS AVE	YONKERS NY 10710–3205
9M860	ELECTRONIC SUB ASSEMBLY MFG CORP (ESAM)	930 SE M STREET PO BOX 376	GRANTS PASS OR 97526–3248
91637	DALE ELECTRONICS INC	2064 12TH AVE PO BOX 609	COLUMBUS NE 68601–3632

Replaceable electrical parts list

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A1	671–2890–10		B039999	CIRCUIT BD ASSY:POWER SUPPLY	80009	671289010
A1	671–2890–11	B040000	B042145	CIRCUIT BD ASSY:POWER SUPPLY (1720 SCH ONLY)	80009	671289011
A1	671–2890–12	B042146		CIRCUIT BD ASSY:POWER SUPPLY (1720 SCH ONLY)	80009	671289011
A1	671–2890–11	B040000	B040823	CIRCUIT BD ASSY:POWER SUPPLY (1721 SCH ONLY)	80009	671289011
A1	671–2890–12	B040824		CIRCUIT BD ASSY:POWER SUPPLY (1721 SCH ONLY)	80009	671289011
A2	671–2236–00		B039999	CIRCUIT BD ASSY:FRONT PANEL	80009	671223600
A2	671–2236–01	B040000		CIRCUIT BD ASSY:FRONT PANEL	80009	671223601
A3	672–1367–06		B031540	CKT BD ASSY:MAIN;NTSC	80009	672136706
A3	672–1367–07	B031541	B041759	CKT BD ASSY:MAIN;NTSC	80009	672136707
A3	672–1367–08	B041760	B041970	CKT BD ASSY:MAIN;NTSC	80009	672136708
A3	672–1367–09	B041971	B041980	CKT BD ASSY:MAIN;NTSC	80009	672136709
A3	672–1367–10	B041981	B042018	CKT BD ASSY:MAIN;NTSC	80009	672136709
A3	672–1367–11	B042019	B042104	CKT BD ASSY:MAIN;NTSC	80009	672136709
A3	672–1367–12	B042105		CKT BD ASSY:MAIN;NTSC (1720SCH ONLY)	80009	672136709
A3	672–1368–06		B030744	CKT BD ASSY:MAIN;PAL	80009	672136806
A3	672–1368–07	B030745	B040757	CKT BD ASSY:MAIN;PAL	80009	672136807
A3	672–1368–08	B040758	B040790	CKT BD ASSY:MAIN;PAL	80009	672136808
A3	672–1368–09	B040782	B040791	CKT BD ASSY:MAIN;PAL	80009	672136809
A3	672–1368–10	B040792	B040808	CKT BD ASSY:MAIN;PAL	80009	672136809
A3	672–1368–11	B040809	B040820	CKT BD ASSY:MAIN;PAL	80009	672136809
A3	672–1368–12	B040821		CKT BD ASSY:MAIN;PAL (1721SCH ONLY)	80009	672136809
A3A1	671–1796–01			CIRCUIT BD ASSY:GRATICULE LIGHT	80009	671179600
A4	671–2234–05		B042145	CKT BD ASSY:NTSC	80009	671223405
A4	671–2234–06	B042146		CKT BD ASSY:NTSC (1720SCH ONLY)	80009	671223405
A4	671–2235–05		B040823	CKT BD ASSY:PAL	80009	671223505
A4	671–2235–06	B040824		CKT BD ASSY:PAL (1721SCH ONLY)	80009	671223505
A10	671–3637–00			CIRCUIT BD ASSY:CRT SOCKET BD	80009	671363700
A11	671–3761–00			CKT BD ASSY:SERIAL FILTER	80009	671376100

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A1	671–2890–10		B039999	CIRCUIT BD ASSY:POWER SUPPLY	80009	671289010
A1	671–2890–11	B040000	B042145	CIRCUIT BD ASSY:POWER SUPPLY (1720 ONLY)	80009	671289011
A1	671–2890–12	B042146		CIRCUIT BD ASSY:POWER SUPPLY (1720 ONLY)	80009	671289011
A1	671–2890–11	B040000	B040823	CIRCUIT BD ASSY:POWER SUPPLY (1721 ONLY)	80009	671289011
A1	671–2890–12	B040824		CIRCUIT BD ASSY:POWER SUPPLY (1721 ONLY)	80009	671289011
A1C1	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C2	283–0021–00			CAP,FXD,CER DI:0.001UF,20%,5000V	TK2058	TCK45YS3H102M–A
A1C3	283–0261–00			CAP,FXD,CER DI:0.01UF,20%,4000V	18796	DHR28Z5U103M4KV
A1C4	283–0261–00			CAP,FXD,CER DI:0.01UF,20%,4000V	18796	DHR28Z5U103M4KV
A1C5	285–1341–01			CAP,FXD,PLSTC:MTLZD FILM;0.1UF,20%,100V,POLYESTER	TK1913	MKS 2 0.1UF 20%
A1C6	281–0771–00			CAP,FXD,CER DI:2200PF,20%,200V	04222	SA102C222MAA
A1C7	285–1470–00			CAP,FXD,PLSTC:MTLZD FILM;330PF,1600VD C/500VAC,POLYPROPYLENE,11 X18	TK1913	FKP1 330/1600/5
A1C8	283–0261–00			CAP,FXD,CER DI:0.01UF,20%,4000V	18796	DHR28Z5U103M4KV
A1C9	283–0261–00			CAP,FXD,CER DI:0.01UF,20%,4000V	18796	DHR28Z5U103M4KV
A1C10	281–0563–00			CAP,FXD,CERAMIC:MLC;0.47UF,20%,50V,0.150 X .290	04222	SA305E474MAA
A1C11	283–0021–00			CAP,FXD,CER DI:0.001UF,20%,5000V	TK2058	TCK45YS3H102M–A
A1C12	281–0707–00			CAP,FXD,CER DI:15000PF,10%,200V	04222	MA302C153KAA
A1C13	281–0707–00			CAP,FXD,CER DI:15000PF,10%,200V	04222	MA302C153KAA
A1C14	281–0707–00			CAP,FXD,CER DI:15000PF,10%,200V	04222	MA302C153KAA
A1C15	285–1341–01			CAP,FXD,PLMTLZDSTC: FILM;0.1UF,20%,100V,POLYESTER	TK1913	MKS 2 0.1UF 20%
A1C16	290–1311–00			CAP,FXD,ALUM:10UF,20%,50V,ESR=1.4 OHM(100KHZ,20C), 5X11MM,105C,5000HRS	55680	UPL1H100MDH1TD
A1C17	285–1341–01			CAP,FXD,PLSTC:MTLZD FILM;0.1UF,20%,100V,POLYESTER	TK1913	MKS 2 0.1UF 20%
A1C18	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C19	290–1310–00			CAP,FXD,ALUM:10UF,20%,160V,ESR=24.9 OHM(120HZ,20C), LS=0.200 INCH,13X20MM,105C,5000HRS	0H1N5	CEJSM2C100M
A1C20	281–0707–00			CAP,FXD,CER DI:15000PF,10%,200V	04222	MA302C153KAA
A1C21	281–0707–00			CAP,FXD,CER DI:15000PF,10%,200V	04222	MA302C153KAA
A1C22	281–0563–00			CAP,FXD,CERAMIC:MLC;0.47UF,20%,50V,0.150 X .290	04222	SA305E474MAA
A1C23	285–1328–00			CAP,FXD,PLSTC:MTLZD FILM;0.01UF,5%,20 00V,POLYPROPYLENE,1.25X.95	TK1913	FKP1 .01/2000/5
A1C24	290–1310–00			CAP,FXD,ALUM:10UF,20%,160V,ESR=24.9 OHM(120HZ,20C), LS=0.200 INCH,13X20MM,105C,5000HRS	0H1N5	CEJSM2C100M
A1C25	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C27	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C28	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C29	290–1267–00			CAP,FXD,ALUM:560UF,20%,50V,ESR=0.40 OHM (100KHZ,20C)	0H1N5	CEEFM1H561M7
A1C30	290–1267–00			CAP,FXD,ALUM:560UF,20%,50V,ESR=0.40 OHM (100KHZ,20C)	0H1N5	CEEFM1H561M7
A1C31	290–1267–00			CAP,FXD,ALUM:560UF,20%,50V,ESR=0.40 OHM (100KHZ,20C)	0H1N5	CEEFM1H561M7

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A1C32	290–1267–00			CAP,FXD,ALUM:560UF,20%,50V,ESR=0.40 OHM (100KHZ,20C)	0H1N5	CEEFM1H561M7
A1C33	290–1310–00			CAP,FXD,ALUM:10UF,20%,160V,ESR=24.9 OHM(120HZ,20C), LS=0.200 INCH,13X20MM,105C,5000HRS	0H1N5	CEJSM2C100M
A1C34	290–1310–00			CAP,FXD,ALUM:10UF,20%,160V,ESR=24.9 OHM(120HZ,20C), LS=0.200 INCH,13X20MM,105C,5000HRS	0H1N5	CEJSM2C100M
A1C35	290–1267–00			CAP,FXD,ALUM:560UF,20%,50V,ESR=0.40 OHM (100KHZ,20C)	0H1N5	CEEFM1H561M7
A1C36	290–1267–00			CAP,FXD,ALUM:560UF,20%,50V,ESR=0.40 OHM (100KHZ,20C)	0H1N5	CEEFM1H561M7
A1C37	290–1267–00			CAP,FXD,ALUM:560UF,20%,50V,ESR=0.40 OHM (100KHZ,20C)	0H1N5	CEEFM1H561M7
A1C38	290–1267–00			CAP,FXD,ALUM:560UF,20%,50V,ESR=0.40 OHM (100KHZ,20C)	0H1N5	CEEFM1H561M7
A1C39	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C40	281–0772–00			CAP,FXD,CERAMIC:MLC;4700PF,10%,100V,0.100 X	04222	SA101C472KAA
A1C41	281–0563–00			CAP,FXD,CERAMIC:MLC;0.47UF,20%,50V,0.150 X .290	04222	SA305E474MAA
A1C42	290–1267–00			CAP,FXD,ALUM:560UF,20%,50V,ESR=0.40 OHM (100KHZ,20C)	0H1N5	CEEFM1H561M7
A1C43	281–0563–00			CAP,FXD,CERAMIC:MLC;0.47UF,20%,50V,0.150 X .290	04222	SA305E474MAA
A1C44	285–1331–00			CAP,FXD,MTLZD:0.47UF,5%,400V	TK1913	MKS4 .47/400/5
A1C45	281–0563–00			CAP,FXD,CERAMIC:MLC;0.47UF,20%,50V,0.150 X .290	04222	SA305E474MAA
A1C46	283–0005–03			CAP,FXD,CER DI:0.01 UF,+80–20%,250V	04222	SR30VE103ZAATR2
A1C47	281–0563–00		671–2890–11	CAP,FXD,CERAMIC:MLC;0.47UF,20%,50V,0.150 X .290	04222	SA305E474MAA
A1C47	283–0059–00	671–2890–12		CAP,FXD,CERAMIC:MLC;1.0UF,20%,50V,0.150 X .290	04222	SA305E474MAA
A1C48	281–0809–00			CAP,FXD,CERAMIC:MLC;200 PF,5%,100V,0.100 X 0.170	04222	SA101A201JAA
A1C49	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C50	281–0563–00			CAP,FXD,CERAMIC:MLC;0.47UF,20%,50V,0.150 X .290	04222	SA305E474MAA
A1C51	281–0773–00			CAP,FXD,CERAMIC:MLC;0.01UF,10%,100V	TK1743	CGB103KEX
A1C52	281–0773–00			CAP,FXD,CERAMIC:MLC;0.01UF,10%,100V	TK1743	CGB103KEX
A1C53	285–1437–00			CAP,FXD,PLSTC:100PF,5%,1600VDC/500VAC	TK1913	FKP1/100/1600/5
A1C54	290–1275–00			CAP,FXD,ALUM:330UF,20%,400V,35X35MM,105C	55680	LGQ2G331MHSC
A1C56	285–1246–00			CAP,FXD,PPR DI:0.022UF,20%,250VAC	TK0515	PME 289 MB 5220
A1C57	285–1222–00			CAP,FXD,PLSTC:0.068UF,20%,250V	TK0515	PME 271 M 568
A1C58	281–0809–00			CAP,FXD,CERAMIC:MLC;200 PF,5%,100V,0.100 X 0.170	04222	SA101A201JAA
A1C59	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C60	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A1C61	281–0768–00			CAP,FXD,CER DI:470PF,20%,100V	04222	SA101A471KAA
A1C65	285–1301–01			CAP,FXD,MTLZD:0.47UF,10%,50VTAPE & AMMO PACK	TK1913	MKS 2 .47/50 OR
A1C66	290–1311–00			CAP,FXD,ALUM:10UF,20%,50V,ESR=1.4 OHM(100KHZ,20C), 5X11MM,105C,5000HRS	55680	UPL1H100MDH1TD
A1CR1	152–0061–00			DIODE,SIG:200V,0.1A,700NS,4.0PF	12969	PV122
A1CR2	152–0061–00			DIODE,SIG:200V,0.1A,700NS,4.0PF	12969	PV122
A1CR3	152–0061–00			DIODE,SIG:200V,0.1A,700NS,4.0PF	12969	PV122
A1CR4	152–0409–00			DIODE,RECT:FAST RCVRY;12KV,10MA,250NS	83701	CRVT150

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A1CR5	152–0061–00			DIODE,SIG:200V,0.1A,700NS,4.0PF	12969	PV122
A1CR6	152–0061–00			DIODE,SIG:200V,0.1A,700NS,4.0PF	12969	PV122
A1CR7	152–0400–00			DIODE,RECT:FAST RCVRY;400V,1A,200NS	0LUA3	1N4936
A1CR8	152–0400–00			DIODE,RECT:FAST RCVRY;400V,1A,200NS	0LUA3	1N4936
A1CR9	152–0400–00			DIODE,RECT:FAST RCVRY;400V,1A,200NS	0LUA3	1N4936
A1CR10	152–0400–00			DIODE,RECT:FAST RCVRY;400V,1A,200NS	0LUA3	1N4936
A1CR11	152–0814–00		671–2890–11	DIO,RECT:ULTRA FAST;150V,3A,1.1VF,30NS,SOFT RCVRY	0LUA3	BYV28–150
A1CR11	152–0808–00	671–2890–12		DIO,RECT:ULTRA FAST;150V,3A,1.1VF,30NS,SOFT RCVRY	0LUA3	BYV28–150
A1CR12	152–0400–00			DIODE,RECT:FAST RCVRY;400V,1A,200NS	0LUA3	1N4936
A1CR13	152–1191–00			DIODE,RECT:SCHTKY;100V,10A,150A IFSM,800MVF AT 10A	04713	MBR10100
A1CR14	152–0400–00			DIODE,RECT:FAST RCVRY;400V,1A,200NS	0LUA3	1N4936
A1CR15	152–0400–00			DIODE,RECT:FAST RCVRY;400V,1A,200NS	0LUA3	1N4936
A1CR16	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A1CR17	152–0400–00			DIODE,RECT:FAST RCVRY;400V,1A,200NS	0LUA3	1N4936
A1CR19	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A1CR20	152–0897–00			DIODE,RECT:FAST RCVRY;1000V,1.5A,300NS,SOFT RCVRY	0LUA3	BYV96E
A1CR21	152–1165–00			DIODE,RECT:ULTRA FAST;600V,4A,50NS	04713	MUR460RL
A1CR22	152–1165–00			DIODE,RECT:ULTRA FAST;600V,4A,50NS	04713	MUR460RL
A1CR23	152–1165–00			DIODE,RECT:ULTRA FAST;600V,4A,50NS	04713	MUR460RL
A1CR24	152–1165–00			DIODE,RECT:ULTRA FAST;600V,4A,50NS	04713	MUR460RL
A1CR25	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A1CR26	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A1CR27	152–0400–00			DIODE,RECT:FAST RCVRY;400V,1A,200NS	0LUA3	1N4936
A1CR29	152–0400–00			DIODE,RECT:FAST RCVRY;400V,1A,200NS	0LUA3	1N4936
A1CR30	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A1CR31	152–0400–00			DIODE,RECT:FAST RCVRY;400V,1A,200NS	0LUA3	1N4936
A1DS1	150–0050–00			LAMP,GLOW:135V MAX,1.9MA,C2A–T,WIRE LEAD	0J9R2	NE–2Q–11R–T
A1DS2	150–0050–00			LAMP,GLOW:135V MAX,1.9MA,C2A–T,WIRE LEAD	0J9R2	NE–2Q–11R–T
A1DS3	150–0050–00			LAMP,GLOW:135V MAX,1.9MA,C2A–T,WIRE LEAD	0J9R2	NE–2Q–11R–T
A1DS4	150–0050–00			LAMP,GLOW:135V MAX,1.9MA,C2A–T,WIRE LEAD	0J9R2	NE–2Q–11R–T
A1F1	159–0021–00			FUSE,CARTRIDGE:3AG,2A,250V,FAST BLOW	71400	AGC–2
				MOUNTING PARTS		
	200–2264–00			CAP,FUSEHOLDER:3AG FUSES,	61935	FEK 031 1666
	204–0906–00			BODY,FUSEHOLDER:3AG & 5 X 20MM FUSES	61935	TYPE FAU 031.35
				END MOUNTING PARTS		
A1J1	131–5338–00			CONN,HDR:PCB/WIREWRAP;MALE,STR,1 X 7,0.15CTR, 0.230 MLG X 0.285 TAIL,30 GOLD,SIDE BYSIDE STACKABLE	22526	65561–107
A1J2	131–4794–00			CONN,HDR:PCB;MALE,STR,1 X 2,0.1 CTR,0.235MLG X 0.112 TAIL,30GOLD,0.035 DIA PCB,SAFETY CONTROLLED	53387	2402–6112 UB

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A1J3	131–5337–00			CONN,HDR:PCB/WIREWRAP;MALE,STR,1 X 4,0.150	22526	65561–104
A1J4	131–3392–00			CONN,HDR:PCB;MALE,STR,1 X 10,0.1 CTR,0.230	00779	1–102844–1
A1J6	119–1946–00			FILTER,RFI:1A,250V,400HZ W/PC TERMINAL	0GV52	FX326–1/02–K–D–
A1L1	108–1412–00			INDUCTOR,FXD:POWER;4.7UH,20%,I<3.7A,RDC<0.017 OHM,Q>10,SRF>30MHZ,BOBBIN	TK2058	TSL0807–4R7M3R0
A1L2	108–1412–00			INDUCTOR,FXD:POWER;4.7UH,20%,I<3.7A,RDC<0.017 OHM,Q>10,SRF>30MHZ,BOBBIN	TK2058	TSL0807–4R7M3R0
A1L3	108–1412–00			INDUCTOR,FXD:POWER;4.7UH,20%,I<3.7A,RDC<0.017 OHM,Q>10,SRF>30MHZ,BOBBIN	TK2058	TSL0807–4R7M3R0
A1L4	108–0205–00			INDUCTOR,FXD:POWER;1MH,5%,IDC<400 MA,RDC<2.12 OHM,Q>47@0.25MHZ	76493	8209
A1Q1	151–0749–00			TRANSISTOR,SIG:BIPOLAR,PNP;400V,500MA,50MHZ,AMPL	04713	MPSA94
A1Q2	151–0190–00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904
A1Q3	151–0350–03			TRANSISTOR,SIG:BIPOLAR,PNP;150V,600MA,100MHZ	04713	2N5401RLRP
A1Q4	151–0347–02			TRANSISTOR,SIG:BIPOLAR,NPN;160V,600MA,100MHZ	04713	2N5551RLRP
A1Q5	151–0350–03			TRANSISTOR,SIG:BIPOLAR,PNP;150V,600MA,100MHZ	04713	2N5401RLRP
A1Q6	151–0476–00			TRANSISTOR,PWR:BIPOLAR,NPN;100V,3.0A,3.0MHZ,AMPL	04713	TIP31C
				ATTACHED PARTS		
	214–3848–00			HEAT SINK,SEMIC:TRANSISTOR,TO–220;ALUMINUM, CLIP–ON,BLACK ANODIZE	13103	6043PB
				END ATTACHED PARTS		
A1Q7	151–0190–00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904
A1Q8	151–0190–00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904
A1Q9	151–1286–00			TRANSISTOR,PWR:MOS,N–CH;800V,4.0A,3.0 OHM	0LUA3	BUK456–800A
				ATTACHED PARTS		
	210–0406–00			NUT,PLAIN,HEX:4–40 X 0.188,BRS CD PL	73743	12161–50
	211–0008–00			SCREW,MACHINE:4–40 X 0.25,PNH,STL	TK0435	ORDER BY DESC
	214–3841–00			HEAT SINK,SEMIC:TRANSISTOR,TO–220;VERT MT,(2) SOLDERABLE TABS,ALUM,BLACK ANODIZE	13103	6021PB
				END ATTACHED PARTS		
A1Q10	151–0350–03			TRANSISTOR,SIG:BIPOLAR,PNP;150V,600MA,100MHZ	04713	2N5401RLRP
A1Q11	151–0528–00			THYRISTOR,PWR:BIPOLAR,SCR;50V,16A RMS,PHASE	0LUA3	BT152–400R
A1R1	303–0155–00			RES,FXD,CMPSN:1.5M OHM,5%,1W	50139	GB1555
A1R2	301–0225–02			RES,FXD,CMPSN:2.2M OHM,5%,0.5W	50139	EB2255
A1R3	303–0155–00			RES,FXD,CMPSN:1.5M OHM,5%,1W	50139	GB1555
A1R4	303–0155–00			RES,FXD,CMPSN:1.5M OHM,5%,1W	50139	GB1555
A1R5	303–0155–00			RES,FXD,CMPSN:1.5M OHM,5%,1W	50139	GB1555
A1R7	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A1R8	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A1R11	311–1256–00			RES,VAR,TRMR:CERMET;2.5M OHM,10%,0.5W,0.375	32997	3386F–1–255

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A1R12	315–0471–03			RES,FXD,CMPSN:470 OHM,5%,0.25W	50139	CB4715
A1R13	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A1R14	322–3001–00			RES,FXD:METAL FILM;10 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10R00F
A1R20	322–3248–00			RES,FXD,FILM:3.74K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF50G37400F
A1R22	322–3329–00			RES,FXD,FILM:26.1K OHM.1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G26101F
A1R24	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A1R25	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A1R26	322–3452–00			RES,FXD,FILM:499K OHM,1%,0.2W,TC=TOMI,SMALL	91637	CCF50–2–G4993FT
A1R27	322–3300–02			RES,FXD,FILM:13K OHM,0.5%,0.2W,TC=T2	91637	CCF501D13001D
A1R28	322–3344–00			RES,FXD,FILM:37.4K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G37401F
A1R29	315–0470–03			RES,FXD,CMPSN:47 OHM,5%,0.25W	50139	CB4705
A1R30	315–0103–03			RES,FXD,CMPSN:10K OHM,5%,0.25W	50139	CB1035
A1R31	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A1R32	322–3452–00			RES,FXD,FILM:499K OHM,1%,0.2W,TC=TOMI,SMALL	91637	CCF50–2–G4993FT
A1R33	322–3300–02			RES,FXD,FILM:13K OHM,0.5%,0.2W,TC=T2	91637	CCF501D13001D
A1R34	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A1R35	322–3162–00			RES,FXD:METAL FILM;475 OHM,1%,0.2W,TC=100 PPM	91637	CCF50G475R0F
A1R36	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A1R37	322–3034–00			RES,FXD:METAL FILM;22.1 OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G22R10F
A1R38	315–0226–01			RES,FXD,CMPSN:22 M OHM,5%,0.25W	50139	CB2265
A1R39	315–0471–03			RES,FXD,CMPSN:470 OHM,5%,0.25W	50139	CB4715
A1R40	315–0103–03			RES,FXD,CMPSN:10K OHM,5%,0.25W	50139	CB1035
A1R41	322–3121–00			RES,FXD:METAL FILM;178 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G178R0F
A1R42	322–3402–00			RES,FXD:METAL FILM;150K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G15002F
A1R43	315–0471–03			RES,FXD,CMPSN:470 OHM,5%,0.25W	50139	CB4715
A1R44	315–0471–03			RES,FXD,CMPSN:470 OHM,5%,0.25W	50139	CB4715
A1R45	311–2239–00			RES,VAR,TRMR:CERMET;100K OHM,20%,0.5W,0.197	TK2073	GF06UT2 104 M L
A1R46	322–3001–00			RES,FXD:METAL FILM;10 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10R00F
A1R47	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A1R48	322–3239–00			RES,FXD,FILM:3.01K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G30100F
A1R49	311–2239–00		671–2890–10	RES,VAR,TRMR:CERMET;100K OHM,20%,0.5W,0.197	TK2073	GF06UT2 104 M L
A1R49	311–2236–00	671–2890–11		RES,VAR,TRMR:CERMET;20K OHM,20%,0.5W,0.197	TK2073	GF06UT2 104 M L
A1R50	322–3001–00			RES,FXD:METAL FILM;10 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10R00F
A1R51	322–3260–00			RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A1R52	322–3001–00			RES,FXD:METAL FILM;10 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10R00F
A1R53	322–3001–00			RES,FXD:METAL FILM;10 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10R00F
A1R54	322–3260–00			RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A1R55	322–3322–00			RES,FXD:METAL FILM;22.1K OHM,1%,0.2W,TC=100	91637	CCF501G22101F

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A1R56	322–3001–00			RES,FXD:METAL FILM;10 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10R00F
A1R57	322–3034–00			RES,FXD:METAL FILM;22.1 OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G22R10F
A1R58	311–2239–00			RES,VAR,TRMR:CERMET;100K OHM,20%,0.5W,0.197	TK2073	GF06UT2 104 M L
A1R59	322–3485–07			RES,FXD,FILM:5K OHM,0.1%,0.2W,TC=T9,SMALL BODY	91637	CCF501C50000B
A1R60	322–3268–00			RES,FXD,FILM:6.04K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G60400F
A1R61	322–3034–00			RES,FXD:METAL FILM;22.1 OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G22R10F
A1R62	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A1R63	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A1R64	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A1R65	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A1R66	322–3452–00			RES,FXD,FILM:499K OHM,1%,0.2W,TC=TOMI,SMALL	91637	CCF50–2–G4993FT
A1R67	322–3001–00			RES,FXD:METAL FILM;10 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10R00F
A1R68	322–3121–00			RES,FXD:METAL FILM;178 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G178R0F
A1R69	322–3289–07			RES,FXD,FILM:10K OHM,0.1%,0.2W,TC=T9,T&R,SM BODY	91637	CCF501C10001B
A1R70	322–3289–07			RES,FXD,FILM:10K OHM,0.1%,0.2W,TC=T9,T&R,SM BODY	91637	CCF501C10001B
A1R71	322–3418–00			RES,FXD:METAL FILM;221K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G22102F
A1R72	322–3001–00			RES,FXD:METAL FILM;10 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10R00F
A1R73	322–3001–00			RES,FXD:METAL FILM;10 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10R00F
A1R74	322–3260–00			RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A1R75	322–3260–00			RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A1R76	322–3248–00			RES,FXD,FILM:3.74K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF50G37400F
A1R77	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A1R78	322–3248–00			RES,FXD,FILM:3.74K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF50G37400F
A1R79	322–3356–00			RES,FXD,FILM:49.9K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G49901F
A1R80	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A1R81	322–3121–00			RES,FXD:METAL FILM;178 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G178R0F
A1R82	322–3260–00			RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A1R83	322–3289–07			RES,FXD,FILM:10K OHM,0.1%,0.2W,TC=T9,T&R,SM BODY	91637	CCF501C10001B
A1R84	322–3315–00			RES,FXD,FILM:18.7K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G18701F
A1R85	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A1R86	308–0793–00			RES,FXD:0.51 OHM,5%,1WTC=150PPM/DEG C,MI	75042	BW20 .51OHM 5PE
A1R87	322–3034–00			RES,FXD:METAL FILM;22.1 OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G22R10F
A1R88	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A1R89	307–0746–00			RES,THERMAL:5 OHM,10%,7A/DEG C	15454	SG200–S STRAI
A1R90	305–0242–00			RES,FXD,CMPSN:2.4K OHM,5%,2W	11502	GF–3 OR GS–3 24
A1R91	306–0104–00			RES,FXD,CMPSN:100K OHM,10%,2W	24546	FP42 OR FP2 100
A1R92	306–0104–00			RES,FXD,CMPSN:100K OHM,10%,2W	24546	FP42 OR FP2 100
A1R93	322–3402–00			RES,FXD:METAL FILM;150K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G15002F

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A1R94	322–3402–00			RES,FXD:METAL FILM;150K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G15002F
A1R95	322–3256–00			RES,FXD,FILM:4.53K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–2–G4531FT
A1R96	322–3356–00			RES,FXD,FILM:49.9K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G49901F
A1R97	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A1R98	322–3289–07			RES,FXD,FILM:10K OHM,0.1%,0.2W,TC=T9,T&R,SM BODY	91637	CCF501C10001B
A1R99	311–2239–00			RES,VAR,TRMR:CERMET;100K OHM,20%,0.5W,0.197	TK2073	GF06UT2 104 M L
A1R101	322–3068–00			RES,FXD:METAL FILM;49.9 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G49R90F
A1R102	308–0290–00			RES,FXD,WW:8 OHM,5%,5W	91637	CW52–8R000J T/R
A1R103	322–3452–00			RES,FXD,FILM:499K OHM,1%,0.2W,TC=TOMI,SMALL	91637	CCF50–2–G4993FT
A1T1	120–1695–00			TRANSFORMER,PWR:HIGH VOLTAGE,FEEDBACK 3V, RESONANT 231V, 100V 1MA,2750V 3.3MA, 6.3V 86MA	75498	120–1695–00
A1T2	120–1945–00			TRANSFORMER,RF:PRI 8UH,2:7,ON–OFF,VERT MT,PC MT	0JR03	120–1945–00
A1T3	120–1944–00			TRANSFORMER,RF:PRI 88V,PRI 15V,SEC 40V AT0.385A,5V AT 2A,15V AT 0.80,IDED,PC MOUNT,1.45 X 1.7 X 1.17H	75498	129–2074–EC
A1U1	152–0900–00			MODULE,HV:7.5KVAC IN,15KVDC OUT,POTTED MODULE	51406	MSL2556
A1U2	156–0067–00			IC,LINEAR:BIPOLAR,OP–AMP;	01295	UA741CP
A1U3	156–1225–00			IC,LINEAR:BIPOLAR,COMPTR;DUAL,OPEN COLL,300NS	01295	LM393P
A1U4	156–2761–01			IC,DIGITAL:HCMOS,MULTIVIBRATOR	0JR04	TC74HC221AP
A1U5	156–2524–00			IC,LINEAR:BIPOLAR,SW–REGULATOR CONTROLLER;PWM, CURRENT MODE,SINGLE TOTEM POLE OUTPUT	48726	UC3842N
A1TP1	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A1TP2	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A1VR1	156–1631–01			IC,LINEAR:BIPOLAR,VR;ADJUST,SHUNT,100MA,2.2%	01295	TL431CLPM
A1VR2	152–0195–00			DIODE,ZENER:5.1V,5%,0.4W	04713	MZ5523D
A1VR3	152–0195–00			DIODE,ZENER:5.1V,5%,0.4W	04713	MZ5523D
A1VR4	152–0149–00			DIODE,ZENER:10V,5%,0.4W	04713	1N961BRL
A1VR5	152–0287–00			DIODE,ZENER:110V,5%,0.4W	04713	1N986BRL
A1VR6	152–0287–00			DIODE,ZENER:110V,5%,0.4W	04713	1N986BRL
A1W1	131–0566–00			BUS,CONDUCTOR:DUMMY RES,0.094 OD X 0.225 L	24546	OMA0207
A1W2	131–0566–00			BUS,CONDUCTOR:DUMMY RES,0.094 OD X 0.225 L	24546	OMA0207
A1W3	131–0566–00			BUS,CONDUCTOR:DUMMY RES,0.094 OD X 0.225 L	24546	OMA0207
A1W4	131–0566–00			BUS,CONDUCTOR:DUMMY RES,0.094 OD X 0.225 L	24546	OMA0207
A2	671–2236–00		B039999	CIRCUIT BD ASSY:FRONT PANEL	80009	671223600
A2	671–2236–01	B040000		CIRCUIT BD ASSY:FRONT PANEL	80009	671223601
A2DS116	150–1286–00			DIODE,OPTO:LED;ASSEMBLY,GRN,150–1109–00 IN	TK1155	150–1286–00
A2DS132	150–1290–00			DIODE,OPTO:LED;ASSEMBLY,GRN,150–1109–00 IN	TK1155	150–1290–00
A2DS146	150–1286–00			DIODE,OPTO:LED;ASSEMBLY,GRN,150–1109–00 IN	TK1155	150–1286–00

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A2DS227	150–1283–00			LED ASSEMBLY:DIRECTIONAL;,1 IN 1	TK1155	150–1283–00
A2DS247	150–1289–00			LED ASSEMBLY:DIRECTIONAL;,2 IN 3 GREEN	TK1155	150–1289–00
A2DS521	150–1282–00			DIODE,OPTO:LED;ASSEMBLY,GRN,150–1109–00 IN	TK1155	150–1282–00
A2DS522	150–1286–00			DIODE,OPTO:LED;ASSEMBLY,GRN,150–1109–00 IN	TK1155	150–1286–00
A2DS523	150–1286–00			DIODE,OPTO:LED;ASSEMBLY,GRN,150–1109–00 IN	TK1155	150–1286–00
A2J101	175–9773–01			CA ASSY,SP:RIBBON;IDC,34,28AWG,4.64L,2X17,O.1,RCPT, CTR PLZ X 2X17,0.1CTR,PCB,SMAE SIDE	TK1462	ORDER BY DESC
A2R100	311–2402–00			ENCODER,OPTICAL:120 CYCLES PER REVOLUTION,0825 SQ,0.375–32 BUSHING,0.25O SHAFT	50434	HRPG–ASCA14R
A2R203	307–0488–00			RES NTWK,FXD,FI:5 100 OHM,20%,0.75W	11236	750–61R100 OHM
A2R212	311–2287–00		671–2236–00	RES,VAR,NONWW:PNL,20K OHM,10%,0.5W	12697	CM45210
A2R212	311–2540–00	671–2236–01		RES,VAR,NONWW:PNL,20K OHM,10%,0.5W	12697	CM45210
				* ATTACHED PARTS *		
	214–4725–00	671–2236–01		SPRING:COMPRESSION SPRING,0.026,302 STNLSS STEEL	8X345	214–4725–00
				* END ATTACHED PARTS *		
A2R232	307–0488–00			RES NTWK,FXD,FI:5 100 OHM,20%,0.75W	11236	750–61R100 OHM
A2R235	307–0488–00			RES NTWK,FXD,FI:5 100 OHM,20%,0.75W	11236	750–61R100 OHM
A2R412	311–2287–00		671–2236–00	RES,VAR,NONWW:PNL,20K OHM,10%,0.5W	12697	CM45210
A2R412	311–2540–00	671–2236–01		RES,VAR,NONWW:PNL,20K OHM,10%,0.5W	12697	CM45210
				* ATTACHED PARTS *		
	214–4725–00	671–2236–01		SPRING:COMPRESSION SPRING,0.026,302 STNLSS STEEL	8X345	214–4725–00
				* END ATTACHED PARTS *		
A2R429	311–2287–00		671–2236–00	RES,VAR,NONWW:PNL,20K OHM,10%,0.5W	12697	CM45210
A2R429	311–2540–00	671–2236–01		RES,VAR,NONWW:PNL,20K OHM,10%,0.5W	12697	CM45210
				* ATTACHED PARTS *		
	214–4725–00	671–2236–01		SPRING:COMPRESSION SPRING,0.026,302 STNLSS STEEL	8X345	214–4725–00
				* END ATTACHED PARTS *		
A2R443	311–2287–00		671–2236–00	RES,VAR,NONWW:PNL,20K OHM,10%,0.5W	12697	CM45210
A2R443	311–2540–00	671–2236–01		RES,VAR,NONWW:PNL,20K OHM,10%,0.5W	12697	CM45210
				* ATTACHED PARTS *		
	214–4725–00	671–2236–01		SPRING:COMPRESSION SPRING,0.026,302 STNLSS STEEL	8X345	214–4725–00
				* END ATTACHED PARTS *		
A2S108	260–2300–00			SWITCH,SIG:SPST;PUSH,MOM,NO,W/GROUND TERM, MANUAL INSERTION,100 GRAMS,SILVER,SEALED	34361	B3F1152
A2S125	260–2300–00			SWITCH,SIG:SPST;PUSH,MOM,NO,W/GROUND TERM, MANUAL INSERTION,100 GRAMS,SILVER,SEALED	34361	B3F1152
A2S142	260–2300–00			SWITCH,SIG:SPST;PUSH,MOM,NO,W/GROUND TERM, MANUAL INSERTION,100 GRAMS,SILVER,SEALED	34361	B3F1152
A2S222	260–2300–00			SWITCH,SIG:SPST;PUSH,MOM,NO,W/GROUND TERM, MANUAL INSERTION,100 GRAMS,SILVER,SEALED	34361	B3F1152

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A2S243	260–2300–00			SWITCH,SIG:SPST;PUSH,MOM,NO,W/GROUND TERM, MANUAL INSERTION,100 GRAMS,SILVER,SEALED	34361	B3F1152
A2S308	260–2300–00			SWITCH,SIG:SPST;PUSH,MOM,NO,W/GROUND TERM, MANUAL INSERTION,100 GRAMS,SILVER,SEALED	34361	B3F1152
A2S317	260–2300–00			SWITCH,SIG:SPST;PUSH,MOM,NO,W/GROUND TERM, MANUAL INSERTION,100 GRAMS,SILVER,SEALED	34361	B3F1152
A2S510	260–2300–00			SWITCH,SIG:SPST;PUSH,MOM,NO,W/GROUND TERM, MANUAL INSERTION,100 GRAMS,SILVER,SEALED	34361	B3F1152
A2S518	260–2300–00			SWITCH,SIG:SPST;PUSH,MOM,NO,W/GROUND TERM, MANUAL INSERTION,100 GRAMS,SILVER,SEALED	34361	B3F1152
A3	672–1367–06		B031540	CKT BD ASSY:MAIN;NTSC	80009	672136706
A3	672–1367–07	B031541	B041759	CKT BD ASSY:MAIN;NTSC	80009	672136707
A3	672–1367–08	B041760	B041970	CKT BD ASSY:MAIN;NTSC	80009	672136708
A3	672–1367–09	B041971	B041980	CKT BD ASSY:MAIN;NTSC	80009	672136709
A3	672–1367–10	B041981	B042018	CKT BD ASSY:MAIN;NTSC	80009	672136709
A3	672–1367–11	B042019	B042104	CKT BD ASSY:MAIN;NTSC	80009	672136709
A3	672–1367–12	B042105		CKT BD ASSY:MAIN;NTSC (1720SCH ONLY)	80009	672136709
A3	672–1368–06		B030744	CKT BD ASSY:MAIN;PAL	80009	672136806
A3	672–1368–07	B030745	B040757	CKT BD ASSY:MAIN;PAL	80009	672136807
A3	672–1368–08	B040758	B040790	CKT BD ASSY:MAIN;PAL	80009	672136808
A3	672–1368–09	B040791	B040791	CKT BD ASSY:MAIN;PAL	80009	672136809
A3	672–1368–10	B040792	B040808	CKT BD ASSY:MAIN;PAL	80009	672136809
A3	672–1368–11	B040809	B040820	CKT BD ASSY:MAIN;PAL	80009	672136809
A3	672–1368–12	B040821		CKT BD ASSY:MAIN;PAL (1721SCH ONLY)	80009	672136809
				ATTACHED PARTS		
	131–0998–00			BUS,CONDUCTOR:9 TERM,8.132 X 0.375 PH BRZ (QUANTITY 2)	TK1947	131–0998–00
	337–0607–00			PLATE,ELEC SHLD:CIRCUIT BOARD (QUANTITY 5)	0J260	337–0607–00
				END ATTACHED PARTS		
A3C1	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C2	290–0748–00			CAP,FXD,ELCTLT:10UF,+50–20%,25WVDC	0H1N5	CEUST1E100
A3C3	281–0812–00			CAP,FXD,CERAMIC:MLC;1000PF,10%,100V,0.100 X	04222	SA101C102KAA
A3C4	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C5	290–0748–00			CAP,FXD,ELCTLT:10UF,+50–20%,25WVDC	0H1N5	CEUST1E100
A3C7	290–0748–00			CAP,FXD,ELCTLT:10UF,+50–20%,25WVDC	0H1N5	CEUST1E100
A3C8	281–0819–00			CAP,FXD,CERAMIC:MLC;33 PF,5%,50V,0.100 X 0.170	04222	SA102A330JAA
A3C9	281–0819–00			CAP,FXD,CERAMIC:MLC;33 PF,5%,50V,0.100 X 0.170	04222	SA102A330JAA
A3C10	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3C11	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C12	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C13	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C14	290–0747–00			CAP,FXD,ELCTLT:100UF,+50–20%,25WVDC	0H1N5	CE02W1E101F
A3C15	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C16	281–0765–00			CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A3C17	281–0765–00			CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A3C18	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C19	281–0773–00			CAP,FXD,CERAMIC:MLC;0.01UF,10%,100V	TK1743	CGB103KEX
A3C20	281–0765–00			CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A3C21	281–0765–00			CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A3C22	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C23	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C24	290–0748–00			CAP,FXD,ELCTLT:10UF,+50–20%,25WVDC	0H1N5	CEUST1E100
A3C25	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C26	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C27	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C28	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C29	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C30	281–0765–00			CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A3C31	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C32	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C33	290–0778–00			CAP,FXD,ALUM:1UF,20%,50V,5 X 11 MM,NONPOLAR	62643	SMEBP50VB1R0M5X
A3C34	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C35	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C36	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C37	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C38	281–0773–00			CAP,FXD,CERAMIC:MLC;0.01UF,10%,100V	TK1743	CGB103KEX
A3C39	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C40	281–0823–00			CAP,FXD,CER DI:470PF,10%,50V	04222	SA101A471KAA
A3C41	281–0812–00			CAP,FXD,CERAMIC:MLC;1000PF,10%,100V,0.100 X	04222	SA101C102KAA
A3C42	281–0819–00			CAP,FXD,CERAMIC:MLC;33 PF,5%,50V,0.100 X 0.170	04222	SA102A330JAA
A3C43	281–0809–00			CAP,FXD,CERAMIC:MLC;200 PF,5%,100V,0.100 X 0.170	04222	SA101A201JAA
A3C44	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C45	281–0823–00			CAP,FXD,CER DI:470PF,10%,50V	04222	SA101A471KAA
A3C46	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C47	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C48	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3C49	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C50	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C51	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C52	281–0826–00			CAP,FXD,CERAMIC:MLC;2200PF,10%,100V,0.100 X	TK1743	CGB222KEX
A3C53	281–0864–00			CAP,FXD,CERAMIC:MLC;430PF,5%,100V,0.100 X 0.170	04222	SA101A431JAA
A3C54	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C55	283–0341–00			CAP,FXD,CER DI:0.047UF,10%,100V,X7R,0.20 X 0.20,O.2 LS;RADIAL	04222	SR211C473KAA
A3C56	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C57	283–0638–01	672–1367–06		CAP,FXD,MICA DI:130PF,1%,500V,TAPE & AMMO PACK	09023	CDA15FD131F03
A3C57	283–0674–01	672–1368–06		CAP,FXD,MICA DI:85PF,500VTAPED & REELED	TK0891	RDM15FD850F03
A3C58	283–0633–01			CAP,FXD,MICA DI:77PF,1%,500V,RADIAL	09023	CDA15ED770F03
A3C59	281–0812–00			CAP,FXD,CERAMIC:MLC;1000PF,10%,100V,0.100 X	04222	SA101C102KAA
A3C60	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C61	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C62	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C63	281–0812–00			CAP,FXD,CERAMIC:MLC;1000PF,10%,100V,0.100 X	04222	SA101C102KAA
A3C64	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C65	281–0809–00			CAP,FXD,CERAMIC:MLC;200 PF,5%,100V,0.100 X 0.170	04222	SA101A201JAA
A3C66	281–0765–00	672–1367–06		CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A3C66	281–0864–00	672–1368–06		CAP,FXD,CERAMIC:MLC;430PF,5%,100V,0.100 X 0.170	04222	SA101A431JAA
A3C67	281–0823–00			CAP,FXD,CER DI:470PF,10%,50V	04222	SA101A471KAA
A3C68	283–0768–01			CAP,FXD,MICA DI:132PF,1%,500VTAPE & AMMO PACK	09023	CDA15FD(132)F03
A3C69	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C70	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C71	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C72	283–0638–01	672–1367–06		CAP,FXD,MICA DI:130PF,1%,500VTAPE & AMMO PACK	09023	CDA15FD131F03
A3C72	283–0674–01	672–1368–06		CAP,FXD,MICA DI:85PF,500VTAPED & REELED	TK0891	RDM15FD850F03
A3C73	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C74	283–0630–01	672–1367–06		CAP,FXD,MICA DI:110PF,1%,500V,TAPE & AMMO PACK	09023	CDA15FD111F03
A3C74	283–0629–01	672–1368–06		CAP,FXD,MICA DI:62PF,1%,500V,TAPE & AMMO PACK	09023	CDA10ED620F03
A3C75	281–0187–00			CAP,VAR,PLSTC:4–40PF,250V	56699	2222 809 08002
A3C76	281–0799–00			CAP,FXD,CER DI:62PF,2%,100V	04222	SA102A620GAA
A3C77	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C78	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C79	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C80	281–0799–00			CAP,FXD,CER DI:62PF,2%,100V	04222	SA102A620GAA
A3C81	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C82	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3C83	281–0823–00			CAP,FXD,CER DI:470PF,10%,50V	04222	SA101A471KAA
A3C84	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C85	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C86	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C87	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C88	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C89	281–0823–00	672–1367–06		CAP,FXD,CER DI:470PF,10%,50V	04222	SA101A471KAA
A3C89	281–0826–00	672–1368–06		CAP,FXD,CERAMIC:MLC;2200PF,10%,100V,0.100 X	TK1743	CGB222KEX
A3C90	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C91	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C92	281–0799–00	672–1367–06		CAP,FXD,CER DI:62PF,2%,100V	04222	SA102A620GAA
A3C92	281–0537–00	672–1368–06		CAP,FXD,CERAMIC:MLC;0.68PF,20%,500V,0.170 X	80009	281053700
A3C93	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C94	290–0943–00	672–1367–06		CAP,FXD,ALUM:47UF,+50–20%,25V,6 X 11MM	0H1N5	CEUSM1E470–Q
A3C95	290–0943–00	672–1367–06		CAP,FXD,ALUM:47UF,+50–20%,25V,6 X 11MM	0H1N5	CEUSM1E470–Q
A3C96	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C97	281–0765–00			CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A3C98	281–0823–00			CAP,FXD,CER DI:470PF,10%,50V	04222	SA101A471KAA
A3C99	283–0644–01			CAP,FXD,MICA DI:150PF,1%,500VTAPE & AMMO PACK	TK0891	ADVISE
A3C100	283–0644–01			CAP,FXD,MICA DI:150PF,1%,500VTAPE & AMMO PACK	TK0891	ADVISE
A3C101	283–0615–01	672–1367–06		CAP,FXD,MICA DI:33PF,5%,500V,TAPE & AMMO PACK	09023	CDA15ED330J03
A3C101	283–0638–01	672–1368–06		CAP,FXD,MICA DI:130PF,1%,500VTAPE & AMMO PACK	09023	CDA15FD131F03
A3C102	281–0759–00			CAP,FXD,CERAMIC:MLC;22PF,10%,100V,0.100 X 0.170	04222	SA102A220KAA
A3C103	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C105	283–0677–01			CAP,FXD,MICA DI:82PF,1%,500V,TAPE & AMMO PACK	09023	CDA15ED820F03
A3C107	283–0677–01			CAP,FXD,MICA DI:82PF,1%,500V,TAPE & AMMO PACK	09023	CDA15ED820F03
A3C108	281–0861–00			CAP,FXD,CER DI:270PF,5%,50V	04222	SA101A271JAA
A3C109	281–0928–00			CAP,FXD,CER DI:150PF,5%	04222	SA101A151JAA
A3C110	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C111	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C112	283–0725–01			CAP,FXD,MICA DI:214PF,1%,500V,TAPE & AMMO PACK	09023	CDA15FD(214)F03
A3C113	283–0725–01			CAP,FXD,MICA DI:214PF,1%,500V,TAPE & AMMO PACK	09023	CDA15FD(214)F03
A3C114	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C115	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C116	281–0763–00			CAP,FXD,CERAMIC:MLC;47PF,10%,100V,0.100 X 0.170	04222	SA102A470KAA
A3C117	281–0773–00			CAP,FXD,CERAMIC:MLC;0.01UF,10%,100V	TK1743	CGB103KEX
A3C118	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C119	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3C120	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C121	281–0812–00			CAP,FXD,CERAMIC:MLC;1000PF,10%,100V,0.100 X	04222	SA101C102KAA
A3C122	281–0812–00			CAP,FXD,CERAMIC:MLC;1000PF,10%,100V,0.100 X	04222	SA101C102KAA
A3C123	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C124	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C125	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C126	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C127	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C128	281–0757–00			CAP,FXD,CERAMIC:MLC;10PF,10%,200V,NPO,0.100	04222	SA102A100KAA
A3C129	281–0765–00			CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A3C130	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C131	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C132	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C133	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C134	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C135	281–0928–00			CAP,FXD,CER DI:150PF,5%	04222	SA101A151JAA
A3C136	281–0773–00			CAP,FXD,CERAMIC:MLC;0.01UF,10%,100V	TK1743	CGB103KEX
A3C137	281–0773–00			CAP,FXD,CERAMIC:MLC;0.01UF,10%,100V	TK1743	CGB103KEX
A3C138	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C139	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C140	290–0776–01			CAP,FXD,ALUM:22UF,20%,10V,ESR=15.07 OHM (120HZ,20C)	55680	UVX1A220MDA1TD
A3C141	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C142	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C143	281–0773–00			CAP,FXD,CERAMIC:MLC;0.01UF,10%,100V,,	TK1743	CGB103KEX
A3C144	281–0158–00			CAP,VAR,CER DI:7–45PF,100WVDC SUBMIN CER DISC TOP ADJ	59660	518–006 G 7–45
A3C145	290–0943–00			CAP,FXD,ALUM:47UF,+50–20%,25V,6 X 11MM	0H1N5	CEUSM1E470–Q
A3C146	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C148	283–0788–01	672–1367–06		CAP,FXD,MICA DI:267PF,1%,500V,TAPE & AMMO PACK	09023	CDA15FD(267)F03
A3C148	283–0646–01	672–1368–06		CAP,FXD,MICA DI:170PF,1%,500V,TAPE & AMMO PACK	09023	CDA15FD171F03
A3C149	283–0633–01	672–1367–06		CAP,FXD,MICA DI:77PF,1%,500V,RADIAL	09023	CDA15ED770F03
A3C149	283–0636–01	672–1368–06		CAP,FXD,MICA DI:36PF,1.%,500V,TAPE & AMMO PACK	09023	CDA15ED360G03
A3C150	290–1311–00			CAP,FXD,ALUM:10UF,20%,50V,ESR=1.4 OHM(100KHZ,20C), 5X11MM,105C,5000HRS	55680	UPL1H100MDH1TD
A3C151	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C152	281–0184–00			CAP,VAR,PLSTC:2–18PF,500VDC	TK1727	2222–809–05003
A3C153	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C154	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C155	290–1193–00			CAP,FXD,ELCTLT:220UF,20%,25V	0H1N5	CEUFM1E221

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3C156	281–0773–00			CAP,FXD,CERAMIC:MLC;0.01UF,10%,100V	TK1743	CGB103KEX
A3C157	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C158	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C159	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C160	283–0638–01	672–1367–06		CAP,FXD,MICA DI:130PF,1%,500VTAPE & AMMO PACK	09023	CDA15FD131F03
A3C160	283–0674–01	672–1368–06		CAP,FXD,MICA DI:85PF,500VTAPED & REELED	TK0891	RDM15FD850F03
A3C161	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C162	290–1193–00			CAP,FXD,ELCTLT:220UF,20%,25V	0H1N5	CEUFM1E221
A3C163	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C164	290–1311–00			CAP,FXD,ALUM:10UF,20%,50V,ESR=1.4 OHM(100KHZ,20C), 5X11MM,105C,5000HRS	55680	UPL1H100MDH1TD
A3C165	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C166	281–0785–00			CAP,FXD,CERAMIC:MLC;68PF,10%,100V,0.100 X 0.170	04222	SA102A680KAA
A3C167	281–0812–00			CAP,FXD,CERAMIC:MLC;1000PF,10%,100V,0.100 X	04222	SA101C102KAA
A3C168	290–1311–00			CAP,FXD,ALUM:10UF,20%,50V,ESR=1.4 OHM(100KHZ,20C), 5X11MM,105C,5000HRS	55680	UPL1H100MDH1TD
A3C169	283–0051–02			CAP,FXD,CER DI:0.0033UF,5%,100V,SQUARE,MI	TK2058	FK22COG2A332J–T
A3C170	281–0863–00			CAP,FXD,CERAMIC:MLC;240PF,5%,100V,0.100 X 0.170	04222	SA101A241JAA
A3C171	290–0943–02			CAP,FXD,ELCTLT:47UF,20%,25VTAPED & REELED	55680	UVX1E470MDA1TD
A3C172	290–0848–00			CAP,FXD,ALUM:47UF,20%,16V,ESR=7.05 OHM(120HZ,25C), 10X12MM,RADIAL.	0H1N5	CEBPM1E470M
A3C173	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C174	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C175	290–0746–00			CAP,FXD,ALUM:47UF,+50%–20%,16V,0.562 X0.351	55680	UVX1J470MPA
A3C176	281–0874–00			CAP,FXD,CER DI:10PF,5%,500V	04222	MA107A100JAA
A3C177	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C178	281–0762–00			CAP,FXD,CERAMIC:MLC;27PF,10%,100V,NPO,0.100	04222	SA102A270KAA
A3C179	281–0797–00			CAP,FXD,CERAMIC:MLC;15PF,10%,100V,,	04222	SA102A150KAA
A3C180	281–0756–00			CAP,FXD,CER:MLC;2.2PF,+/–0.5PF,200V,NPO,0.100 X 0.170	04222	SA102A2R2DAA
A3C181	281–0537–00			CAP,FXD,CERAMIC:MLC;0.68PF,20%,500V,0.170 X	80009	281053700
A3C182	283–0177–05			CAP,FXD,CER DI:1UF,+80–20%,25V	04222	SR303E105ZAAAP1
A3C183	281–0302–00			CAP,VAR,PLSTC:1.2–4PF,100V	52769	GSX367
A3C184	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C185	281–0812–00			CAP,FXD,CERAMIC:MLC;1000PF,10%,100V,0.100 X	04222	SA101C102KAA
A3C186	281–0773–00			CAP,FXD,CERAMIC:MLC;0.01UF,10%,100V	TK1743	CGB103KEX
A3C187	281–0756–00			CAP,FXD,CER:MLC;2.2PF,+/–0.5PF,200V,NPO,0.100 X 0.170	04222	SA102A2R2DAA
A3C188	281–0756–00			CAP,FXD,CER:MLC;2.2PF,+/–0.5PF,200V,NPO,0.100 X 0.170	04222	SA102A2R2DAA
A3C189	281–0756–00			CAP,FXD,CER:MLC;2.2PF,+/–0.5PF,200V,NPO,0.100 X 0.170	04222	SA102A2R2DAA
A3C190	290–0746–00			CAP,FXD,ALUM:47UF,+50%–20%,16V,0.562 X0.351	55680	UVX1J470MPA

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3C191	290–0848–00			CAP,FXD,ALUM:47UF,20%,16V,ESR=7.05 OHM(120HZ,25C), 10X12MM,RADIAL	0H1N5	CEBPM1E470M
A3C192	281–0893–00			CAP,FXD,CERAMIC:MLC;4.7PF,+/–0.5PF,100V,0.100 X 0.170	04222	SA102A4R7DAA
A3C193	281–0819–00			CAP,FXD,CERAMIC:MLC;33 PF,5%,50V,0.100 X 0.170	04222	SA102A330JAA
A3C194	281–0765–00			CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A3C195	281–0765–00			CAP,FXD,CER DI:100PF,5%,100V	04222	SA102A101JAA
A3C196	281–0773–00	672–1368–06		CAP,FXD,CERAMIC:MLC;0.01UF,10%,100V	TK1743	CGB103KEX
A3C197	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C198	281–0823–00			CAP,FXD,CER DI:470PF,10%,50V	04222	SA101A471KAA
A3C199	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A3C200	281–0302–00			CAP,VAR,PLSTC:1.2–4PF,100V	52769	GSX367
A3C201	290–1295–00	672–1367–06		CAP,FXD,ALUM:10UF,20%,16V,5 X 9 MM;RDL,105 DEG,BULK	55680	URT1C100MCH
A3C202	283–0177–00	672–1367–07		CAP,FXD,ALUM:.1UF,20%,50V,(HANDADD)	CA1000	SR303E105ZAA
A3C202	283–0177–00	672–1368–07		CAP,FXD,ALUM:.1UF,20%,50V,(HANDADD)	CA1000	SR303E105ZAA
A3C203	281–0775–00	672–1367–07		CAP,FXD,ALUM:.1UF,20%,50V,(HANDADD)	CA1000	SA105E104MAA
A3C203	281–0775–00	672–1368–07		CAP,FXD,ALUM:.1UF,20%,50V,(HANDADD)	CA1000	SA105E104MAA
A3C204	281–0759–00	672–1367–08	672–1367–11	CAP,FXD,CER:.22UF,10%,100V	04222	SA102A220KAA
A3C204	281–0763–00	672–1367–12		CAP,FXD,CER:.47pF,10%,100V;AXIAL	04222	SA102A470KAA
A3C204	281–0759–00	672–1368–08	672–1368–11	CAP,FXD,CER:.22UF,10%,100V	04222	SA102A220KAA
A3C204	281–0763–00	672–1368–12		CAP,FXD,CER:.47pF,10%,100V;AXIAL	04222	SA102A470KAA
A3C205	283–0175–00	672–1367–09		CAP,FXD,CER:.10pF,5%,200V,SQUARE	CA1000	W150200NP0100J
A3C205	283–0175–00	672–1368–09		CAP,FXD,CER:.10pF,5%,200V,SQUARE	CA1000	W150200NP0100J
A3C206	281–0771–00	672–1367–11		CAP,FXD,CER:.2200pF,5%,200V,TUBULAR MI	CA1000	W150200NP0100J
A3C206	281–0771–00	672–1368–11		CAP,FXD,CER:.2200pF,5%,200V,TUBULAR MI	CA1000	W150200NP0100J
A3C207	281–0771–00	672–1367–11		CAP,FXD,CER:.2200pF,5%,200V,TUBULAR MI	CA1000	W150200NP0100J
A3C207	281–0771–00	672–1368–11		CAP,FXD,CER:.2200pF,5%,200V,TUBULAR MI	CA1000	W150200NP0100J
A3CR1	152–0400–00			DIODE,RECT:FAST RCVRY;400V,1A,200NS	0LUA3	1N4936
A3CR2	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR3	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR4	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR5	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR6	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR7	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR8	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR9	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR10	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR11	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR12	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR13	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3CR14	152–0322–00			DIODE,SIG:SCHTKY;15V,410MVF AT 1MA,1.2PF	50434	5082–2672–T25
A3CR15	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR16	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR17	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR18	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR19	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR20	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR21	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR22	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR23	152–0066–00			DIODE,RECT:400V,1A,IFSM=30A,1.2VF,2US	0LUA3	1N5060
A3CR24	152–0066–00			DIODE,RECT:400V,1A,IFSM=30A,1.2VF,2US	0LUA3	1N5060
A3CR25	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR26	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR27	152–0066–00			DIODE,RECT:400V,1A,IFSM=30A,1.2VF,2US	0LUA3	1N5060
A3CR28	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR29	152–0066–00			DIODE,RECT:400V,1A,IFSM=30A,1.2VF,2US	0LUA3	1N5060
A3CR30	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR31	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR32	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR33	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR34	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR35	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR36	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR37	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR38	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR39	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR40	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR41	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR42	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR43	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A3CR44	152–0612–00			DIODE,SIG:VVC;50V,15–20PF,C4/30=2.33,Q=15	04713	SMV1561
A3CR45	152–0400–00			DIODE,RECT:FAST RCVRY;400V,1A,200NS	0LUA3	1N4936
A3J3	131–4187–00			CONN,HDR:PCB,MALE,1 X 3,0.1 CTR,0.240 MLG X	58050	082–0343–AS10
A3J4	131–4752–00			CONN,HDR:PCB;MALE,45 DEG,1 X 2,0.1CTR,0.240 MLG X 0.110 TAIL,30 GOLD	58050	082–0243–AS10
A3J5	131–4530–00			CONN,HDR:PCB;MALE,STR,1 X 3,0.1 CTR,0.230 MLG X 0.120 TAIL,30GOLD,BD RETENTION	00779	104344–1
A3J6	131–4187–00			CONN,HDR:PCB,MALE,1 X 3,0.1 CTR,0.240 MLG X	58050	082–0343–AS10
A3J7	131–4187–00			CONN,HDR:PCB,MALE,1 X 3,0.1 CTR,0.240 MLG X	58050	082–0343–AS10

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3J8	131–4794–00			CONN,HDR:PCB;MALE,STR,1 X 2,0.1 CTR,0.235MLG X 0.112 TAIL,30GOLD,0.035 DIA PCB,SAFETY CONTROLLED	53387	2402–6112 UB
A3J9	131–3528–00			CONN,HDR:PCB;MALE,RTANG,2 X 12,0.1CTR,0.350 H X 0.112 TAIL,SHRD/4 SIDES,0.350 LONG,W/O LATCHES	56501	609–2407
A3J12	175–9797–00			CA ASSY,SP:FLAT FLEX;FLX,10,27 AWG,2.5 L,1 X 10,BOX X STR,SLDR TAB,CONN NON PLZ	TK2469	175–9797–00
A3J13	131–3364–00			CONN,HDR:PCB;MALE,STR,2 X 17,0.1 CTR,0.365D	53387	2534–6002UB
A3J14	131–4530–00			CONN,HDR:PCB;MALE,STR,1 X 3,0.1 CTR,0.230MLG X 0.120 TAIL,30GOLD,BD RETENTION	00779	104344–1
A3J15	131–4752–00			CONN,HDR:PCB;MALE,45 DEG,1 X 2,0.1CTR,0.240 MLG X 0.110 TAIL,30 GOLD	58050	082–0243–AS10
A3J17	131–4530–00			CONN,HDR:PCB;MALE,STR,1 X 3,0.1 CTR,0.230MLG X 0.120 TAIL,30GOLD,BD RETENTION	00779	104344–1
A3L1	108–1262–00			INDUCTOR,FXD:POWER;100UH,10%,I<0.75A,RDC<0.23 OHM,Q>15,SRF>5.4MHZ,BOBBIN CORE	TK2058	TSL0807–101KR75
A3L2	108–0317–01			INDUCTOR,FXD:CUSTOM,POWER;15UH,10%,IDC<460 MA,RDC<1.2 OHM,Q>55@2.5MHZ,SRF>30 MHZ	0JR03	108–0317–01
A3L3	108–1343–00			INDUCTOR,FXD:POWER;100UH,10%,I<0.165A,RDC<3.5 OHM,Q>60,SRF>5.5MHZ	TK2058	SP0305–101K
A3L4	108–0317–01			INDUCTOR,FXD:CUSTOM,POWER;15UH,10%,IDC<460 MA,RDC<1.2 OHM,Q>55@2.5MHZ,SRF>30 MHZ	0JR03	108–0317–01
A3L5	108–0317–01			INDUCTOR,FXD:CUSTOM,POWER;15UH,10%,IDC<460 MA,RDC<1.2 OHM,Q>55@2.5MHZ,SRF>30 MHZ	0JR03	108–0317–01
A3L6	108–0317–01			INDUCTOR,FXD:CUSTOM,POWER;15UH,10%,IDC<460 MA,RDC<1.2 OHM,Q>55@2.5MHZ,SRF>30 MHZ	0JR03	108–0317–01
A3L7	108–1352–00			INDUCTOR,FXD:SIGNAL;22UH,10%,IDC<285 MA,RDC <1.2 OHM,Q>50@2.5MHZ,SRF>13 MHZ	TK2058	SPT0305–220K–2
A3L9	108–0317–01			INDUCTOR,FXD:CUSTOM,POWER;15UH,10%,IDC<460 MA,RDC<1.2 OHM,Q>55@2.5MHZ,SRF>30 MHZ	0JR03	108–0317–01
A3L10	108–0317–01			INDUCTOR,FXD:CUSTOM,POWER;15UH,10%,IDC<460 MA,RDC<1.2 OHM,Q>55@2.5MHZ,SRF>30 MHZ	0JR03	108–0317–01
A3L11	108–0317–01			INDUCTOR,FXD:CUSTOM,POWER;15UH,10%,IDC<460 MA,RDC<1.2 OHM,Q>55@2.5MHZ,SRF>30 MHZ	0JR03	108–0317–01
A3P1	131–3571–00			CONN,HDR:PCB;MALE,RTANG,2 X 17,0.1CTR,0.350 H X 0.120 TAIL,SHRD/4 SIDES,CTR PLZ,30 GOLD	TK1462	FAP–34–08–2–OAS
A3P3	131–3957–00			CONN,SHUNT:SHUNT,1 X 2,0.1 CTR,JUMPER,0.2 H,LOW PROFILE,BLACK	22526	68786–202
A3P5	131–3957–00			CONN,SHUNT:SHUNT,1 X 2,0.1 CTR,JUMPER,0.2 H,LOW PROFILE,BLACK	22526	68786–202
A3P6	131–3957–00			CONN,SHUNT:SHUNT,1 X 2,0.1 CTR,JUMPER,0.2 H,LOW PROFILE,BLACK	22526	68786–202
A3P7	131–3957–00			CONN,SHUNT:SHUNT,1 X 2,0.1 CTR,JUMPER,0.2 H,LOW PROFILE,BLACK	22526	68786–202
A3P14	131–3957–00			CONN,SHUNT:SHUNT,1 X 2,0.1 CTR,JUMPER,0.2 H,LOW PROFILE,BLACK	22526	68786–202

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3P17	131–3957–00			CONN,SHUNT:SHUNT,1 X 2,0.1 CTR,JUMPER,0.2 H,LOW PROFILE,BLACK	22526	68786–202
A3Q1	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q2	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q3	151–0710–02			TRANSISTOR,SIG:BIPOLAR,NPN;40V,1.0A,50MHZ,AMPL	04713	MPSW01ARLRP
A3Q4	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q5	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q6	151–0216–04			TRANSISTOR,SIG:BIPOLAR,PNP;25V,100MA,170MHZ,AMPL	04713	MPS6523RLRP
A3Q7	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q8	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q9	151–0223–00			TRANSISTOR,SIG:BIPOLAR,NPN;15V,500MA,SWITCHING	04713	MPS2369A
A3Q10	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q11	151–1005–03			TRANSISTOR,SIG:JFET,N–CH;5V,6MA,2MS,500 OHM	66182	SNJ1641
A3Q12	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q13	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q14	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q15	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q16	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q17	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q18	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q19	151–0221–08			TRANSISTOR,SIG:BIPOLAR,PNP;12V,80MA,SWITCHING	27014	PN4258/D75Z
A3Q20	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q21	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q22	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q23	151–0221–08			TRANSISTOR,SIG:BIPOLAR,PNP;12V,80MA,SWITCHING	27014	PN4258/D75Z
A3Q24	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q25	151–0221–08			TRANSISTOR,SIG:BIPOLAR,PNP;12V,80MA,SWITCHING	27014	PN4258/D75Z
A3Q26	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q27	151–0223–00			TRANSISTOR,SIG:BIPOLAR,NPN;15V,500MA,SWITCHING	04713	MPS2369A
A3Q28	151–0223–00			TRANSISTOR,SIG:BIPOLAR,NPN;15V,500MA,SWITCHING	04713	MPS2369A
A3Q29	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q30	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q31	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q32	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q33	151–0221–08			TRANSISTOR,SIG:BIPOLAR,PNP;12V,80MA,SWITCHING	27014	PN4258/D75Z
A3Q34	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q35	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q36	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q37	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3Q38	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q39	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q40	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q41	151–0347–02			TRANSISTOR,SIG:BIPOLAR,NPN;160V,600MA,100MHZ	04713	2N5551RLRP
A3Q42	151–0347–02			TRANSISTOR,SIG:BIPOLAR,NPN;160V,600MA,100MHZ	04713	2N5551RLRP
A3Q43	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q44	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q45	151–0223–00			TRANSISTOR,SIG:BIPOLAR,NPN;15V,500MA,SWITCHING	04713	MPS2369A
A3Q46	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q47	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q48	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q49	151–0223–00			TRANSISTOR,SIG:BIPOLAR,NPN;15V,500MA,SWITCHING	04713	MPS2369A
A3Q50	151–0195–02			TRANSISTOR,SIG:BIPOLAR,NPN;25V,100MA,200MHZ,AMPL	04713	SPS8801RLRP
A3Q51	151–0195–02			TRANSISTOR,SIG:BIPOLAR,NPN;25V,100MA,200MHZ,AMPL	04713	SPS8801RLRP
A3Q52	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q53	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q54	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q55	151–0223–00			TRANSISTOR,SIG:BIPOLAR,NPN;15V,500MA,SWITCHING	04713	MPS2369A
A3Q56	151–0195–02			TRANSISTOR,SIG:BIPOLAR,NPN;20V,100MA,150MHZ,AMPL	04713	MPS6521RLRP
A3Q57	151–0195–02			TRANSISTOR,SIG:BIPOLAR,NPN;20V,100MA,150MHZ,AMPL	04713	MPS6521RLRP
A3Q58	151–1025–03			TRANSISTOR,SIG:JFET,N–CH;6V,15MA,4.5MS,AMPLIFIER	17856	J304TA
A3Q59	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q60	151–1059–01			TRANSISTOR,SIG:JFET,N–CH;10V,30MA(MIN),30OHM	04713	MPF4391RLRP
A3Q61	151–0221–08			TRANSISTOR,SIG:BIPOLAR,PNP;12V,80MA,SWITCHING	27014	PN4258/D75Z
A3Q62	151–0223–00			TRANSISTOR,SIG:BIPOLAR,NPN;15V,500MA,SWITCHING	04713	MPS2369A
A3Q63	151–0223–00			TRANSISTOR,SIG:BIPOLAR,NPN;15V,500MA,SWITCHING	04713	MPS2369A
A3Q64	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q65	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q66	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q68	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q69	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q70	151–0347–02			TRANSISTOR,SIG:BIPOLAR,NPN;160V,600MA,100MHZ	04713	2N5551RLRP
A3Q71	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q72	151–1025–03			TRANSISTOR,SIG:JFET,N–CH;6V,15MA,4.5MS,AMPLIFIER	17856	J304TA
A3Q73	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q74	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q75	151–0223–00			TRANSISTOR,SIG:BIPOLAR,NPN;15V,500MA,SWITCHING	04713	MPS2369A
A3Q76	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3Q77	151–0195–02			TRANSISTOR,SIG:BIPOLAR,NPN;25V,100MA,200MHZ,AMPL	04713	SPS8801RLRP
A3Q78	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q79	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q80	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q81	151–0221–08			TRANSISTOR,SIG:BIPOLAR,PNP;12V,80MA,SWITCHING	27014	PN4258/D75Z
A3Q82	151–0223–00			TRANSISTOR,SIG:BIPOLAR,NPN;15V,500MA,SWITCHING	04713	MPS2369A
A3Q83	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q84	151–0223–00			TRANSISTOR,SIG:BIPOLAR,NPN;15V,500MA,SWITCHING	04713	MPS2369A
A3Q85	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q86	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q87	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q88	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q89	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q90	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q91	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q92	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q93	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q94	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A3Q95	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q96	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A3Q97	151–0190–00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904
A3Q98	151–0190–00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904
A3R1	301–0101–00			RES,FXD,FILM:100 OHM,5%,0.5W	TK1727	SFR30 2322–182–
A3R2	311–2269–00			RES,VAR,NONWW:TRMR,20K OHM,20%,0.5WLINEAR,MI	TK2073	GF06VT2 203 M L
A3R3	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R4	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R5	311–2269–00			RES,VAR,NONWW:TRMR,20K OHM,20%,0.5WLINEAR,MI	TK2073	GF06VT2 203 M L
A3R6	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R7	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R8	311–2269–00			RES,VAR,NONWW:TRMR,20K OHM,20%,0.5WLINEAR,MI	TK2073	GF06VT2 203 M L
A3R9	322–3322–00			RES,FXD:METAL FILM;22.1K OHM,1%,0.2W,TC=100	91637	CCF501G22101F
A3R10	311–2269–00			RES,VAR,NONWW:TRMR,20K OHM,20%,0.5WLINEAR,MI	TK2073	GF06VT2 203 M L
A3R11	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R12	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R13	322–3354–00			RES,FXD:METAL FILM;47.5K OHM,1%,0.2W,TC=100	91637	CCF501G47501F
A3R14	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A3R15	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A3R16	322–3369–00			RES,FXD:METAL FILM;68.1K OHM,1%,0.2W,TC=100	57668	CRB20 FXE 68R1

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3R17	322–3281–00			RES,FXD:METAL FILM;8.25K OHM,1%,0.2W,TC=100	91637	CCF501G82500F
A3R18	307–0106–00			RES,FXD,CMPSN:4.7 OHM,5%,0.25W	50139	CB47G5
A3R19	322–3402–00			RES,FXD:METAL FILM;150K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G15002F
A3R20	322–3322–00			RES,FXD:METAL FILM;22.1K OHM,1%,0.2W,TC=100	91637	CCF501G22101F
A3R21	322–3402–00			RES,FXD:METAL FILM;150K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G15002F
A3R22	322–3254–00			RES,FXD,FILM:4.32K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF502G4321FT
A3R23	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R24	307–0446–00			RES NTWK,FXD,FI:10K OHM,20%,(9)RES	11236	750–101–R10K
A3R25	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R26	322–3410–00			RES,FXD:METAL FILM;182K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G1823FT
A3R27	322–3251–00			RES,FXD,FILM:4.02K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G40200F
A3R28	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R29	322–3239–00			RES,FXD,FILM:3.01K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G30100F
A3R30	322–3314–00			RES,FXD:METAL FILM;18.2K OHM,1%,0.2W,TC=100	91637	CCF501G18201F
A3R31	311–2236–00			RES,VAR,TRMR:CERMET;20K OHM,20%,0.5W,0.197 SQ,SIDE ADJUST	TK2073	GF06UT2 203 M L
A3R32	322–3314–00			RES,FXD:METAL FILM;18.2K OHM,1%,0.2W,TC=100	91637	CCF501G18201F
A3R33	322–3402–00			RES,FXD:METAL FILM;150K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G15002F
A3R34	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R35	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R36	322–3239–00			RES,FXD,FILM:3.01K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G30100F
A3R37	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R38	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R39	322–3318–00			RES,FXD,FILM:MET FILM;20K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20001F
A3R40	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R41	311–2236–00			RES,VAR,TRMR:CERMET;20K OHM,20%,0.5W,0.197 SQ,SIDE ADJUST	TK2073	GF06UT2 203 M L
A3R42	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R43	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R44	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R45	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R46	315–0106–00			RES,FXD,FILM:10M OHM,5%,0.25W	TK1727	SFR25 2322–181–
A3R47	322–3261–00			RES,FXD,FILM:5.11K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50G5111FT
A3R48	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R49	322–3184–00	672–1367–06		RES,FXD,FILM:806 OHM,1%,0.2W,TC=T0,SMALL BODY	91637	CCF501G806FOR
A3R49	322–3164–00	672–1368–06		RES,FXD,FILM:499 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G499ROF
A3R50	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R51	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R52	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F

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Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3R53	322–3318–00			RES,FXD,FILM:MET FILM;20K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20001F
A3R54	322–3377–00			RES,FXD:METAL FILM;82.5K OHM,1%,0.2W,TC=100	91637	CCF50–2F82501F
A3R55	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R56	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R57	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A3R58	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R59	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R60	322–3327–00			RES,FXD,FILM:24.9K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–2–G24901F
A3R61	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R62	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R63	322–3396–00			RES,FXD,FILM:130K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF50–2–G1303F
A3R64	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R65	322–3001–00			RES,FXD:METAL FILM;10 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10R00F
A3R66	322–3258–00			RES,FXD:METAL FILM;4.75K OHM,1%,0.2W,TC=100	56845	CCF50–2–G4751FT
A3R67	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R68	131–4566–00	672–1367–06		BUS,CNDCT:0 OHM,300 SPACING,SM BODYMI,DUMMY RES	91637	FRJ–50
A3R68	322–3481–00	672–1368–06		RES,FXD,FILM:1M OHM.1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G10003F
A3R69	322–3412–00			RES,FXD,FILM:191K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF501G19102F
A3R70	322–3331–00			RES,FXD:METAL FILM;27.4K OHM,1%,0.2W,TC=100	57668	CRB20 FXE 27K4
A3R71	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R72	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R73	322–3322–00			RES,FXD:METAL FILM;22.1K OHM,1%,0.2W,TC=100	91637	CCF501G22101F
A3R74	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R75	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R76	322–3214–00			RES,FXD,FILM:1.65K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50G16500F
A3R77	322–3421–00			RES,FXD,FILM:237K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF50–2F23702F
A3R78	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R79	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R80	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R81	322–3254–00			RES,FXD,FILM:4.32K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF502G4321FT
A3R82	322–3293–00			RES,FXD:METAL FILM;11K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G11001F
A3R83	322–3481–00			RES,FXD,FILM:1M OHM.1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G10003F
A3R84	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R85	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R86	322–3214–00			RES,FXD,FILM:1.65K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50G16500F
A3R87	322–3260–00			RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A3R88	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R89	322–3289–00	672–1367–06		RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F

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Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3R89	322–3318–00	672–1368–06		RES,FXD,FILM:MET FILM;20K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20001F
A3R90	322–3285–00			RES,FXD,FILM:9.09K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G90900F
A3R91	322–3258–00			RES,FXD:METAL FILM;4.75K OHM,1%,0.2W,TC=100	56845	CCF50–2–G4751FT
A3R92	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A3R93	322–3260–00			RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A3R94	311–2238–00			RES,VAR,TRMR:CERMET;50K OHM,20%,0.5W,0.197 SQ,SIDE ADJUST	TK2073	GF06UT2 503 M L
A3R95	322–3322–00			RES,FXD:METAL FILM;22.1K OHM,1%,0.2W,TC=100	91637	CCF501G22101F
A3R96	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R97	311–2227–00	672–1368–06		RES,VAR,TRMR:CERMET;100 OHM,20%,0.5W,0.197 SQ,TOP ADJUST	TK2073	GF06UT2 101 M L
A3R98	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R99	322–3114–00			RES,FXD:METAL FILM;150 OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1500F
A3R100	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R101	322–3220–00			RES,FXD,FILM:1.91K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G19100F
A3R102	322–3481–00			RES,FXD,FILM:1M OHM.1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G10003F
A3R103	322–3258–00			RES,FXD:METAL FILM;4.75K OHM,1%,0.2W,TC=100	56845	CCF50–2–G4751FT
A3R104	322–3393–00			RES,FXD:METAL FILM;121K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G12102F
A3R105	322–3260–00			RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A3R106	322–3318–00			RES,FXD,FILM:MET FILM;20K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20001F
A3R107	322–3339–00			RES,FXD:METAL FILM;33.2K OHM,1%,0.2W,TC=100	91637	CCF50–2–G3322FT
A3R108	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R109	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R110	322–3356–00			RES,FXD,FILM:49.9K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G49901F
A3R111	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R112	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R113	322–3135–00			RES,FXD,FILM:249 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G249R0F
A3R114	311–2238–00			RES,VAR,TRMR:CERMET;50K OHM,20%,0.5W,0.197 SQ,SIDE ADJUST	TK2073	GF06UT2 503 M L
A3R115	322–3322–00		672–1367–09	RES,FXD:METAL FILM;22.1K OHM,1%,0.2W,TC=100	91637	CCF501G22101F
A3R115	322–3347–00	672–1367–10		RES,FXD:METAL FILM;40.2K OHM,1%,0.2W,TC=100	91637	CCF501G22101F
A3R115	322–3322–00		672–1368–09	RES,FXD:METAL FILM;22.1K OHM,1%,0.2W,TC=100	91637	CCF501G22101F
A3R115	322–3347–00	672–1368–10		RES,FXD:METAL FILM;40.2K OHM,1%,0.2W,TC=100	91637	CCF501G22101F
A3R116	322–3481–00			RES,FXD,FILM:1M OHM.1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G10003F
A3R117	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R118	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R119	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R120	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R121	322–3286–00			RES,FXD,FILM:9.31K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G93100F

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3R122	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R123	322–3357–00			RES,FXD,FILM:51.1K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G51101F
A3R124	322–3418–00		672–1367–09	RES,FXD:METAL FILM;221K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G22102F
A3R124	322–3418–00		672–1368–09	RES,FXD:METAL FILM;221K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G22102F
A3R125	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R126	322–3141–00			RES,FXD,FILM:287 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G287ROF
A3R127	315–0135–00			RES,FXD,FILM:1.3M OHM,5%,0.25W	19701	5043EM1M300J
A3R128	322–3157–00			RES,FXD,FILM:422 OHM,1%,0.2W,TC=T0MI,SMALL BODY	57668	CRB20 FXE 422E
A3R129	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R130	322–3231–00			RES,FXD,FILM:2.49K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–1G24900F
A3R131	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R132	322–3487–00			RES,FXD,FILM:500 OHM,1%,0.2W,TC=TO	91637	CCF501G500R0F
A3R133	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R134	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R135	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R136	322–3450–00			RES,FXD,FILM:475K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF50–2G47502F
A3R137	322–3339–00			RES,FXD:METAL FILM;33.2K OHM,1%,0.2W,TC=100	91637	CCF50–2–G3322FT
A3R138	322–3106–00			RES,FXD,FILM:124 OHM,1%,0.2W,TC=100PPM,SM BODY	91637	CCF502G124ROFT
A3R139	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R140	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R141	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R142	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R144	322–3487–00			RES,FXD,FILM:500 OHM,1%,0.2W,TC=TO	91637	CCF501G500R0F
A3R145	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R146	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R147	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R148	322–3154–00			RES,FXD:METAL FILM;392 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G392R0F
A3R149	322–3322–00			RES,FXD:METAL FILM;22.1K OHM,1%,0.2W,TC=100	91637	CCF501G22101F
A3R150	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R151	322–3243–00			RES,FXD:METAL FILM;3.32K OHM,1%,0.2W,TC=100	91637	CCF50–1–G33200F
A3R152	322–3210–00			RES,FXD:METAL FILM;1.5K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G15000F
A3R153	322–3157–00			RES,FXD,FILM:422 OHM,1%,0.2W,TC=T0MI,SMALL BODY	57668	CRB20 FXE 422E
A3R154	322–3273–00			RES,FXD:METAL FILM;6.81K OHM,1%,0.2W,TC=100	91637	CCF50–2–G68100F
A3R155	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R156	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R157	322–3258–00			RES,FXD:METAL FILM;4.75K OHM,1%,0.2W,TC=100	56845	CCF50–2–G4751FT
A3R158	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R159	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3R160	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R161	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R162	322–3172–00			RES,FXD,FILM:604 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G604ROF
A3R163	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R164	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R165	322–3269–02			RES,FXD,FILM:6.19K OHM,0.2W,5%TAPED & REELED	91637	CCF501D61900D
A3R166	322–3173–00			RES,FXD,FILM:619 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF50–2F619R0F
A3R167	322–3339–00			RES,FXD:METAL FILM;33.2K OHM,1%,0.2W,TC=100	91637	CCF50–2–G3322FT
A3R168	322–3228–00			RES,FXD,FILM:2.32K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–1G2320F
A3R169	322–3260–00			RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A3R170	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R171	322–3322–00			RES,FXD:METAL FILM;22.1K OHM,1%,0.2W,TC=100	91637	CCF501G22101F
A3R172	322–3322–00			RES,FXD:METAL FILM;22.1K OHM,1%,0.2W,TC=100	91637	CCF501G22101F
A3R173	322–3322–00			RES,FXD:METAL FILM;22.1K OHM,1%,0.2W,TC=100	91637	CCF501G22101F
A3R174	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R175	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R176	322–3322–00			RES,FXD:METAL FILM;22.1K OHM,1%,0.2W,TC=100	91637	CCF501G22101F
A3R177	322–3339–00			RES,FXD:METAL FILM;33.2K OHM,1%,0.2W,TC=100	91637	CCF50–2–G3322FT
A3R178	322–3318–00			RES,FXD,FILM:MET FILM;20K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20001F
A3R179	322–3126–00			RES,FXD,FILM:200 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G200ROF
A3R180	322–3148–00	672–1367–06		RES,FXD,FILM:340 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF50–2F340R0F
A3R180	322–3157–00	672–1368–06		RES,FXD,FILM:422 OHM,1%,0.2W,TC=T0MI,SMALL BODY	57668	CRB20 FXE 422E
A3R181	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R182	322–3269–02			RES,FXD,FILM:6.19K OHM,0.2W,5%TAPED & REELED	91637	CCF501D61900D
A3R183	322–3171–00			RES,FXD,FILM:590 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G590R0F
A3R184	322–3185–00			RES,FXD:METAL FILM;825 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G825ROF
A3R185	322–3177–02			RES,FXD,FILM:681 OHM,0.5%,0.2W,TC=T2	91637	CMF501D681ROD
A3R186	322–3249–00			RES,FXD,FILM:3.83K OHM,1%,0.2W,TC=T0MI,SM BODY	56845	CCF50–2–G3831FT
A3R187	322–3234–00	672–1367–06		RES,FXD,FILM:2.67K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–2F26700F
A3R187	322–3193–07	672–1368–06		RES,FXD,FILM:1K OHM,0.1%,0.2W,TC=T9	91637	CCF501C10000B
A3R188	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R189	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R190	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R191	322–3172–00			RES,FXD,FILM:604 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G604ROF
A3R192	322–3273–00			RES,FXD:METAL FILM;6.81K OHM,1%,0.2W,TC=100	91637	CCF50–2–G68100F
A3R193	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R194	131–4566–00	672–1367–06		BUS,CNDCT:0 OHM,300 SPACING,SM BODYMI,DUMMY RES	91637	FRJ–50
A3R194	322–3481–00	672–1368–06		RES,FXD,FILM:1M OHM.1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G10003F

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3R195	322–3481–00	672–1367–06		RES,FXD,FILM:1M OHM.1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G10003F
A3R195	131–4566–00	672–1368–06		BUS,CNDCT:0 OHM,300 SPACING,SM BODYMI,DUMMY RES	91637	FRJ–50
A3R196	322–3154–00			RES,FXD:METAL FILM;392 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G392R0F
A3R197	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R198	322–3171–00			RES,FXD,FILM:590 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G590R0F
A3R199	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R200	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R201	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R202	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R203	322–3318–00			RES,FXD,FILM:MET FILM;20K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20001F
A3R204	322–3141–00			RES,FXD,FILM:287 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G287ROF
A3R205	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R206	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R207	322–3228–00			RES,FXD,FILM:2.32K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–1G2320F
A3R208	322–3260–00			RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A3R209	322–3273–00			RES,FXD:METAL FILM;6.81K OHM,1%,0.2W,TC=100	91637	CCF50–2–G68100F
A3R210	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R211	322–3154–00			RES,FXD:METAL FILM;392 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G392R0F
A3R212	322–3230–00			RES,FXD,FILM:2.43K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–2–G2431FT
A3R213	322–3210–00			RES,FXD:METAL FILM;1.5K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G15000F
A3R214	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R215	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R216	322–3177–02			RES,FXD,FILM:681 OHM,0.5%,0.2W,TC=T2	91637	CMF501D681ROD
A3R217	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R218	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R219	322–3233–00			RES,FXD,FILM:2.61K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–2–G2611FT
A3R220	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R221	322–3213–00			RES,FXD,FILM:1.62K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G16200F
A3R222	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R223	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R224	322–3487–00			RES,FXD,FILM:500 OHM,1%,0.2W,TC=TO	91637	CCF501G500R0F
A3R225	322–3487–00			RES,FXD,FILM:500 OHM,1%,0.2W,TC=TO	91637	CCF501G500R0F
A3R226	322–3171–00	672–1367–06		RES,FXD,FILM:590 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G590R0F
A3R226	322–3001–00	672–1368–06		RES,FXD:METAL FILM;10 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10R00F
A3R227	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R228	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R229	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R230	322–3126–00			RES,FXD,FILM:200 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G200ROF

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3R231	322–3224–00			RES,FXD,FILM:2.1K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF50–2F21000F
A3R232	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R233	322–3213–00			RES,FXD,FILM:1.62K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G16200F
A3R234	322–3258–00			RES,FXD:METAL FILM;4.75K OHM,1%,0.2W,TC=100	56845	CCF50–2–G4751FT
A3R235	322–3233–00			RES,FXD,FILM:2.61K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–2–G2611FT
A3R236	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R237	322–3269–02			RES,FXD,FILM:6.19K OHM,0.2W,5%TAPED & REELED	91637	CCF501D61900D
A3R238	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R239	322–3273–00			RES,FXD:METAL FILM;6.81K OHM,1%,0.2W,TC=100	91637	CCF50–2–G68100F
A3R240	322–3215–00	672–1367–06		RES,FXD,FILM:1.69K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–2F16900F
A3R240	322–3197–00	672–1368–06		RES,FXD,FILM:1.1K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF501G11000F
A3R241	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R242	322–3151–00			RES,FXD,FILM:365 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G365ROF
A3R243	322–3151–00			RES,FXD,FILM:365 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G365ROF
A3R244	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R245	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R246	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R247	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R248	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R249	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R250	322–3326–00			RES,FXD,FILM:24.3K OHM,1%,0.2W,TC–T0MI,SM BODY	91637	CCF50–2F24301F
A3R251	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R252	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R253	322–3126–00			RES,FXD,FILM:200 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G200ROF
A3R254	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R255	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R256	322–3207–00			RES,FXD,FILM:1.4K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF501G14000F
A3R257	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R258	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R259	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R260	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R261	322–3147–00			RES,FXD:METAL FILM;332 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G332R0F
A3R262	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R263	322–3418–00			RES,FXD:METAL FILM;221K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G22102F
A3R264	322–3322–00			RES,FXD:METAL FILM;22.1K OHM,1%,0.2W,TC=100	91637	CCF501G22101F
A3R265	322–3342–00			RES,FXD,FILM:35.7K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–2–G3572F
A3R266	322–3310–00			RES,FXD,FILM:16.5K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G16501F
A3R267	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3R268	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A3R269	322–3126–00			RES,FXD,FILM:200 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G200ROF
A3R270	322–3164–00			RES,FXD,FILM:499 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G499ROF
A3R271	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R272	322–3326–00			RES,FXD,FILM:24.3K OHM,1%,0.2W,TC–T0MI,SM BODY	91637	CCF50–2F24301F
A3R273	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R274	322–3207–00			RES,FXD,FILM:1.4K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF501G14000F
A3R275	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R276	322–3189–00			RES,FXD,FILM:909 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G909FOR
A3R277	322–3281–00			RES,FXD:METAL FILM;8.25K OHM,1%,0.2W,TC=100	91637	CCF501G82500F
A3R278	322–3254–00	672–1367–06		RES,FXD,FILM:4.32K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF502G4321FT
A3R278	322–3270–02	672–1368–06		RES,FXD,FILM:6.34K OHM,0.5%,0.2W,TC=T2TAPED	91637	CCF501D63400D
A3R279	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A3R280	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R281	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A3R282	311–2235–00			RES,VAR,TRMR:CERMET;10K OHM,20%,0.5W,0.197 SQ,TOP ADJUST	TK2073	GF06UT2 103 M L
A3R283	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R284	322–3239–00			RES,FXD,FILM:3.01K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G30100F
A3R285	322–3164–00			RES,FXD,FILM:499 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G499ROF
A3R286	322–3239–00			RES,FXD,FILM:3.01K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G30100F
A3R287	322–3322–00			RES,FXD:METAL FILM;22.1K OHM,1%,0.2W,TC=100	91637	CCF501G22101F
A3R288	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R289	322–3356–00			RES,FXD,FILM:49.9K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G49901F
A3R290	322–3281–00			RES,FXD:METAL FILM;8.25K OHM,1%,0.2W,TC=100	91637	CCF501G82500F
A3R291	322–3162–00			RES,FXD:METAL FILM;475 OHM,1%,0.2W,TC=100 PPM	91637	CCF50G475R0F
A3R292	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R293	311–2236–00			RES,VAR,TRMR:CERMET;20K OHM,20%,0.5W,0.197 SQ,SIDE ADJUST	TK2073	GF06UT2 203 M L
A3R294	322–3085–00			RES,FXD:METAL FILM;75 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G75R00F
A3R295	322–3277–00			RES,FXD,FILM:7.5K OHM,1%,0.2W,TC=T0,SMALL BODY	91637	CCF501G75000F
A3R296	322–3254–00			RES,FXD,FILM:4.32K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF502G4321FT
A3R297	322–3254–00			RES,FXD,FILM:4.32K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF502G4321FT
A3R298	322–3277–00			RES,FXD,FILM:7.5K OHM,1%,0.2W,TC=T0,SMALL BODY	91637	CCF501G75000F
A3R299	322–3322–00			RES,FXD:METAL FILM;22.1K OHM,1%,0.2W,TC=100	91637	CCF501G22101F
A3R300	322–3354–00			RES,FXD:METAL FILM;47.5K OHM,1%,0.2W,TC=100	91637	CCF501G47501F
A3R301	308–0549–00			RES,FXD,WW:6.3K OHM,1%,3W	91637	RS2B–B63000F
A3R302	311–2238–00			RES,VAR,TRMR:CERMET;50K OHM,20%,0.5W,0.197 SQ,SIDE ADJUST	TK2073	GF06UT2 503 M L

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3R303	308–0549–00			RES,FXD,WW:6.3K OHM,1%,3W	91637	RS2B–B63000F
A3R304	322–3154–00			RES,FXD:METAL FILM;392 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G392R0F
A3R305	322–3266–00			RES,FXD,FILM:5.76K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G57600F
A3R306	322–3277–00			RES,FXD,FILM:7.5K OHM,1%,0.2W,TC=T0,SMALL BODY	91637	CCF501G75000F
A3R307	322–3277–00			RES,FXD,FILM:7.5K OHM,1%,0.2W,TC=T0,SMALL BODY	91637	CCF501G75000F
A3R308	322–3246–00			RES,FXD,FILM:3.57K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G35700F
A3R309	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R310	322–3177–02			RES,FXD,FILM:681 OHM,0.5%,0.2W,TC=T2	91637	CMF501D681ROD
A3R311	322–3162–00			RES,FXD:METAL FILM;475 OHM,1%,0.2W,TC=100 PPM	91637	CCF50G475R0F
A3R312	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R313	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R314	322–3357–00			RES,FXD,FILM:51.1K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G51101F
A3R315	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R316	322–3243–00			RES,FXD:METAL FILM;3.32K OHM,1%,0.2W,TC=100	91637	CCF50–1–G33200F
A3R317	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R318	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R319	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R320	322–3293–00			RES,FXD:METAL FILM;11K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G11001F
A3R321	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R322	322–3246–00			RES,FXD,FILM:3.57K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G35700F
A3R323	322–3130–00			RES,FXD:METAL FILM;221 OHM,1%,0.2W,TC=100 PPM	57668	RB20FX221E
A3R324	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R325	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R326	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R327	322–3322–00			RES,FXD:METAL FILM;22.1K OHM,1%,0.2W,TC=100	91637	CCF501G22101F
A3R328	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R329	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R330	322–3481–00			RES,FXD,FILM:1M OHM.1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G10003F
A3R331	322–3243–00			RES,FXD:METAL FILM;3.32K OHM,1%,0.2W,TC=100	91637	CCF50–1–G33200F
A3R332	322–3164–00			RES,FXD,FILM:499 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G499ROF
A3R333	311–2231–00			RES,VAR,TRMR:CERMET;1K OHM,20%,0.5W,0.197 SQ,TOP ADJUST	TK2073	GF06UT2 102 M L
A3R334	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R335	322–3177–02			RES,FXD,FILM:681 OHM,0.5%,0.2W,TC=T2	91637	CMF501D681ROD
A3R336	311–2231–00			RES,VAR,TRMR:CERMET;1K OHM,20%,0.5W,0.197 SQ,TOP ADJUST	TK2073	GF06UT2 102 M L
A3R337	322–3162–00			RES,FXD:METAL FILM;475 OHM,1%,0.2W,TC=100 PPM	91637	CCF50G475R0F
A3R338	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R339	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3R340	322–3130–00			RES,FXD:METAL FILM;221 OHM,1%,0.2W,TC=100 PPM	57668	RB20FX221E
A3R341	322–3293–00			RES,FXD:METAL FILM;11K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G11001F
A3R342	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R343	322–3154–00			RES,FXD:METAL FILM;392 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G392R0F
A3R344	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R345	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R346	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R347	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R348	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R349	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R350	322–3281–00			RES,FXD:METAL FILM;8.25K OHM,1%,0.2W,TC=100	91637	CCF501G82500F
A3R351	322–3069–00			RES,FXD,FILM:51.1 OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF501G51R10F
A3R352	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R353	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R354	322–3281–00			RES,FXD:METAL FILM;8.25K OHM,1%,0.2W,TC=100	91637	CCF501G82500F
A3R355	322–3273–00			RES,FXD:METAL FILM;6.81K OHM,1%,0.2W,TC=100	91637	CCF50–2–G68100F
A3R356	322–3243–00			RES,FXD:METAL FILM;3.32K OHM,1%,0.2W,TC=100	91637	CCF50–1–G33200F
A3R357	322–3164–00			RES,FXD,FILM:499 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G499ROF
A3R358	322–3210–00			RES,FXD:METAL FILM;1.5K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G15000F
A3R359	322–3268–00			RES,FXD,FILM:6.04K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G60400F
A3R360	322–3148–00	672–1367–06		RES,FXD,FILM:340 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF50–2F340R0F
A3R360	322–3157–00	672–1368–06		RES,FXD,FILM:422 OHM,1%,0.2W,TC=T0MI,SMALL BODY	57668	CRB20 FXE 422E
A3R361	322–3148–00	672–1367–06		RES,FXD,FILM:340 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF50–2F340R0F
A3R361	322–3157–00	672–1368–06		RES,FXD,FILM:422 OHM,1%,0.2W,TC=T0MI,SMALL BODY	57668	CRB20 FXE 422E
A3R362	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R363	322–3181–00			RES,FXD,FILM:750 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G750ROF
A3R364	322–3295–00			RES,FXD:METAL FILM;11.5K OHM,1%,0.2W,TC=100	91637	CCF50G11501F
A3R365	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R366	322–3189–00			RES,FXD,FILM:909 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G909FOR
A3R367	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R368	322–3246–00			RES,FXD,FILM:3.57K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G35700F
A3R369	322–3066–00			RES,FXD:METAL FILM;47.5 OHM,1%,0.2W,TC=100 PPM	09969	CCF502G47R50F
A3R370	322–3297–00			RES,FXD:METAL FILM;12.1K OHM,1%,0.2W,TC=100	91637	CCF501G12101F
A3R371	322–3114–00			RES,FXD:METAL FILM;150 OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1500F
A3R372	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R373	322–3201–00			RES,FXD:METAL FILM;1.21K OHM,1%,0.2W,TC=100	91637	CCF501G12100F
A3R374	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R375	322–3147–00			RES,FXD:METAL FILM;332 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G332R0F

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3R376	322–3185–00			RES,FXD:METAL FILM;825 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G825ROF
A3R377	311–2236–00			RES,VAR,TRMR:CERMET;20K OHM,20%,0.5W,0.197 SQ,SIDE ADJUST	TK2073	GF06UT2 203 M L
A3R378	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R379	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R380	322–3181–00			RES,FXD,FILM:750 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G750ROF
A3R381	322–3269–02			RES,FXD,FILM:6.19K OHM,0.2W,5%TAPED & REELED	91637	CCF501D61900D
A3R382	322–3269–02			RES,FXD,FILM:6.19K OHM,0.2W,5%TAPED & REELED	91637	CCF501D61900D
A3R383	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R384	322–3473–00			RES,FXD,FILM:825K OHM,1%,0.2W,TC=100PPM,MI,SMALL BODY,TAPE&REEL	91637	CCF50–2F82502FT
A3R385	322–3281–00			RES,FXD:METAL FILM;8.25K OHM,1%,0.2W,TC=100	91637	CCF501G82500F
A3R386	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R387	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R388	311–2236–00			RES,VAR,TRMR:CERMET;20K OHM,20%,0.5W,0.197 SQ,SIDE ADJUST	TK2073	GF06UT2 203 M L
A3R389	322–3299–00			RES,FXD,FILM:12.7K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G12701F
A3R390	311–2236–00			RES,VAR,TRMR:CERMET;20K OHM,20%,0.5W,0.197 SQ,SIDE ADJUST	TK2073	GF06UT2 203 M L
A3R391	322–3293–00			RES,FXD:METAL FILM;11K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G11001F
A3R392	322–3218–00			RES,FXD:METAL FILM;1.82K OHM,1%,0.2W,TC=100	91637	CCF501G18200F
A3R393	322–3277–00			RES,FXD,FILM:7.5K OHM,1%,0.2W,TC=T0,SMALL BODY	91637	CCF501G75000F
A3R394	322–3261–00			RES,FXD,FILM:5.11K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50G5111FT
A3R395	322–3265–00			RES,FXD:METAL FILM;5.62K OHM,1%,0.2W,TC=100	91637	CCF501G56200F
A3R396	322–3218–00			RES,FXD:METAL FILM;1.82K OHM,1%,0.2W,TC=100	91637	CCF501G18200F
A3R397	322–3273–00			RES,FXD:METAL FILM;6.81K OHM,1%,0.2W,TC=100	91637	CCF50–2–G68100F
A3R398	322–3185–00			RES,FXD:METAL FILM;825 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G825ROF
A3R399	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R400	322–3162–00			RES,FXD:METAL FILM;475 OHM,1%,0.2W,TC=100 PPM	91637	CCF50G475R0F
A3R401	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R402	322–3226–00			RES,FXD:METAL FILM;2.21K OHM,1%,0.2W,TC=100	91637	CCF501G22100F
A3R403	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R404	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R405	322–3232–00			RES,FXD,FILM:2.55K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G25500F
A3R406	322–3308–00			RES,FXD,FILM:15.8K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G15801F
A3R407	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R408	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R409	322–3243–00			RES,FXD:METAL FILM;3.32K OHM,1%,0.2W,TC=100	91637	CCF50–1–G33200F
A3R410	322–3260–00			RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A3R411	322–3306–00			RES,FXD:METAL FILM;15K OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1502F

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3R412	322–3262–00			RES,FXD,FILM:5.23K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF50G52300F
A3R413	322–3260–00			RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A3R414	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R415	322–3335–00			RES,FXD,FILM:30.1K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G30101F
A3R416	322–3346–00			RES,FXD:METAL FILM;39.2K OHM,1%,0.2W,TC=100	91637	CCF50–2–G39201F
A3R417	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R418	322–3273–00			RES,FXD:METAL FILM;6.81K OHM,1%,0.2W,TC=100	91637	CCF50–2–G68100F
A3R419	322–3250–00			RES,FXD:METAL FILM;3.92K OHM,1%,0.2W,TC=100	91637	CCF50–2F39200F
A3R420	322–3281–00			RES,FXD:METAL FILM;8.25K OHM,1%,0.2W,TC=100	91637	CCF501G82500F
A3R421	322–3273–00			RES,FXD:METAL FILM;6.81K OHM,1%,0.2W,TC=100	91637	CCF50–2–G68100F
A3R422	322–3481–00			RES,FXD,FILM:1M OHM.1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G10003F
A3R423	322–3260–00			RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A3R424	322–3239–00			RES,FXD,FILM:3.01K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G30100F
A3R425	322–3285–00			RES,FXD,FILM:9.09K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G90900F
A3R426	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R427	322–3260–00			RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A3R428	322–3252–00			RES,FXD,FILM:4.12K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G41200F
A3R429	322–3252–00			RES,FXD,FILM:4.12K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G41200F
A3R430	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R431	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R432	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R433	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R434	322–3326–00			RES,FXD,FILM:24.3K OHM,1%,0.2W,TC–T0MI,SM BODY	91637	CCF50–2F24301F
A3R435	322–3243–00			RES,FXD:METAL FILM;3.32K OHM,1%,0.2W,TC=100	91637	CCF50–1–G33200F
A3R436	322–3322–00			RES,FXD:METAL FILM;22.1K OHM,1%,0.2W,TC=100	91637	CCF501G22101F
A3R437	322–3258–00			RES,FXD:METAL FILM;4.75K OHM,1%,0.2W,TC=100	56845	CCF50–2–G4751FT
A3R438	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R439	322–3322–00			RES,FXD:METAL FILM;22.1K OHM,1%,0.2W,TC=100	91637	CCF501G22101F
A3R440	322–3250–00			RES,FXD:METAL FILM;3.92K OHM,1%,0.2W,TC=100	91637	CCF50–2F39200F
A3R441	322–3354–00			RES,FXD:METAL FILM;47.5K OHM,1%,0.2W,TC=100	91637	CCF501G47501F
A3R442	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R443	322–3250–00			RES,FXD:METAL FILM;3.92K OHM,1%,0.2W,TC=100	91637	CCF50–2F39200F
A3R444	322–3481–00			RES,FXD,FILM:1M OHM.1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G10003F
A3R445	322–3306–00			RES,FXD:METAL FILM;15K OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1502F
A3R446	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R447	322–3260–00			RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A3R449	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R450	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3R451	322–3299–00			RES,FXD,FILM:12.7K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G12701F
A3R452	322–3281–00			RES,FXD:METAL FILM;8.25K OHM,1%,0.2W,TC=100	91637	CCF501G82500F
A3R453	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A3R454	322–3473–00			RES,FXD,FILM:825K OHM,1%,0.2W,TC=100PPM,MI,SMALL BODY,TAPE&REEL	91637	CCF50–2F82502FT
A3R455	322–3258–00			RES,FXD:METAL FILM;4.75K OHM,1%,0.2W,TC=100	56845	CCF50–2–G4751FT
A3R456	322–3265–00			RES,FXD:METAL FILM;5.62K OHM,1%,0.2W,TC=100	91637	CCF501G56200F
A3R457	322–3277–00			RES,FXD,FILM:7.5K OHM,1%,0.2W,TC=T0,SMALL BODY	91637	CCF501G75000F
A3R458	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R459	311–2231–00			RES,VAR,TRMR:CERMET;1K OHM,20%,0.5W,0.197 SQ,TOP ADJUST	TK2073	GF06UT2 102 M L
A3R460	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R461	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A3R462	322–3210–00			RES,FXD:METAL FILM;1.5K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G15000F
A3R463	322–3306–00			RES,FXD:METAL FILM;15K OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1502F
A3R464	322–3306–00			RES,FXD:METAL FILM;15K OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1502F
A3R465	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R466	322–3260–00			RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A3R467	322–3277–00			RES,FXD,FILM:7.5K OHM,1%,0.2W,TC=T0,SMALL BODY	91637	CCF501G75000F
A3R468	322–3051–00			RES,FXD:METAL FILM;33.2 OHM,1%,0.2W,TC=100 PPM	57668	CRB20FXE33E2
A3R469	322–3250–00			RES,FXD:METAL FILM;3.92K OHM,1%,0.2W,TC=100	91637	CCF50–2F39200F
A3R470	322–3306–00			RES,FXD:METAL FILM;15K OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1502F
A3R471	322–3305–00			RES,FXD,FILM:14.7K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–2–G1472FT
A3R472	322–3239–00			RES,FXD,FILM:3.01K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G30100F
A3R473	322–3402–00			RES,FXD:METAL FILM;150K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G15002F
A3R474	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R475	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A3R476	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A3R477	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A3R478	322–3193–07	672–1367–06		RES,FXD,FILM:1K OHM,0.1%,0.2W,TC=T9	91637	CCF501C10000B
A3R478	322–3481–00	672–1368–06		RES,FXD,FILM:1M OHM.1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G10003F
A3R479	322–3097–00	672–1367–08		RES,FXD,FILM:100 OHM OHM.1%,0.2W,TC=100PPM	91637	CCF501000FR36
A3R479	322–3097–00	672–1368–08		RES,FXD,FILM:100 OHM OHM.1%,0.2W,TC=100PPM	91637	CCF501000FR36
A3R480	322–3318–00	672–1367–11		RES,FXD,FILM:20K OHM OHM.1%,0.2W,TC=100PPM	57668	CRB20T68EFX2002
A3R480	322–3318–00	672–1368–11		RES,FXD,FILM:20K OHM OHM.1%,0.2W,TC=100PPM	57668	CRB20T68EFX2002
A3R481	322–3318–00	672–1367–11		RES,FXD,FILM:20K OHM OHM.1%,0.2W,TC=100PPM	57668	CRB20T68EFX2002
A3R481	322–3318–00	672–1368–11		RES,FXD,FILM:20K OHM OHM.1%,0.2W,TC=100PPM	57668	CRB20T68EFX2002
A3TP1	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3TP2	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A3TP3	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A3TP4	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A3TP5	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A3U1	156–1225–00			IC,LINEAR:BIPOLAR,CMPTR;DUAL,OPEN COLL,300NS	01295	LM393P
A3U2	160–8647–01		672–1367–10	IC,DGTL:NMOS,MICROCMPTR,8–BIT,8K BYTES, EPROM,8753,DIP 40	80009	160864701
A3U2	160–8647–02	672–1367–11		IC,DGTL:NMOS,MICROCMPTR,8–BIT,8K BYTES, EPROM,8753,DIP 40 PGM 156–2719–00	80009	160864701
A3U2	160–8647–01		672–1368–10	IC,DGTL:NMOS,MICROCMPTR,8–BIT,8K BYTES, EPROM,8753,DIP 40	80009	160864701
A3U2	160–8647–02	672–1368–11		IC,DGTL:NMOS,MICROCMPTR,8–BIT,8K BYTES, EPROM,8753,DIP 40 PGM 156–2719–00	80009	160864701
				MOUNTING PARTS		
	136–0757–00			SKT,DIP:PCB;FEM,STR,2 X 20,40 POS,0.1 X 0.6 CTR,0.175 H X 0.130 TAIL,BECU,TIN,ACCOM 0.008–0.015 X 0.014–0.022 IC	00779	2–641606–3
				END MOUNTING PARTS		
A3U3	156–2029–00			IC,MEMORY:NMOS,NVRAM;16 X 16, SERIALDATA	60395	X2444D
A3U4	156–1126–00			IC,LINEAR:BIPOLAR,CMPTR;OPEN COLLECTOR,200NS	01295	LM311P
A3U5	156–1373–00			IC,DIGITAL:LSTTL,BUFFER/DRIVER;QUAD, 3–STATE	01295	SN74LS125AN
A3U6	156–0991–02			IC,LINEAR:BIPOLAR,VR;POS,5.0V,100MA,5%	01295	UA78L05ACLPM
A3U7	156–0913–00			IC,DIGITAL:LSTTL,FLIP FLOP;OCTAL D–TYPE, ENABLE	01295	SN74LS377N
A3U8	156–2980–00			IC,DIGITAL:HCMOS,QUADRATURE DCDR/CNTR–BIT LATCH	50444	HCTL–2000
A3U9	156–1200–00			IC,LINEAR:BIFET,OP–AMP;QUAD	01295	TL074CN
A3U10	156–0913–00			IC,DIGITAL:LSTTL,FLIP FLOP;OCTAL D–TYPE, ENABLE	01295	SN74LS377N
A3U11	156–1858–00			IC,DGTL:ALSTTL,LATCH;OCTAL D–TYPE TRANS, 3–STATE	01295	SN74ALS573CN
A3U12	156–4082–00			IC,CONVERTER:CMOS,D/A;12 BIT,DUAL,VOLTAGE OUT,MPU COMPATIBLE,BYTE LOADING,REFERENCE	24355	AD7237JN
A3U13	156–0913–00			IC,DIGITAL:LSTTL,FLIP FLOP;OCTAL D–TYPE, ENABLE	01295	SN74LS377N
A3U14	156–1225–00			IC,LINEAR:BIPOLAR,CMPTR;DUAL,OPEN COLL,300NS	01295	LM393P
A3U15	156–1225–00			IC,LINEAR:BIPOLAR,CMPTR;DUAL,OPEN COLL,300NS	01295	LM393P
A3U16	156–0048–00			IC,LINEAR:BIPOLAR,TRANSISTOR ARRAY;(5),NPN,(1)DIFF PAIR,(3)IND,15V,50MA,300MHZ,AMPLIFIER	34371	CA3046
A3U17	160–8648–00			IC,DIGITAL:CMOS,PLD;EEPLD,16V8,15NS,90MA	80009	160864800
				MOUNTING PARTS		
	136–0752–00			SOCKET,DIP:PCB;FEMALE,STR,2 X 10,0.3 CTR,0.210 H X 0.128 TAIL,TIN,PHOS BRONZE	00779	2–641602–3
				END MOUNTING PARTS		

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3U18	156–0854–00			IC,LINEAR:BIPOLAR,OP–AMP;LOW INPUT BIAS CURRENT, LOW OFFSET VOLTAGE	27014	LM308AN
A3U19	156–2460–00			IC,MISC:BIPOLAR,MOD/DEMOD;BALANCED	04713	MC1496P
A3U20	156–4143–00			IC,MISC:CMOS,ANALOG SW;SGL SPST,45 OHM, 250NS	1ES66	DG417DJ
A3U21	156–1149–00			IC,LINEAR:BIFET,OP–AMP	27014	LF351N
A3U22	156–0912–00			IC,LINEAR:BIPOLAR,OP–AMP;TRANSCONDUCTANCE	27014	LM3080N
A3U23	156–2460–00			IC,MISC:BIPOLAR,MOD/DEMOD;BALANCED	04713	MC1496P
A3U24	156–2460–00			IC,MISC:BIPOLAR,MOD/DEMOD;BALANCED	04713	MC1496P
A3U25	156–2009–00			IC,DIGITAL:HCMOS,FLIP FLOP;DUAL D–TYPE	04713	MC74HC74AN
A3U26	156–2460–00			IC,MISC:BIPOLAR,MOD/DEMOD;BALANCED	04713	MC1496P
A3U27	156–2460–00			IC,MISC:BIPOLAR,MOD/DEMOD;BALANCED	04713	MC1496P
A3U28	156–2761–01			IC,DIGITAL:HCMOS,MULTIVIBRATOR	0JR04	TC74HC221AP
A3U29	156–0411–00			IC,LINEAR:BIPOLAR,COMPARATOR;QUAD,SGL SPLY,300NS	01295	LM339N
A3U30	156–0742–00			IC,LINEAR:BIPOLAR,OP–AMP;HIGH SLEW RATE	01295	LM318P
A3U31	156–0912–00			IC,LINEAR:BIPOLAR,OP–AMP;TRANSCONDUCTANCE	27014	LM3080N
A3U32	156–0912–00			IC,LINEAR:BIPOLAR,OP–AMP;TRANSCONDUCTANCE	27014	LM3080N
A3U33	156–0912–00			IC,LINEAR:BIPOLAR,OP–AMP;TRANSCONDUCTANCE	27014	LM3080N
A3U34	156–0411–00			IC,LINEAR:BIPOLAR,COMPARATOR;QUAD,SGL SPLY,300NS	01295	LM339N
A3U35	156–1850–00			IC,MISC:CMOS,ANALOG SWITCH;QUAD	17856	DG211CJ
A3U36	156–2460–00			IC,MISC:BIPOLAR,MOD/DEMOD;BALANCED	04713	MC1496P
A3U37	156–2460–00			IC,MISC:BIPOLAR,MOD/DEMOD;BALANCED	04713	MC1496P
A3U38	156–1850–00			IC,MISC:CMOS,ANALOG SWITCH;QUAD	17856	DG211CJ
A3U39	156–2558–00			IC,LINEAR:BIPOLAR,VR;POS,12V,1.5A,2%	01295	TL780–12CKC
A3U40	156–0048–00			IC,LINEAR:BIPOLAR,TRANSISTOR ARRAY;(5),NPN,(1)DIFF PAIR,(3)IND,15V,50MA,300MHZ,AMPLIFIER	34371	CA3046
A3U41	156–0048–00			IC,LINEAR:BIPOLAR,TRANSISTOR ARRAY;(5),NPN,(1)DIFF PAIR,(3)IND,15V,50MA,300MHZ,AMPLIFIER	34371	CA3046
A3U42	156–2559–00			IC,LINEAR:BIPOLAR,VR;NEG,–12V,1.5A,2%	48726	UC7912ACT
A3U43	156–0912–00			IC,LINEAR:BIPOLAR,OP–AMP;TRANSCONDUCTANCE	27014	LM3080N
A3U44	156–0067–00			IC,LINEAR:BIPOLAR,OP–AMP	01295	UA741CP
A3U45	156–1149–00			IC,LINEAR:BIFET,OP–AMP	27014	LF351N
A3VR1	152–0195–00			DIODE,ZENER:5.1V,5%,0.4W	04713	MZ5523D
A3VR2	152–0226–00			DIODE,ZENER:5.1V,5%,0.4W	14552	TD3810980
A3VR3	152–0486–00			DIODE,ZENER:6.2V,2%,0.4W	04713	SZG20008RL
A3VR4	152–0304–00			DIODE,ZENER:20V,5%,0.4W	04713	1N968BRL
A3VR5	152–0226–00			DIODE,ZENER:5.1V,5%,0.4W	14552	TD3810980
A3VR6	152–0486–00			DIODE,ZENER:6.2V,2%,0.4W	04713	SZG20008RL
A3VR7	152–0466–00			SEMICOND DVC,DI:ZEN,SI,15V,5%,0.33WTELEQUIPMENT	80009	152046600
A3W1	196–3362–00			LEAD,ELECTRICAL:24 AWG,5.875 L	TK2469	196–3362–00

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A3W100	174–2608–00			CA ASSY,SP,ELEC:10,28 AWG,9.8 L,RIBBON	53387	174–2608–00
A3Y1	158–0300–00			XTAL UNIT,QTZ:12.0 MHZ,50 PPM,SERIES	61429	FOX120X
A3Y2	158–0317–00	672–1367–06		XTAL UNIT,QTZ:3.579545MHZ, +/–0.003%,PARALLEL, CL=16PF,HC–49U–A	TK1919	HC–49/U 3.57954
A3Y2	158–0318–00	672–1368–06		XTAL UNIT,QTZ:4.433619MHZ, +/–0.003%,PARALLEL, CL=16PF, HC–49/U–A	TK1919	HC–49/U 4.43361
A3A1	671–1796–00			CIRCUIT BD ASSY:GRATICULE LIGHT	80009	671179600
A3A1DS100	150–0168–00			LAMP,INCAND:14V,0.08A,WEDGE BASE,T1.75 FOR SKT MT	55335	73W
				MOUNTING PARTS		
	136–1119–00			SOCKET,LPHLDR:PCB,LAMPHOLDER;FEM,STR,SGL,0.404 H X 0.218 TAIL,TIN,T–1.75 WEDGE BASE	65654	CIC 7500 A–VALO
				END MOUNTING PARTS		
A3A1DS200	150–0168–00			LAMP,INCAND:14V,0.08A,WEDGE BASE,T1.75 FOR SKT MT	55335	73W
				MOUNTING PARTS		
	136–1119–00			SOCKET,LPHLDR:PCB,LAMPHOLDER;FEM,STR,SGL,0.404 H X 0.218 TAIL,TIN,T–1.75 WEDGE BASE	65654	CIC 7500 A–VALO
				END MOUNTING PARTS		
A3A1DS300	150–0168–00			LAMP,INCAND:14V,0.08A,WEDGE BASE,T1.75 FOR SKT MT	55335	73W
				MOUNTING PARTS		
	136–1119–00			SOCKET,LPHLDR:PCB,LAMPHOLDER;FEM,STR,SGL,0.404 H X 0.218 TAIL,TIN,T–1.75 WEDGE BASE	65654	CIC 7500 A–VALO
				END MOUNTING PARTS		
A3A1J100	131–4530–00			CONN,HDR:PCB;MALE,STR,1 X 3,0.1 CTR,0.230 MLG X 0.120 TAIL,30GOLD,BD RETENTION	00779	104344–1
A3A1P100	131–0993–00			CONN,BOX:SHUNT;FEMALE,STR,1 X 2,0.1 CTR,0.385 H,30 GOLD,BLACK,JUMPER	22526	65474–006
A3A1P200	131–1806–00			CONN,HDR:PCB;MALE,RTANG,1 X 31,0.15 CTR,0.230 MLG X 0.120 TAIL,30 GOLD	22526	65595–131
A3A1P800	131–1806–00			CONN,HDR:PCB;MALE,RTANG,1 X 31,0.15 CTR,0.230 MLG X 0.120 TAIL,30 GOLD	22526	65595–131

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A4	671–2234–05		B042145	CKT BD ASSY:NTSC	80009	671223405
A4	671–2234–06	B042146		CKT BD ASSY:NTSC (1720SCH ONLY)	80009	671223405
A4	671–2235–05		B040823	CKT BD ASSY:PAL	80009	671223505
A4	671–2235–06	B040824		CKT BD ASSY:PAL (1721SCH ONLY)	80009	671223505
A4C1	290–0973–03			CAP,FXD,ALUM:100UF,20%,35V,ESR=1.99 OHM (120HZ,20C),8 X 11.5MM,LS=3.5MM	55680	UVX1V101MPA1TD
A4C2	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C3	283–0642–01			CAP,FXD,MICA DI:33PF,2%,500VTAPE & AMMO PACK	09023	CDA10ED330G03
A4C4	283–0642–01			CAP,FXD,MICA DI:33PF,2%,500VTAPE & AMMO PACK	09023	CDA10ED330G03
A4C5	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C6	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C7	283–0177–05			CAP,FXD,CER DI:1UF,+80–20%,25V	04222	SR303E105ZAAAP1
A4C8	283–0203–00			CAP,FXD,CER DI:0.47UF,20%,50V	04222	SR305C474MAA
A4C9	281–0864–00			CAP,FXD,CERAMIC:MLC;430PF,5%,100V,0.100 X 0.170	04222	SA101A431JAA
A4C10	281–0812–00			CAP,FXD,CERAMIC:MLC;1000PF,10%,100V,0.100 X	04222	SA101C102KAA
A4C11	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C12	281–0302–00			CAP,VAR,PLSTC:1.2–4PF,100V	52769	GSX367
A4C13	283–0625–01	671–2234–05		CAP,FXD,MICA DI:220PF,1%,500VTAPE & AMMO PACK	09023	CDA10FD221F03
A4C13	283–0644–01	671–2235–05		CAP,FXD,MICA DI:150PF,1%,500VTAPE & AMMO PACK	TK0891	ADVISE
A4C14	290–1311–00			CAP,FXD,ALUM:10UF,20%,50V,ESR=1.4 OHM(100KHZ,20C), 5X11MM,105C,5000HRS	55680	UPL1H100MDH1TD
A4C15	281–0925–01			CAP,FXD,CERAMIC:MLC;0.22UF,20%,50V,Z5U.0.170 X 0.120	04222	SA115E224MAA
A4C16	281–0865–00			CAP,FXD,CER DI:1000PF,5%,100V	04222	SA201A102JAA
A4C17	281–0767–00			CAP,FXD,CERAMIC:MLC;330PF,20%,100V,0.100 X 0.170	04222	SA102C331MAA
A4C18	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C19	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C20	283–0785–01			CAP,FXD,MICA DI:250PF,1%,500V,TAPE & AMMO PACK	09023	CDA15FD251F03
A4C21	283–0100–00			CAP,FXD,CER DI:0.0047UF,10%,200V	04222	SR302A472KAA
A4C22	290–0848–00			CAP,FXD,ALUM:47UF,20%,16V,ESR=7.05 OHM(120HZ,25C), 10X12MM,RADIAL.	0H1N5	CEBPM1E470M
A4C23	281–0863–00			CAP,FXD,CERAMIC:MLC;240PF,5%,100V,0.100 X 0.170	04222	SA101A241JAA
A4C24	283–0766–01			CAP,FXD,MICA DI:47PF,1%,500V,TAPE & AMMO PACK	09023	CDA15ED470D03
A4C25	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C26	290–1311–00			CAP,FXD,ALUM:10UF,20%,50V,ESR=1.4 OHM(100KHZ,20C), 5X11MM,105C,5000HRS	55680	UPL1H100MDH1TD
A4C27	283–0638–01			CAP,FXD,MICA DI:130PF,1%,500VTAPE & AMMO PACK	09023	CDA15FD131F03
A4C28	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C29	281–0812–00			CAP,FXD,CERAMIC:MLC;1000PF,10%,100V,0.100 X	04222	SA101C102KAA

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A4C30	283–0633–01			CAP,FXD,MICA DI:77PF,1%,500V,RADIAL	09023	CDA15ED770F03
A4C31	283–0632–01			CAP,FXD,MICA DI:87PF,1%,500V,TAPE & AMMO PACK	09023	CDA15FD870F03
A4C32	281–0775–01	671–2235–05		CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C33	281–0812–00	671–2235–05		CAP,FXD,CERAMIC:MLC;1000PF,10%,100V,0.100 X	04222	SA101C102KAA
A4C34	281–0775–01	671–2235–05		CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C35	283–0026–00	671–2235–05		CAP,FXD,CER DI:0.2UF,+80–20%,25V	04222	SR305C204MAA
A4C36	281–0775–01	671–2235–05		CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C37	283–0341–00	671–2235–05		CAP,FXD,CER DI:0.047UF,10%,100V,X7R,0.20 X 0.20,O.2 LS;RADIAL	04222	SR211C473KAA
A4C38	281–0775–01	671–2235–05		CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C39	281–0775–01	671–2235–05		CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C40	281–0775–01	671–2235–05		CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C41	283–0620–01	671–2235–05		CAP,FXD,MICA DI:470PF,1%,500V,TAPE & AMMO PACK	09023	CDA15FD471F03
A4C42	283–0620–01	671–2235–05		CAP,FXD,MICA DI:470PF,1%,500V,TAPE & AMMO PACK	09023	CDA15FD471F03
A4C43	281–0812–00	671–2235–05		CAP,FXD,CERAMIC:MLC;1000PF,10%,100V,0.100 X	04222	SA101C102KAA
A4C44	281–0775–01	671–2235–05		CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C45	281–0775–01	671–2235–05		CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C46	281–0812–00	671–2235–05		CAP,FXD,CERAMIC:MLC;1000PF,10%,100V,0.100 X	04222	SA101C102KAA
A4C47	281–0772–00	671–2235–05		CAP,FXD,CERAMIC:MLC;4700PF,10%,100V,0.100 X	04222	SA101C472KAA
A4C48	281–0851–00	671–2235–05		CAP,FXD,CERAMIC:MLC;180PF,5%,100VDC,0.100 X	04222	SA101A181JAA
A4C49	283–0663–01	671–2235–05		CAP,FXD,MICA DI:16.8PF,500VTAPED & REELED	TK0891	RDM15CD16R8D03
A4C50	281–0775–01	671–2235–05		CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C51	281–0812–00	671–2235–05		CAP,FXD,CERAMIC:MLC;1000PF,10%,100V,0.100 X	04222	SA101C102KAA
A4C52	283–0680–00	671–2235–05		CAP,FXD,MICA DI:330PF,1%,500V	TK0891	RDM15FD331F03
A4C53	283–0633–01	671–2235–05		CAP,FXD,MICA DI:77PF,1%,500V,RADIAL	09023	CDA15ED770F03
A4C54	281–0775–01	671–2235–05		CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C55	283–0768–01	671–2235–05		CAP,FXD,MICA DI:132PF,1%,500VTAPE & AMMO PACK	09023	CDA15FD(132)F03
A4C56	281–0812–00	671–2235–05		CAP,FXD,CERAMIC:MLC;1000PF,10%,100V,0.100 X	04222	SA101C102KAA
A4C57	283–0674–01	671–2235–05		CAP,FXD,MICA DI:85PF,500VTAPED & REELED	TK0891	RDM15FD850F03
A4C58	281–0775–01	671–2235–05		CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C59	281–0773–00	671–2235–05		CAP,FXD,CERAMIC:MLC;0.01UF,10%,100V	TK1743	CGB103KEX
A4C60	290–1311–00			CAP,FXD,ALUM:10UF,20%,50V,ESR=1.4 OHM(100KHZ,20C), 5X11MM,105C,5000HRS	55680	UPL1H100MDH1TD
A4C61	281–0775–01	671–2235–05		CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C62	290–1311–00			CAP,FXD,ALUM:10UF,20%,50V,ESR=1.4 OHM(100KHZ,20C), 5X11MM,105C,5000HRS	55680	UPL1H100MDH1TD
A4C63	290–1311–00			CAP,FXD,ALUM:10UF,20%,50V,ESR=1.4 OHM(100KHZ,20C), 5X11MM,105C,5000HRS	55680	UPL1H100MDH1TD
A4C64	290–1311–00			CAP,FXD,ALUM:10UF,20%,50V,ESR=1.4 OHM(100KHZ,20C), 5X11MM,105C,5000HRS	55680	UPL1H100MDH1TD

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A4C65	283–0594–02			CAP,FXD,MICA DI:1000PF,1%,100V,TAPE & AMMO PACK	09023	CDA15FA102F03
A4C66	281–0707–00			CAP,FXD,CER DI:15000PF,10%,200V	04222	MA302C153KAA
A4C67	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C68	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C69	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C70	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C71	283–0680–00	671–2234–05		CAP,FXD,MICA DI:330PF,1%,500V	TK0891	RDM15FD331F03
A4C71	283–0725–01	671–2235–05		CAP,FXD,MICA DI:214PF,1%,500V,TAPE & AMMO PACK	09023	CDA15FD(214)F03
A4C72	281–0812–00			CAP,FXD,CERAMIC:MLC;1000PF,10%,100V,0.100 X	04222	SA101C102KAA
A4C73	283–0672–01			CAP,FXD,MICA DI:200PF,1%,500VTAPE & AMMO PACK	09023	CDA15FD201F03
A4C74	283–0680–00	671–2234–05		CAP,FXD,MICA DI:330PF,1%,500V	TK0891	RDM15FD331F03
A4C74	283–0725–01	671–2235–05		CAP,FXD,MICA DI:214PF,1%,500V,TAPE & AMMO PACK	09023	CDA15FD(214)F03
A4C75	283–0594–02			CAP,FXD,MICA DI:1000PF,1%,100V,TAPE & AMMO PACK	09023	CDA15FA102F03
A4C76	281–0773–00			CAP,FXD,CERAMIC:MLC;0.01UF,10%,100V	TK1743	CGB103KEX
A4C77	283–0644–01			CAP,FXD,MICA DI:150PF,1%,500VTAPE & AMMO PACK	TK0891	ADVISE
A4C78	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C79	290–0848–00			CAP,FXD,ALUM:47UF,20%,16V,ESR=7.05 OHM(120HZ,25C), 10X12MM,RADIAL.	0H1N5	CEBPM1E470M
A4C80	281–0816–00			CAP,FXD,CERAMIC:MLC;82 PF,5%,100V,0.100 X 0.170	TK1743	CGB820JEN
A4C81	281–0814–00			CAP,FXD,CERAMIC:MLC;100 PF,10%,100V,0.100 X	TK1743	CGB101KEN
A4C82	281–0756–00			CAP,FXD,CER:MLC;2.2PF,+/–0.5PF,200V,NPO,0.100 X 0.170	04222	SA102A2R2DAA
A4C83	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C84	281–0812–00			CAP,FXD,CERAMIC:MLC;1000PF,10%,100V,0.100 X	04222	SA101C102KAA
A4C85	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C86	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C87	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C88	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C89	290–0778–00			CAP,FXD,ALUM:1UF,20%,50V,5 X 11 MM,NONPOLAR	62643	SMEBP50VB1R0M5X
A4C90	290–0778–00			CAP,FXD,ALUM:1UF,20%,50V,5 X 11 MM,NONPOLAR	62643	SMEBP50VB1R0M5X
A4C91	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C92	281–0773–00			CAP,FXD,CERAMIC:MLC;0.01UF,10%,100V	TK1743	CGB103KEX
A4C93	281–0773–00			CAP,FXD,CERAMIC:MLC;0.01UF,10%,100V	TK1743	CGB103KEX
A4C94	283–0638–01	671–2234–05		CAP,FXD,MICA DI:130PF,1%,500VTAPE & AMMO PACK	09023	CDA15FD131F03
A4C94	283–0674–01	671–2235–05		CAP,FXD,MICA DI:85PF,500VTAPED & REELED	TK0891	RDM15FD850F03
A4C95	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C96	281–0809–00			CAP,FXD,CERAMIC:MLC;200 PF,5%,100V,0.100 X 0.170	04222	SA101A201JAA
A4C97	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C98	281–0759–00			CAP,FXD,CERAMIC:MLC;22PF,10%,100V,0.100 X 0.170	04222	SA102A220KAA
A4C99	281–0759–00			CAP,FXD,CERAMIC:MLC;22PF,10%,100V,0.100 X 0.170	04222	SA102A220KAA

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A4C101	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C102	283–0341–00			CAP,FXD,CER DI:0.047UF,10%,100V,X7R,0.20 X 0.20,O.2 LS;RADIAL	04222	SR211C473KAA
A4C103	290–1311–00			CAP,FXD,ALUM:10UF,20%,50V,ESR=1.4 OHM(100KHZ,20C), 5X11MM,105C,5000HRS	55680	UPL1H100MDH1TD
A4C104	283–0698–01			CAP,FXD,MICA DI:390PF,1%,500V,TAPE & AMMO PACK	09023	CDA15FD391F03
A4C105	283–0339–00			CAP,FXD,CERAMIC:MLC;0.22UF,10%,50V,X7R,0.30	04222	SR305C224KAA
A4C106	281–0791–00			CAP,FXD,CERAMIC:MLC;270PF,10%,100V,0.100 X 0.170	04222	SA102C271KAA
A4C107	283–0788–01			CAP,FXD,MICA DI:267PF,1%,500V,TAPE & AMMO PACK	09023	CDA15FD(267)F03
A4C108	281–0852–00			CAP,FXD,CERAMIC:MLC;1800PF,10%,100VDC,0.100	04222	SA101C182KAA
A4C109	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C110	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C111	283–0697–00			CAP,FXD,MICA DI:545PF,1%,300V	TK0891	RDM15FC5450F03
A4C112	283–0641–00			CAP,FXD,MICA DI:180PF,1%,100V	TK0891	RDM15FD181F03
A4C113	283–0672–01			CAP,FXD,MICA DI:200PF,1%,500VTAPE & AMMO PACK	09023	CDA15FD201F03
A4C114	281–0788–00			CAP,FXD,CERAMIC:MLC;470PF,10%,100V,0.100 X 0.170	04222	SA102C471KAA
A4C115	281–0864–00			CAP,FXD,CERAMIC:MLC;430PF,5%,100V,0.100 X 0.170	04222	SA101A431JAA
A4C116	290–0778–00			CAP,FXD,ALUM:1UF,20%,50V,5 X 11 MM,NONPOLAR	62643	SMEBP50VB1R0M5X
A4C117	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C118	281–0775–01			CAP,FXD,CERAMIC:MCL;0.1UF,20%,50V,Z5U,0.170	04222	SA105E104MAA
A4C119	281–0816–00			CAP,FXD,CERAMIC:MLC;82 PF,5%,100V,0.100 X 0.170	TK1743	CGB820JEN
A4CR1	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A4CR2	152–1187–00			DIODE,SIG:VVC;30V,11PF AT 3V,2.1PF AT 25V,C3/C25=5.2, Q=300,IR=50NA	80009	152118700
A4CR3	152–0141–02	671–2235–05		DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A4CR4	152–0141–02	671–2235–05		DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A4CR5	152–0141–02	671–2235–05		DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A4CR6	152–0141–02	671–2235–05		DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A4CR7	152–0141–02	671–2235–05		DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A4CR8	152–0141–02	671–2235–05		DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A4CR9	152–0141–02	671–2235–05		DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A4CR10	152–0066–00			DIODE,RECT:400V,1A,IFSM=30A,1.2VF,2US	0LUA3	1N5060
A4CR11	152–0066–00			DIODE,RECT:400V,1A,IFSM=30A,1.2VF,2US	0LUA3	1N5060
A4CR12	152–0066–00			DIODE,RECT:400V,1A,IFSM=30A,1.2VF,2US	0LUA3	1N5060
A4CR13	152–0066–00			DIODE,RECT:400V,1A,IFSM=30A,1.2VF,2US	0LUA3	1N5060
A4CR14	152–0141–02	671–2235–05		DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A4CR15	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A4CR16	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A4CR17	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A4CR18	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A4CR19	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A4CR20	152–0322–00			DIODE,SIG:SCHTKY;15V,410MVF AT 1MA,1.2PF	50434	5082–2672–T25
A4CR21	152–0322–00			DIODE,SIG:SCHTKY;15V,410MVF AT 1MA,1.2PF	50434	5082–2672–T25
A4CR22	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A4CR23	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A4CR24	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A4CR25	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A4CR26	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A4CR27	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A4CR28	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A4CR29	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A4CR30	152–0141–02			DIODE,SIG:ULTRA FAST;40V,150MA,4NS,2PF	27014	FDH9427
A4CR31	152–0612–00	671–2235–05		DIODE,SIG:VVC;50V,15–20PF,C4/30=2.33,Q=15	04713	SMV1561
A4CR32	152–0269–01			DIODE,SIG:VVC;C4=33PF,5%,C4/C20=2	04713	SMV1263–1
A4J1	131–4530–00			CONN,HDR:PCB;MALE,STR,1 X 3,0.1 CTR,0.230MLG X 0.120 TAIL,30GOLD,BD RETENTION	00779	104344–1
A4J2	131–3364–00			CONN,HDR:PCB;MALE,STR,2 X 17,0.1 CTR,0.365D	53387	2534–6002UB
A4J3	131–4794–00			CONN,HDR:PCB;MALE,STR,1 X 2,0.1 CTR,0.235MLG X 0.112 TAIL,30GOLD,0.035 DIA PCB,SAFETY CONTROLLED	53387	2402–6112 UB
A4J4	131–4530–00			CONN,HDR:PCB;MALE,STR,1 X 3,0.1 CTR,0.230MLG X 0.120 TAIL,30GOLD,BD RETENTION	00779	104344–1
A4J5	131–4530–00			CONN,HDR:PCB;MALE,STR,1 X 3,0.1 CTR,0.230MLG X 0.120 TAIL,30GOLD,BD RETENTION	00779	104344–1
A4J6	131–4530–00			CONN,HDR:PCB;MALE,STR,1 X 3,0.1 CTR,0.230MLG X 0.120 TAIL,30GOLD,BD RETENTION	00779	104344–1
A4L1	108–1212–00			INDUCTOR,FXD:CUSTOM,SIGNAL;9UH,2%,IDC<300 MA,RDC<1.6 OHM,Q>60@4MHZ,SRF>50 MHZ	0JR03	108–1212–00
A4L2	108–0317–01	671–2235–05		INDUCTOR,FXD:CUSTOM,POWER;15UH,10%,IDC<460 MA,RDC<1.2 OHM,Q>55@2.5MHZ,SRF>30 MHZ	0JR03	108–0317–01
A4L3	108–1212–00			INDUCTOR,FXD:CUSTOM,SIGNAL;9UH,2%,IDC<300 MA,RDC<1.6 OHM,Q>60@4MHZ,SRF>50 MHZ	0JR03	108–1212–00
A4L4	108–0317–01			INDUCTOR,FXD:CUSTOM,POWER;15UH,10%,IDC<460 MA,RDC<1.2 OHM,Q>55@2.5MHZ,SRF>30 MHZ	0JR03	108–0317–01
A4L5	108–0317–01			INDUCTOR,FXD:CUSTOM,POWER;15UH,10%,IDC<460 MA,RDC<1.2 OHM,Q>55@2.5MHZ,SRF>30 MHZ	0JR03	108–0317–01
A4L6	108–0215–00			INDUCTOR,FXD:CUSTOM,PWR;1.1UH,10%,IDC<5108 AWG	0JR03	108–0215–00
A4L7	108–1212–00			INDUCTOR,FXD:CUSTOM,SIGNAL;9UH,2%,IDC<300 MA,RDC<1.6 OHM,Q>60@4MHZ,SRF>50 MHZ	0JR03	108–1212–00
A4P1	131–3957–00			CONN,SHUNT:SHUNT,1 X 2,0.1 CTR,JUMPER,0.2 H,LOW PROFILE,BLACK	22526	68786–202
A4P4	131–3957–00			CONN,SHUNT:SHUNT,1 X 2,0.1 CTR,JUMPER,0.2 H,LOW PROFILE,BLACK	22526	68786–202

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A4P5	131–3957–00			CONN,SHUNT:SHUNT,1 X 2,0.1 CTR,JUMPER,0.2 H,LOW PROFILE,BLACK	22526	68786–202
A4P6	131–3957–00			CONN,SHUNT:SHUNT,1 X 2,0.1 CTR,JUMPER,0.2 H,LOW PROFILE,BLACK	22526	68786–202
A4Q2	151–0736–00			TRANSISTOR,SIG:BIPOLAR,NPN;40V,600MA,250MHZ,AMPL	0JR04	2N4401
A4Q3	151–0221–08			TRANSISTOR,SIG:BIPOLAR,PNP;12V,80MA,SWITCHING	27014	PN4258/D75Z
A4Q4	151–0221–08			TRANSISTOR,SIG:BIPOLAR,PNP;12V,80MA,SWITCHING	27014	PN4258/D75Z
A4Q5	151–0221–08			TRANSISTOR,SIG:BIPOLAR,PNP;12V,80MA,SWITCHING	27014	PN4258/D75Z
A4Q6	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A4Q7	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A4Q8	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A4Q9	151–0223–00	671–2235–05		TRANSISTOR,SIG:BIPOLAR,NPN;15V,500MA,SWITCHING	04713	MPS2369A
A4Q10	151–0190–09	671–2235–05		TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A4Q11	151–0188–05	671–2235–05		TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A4Q12	151–0190–09	671–2235–05		TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A4Q13	151–0190–09	671–2235–05		TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A4Q14	151–0190–09	671–2235–05		TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A4Q15	151–0190–09	671–2235–05		TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A4Q16	151–0190–09	671–2235–05		TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A4Q17	151–0188–05	671–2235–05		TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A4Q18	151–0190–09	671–2235–05		TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A4Q19	151–0190–09	671–2235–05		TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A4Q20	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A4Q21	151–0223–00			TRANSISTOR,SIG:BIPOLAR,NPN;15V,500MA,SWITCHING	04713	MPS2369A
A4Q22	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A4Q23	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A4Q24	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A4Q25	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A4Q26	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A4Q27	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A4Q28	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A4Q29	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A4Q30	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A4Q31	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A4Q32	151–1005–03			TRANSISTOR,SIG:JFET,N–CH;5V,6MA,2MS,500 OHM	66182	SNJ1641
A4Q33	151–1005–03			TRANSISTOR,SIG:JFET,N–CH;5V,6MA,2MS,500 OHM	66182	SNJ1641
A4Q34	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A4Q35	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A4Q36	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A4Q37	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A4Q38	151–0221–08			TRANSISTOR,SIG:BIPOLAR,PNP;12V,80MA,SWITCHING	27014	PN4258/D75Z
A4Q39	151–1005–03			TRANSISTOR,SIG:JFET,N–CH;5V,6MA,2MS,500 OHM	66182	SNJ1641
A4Q40	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A4Q41	151–0190–09			TRANSISTOR,SIG:BIPOLAR,NPN;40V,200MA,300MHZ,AMPL	0JR04	2N3904TPE2
A4Q42	151–0188–05			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMPL	0JR04	2N3906TPE2
A4R1	322–3285–00			RES,FXD,FILM:9.09K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G90900F
A4R3	322–3260–00			RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A4R4	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R5	311–2237–00			RES,VAR,TRMR:CERMET;25K OHM,20%,0.5W,0.197SQ,SIDE ADJUST	TK2073	GF06UT2 253 M L
A4R6	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R7	322–3243–00			RES,FXD:METAL FILM;3.32K OHM,1%,0.2W,TC=100	91637	CCF50–1–G33200F
A4R8	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R9	322–3162–00			RES,FXD:METAL FILM;475 OHM,1%,0.2W,TC=100 PPM	91637	CCF50G475R0F
A4R10	322–3354–00			RES,FXD:METAL FILM;47.5K OHM,1%,0.2W,TC=100	91637	CCF501G47501F
A4R11	322–3272–00			RES,FXD,FILM:6.65K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–2–G66500F
A4R12	322–3162–00			RES,FXD:METAL FILM;475 OHM,1%,0.2W,TC=100 PPM	91637	CCF50G475R0F
A4R13	322–3231–00			RES,FXD,FILM:2.49K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–1G24900F
A4R14	322–3001–00			RES,FXD:METAL FILM;10 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10R00F
A4R15	322–3184–00			RES,FXD,FILM:806 OHM,1%,0.2W,TC=T0,SMALL BODY	91637	CCF501G806FOR
A4R16	322–3184–00			RES,FXD,FILM:806 OHM,1%,0.2W,TC=T0TAPED & R EELED,SMALL BODY	91637	CCF501G806FOR
A4R17	322–3258–00			RES,FXD:METAL FILM;4.75K OHM,1%,0.2W,TC=100	56845	CCF50–2–G4751FT
A4R18	322–3393–00			RES,FXD:METAL FILM;121K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G12102F
A4R19	322–3431–00			RES,FXD,FILM:301K OHM,1%,0.2W,TC=T0,SMALL BODY	91637	CCF501G30102F
A4R20	322–3162–00			RES,FXD:METAL FILM;475 OHM,1%,0.2W,TC=100 PPM	91637	CCF50G475R0F
A4R21	322–3155–00			RES,FXD,FILM:402 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G402ROF
A4R22	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R23	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A4R24	322–3265–00			RES,FXD:METAL FILM;5.62K OHM,1%,0.2W,TC=100	91637	CCF501G56200F
A4R25	322–3265–00			RES,FXD:METAL FILM;5.62K OHM,1%,0.2W,TC=100	91637	CCF501G56200F
A4R26	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A4R27	322–3226–00			RES,FXD:METAL FILM;2.21K OHM,1%,0.2W,TC=100	91637	CCF501G22100F
A4R28	322–3258–00			RES,FXD:METAL FILM;4.75K OHM,1%,0.2W,TC=100	56845	CCF50–2–G4751FT
A4R29	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R30	322–3469–00			RES,FXD,FILM:750K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF501G75002F
A4R31	322–3329–00			RES,FXD,FILM:26.1K OHM.1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G26101F
A4R33	322–3126–00			RES,FXD,FILM:200 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G200ROF

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A4R34	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R35	322–3132–00			RES,FXD,FILM:232 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF50–2–G232ROF
A4R36	322–3126–00			RES,FXD,FILM:200 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G200ROF
A4R37	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R38	322–3258–00			RES,FXD:METAL FILM;4.75K OHM,1%,0.2W,TC=100	56845	CCF50–2–G4751FT
A4R39	322–3226–00			RES,FXD:METAL FILM;2.21K OHM,1%,0.2W,TC=100	91637	CCF501G22100F
A4R40	322–3210–00			RES,FXD:METAL FILM;1.5K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G15000F
A4R41	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R42	322–3210–00			RES,FXD:METAL FILM;1.5K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G15000F
A4R43	322–3243–00			RES,FXD:METAL FILM;3.32K OHM,1%,0.2W,TC=100	91637	CCF50–1–G33200F
A4R44	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A4R45	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A4R46	322–3126–00			RES,FXD,FILM:200 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G200ROF
A4R47	322–3001–00			RES,FXD:METAL FILM;10 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10R00F
A4R48	322–3184–00			RES,FXD,FILM:806 OHM,1%,0.2W,TC=T0,SMALL BODY	91637	CCF501G806FOR
A4R49	322–3258–00			RES,FXD:METAL FILM;4.75K OHM,1%,0.2W,TC=100	56845	CCF50–2–G4751FT
A4R50	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A4R51	322–3306–00			RES,FXD:METAL FILM;15K OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1502F
A4R52	322–3197–00			RES,FXD,FILM:1.1K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF501G11000F
A4R53	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A4R54	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R55	322–3184–00			RES,FXD,FILM:806 OHM,1%,0.2W,TC=T0,SMALL BODY	91637	CCF501G806FOR
A4R56	322–3226–00			RES,FXD:METAL FILM;2.21K OHM,1%,0.2W,TC=100	91637	CCF501G22100F
A4R57	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R58	322–3228–00			RES,FXD,FILM:2.32K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–1G2320F
A4R59	322–3208–00			RES,FXD,FILM:1.43K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G14300F
A4R60	322–3188–00			RES,FXD,FILM:887 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G887R0F
A4R61	322–3188–00			RES,FXD,FILM:887 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G887R0F
A4R62	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R63	322–3251–00	671–2235–05		RES,FXD,FILM:4.02K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G40200F
A4R64	322–3289–00	671–2235–05		RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R65	322–3306–00	671–2235–05		RES,FXD:METAL FILM;15K OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1502F
A4R66	322–3385–00	671–2235–05		RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A4R67	322–3280–00	671–2235–05		RES,FXD,FILM:8.06K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G80600F
A4R68	322–3261–00	671–2235–05		RES,FXD,FILM:5.11K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50G5111FT
A4R69	322–3164–00	671–2235–05		RES,FXD,FILM:499 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G499ROF
A4R70	322–3097–00	671–2235–05		RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R71	322–3261–00	671–2235–05		RES,FXD,FILM:5.11K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50G5111FT

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A4R73	322–3205–00	671–2235–05		RES,FXD,FILM:1.33K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G13300F
A4R74	322–3289–00	671–2235–05		RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R75	315–0475–00	671–2235–05		RES,FXD,FILM:4.7M OHM,5%,0.25W	TK1727	SFR25 2322–181–
A4R76	322–3289–00	671–2235–05		RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R77	322–3289–00	671–2235–05		RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R78	322–3405–00	671–2235–05		RES,FXD,FILM:162K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF50–2F16202F
A4R79	322–3289–00	671–2235–05		RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R80	322–3097–00	671–2235–05		RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R81	322–3356–00	671–2235–05		RES,FXD,FILM:49.9K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G49901F
A4R82	322–3193–00	671–2235–05		RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A4R83	322–3261–00	671–2235–05		RES,FXD,FILM:5.11K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50G5111FT
A4R84	322–3289–00	671–2235–05		RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R85	322–3251–00	671–2235–05		RES,FXD,FILM:4.02K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G40200F
A4R86	322–3222–00	671–2235–05		RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A4R87	322–3274–00	671–2235–05		RES,FXD,FILM:6.98K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–2–G–69800
A4R88	322–3318–00	671–2235–05		RES,FXD,FILM:MET FILM;20K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20001F
A4R89	322–3289–00	671–2235–05		RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R90	322–3250–00	671–2235–05		RES,FXD:METAL FILM;3.92K OHM,1%,0.2W,TC=100	91637	CCF50–2F39200F
A4R91	322–3097–00	671–2235–05		RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R92	322–3289–00	671–2235–05		RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R93	322–3205–00	671–2235–05		RES,FXD,FILM:1.33K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G13300F
A4R94	322–3261–00	671–2235–05		RES,FXD,FILM:5.11K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50G5111FT
A4R95	322–3097–00	671–2235–05		RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R96	322–3097–00	671–2235–05		RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R97	322–3246–00	671–2235–05		RES,FXD,FILM:3.57K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G35700F
A4R98	322–3274–00	671–2235–05		RES,FXD,FILM:6.98K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–2–G–69800
A4R99	322–3327–00	671–2235–05		RES,FXD,FILM:24.9K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–2–G24901F
A4R100	322–3157–00	671–2235–05		RES,FXD,FILM:422 OHM,1%,0.2W,TC=T0MI,SMALL BODY	57668	CRB20 FXE 422E
A4R101	322–3243–00	671–2235–05		RES,FXD:METAL FILM;3.32K OHM,1%,0.2W,TC=100	91637	CCF50–1–G33200F
A4R102	322–3431–00	671–2235–05		RES,FXD,FILM:301K OHM,1%,0.2W,TC=T0,SMALL BODY	91637	CCF501G30102F
A4R103	322–3250–00	671–2235–05		RES,FXD:METAL FILM;3.92K OHM,1%,0.2W,TC=100	91637	CCF50–2F39200F
A4R104	322–3339–00	671–2235–05		RES,FXD:METAL FILM;33.2K OHM,1%,0.2W,TC=100	91637	CCF50–2–G3322FT
A4R105	322–3465–00	671–2235–05		RES,FXD,FILM:681K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF50–2–G6813F
A4R106	322–3157–00	671–2235–05		RES,FXD,FILM:422 OHM,1%,0.2W,TC=T0MI,SMALL BODY	57668	CRB20 FXE 422E
A4R107	322–3243–00	671–2235–05		RES,FXD:METAL FILM;3.32K OHM,1%,0.2W,TC=100	91637	CCF50–1–G33200F
A4R108	322–3097–00	671–2235–05		RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R109	322–3097–00	671–2235–05		RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R110	322–3157–00	671–2235–05		RES,FXD,FILM:422 OHM,1%,0.2W,TC=T0MI,SMALL BODY	57668	CRB20 FXE 422E

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A4R111	322–3437–00	671–2235–05		RES,FXD,FILM:348K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF501G34802F
A4R112	322–3243–00	671–2235–05		RES,FXD:METAL FILM;3.32K OHM,1%,0.2W,TC=100	91637	CCF50–1–G33200F
A4R113	322–3147–00	671–2235–05		RES,FXD:METAL FILM;332 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G332R0F
A4R114	322–3097–00	671–2235–05		RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R115	322–3157–00	671–2235–05		RES,FXD,FILM:422 OHM,1%,0.2W,TC=T0MI,SMALL BODY	57668	CRB20 FXE 422E
A4R116	322–3222–00	671–2235–05		RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A4R117	322–3322–00	671–2235–05		RES,FXD:METAL FILM;22.1K OHM,1%,0.2W,TC=100	91637	CCF501G22101F
A4R118	322–3277–00	671–2235–05		RES,FXD,FILM:7.5K OHM,1%,0.2W,TC=T0,SMALL BODY	91637	CCF501G75000F
A4R119	322–3097–00	671–2235–05		RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R120	322–3222–00	671–2235–05		RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A4R121	322–3193–00	671–2235–05		RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F
A4R122	322–3289–00	671–2235–05		RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R123	322–3268–00	671–2235–05		RES,FXD,FILM:6.04K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G60400F
A4R124	322–3243–00	671–2235–05		RES,FXD:METAL FILM;3.32K OHM,1%,0.2W,TC=100	91637	CCF50–1–G33200F
A4R125	322–3260–00	671–2235–05		RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A4R126	322–3385–00	671–2235–05		RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A4R127	322–3097–00	671–2235–05		RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R128	322–3289–00	671–2235–05		RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R129	322–3260–00			RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A4R130	322–3260–00			RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A4R131	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A4R132	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R133	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R134	311–2273–00			RES,VAR,TRMR:CERMET;2K OHM,20%,0.5W,0.197 SQ,SIDE ADJUST	TK2073	GF06VT2 202 M L
A4R135	322–3243–00			RES,FXD:METAL FILM;3.32K OHM,1%,0.2W,TC=100	91637	CCF50–1–G33200F
A4R136	322–3197–00			RES,FXD,FILM:1.1K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF501G11000F
A4R137	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A4R138	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R139	322–3243–00			RES,FXD:METAL FILM;3.32K OHM,1%,0.2W,TC=100	91637	CCF50–1–G33200F
A4R140	311–2265–00			RES,VAR,NONWW:TRMR,200K OHM,20%,0.5WLINEAR,MI	TK2073	GF06VT2 204 M L
A4R141	322–3248–00		671–2234–05	RES,FXD,FILM:3.74K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF50G37400F
A4R141	322–3230–00	671–2234–06		RES,FXD,FILM:2.43K OHM,1%,0.2W,TC=T0 M	91637	CCF50–2431F–R36
A4R141	322–3248–00		671–2235–05	RES,FXD,FILM:3.74K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF50G37400F
A4R141	322–3230–00	671–2235–06		RES,FXD,FILM:2.43K OHM,1%,0.2W,TC=T0 M	91637	CCF50–2431F–R36
A4R142	322–3239–00			RES,FXD,FILM:3.01K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G30100F
A4R143	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R144	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A4R145	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A4R146	322–3132–00	671–2234–05		RES,FXD,FILM:232 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF50–2–G232ROF
A4R146	322–3141–00	671–2235–05		RES,FXD,FILM:287 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G287ROF
A4R147	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A4R148	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R149	322–3277–00			RES,FXD,FILM:7.5K OHM,1%,0.2W,TC=T0,SMALL BODY	91637	CCF501G75000F
A4R150	322–3306–00			RES,FXD:METAL FILM;15K OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1502F
A4R151	322–3234–00			RES,FXD,FILM:2.67K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–2F26700F
A4R152	322–3342–00			RES,FXD,FILM:35.7K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–2–G3572F
A4R153	322–3234–00			RES,FXD,FILM:2.67K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–2F26700F
A4R154	311–2270–00			RES,VAR,TRMR:CERMET;10K OHM,20%,0.5W,0.197SQ,SIDE ADJUST	TK2073	GF06VT2 103 M L
A4R155	322–3243–00			RES,FXD:METAL FILM;3.32K OHM,1%,0.2W,TC=100	91637	CCF50–1–G33200F
A4R156	322–3260–00			RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A4R157	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R158	322–3239–00			RES,FXD,FILM:3.01K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G30100F
A4R159	322–3231–00			RES,FXD,FILM:2.49K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–1G24900F
A4R160	322–3243–00			RES,FXD:METAL FILM;3.32K OHM,1%,0.2W,TC=100	91637	CCF50–1–G33200F
A4R161	322–3318–00			RES,FXD,FILM:MET FILM;20K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20001F
A4R162	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R163	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R164	322–3256–00			RES,FXD,FILM:4.53K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50–2–G4531FT
A4R165	322–3172–00			RES,FXD,FILM:604 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G604ROF
A4R166	322–3172–00			RES,FXD,FILM:604 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G604ROF
A4R167	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R168	322–3162–00			RES,FXD:METAL FILM;475 OHM,1%,0.2W,TC=100 PPM	91637	CCF50G475R0F
A4R169	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A4R170	322–3261–00			RES,FXD,FILM:5.11K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50G5111FT
A4R171	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R172	322–3250–00			RES,FXD:METAL FILM;3.92K OHM,1%,0.2W,TC=100	91637	CCF50–2F39200F
A4R173	322–3293–00			RES,FXD:METAL FILM;11K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G11001F
A4R174	322–3097–00			RES,FXD:METAL FILM;100 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G100R0F
A4R175	322–3322–00			RES,FXD:METAL FILM;22.1K OHM,1%,0.2W,TC=100	91637	CCF501G22101F
A4R176	322–3260–00			RES,FXD,FILM:4.99K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G49900F
A4R177	322–3293–00			RES,FXD:METAL FILM;11K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G11001F
A4R178	322–3181–00			RES,FXD,FILM:750 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G750ROF
A4R179	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R180	311–2269–00			RES,VAR,NONWW:TRMR,20K OHM,20%,0.5WLINEAR,MI	TK2073	GF06VT2 203 M L
A4R181	322–3402–00			RES,FXD:METAL FILM;150K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G15002F
A4R182	322–3193–00			RES,FXD:METAL FILM;1K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10000F

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A4R183	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A4R184	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R185	315–0396–00			RES,FXD,FILM:39M OHM,5%,0.25W	50139	CB3965
A4R186	315–0396–00			RES,FXD,FILM:39M OHM,5%,0.25W	50139	CB3965
A4R187	322–3164–00			RES,FXD,FILM:499 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G499ROF
A4R188	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A4R189	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R190	322–3162–00			RES,FXD:METAL FILM;475 OHM,1%,0.2W,TC=100 PPM	91637	CCF50G475R0F
A4R191	322–3109–00			RES,FXD,FILM:133 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF50–2F133R0F
A4R192	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R193	311–2257–00			RES,VAR,TRMR:CERMET;500 OHM,20%,0.5W,0.197SQ,SIDE ADJUST	TK2073	GF06VT2 501 M L
A4R194	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A4R195	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A4R196	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R197	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A4R198	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A4R199	322–3311–00			RES,FXD,FILM:16.9K OHM,1%,0.2W,TC=T0MI,SM BODY	56845	CCF–50–2–1692F
A4R200	322–3273–00			RES,FXD:METAL FILM;6.81K OHM,1%,0.2W,TC=100	91637	CCF50–2–G68100F
A4R201	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R202	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R203	322–3273–00			RES,FXD:METAL FILM;6.81K OHM,1%,0.2W,TC=100	91637	CCF50–2–G68100F
A4R204	322–3201–00			RES,FXD:METAL FILM;1.21K OHM,1%,0.2W,TC=100	91637	CCF501G12100F
A4R205	322–3261–00			RES,FXD,FILM:5.11K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50G5111FT
A4R206	322–3154–00			RES,FXD:METAL FILM;392 OHM,1%,0.2W,TC=100 PPM	91637	CCF501G392R0F
A4R207	322–3126–00			RES,FXD,FILM:200 OHM,1%,0.2W,TC=T0MI,SMALL BODY	91637	CCF501G200ROF
A4R208	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R209	322–3329–00			RES,FXD,FILM:26.1K OHM.1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G26101F
A4R210	322–3261–00			RES,FXD,FILM:5.11K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF50G5111FT
A4R211	322–3418–00			RES,FXD:METAL FILM;221K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G22102F
A4R212	315–0275–00			RES,FXD,FILM:2.7M OHM,5%,0.25W	TK1727	SFR25 2322–181–
A4R213	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A4R214	322–3335–00			RES,FXD,FILM:30.1K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G30101F
A4R215	322–3201–00			RES,FXD:METAL FILM;1.21K OHM,1%,0.2W,TC=100	91637	CCF501G12100F
A4R216	322–3365–00			RES,FXD,FILM:61.9K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G61901F
A4R217	322–3269–02			RES,FXD,FILM:6.19K OHM,0.2W,5%TAPED & REELED	91637	CCF501D61900D
A4R218	322–3222–00			RES,FXD:METAL FILM;2K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G20000F
A4R219	322–3385–00			RES,FXD:METAL FILM;100K OHM,1%,0.2W,TC=100 PPM	91637	CCF501G10002F
A4R220	315–0205–00			RES,FXD,FILM:2M OHM,5%,0.25W	TK1727	SFR25 2322–181–

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A4R221	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R222	322–3280–00			RES,FXD,FILM:8.06K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G80600F
A4R223	322–3251–00			RES,FXD,FILM:4.02K OHM,1%,0.2W,TC=T0TAPED &	91637	CCF501G40200F
A4R224	322–3392–00			RES,FXD,FILM:118K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF501G11802F
A4R225	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R226	322–3339–00			RES,FXD:METAL FILM;33.2K OHM,1%,0.2W,TC=100	91637	CCF50–2–G3322FT
A4R227	322–3306–00			RES,FXD:METAL FILM;15K OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1502F
A4R228	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R229	322–3346–00			RES,FXD:METAL FILM;39.2K OHM,1%,0.2W,TC=100	91637	CCF50–2–G39201F
A4R230	322–3335–00			RES,FXD,FILM:30.1K OHM,1%,0.2W,TC=T0MI,SM BODY	91637	CCF501G30101F
A4R231	322–3306–00			RES,FXD:METAL FILM;15K OHM,1%,0.2W,TC=100 PPM	91637	CCF50–2–G1502F
A4R232	322–3457–00			RES,FXD,FILM:562K OHM,1%,0.2W,TC=T0MI,SMALL	91637	CCF50–2F56202F
A4R233	322–3289–00			RES,FXD:METAL FILM;10K OHM,1%,0.2W,TC=100 PPM	91637	CCF50G10001F
A4R234	131–4566–00			BUS,CNDTR:0 OHM,300 SPACING,SM BODYMI,DUM RES	91637	FRJ–50
A4TP1	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A4TP2	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A4TP3	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A4TP4	214–4085–00	671–2235–05		TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A4TP5	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A4TP6	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A4TP7	214–4085–00			TERM,TEST POINT:0.070 ID,0.220 H,0.063 DIAP CB,0.015 X 0.032 BRASS,W/RED NYLON COLLAR	26364	104–01–02
A4U1	156–1335–00			IC,DIGITAL:LSTTL,MULTIVIBRATOR;DUAL RETRIGMONOST-ABLE	27014	DM96LS02N
A4U2	156–0295–02			IC,DIGITAL:ECL,GATE	04713	MC10107P
A4U3	155–0144–00			MICROCKT,LINEAR:SYN STRIPPER	80009	155014400
A4U4	156–0048–00			IC,LINEAR:BIPOLAR,TRANSISTOR ARRAY;(5),NPN,(1)DIFF PAIR,(3)IND,15V,50MA,300MHZ,AMPLIFIER	34371	CA3046
A4U5	156–2460–00			IC,MISC:BIPOLAR,MOD/DEMOD;BALANCED	04713	MC1496P
A4U6	156–1126–00			IC,LINEAR:BIPOLAR,COMPARATOR;OPEN COLL,200NS	01295	LM311P
A4U7	156–1460–00	671–2235–05		IC,PROCESSOR:NMOS,PERIPHERAL;PROGRAMABLE COMMUNICATION INTERFACE	1CH66	SCN2661BC1N28
A4U8	156–1225–00	671–2235–05		IC,LINEAR:BIPOLAR,CMPTR;DUAL,OPEN COLL,300NS	01295	LM393P
A4U9	156–1200–00	671–2235–05		IC,LINEAR:BIFET,OP–AMP;QUAD	01295	TL074CN
A4U10	156–0704–00	671–2235–05		IC,MISC:CMOS,PLL;LOW SPEED	04713	MC14046BCP
A4U11	156–2761–01	671–2235–05		IC,DIGITAL:HCMOS,MULTIVIBRATOR	0JR04	TC74HC221AP

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Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A4U12	156–0799–00	671–2235–05		IC,DIGITAL:CMOS,COUNTER;5–STAGE JOHNSON DECADE, WITH BUILT–IN CODE CONVERTER	04713	MC14017BCP
A4U13	156–2559–00			IC,LINEAR:BIPOLAR,VR;NEG,–12V,1.5A,2%	48726	UC7912ACT
A4U14	156–2558–00			IC,LINEAR:BIPOLAR,VR;POSITIVE,12V,1.5A,2%	01295	TL780–12CKC
A4U15	156–2761–01			IC,DIGITAL:HCMOS,MULTIVIBRATOR	0JR04	TC74HC221AP
A4U16	160–8651–00			IC,DIGITAL:CMOS,PLD;EEPLD,16V8,25NS,45MA	80009	160865100
				MOUNTING PARTS		
	136–0752–00			SOCKET,DIP:PCB;FEMALE,STR,2 X 10,0.3 CTR,0.210 H X 0.128 TAIL,TIN,PHOS BRONZE	00779	2–641602–3
				END MOUNTING PARTS		
A4U17	156–2761–01			IC,DIGITAL:HCMOS,MULTIVIBRATOR	0JR04	TC74HC221AP
A4U18	156–0048–00			IC,LINEAR:BIPOLAR,TRANSISTOR ARRAY;(5),NPN,(1)DIFF PAIR,(3)IND,15V,50MA,300MHZ,AMPLIFIER	34371	CA3046
A4U19	156–4135–00			IC,LINEAR:BIPOLAR,COMPARATOR;TTL OUT,9NS,LATCH	1ES66	MAX9686BCPA
A4U20	156–1611–00			IC,DIGITAL:FTTL,FLIP FLOP;DUAL D–TYPE	04713	MC74F74N
A4U21	156–1611–00			IC,DIGITAL:FTTL,FLIP FLOP;DUAL D–TYPE	04713	MC74F74N
A4U22	156–1200–00			IC,LINEAR:BIFET,OP–AMP;QUAD	01295	TL074CN
A4U23	160–8650–00			IC,DIGITAL:CMOS,PLD;EEPLD,20V8,15NS,115MA	80009	160865000
				MOUNTING PARTS		
	136–0925–00			SOCKET,DIP:PCB;24 POS,2 X 12,0.1 X 0.3 CTR,0.196 H X 0.130 TAIL,BECU,TIN,ACCOM 0.008–0.015THRU 0.014 X 0.022 LEADS	00779	2–641932–3
				END MOUNTING PARTS		
A4U24	156–1611–00			IC,DIGITAL:FTTL,FLIP FLOP;DUAL D–TYPE	04713	MC74F74N
A4U25	160–8649–01			IC,DIGITAL:CMOS,PLD;OTP,22V10,25NS,33.3MHZ,90MA	80009	160864901
				MOUNTING PARTS		
	136–0925–00			SOCKET,DIP:PCB;24 POS,2 X 12,0.1 X 0.3 CTR,0.196 H X 0.130 TAIL,BECU,TIN,ACCOM 0.008–0.015THRU 0.014 X 0.022 LEADS	00779	2–641932–3
				END MOUNTING PARTS		
A4U26	156–0912–00			IC,LINEAR:BIPOLAR,OP–AMP;TRANSCONDUCTANCE	27014	LM3080N
A4U27	156–1191–00			IC,LINEAR:BIFET,OP–AMP;DUAL	01295	TL072ACP
A4U28	156–1852–00			IC,DIGITAL:HCMOS,GATE;HEX INVERTER, UNBUFFERED	04713	MC74HCU04N
A4VR1	156–1631–00			IC,LINEAR:BIPOLAR,VR;SHUNT,ADJUSTABLE,100MA	01295	TL431CLP
A4VR2	152–0195–00			DIODE,ZENER:5.1V,5%,0.4W	04713	MZ5523D
A4Y1	158–0396–00	671–2234–05		XTAL,UNIT QTZ:3.587412MHZ,+/–0.005%,SERIES,CL 16PF,4 PIN MINI DIP PKG	14301	016–210–00071
A4Y1	158–0395–00	671–2235–05		XTAL,UNIT QTZ:4.4375MHZ,+/–0.005%,SERIES,CL 16PF,4 PIN MINI DIP PKG	14301	016–210–00072
A4Y2	158–0409–00	671–2235–05		CRYSTAL:4.433619MHZ,+/–0.005%,PARALLEL,CL=16PF, ESR=120 OHM,PKG MINI DIP	14301	016–210–00107

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Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A4Y3	158–0352–00	671–2234–05		XTAL UNIT,QTZ:14.318180MHZ,0.002%,PARALLEL, CL 30 PF,4 PIN MINI DIP	14301	016–210–00040
A4Y3	158–0353–00	671–2235–05		XTAL UNIT,QTZ:17.734480MHZ,0.002%,PARALLEL, CL 30 PF, 4 PIN MINI DIP PKG	14301	016–210–00041
A10	671–3637–00			CIRCUIT BD ASSY:CRT SOCKET BD	80009	671363700
A11	671–3761–00			CKT BD ASSY:SERIAL FILTER	80009	671376100
S1	260–2465–00			SWITCH,PUSH:0.4A,125VAC,W/SOLDER LUG,BUTTON	31918	(602844)
				ATTACHED PARTS		
	174–2648–00			CA ASSY,SP:RIBBON,POWER SWITCH;MIXED/CRIMP,2,26 AWG,3.5 L,0.1 CTR 2 POS RCPT X 0.2 INCH CUT/STRIP	TK2469	174–2648–00
				END ATTACHED PARTS		
V1	154–0983–00			ELECTRON TUBE:CRT,FINISHED,D14–375GH/983;A852B (1720SCH ONLY)	80009	154098300
V1	154–0984–00			ELECTRON TUBE:CRT,FINISHED,D14–375GH/984;A853B, SAFETY CONTROLLED (1721SCH ONLY)	80009	154098400
V1	154–0983–16			ELECTRON,TUBE:CRT,FINISHED,D14–375WA/983 (1720SCH OPTION 74 ONLY)	80009	154098316
V1	154–0984–16			ELECTRON,TUBE:CRT,FINISHED,D14–375WA/984 (1721SCH OPTION 74 ONLY)	80009	154098416
				ATTACHED PARTS		
	131–6014–00			CA ASSY,CRT:DISCRETE,ANODE LEAD;CRT,1,22 AWG,30KV,UL3239,58MM DIA A NODE X 1.9 L,0.125	20093	131–6014–00
				END ATTACHED PARTS		
W1	179–2997–01			WIRE HARNESS:DESCRETE,CRT ASSY;CPD,5,24AWG,5,26 AWG,1X4,0.1CTR & 1X7,RCPT X 1X4 & 1X7,0.1 RCPT : CRT CABLE	80009	179299700
W3	174–3511–01			CA ASSY,SP:DESCRETE;CPD,4,26 AWG,8.0L,1X7,0.1CTR, RCPT X STRAIN RELIEF,PCB : CRT DEFLECTION LEADS	9M860	174–3511–00
				ATTACHED PARTS		
	344–0111–00			INSUL,SPREADER:DEFL LEADS,POLYPROPYLENE (QUANTITY 2)	TK1617	NA
	343–0298–00			STRAP,RETAINING0.25 DIA CABLE		
				END ATTACHED PARTS		
W8	174–0123–00			CA ASSY,SP:RIBBON;IDC,24,26 AWG,20.0 L,2X12,0.1 CTR,RCPT X 15 POS,DSUB,MALE & 9 POS,DSUB,MALE (CONNECTED AT A3J8 TO REAR PANEL)	00779	5133–7198–1
W12	174–2609–00			CA ASSY,SP,ELEC:34,28 AWG,12.5 L (CONNECTED AT A3J13 AND A4J2)	53387	174–2609–00
				MOUNTING PARTS		
	253–0176–00			TAPE,PRESS SENS:VINYL FOAM,0.5 X 0.062,DOUBLE SIDED ADHESIVE	2K262	ORDER BY DESC

Replaceable electrical parts list (Cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
				END MOUNTING PARTS		
W14	174–1446–00			CABLE ASSY,:COAX;RFD,50 OHM,13.0L,1X2,0.1CTR,RCPT, BOTH ENDS (CONNECTED AT A3J14 AND A4J3)	TK2469	ORDER BY DESC

Diagrams/Circuit Board Illustrations

Diagrams/Circuit Board Illustrations

Symbols

Graphic symbols and class designation letters are based on ANSI Standard Y32.2–1975.

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

Overline, parenthesis, or leading slash indicate a low asserting state.

Example: $\overline{\text{ID CONTROL}}$, (ID CONTROL), or /ID CONTROL.

Abbreviations are based on ANSI Y1.1–1972.

Other ANSI standards that are used in the preparation of diagrams by Tektronix, Inc. are:

Y14.15, 1966 -- Drafting Practices.
Y14.2, 1973 -- Line Conventions and Lettering.
Y10.5, 1968 -- Letter Symbols for Quantities Used in Electrical Science and Electrical Engineering.

American National Standard Institute
1430 Broadway, New York, New York 10018

Component Values

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

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

The following information and special symbols may appear in this manual.

Assembly Numbers

Each assembly in the instrument is assigned an assembly number (e.g., A20). The assembly number appears on the diagram (in circuit board outline), circuit board illustration title, and lookup table for the schematic diagram.

The Replaceable Electrical Parts List is arranged by assembly number in numerical sequence; the components are listed by component number. Example:

Grid Coordinates

The schematic diagram and circuit board component location illustration have grids. A lookup table with the grid coordinates is provided for ease of locating the component. Only the components illustrated on the facing diagram are listed in the lookup table.

When more than one schematic diagram is used to illustrate the circuitry on a circuit board, the circuit board illustration will only appear opposite the first diagram; the lookup table will list the diagram number of other diagrams that the other circuitry appears on.

1720SCH MAIN BLOCK DIAGRAM

Static Sensitive Devices
See Maintenance Section

A3 Main Board

A3 Main Board *(with cross-references to schematic diagrams 2 thru 7).*

V			+
C1	12	C5	A4
C2	12	D4	A5
C3	12	C4	A5
C4	12	C4	A5
C5	7	C2	A2
C6	12	C4	A4
C7	7	B3	B6
C8	7	C2	B4
C9	7	C2	B5
C10	7	B2	B5
C11	7	A3	B6
C12	5	A5	B2
C13	5	A5	C2
C14	7	A2	B6
C15	5	A5	C3
C16	6	B5	C6
C17	6	B3	C6
C18	4	F3	D5
C19	4	E4	C5
C20	6	B4	D6
C21	6	B3	D6
C22	5	B5	D2
C23	5	A5	D3
C24	7	F2	D1
C25	7	F2	D2
C26	7	G2	D3
C27	12	D2	E2
C28	6	D1	E3
C29	12	D1	E2
C30	4	E3	E5
C31	4	D2	E5
C32	5	A5	F3
C33	4	E2	E5
C34	12	C2	F2
C35	12	C3	F2
C36	5	E5	F2
C37	5	D4	F3
C38	4	G4	F5
C39	4	G4	F5
C40	5	B2	F2
C41	5	E5	F3
C42	4	G4	F6
C43	4	H5	F6
C44	5	B2	F1
C45	5	B3	F2
C46	5	E5	F2
C47	4	H3	F6
C48	4	H4	F6
C49	5	C2	G1
C50	5	B3	G2
C51	5	D4	F3
C52	4	D4	F5
C53	4	E4	F5
C54	4	F4	G5
C55	4	H4	F6
C56	4	F4	G6
C57	5	C2	G2
C58	5	G5	G3
C59	5	F4	G3
C60	4	C5	G5
C61	4	C5	G6
C62	4	F3	G5
C63	5	C3	G1
C64	4	A1	G5
C65	4	F5	H6
C66	4	C3	G6
C67	5	E2	H1
C68	5	G5	G2
C69	3	A2	H3
C70	4	D5	H5
C71	5	F2	H1
C72	5	F1	H1
C73	5	D2	H3
C74	5	D2	H3
C75	5	D2	H3
C76	4	B4	H5
C77	4	A1	H6
C78	5	F1	I1
C79	5	F2	I2
C80	4	B4	I4
C81	4	A3	I5
C82	4	A3	I5
C83	5	E3	I1
C84	5	G1	I2
C85	5	A5	I2
C86	4	B2	I4
C87	4	A4	I4

V			+
C88	4	A3	I5
C89	4	C3	I5
C90	5	F4	I1
C91	4	B3	I5
C92	4	A3	I5
C93	5	D3	J2
C94	3	E1	I2
C95	3	E3	I3
C96	5	B5	J5
C97	3	A3	J5
C98	2	H2	J1
C99	3	E2	J2
C100	3	E4	J3
C101	2	B4	J4
C102	6	G5	J6
C103	2	G3	J1
C104	3	E2	J2
C105	3	F2	J2
C106	3	E4	J3
C107	3	F4	J3
C108	3	B3	J4
C109	4	C1	J5
C110	2	G2	K1
C111	2	G1	K2
C112	3	F2	J2
C113	3	F4	J3
C114	2	F3	K1
C115	2	F3	K1
C116	3	G2	K5
C117	3	B5	K5
C118	3	H1	K5
C119	3	H1	K6
C120	3	C5	K5
C121	3	D3	K5
C122	3	D3	K5
C123	2	F3	K1
C124	2	G3	L1
C125	3	D5	L4
C126	3	C5	K5
C127	2	F2	L1
C128	3	B4	L4
C129	3	B4	L5
C130	2	F2	L1
C131	6	D4	L2
C132	6	D4	L3
C133	6	E4	L3
C134	2	G2	M1
C135	3	A4	L4
C136	3	B4	M4
C137	3	C4	L5
C138	3	D4	L5
C139	3	C3	M6
C140	6	F4	M2
C141	6	F4	M2
C142	6	F4	M2
C143	3	C4	L4
C144	3	B2	M6
C145	3	D2	M6
C146	3	B2	M6
C147	3	C4	K5
C148	3	A2	M5
C149	3	B2	M5
C150	12	A5	N1
C151	6	H3	N2
C152	6	G3	N2
C153	1	E2	N3
C154	1	F1	M5
C155	12	B5	N1
C156	3	B1	N6
C157	3	C1	N6
C158	1	E2	O3
C159	1	E2	O3
C160	1	E3	N4
C161	3	C1	O6
C162	12	B5	O1
C163	5	A4	O1
C164	12	A5	N2
C165	3	C1	O6
C166	2	A4	O3
C167	1	B2	O3
C168	12	A3	O3
C169	2	F4	O4
C170	2	F4	O4
C171	2	C2	O5
C172	1	E4	P1
C173	5	A4	O1
C174	1	D4	O2

V			+
C175	1	D3	O2
C176	2	B3	P3
C177	2	F4	O5
C178	2	D2	O6
C179	1	E3	P1
C180	1	D4	P2
C181	1	D4	P2
C182	2	C2	P5
C183	1	B3	P2
C184	1	C3	P4
C185	1	B3	P4
C186	1	C4	P5
C187	1	C5	P5
C188	1	B5	P6
C189	1	B3	P3
C190	1	C4	P3
C191	1	B5	P6
C192	2	G4	P4
C193	3	C5	L4
C194	3	G2	L2
C195	3	G4	L3
C196	4	G3	F5
C197	5	B2	H1
C198	12	D	2
C199	4	E3	E5
C200	3	C2	M6
C201	4	G5	D4
C202	7	C1	
C203	7	G2	
CR1	12	C4	A5
CR2	7	A2	B5
CR3	6	C1	B5
CR4	12	B2	D1
CR5	12	D1	E2
CR6	12	D1	E2
CR7	6	D1	E3
CR8	4	E2	E6
CR9	12	D1	E2
CR10	4	F2	E6
CR11	4	D2	E6
CR12	12	C2	F2
CR13	4	G4	F5
CR14	4	E4	F5
CR15	5	C2	G1
CR16	5	A2	G2
CR17	4	E1	G3
CR18	4	D1	H6
CR19	4	G1	H3
CR20	3	C5	K4
CR21	3	C5	K4
CR22	6	F2	L2
CR23	12	B5	M1
CR24	12	B5	M1
CR25	3	B4	M5
CR26	6	H2	M2
CR27	12	B5	N1
CR28	6	H2	M2
CR29	12	B5	N2
CR30	6	G2	N3
CR31	3	C1	N6
CR32	3	C1	N6
CR33	6	G2	N3
CR34	2	G4	O5
CR35	2	B4	O3
CR36	2	D2	O6
CR37	2	D2	O6
CR38	2	F4	O5
CR39	2	C2	P6
CR40	2	D2	P6
CR41	1	C3	P3
CR42	2	H4	P4
CR43	1	C2	P2
CR44	5	B3	G2
CR45	7	B2	B6
J1	12	D4	A3
J3	7	B2	B3
J4	12	D5	C3
J5	4	F5	D5
J6	6	B5	D6
J7	6	B3	D6
J8	6	D2	E3
J9	6	A1	F6
J10	7	D4	F3
J12	12	A3	H1
J13	7	H2	H4

V			+
J14	2	C4	I4
J15	3	D3	K5
J16	3	H1	K6
J17	2	B2	O3
J18	7	C4	O3
L1	12	C4	E1
L2	5	C2	G1
L3	4	D4	G5
L4	5	D2	H3
L5	5	F1	I2
L6	4	B4	I4
L7	4	C2	I6
L9	3	B2	M5
L10	3	A2	M5
L11	1	F3	O6
Q1	12	C5	A3
Q2	12	C5	A3
Q3	12	C4	A4
Q4	6	C1	C6
Q5	4	G5	D5
Q6	4	E3	D5
Q7	12	B2	D1
Q8	4	G5	D5
Q9	6	D1	E3
Q10	4	E3	E5
Q11	4	E3	E5
Q12	4	F2	E5
Q13	12	B1	E1
Q14	5	C2	F2
Q15	4	G3	F5
Q16	5	G5	G2
Q17	4	D4	G5
Q18	4	D4	G6
Q19	4	F2	G6
Q20	5	B2	G1
Q21	5	C2	G1
Q22	5	G2	H2
Q23	4	C4	G5
Q24	5	D2	H2
Q25	4	F1	G6
Q26	5	G5	G3
Q27	4	B4	H5
Q28	4	B4	H5
Q29	4	D1	I6
Q30	2	C4	I4
Q31	4	B2	I4
Q32	4	B2	I5
Q33	4	B2	I5
Q34	6	F5	I6
Q35	6	G5	I6
Q36	4	D1	I6
Q37	2	C3	I4
Q38	2	C4	I4
Q39	6	G4	J6
Q40	6	G4	J6
Q41	6	G4	J6
Q42	6	G4	J6
Q43	3	E2	J2
Q44	3	E4	J3
Q45	3	A5	J4
Q46	3	F2	K2
Q47	3	F4	K3
Q48	3	B3	J4
Q49	2	F3	K1
Q50	3	F2	K2
Q51	3	F4	K3
Q52	3	G2	K2
Q53	3	G4	K3
Q54	3	C3	K4
Q55	2	F2	L1
Q56	3	G2	K2
Q57	3	G4	L3
Q58	3	D5	L5
Q59	3	B4	L4
Q60	3	B4	L4
Q61	3	C4	M5
Q62	3	B2	M6
Q63	3	C3	M6
Q64	1	G1	N4
Q65	1	G1	M5
Q66	6	G3	M2
Q67	6	G2	M3
Q68	6	G3	N2
Q69	6	G3	N2
Q70	6	G2	N3

V			+
Q71	6	G3	O2
Q72	3	D1	O6
Q73	1	E4	O2
Q74	2	G4	O4
Q75	2	A3	O3
Q76	2	F4	P4
Q77	2	C2	O5
Q78	2	D2	O5
Q79	2	D2	O6
Q80	1	E3	P2
Q81	2	A3	P3
Q82	2	A3	P3
Q83	2	B4	P3
Q84	2	G4	P4
Q85	2	B2	O5
Q86	2	C3	P6
Q87	2	D2	O6
Q88	1	D3	P2
Q89	1	D3	P2
Q90	1	C3	P1
Q91	1	C2	Q2
Q92	1	B3	P4
Q93	1	B3	P4
Q94	1	C5	P5
Q95	1	B5	P5
Q96	1	B5	P5
Q97	5	D2	G2
Q98	1	H1	N4
R1	12	D5	A3
R2	6	H4	A4
R3	12	C5	A3
R4	12	C5	A4
R5	6	H3	A4
R6	12	B4	A4
R7	12	C4	A4
R8	1	B1	A5
R9	12	B4	R9
R10	12	C5	A5
R11	12	C4	A4
R12	12	C3	A4
R13	12	C4	A5
R14	12	B3	A5
R15	12	B4	A5
R16	12	B1	B2
R17	7	C2	B3
R18	12	C3	B5
R19	7	A3	B6
R20	7	B2	B5
R21	7	A3	B6
R22	7	A3	B6
R23	6	C1	B6
R24	7	D1	C2
R25	7	D2	C4
R26	6	C1	C5
R27	7	A3	B6
R28	7	E4	C3
R29	6	C3	C4
R30	6	C4	C5
R31	6	C4	C6
R32	6	C3	B5
R33	6	C3	C5
R34	6	D3	C5
R35	6	D4	C5
R36	6	C4	C6
R37	6	B5	C6
R38	6	C3	C6
R39	6	B5	C6
R40	6	B3	C6
R41	6	C3	D5
R42	6	B3	C6
R43	6	B3	D6
R44	4	F4	C5
R45	4	G4	D5
R46	4	E4	C5
R47	4	F3	D5
R48	6	C4	D5
R49	4	E2	D5
R50	6	B4	D6
R51	6	C1	D6
R52	6	B5	D6
R53	6	B3	D6
R54	12	B2	D1
R55	12	B2	D1
R56	12	B2	D2
R57	4	F5	D5
R58	4	E3	D5

V			+
R59	4	E4	D6
R60	4	E2	D6
R61	6	B4	D6
R62	6	B4	D6
R63	12	B2	D1
R64	12	B2	D1
R65	7	F2	D2
R66	4	F3	D5
R67	4	E3	D5
R68	4	G2	D6
R69	6	C1	D6
R70	12	D1	E2
R71	6	E1	E2
R72	6	D1	E3
R73	6	D1	E3
R74	7	F1	E4
R75	4	F5	D5
R76	4	C3	E5
R77	4	E3	E5
R78	12	B1	E1
R79	12	B1	E1
R80	12	D2	E1
R81	12	D1	E2
R82	12	D2	E2
R83	6	D1	E3
R84	6	D2	E3
R85	6	D2	E3
R86	4	B2	E5
R87	4	E3	E5
R88	4	F2	E5
R89	4	F2	D6
R90	4	D2	E6
R91	12	C1	E2
R92	4	E2	E5
R93	4	D2	E5
R94	12	B1	F1
R95	12	B1	F1
R96	12	D3	F2
R97	5	E5	F2
R98	5	D5	F2
R99	5	E5	F3
R100	5	D5	F3
R101	5	D5	F3
R102	4	G4	F5
R103	4	G5	F5
R104	4	G4	F5
R105	4	D2	F6
R106	12	C2	F1
R107	5	A2	F1
R108	12	C2	F1
R109	12	D2	F1
R110	5	B3	F1
R111	5	A2	F1
R112	5	B2	F2
R113	5	E5	F3
R114	4	C5	F4
R115	4	G3	F5
R116	4	H4	F5
R117	4	G3	F6
R118	5	A2	F1
R119	5	C3	F1
R120	5	A3	F2
R121	5	D4	F3
R122	5	D4	F3
R123	4	C5	F4
R124	4	G3	F5
R125	4	E4	F5
R126	4	E4	F5
R127	4	G5	F6
R128	5	E4	F3
R129	5	G5	G3
R130	5	D4	F3
R131	5	D5	F3
R132	4	D4	G5
R133	4	G4	G5
R134	4	F2	G6
R135	5	B2	G1
R136	5	C2	G1
R137	5	C2	G1
R138	5	C3	G1
R139	5	C2	G1
R140	5	G2	H2
R141	5	A3	G2
R142	5	G5	G2
R144	4	D4	G5
R145	4	C5	G5
R146	4	C5	G5

V			+
R147	4	C5	G5
R148	4	F4	G6
R149	4	F2	G6
R150	5	C3	G1
R151	5	G2	G3
R152	5	D2	G2
R153	5	F5	G3
R154	5	F5	G3
R155	4	C5	G5
R156	4	C4	G6
R157	4	F3	G6
R158	4	F1	G6
R159	5	E2	H1
R160	5	E2	H1
R161	5	E2	H2
R162	5	E2	H2
R163	5	C2	G2
R164	5	G5	H3
R165	4	E1	H3
R166	4	A1	G6
R167	4	F1	H6
R168	5	F2	H1
R169	5	E2	H2
R170	5	G5	H3
R171	2	F1	H5
R172	2	F2	H5
R173	4	B4	H5
R174	4	C4	H6
R175	4	C4	H6
R176	4	B5	H6
R177	4	D1	H6
R178	4	D1	H6
R179	5	E2	H2
R180	5	E1	H2
R181	5	E2	H2
R182	4	G1	H3
R183	4	B4	H5
R184	4	B1	H6
R185	4	B1	H6
R186	4	D1	H6
R187	4	D1	H6
R188	4	D1	H6
R189	5	E3	I1
R190	5	F1	I1
R191	5	E3	I2
R192	5	G1	I2
R193	5	F4	H2
R194	3	A3	I3
R195	3	A2	I3
R196	3	B3	I3
R197	3	B3	I3
R198	4	B4	I5
R199	4	B3	I5
R200	4	B3	I5
R201	4	B3	I5
R202	4	B3	I6
R203	6	F5	I6
R204	4	C2	H6
R205	5	E3	I1
R206	5	E3	I1
R207	5	F3	I2
R208	5	E3	I2
R209	5	G2	I2
R210	3	B2	I3
R211	3	B2	I3
R212	2	C4	I4
R213	2	C4	I5
R214	4	B2	I6
R215	6	G5	I6
R216	6	F5	I6
R217	6	H3	I6
R218	3	E1	I2
R219	3	E2	I2
R220	3	E3	I3
R221	3	E4	I3
R222	4	B5	I3
R223	4	B4	I3
R224	4	B2	I4
R225	4	C2	I4
R226	4	A3	I5
R227	6	F5	I6
R228	6	F5	I6
R229	6	H5	I6
R230	5	E3	J1
R231	5	E3	J1
R232	5	E3	J2
R233	3	E2	I2

V			+
R234	4	F1	I3
R235	3	E4	I3
R236	2	C4	I5
R237	2	C4	I5
R238	4	A3	J5
R239	3	B3	J5
R240	4	B3	I5
R241	4	B3	I6
R242	6	G5	I6
R243	6	G5	I6
R244	3	E2	J2
R245	3	E2	J2
R246	3	E2	J2
R247	3	E4	J3
R248	3	E4	J3
R249	2	C4	J4
R250	6	G3	J6
R251	6	F4	J6
R252	6	G4	J6
R253	2	G2	J2
R254	2	G2	J2
R255	3	F2	J2
R256	3	F2	J2
R257	3	E2	J2
R258	3	F4	J3
R259	3	E4	J3
R260	3	E4	J3
R261	2	C3	J4
R262	2	C4	J4
R263	3	A5	J5
R264	3	A4	J5
R265	3	A4	J6
R266	4	C1	J5
R267	2	H1	K1
R268	2	G2	K1
R269	2	G1	K2
R270	3	F2	K2
R271	3	E2	J2
R272	3	F3	K3
R273	3	E4	J3
R274	3	F4	J3
R275	3	B3	J4
R276	3	B3	K4
R277	3	B3	K4
R278	3	G2	K5
R279	2	F3	K1
R280	2	F3	K1
R281	2	G1	K1
R282	2	G1	K2
R283	3	F3	K2
R284	3	F2	K2
R285	3	F4	K3
R286	3	F4	K3
R287	3	C1	K4
R288	3	A4	K4
R289	3	B5	K5
R290	3	B5	K4
R291	3	B5	K4
R292	3	G1	K5
R293	3	B5	K5
R294	3	H1	K5
R295	3	F2	K2
R296	3	F1	K2
R297	3	F3	K3
R298	3	F4	K3
R299	3	C5	K4
R300	3	B3	K4
R301	6	G4	K6
R302	3	D3	K6
R303	6	G4	K6
R304	2	G3	L1
R305	2	G1	K1
R306	3	G2	L2
R307	3	G4	L3
R308	3	G4	L3
R309	3	A4	L4
R310	3	D4	K5
R311	3	C4	L5
R312	3	D3	L5
R313	3	C4	L5
R314	3	D3	L6
R315	3	C2	L6
R316	3	D1	L6
R317	3	C4	L1
R318	6	F2	L2
R319	6	F2	L2
R320	6	E3	L2

V			+
R321	3	G2	L2
R322	3	G2	L2
R323	6	E3	L2
R324	3	G1	L2
R325	3	G4	L3
R326	3	G5	L3
R327	3	B4	L4
R328	3	B4	L4
R329	3	B4	L4
R330	3	B4	L5
R331	3	D5	L5
R332	3	C4	L5
R333	3	D4	L6
R334	3	D3	L6
R335	3	D2	L6
R336	3	D2	K6
R337	3	C2	L6
R338	2	F2	L1
R339	2	F2	L1
R340	6	E4	L2
R341	6	E4	L2
R342	3	B5	L5
R343	2	G2	M1
R344	3	C4	L4
R345	3	D4	M5
R346	3	C4	L6
R347	3	C4	M6
R348	3	D2	M6
R349	1	D2	M3
R350	1	D2	M3
R351	3	A2	M4
R352	3	C2	M6
R353	3	C2	M6
R354	3	C3	M2
R355	3	C3	M2
R356	3	G3	M2
R357	1	D1	M3
R358	1	G1	M4
R359	1	G1	M4
R360	3	B2	M6
R361	3	B2	M6
R362	6	H2	M2
R363	6	G3	N2
R364	1	D2	M3
R365	1	G1	M5
R366	1	G1	M5
R367	1	F1	M5
R368	1	F1	M5
R369	1	G1	M5
R370	1	F2	M5
R371	1	F3	M5
R372	1	F2	M5
R373	1	E3	M6
R374	1	F3	M6
R375	1	F3	M6
R376	1	F4	M6
R377	3	B1	M6
R378	6	H3	N2
R379	6	G3	N2
R380	6	G3	N2
R381	6	G2	N3
R382	6	G2	N3
R383	1	D1	N3
R384	1	C1	N3
R385	3	B1	N6
R386	6	F2	N2
R387	6	G3	N2
R388	6	F3	O2
R389	1	D1	N3
R390	1	D1	N3
R391	1	E2	N4
R392	1	H2	N5
R393	1	H2	N5
R394	1	H2	N5
R395	1	G4	N5
R396	1	G4	N5
R397	1	G4	N5
R398	1	G4	N6
R399	1	G3	N6
R400	3	B1	N6
R401	6	G3	N2
R402	6	G3	N2
R403	1	E4	O2
R404	2	G4	O4
R405	2	F4	O5
R406	1	E5	O1
R407	1	E4	O2

V			+
R408	1	D3	O2
R409	1	F4	O2
R410	1	B2	O3
R411	2	G4	O4
R412	2	F5	O4
R413	2	F4	O4
R414	2	G4	O4
R415	2	F4	O4
R416	2	G5	O5
R417	2	D2	O6
R418	2	C2	O6
R419	2	D1	O6
R420	2	D2	O6
R421	2	D2	O6
R422	1	E5	O1
R423	1	D4	P1
R424	1	D3	O2
R425	1	D3	O2
R426	1	D4	P2
R427	2	B4	O3
R428	2	B3	O3
R429	2	B3	P3
R430	2	B3	P3
R431	2	B3	O3
R432	2	B4	P3
R433	2	A4	P3
R434	2	G4	P4
R435	2	F4	O5
R436	2	C2	O5
R437	2	C2	O5
R438	2	C2	P6
R439	2	C2	P6
R440	2	D2	P6
R441	2	D2	O6
R442	1	E3	P1
R443	1	D3	P1
R444	1	E4	O2
R445	1	D4	P2
R446	2	B3	P3
R447	2	G4	P4
R449	2	B2	P5
R450	2	B2	P5
R451	2	B3	P5
R452	2	C3	P5
R453	2	C3	P6
R454	2	D3	P6
R455	1	D4	P1
R456	1	D3	P2
R457	1	C3	P2
R458	1	C4	P3
R459	1	B4	P3
R460	1	B3	P4
R461	1	B3	P4
R462	1	C5	P5
R463	1	C5	P5
R464	1	B3	P2
R465	1	C2	P2
R466	1	B2	P2
R467	1	C4	P3
R468	1	C4	P5
R469	1	B4	P5
R470	1	B5	P5
R471	1	B4	P3
R472	1	B5	Q5
R473	5	B2	H1
R474	5	D2	G2
R475	5	D3	G2
R476	1	G1	M4
R477	1	H1	N4
R478	5	D5	G3
TP1	4	H3	F5
TP2	5	G2	H2
TP3	5	H5	G3
TP4	3	G4	K3
TP5	3	G2	K3
U1A	12	B4	A4
U1B	12	C4	A4
U2	7	C2	B2
U3	7	B3	B5
U4	7	B3	B6
U5A	6	B1	B4
U5B	6	B1	B4
U5C	7	E2	B4
U5D	7	E4	B4

V			+
U6	7	A2	B8
U7	7	F3	C2
U8	7	E4	C3
U9A	6	C3	C5
U9B	6

Schematic Diagram <1> Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A3. *(Partial Assembly A3 also shown on schematics 2 thru 7.*

C153	E2	Q73	E4	R391	E2	R464	B3
C154	F1	Q80	E3	R392	H2	R465	C2
C158	E2	Q88	D3			R466	B2
C159	E2	Q89	D3	R393	H2	R467	C4
C160	E3	Q90	C3	R394	H2	R468	C4
C167	B2	Q91	C2	R395	G4		
C172	E4	Q92	B3	R396	G4	R469	B4
C174	D4	Q93	B3	R397	G4	R470	B5
C175	D3	Q94	C5	R398	G4	R471	B4
C179	E3	Q95	B5	R399	G3	R472	B5
		Q96	B5	R403	E4	R473	B2
C180	D4	Q98	H1	R406	E5	R474	D2
C181	D4			R407	E4	R475	D3
C183	B3	R349	D2	R408	D3	R476	G1
C184	C3	R350	D2	R409	F4	R477	H1
C185	B3	R357	D1	R410	B2		
C186	C4	R358	G1	R422	E5	U38A	D2
C187	C5	R359	G1	R423	D4	U38B	D1
C188	B5	R364	D2	R424	D3	U38C	D1
C189	B3	R365	G1			U38D	D2
C190	C4			R425	D3	U40A	G2
C191	B5	R366	G1	R426	D4	U40B	G2
CR41	C3	R367	F1	R442	E3	U40C	H2
CR43	C2	R368	F1	R443	D3	U40D	F2
		R369	G1	R444	E4	U41A	F3
J19	A3	R370	F2	R445	D4	U41B	G3
J20	A3	R371	F3	R455	D4	U41C	G4
J21	A4	R372	F2	R456	D3	U41D	F2
J22	A4	R373	E3			U44	E2
J23	A5	R374	F3	R457	C3	U45	E4
J24	A5	R375	F3	R458	C4		
		R376	F4	R459	B4	VR5	F3
L11	F3	R383	D1	R460	B3	VR6	E3
		R384	C1	R461	B3	VR7	C4
Q64	G1	R389	D1	R462	C5		
Q65	G1	R390	D1	R463	C5		

CKT #	NTSC	PAL
C160	130PF	85PF

INPUT AMPLIFIER <1>

Schematic Diagram <2> Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A3. *(Partial Assembly A3 also shown on schematics 1 and 3 thru 7.*

C98	H2	J17	B2	R253	G2	R428	B3
C103	G3			R254	G2	R429	B3
C110	G2	P14	C4	R261	C3	R430	B3
C111	G1	P17	B2	R262	C4	R431	B3
C114	F3			R267	H1		
C115	F3	Q30	C4	R268	G2	R432	B4
C123	F3	Q37	C3	R269	G1	R433	A4
C124	G3	Q38	C4			R434	G4
C127	F2	Q49	F3	R279	F3	R435	F4
C130	F2	Q50	F2	R280	F3	R436	C2
		Q55	F2	R281	G1	R437	C2
C134	G2	Q74	G4	R282	G1	R438	C2
C166	A4	Q75	A3	R304	G3	R439	C2
C169	F4	Q76	F4	R305	G1	R440	D2
C170	F4	Q77	C2	R338	F2		
C171	C2	Q78	D2	R339	F2	R441	D2
C176	B3	Q79	D2	R343	G2	R446	B3
C177	F4	Q81	A3	R404	G4	R447	G4
C178	D2	Q82	A3	R405	F4	R449	B2
C182	C2	Q83	B4	R411	G4	R450	B2
C192	G4	Q84	G4	R412	F5	R451	B3
		Q85	B2	R413	F4	R452	C3
CR34	G4	Q86	C3	R414	G4	R453	C3
CR35	B4	Q87	D2			R454	D3
CR36	D2			R415	F4		
CR37	D2	R171	F1	R416	G5	U29A	G3
CR38	F4	R172	F2	R417	D2	U29B	G2
CR39	C2	R212	C4	R418	C2	U29C	G1
CR40	D2	R213	C4	R419	D1	U29D	G3
CR42	H4	R236	C4	R420	D2	U31	F3
		R237	C4	R421	D2	U33	F2
J14	C4	R249	C4	R427	B4		

CKT #	NTSC	PAL
C101	33PF	85PF

PART OF A3 MAIN BOARD

Schematic Diagram <3> Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A3. *(Partial Assembly A3 also shown on schematics 1, 2 and 4 thru 7).*

C69	A2	CR25	B4	R258	F4	R317	C4
C94	E1	CR31	C1	R259	E4	R321	G2
C95	E3	CR32	C1	R260	E4	R322	G2
C97	A3			R263	A5	R324	G1
C99	E2	J15	D3	R264	A4	R325	G4
C100	E4	J16	H1	R265	A4	R326	G5
C104	E2					R327	B4
C105	F2	L9	B2	R270	F2	R328	B4
C106	E4	L10	A2	R271	E2	R329	B4
C107	F4			R272	F3		
C108	B3	Q43	E2	R273	E4	R330	B4
C112	F2	Q44	E4	R274	F4	R331	D5
C113	F4	Q45	A5	R275	B3	R332	C4
C116	G2	Q46	F2	R276	B3	R333	D4
C117	B5	Q47	F4	R277	B3	R334	D3
		Q48	B3	R278	G2	R335	D2
C118	H1	Q50	F2	R283	F3	R336	D2
C119	H1	Q51	F4	R284	F2	R337	C2
C120	C5	Q52	G2			R342	B5
C121	D3	Q53	G4	R285	F4	R344	C4
C122	D3			R286	F4	R345	D4
C125	D5	Q54	C3	R287	C1	R346	C4
C126	C5	Q56	G2	R288	A4	R347	C4
C128	B4	Q57	G4	R289	B5		
C129	B4	Q58	D5	R290	B5	R348	D2
C135	A4	Q59	B4	R291	B5	R351	A2
C136	B4	Q60	B4	R292	G1	R352	C2
C137	C4	Q61	C4	R293	B5	R353	C2
C138	D4	Q62	B2	R294	H1	R354	C3
C139	C3	Q63	C3	R295	F2	R355	C3
C143	C4	Q72	D1			R356	G3
				R296	F1	R360	B2
C144	B2	R210	B2	R297	F3	R361	B2
C145	D2	R211	B2	R298	F4	R377	B1
C146	B2	R218	E1	R299	C5	R385	B1
C147	C4	R219	E2	R300	B3	R400	B1
C148	A2	R220	E3	R302	D3		
C149	B2	R221	E4	R306	G2	TP4	G4
C156	B1	R233	E2	R307	G4	TP5	G2
C157	C1	R235	E4	R308	G4		
C161	C1	R239	B3	R309	A4	U25A	B2
C165	C1	R244	E2	R310	D4	U28B	A3
C193	C5	R245	E2			U30	G1
C194	G2	R246	E2	R311	C4	U32	C5
C195	G4	R247	E4	R312	D3	U43	C1
C200	C2	R248	E4	R313	C4		
		R255	F2	R314	D3	VR2	F3
CR20	C5	R256	F2	R315	C2	VR4	G3
CR21	C5	R257	E2	R316	D1		

CKT #	NTSC	PAL
C148	267PF	170PF
C149	77PF	36PF
R194	0	1.00M
R195	1.00M	0
R278	4.32K	6.34K
R360	340.0	422.0
R361	340.0	422.0
C200	NOT INSTALLED	1.2-4.0PF

Schematic Diagram <4> Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A3. *(Partial Assembly A3 also shown on schematics 1, 2, 3, and 5 thru 7).*

C18	F3			R77	E3	R177	D1
C19	E4	J5	F5	R86	B2	R178	D1
C30	E3			R87	E3	R182	G1
C31	D2	L3	D4	R88	F2	R183	B4
C42	G4	L6	B4	R89	F2		
C43	H5	L7	C2			R184	B1
C47	H3			R90	D2	R185	B1
C48	H4	P5	F5	R92	E2	R186	D1
C52	D4			R93	D2	R187	D1
C53	E4	Q5	G5	R102	G4	R188	D1
C54	F4	Q6	E3	R103	G5	R198	B4
C55	H4	Q8	G5	R104	G4	R199	B3
C56	F4			R105	D2	R200	B3
C60	C5	Q10	E3	R114	C5	R201	B3
		Q11	E3	R115	G3	R202	B3
C61	C5	Q12	F2	R116	H4	R204	C2
C62	F3	Q15	G3	R117	G3	R214	B2
C64	A1	Q17	D4	R123	C5	R222	B5
C65	F5	Q18	D4				
C66	C3	Q19	F2	R124	G3	R223	B4
C70	D5	Q23	C4	R125	E4	R224	B2
C76	B4			R126	E4	R225	C2
		Q25	F1	R127	G5	R226	A3
C77	A1	Q27	B4	R132	D4	R234	F1
C80	B4	Q28	B4	R133	G4	R238	A3
C81	A3	Q29	D1	R134	F2	R240	B3
C82	A3	Q31	B2	R144	D4	R241	B3
C86	B2	Q32	B2	R145	C5	R266	C1
C87	A4	Q33	B2	R146	C5		
C88	A3	Q36	D1	R147	C5	TP1	H3
C89	C3			R148	F4		
C91	B3	R44	F4	R149	F2	U14A	E2
C92	A3	R45	G4			U14B	E3
C109	C1	R46	E4	R155	C5	U20	G4
C196	G3	R47	F3	R156	C4	U21	G3
C199	E3	R49	E2	R157	F3	U22	F4
C201	G5	R57	F5	R158	F1	U23	D5
		R58	E3	R165	E1	U23	D4
CR10	F2	R59	E4	R166	A1	U25B	G1
CR11	D2	R60	E2	R167	F1	U26	B3
CR13	G4	R66	F3	R173	B4	U26	B3
CR14	E4	R67	E3	R174	C4	U28A	C1
CR17	E1	R68	G2	R175	C4		
CR18	D1	R75	F5	R176	B5	VR1	A1
CR19	G1	R76	C3				

CKT #	NTSC	PAL
C92	62PF	.68PF
C196	NOT INSTALLED	.01UF
C201	10UF	NOT INSTALLED
R68	0	1.00M
R226	590.0	10.0
R240	1.69K	1.10K

Schematic Diagram <5> Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A3. *(Partial Assembly A3 also shown on schematics 1 thru 4 and 6, 7).*

C12	A5	C93	D3	R113	E5	R179	E2
C13	A5	C96	B5	R118	A2	R180	E1
C15	A5	C163	A4	R119	C3	R181	E2
C22	B5	C173	A4	R120	A3	R189	E3
C23	A5	C197	B2	R121	D4	R190	F1
C32	A5			R122	D4	R191	E3
C36	E5	CR15	C2	R128	E4	R192	G1
C37	D4	CR16	A2	R129	G5	R193	F4
C40	B2	CR44	B3			R205	E3
C41	E5			R130	D4	R206	E3
C44	B2	L2	C2	R131	D5	R207	F3
C45	B3	L4	D2	R135	B2		
C46	E5	L5	F1	R136	C2	R208	E3
		L6	B4	R137	C2	R209	G2
C49	C2			R138	C3	R230	E3
C50	B3	Q14	C2	R139	C2	R231	E3
C51	D4	Q15	G3	R140	G2	R232	E3
C57	C2	Q16	G5	R141	A3	R473	B2
C58	G5	Q20	B2	R142	G5	R474	D2
C59	F4	Q21	C2	R150	C3	R475	D3
C63	C3	Q22	G2			R478	D5
C67	E2	Q24	D2	R151	G2		
C68	G5	Q26	G5	R152	D2	TP2	G2
C71	F2	Q97	D2	R153	F5	TP3	H5
C72	F1			R154	F5		
C73	D2	R97	E5	R159	E2	U19	D5
C74	D2	R98	D5	R160	E2	U19	D4
C75	D2	R99	E5	R161	E2	U24	E1
		R100	D5	R162	E2	U24	E2
C78	F1	R101	D5	R163	C2	U27	E3
C79	F2	R107	A2	R164	G5	U27	E3
C83	E3	R110	B3	R168	F2		
C84	G1	R111	A2	R169	E2	Y2	B2
C85	A5	R112	B2	R170	G5		

CKT #	NTSC	PAL
C57	130PF	85PF
C72	130PF	85PF
C74	110PF	62PF
R180	340.0	422.0
R478	1.00K	1.00M
Y2	3.58MHZ	4.43MHZ
R97	NOT INSTALLED	100

A11 Serial Filter Board

Schematic Diagram <6> Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A3. *(Partial Assembly A3 also shown on schematics 1 thru 5 and 7).*

C16	B5	Q66	G3	R215	G5	U34D	E3
C17	B3	Q67	G2	R216	F5	U35A	D4
C20	B4	Q68	G3	R217	H3	U35B	D4
C21	B3	Q69	G3			U35C	D3
C28	D1	Q70	G2	R242	G5	U35D	D3
C102	G5	Q71	G3	R243	G5		
C131	D4			R250	G3	VR3	E4
C132	D4	R2	H4	R251	F4		
C133	E4	R5	H3	R252	G4	**A11 Serial Filter**	
C140	F4	R23	C1	R301	G4		
C141	F4	R26	C1	R303	G4	C1	A5
C142	F4	R29	C3	R318	F2	C2	A5
C151	H3	R30	C4	R319	F2	C3	A5
C152	G3	R31	C4	R320	E3	C4	A5
		R32	C3	R323	E3	C5	A5
CR3	C1	R33	C3	R340	E4	C6	A5
CR7	D1	R34	D3	R341	E4	C7	A4
CR22	F2	R35	D4	R362	H2	C8	A4
CR26	H2	R36	C4			C9	A4
CR28	H2			R363	G3	C10	A4
CR33	G2	R37	B5	R378	H3	C11	A4
		R38	C3	R379	G3	C12	A4
J6	B5	R39	B5	R380	G3	C13	A4
J7	B3	R40	B3	R381	G2	C14	A4
J8	D2	R41	C3	R382	G2	C15	A3
J9	A1	R42	B3	R385	B1	C16	A3
J25	H4	R43	B3	R386	F2	C17	A3
J26	H4	R48	C4	R387	G3	C18	A3
J27	H2	R50	B4	R388	F3		
J28	H2	R51	C1	R401	G3	FL1	A5
		R52	B5	R402	G3	FL2	A5
P6	B5	R53	B3			FL3	A5
P7	B3			U5A	B1	FL4	A4
		R61	B4	U5B	B1	FL5	A4
Q4	C1	R62	B4	U9A	C3	FL6	A4
Q9	D1	R69	C1	U9B	C4	FL7	A4
Q34	F5	R71	E1	U9C	D4	FL8	A3
Q35	G5	R72	D1	U9D	D3	FL9	A3
Q39	G4	R73	D1	U17	E1		
Q40	G4	R83	D1	U34A	E4	J1	B4
Q41	G4	R84	D2	U34B	E4	J2	A4
Q42	G4	R85	D2	U34C	E3		

1720 SCH VECTORSCOPE

DEFLECTION AMPLIFIER <6>

Schematic Diagram <7> Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A3. *(Partial Assembly A3 also shown on schematics 1 thru 6).*

C5	C2	R19	A3
C7	B3	R20	B2
C8	C2	R21	A3
C9	C2	R22	A3
C10	B2	R24	D1
C11	A3	R25	D2
C14	A2	R27	A3
C24	F2	R28	E4
C25	F2	R65	F2
C26	G2	R74	F1
C202	C1	R479	G5
C203	G2	R480	C4
C204	E2	R481	C4
C205	E2		
C206	D4	U2	C2
D207	D4	U3	B3
		U4	B3
CR2	A2	U5C	E2
CR45	B2	U5D	E4
		U6	A2
J3	B2	U7	F3
J10	D4	U8	E4
J13	H2	U10	F4
J18	C4	U11	E1
		U12	F1
P1	A3	U13	F4
P3	B2		
		Y1	C2
R17	C2		

NOTE: ** SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES.

A4 SCH BOARD

Static Sensitive Devices
See Maintenance Section

A4 SCH Board and Diagram <8> Component Locator *(with cross-references to schematic diagrams 8, 9, 10 thru 11).*

V			+
C1	9	G2	A2
C2	9	G5	A1
C3	9	A4	A2
C4	9	B5	B2
C5	9	G5	B3
C6	9	B3	B2
C7	9	D2	B3
C8	9	E2	B3
C9	9	C3	B1
C10	9	C3	B2
C11	9	D5	B2
C12	9	C3	B1
C13	9	C2	B3
C14	9	D1	B3
C15	9	D1	B2
C16	9	C3	B2
C17	9	D4	C1
C18	9	D5	C2
C19	9	E4	C2
C20	9	E1	B3
C21	9	C3	C1
C22	9	D1	C3
C23	9	F4	C2
C24	9	C1	C3
C25	9	F3	D1
C26	9	F4	D2
C27	9	C2	C3
C28	9	G4	D1
C29	9	E4	D3
C30	9	B1	D3
C31	9	B1	D3
C32	11	A2	E3
C33	11	C3	F1
C34	11	C5	F2
C35	11	G2	F2
C36	11	A2	F3
C37	11	G2	F2
C38	11	D3	F1
C39	11	D5	F2
C40	11	B5	F2
C41	11	B2	F3
C42	11	B2	F3
C43	11	D5	G2
C44	11	B5	G3
C45	11	D3	G1

V			+
C46	11	D3	I1
C47	11	C4	G2
C48	11	C5	G2
C49	11	C3	G2
C50	11	E5	G1
C51	11	C2	G3
C52	11	C3	G1
C53	11	B3	H1
C54	11	B1	H4
C55	11	B3	H1
C56	11	E4	H2
C57	11	C2	H3
C58	11	E5	H2
C59	11	F4	H3
C60	9	G2	H2
C61	11	E5	H2
C62	9	H2	I2
C63	9	G1	I2
C64	9	H1	I2
C65	8	H2	I3
C66	9	H3	J2
C67	10	F5	J1
C68	9	G5	J2
C69	9	G5	J2
C70	10	F4	J1
C71	10	F5	J2
C72	10	F4	K1
C73	10	E4	K1
C74	10	G5	K2
C75	8	G2	K3
C76	8	B1	K3
C77	10	E4	K1
C78	9	H5	K3
C79	8	D3	K4
C80	8	F4	L3
C81	10	F3	L1
C82	8	G4	L3
C83	9	H5	L3
C84	8	G4	L3
C85	9	G5	L1
C86	10	B4	L2
C87	9	G5	L3
C88	9	G5	M1
C89	8	F4	M4

V			+
C90	8	D4	M4
C91	9	G5	M1
C92	8	E4	M2
C93	8	E3	M4
C94	8	E4	N4
C95	9	H5	N1
C96	8	E5	N3
C97	9	H5	N3
C98	8	F4	N3
C99	8	F3	N3
C100	8	E3	N3
C101	10	B3	N1
C102	10	E1	N2
C103	8	C1	N4
C104	10	B3	N1
C105	10	E1	N2
C106	8	D1	N3
C107	10	A3	Q1
C108	8	D2	N3
C109	10	H2	Q1
C110	8	E2	Q3
C111	8	E2	Q3
C112	8	E2	Q3
C113	8	E2	Q4
C114	10	A3	Q1
C115	10	C1	Q2
C116	10	H2	Q2
C117	9	H5	Q3
C118	10	A2	O1
C119	10	C1	O2
CR1	9	A5	B3
CR2	9	C3	B1
CR3	11	H3	F2
CR4	11	C5	F2
CR5	11	G2	G3
CR6	11	G2	G3
CR7	11	F4	H2
CR8	11	F5	H2
CR9	11	C1	H3
CR10	9	H2	I2
CR11	9	H1	I2
CR12	9	H1	I2
CR13	9	H1	I2

V			+
CR14	11	B4	I2
CR15	10	D2	K2
CR16	8	F4	L3
CR17	8	F4	L3
CR18	10	B4	L2
CR19	8	E4	L4
CR20	8	E4	M3
CR21	8	E3	M3
CR22	10	G2	O2
CR23	8	D1	O2
CR24	8	D1	N3
CR25	8	C1	N4
CR26	10	E1	O1
CR27	10	H2	O2
CR28	8	C1	N4
CR29	10	A	O1
CR30	8	D2	O3
CR31	11	A2	E3
CR32	10	A2	O1
J1	9	E2	A3
J2	8	A2	I4
J3	10	H5	J1
J4	8	B4	J2
J5	10	C3	M1
J6	10	C3	M2
L1	9	C3	B1
L2	11	C2	B3
L3	10	G5	K1
L4	10	E4	K1
L5	8	E4	M4
L6	10	A3	N1
L7	8	E2	O3
Q1	9	A4	A2
Q2	9	H2	A3
Q3	9	E3	B3
Q4	9	C4	C1
Q5	9	B4	C1
Q6	9	C1	D3
Q7	9	B1	D3
Q8	9	B1	D3
Q9	11	E3	G2
Q10	11	B2	G3
Q11	11	B1	G4

V			+
Q12	11	C3	G1
Q13	11	C2	G3
Q14	11	B3	H1
Q15	11	C2	G3
Q16	11	D2	H3
Q17	11	D1	H3
Q18	11	B4	I3
Q19	11	B4	I3
Q20	10	H5	J1
Q21	10	F5	J1
Q22	10	F4	K1
Q23	10	G5	K2
Q24	10	E5	K2
Q25	10	D5	K1
Q26	8	D3	L3
Q27	8	D3	L4
Q28	10	E5	L1
Q29	10	C4	L2
Q30	8	E3	M4
Q31	10	F2	M2
Q32	8	E4	M3
Q33	8	E3	M3
Q34	8	E5	M3
Q35	8	E3	M4
Q36	10	D1	N2
Q37	10	F2	N2
Q38	10	A3	N1
Q39	10	E1	N1
Q40	8	D1	N2
Q41	10	G2	O2
Q42	8	C1	O4
R1	9	G2	A3
R3	9	B4	A2
R4	9	G2	A3
R5	9	B4	A2
R6	9	G2	A3
R7	9	F2	B3
R8	9	H2	A3
R9	9	B3	B2
R10	9	E1	B3
R11	9	B4	B2
R12	9	D4	B1
R13	9	C3	B1
R14	9	D5	B2

V			+
R15	9	B5	B2
R16	9	C5	B2
R17	9	E2	B2
R18	9	C3	C1
R19	9	C4	C1
R20	9	D4	C1
R21	9	C4	C1
R22	9	E4	C2
R23	9	E4	C2
R24	9	E4	C2
R25	9	E4	C2
R26	9	E4	C2
R27	9	E3	B2
R28	9	F3	C2
R29	9	E3	C3
R30	9	D2	B3
R31	9	D2	B3
R32	9	C4	C1
R33	9	C3	C1
R34	9	C4	C1
R35	9	B3	C2
R36	9	B4	C2
R37	9	E3	C3
R38	9	D1	C3
R39	9	C2	C3
R40	9	C4	C1
R41	9	C1	D3
R42	9	C5	D3
R43	9	F3	C3
R44	9	F3	D1
R45	9	F4	D1
R46	9	C4	D1
R47	9	E4	D1
R48	9	C1	C2
R49	9	G4	D2
R50	9	F3	C3
R51	9	F4	D1
R52	9	E4	D1
R53	9	E4	D1
R54	9	E4	D2
R55	9	C1	D2
R56	9	C1	D3
R57	9	B1	D3
R58	9	B2	D3
R59	9	B1	D3

V			+
R60	9	B1	D3
R61	9	B1	D3
R62	9	B1	D3
R63	11	A2	E3
R64	11	H2	E3
R65	11	H2	E3
R66	11	A1	E3
R67	11	A2	E3
R68	11	D3	F1
R69	11	E3	F1
R70	11	C3	F1
R71	11	C3	F1
R72	11	D4	F1
R73	11	D3	F1
R74	11	D5	F2
R75	11	D5	F2
R76	11	G3	F3
R77	11	D5	F2
R78	11	G2	F2
R79	11	G3	F3
R80	11	B2	F3
R81	11	B2	F3
R82	11	D3	G1
R83	11	D3	G1
R84	11	E5	G2
R85	11	E3	G2
R86	11	E2	G2
R87	11	C5	G3
R88	11	G2	F3
R89	11	G2	G3
R90	11	B2	G3
R91	11	B2	G3
R92	11	B1	F4
R93	11	D3	G1
R94	11	D3	G1
R95	11	D3	G1
R96	11	E3	G2
R97	11	C5	G2
R98	11	C5	G3
R99	11	G2	G3
R100	11	B3	G1
R101	11	C3	G1
R102	11	G2	G3
R103	11	C2	G3
R104	11	B1	G3

V			+
R105	11	B1	G4
R106	11	B3	G1
R107	11	B3	H1
R108	11	C3	G1
R109	11	B3	H1
R110	11	B3	H1
R111	11	G3	G2
R112	11	C2	G3
R113	11	C2	G3
R114	11	C2	H3
R115	11	A3	H1
R116	11	F4	H2
R117	11	E4	H2
R118	11	F4	H3
R119	11	D2	H3
R120	11	D1	H4
R121	11	E2	H3
R122	11	D1	H4
R123	11	B4	13
R124	11	D2	13
R125	11	B4	13
R126	11	B4	14
R127	11	B4	13
R128	11	A4	14
R129	9	H3	J2
R130	8	H2	I3
R131	10	F5	J1
R132	10	F5	J1
R133	10	G5	J1
R134	10	G5	J1
R135	10	H4	J1
R136	10	F5	J1
R137	10	F4	K1
R138	10	F4	K1
R139	10	G5	K2
R140	10	D2	K2
R141	8	B1	K3
R142	10	E5	K1
R143	10	G5	K2
R144	10	E4	K1
R145	10	E5	K1
R146	10	G5	K1
R147	10	D5	K1
R148	10	D5	K2

V			+
R149	10	E2	K1
R150	10	E2	K2
R151	10	G3	K2
R152	8	G2	K2
R153	8	G4	K2
R154	10	E5	L1
R155	10	E5	L1
R156	10	E2	K2
R157	10	G4	K2
R158	10	F4	K2
R159	8	G4	L3
R160	8	D3	L3
R161	8	D4	L4
R162	10	D4	L1
R163	10	F3	L1
R164	10	F4	L1
R165	8	G5	L2
R166	8	G5	L2
R167	8	G4	L2
R168	8	F4	L3
R169	8	D4	L3
R170	8	D4	L3
R171	8	D3	L3
R172	8	D4	L3
R173	8	D4	L4
R174	10	C4	L2
R175	10	B4	L2
R176	8	E4	L3
R177	8	E3	L3
R178	10	C4	L2
R179	10	F4	M2
R180	8	F3	L2
R181	8	F3	M3
R182	8	E3	L4
R183	8	D4	L4
R184	10	F2	M2
R185	8	E5	M3
R186	8	E3	M4
R187	10	F2	M2
R188	8	F4	M3
R189	8	F4	M3
R190	8	E4	M4
R191	10	G2	M2

V			+
R192	10	D1	M2
R193	10	F2	N2
R194	8	F3	M3
R195	8	F4	N3
R196	8	F3	M3
R197	8	F3	N3
R198	10	D1	N2
R199	8	E1	N2
R200	8	E5	N3
R201	8	F5	N3
R202	8	F3	N3
R203	8	E3	N4
R204	10	A3	N1
R205	10	A3	N1
R206	10	B3	N1
R207	10	B3	N1
R208	10	D1	N1
R209	10	E1	N2
R210	10	A3	N1
R211	10	E2	N2
R212	10	E1	O2
R213	10	G2	O2
R214	10	G1	N3
R215	8	D1	N3
R216	8	D1	N3
R217	8	C1	N4
R218	8	D1	N4
R219	10	H2	O1
R220	10	G1	O2
R221	8	D1	N4
R222	10	A2	O1
R223	10	A2	O1
R224	10	A1	O1
R225	8	E2	O3
R226	8	C1	O4
R227	10	A1	O1
R228	10	B1	O2
R229	10	B1	O2
R230	10	B1	O2
R231	10	B1	P2
R232	10	C1	P2
R233	10	D5	K1

V			+
TP1	9	C3	C1
TP2	9	D1	D2
TP3	9	G4	D1
TP4	11	H3	E2
TP5	9	G4	J2
TP6	8	D1	M2
TP7	10	A1	P1
U1	9	B5	A2
U2	9	D5	B1
U3	9	D1	B3
U4	9	C4	C1
U5	9	E4	C3
U6	9	F4	D2
U7	11	D3	F1
U8	11	D5	F2
U9	11	A5	F2
U10	11	F3	G2
U11	11	E5	G2
U12	11	F3	H2
U13	9	G1	H1
U14	9	G1	I1
U15	9	H4	J3
U16	8	C4	J3
U17	8	G3	K3
U18	10	F4	L1
U19	8	G4	L3
U20	10	D4	L1
U21	10	E3	M1
U22	8	D1	L3
U23	10	D3	M1
U24	10	B3	M1
U25	8	F1	N2
U26	8	C1	N3
U27	10	H1	O1
U28	8	E2	O3
VR1	8	G4	L2
VR2	8	D3	L4
Y1	9	C3	B1
Y2	11	B2	E3
Y3	10	A3	O1

CKT #	NTSC	PAL
C94	130PF	85PF

Schematic Diagram <9> Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A4. *(Partial Assembly A4 also shown on schematics 8, 10 and 11.*

C1	G2	C69	G5	R10	E1	R48	C1
C2	G5	C78	H5	R11	B4	R49	G4
C3	A4	C83	H5	R12	D4	R50	F3
C4	B5	C85	G5	R13	C3	R51	F4
C5	G5	C87	G5	R14	D5	R52	E4
C6	B3	C88	G5	R15	B5	R53	E4
C7	D2	C91	G5	R16	C5	R54	E4
C8	E2	C95	H5			R55	C1
C9	C3	C97	H5	R17	E2	R56	C1
C10	C3	C117	H5	R18	C3	R57	B1
C11	D5			R19	C4	R58	B2
C12	C3	CR1	A5	R20	D4	R59	B1
C13	C2	CR2	C3	R21	C4	R60	B1
C14	D1	CR10	H2	R22	E4	R61	B1
		CR11	H1	R23	E4	R62	B1
C15	D1	CR12	H1	R24	E4	R234	B4
C16	C3	CR13	H1	R25	E4		
C17	D4			R26	E4	TP1	C3
C18	D5	J1	E2	R27	E3	TP2	F4
C19	E4			R28	F3	TP3	G4
C20	E1	L1	C3	R29	E3	TP5	G4
C21	C3			R30	D2		
C22	D1	P1	E2	R31	D2	U1A	B5
C23	F4			R32	C4	U1B	A5
C24	C1	Q2	H2	R33	C3	U2A	D5
C25	F3	Q3	E3	R34	C4	U2B	B3
C26	F4	Q4	C4			U2C	C3
C27	C2	Q5	B4	R35	B3	U3	D1
C28	G4	Q6	C1	R36	B4	U4A	C4
C29	E4	Q7	B1	R37	E3	U4B	C4
		Q8	B1	R38	D1	U4C	B5
C30	B1			R39	C2	U4D	C4
C31	B1	R1	G2	R40	C4	U5	E4
C60	G2	R3	B4	R41	C1	U6	F4
C62	H2	R4	G2	R42	C5	U13	G1
C63	G1	R5	B4	R43	F3	U14	G1
C64	H1	R6	G2	R44	F3	U15A	H4
C65	H2	R7	F2	R45	F4		
C66	H3	R8	H2	R46	C4	Y1	C3
C68	G5	R9	B3	R47	E4		

CKT #	NTSC	PAL
C13	220PF	150PF
Y1	3.587412MHZ	4.4375MHZ

Schematic Diagram <10> Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A4. *(Partial Assembly A4 also shown on schematics 8, 9 and 11.*

C67	F5	L4	E4	R145	E5	R210	A3
C70	F4	L6	A3	R146	G5	R211	E2
C71	F5			R147	D5	R212	E1
C72	F4	P5	C3	R148	D5	R213	G2
C73	E4	P6	C3	R149	E2	R214	G1
C74	G5			R150	E2	R219	H2
C77	E4	Q20	H5			R220	G1
C81	F3	Q21	F5	R151	G3	R222	A2
C86	B4	Q22	F4	R154	E5	R223	A2
C101	B3	Q23	G5	R155	E5	R224	A1
C102	E1	Q24	E5	R156	E2	R227	A1
C104	B3	Q25	D5	R157	G4	R228	B1
C105	E1	Q28	E5	R158	F4	R229	B1
C107	A3	Q29	C4	R162	D4	R230	B1
C109	H2	Q31	F2	R163	F3	R231	B1
C114	A3	Q36	D1	R164	F4	R232	C1
C115	C1	Q37	F2	R174	C4	R233	D5
C116	H2	Q38	A3	R175	B4		
C118	A2	Q39	E1	R178	C4	U18A	F4
C119	C1	Q41	G2	R179	F4	U18B	F4
				R184	F2	U18C	G4
CR15	D2	R131	F5	R187	F2	U18D	F3
CR18	B4	R132	F5	R191	G2	U20A	D4
CR22	G2	R133	G5	R192	D1	U20B	D3
CR26	E1	R134	G5			U21A	E3
CR27	H2	R135	H4	R193	F2	U21B	E3
CR29	A1	R136	F5	R198	D1	U23	D3
CR32	A2	R137	F4	R204	A3	U24A	B3
		R138	F4	R205	A3	U24B	B3
J3	H5	R139	G5	R206	B3	U27A	H1
J5	C3	R140	D2	R207	B3	U27B	B1
J6	C3	R142	E5	R208	D1		
		R143	G5	R209	E1	Y3	A3
L3	G5	R144	E4				

CKT #	NTSC	PAL
C71	330PF	214PF
C74	330PF	214PF
R146	232.0	287.0
Y3	14.318MHZ	17.734MHZ

Schematic Diagram <11> Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A4. *(Partial Assembly A4 also shown on schematics 8, 9 and 10.*

C32	A2	CR7	F4	R78	G2	R111	G3
C33	C3	CR8	F5	R79	G3	R112	C2
C34	C5	CR9	C1	R80	B2	R113	C2
C35	G2	CR14	B4	R81	B2	R114	C2
C36	A2	CR31	A2	R82	D3	R115	A3
C37	G2			R83	D3	R116	F4
C38	D3	L2	C2	R84	E5	R117	E4
C39	D5					R118	F4
C40	B5	Q9	E3	R85	E3	R119	D2
C41	B2	Q10	B2	R86	E2	R120	D1
		Q11	B1	R87	C5	R121	E2
C42	B2	Q12	C3	R88	G2	R122	D1
C43	D5	Q13	C2	R89	G2	R123	B4
C44	B5	Q14	B3	R90	B2	R124	D2
C45	D3	Q15	C2	R91	B2	R125	B4
C46	D3	Q16	D2	R92	B1	R126	B4
C47	C4	Q17	D1	R93	D3	R127	B4
C48	C5	Q18	B4	R94	D3	R128	A4
C49	C3	Q19	B4	R95	D3		
C50	E5			R96	E3	TP4	H3
C51	C2	R63	A2	R97	C5		
C52	C3	R64	H2	R98	C5	U7	D3
C53	B3	R65	H2			U7	D3
C54	B1	R66	A1	R99	G2	U8A	D5
C55	B3	R67	A2	R100	B3	U8B	E3
		R68	D3	R101	C3	U9A	A5
C56	E4	R69	E3	R102	G2	U9B	G3
C57	C2	R70	C3	R103	C2	U9C	G2
C58	E5	R71	C3	R104	B1	U9D	C5
C59	F4	R72	D4	R105	B1	U10	F3
C61	E5	R73	D3	R106	B3	U11A	E5
CR3	H3	R74	D5	R107	B3	U11B	F4
CR4	C5	R75	D5	R108	C3	U12	F3
CR5	G2	R76	G3	R109	B3		
CR6	G2	R77	D5	R110	B3	Y2	B2

ALL PARTS ON THIS PAGE USED ONLY IN 1721SCH (PAL) INSTRUMENTS

PART OF A4 SCH BOARD

Schematic Diagram <12> Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A3. *(Partial Assembly A3 also shown on schematics 1 thru 7.*

A3 MAIN	
C1	C5
C2	D4
C3	C4
C4	C4
C6	C4
C27	D2
C29	D1
C34	C2
C35	C3
C150	A5
C162	B5
C164	A5
C168	A3
C198	D2
CR1	C4
CR4	B2
CR5	D1
CR6	D1
CR9	D1
CR12	C2
CR23	B5
CR24	B5
CR27	B5
CR29	B5
J1	D4
J4	D5
J12	A3
L1	C4
M6	A3
M13	A3
Q1	C5
Q2	C5
Q3	C4
Q7	B2
Q13	B1
R1	D5
R3	C5
R4	C5
R6	B4
R7	C4
R9	B4
R10	C5
R11	C4
R12	C3
R13	C4
R14	B3
R15	B4
R16	B1
R18	C3
R54	B2
R55	B2
R56	B2
R63	B2
R64	B2
R70	D1
R78	B1
R79	B1
R80	D2
R81	D1
R82	D2
R91	C1
R94	B1
R95	B1
R96	D3
R106	C2
R108	C2
R109	D2
U1A	B4
U1B	C4
U15A	B2
U15B	B1
U16A	D2
U16B	D2
U16C	D2
U16D	A4

A3A1 GRAT LIGHT	
DS100	E4
DS200	E4
DS300	E4
J100	D3
P100	D3
P200	D4
P800	D4

A1 FRONT PANEL	
DS116A	G4
DS116B	E3
DS132A	F3
DS132B	F3
DS132C	G3
DS146A	G5
DS146B	F5
DS227	F3
DS247A	F5
DS247B	F5
DS247C	F5
DS521	E5
DS522A	F4
DS522B	E4
DS523A	F4
DS523B	F4
J101	H3
R100	G2
R203	F3
R212	G2
R232	F3
R235	F4
R412	G1
R429	G1
R443	G1
S108	F1
S125	F1
S142	E1
S222	F1
S243	F1
S308	E1
S317	E2
S510	F2
S518	F2

) (2raSd34Sel 1 a4rA

Static Sensitive Devices
See Maintenance Section

1720 SCH VECTORSCOPE

CONTROL CIRCUIT & FRONT PANEL <12>

Static Sensitive Devices
See Maintenance Section

A1 Power Supply Board

Schematic Diagram <13> Component Locator Chart

The schematic diagram has an alphanumeric grid to assist in locating parts within that diagram.

Assembly A1. Partial Assembly A1 also shown on Diagram 14.

V		+	V		+	V		+	V		+	V		+
C29	F2	F1	C55	E3	H3	CR26	F4	H4	R71	F4	H4	R95	B4	J3
C30	F2	F2	C56	B2	M3	CR27	D3	J1				R96	A4	K3
C31	F3	F3				CR28	G4	H5	R72	D5	H4			
			C57	B2	N5	CR29	E4	H5	R73	E5	I4	R97	A3	J3
C32	F2	F3	C58	B3	J2				R74	C4	J5	R98	F4	H4
C33	G2	F4	C59	B4	J3	DS4	D2	L2	R75	B5	J4	R101	C3	K2
C35	F3	G3	C60	B5	J4				R76	C5	I4	R102	C2	M1
C36	G2	G3	C62	E1	H1	F1	B2	M4						
			C63	E1	G1				R77	D4	I4	RV1	D2	I3
C37	G3	G4	C64	G4	G4				R78	B4	J4			
C38	G2	G4				J2	H5	B5	R79	B3	J2	T2	E4	H5
C39	E4	G4	CR10	F1	G2	J4	H3	F5	R80	C4	J4	T3	E2	G3
C40	F4	H4	CR11	F2	G2	J5	H1	F1	R81	D3	J1			
C41	E4	I4	CR12	F2	G1	J6	A2	M3				TP1	F5	F4
			CR13	F3	G2	J10	A2	N1	R82	C3	J2	TP2	E5	K4
C42	D3	I1	CR14	E2	G3				R83	C5	J2			
C43	C4	J4	CR15	E4	G5	L1	F3	F2	R84	B5	J2	U3A	C4	J3
C44	D2	I3				L2	F2	G1	R85	G4	H5	U3B	B3	J3
C45	D4	I4	CR16	D5	I4	L3	F2	G2	R86	D3	J1	U4A	D4	I5
C46	C5	I4	CR17	E2	I2	L4	C2	N1				U4B	C4	I5
			CR18	D2	I2				R87	D3	K2	U5	C3	J2
C47	A3	J3	CR19	B3	K3	Q7	D5	I4	R88	B4	J2			
C48	C4	J4	CR20	E3	I3	Q8	E4	I4	R89	B2	M4	VR1	F4	H4
C49	D3	J2				Q9	D3	J1	R90	E3	I3			
C50	C3	J2	CR21	B2	L4				R91	D2	K1	W1	G3	E4
C51	C3	K2	CR22	B2	L4							W2	G3	E4
			CR23	B2	L4	R679	F2	F4	R92	D2	K1	W3	G2	E4
C52	C4	J2	CR24	B2	L4	R68	F4	G5	R93	D2	L2	W4	G2	E5
C53	E3	I2	CR25	B3	J2	R69	G4	G5	R94	D2	L2			
C54	C2	M2				R70	G4	G4						

CAUTION: ALL CIRCUITRY TO THE LEFT OF THE ISOLATION BOUNDARY IS AT POWER LINE POTENTIAL AND REQUIRES AN ISOLATION TRANSFORMER TO SERVICE.
ISOLATION BOUNDARY
LINE RECTIFIER AND FILTER
MOUNTING
REAR PANEL
J6
J10
90-250V
F1 2A
C56 .022UF
C57 .068UF
R89 5
CR23
CR22
CR24
CR21
C54 330UF
L4 1MH
R102 8
R91 100K
R92 100K
R93 150K
R94 150K
DS4
C44 .47UF
C49 .1UF
C42 560UF
CLAMP
RV1
CR18
CR17
CR14
CR13
CR10
CR11
CR12
T3
C55
NOT INSTALLED
C62
C63
OUTPUT FILTERS
L3 4.7UH
L2 4.7UH
L1 4.7UH
C30 560UF
C36 560UF
C29 560UF
C38 560UF
C32 560UF
C33 10UF
C35 560UF
C31 560UF
C37 560UF
R67 10.0
W4 0 OHM
W3 0 OHM
W2 0 OHM
W1 0 OHM
+15V
+15A
-15V
-15A
+40V
+40VA
+5V
+5D
J5
USED WITH 1700F10 UPGRADE ONLY
(DC OPER.)
OUTPUT UV SHUTDOWN
PULSE WIDTH MODULATOR
SWITCHER MOSFET
SNUBBER
U5 UC3842
COMP
VFB
ISEN
RT/CT
REF
VCC
OUT
GND
U3B LM393
CR19
CR25
R97 2.00K
C47 1.0 UF
R79 49.9K
C58 200PF
R96 49.9K
C59 .1UF
C50 .47UF
CR27
R81 178
R82 4.99K
R87 22.1
R101 49.9
C51 .01UF
Q9
C53 100PF
R90 2.4K
CR20
R86 .51
VR3 5.1V
R14 10.0
R13 100
Q11
J4
A4 <14> J4-1
D5 <14> FOCUS
A4 <14> ZAXIS
NC
+100V
+40V
+15V
+5V
-15V
J4 CONNECTS TO J12
<12>
A3 MAIN BOARD
FEEDBACK TRANSFORMER DRIVER
U4B 74LS221
CX
RX
A
B
C L
Q
R88 2.00K
C52 .01UF
R95 4.53K
R78 3.74K
R75 4.99K
C60 .1UF
U3A LM393
C43 .47UF
R74 4.99K
R80 2.00K
C48 200PF
U4A 74LS221
C45 .47UF
R77 100
C41 .47UF
CR29
T2
C61 470PF
R62 100
Q8
Q7
R72 10.0
R73 10.0
ERROR AMPLIFIER
R98 10.00K
CR26
CR15
C39 .1UF
R68 178
VR4 10V
VR1
C40 4700PF
R71 221K
R69 10.00K
R85 100K
R99 100K
+5V ADJUST
R70 10.00K
FRONT PANEL
POWER
(OPEN = ON)
S1
J2
R83 10.00K
R84 18.7K
R76 3.74K
C46 .01UF
CR16
PEAK DETECTOR
LINE SIDE COMMON
TP2
SECONDARY GROUND (CHASSIS GROUND)
TP1
See parts list for earier values and serial number ranges
PART OF A1 POWER SUPPLY

A1 Power Supply Board Component Locator

(with cross-references to schematic diagrams 13 and 14)

V			+
C1	10	C4	A4
C2	10	D3	D1
C3	10	D3	A2
C4	10	D3	A2
C5	10	D4	B3
C6	10	C4	B4
C7	10	F3	B1
C8	10	D3	B2
C9	10	E2	B2
C10	10	C5	B4
C11	10	E2	B1
C12	10	D2	C4
C13	10	D2	C4
C14	10	D2	C4
C15	10	F2	C4
C16	10	C2	C3
C17	10	F2	D4
C18	10	F3	E1
C19	10	C1	D4
C20	10	C2	D4
C21	10	C1	D4
C22	10	B2	E2
C23	10	B2	E3
C24	10	D1	E4
C25	10	A3	E2
C27	10	B1	E3
C28	10	B1	E3
C29	9	F2	F1
C30	9	F2	F2
C31	9	F3	F3
C32	9	F2	F3
C33	9	G2	F4
C34	10	D1	F4
C35	9	F3	G3
C36	9	G2	G3
C37	9	G3	G4
C38	9	G2	G4
C39	9	E4	G4
C40	9	F4	H4
C41	9	E4	I4
C42	9	D3	I1
C43	9	C4	J4
C44	9	D2	I3
C45	9	D4	I4
C46	9	C5	I4
C47	9	A3	J3
C48	9	C4	J4
C49	9	D3	J2
C50	9	C3	J2
C51	9	C3	K2
C52	9	C4	J2
C53	9	E3	I2
C54	9	C2	M2
C55	9	E3	H3
C56	9	B2	M3
C57	9	B2	N5
C58	9	B3	J2
C59	9	B4	J3
C60	9	B5	J4
C62	9	E1	H1
C63	9	E1	G1
C64	9	G4	G4
C65	10	B2	F4

V			+
C66	10	A2	E2
CR1	10	E2	B1
CR2	10	D4	B3
CR3	10	E2	B1
CR4	10	C2	B2
CR5	10	D2	C3
CR6	10	E2	C3
CR7	10	C2	D4
CR8	10	C2	D4
CR9	10	C1	E4
CR10	9	F1	G2
CR11	9	F2	G2
CR12	9	F2	G1
CR13	9	F3	G2
CR14	9	E2	G3
CR15	9	E4	G5
CR16	9	D5	I4
CR17	9	E2	I2
CR18	9	D2	I2
CR19	9	B3	K3
CR20	9	E3	I3
CR21	9	B2	L4
CR22	9	B2	L4
CR23	9	B2	L4
CR24	9	B2	L4
CR25	9	B3	J2
CR26	9	F4	H4
CR27	9	D3	J1
CR28	9	G4	H5
CR29	9	E4	H5
CR30	10	A2	E2
CR31	10	A2	E2
DS1	10	E2	B2
DS2	10	E2	B2
DS3	10	E3	B2
DS4	9	D2	L2
F1	9	B2	M4
FIL1	10	C3	C1
FIL2	10	C3	C1
J1	10	F3	B1
J2	9	H5	B5
J3	10	F2	D1
J4	9	H3	F5
J5	9	H1	F1
J6	9	A2	M3
J10	9	A2	N1
J11	10	F4	A2
L1	9	F3	F2
L2	9	F2	G1
L3	9	F2	G2
L4	9	C2	N1
Q1	10	E5	B3
Q2	10	E5	A3
Q3	10	D4	B4
Q4	10	D4	B4
Q5	10	C4	B4
Q6	10	B2	E1
Q7	9	D5	I4
Q8	9	E4	I4
Q9	9	D3	J1
Q10	10	A2	E2
R1	10	E3	A1

V			+
R2	10	E4	A2
R3	10	E4	A2
R4	10	E4	A3
R5	10	E5	A3
R7	10	B4	A4
R8	10	B4	A4
R11	10	F4	A2
R12	10	D3	C1
R20	10	C4	A4
R21	10	C5	A4
R22	10	D5	A4
R23	10	B4	A4
R24	10	D5	A4
R25	10	B4	A4
R26	10	E5	A3
R27	10	E5	A4
R28	10	E5	A4
R29	10	D2	B1
R30	10	D2	A2
R31	10	D4	B3
R32	10	E5	B3
R33	10	C4	B4
R34	10	C4	B4
R35	10	D4	B3
R36	10	D4	B3
R37	10	C5	B4
R38	10	E2	B1
R39	10	E2	B1
R40	10	D2	B2
R41	10	D4	B3
R42	10	E3	C1
R43	10	E2	B3
R44	10	D2	B3
R45	10	F2	C4
R46	10	E3	C1
R47	10	D2	C3
R48	10	C2	C4
R49	10	F2	C4
R50	10	F2	E1
R51	10	F3	E1
R52	10	F2	E1
R53	10	F2	E1
R54	10	F2	E1
R55	10	D2	D4
R56	10	F3	E1
R57	10	B2	E1
R58	10	D2	E4
R59	10	B1	E2
R60	10	C1	E3
R61	10	D1	E4
R63	10	A2	E2
R64	10	C2	E2
R65	10	B1	E3
R66	10	B1	E3
R67	9	F2	F4
R68	9	F4	G5
R69	9	G4	G5
R70	9	G4	G4
R71	9	F4	H4
R72	9	D5	H4
R73	9	E5	I4
R74	9	C4	J5

A10 CRT Socket Board (Front of Board)

A10 CRT Socket Board (Back of Board)

V			+
R75	9	B5	J4
R76	9	C5	I4
R77	9	D4	I4
R78	9	B4	J4
R79	9	B3	J2
R80	9	C4	J4
R81	9	D3	J1
R82	9	C3	J2
R83	9	C5	J2
R84	9	B5	J2
R85	9	G4	H5
R86	9	D3	J1
R87	9	D3	K2
R88	9	B4	J2
R89	9	B2	M4
R90	9	E3	I3
R91	9	D2	K1
R92	9	D2	K1
R93	9	D2	L2
R94	9	D2	L2
R95	9	B4	J3
R96	9	A4	K3
R97	9	A3	J3
R98	9	F4	H4
R101	9	C3	K2
R102	9	C2	M1
R103	10	A2	E2

V			+
RV1	9	D2	I3
T1	10	B2	C4
T2	9	E4	H5
T3	9	E2	G3
TP1	9	F5	F4
TP2	9	E5	K4
U1	10	D1	C1
U2	10	B1	F4
U3A	9	C4	J3
U3B	9	B3	J3
U4A	9	D4	I5
U4B	9	C4	I5
U5	9	C3	J2
VR1	9	F4	H4
VR2	10	A2	E2
VR5	10	D2	B2
VR6	10	D2	B2
W1	9	G3	E4
W2	9	G3	E4
W3	9	G2	E4
W4	9	G2	E5

HV OSC & ERROR AMP
GRID DRIVE
Z AXIS AMPLIFIER
FOCUS AMPLIFIER
V1 TUBE SOCKET VISUAL AID
A10 CRT SOCKET BOARD
PART OF A1 POWER SUPPLY
NOTE: ✳✳ SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES
✳ NOT INSTALLED
WIRE COLOR CODES
WHT/BLK/RED
WHT/BLUE
WHT/GRN
WHT/GRAY
BRN/RED
WHT/RED
WHT/BRN
WHT/BLK
BRN
GEOMETRY
CRT BIAS
ASTIG
CENTER FOCUS
+100V 671-2890-10 AND BELOW
+11KV POST
5.5KV P-P
P320 IS PART OF CRT
TRACE ROTATION
HORIZONTAL DEFLECTION
VERTICAL DEFLECTION
GREEN
RED
BRN
BLUE
BOARD CAP
(g3) FOCUS
ASTIG (g4)
(g1) GRID
GEOM (g5)
(k) Cathode
VERT PLATE (y2)
(f) Filament
VERT PLATE (y1)
(x1) HORIZ PLATE
(g2) 1st ANODE
HORIZ PLATE (x2)

Replaceable Mechanical Parts

Replaceable Mechanical Parts

This section contains a list of the replaceable mechanical components for the 1720SCH-Series Vectorscope/SCH Monitor. Use this list to identify and order replacement parts.

Parts Ordering Information

Replacement parts are available through your local Tektronix field office or representative.

Changes to Tektronix products are sometimes made to accommodate improved components as they become available and to give you the benefit of the latest improvements. Therefore, when ordering parts, it is important to include the following information in your order:

- Part number
- Instrument type or model number
- Instrument serial number
- Instrument modification number, if applicable

If you order a part that has been replaced with a different or improved part, your local Tektronix field office or representative will contact you concerning any change in part number.

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

Using the Replaceable Mechanical Parts List

The tabular information in the Replaceable Mechanical Parts List is arranged for quick retrieval. Understanding the structure and features of the list will help you find all of the information you need for ordering replacement parts. The following table describes the content of each column in the parts list.

Parts list column descriptions

Column	Column name	Description
1	Figure & index number	Items in this section are referenced by figure and index numbers to the exploded view illustrations that follow.
2	Tektronix part number	Use this part number when ordering replacement parts from Tektronix.
3 and 4	Serial number	Column three indicates the serial number at which the part was first effective. Column four indicates the serial number at which the part was discontinued. No entry indicates the part is good for all serial numbers.
5	Qty	This indicates the quantity of parts used.
6	Name & description	An item name is separated from the description by a colon (:). Because of space limitations, an item name may sometimes appear as incomplete. Use the U.S. Federal Catalog handbook H6-1 for further item name identification.
7	Mfr. code	This indicates the code of the actual manufacturer of the part.
8	Mfr. part number	This indicates the actual manufacturer's or vendor's part number.

Abbreviations

Abbreviations conform to American National Standard ANSI Y1.1–1972.

Chassis Parts

Chassis-mounted parts and cable assemblies are located at the end of the Replaceable Electrical Parts List.

Mfr. Code to Manufacturer Cross Index

The table titled Manufacturers Cross Index shows codes, names, and addresses of manufacturers or vendors of components listed in the parts list.

Manufacturers cross index

Mfr. code	Manufacturer	Address	City, state, zip code
S3109	FELLER U.S. CORPORATION	72 Veronica Ave Unit 4	Summerset NJ 08873
TK0435	LEWIS SCREW CO	4300 S RACINE AVE	CHICAGO IL 60609–3320
TK1547	MOORE ELECTRONICS INC (DIST)	19500 SW 90TH COURT PO BOX 1030	TUALATIN OR 97062
TK1572	RAN–ROB INC	631 85TH AVE	OAKLAND CA 94621–1254
TK2364	ARROW/KIERULFF ELECTRONICS	1800 NW 167TH PLACE SUITE 145	BEAVERTON OR 97006
0KBZ5	MORELLIS Q & D PLASTICS	1812 16TH AVE PO BOX 487	FOREST GROVE OR 97116–0487
0KB01	STAUFFER SUPPLY	810 SE SHERMAN	PORTLAND OR 97214
07416	NELSON NAME PLATE CO	3191 CASITAS	LOS ANGELES CA 90039–2410
18677	SCANBE MFG CO DIV OF ZERO CORP	3445 FLETCHER AVE	EL MONTE CA 91731
2K262	BOYD CORP	6136 NE 87th AVE PO BOX 20038	PORTLAND OR 97220
22670	G M NAMEPLATE INC	2040 15TH AVE WEST	SEATTLE WA 98119–2728
24931	SPECIALTY CONNECTOR CO INC	2100 EARLYWOOD DR PO BOX 547	FRANKLIN IN 46131
3L462	QUALITY PLASTICS DIV. OF MOLL PLASTICRAFTERS L.P.	2101 CRESTVIEW DRIVE	NEWBERG, OR 97132–9518
31918	ITT CANNON SWITCH PRODUCTS	8081 WALLACE RD	EDEN PRAIRIE MN 55344–8798
34785	DEK INC	3480 SWENSON AVE	ST CHARLES IL 60174–3450
5F520	PANEL COMPONENTS CORP	PO BOX 115	OSKALOOSA, IA 52557
55335	JKL COMPONENTS CORP	13343 PAXTON STREET	PACOIMA CA 91331
56501	THOMAS & BETTS CORP	1555 LYNNFIELD RD	MEMPHIS, TN
71400	BUSSMANN DIV OF COOPER INDUSTRIES INC	114 OLD STATE RD PO BOX 14460	ST LOUIS MO 63178
73743	FISCHER SPECIAL MFG CO	111 INDUSTRIAL RD	COLD SPRING KY 41076–9749
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077–0001
80126	PACIFIC ELECTRICORD CO	747 W REDONDO BEACH PO BOX 10	GARDENA CA 90247–4203
85471	BOYD CORP	13885 RAMOMA AVE	CHINO CA 91710
93907	TEXTRON INC CAMCAR DIV	600 18TH AVE	ROCKFORD IL 61108–5181

Replaceable mechanical parts list

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
1–1	426–2102–00			1	FRAME,CRT:BEZEL, *MOUNTING PARTS*	3L462	ORDER BY DESC
–2	211–0690–02			2	SCREW,MACHINE:6–32 X 0.875,PNH,SST *END MOUNTING PARTS*	93907	B20–70430
–3	333–3306–00			1	PANEL,FRONT:1720	22670	ORDER BY DESC
–4	378–0258–00			1	FLTR,CONTRASTIN:GRAY,POLYCARBONATE	80009	378025800
–5	333–3961–01 333–3961–02	 B040000	B039999	1	PANEL,FRONT:1720SCH (1720SCH ONLY)	80009	333396201
	333–3962–01 333–3962–02	 B040000	B039999	1	PANEL,FRONT:1721SCH (1721SCH ONLY) *MOUNTING PARTS*	80009	333396101
–6	211–0721–00			2	SCREW,MACH:6–32 X 0.375,PNH,STL,CDPL,T–15 TORX DR *END MOUNTING PARTS*	0KB01	ORDER BY DESC
–7	————			1	CIRCUIT BD ASSY:FRONT PANEL (SEE A2 REPL) *MOUNTING PARTS*		
–8	211–0721–00			4	SCREW,MACH:6–32 X 0.375,PNH,STL,CDPL,T–15 TORX DR *END MOUNTING PARTS*	0KB01	ORDER BY DESC
–9	426–2101–01 426–2101–04 348–1527–00	 B040000	B039999	1	FRAME SECT,CAB.:FRONT GASKET,WIRE;WIRE MESH,EMI,0.125H X 0.188 X 0.002 *MOUNTING PARTS*	3L462 PL2010	ORDER BY DESC ORDER BY DESC
–10	211–0721–00			3	SCREW,MACH:6–32 X 0.375,PNH,STL,CDPL,T–15 TORX DR *END MOUNTING PARTS*	0KB01	ORDER BY DESC
–11	————			1	SW,PUSH:0.4A,125VAC,W/SLDR LUG,BTNW/YEL INDICATOR (SEE S1 REPL) *MOUNTING PARTS*		
–12	210–0405–00			2	NUT,PLAIN,HEX:2–56 X 0.188,BRS CD PL	73743	12157–50
–13	211–0100–00			2	SCREW,MACHINE:2–56 X 0.750,PNH,STL *END MOUNTING PARTS*	TK0435	ORDER BY DESC
–14	————			1	CKT BD ASSY:MAIN;NTSC (SEE A3 REPL) *MOUNTING PARTS*		
–15	211–0721–00			8	SCREW,MACH:6–32 X 0.375,PNH,STL,CDPL,T–15 TORX DR *END MOUNTING PARTS*	0KB01	ORDER BY DESC
–16	————			1	CIRCUIT BD ASSY:GRATICULE LIGHT (SEE A3A1 REPL)		
–17	337–3321–00			1	SHIELD,ELEC:CKT BD 1730	85471	337–3321–00
–18	————			1	CIRCUIT BD ASSY:POWER SUPPLY (SEE A1 REPL) *MOUNTING PARTS*		
–19	211–0721–00		B041999	7	SCREW,MACH:6–32 X 0.375,PNH,STL,CDPL,T–15 TORX DR (1720 SCH ONLY)	0KB01	ORDER BY DESC
–19	211–0721–00	B042000		6	SCREW,MACH:6–32 X 0.375,PNH,STL,CDPL,T–15 TORX DR (1720 SCH ONLY)	0KB01	ORDER BY DESC

Replaceable mechanical parts list (Cont.)

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
–19	211–0721–00		B040804	7	SCREW,MACH:6–32 X 0.375,PNH,STL,CDPL,T–15 TORX DR (1721 ONLY)	0KB01	ORDER BY DESC
–19	211–0721–00	B040805		6	SCREW,MACH:6–32 X 0.375,PNH,STL,CDPL,T–15 TORX DR (1721 ONLY)	0KB01	ORDER BY DESC
–20	211–0014–00			2	SCREW,MACHINE:4–40 X 0.5,PNH,STL	TK0435	ORDER BY DESC
–21	337–3796–01	B040000		1	SHIELD,ELEC:0.032 BRASS,C26000,0.5 HARD *END MOUNTING PARTS*	80009	337379601
–22	131–3573–00			1	CONN,PLUG,ELEC:MALE,W/LOCKING ADAPTER	80126	B–0779
–23	337–3257–00			2	SHIELD,CKT BD:LV PWR SUPPLY	2K262	ORDER BY DESC
–24	337–3931–00			1	SHIELD,ELEC:ALUMINUM	80009	337393100
–25	175–9872–01			1	CA ASSY,SP,ELEC:2,18 AWG,2.5 L,0–N	TK2364	175–9872–01
–26	333–3309–02		B039999	1	PANEL,REAR:REAR PANEL;1720	80009	333330903
–26	333–3309–03	B040000		1	PANEL,REAR:REAR PANEL;1720 *MOUNTING PARTS*	80009	333330903
–27	211–0721–00			3	SCREW,MACH:6–32 X 0.375,PNH,STL,CDPL,T–15 TORX DR *END MOUNTING PARTS*	0KB01	ORDER BY DESC
–28	131–0106–02			7	CONN,RF JACK:BNC;50 OHM,FEM,STR,SLDR CUP/FRT PNL, 0.520 MLG X0.403 TAIL,0.04 L SLDR CUP,0.380,D/1 FLAT	24931	28JR178–1
–29	174–0335–00			1	LEAD,ELECTRICAL:22 AWG,8.75 L,9–N	80009	174033500
–30	210–0255–00			3	TERMINAL,LUG:0.391 ID,LOCKING,BRS CD PL	TK1572	ORDER BY DESC
–31	174–0123–02			1	CABLE ASSY SP:ELEC,24,26 AWG,21.0 L, RIBBON *MOUNTING PARTS*	80009	174012302
–32	214–3903–01			2	SCREW,JACK:4–40 X 0.312 EXT THD,4–40 INT THD,0.188 HEX,STEEL,CADPLATE *END MOUNTING PARTS*	0KB01	214–3903–01
–33	————			1	CKT BD ASSY:SERIAL FILTER (SEE A11 REPL) *MOUNTING PARTS*		
–34	214–3903–01			2	SCREW,JACK:4–40 X 0.312 EXT THD,4–40 INT THD,0.188 HEX,STEEL,CADPLATE *END MOUNTING PARTS*	0KB01	214–3903–01
–35	348–1464–00			1	MANCHET:CRT,END RUBBER MANCHET,31.5MM THK X63MM OD,50.5 ID	80009	348146400
–36	407–4395–00			1	BRACKET,CRT:BACK,0.062,AL *MOUNTING PARTS*	80009	407439500
–37	210–0457–00			2	NUT,PL,ASSEM WA:6–32 X 0.312,STL CD PL *END MOUNTING PARTS*	TK0435	ORDER BY DESC
–38	————			1	CIRCUIT BD ASSY:CRT SOCKET BD (SEE A10 REPL)		
–39	346–0133–00			1	STRAP,TIEDOWN,E:14.0 X 0.091,NYLON	56501	TY234M EURO DIR
–40	337–4064–00			1	SHIELD, ELEC:MU–METAL CRT SHIELD	80009	337406400
–41	334–1379–00			1	MARKER,IDENT:MKD HI VACUUM	07416	ORDER BY DESC
–42	386–4443–00			1	SUPPORT,SHIELD:CRT,FRONT,PLASTIC	80009	386444300

Replaceable mechanical parts list (Cont.)

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
–43	————			1	ELECTRON TUBE:CRT,FINISHED,D14–375GH/983;1720, 1720SCH,A852B (SEE V1 REPL)		
–44	————			1	CKT BD ASSY:NTSC (SEE A4 REPL)		
					MOUNTING PARTS		
–45	211–0721–00			4	SCREW,MACH:6–32 X 0.375,PNH,STL,CDPL,T–15 TORX DR	0KB01	ORDER BY DESC
					END MOUNTING PARTS		
–46	351–0688–00			1	GUIDE,CKT BOARD:NYLON,12.0 L	18677	11633–5
–47	348–0171–00			1	GROMMET,PLASTIC:BLACK,U–SHAPED,0.276 ID	0KBZ5	NA
–48	343–0916–00		B041998	1	CLAMP,LOOP:0.5 ID,NYLON (1720 SCH)	34785	029–500
–48	343–0013–00	B041999		1	CLAMP,LOOP:0.375 ID,NYLON,SAFETY CONTROLLED (1720 SCH)	34785	029–500
–48	343–0916–00		B040804	1	CLAMP,LOOP:0.5 ID,NYLON (1721 SCH)	34785	029–500
–48	343–0013–00	B040805		1	CLAMP,LOOP:0.375 ID,NYLON,SAFETY CONTROLLED (1721 SCH)	34785	029–500
–49	426–2103–07			1	FRAME, CHASSIS:ALUMINUM	80009	426210306
–50	211–0720–01		B041998	2	SCREW,MACH:6–32 X 0.50,PNH,STL,TORX T–15 WITH SLOT (1720 SCH)	0KB01	211–0720–01
–50	211–0720–01	B041999		3	SCREW,MACH:6–32 X 0.50,PNH,STL,TORX T–15 WITH SLOT (1720 SCH)	0KB01	211–0720–01
–50	211–0720–01		B040804	2	SCREW,MACH:6–32 X 0.50,PNH,STL,TORX T–15 WITH SLOT (1721 SCH)	0KB01	211–0720–01
–50	211–0720–01	B040805		3	SCREW,MACH:6–32 X 0.50,PNH,STL,TORX T–15 WITH SLOT (1721 SCH)	0KB01	211–0720–01
–56	129–1308–00	B041999		1	SPACER,POST 6–32 X 0.75 HEX,STL, CAD PL (1720 SCH)	00570	129–1308–00
–56	129–1308–00	B040805		1	SPACER,POST 6–32 X 0.75 HEX,STL, CAD PL (1721 SCH)	00570	129–1308–00
					STANDARD ACCESSORIES		
	070–8341–02			1	MANUAL,TECH:INSTRUCTION,1720SCH	80009	070834102
	150–0168–00			3	LAMP,INCAND:14V,0.08A,WEDGE BASE,T1.75 FOR SKT MT	55335	73W
	159–0021–00			1	FUSE,CARTRIDGE:3AG,2A,250V,FAST BLOW	71400	AGC–2
	012–1422–01			1	CA ASSY,SP,ELEC:MLD,1720	TK1547	012–1422–01
–51	161–0216–00			1	CABLE ASSY,PWR:3,18 AWG,2.5M L,BLACK (STANDARD ONLY)	80126	C7120–25M–BL
					OPTIONAL ACCESSORIES		
–52	161–0215–00			1	CABLE ASSY,PWR,:3,0.75MU,2.5MM L,GREY (EUROPEAN OPTION A1 ONLY)	80126	0–5335–008–GY
–53	161–0066–10			1	CA ASSY,PWR:3,0.1MM SQ,250V/10A,2.5 METER,STR, IEC320,RCPT X 13A,FUSED UK PLUG(13A FUSE),UNITED KINGDOM,SAFTEY CONTROLLED (UNITED KINGDOM OPTION A2 ONLY)	S3109	BS/13–H05VVF3G0

Replaceable mechanical parts list (Cont.)

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
–54	161–0066–11			1	CA ASSY,PWR:3,1.0MM SQ,250V/10A,2.5 METER,STR, IEC320,RCPT,AUSTRALIA,SAFTEY CONTROLLED (AUSTRALIAN OPTION A3 ONLY)	S3109	198–000
–55	161–0212–00			1	CABLE ASSY,PWR,:3,1.0MM SQ,220V,2.5 METERS (SWISS OPTION A5 ONLY)	5F520	86542000
	016–0475–00			1	VIEWING HOOD:1740	80009	016047500
	200–3897–01			1	COVER,FRONT:1700F02,HOT STAMPED	80009	200389701
				1	CAMERA,SCOPE:C9 (OPTION 20 ONLY)		
				1	PLAIN CASE:1700F00		
				1	PTD CASE ASSY:1700F02		
				1	RACK ADAPTER:1700F05		
				1	FILLER PANEL:1700F06		
				1	DRAWER,UTILITY:1700F07		

FIG. 1 EXPLODED VIEW

1720SCH-Series