

Service Manual



TDS6000B & TDS6000C Series Digital Storage Oscilloscope

071-1798-00

This document applies to firmware version 4.00 and above.

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.

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- Worldwide, visit www.tektronix.com to find contacts in your area.

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Tektronix warrants that this product will be free from defects in materials and workmanship for a period of one (1) year from the date of shipment. If any such product proves defective during this warranty period, Tektronix, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product. Parts, modules and replacement products used by Tektronix for warranty work may be new or reconditioned to like new performance. All replaced parts, modules and products become the property of Tektronix.

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

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

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Table of Contents

Figures	iii
Tables	iv
General Safety Summary	v
Service Safety Summary	vii
Environmental Considerations	ix
Preface	xi
Manual Conventions	xi

Operating Information

Installation and Operating Information	1-1
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Theory of Operation

Module Overviews	2-1
General	2-1
Input Signal Path	2-1
Display Panel	2-1
Front Panel	2-2
Rear Panel	2-2
Low Voltage Power Supply	2-2
Fans	2-3
Block diagram	2-3

Adjustment Procedure

Maintenance

Preventing ESD	4-1
Inspection and Cleaning	4-2
General Care	4-2
Flat Panel Display Cleaning	4-2
Interior Cleaning	4-3
Exterior Cleaning	4-3
Inspection	4-3
Removal and Installation Procedures	4-7
Preparation	4-7
Trim, Cabinet, and Module Removal	4-9

Removal Procedures	4-13
Acquisition Module	4-13
MicroATX Module	4-13
Bridge Module	4-14
PowerPC (PPC) Module	4-14
CD-ROM Drive	4-15
Display	4-15
Side Fans	4-15
Internal Fans	4-15
Front Panel	4-16
USB Module	4-16
Hard Disk Drive	4-16
Troubleshooting	4-17
Service Level	4-17
Check for Common Problems	4-17
Equipment Required	4-19
Fault Isolation Procedure	4-19
Checking the Power Supply Voltages	4-21
If the Oscilloscope Will Not Boot	4-24
Booting Into Windows	4-24
If the Oscilloscope Application Does Not Work	4-24
PPC and MicroATX PC Diagnostics	4-25
Power-on diagnostics	4-25
Checkit Utilities	4-27
Diagnostics	4-28
Software Updates	4-28
After Repair	4-29
BIOS Error Messages	4-29
BIOS Beep Codes	4-31
DIP Switch Controls	4-31
Diagnostic LED	4-32
Troubleshooting Using Reset Circuits	4-34
Update/Restore the MicroATX Board CMOS	4-36
Installing an Authorization Key	4-37
Repackaging Instructions	4-39
Packaging	4-39
Shipping to the Service Center	4-39

Mechanical Parts List

Parts Ordering Information	5-1
Module Servicing	5-1
Using the Replaceable Parts List	5-2
Abbreviations	5-2
Mfr. Code to Manufacturer Cross Index	5-2

List of Figures

Figure 2-1: TDS6000B and TDS6000C series block diagram	2-3
Figure 4-1: Locator for trim and cabinet removal	4-11
Figure 4-2: Locator for internal modules	4-12
Figure 4-3: Primary troubleshooting tree	4-20
Figure 4-4: Low voltage power supply LED locations	4-21
Figure 4-5: Location of power-on and overcurrent LEDs	4-22
Figure 4-6: Connectors J1, J2, and J3	4-23
Figure 4-7: The three PCI busses	4-34
Figure 4-8: PCI and MicroATX video connectors	4-35
Figure 4-9: Switch, jumper, and reset button locations	4-36
Figure 5-1: External parts	5-7
Figure 5-2: Front panel and drives	5-10
Figure 5-3: Front panel and drives (cont.)	5-12
Figure 5-4: Power supply	5-14
Figure 5-5: ATX module detail	5-16
Figure 5-6: Accessories	5-17

List of Tables

Table 4-1: External inspection check list	4-3
Table 4-2: Tools required for module removal	4-8
Table 4-3: Column legend for Table 4-5	4-9
Table 4-4: Accessing modules	4-9
Table 4-5: Failure symptoms and possible causes	4-17
Table 4-6: LVPS LED descriptions	4-21
Table 4-7: Power supply voltages	4-23
Table 4-8: Power-on diagnostic tests	4-25
Table 4-9: Action required for module replacement	4-29
Table 4-10: BIOS error messages	4-30
Table 4-11: Beep codes	4-31
Table 4-12: DIP switch functions	4-32
Table 4-13: Diagnostic LED	4-33

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.

While using this product, you may need to access other parts of a larger system. Read the safety sections of the other component manuals for warnings and cautions related to operating the system.

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.

The inputs are not rated for connection to mains or Category II, III, or IV circuits.

Connect the probe reference lead to earth ground only.

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

Power Disconnect. The power cord disconnects the product from the power source. Do not block the power cord; it must remain accessible to the user at all times.

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

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

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

Use Proper Fuse. Use only the fuse type and rating specified for this product.

Wear Eye Protection. Wear eye protection if exposure to high-intensity rays or laser radiation exists.

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.

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.*

Symbols and 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.

The following symbols may appear on the product:



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.

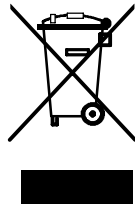
Environmental Considerations

This section provides information about the environmental impact of the product.

Product End-of-Life Handling

Observe the following guidelines when recycling an instrument or component:

Equipment Recycling. Production of this equipment required the extraction and use of natural resources. The equipment may contain substances that could be harmful to the environment or human health if improperly handled at the product's end of life. In order to avoid release of such substances into the environment and to reduce the use of natural resources, we encourage you to recycle this product in an appropriate system that will ensure that most of the materials are reused or recycled appropriately.



The symbol shown to the left indicates that this product complies with the European Union's requirements according to Directive 2002/96/EC on waste electrical and electronic equipment (WEEE). For information about recycling options, check the Support/Service section of the Tektronix Web site (www.tektronix.com).

Mercury Notification. This product uses an LCD backlight lamp that contains mercury. Disposal may be regulated due to environmental considerations. Please contact your local authorities or, within the United States, the Electronics Industries Alliance (www.eiae.org) for disposal or recycling information.

Restriction of Hazardous Substances

This product has been classified as Monitoring and Control equipment, and is outside the scope of the 2002/95/EC RoHS Directive. This product is known to contain lead, cadmium, mercury, and hexavalent chromium.

Preface

This is the service manual for the TDS6000B & TDS6000C Digital Storage Oscilloscope products. Read this preface to learn how this manual is structured, what conventions it uses, and where you can find other information related to servicing this product. Read the safety summaries preceding this preface for safety and other important background information needed before using this manual to service this product.

Manual Conventions

This manual uses certain conventions that you should become familiar with before attempting service.

Replaceable Parts

This manual refers to any field-replaceable assembly or mechanical part specifically by its name or generically as a replaceable part or module. In general, a replaceable part is any circuit board or assembly, such as the hard disk drive, or a mechanical part, such as the I/O port connectors, that is listed in the replaceable parts list.

Safety

Symbols and terms related to safety appear in the *Service Safety Summary* found at the beginning of this manual.



Operating Information

Operating Information

For information on installing and operating your TDS6000B or TDS6000C Series Digital Storage Oscilloscope, refer to the *TDS6000B & TDS6000C Series Digital Storage Oscilloscopes Quick Start User Manual*. This manual is available on the Web at www.tektronix.com.



Theory of Operation

Theory of Operation

This section describes the electrical operation of the oscilloscope. Figure 2-1 on page 2-3 shows the module interconnections.

Module Overviews

Module overviews describe the basic operation of each functional circuit block as shown in Figure 2-1 on page 2-3.

General A dual-processor system controls the oscilloscope. The oscilloscope features an XGA resolution flat-panel display, a transparent touch screen, and a front-panel with direct access to commonly used oscilloscope functions. You can also use the oscilloscope with a mouse pointing device or keyboard.

Input Signal Path A signal enters the oscilloscope through a direct coaxial connection to the input connector, or a probe connected to the front panel.

Acquisition Board. The acquisition board conditions the input signals, samples them, converts them to digital signals, and controls the acquisition process under direction of the processor system. The acquisition system includes the multi-source trigger, acquisition timebase, and acquisition mode generation and control circuitry. The acquisition board is located in the bottom compartment of the oscilloscope. Four vertical channels are accommodated. All channels feature a TekConnect® interface for additional front-end signal conditioning functions.

Processor System. The processor system contains two processor boards with microprocessors that control the entire oscilloscope.

Display Panel Waveforms and menus are displayed on a 10.4 inch, color, active-matrix LCD display with touch panel.

Display System. Text and waveforms are processed by different parts of the display circuitry. The display system (display adapter board and inverter board) sends the text and waveform information to the display panel.

Touch Panel. The display board sends information from the touch panel to the processor. Any changes in settings are reported to the processor system.

Front Panel The MicroATX board reads the front-panel switches and encoders. Any changes in their settings are reported to the processor system. The MicroATX board also turns the LEDs on and off.

Menu Switches. Front-panel menu switches are also read by the MicroATX board. The touch screen processor sends any changes in menu selections to the MicroATX processor system. The **ON/STBY** switch passes through the display adapter board to the MicroATX board. The MicroATX board creates the signal sent to the power supply to toggle power.

PowerPC Board. The PowerPC (PPC) board provides fast access to the Acquisition board and the display system. The MicroATX board reads the front-panel switches and encoders and implements any changes requested by their settings. The PPC board provides a GPIB interface through a rear panel connector.

MicroATX Board. The MicroATX board provides standard Windows functionality and I/O port interfaces to the rear panel.

Micro ATX Bridge Board. Both processor systems, CDROM-RW drive, and hard disk drive are connected together by, and communicate through, the bridge board.

Rear Panel The hard disk drive and CDROM-drive provide access to stored waveform data and software to customize your oscilloscope with your measurement needs. The GPIB allows for external control of the oscilloscope.

You can make hardcopies via the USB and parallel ports.

The MicroATX board has four USB ports and one serial port on the rear panel. The MicroATX board also provides a front panel USB port. The MicroATX has one serial port, which is routed to the rear panel. A microphone input and earphone output exist on the MicroATX rear panel. Ethernet connector is RJ-45. Keyboard and mouse are both PS/2.

Low Voltage Power Supply The low voltage power supply is a switching power converter with active power factor control. It supplies power to all of the circuitry in the oscilloscope.

The **ON/STBY** switch, located on the front panel, also controls all of the power to the oscilloscope except for part of the circuitry in the standby power supply.

The power supply sends a power fail (~PF) warning to the processor and acquisition systems if the power is going down.

Power is distributed throughout the oscilloscope through the front and rear power distribution bus boards.

Fans Two fan assemblies (six on the Side Fan Assembly and four on the Internal Fan Assembly) provide forced air cooling for the oscilloscope. The fans are controlled by the PPC.

Block Diagram

This section contains the block diagram of the TDS6000B and TDS6000C Digital Storage Oscilloscopes and modules, showing the major circuit blocks or modules. The block diagram is shown in Figure 2-1, below.

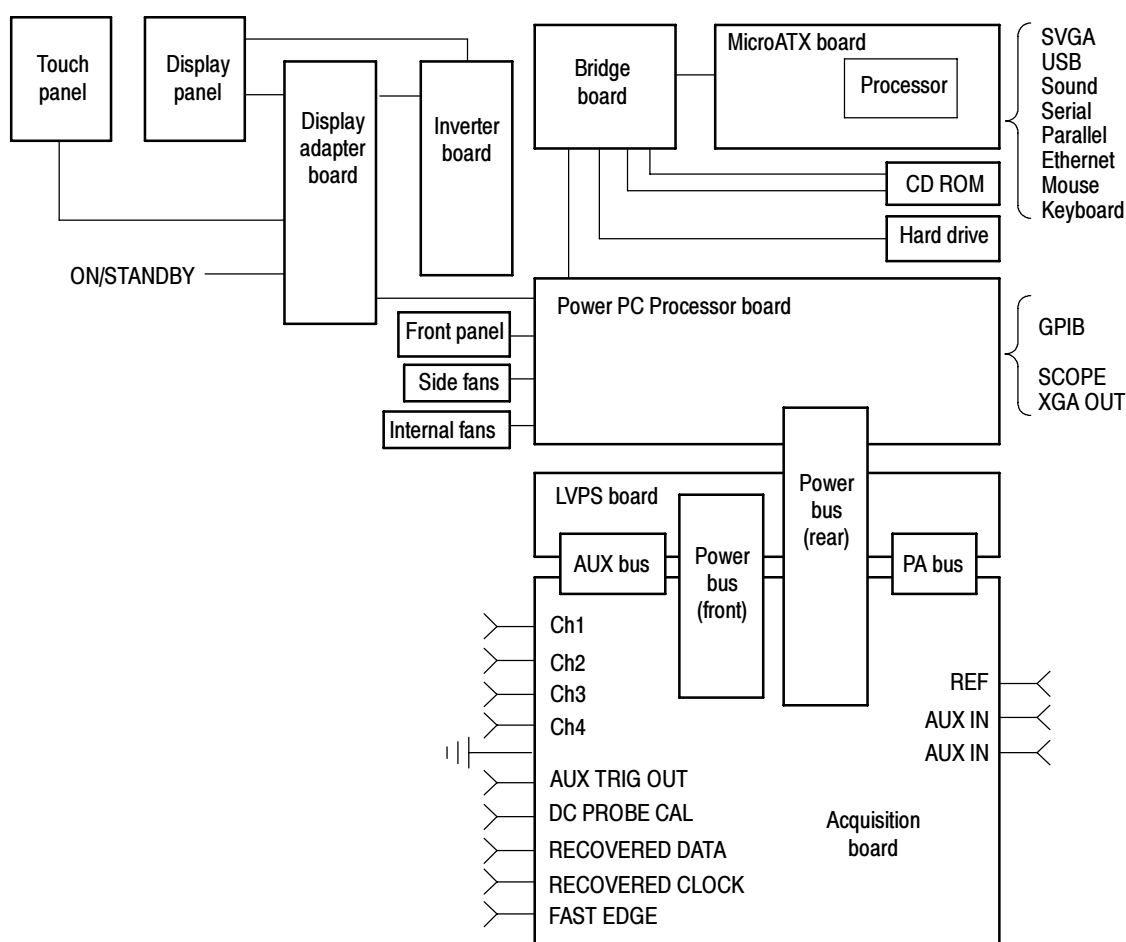


Figure 2-1: TDS6000B and TDS6000C series block diagram



Adjustment Procedures



Adjustment Procedures

There are no user adjustment procedures for the TDS6000B and TDS6000C Digital Storage Oscilloscopes. Adjustment of these instruments must be performed by a Tektronix Service Center.



Maintenance

Maintenance

This section contains the information needed to do periodic and corrective maintenance on the oscilloscope. The following subsections are included:

- *Preventing ESD* — General information on preventing damage by electrostatic discharge.
- *Inspection and Cleaning* — Information and procedures for inspecting the oscilloscope and cleaning its external and internal modules.
- *Removal and Installation Procedures* — Procedures for the removal of defective modules and replacement of new or repaired modules. Also included is a procedure for disassembly of the oscilloscope for cleaning.
- *Troubleshooting* — Information for isolating failed modules. Included are instructions for operating the oscilloscope diagnostic routines and troubleshooting trees. Most of the trees make use of the internal diagnostic routines to speed fault isolation to a module.
- *Repackaging Instructions* — Information on returning an oscilloscope for service.

Preventing ESD

Before servicing this product, read the safety summary and *Introduction* at the front of the manual and the ESD information below.



CAUTION. *Static discharge can damage any semiconductor component in this oscilloscope.*

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

1. Minimize handling of static-sensitive circuit boards and components.
2. Transport and store static-sensitive modules in their static protected containers or on a metal rail. Label any package that contains static-sensitive boards.
3. Discharge the static voltage from your body by wearing a grounded antistatic wrist strap while handling these modules. Do service of static-sensitive modules only at a static-free work station.

4. Nothing capable of generating or holding a static charge should be allowed on the work station surface.
5. Handle circuit boards by the edges when possible.
6. Do not slide the circuit boards over any surface.
7. Avoid handling circuit boards in areas that have a floor or work-surface covering capable of generating a static charge.

Inspection and Cleaning

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

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

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

General Care

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

Flat Panel Display Cleaning

The display is a soft plastic display and must be treated with care during cleaning.



CAUTION. *Improper cleaning agents or methods can damage the flat panel display.*

Avoid using abrasive cleaners or commercial glass cleaners to clean the display surface.

Avoid spraying liquids directly on the display surface.

Avoid scrubbing the display with excessive force.

Clean the flat panel display surface by gently rubbing the display with a clean-room wipe (such as Wypall Medium Duty Wipes, #05701, available from Kimberly-Clark Corporation).

Interior Cleaning

Use a dry, low-velocity stream of air to clean the interior of the chassis. Use a soft-bristle, non-static-producing brush for cleaning around components. If you must use a liquid for minor interior cleaning, use a 75% isopropyl alcohol solution and rinse with deionized water.



WARNING. Before performing any procedure that follows, power down the instrument and disconnect it from line voltage.

Exterior Cleaning

Clean the exterior surfaces of the chassis with a dry lint-free cloth or a soft-bristle brush. If any dirt remains, use a cloth or swab dipped in a 75% isopropyl alcohol solution. Use a swab to clean narrow spaces around controls and connectors. Do not use abrasive compounds on any part of the chassis that may damage the chassis.

Clean the On/Standby switch using a dampened cleaning towel. Do not spray or wet the switch directly.



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

Lubrication. There is no periodic lubrication required for this oscilloscope.

Inspection

Inspection — Exterior. Inspect the outside of the oscilloscope for damage, wear, and missing parts, using Table 4-1 as a guide. Immediately repair defects that could cause personal injury or lead to further damage to the oscilloscope.

Table 4-1: External inspection check list

Item	Inspect for	Repair action
Cabinet, front panel, and cover	Cracks, scratches, deformations, damaged hardware	Repair or replace defective module
Front-panel knobs	Missing, damaged, or loose knobs	Repair or replace missing or defective knobs
Connectors	Broken shells, cracked insulation, and deformed contacts. Dirt in connectors	Repair or replace defective modules. Clear or wash out dirt

Table 4- 1: External inspection check list (Cont.)

Item	Inspect for	Repair action
Carrying handle, and cabinet feet	Correct operation	Repair or replace defective module
Accessories	Missing items or parts of items, bent pins, broken or frayed cables, and damaged connectors	Repair or replace damaged or missing items, frayed cables, and defective modules

If the display is very dirty, moisten the wipe with distilled water or a 75% isopropyl alcohol solution and gently rub the display surface. Avoid using excess force or you may damage the plastic display surface.



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

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

Inspect the internal portions of the oscilloscope for damage and wear. Defects found should be repaired immediately.

If any circuit board is replaced, check Table 4-9 in the *Troubleshooting* portion of this Section to see if it is necessary to adjust the oscilloscope.



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

Cleaning Procedure — Interior. To clean the oscilloscope interior, do the following steps:

1. Blow off dust with dry, low-pressure, deionized air (approximately 9 psi).
2. Remove any remaining dust with a lint-free cloth dampened in isopropyl alcohol (75% solution) and rinse with warm deionized water. (A cotton-tipped applicator is useful for cleaning in narrow spaces and on circuit boards.)

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

3. If steps 1 and 2 do not remove all the dust or dirt, the oscilloscope may be spray washed using a solution of 75% isopropyl alcohol by doing steps 4 through 8.
4. Gain access to the parts to be cleaned by removing easily accessible shields and panels (see *Removal and Installation Procedures*).
5. Spray wash dirty parts with the isopropyl alcohol and wait 60 seconds for the majority of the alcohol to evaporate.
6. Use hot (120° F to 140° F) deionized water to thoroughly rinse them.
7. Dry all parts with low-pressure, deionized air.
8. Dry all components and assemblies in an oven or drying compartment using low-temperature (125° F to 150° F) circulating air.

Removal and Installation Procedures

This subsection contains procedures for removal and installation of all mechanical and electrical modules.

Preparation



WARNING. Before doing this or any other procedure in this manual, read the Safety Summary found at the beginning of this manual. Also, to prevent possible injury to service personnel or damage to the oscilloscope components, read Installation in the TDS6000B & TDS6000C Series Digital Storage Oscilloscopes Quick Start User Manual, available on the Web at www.tektronix.com, and Preventing ESD in this section.

This subsection contains the following items:

- This preparatory information that you need to properly do the procedures that follow.
- List of tools required to remove all modules.
- Procedures for removal and reinstallation of the electrical and mechanical modules.



WARNING. Before doing any procedure in this subsection, disconnect the power cord from the line voltage source. Failure to do so could cause serious injury or death.

NOTE. Read Equipment Required for a list of the tools needed to remove and install modules in this oscilloscope. See Table 4-2, on page 4-8. Read the cleaning procedure before disassembling the oscilloscope for cleaning.

Equipment Required. Most modules in the TDS6000B & TDS6000C Digital Storage Oscilloscopes can be removed with a screwdriver handle mounted with a size T-15, Torx® screwdriver tip. Other tools needed for complete disassembly are listed in Table 4-2, on page 4-8.

Table 4-2: Tools required for module removal

Item no.	Name	Description	General tool number
1	Screwdriver handle	Accepts Torx-driver bits	620-440
2	T-10 Torx tip	Used for removing the electrical or optical module chassis. Torx-driver bit for T-10 size screw heads	640-235
3	T-15 Torx tip	Used for removing most oscilloscope screws. Torx-driver bit for T-15 size screw heads	640-247
4	$\frac{1}{8}$ inch flat-bladed screwdriver	Screwdriver for unlocking cable connectors	Standard tool
5	#0 phillips screwdriver	Screwdriver for removing small phillips screws, CD & hard drive	Standard tool
6	Angle-Tip Tweezers	Used to remove front panel knobs	Standard tool
7	$\frac{3}{16}$ inch open-end wrench or $\frac{3}{16}$ inch nutdriver	Used to remove the rear panel nut posts	Standard tool
8	$\frac{9}{32}$ inch open-end wrench or $\frac{9}{32}$ inch nutdriver	Used to remove the rear panel nut posts	Standard tool
9	MA-800G Soldering Aid	Used to remove the front panel trim	Standard tool

Trim, Cabinet, and Module Removal

Table 4-3: Column legend for Table 4-5

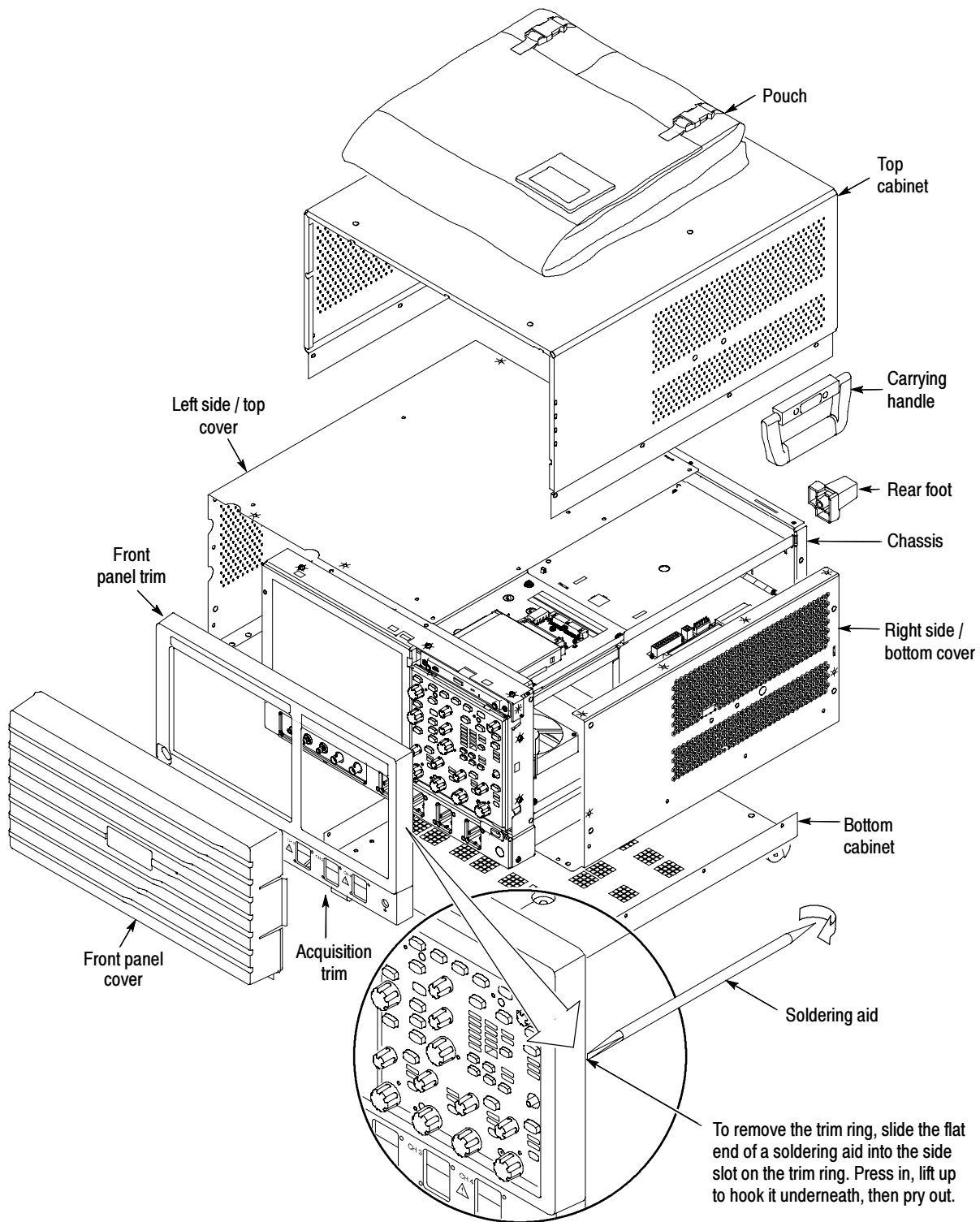
A - Front cover (if installed)	H - Front panel assembly	O - Bridge board
B - Front panel trim	I - 12V Aux distribution board	P - # of T15 Torx tip screws to remove
C - Pouch (if installed)	J - Distribution board, front	Q - Number of connectors to unplug
D - Cabinet, bottom	K - Distribution board, rear	R - Page reference
E - Cabinet, top	L - PA Bus board assembly	S - Figure number reference
F - Cover, LH side/top	M - MicroATX	
G - Cover, RH side, bottom	N - Connector bracket, CD-ROM drive	

Table 4-4: Accessing modules

Assembly to replace	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	Comment(s) / additional assemblies to remove
Acquisition																		5-15	5-4	Acquisition bd. is not field serviceable. Contact service depot.
MicroATX			✓	✓	✓	✓	✓							✓		11	1	5-15	5-4	Unfasten CD-ROM mounting bracket to enable rotation of MicroATX.
Bridge			✓	✓	✓	✓	✓				✓	✓	✓			10		5-15	5-4	Remove 10 T15 screws securing Power PC processor. Remove 2 hex-head jack screws securing Bridge connector to rear of unit. Slide PPC forward to clear Bridge connector. Lift Bridge from slot on PPC.
CD-ROM drive	✓															2		5-13	5-3	Remove CD-ROM bezel. Pull out CD-ROM drive.
CD-ROM drive connector	✓	✓	✓	✓	✓	✓										1	2	5-13	5-3	Remove CD-ROM drive. Remove CD-ROM connector.
Power PC (PCC) processor			✓	✓	✓	✓	✓				✓	✓	✓		✓	10	2	5-13 5-15	5-3 5-4	Remove MicroATX board, hard drive, CDROM-RW, Bridge board
Display	✓	✓	✓	✓	✓											4	2	5-11	5-2	
Display adapter																3	4	5-11	5-2	Remove display assy. Remove display adaptor
Display touch-screen																	2	5-11	5-2	Remove display assy. Remove touch-screen.
Distribution board - 12V AUX			✓	✓	✓	✓	✓											5-13	5-3	

Table 4-4: Accessing modules (Cont.)

Assembly to replace	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	Comment(s) / additional assemblies to remove
Distribution board - front			✓	✓	✓	✓	✓											5-13	5-3	
Distribution board - rear			✓	✓	✓	✓	✓										2	5-13	5-3	
Distribution board - PA bus			✓	✓	✓	✓	✓											5-13	5-3	
Fans, side			✓	✓	✓	✓							✓			2	2	5-13	5-3	Unplug 2 fan connectors. Unsnap 2 cable clamps. Remove 2 screws from top of fan assembly. Lift fan assembly out.
Fans, internal			✓	✓	✓	✓	✓									2	2	5-13	5-3	Unplug 2 fan connectors. Remove 2 screws from RH side of fan assembly. Slide fan assembly out to right.
Front panel	✓	✓	✓	✓												4	1	5-11	5-2	
Front panel interface								✓								8		5-11	5-2	Remove front panel knobs
Front panel keypad								✓										5-11	5-2	Remove front panel knobs, front panel interface
Hard disk drive (HDD)																2		5-13	5-3	Loosen 2 thumbscrews. Pull out HDD.
Hard disk drive connector			✓	✓	✓											1	2	5-13	5-3	Remove HDD. Remove HDD connector.
Low voltage power supply (LVPS)			✓	✓	✓	✓	✓		✓	✓	✓	✓				5	2	5-15	5-4	Remove all four distribution boards.
USB port (front panel)	✓	✓						✓								1	1	5-11	5-2	

**Figure 4-1: Locator for trim and cabinet removal**

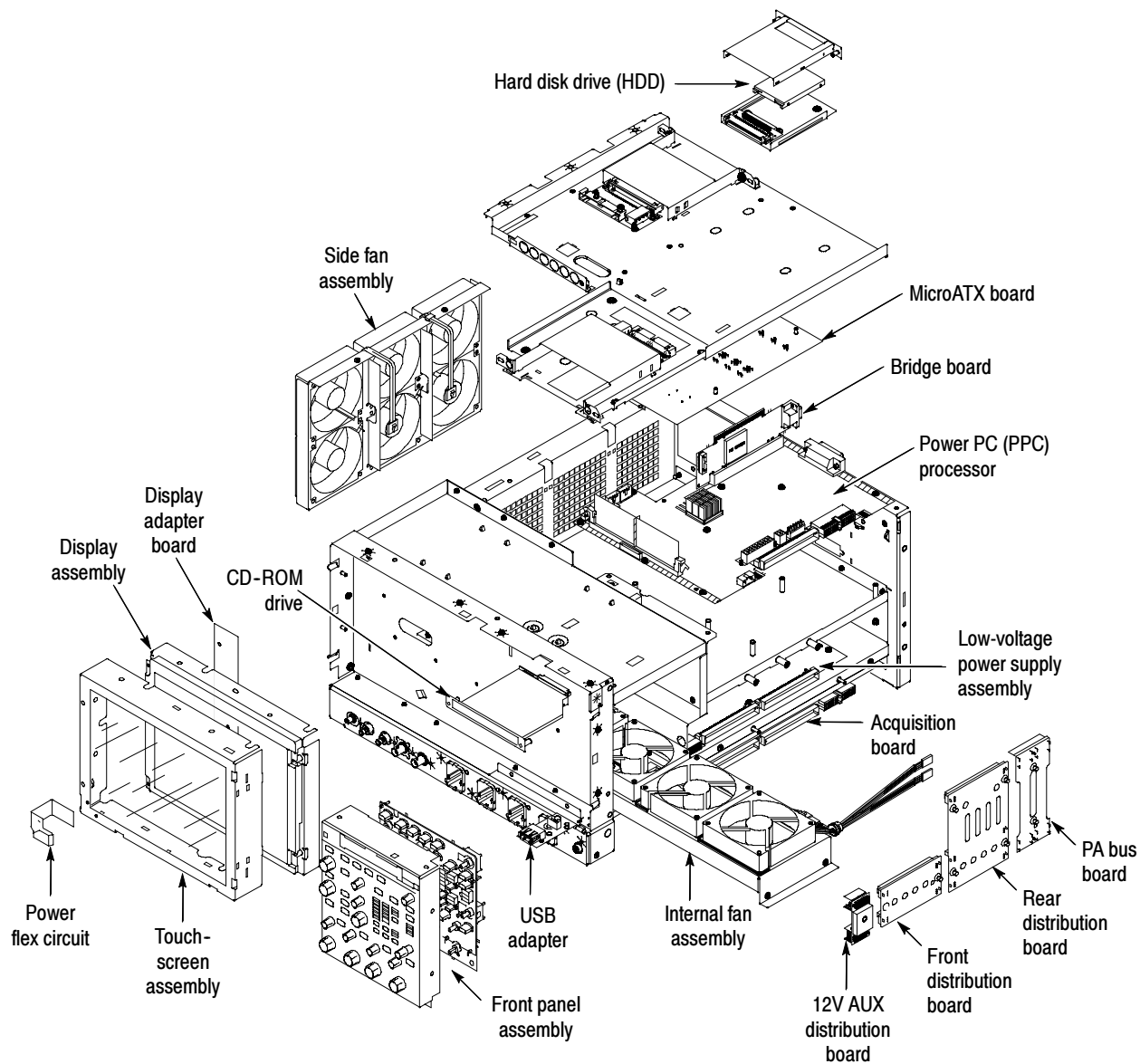


Figure 4-2: Locator for internal modules

Removal Procedures

NOTE. Unless directed otherwise, installation is the reverse of the removal procedure.

These procedures assume you have access to the module you are removing. Refer to Table 4-4, page 4-9, to determine which trim and/or modules to remove to gain access, and to direct you to the appropriate exploded drawing. Figures 4-1 and 4-2, pages 4-11 and 4-12, are also provided as a quick reference for trim and module locations.



CAUTION. When removing or installing the keypad, make sure you do not touch the switch contacts with your fingers. The oils in your fingers will degrade or damage the switch contacts. To help prevent damage to the keypad use cotton gloves when removing or installing the keyboard pad.



CAUTION. To avoid damage to the front panel Standby/On switch assembly, do not set the Display module assembly on a work surface. Sliding the oscilloscope over the edge of the work surface could break off the On/Standby switch assembly.

Acquisition Module

The Acquisition module is not field serviceable. Contact the Tektronix service depot for assistance.

MicroATX module

Follow these steps to remove the MicroATX module.

1. Remove the four securing screws from the rear-panel and the three screws from the side of the MicroATX module.
2. Disconnect the 12V Power Supply cable from J510 on the Power PC (PPC) module.
3. Disconnect the Power Supply cable from J410 on the PPC module.
4. Gently lift up on the MicroATX chassis until the Bridge module disconnects from the MicroATX module PCI connector.
5. Raise the MicroATX chassis on its hinge, unsnap the prop, and insert the prop into the retaining slot in the Main chassis side bar.
6. Disconnect the MicroATX cable from J9G1 on the MicroATX module.

7. Disconnect the Drive Power cable from J180 on the PPC module.
8. Disconnect the USB cable from J9F2 on the MicroATX module.
9. Raise the MicroATX chassis and snap the prop back into place.
10. Move the MicroATX chassis toward the back of the instrument, to disengage the hinge, and lift it away from the Main chassis.

Bridge Module

Follow these steps to remove the Bridge module.

1. Raise the MicroATX module, as described in the previous step.
2. Remove the 10 screws securing the PPC module to the Main chassis.
3. Remove the two jack screws securing the XGA OUT connector to the rear panel.
4. Remove the two jack screws securing the GPIB connector to the rear panel.
5. Slide the PPC module slightly toward the front of the oscilloscope, until the XGA OUT connector is clear.
6. Unplug the Bridge module from J870 on the PPC module and lift it out.

Power PC (PPC)

Follow these steps to remove the Power PC (PPC) module.

1. Raise the MicroATX module, as described previously.
2. Disconnect and remove the Rear Power Distribution module.
3. Disconnect and remove the PA Bus module.
4. Disconnect the Wide Display cable from J290 on the PPC module.
5. Disconnect the Narrow Display cable from J205 on the PPC module.
6. Disconnect the Fan Extender cables from J291 and J390 on the PPC module.
7. Remove the 10 screws securing the PPC module to the Main chassis.
8. Remove the two jack screws securing the XGA OUT connector to the rear panel.
9. Remove the two jack screws securing the GPIB connector to the rear panel.
10. Slide the PPC module slightly toward the front of the oscilloscope, until the XGA OUT connector is clear, then lift the PPC and Bridge modules out as a unit.

CD-ROM Drive

Follow these steps to remove the CD-ROM drive.

1. Remove the two screws securing the CD-ROM bezel, and remove the bezel.
2. Pull the CD-ROM drive out from the Main chassis.
3. Remove the four screws securing the CD-ROM drive and Adapter board to the CD-ROM drive bracket.
4. Separate the CD-ROM drive and the Adapter board.

Display

Follow these steps to remove the Display module.

1. Remove the four screws securing the display to the Main chassis; two on the top and two on the left side.
2. Gently remove the Display module from the Main chassis.
3. Disconnect the smaller Display cable from J3 on the Display Adapter board.
4. Disconnect the larger Display cable from J2 on the Display Adapter board.



CAUTION. *Be careful when removing and reinstalling the Display module cables. If the connectors have bent pins or are installed incorrectly the Display may be destroyed.*

Side Fans

Follow these steps to remove the side fan assembly.

1. Disconnect the fan cables from the fan cable extenders.
2. Unsnap the cable clamps controlling the fan cables.
3. Remove the two screws securing the fan assembly to the Main chassis.
4. Lift the fan assembly up off the tabs on the Main chassis.

Internal Fans

Follow these steps to remove the Internal Fan assembly.

1. Remove the two screws securing the internal fan assembly to the Main chassis.
2. Slide the fan assembly out of the Main chassis.
3. Disconnect the two fan cables.

Front Panel Follow these steps to remove the Front Panel.

1. Remove the six screws that secure the Front Panel to the Main chassis; two on the top, two on the right side, and two on the bottom.
2. Pull the Front Panel away from the Main chassis.
3. Disconnect the Front Panel cable from P1 on the Front Panel module.

USB Module Follow these steps to remove the USB module.

1. Disconnect the USB cable from J1 on the USB module.
2. Remove the one screw securing the USB module to the Main chassis.
3. Lift the USB module from its guide post.

Hard Disk Drive Follow these steps to remove the hard disk drive.

1. Loosen the thumbscrews securing the hard drive to the rear panel.
2. Grasp the hard disk drive assembly by the thumb screws and pull until the handle is exposed. Grasp the handle and pull the hard drive assembly straight out of the instrument.
3. Pry the detents retaining the top cover apart, and remove the top cover.
4. Remove the four screws securing the hard drive to the bottom cover.
5. Separate the hard disk drive from the HDD Adapter board.

To replace the hard drive.

1. Connect the hard drive to the HDD Adapter board.
2. Attach the hard drive to the bottom cover with the four screws removed above.
3. Snap the top cover onto the bottom cover.
4. Leaving the cover/handle extended, push the hard drive assembly into place until it stops, ensuring that it is straight. Push the hard drive assembly firmly to ensure that the connector is seated properly.
5. Slide the cover/handle in until it stops. It will be almost flush with the back panel.
6. Finger tighten the two thumb screws to ensure that the removeable hard drive is properly seated.

Troubleshooting



WARNING. Before performing this or any other procedure in this manual, read the General Safety Summary and Service Safety Summary found at the beginning of this manual.

To prevent possible injury to service personnel or damage to electrical components, please read Preventing ESD on page 4-1.

This section contains information and procedures designed to help you isolate faults to a module.

This section assumes that service personnel have the prerequisite skills required to work on this oscilloscope, including PC troubleshooting and Windows operating system skills. Details of PC and Windows operation and service are not in this manual.

For assistance, contact your local Tektronix Service Center.

Service Level

This subsection contains information and procedures designed to help you isolate faulty modules in the oscilloscope. If a module needs to be replaced, follow the *Removal and Installation Procedures* located in this section.

Check for Common Problems

Use Table 4-5 to quickly isolate possible failures. The table lists problems and possible causes. The list is not exhaustive, but it may help you eliminate a problem that is quick to fix, such as a blown fuse or loose cable.

Table 4-5: Failure symptoms and possible causes

Symptom	Possible cause(s)
Oscilloscope will not power on	■ Power cord not plugged in ■ Faulty power supply
Front panel light comes on (oscilloscope powers on), but one or more fans will not operate	■ Faulty fan cable ■ Defective fan assembly ■ Faulty power supply

Table 4-5: Failure symptoms and possible causes (Cont.)

Symptom	Possible cause(s)
PPC appears “dead”; power light comes on, but monitor screen(s) is (are) blank, oscilloscope emits no beeps	■ SO DIMMs incorrectly installed or missing. Missing DIMMs will cause a POST fault and MicroATX will beep ■ Defective Power PC (PPC) board ■ Hold down on-standby button on the PPC, if system boots, replace the power supply
Hard disk drive related symptoms	■ Improperly seated hard disk drive assembly ■ Defective hard disk drive ■ Incorrect hard disk type selected in the BIOS setup ■ Replaceable hard disk drive not installed ■ Power supply failure ■ Corrupted BIOS module firmware, reinstall firmware ■ Hard disk drive not configured as bootable (slave) master hard disk drive ■ Loose cable ■ Faulty bridge board ■ Faulty PPC board
CD-ROM related symptoms	■ Defective CD-ROM ■ Defective CD-ROM drive cable ■ Defective CD-ROM board ■ Incorrect CD-ROM configuration in the BIOS setup

Table 4-5: Failure symptoms and possible causes (Cont.)

Symptom	Possible cause(s)
Flat panel display blank	■ Display selection jumper set incorrectly on front panel board (there are no jumpers on the board when the oscilloscope is shipped from the factory; this is the correct default setting) ■ Video adapter set to Integrated (connect monitor to MicroATX VIDEO port, enter BIOS, set Video Adapter = PCI) ■ BIOS setting not Advance > Video Configuration > Primary Video Adapter = PCI ■ Defective cable from front panel board to display adapter board ■ Defective cable from inverter board to display adapter board ■ Defective cable from inverter board to backlighting display lamp ■ Defective backlighting display lamp ■ Faulty display ■ Faulty controller board ■ Faulty inverter board ■ Faulty display adapter board
BIOS error messages	■ Refer to the BIOS error message tables starting on page 4-30

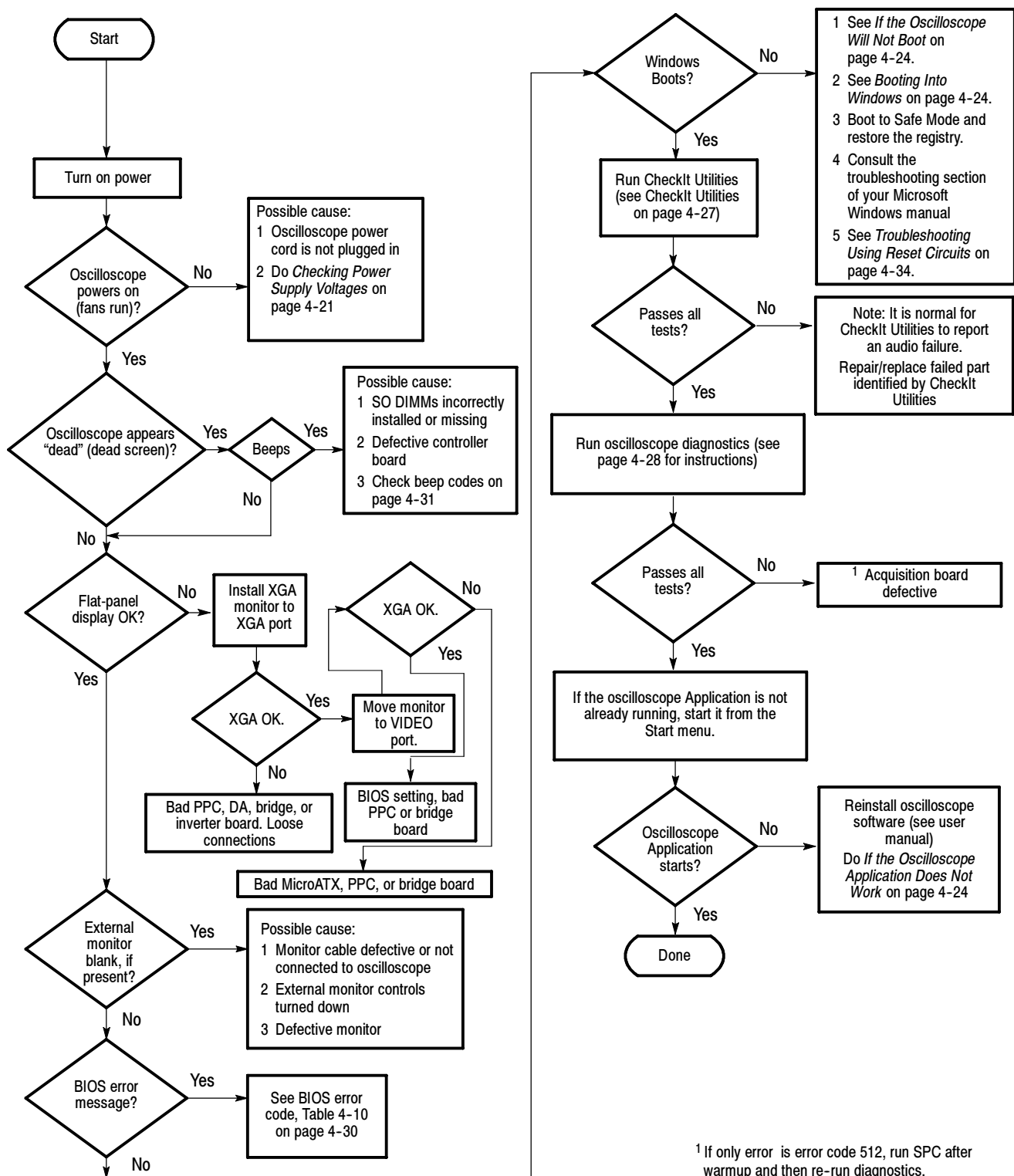
Equipment Required

You will need a digital voltmeter to check power supply voltages, as described on page 4-22.

Testing might also be required to correct some faults. Under those circumstances, you will need the test equipment listed in the *TDS6000B & TDS6000C Specifications and Performance Verification* Technical Reference, available on the documentation CD-ROM supplied with your instrument, or on the Web at www.tektronix.com.

Fault Isolation Procedure

Follow the primary troubleshooting tree in Figure 4-3 for fault isolation. This tree calls for you to run the diagnostics programs, and check for BIOS errors.



¹ If only error is error code 512, run SPC after warmup and then re-run diagnostics.

Checking the Power Supply Voltages

First, make a visual check. As viewed from the right side of the oscilloscope, there are 11 LEDs on the power supply, which can be seen through the side panel (see Figure 4-4). DS10 and DS11 are the Global Power indicators, DS3 is the Standby indicator. When mains power is applied DS10 and DS11 will be on (green). When the oscilloscope is in standby mode, DS3 will be on (red). When the oscilloscope is switched to Operate mode, the red standby light will go off and the remaining LEDs should turn on (green). If DS3 (red) comes on while the oscilloscope is on, it indicates an overcurrent condition. Table 4-6 shows what is indicated by the other LEDs.

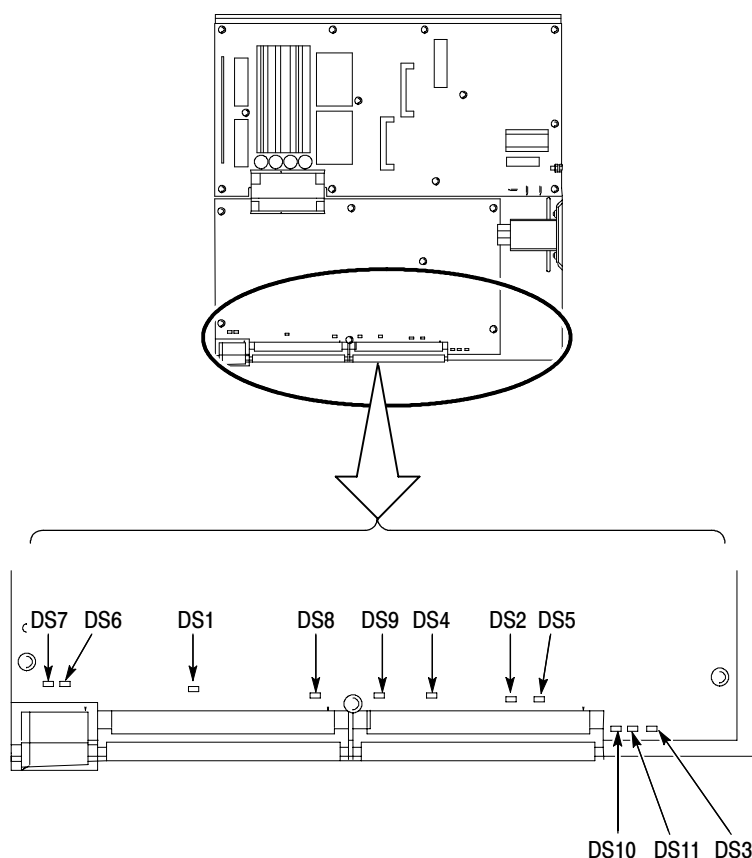


Figure 4-4: Low voltage power supply LED locations

Table 4-6: LVPS LED descriptions

LED	Voltage	LED Indicates
DS1	-5 V	Good to ACQ board
DS2	+3.3 V	Good to PPC, ATX, and ACQ boards
DS4	+5 V	Good to PPC, ATX, and ACQ boards

Table 4-6: LVPS LED descriptions (Cont.)

LED	Voltage	LED Indicates
DS5	+12 V	Good to PPC and ATX boards
DS6	+12 V Aux 1	Good to ACQ bd. regulators ¹
DS7	+12 V Aux 2	Good to ACQ bd. regulators ¹
DS8	+15 V	Good to ACQ board
DS9	-15 V	Good to ACQ board

¹ Becomes +2.6 V Demux supply.

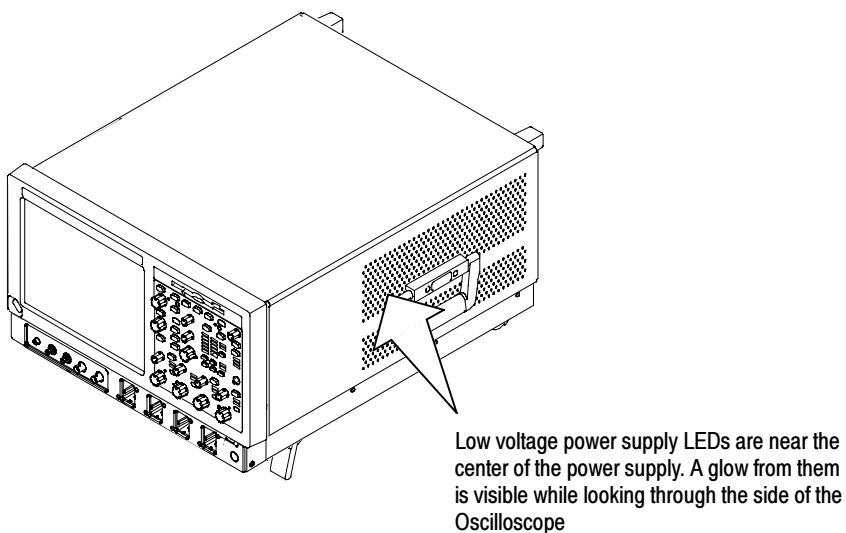


Figure 4-5: Location of power-on and over current LEDs

To check the power supply voltages, power on the oscilloscope and connect the reference lead of a digital voltmeter to chassis ground.

Attach a 0.025 inch square pin to the probe tip of the other lead and insert it into a pin on one of the connectors. The pins that should be carrying voltages are listed in Table 4-7. The location of the J1 and J2 connectors is shown in Figure 4-6 on page 4-23.

Measure the power supply voltages with the voltmeter and compare each reading to the values listed in the tables. If the voltages are within about 5% of the nominal voltages, your power supply is functional.

Table 4-7: Power supply voltages

Auxiliary power distribution board (P3) and Power supply (J3)	Voltage	Front power distribution board (P2) and Power supply (J2)	Voltage	Rear power distribution board (P1) and Power supply (J1)	Voltage
Pins A/B/C1, 2, 3, 9, 10, 11	+12 V	Pins A/B/C1, 2, 3, 4, 7, 8, 11, 12, 13, 14	+5 V	Pins A/B/C9, 10, 11	+12 V
Pins D1, 11	+6 V	Pins A/B/C16, 17, 18, 21, 22, 23, 26, 27, 28, 29	-5 V	Pins A/B/C14, 15, 16, 19, 20, 21, 22	+3 V
Pins D2, 3, 9, 10	+12 V	Pins A31, 32	+15 V	Pins A/B/C25, 26, 27, 30, 31, 32	+5 V
Pins E1, 11	+3 V	Pins C31, 32	-15 V		
Pins E2, 3, 9, 10	+12 V				

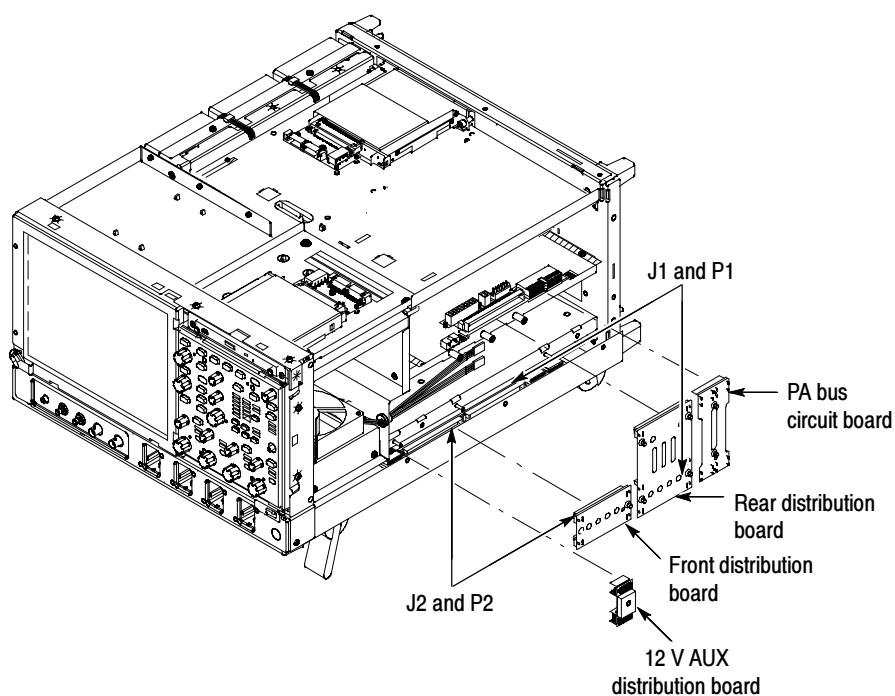


Figure 4-6: Connectors J1, J2, and J3

If the Oscilloscope Will Not Boot

If there is a display on the XGA port, but not on the LCD, the oscilloscope may be in safe mode. Reboot the oscilloscope to clear this condition. If this does not fix the problem, then replace the display assembly (LCD, lamps, and cable).

At boot time, and while using an external monitor connected to the MicroATX external video port, press F2 to enter the BIOS setup. The Advanced Video Configuration menu lets you select PCI (LCD) or Integrated (the MicroATX VIDEO port on the rear panel). The lower XGA port on the rear panel is the PCI video port (driven by the same video controller as the LCD).

Booting Into Windows

If the oscilloscope will not boot, run the CMOS restore utility (see Update/Restore the MicroATX Board CMOS on page 4-36).

If booting starts, finds the hard disk, but hangs displaying the Windows splash screen:

1. Select the Integrated video port using the setup menu.
2. Disable the busses and disconnect the PPC board by installing J114 and J115 (see Figure 4-9, page 4-36).
3. If the system boots (It will only boot to Windows, the oscilloscope application will not run) to the external MicroATX video port, replace the PPC bridge board.

If the Oscilloscope Application Does Not Work

If the oscilloscope boots into Windows, but the oscilloscope application does not work (the initial splash screen is displayed), check the following:

1. The application software.
2. The Acquisition board.
3. The PPC board.
4. Did someone exit the application using the Task Manager and then try to reenter the application without rebooting?
5. Check the desktop properties (right click on the desktop and select Properties). On the Settings tab, 16 bit is required. Video merge will not work with other settings. If you change the setting, reboot.
6. On the Settings tab of the desktop properties, select Advanced and then the Performance tab. Hardware Acceleration must be set to Full for video merge to work. If you change the setting, reboot.

PPC and MicroATX PC Diagnostics

The primary diagnostics for the oscilloscope are the power-on diagnostics, the CheckIt Utilities diagnostics, and the oscilloscope diagnostics. Procedures for running these diagnostics are described next.

Power-on Diagnostics

The power-on diagnostics check the basic functionality of the oscilloscope at every power on. If any failures occur at power on, the screen displays the calibration and diagnostics property page. Table 4-8 lists a subset of the power on tests. Use the results of the tests to help you isolate problems to system modules.

The power on tests ensure that hardware is installed and can be accessed by the software. The tests provide limited diagnostic information, but do not provide any performance information. The oscilloscope diagnostics provide more extensive tests than the power-on diagnostics.

The power on tests check the generic hardware including the keyboard, mouse, memory, CPU, and associated peripherals. The interrupt lines and trigger lines are also checked.

If there are no failures, you can view the results of the tests in the Instrument Diagnostics page under the Utilities menu.

Table 4-8: Power-on diagnostic tests

Component	Group & test	Error Codes	Power on	Extended
Mainframe	VTC Reset Test		✓	
	VTC Walk1 Test		✓	
	ADG Register Test		✓	
	ADG VXI Addr Test		✓	
	ADG VXI Data Test		✓	
System	Interrupt Lines		✓	✓
	Trigger Lines		✓	✓
Processor	Memory	111 DRAMWalk1 112 DRAMCell 113 DRAMMarch 114 NVRAM		✓
	PCI Bus	121 Scan Test		✓

Table 4-8: Power-on diagnostic tests (Cont.)

Component	Group & test	Error Codes	Power on	Extended
RegAccess	Ch1 Serial	211 AtoD 212 DAC 213 Preamp		✓
	Ch2 Serial	221 AtoD 222 DAC 223 Preamp		✓
	Ch3 Serial	231 AtoD 232 DAC 233 Preamp		✓
	Ch4 Serial	241 AtoD 242 DAC 243 Preamp		✓
	Direct R/W	251 Demux 252 DSY 253 SBTL 254 SGTL		✓
	IIC	261 AckIdle 262 Pogo_U1 263 U1350		✓
	Relays	271 Interrupt 272 Overloads 273 ShiftLoop		✓
	Serial	281 PA_unique 282 PLL 283 TH_IDs 284 TH_unique 285 Trigger DAC 286 U1500 287 U2000		✓

Table 4-8: Power-on diagnostic tests (Cont.)

Component	Group & test	Error Codes	Power on	Extended
Acquisition	DemuxMem	311 MemData 312 MemAddr 313 DMA Read 314 DMA Write 315 FIR		✓
	Demux	321 RunAB 322 AcqDone 323 Xfer 324 ICD Bus 325 Intrlv 326 XYtest 327 FIR		✓
	Vertical	331 ADC Connects		✓
	Interrupt	341 Bit Tests		✓
	HF Step	351 PhaseCal	✓	✓
	PLL	361 Clock Freq		✓
	Acq Modes	371 HiRes 372 Peak Detect 373 SubSample		✓
	Memory	381 DataFormat 382 MemSpeed		✓
Trigger	Inputs	411 Line Started 412 CH1 started 413 CH2 started 414 CH3 started 415 CH4 started 416 Events 417 Comm		✓
	Internals	421 BTrig 422 BTrigEvents 423 TimeInterp 424 Holdoff 425 TrigInfo		✓
	Nibble	471 Bus		✓
Misc	Cal Integrity	511 Factory Cal 512 SPC (run SPC)		✓
	GPIO	521 Interface		✓

CheckIt Utilities

If the oscilloscope passes all the BIOS tests and Windows boots, the primary tree calls for you to run CheckIt Utilities diagnostics software. CheckIt Utilities is a comprehensive diagnostic software application to check and verify the operation of the PC hardware in the oscilloscope.

CheckIt Utilities. To run the CheckIt Utilities, you must have either a working keyboard, a pointing device (mouse), and WindowsXP must be running. Before starting the utilities install a test floppy disk in the floppy disk drive and a test CD in the CD-ROM drive. Refer to the CheckIt Utilities online help for additional information on running the utilities. Repair or replace any failed component identified by the CheckIt Utilities.

Oscilloscope Diagnostics. If the oscilloscope passes all the CheckIt Utilities tests, the primary tree calls for you to run the oscilloscope extended diagnostics. The oscilloscope Diagnostics are a comprehensive software test that checks the functionality of the oscilloscope. If the oscilloscope Diagnostics test fails, the oscilloscope is defective.

Diagnostics

The oscilloscope has two levels of internal diagnostics that focus on verifying, adjusting, and if need be, isolating faulty modules.

Both levels of internal diagnostics report any defective modules. If a defective module is found, replace the module.

The two levels of diagnostics are the short confidence set and the extended set that tests the oscilloscope circuitry in depth and takes more time. At power on, the oscilloscope automatically executes the short set. The extended set is optional and is executed by using the following procedure:

Prerequisites: Power on the oscilloscope and allow a 20 minute warm-up before doing this procedure.

1. Turn off all other applications.
2. From the menu bar, touch **Utilities** and then select **Instrument Diagnostics**.

Software Updates

Software updates are easy to do. Simply install the firmware CD in your oscilloscope and follow the displayed instructions or the instructions that accompany the CD.

Firmware updates are available for download at no charge from the Tektronix web site. To find available software updates for your oscilloscope, go to www.tektronix.com/software and enter your oscilloscope's model number as keyword. Updates are also available on CD. If you want to order a software update on CD, contact your Tektronix service center.

After Repair

After removal and replacement of a module due to electrical failure, you must perform the adjustment or software update as indicated in Table 4-9.

Table 4-9: Action required for module replaced

Module replaced	Adjustment required ¹	Software update required
Front panel assembly	No	None
Acquisition board	Yes ²	None
PPC Processor board	No ³	Installation by Tektronix is required
MicroATX processor assembly Same version	No	None
Updated	No	Windows, oscilloscope application
Display panel or display system	No	None
Power supply	Yes	None
Interconnect boards	No	None
Fans	No	None
Hard drive New	No	Windows, oscilloscope application, optional software applications, run SPC after warmup
Spare	No	Run SPC after warmup

¹ Adjustment must be performed by Tektronix.

² Replacement of this board must be performed by Tektronix.

³ Run SPC after the oscilloscope warms up.

BIOS Error Messages

When the MicroATX board powers-on, the BIOS runs power-on-self-tests (POST) to check the board. The BIOS writes error codes to location 80h and tries to write the codes to the display. If the error is fatal, then the POST code indicates the last successful checkpoint reached. Table 4-10 lists the error messages displayed by the BIOS.

Once the display is enabled, errors are written to the display as text messages. These messages are always displayed unless the board is configured for silent boot or headless (no keyboard, mouse, or display) operation.

Table 4- 10: BIOS Error messages

Error message	Description
GA20 Error	Error when switching to protected mode during the memory test.
Pri Master HDD Error, Pri Slave HDD Error Sec Master HDD Error, Sec Slave HDD Error	Could not read sector.
Pri Master Drive - ATAPI Incompatible PRI Slave Drive - ATAPI Incompatible Sec Master Drive - ATAPI Incompatible Sec Slave Drive - ATAPI Incompatible	Drive not an ATAPI device. Run Setup, and make sure device is set up correctly.
A: Drive Error	No response from drive.
Cache Memory Bad	Memory may be bad.
CMOS Battery Low	Replace battery.
CMOS Display Type Wrong	Check Setup to make sure type is correct.
CMOS Checksum Bad	Run Setup to reset values.
CMOS Settings Wrong	Settings corrupted or the battery has failed.
CMOS Date/Time Not Set	Run Setup to correct values.
DMA Error	Error during read/write test of controller.
FDC Failure	Error while trying to access controller.
HDC Failure	Error while trying to access controller.
Checking NVRAM. . . .	NVRAM is being checked.
Update OK!	Invalid NVRAM has been updated.
Updated Failed	Unable to update invalid NVRAM.
Keyboard Error	Make sure keyboard is connected properly.
KB/Interface Error	Keyboard test failed.
Memory Size Decreased	If no memory was removed, the memory may be bad.
Memory Size Increased	If no memory was added, system may have a problem.
Memory Size Changed	If no memory was added or removed, the memory may be bad.
No Boot Device Available	Boot device not found.
Off Board Parity Error	Parity error occurred on an off-board card.
On Board Parity Error	Parity error occurred in on-board memory.
Parity Error	Error occurred in on-board memory at an unknown address.
NVRAM/CMOS/PASSWORD cleared by Jumper	Turn off power and remove the jumper.
<CTRL_N> Pressed	CMOS is ignored and NVRAM is cleared. Enter Setup.

BIOS Beep Codes

When the MicroATX board powers-on a number of the BIOS checkpoints generate an audible ‘beep’ code on failure using the standard PC speaker (also routed through the board audio system). The beep codes are listed in Table 4-11. Codes are also written to I/O port 80h and the video adapters. External ROM modules may issue a series of tones on error detection.

The BIOS generates one short beep if the power up self tests complete without error.

If your instrument does not contain a speaker, attach a speaker to the display-adaptor board square pins to hear the codes.

Table 4-11: Beep codes

Beep code	Error message
1	Refresh failure
2	Cannot reset parity
3	Memory failure, first 64 KB
4	Timer failure
5	Not used
6	Cannot toggle 8042 GateA20
7	Exception interrupt error
8	Display memory R/W error
9	Not used
10	CMOS Shutdown register test error
11	Invalid BIOS
1 long, 1 short	Video configuration failure, or external ROM module checksum error

DIP Switch Controls

DIP switches (see Figure 4-9 on page 4-36) are used to direct program flow during power on self test (POST) of the power PC (PPC). A switch set to ON is closed and presents a low state (0 V) to the switch buffer. This is the default switch position. A switch set to OFF is open and presents a high state (3.3 V) to the switch buffer. This is the ‘set’ position. Table 4-12 describes the switch functions.

Table 4- 12: DIP switch functions

Switch	Test option		
	Default	Set	Description
1	1 Meg RAM test	32 Meg RAM test	POST cannot determine how much DRAM is installed in the board.
2	Enable phase 2 POST	Disable phase 2 POST	Use to disable phase 2 of POST.
3	Do not loop on phase 2 POST	Loop on entire phase 2 POST	This switch is checked at every loop iteration, so it is possible to break out of this loop by moving switch 3 to the default position. You cannot loop on a single passing test.
4	Allow debug output	Suppress debug output	Used by the console. Checked at every write operation.
5	Loop on failing test	Continue past failing test	If a test fails (except DRAM march test) and switch 6 is set, this switch is checked. You can break out of the loop by moving switch 5 to the set position, removing the fault, or by setting switch 6 to the default position.
6	Stop on failing test	Continue past failing test	If set and a test fails, the program checks switch 5. If not set, the program will stop on a failure by branching to a loop. To exit the loop, reset the power PC.
7	Do not cycle application diagnostics	Application diagnostic cycle	If set, the power-on diagnostics cycle, which prevents completion of the boot sequence.
8	Do not force power-up diagnostics	Forces power-up diagnostics	At power-on this switch is checked, and if set, power-up diagnostics will run.

Diagnostic LED

Table 4-13 lists the actions performed at power-up of the power pc (PPC) and the associated display on the diagnostic LED. See Figure 4-9 on page 4-36 for the location of the Diagnostic LED (DS320). Until the MPC106 is initialized the LED is not active. RESET forces the display to 8. H, L, P, and a blinking - indicate where the program is in the power-up sequence. As tests occur, the associated number is displayed on the LED. A failing test displays a decimal point and the test number.

Table 4-13: Diagnostic LED

LED	Diagnostic status		
	Passed test	Testing	Test method
8.		MPC740 initialization, MPC106 walking one test, or MPC106 configuration test	Walk a one through configuration register. Use addresses FEC00000 and FEE00000. A one is walked through the lower data bus. Requests the vendor identifier. Use addresses FEC00000 and FEE00000. Vendor identifier data is presented on the lower data bus. Data 0x0face106 is written to the MPC740 register gpr2 if the correct vendor identifier is returned. If the incorrect identifier is returned, data 0x01bad106 is written to the register.
0	MPC740 initialization, MPC106 walking one test, or MPC106 configuration test	First PCI access test and UART initialize	This is not a pass/fail test, only an attempt to read the PCI bus. Read the configuration space of the SIO. The SIO should return the vendor/device identifier (0x00021057), within MPC740 gpr2 register. No data comparison or fault determination occurs. DIP switches are not checked. Set UART to 9600, n, 8, 1. No testing or fault reporting is performed. Once completed, console is usable. Dip switches are not checked.
1	First PCI access test and UART initialize	PC87560 walking-one	Walk a one through the configuration register. Walk a one through the AD bus.
2	PC87560 walking-one	PC87560 configuration	Request vendor/device identifier. Data 0x0face560 is written to MPC740 register gpr6 if correct identifier is returned. If incorrect identifier is returned, data 0x01bad560 is written to MPC740 register gpr6.
3	PC87560 configuration	DEC21554 configuration	Request vendor/device identifier. Data 0x0face215 is written to MPC740 register gpr6 if correct identifier is returned. If incorrect identifier is returned, data 0x01bad215 is written to MPC740 register gpr6.
4	DEC21554 configuration	RS232 interface test	Send UUUUUUUU (55hex, 1010101 binary) to console.
5	RS232 interface test	ROM checksum	Calculate device checksum and compare with checksum in ROM.
6	ROM checksum	DRAM cell test with cache	Test address lines. Write patterns to address range set by switch 1. From start address (000000000) to end address, write hex pattern aaaaaaaa. Repeat for hex patterns cccccccc and f0f0f0f0.
7	DRAM cell test with cache	DRAM march test without cache	DRAM march test. Test data lines. Write to address range set by switch 1. Cache is disabled.
8	DRAM march test without cache	DRAM march test with cache	Test data lines. Write to address range set by switch 1.
9	DRAM march test with cache	DRAM walking one	Test data lines. Walk a one through DRAM memory location. Cache is disabled. Walk a one through buss MEM_DL.
A	DRAM walking one	NVRAM walking one	Walk a one through NVRAM memory location. Cache is disabled. Walk a one through bus XPC_ISA_D.
H	POST passed		

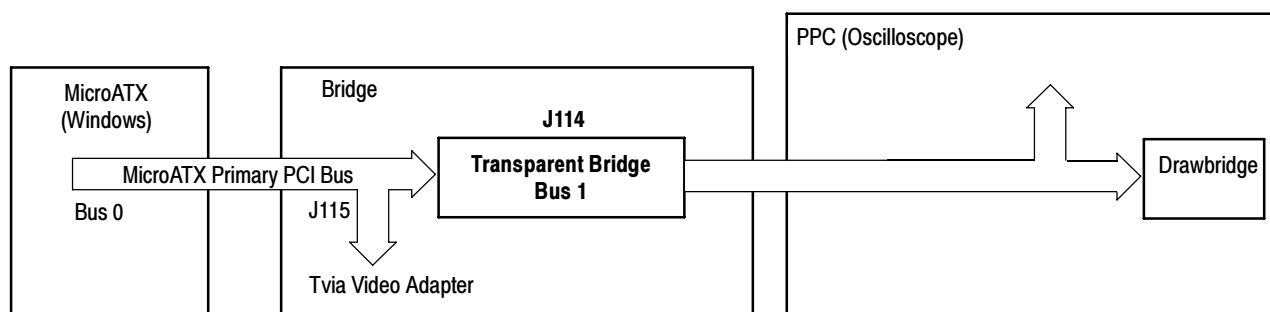
Table 4- 13: Diagnostic LED (Cont.)

LED	Diagnostic status		
	Passed test	Testing	Test method
L		Boot parameters loaded and waiting for host	Program has loaded boot parameters and is waiting to connect to host.
P		Loading files from host	Program has connected to host and is loading oscilloscope files.
—	Load process complete		Files have completed loading.

Troubleshooting Using Reset Circuits

The Power PC (PPC) board uses a combination of removable jumpers and surface mount resistors to manipulate circuit reset for troubleshooting.

There are three PCI busses on the PPC board, the MicroATX primary PCI bus, L2 PCI bus, and the embedded PPC PCI bus. A hardware fault on any of these busses can prevent Windows from starting properly.

**Figure 4- 7: The three PCI busses**

Using jumpers J114 and J115 (see Figure 4-9 on page 4-36) you can selectively remove components from the MicroATX primary PCI bus. This is useful when Windows will not start. The Bridge board components on the MicroATX primary PCI bus are the Intel 21152 transparent bridge, and the Tvia CP5202 video adapter.

Installing J114 forces the transparent bridge, all components on the L2 PCI bus, and all components on the PPC PCI bus into reset. If this allows Windows to start, you will need to eliminate the PPC PCI bus. The easiest way to force the PPC PCI bus into reset is to press and hold the PPC reset button, S100. So, adding jumper J114, and holding the reset button, determine if the instrument will boot to Windows.

Installing J115 removes the Tvia video adapter from the Windows side. Note, neither the Bridge board XGA port or the LCD will function if J115 is installed. Use the MicroATX VIDEO port (see Figure 4-8).

NOTE. The Tvia video adapter located on the Bridge board is the primary video adapter. A second video adapter is located on the MicroATX board. The second adapter is an Integrated MicroATX video adapter and the Tvia video adapter is a PCI bus video adapter. The Tvia adapter is made the primary video adapter because it can drive LCD panels. Tektronix forces the Tvia adapter to be the primary video adapter via BIOS setting Advance→ Video Configuration→ Primary Video Adapter = PCI.

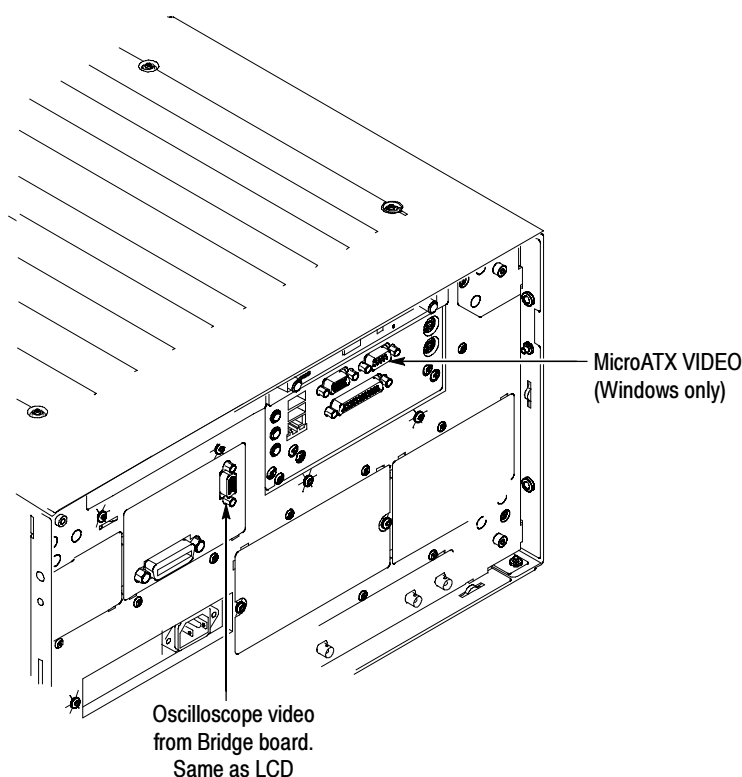


Figure 4-8: PCI and MicroATX video connectors

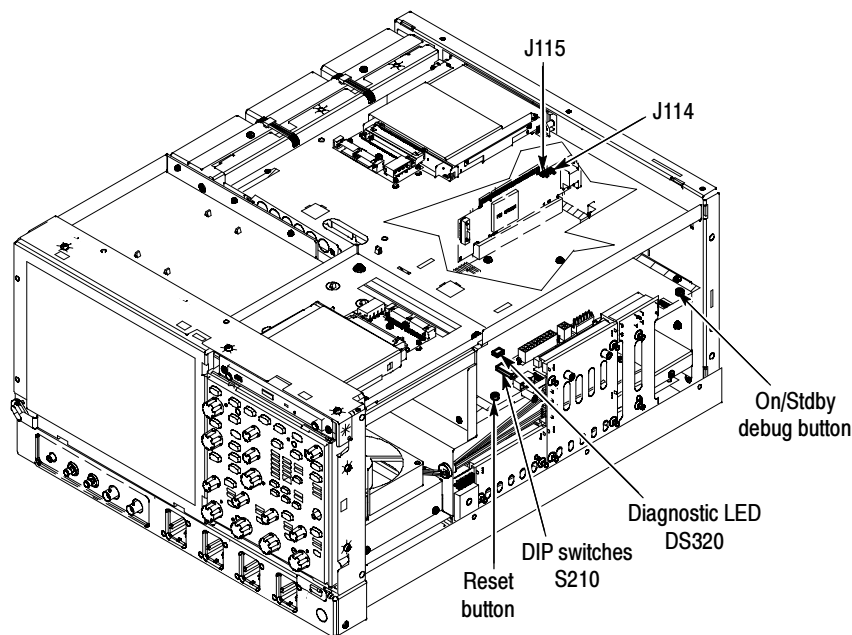


Figure 4-9: Switch, jumper, and reset button locations

Update/Restore the MicroATX Board CMOS

If the CMOS parameters become corrupted, restore the CMOS memory using one of the following procedures:



CAUTION. Install only CMOS parameters from Tektronix. CMOS parameters from other manufacturers may make your oscilloscope inoperable.

If you cannot restore the CMOS memory, replace the battery.

Restore the CMOS as follows:

1. Press the **F2** key during reboot to enter the BIOS SETUP UTILITY.
2. In the BIOS SETUP UTILITY, press the **F9** key.
3. Press the **Enter** key to Load Optimal Defaults.
4. In the BIOS SETUP UTILITY, press the **F10** key.
5. Press the **Enter** key to Save configuration changes and exit.

Installing an Authorization Key

If you replace your PPC board you will need to reinstall the authorization key (keycode) to return the previous configuration. The keycode for the current configuraiton is printed on the rear panel label for reference.

If you purchase new options, you will receive a new keycode to activate the new configuration.

Install the authorization key using the following procedure:

1. From the oscilloscope menu bar, touch the **Utilities** menu, select **Option Installation**, and then touch **Continue**.
2. Enter the new key using an attached keyboard.
3. Touch **Continue**.

Repackaging Instructions

This section contains the information needed to repack the oscilloscope for shipment or storage.

Packaging

When repacking the oscilloscope for shipment, use the original packaging. If the packaging is unavailable or unfit for use, contact your local Tektronix representative to obtain new packaging.

Seal the shipping carton with an industrial stapler or strapping tape.

Shipping to the Service Center

Contact the Service Center to get an RMA (return material authorization) number, and any return or shipping information you may need.

If the oscilloscope is being shipped to a Tektronix Service Center, enclose the following information:

- The RMA number.
- The owner's address.
- Name and phone number of a contact person.
- Type and serial number of the oscilloscope.
- Reason for returning.
- A complete description of the service required.

Mark the address of the Tektronix Service Center and the return address on the shipping carton in two prominent locations.



Replaceable Mechanical Parts

Mechanical Parts List

This section contains a list of the replaceable modules for the oscilloscope. 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 instruments are sometimes made to accommodate improved components as they become available and to give you the benefit of the latest circuit improvements. Therefore, when ordering parts, it is important to include the following information in your order.

- 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.

Module Servicing

Modules can be serviced by selecting one of the following three options. Contact your local Tektronix service center or representative for repair assistance.

Module Exchange. In some cases you may exchange your module for a remanufactured module. These modules cost significantly less than new modules and meet the same factory specifications. For more information about the module exchange program, call 1-800-833-9200, select option 2.

Module Repair and Return. You may ship your module to us for repair, after which we will return it to you.

New Modules. You may purchase replacement modules in the same way as other replacement parts.

Using the Replaceable Parts List

This section contains a list of the mechanical and/or electrical components that are replaceable for the oscilloscope. Use this list to identify and order replacement parts. The following table describes 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 component number.
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 entries 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. (Code to name and address cross reference is located after this page.)
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.

Mfr. Code to Manufacturer Cross Index

The following table cross indexes 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
00779	AMP INC.	CUSTOMER SERVICE DEPT PO BOX 3608	HARRISBURG, PA 17105-3608
01295	TEXAS INSTRUMENTS INC	SEMICONDUCTOR GROUP 13500 N CENTRAL EXPRESSWAY PO BOX 655303	DALLAS, TX 75272-5303
01KV9	MERIX CORP	1521 POPLAR LANE PO BOX 3000	FOREST GROVE, OR 97116
01963	CHERRY ELECTRICAL PRODUCTS CO	3600 SUNSET AVENUE	WAUKEGAN, IL 60087-3214
03ZT7	MOBILE PLANET	9175 DEERING AVE	CHATSWORTH, CA 91311
04713	MOTOROLA INC	SEMICONDUCTOR PRODUCTS SECTOR 5005 E MCDOWELL ROAD	PHOENIX, AZ 85008-4229
049S6	FUJITSU COMPUTER PRODUCTS OF AMERICA INC	2904 ORCHARD PARKWAY	SAN JOSE, CA 95134-2009

Manufacturers cross index (cont.)

Mfr. code	Manufacturer	Address	City, state, zip code
05791	LYN-TRON INC	SOUTH 6001 THOMAS MALLEN RD	SPOKANE, WA 99204
060D9	UNITREK CORPORATION	3000 COLUMBIA HOUSE BLVD, SUITE 1 20	VANCOUVER, WA 98661
06666	GENERAL DEVICES	PO BOX 39100	INDIANAPOLIS, IN 46239
06915	RICHCO	5825 N TRIPP AVE P.O. BOX 804238	CHICAGO, IL 60646
07416	NELSON NAME PLATE COMPANY	3191 CASITAS AVENUE	LOS ANGELES, CA 90039-2410
0ADN8	DELTA PRODUCTS CORP-DPZ	4405 CUSHING PARKWAY	FREMONT, CA 94538
0B0A9	DALLAS SEMICONDUCTOR	4350 BELTWOOD PKWY S	DALLAS, TX 75244
0GZV8	HUBER & SUHNER INC	19 THOMPSON DRIVE	ESSEX JUNCTION, VT 05452-3408
0J9P9	GEROME MFG CO INC	PO BOX 737 403 NORTH MAIN	NEWBERG, OR 97132
0KB01	STAUFFER SUPPLY CO	810 SE SHERMAN	PORTLAND, OR 97214-4657
0KB05	NORTH STAR NAMEPLATE INC	5750 NE MOORE COURT	HILLSBORO, OR 97124-6474
0KBZ5	Q & D PLASTICS INC	1812 - 16TH AVENUE PO BOX 487	FOREST GROVE, OR 97116-0487
12136	PHC INDUSTRIES INC	1643 HADDON AVE PO BOX 1448	CAMDEN, NJ 08103
16179	M/A COM INC	1011 PAWTUCKER BLVD. PO BOX 3295	LOWELL, MA 01853-3295
1AW87	LEWIS SCREW CO.	4300 SOUTH RACINE AVENUE	CHICAGO, IL 60609
1DM20	PARLEX CORP	7 INDUSTRIAL WAY	SALEM, NH 03079
20944	ANRITSU COMPANY	685 JARVIS DRIVE	MORGAN HILLS, CA 95037
22526	FCI/BERG ELECTRONICS INC	825 OLD TRAIL ROAD	ETTERS, PA 17319-9769
22670	GM NAMEPLATE INCORPORATED	2040 15TH AVE WEST	SEATTLE, WA 98119-2783
24931	FCI/BERG ELECTRONICS INC	RF/COAXIAL DIV 2100 EARLYWOOD DR PO BOX 547	FRANKLIN, IN 46131
26003	MARTEK POWER MDI	4115 SPENCER STREET	TORRANCE, CA 90503-2489
26805	M/A COM OMNI SPECTRA INC	MICROWAVE CONNECTOR DIV 140 4TH AVE	WALTHAM, MA 02254
2K262	BOYD CORPORATION	6136 NE 87TH AVENUE	PORTLAND, OR 97220
2W733	BELDEN WIRE & CABLE COMPANY	2200 US HWY 27 SOUTH PO BOX 1980	RICHMOND, IN 47374
32559	BIVAR INC	4 THOMAS ST	IRVINE, CA 92718
34649	INTEL CORPORATION	3065 BOWERS PO BOX 58130	SANTA CLARA, CA 95051-8130
3M099	PORTLAND SCREW COMPANY	6520 N BASIN AVE	PORTLAND, OR 97217
46628	LOGITECH INC	6505 KAISER DR	FREMONT, CA 94555
50356	TEAC AMERICA INC	7733 TELEGRAPH RD PO BOX 750	MONTEBELLO, CA 90640-6537
5Y400	TRIAx METAL PRODUCTS INC	1880 SW MERLO DRIVE	BEAVERTON, OR 97006

Manufacturers cross index (cont.)

Mfr. code	Manufacturer	Address	City, state, zip code
61058	MATSUSHITA ELECTRIC CORP OF AMERICA	PANASONIC INDUSTRIAL CO DIV TWO PANASONIC WAY	SECAUCUS, NJ 07094
64537	KDI/TRIANGLE CORPORATION	60 S JEFFERSON RD	WHIPPANY, NJ 07981
6Y440	MICRON SEMICONDUCTOR PRODUCTS INC	8000 S FEDERAL WAY PO BOX 6	BOISE, ID 83707-0006
71400	BUSSMANN	DIVISION COOPER INDUSTRIES INC PO BOX 14460	ST LOUIS, MO 63178
74594	COMPONENT RESOURCES INC	BUSSMAN PARTS C/O CASEY LAKEY 14525 SW WALKER ROAD	BEAVERTON, OR 97006
75915	LITTELFUSE INC	800 E NORTHWEST HWY	DES PLAINES, IL 60016-3049
76096	ELMA ELECTRONICS INC	41440 CHRISTY ST	FREMONT, CA 94538
78189	SHAKEPROOF	DIVISION OF ILLINOIS TOOL WORK ST. CHARLES ROAD	ELGIN, IL 60120
7X318	KASO PLASTICS INC	5720-C NE 121ST AVE, STE 110	VANCOUVER, WA 98682
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON, OR 97077-0001
86928	SEASTROM MFG CO INC	456 SEASTROM STREET	TWIN FALLS, ID 83301
8X345	NORTHWEST SPRING MFG CO	5858 WILLOW LANE	LAKE OSWEGO, OR 97035
93907	CAMCAR DIV OF TEXTRON INC	ATTN: ALICIA SANFORD 516 18TH AVE	ROCKFORD, IL 611045181
94222	SOUTHCO, INC.	210 N BRINTON LAKE RD	CONCORDVILLE, PA 19331
9914420 5	BEIJING MINGDAR TECHNOLOGY INC	RM 213 LUIPU BLDG, NO 5 XIAGUANGLI, CHAOYANG DISTRICT	BEIJING, CN
S5769	NEC CORPORATION	NEC BUILDING 7-1, SHIBA 5 CHOME MINATO-KU	TOKYO, JP 108
TK0588	UNIVERSAL PRECISION PRODUCT	1775 NW CORNELIUS PASS RD	HILLSBORO, OR 97124
TK1163	POLYCAST INC	14140 SW 72ND AVE SUITE 100	TIGARD, OR 97224
TK1943	NEILSEN MANUFACTURING INC	3501 PORTLAND RD NE	SALEM, OR 97303
TK2172	WYLE ELECTRONICS INC	10300 SW NIMBUS AVE BLDG P, SUITE B	PORTLAND, OR 97223
TK2250	ARROW ELECTRONICS INC.	9500 SW NIMBUS AVE, BLDG E	BEAVERTON, OR 97008-7163
TK2376	CONDUCTIVE RUBBER TECH	22125 17TH AVE SE, SUITE 117	BOTHELL, WA 98021
TK2491	RIFOCS CORPORATION	1340 FLYNN RD	CAMARILLO, CA 93012
TK2548	XEROX CORPORATION	14181 SW MILLIKAN WAY	BEAVERTON, OR 97005
TK2563	REVTEK INC	4288 SE INTERNATIONAL WAY	PORTLAND, OR 97222
TK2582	TUFF CAT USA LLC	814 N HAYDEN MEADOWS DRIVE	PORTLAND, OR 97217
TK2601	MAXTEK COMPONENTS CORPORATION	13335 SW TERMAN RD PO BOX 428	BEAVERTON, OR 97075-0428
TK2647	INSTRUMENT SPECIALTIES CO INC.	C/O TEMCO NW 1336 SE 51ST STREET	HILLSBORO, OR 97123

Manufacturers cross index (cont.)

Mfr. code	Manufacturer	Address	City, state, zip code
TK6173	MULTI-FINELINE ELECTRONIX INC (MFLEX)	DBA: MFLEX 1301 N DYNAMICS STREET	ANAHEIM, CA 92806
TK6181	IMC PLASTICS INC	19400 SW TETON AVE	TUALATIN, OR 97062
TK6253	VOLEX INTERCONNECT INC	646 CARRIBEAN DR	SUNNYVALE, CA 94089-1108

Replaceable Parts List

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discount'd	Qty	Name & description	Mfr. code	Mfr. part number
5-1					External Parts		
-1	211-1050-00			35	SCREW, MACHINE; 6-32 X 0.312 L, PNH, STL CAD PLT, T15	78189	60-060845-OX
-2	355-0298-00			4	STUD. SNAP; 0.570 DIA,0.165 THK, STAINLESS STEEL	TK0588	355-0298-00
-3	016-1441-00			1	POUCH; BLACK CORDURA	TK6106	016-1441-00
-4	200-4854-00			1	COVER, SKIN; OUTER TUCK UNDER,	1WNW 6	200-4854-00
-5	367-0528-00			1	HANDLE, CARRYING; DUAL DUROMETER MOLDED, POLYPROPYLENE,	12136	367-0528-00
-6	407-4887-00			1	BRACKET; HANDLE BASE, PC/ABS ALLOY, BAYER BAYBLEND FR-110, TEK BLUE,	TK2565	407-4887-00
-7	212-0232-00			2	SCREW, MACHINE; 8-32 X 1.125L, PNH, STL, BLACK ZINK SPEC #ASTM B633 TYPE II, T20	0KB01	212023200
-8	211-0720-00			4	SCR, ASSEM WSHR; 6-32 X 0.500, PNH, STL, CDPL, T-15 TORX DR,MACHINE	78189	60-060845-OX
-9	348-1648-00			4	FOOT; REAR W/CORD WRAP, THERMO PLASTIC	7X318	348-1648-00
-10	161-0104-00			1	CABLE ASSY, PWR; 3, 18 AWG, 98.0 L, 125V/10AMP, RIGHT ANGLE, IEC320, NEMA 15-5P,	TK6121	3572WV88.2GI
-11	200-4941-00			1	COVER,BOTTOM; RIGHT,AL, (TDS6124C/TDS6154C ONLY)	TK6621	200494100
	200-4838-00			1	COVER,BOTTOM; RIGHT,AL (TDS6604B/TDS6804B ONLY)	TK1943	200-4838-00
-12	348-1515-00			1	FEET, CABINET; BLACK, GLASS-FIBRE REINFORCED PLASTIC, SET OF 4 FEET, 4 RUBBER INSERTS,	76096	63-526
-13	200-4855-00			1	COVER; BLACK, 0.05 AL, VINYL CLAD (TDS6604B/TDS6804B ONLY)	1WNW 6	200-4855-00
	200-4942-00			1	COVER; BLACK,0.05 AL,VINYL CLAD (TDS6124C/TDS6154C ONLY)	80009	200-4942-00
-14	101-0168-00			1	TRIM RING, FRONT	80009	101016800
-15	101-0159-00			1	TRIM,INPUT; PLASTIC,BLACK,ABS,	TK2565	101-0159-00
-16	200-4653-00			1	COVER, FRONT; PROTECTIVE, FR110, TEK BLUE	7X318	200-4653-00
-17	335-1046-00			1	MARKER,IDENT; LABEL,FRONT BNC INPUT,	0KB05	335104600
-18	260-2783-00			1	SWITCH, KEYPAD; ELASTOMERIC, FRONT PANEL, PUSHBUTTON,	22670	260-2783-00
-19	335-1305-00			1	LABEL;IDENT, TDS6124C (TDS6124C ONLY)	0KB05	335130500
	335-1311-00			1	LABEL;IDENT; TDS6154C (TDS6154C ONLY)	0KB05	335131100
	335-1044-00			1	MARKER,IDENT; LABEL,IDENTIFICATION (TDS6804B ONLY)	0KB05	335104400
	335-1045-00			1	MARKER,IDENT; LABEL,IDENTIFICATION (TDS6604B ONLY)	0KB05	335104500
-20	200-4839-00			1	COVER, TOP; LEFT, AL	TK1943	200-4839-00

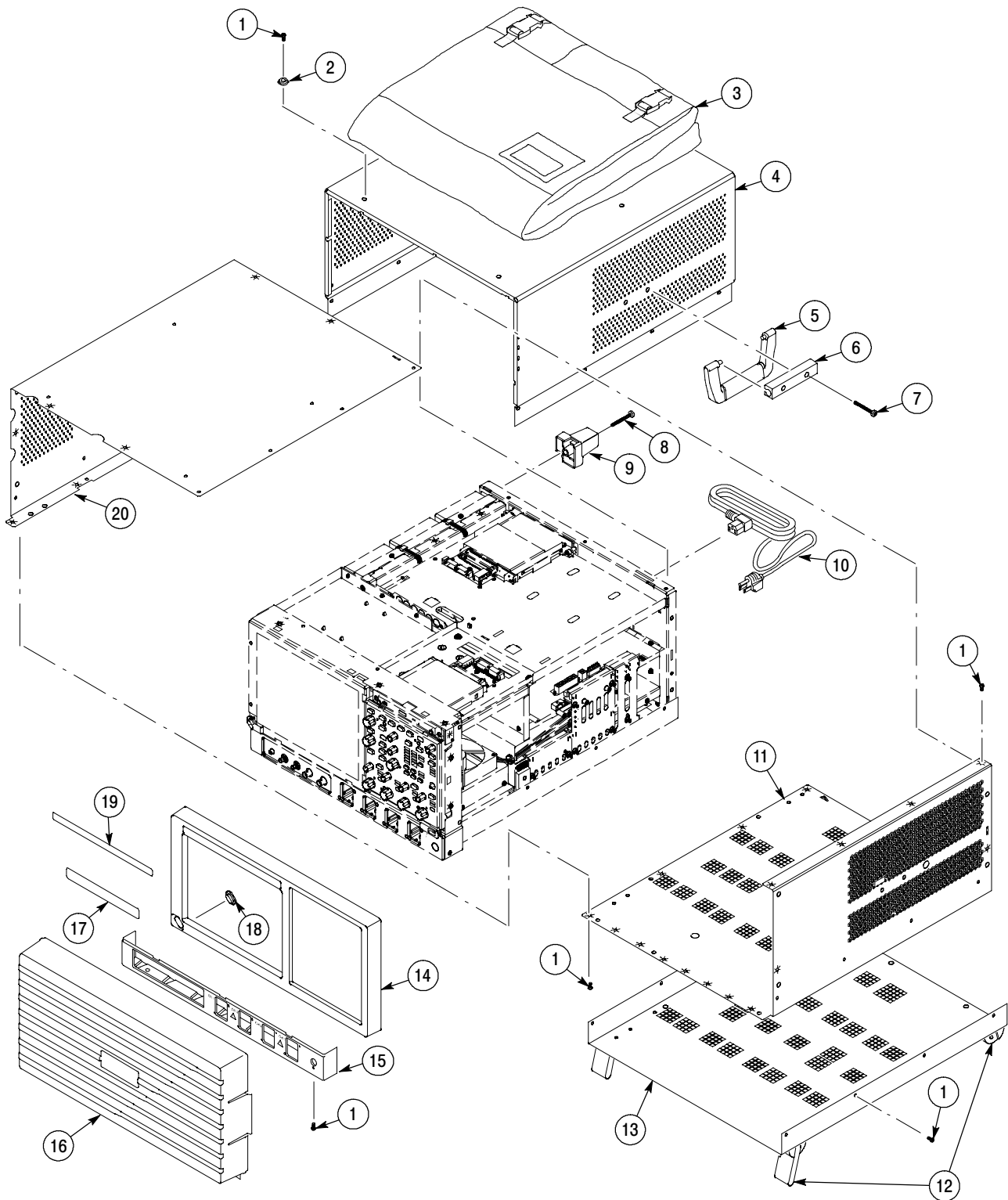


Figure 5-1: External parts

Replaceable Parts List

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discount'd	Qty	Name & description	Mfr. code	Mfr. part number
5-2					Front panel and drives		
-1	211-1050-00			15	SCREW, MACHINE; 6-32 X 0.312 L, PNH, STL CAD PLT, T15	0KB01	211105000
-2	679-5705-00			1	IDE1 ADAPTER BOARD		
-3	441-2320-00			1	CHASSIS; DRIVE FRAME,BOTTOM,GAL-XC,STEEL	80009	441-2320-00
-4	343-1682-00			1	CLAMP, HINGED FLAT CABLE (ARROWHEAD BASE), NYLON		HFCC-A-8-01
-5	174-4321-00			1	CABLE ASSY; FLAT FLEX, 26POS, 10.440L, FRONT PANEL (Connects between J1 on Front Panel and J150 on Power PC Processor)	1DM20	174-4321-00
-6	679-5660-00			1	CIRCUIT BD ASSY; USB FRONT PANEL, WIRED 389345000		
-7	614-1028-00			1	MODULAR ASSY, FRONT PANEL	80009	614-1028-00
-8	679-5795-00			1	CKT BD SUBASSY; FRONT PANEL,W/INTEGRATED ENCODERS,4 CH	80009	679-5795-00
-9	260-2760-00			1	SWITCH,KEYPAD; ELASTOMERIC,FRONT PANEL,PUSH BUTTON	80009	260-2760-00
-10	366-0821-00			7	KNOB, CAP; 0.650 D, SOFT FEEL COATING, PC/ABS BAYBLEND, FR110, TEK SILVER GRAY (TDS6000B Only)	22670	366-0821-00
	366-0837-00			7	KNOB,CAP;0.650 DIAMETER,SOFT FEEL COATING (TDS6000C Only)	80009	366-0837-00
-11	366-0819-00			1	KNOB,EPS; PUSH BUTTON ENCODER, SOFT FEEL COATING, PC/ABS BAYBLEND, FR110, TEK SILVER GRAY (TDS6000B Only)	22670	366-0819-00
	366-0835-00			1	KNOB,EPS;PUSH BUTTON ENCODER, SOFT FEEL (TDS6000C Only)	80009	366-0835-00
-12	366-0820-00			7	KNOB, CAP; 0.425 DIA,SOFT FEEL COATING, PC/ABS,BAY-BLEND, FR110,TEK SILVER GRAY (TDS6000B Only)	22670	366-0820-00
	366-0836-00			7	KNOB,CAP;0.650 DIAMETER,SOFT FEEL COATING (TDS6000C Only)	80009	366-0836-00
-13	333-4491-00			1	PANEL ASSEMBLY; FRONT SUBPANEL,W/BRACKET ASSEMBLY,BEZEL & LABEL	80009	333-4491-00
-14	650-4623-00			1	TOUCH SCREEN ASSEMBLY; TDS6000C; CSA6000C		
-15	259-0155-01			1	FLEX CIRCUIT; POWER SWITCH, W/LED (Connects to J7 on Display Adapter Board)	22670	259-0155-01
-16	650-4632-00			1	DISPLAY ASSEMBLY	80009	650-4632-00
-17	174-4791-00			1	CA ASSY; DISPLAY ADAPTER TO XGA DISPLAY, SAFETY CONTROLLED (Connects between J8 on Display Adapter Board and 20-pin connector on Display)	060D9	174-4791-00
-18	679-5497-00			1	DISPLAY ADAPTER; TDS6000C		
-19	174-4794-00			1	CA ASSY; DISPLAY ADAPTER TO INVERTOR, SAFETY CONTROLLED Connects between J5 on Display Adapter Board and CN1 on ALPS Inverter Board, also on back of Display Assembly)	060D9	174-4794-00
-20	211-0720-00			2	SCR,ASSEM WSHR; 6-32 X 0.500,PNH,STL,CDPL,T-15 TORX DR,MACHINE	80009	211-0720-00
-21	200-4829-01			1	COVER; CD	80009	200-4829-01

Replaceable Parts List (Cont.)

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
-22	119-6839-00			1	DISK DRIVE; OPTICAL, CD-RW, 5.25 SLIM, IDE, 24X, 24X, 10X, 650/700MB, 110MS; SAFETY CONTROLLED	50356	CD-W224E-A93
-23	679-5653-00			1	CDRW ADAPTER BD; 389-3445-00		
-24	407-4943-00			1	BRACKET; CD-ROM; EG STEEL	1WNW 6	407-4943-00
-25	211-0950-00			4	SCREW, MACHINE; M2X.4X3L,PHL, PNH, STL NI PL	0KB01	0310248-0

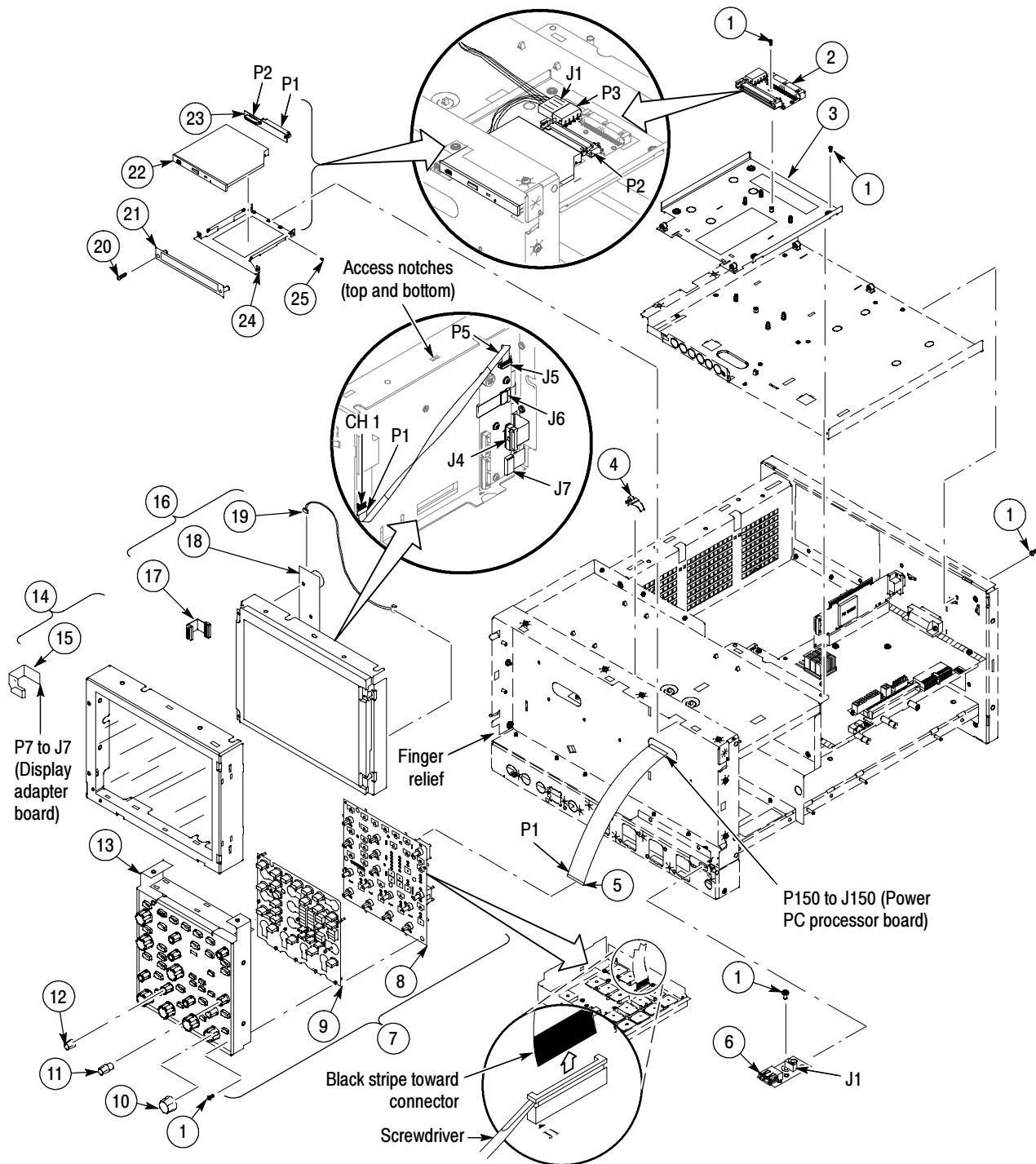


Figure 5-2: Front panel and drives

Replaceable Parts List

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discontinued	Qty	Name & description	Mfr. code	Mfr. part number
5-3					Front panel and drives (cont.)		
-1	650-4685-00			1	MODULAR KIT, REMOVABLE DISK DRIVE ASSEMBLY (TDS6804B/TDS6604B Only)	80009	650-4685-00
	650-4759-00			1	REMOVABLE DISK DRIVE ASSEMBLY (TDS6000C Only)	80009	650-4759-00
-2	200-4829-00			1	COVER; CD	80009	200-4829-00
-3	211-1081-00			2	SCREW, MACHINE; M3 X 0.5 X 3.5MM, FLAT WAFER HD W/SERRATIONS STRESS RELIEVED, PHL, 0.0002 STL ZI PLT	80009	211-1081-00
-4	407-4945-00			1	BRKT SUPPORT, REMOVABLE HD: TOP, GAL-XC; STEEL	1WNW 6	407-4945-00
-5	119-6832-00			1	HARD DISK DRIVE, 40 GB, 2.5 IN, IDE0ATAPI-6, 4200 RPM, SAFETY CONTROLLED	80009	119-6832-00
-6	679-5654-00			1	HDD ADAPTER		
-7	211-1050-00			6	SCREW, MACHINE; 6-32 X 0.312 L, PNH, STL CAD PLT, T15	0KB01	211-1050-00
-8	407-4943-00			1	BRACKET; CD-ROM; EG STEEL	1WNW 6	407-4943-00
-9	407-4944-00			1	BRACKET; REMOVABLE HD BOTTOM; GAL-XC; STEEL	1WNW 6	407-4944-00
-10	211-1081-00			4	SCREW, MACHINE; M3 X 0.5 X 3.5MM, F6LAT WAFER HD W/SERRATIONS, PHL, 0.0002 STL ZI PLT	0KB01	211-1081-00
-11	679-5722-00			1	DIAG PA BUS CONNECTOR	80009	679-5722-00
-12	679-5723-00			1	DIAGNOSTIC REAR POWER DISTRIBUTION, MINUS P11 AND P101; TESTED, 389-3045-00 WIRED; TDS7000 SERIES	80009	679-5723-00
-13	679-5724-00			1	CKT BD SUBASSY; 678-1092-00, GPIB INTERFACE	80009	679-5724-00
-14	361-1762-00			8	SPACER, SUPPORT; 0.250 X 0.171 X 0.375, CIRCUIT BOARD, NYLON CPST-4-01	06915	CPST-4-01
-15	679-5695-00			1	CIRCUIT BD ASSY; AUX POWER, WIRED 389347900		
-16	174-4871-00			2	CABLE ASSY; EXTENSION, SAFETY CONTROLLED	80009	174-4871-00
-17	358-0161-05			1	BSHG, STRAIN RLF; U/W 0.29 DIA CABLE, STRAIGHT	80009	1147 SR-5P-4
-18	437-0510-00			1	TRAY, FAN; FOUR 119-5935-00 FANS; SAFETY CONTROLLED	80009	437-0510-00
-19	174-4267-00			2	CA ASSY; DISCRETE, IDC, FAN TRAY EXTENDER (Connects between fans and J390 & J291 on Power PC Processor)	060D9	174-4267-00
-20	343-1681-00			1	CABLE, CLAMP; FLAT; NYLON	80009	343-1681-00
-21	437-0846-01			1	FAN ASSEMBLY; 6 FANS (119-5935-00), ASSEMBLED TO FAN TRAY (436-0373-01) W/NYLON RIVETS (210-0164-00), 12.00 X 7.65 X 1.75, SAFETY CONTROLLED	80009	437-0846-01

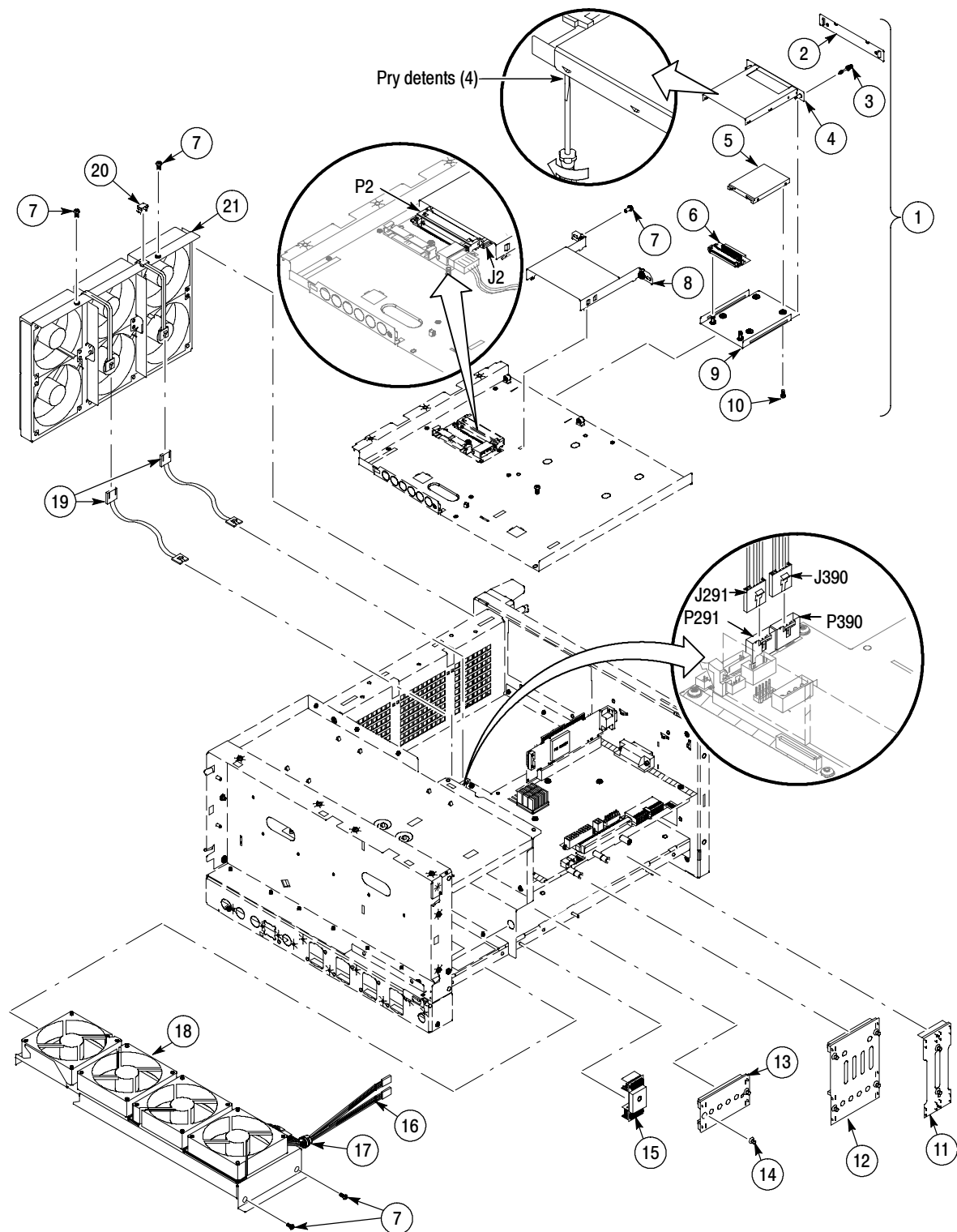


Figure 5-3: Front panel and drives (cont.)

Replaceable Parts List

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discount'd	Qty	Name & description	Mfr. code	Mfr. part number
5-4					Power supply		
-1	211-1050-00			8	SCREW, MACHINE; 6-32 X 0.312 L, PNH, STL CAD PLT, T155	0KB01	211-1050-00
-2	679-5705-00			1	IDE ADAPTER BOARD, HARD DISK DRIVE		
-3	441-2368-00			1	CHASSIS ASSY; ATX, SAFETY CONTROLLED	1WNW6	441236800
-4	214-3903-00			2	SCREW, JACK; 4-40 X 0.312 LONG, 0.188 H HEX HEAD STAND OFF, 4-40 INT THD, X 0.312 THD EXT 4-40	55566	4750-3-12 (+LOCK-WASHER)
-5	213-1061-00			2	SCREW; JACK; 6-32 X 0.320 EXT THD, M3.5 X 0.6-6 INT THD X 0.215L, GPIB, BLACK OXIDE	00779	554043-3
-6	671-5814-00			1	CIRCUIT BD ASSY; PROCESSOR, TESTED, 389339000 WIRED (REQUIRES PROGRAMMING AT A TEKTRONIX SERVICE CENTER)	80009	671-5814-00
-7	131-1315-01			3	CONN, RF JACK; BNC, PNL, 50 OHM, FEMALE, STR, 0.375-32 THD	TK6592	28JR306-1
-8	650-4604-02			1	MODULAR ASSY; POWER SUPPLY	80009	650-4604-02
-9	210-0465-00			1	NUT, PLAIN, HEX; 0.25-32 X 0.375, BRS CD PL	0KB01	210-0465-00
-10	210-0046-00			1	WASHER, LOCK; 0.261 ID, INTL, 0.018 THK	78189	1214-05-00-0541C
-11	136-0140-00			1	JACK, TIP; BANANA, CHARCOAL GRAY	TK6065	136-0140-00
-12	343-1682-00			1	CLAMP, HINGED FLAT CABLE (ARROWHEAD BASE), NYLON		HFCC-A-8-01
-13	174-4792-00			1	CA ASSY; DISPLAY ADAPTER TO PPC, SAFETY CONTROLLED (Connects between J290 on Power PC Processor and J2 on Display Adapter)	060D9	174-4792-00
-14	174-4793-00			1	CA ASSY; DISPLAY ADAPTER TO BRIDGE, SAFETY CONTROLLED (Connects between J205 on Bridge Board and J3 on Display Adapter)	060D9	174-4793-00
-15	174-4806-00			1	CA ASSY; ATX DRIVE POWER, 24.0 L, 4 CONDUCTORS, SAFETY CONTROLLED (Connects between J180 on Power PC Processor, P3 on IDE Adapter - Hard Disk Drive and P3 on IDE Adapter - CD-ROM. NOTE: All 3 plugs are the same. One is labeled MB, one is labeled P1 and one is labeled P3.	80009	174-4806-00

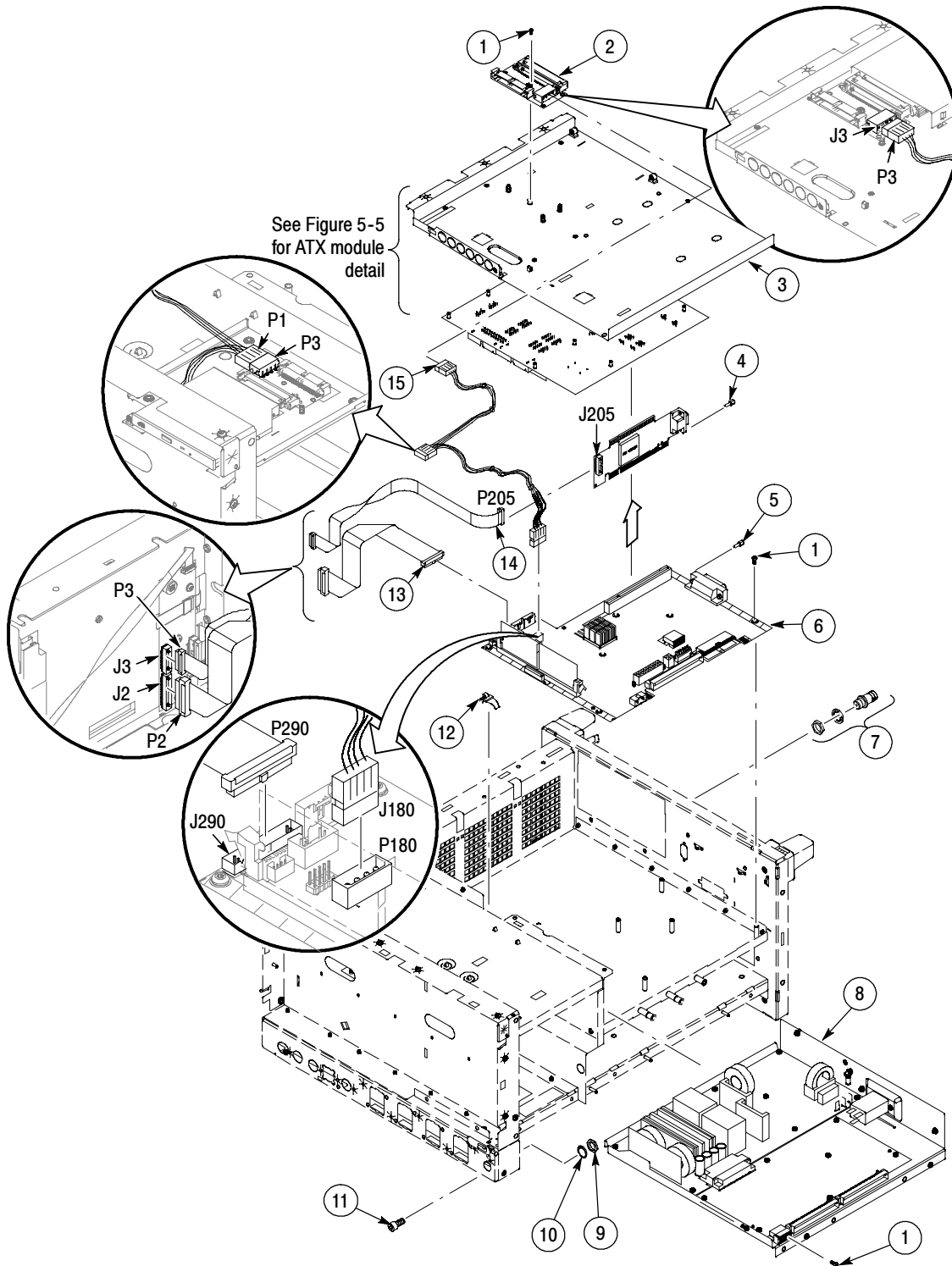


Figure 5-4: Power supply

Replaceable Parts List

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
5-5					ATX module detail		
-1	119-7150-00			1	PROCESSOR; PENTIUM 4,2.8 GHZ INTERNAL CLOCK;2A; 0.13 MICRON,512KB L2 CACHE,400MHZ BUS;RK80532PE072512,FCBGA 478		RK80532PE072512
-2	156-9442-00			2	IC, MEMORY; CMOS, DDR SDRAM; 64MEG X 664, 512MEG, 266MHZ, CL=2.5, PC2100; DIMM184	6Y440	MT16VDDT6464AG-265C4
-3	174-4797-00			1	CA ASSY; 20 PIN ATX POWER, SAFETY CONTROLLED (Connects between J3J1 on ATX Board and J410 on Power PC Processor)	060D9	174-4797-00
-4	174-4975-00			1	CABLE, UDMA, ROUND, RIBBON,18 INCHES LONG, SAFETY CONTROLLED (Secondary IDE cable, connects between J6J1 on ATX Board and P1 on CD-ROM drive)	060D9	174-4975-00
-5	174-4906-00			1	CA ASSY, UDMA; FLAT ROUND, 7 IN, PRIMARY IDE SAFETY CONTROLLED (Primary IDE cable, connects between J6J2 on ATX board and P1 on Hard Disk Drive)	060D9	174-4906-00
-6	174-4808-00			1	CA ASSY; USB 2.0,DUAL HEAD,16.0 L (Connects between J9H1 on ATX board, J182 on Power PC Processor and J1 on Front iPanel USB connector)	80009	174-4808-00
-7	174-4807-00			1	CA ASSY; ATX USB, PLUS MISC. TO DISPLAY, SAFETY CONTROLLED (Connects between J9J1 on ATX board and J183 on Power PC Processor)	060D9	174-4807-00
-8	146-0096-00			1	BATTERY,DRY:3.0V,LITHIUM MANGANESE DIOXIDE, 210MAH,20 X 3.2MM COINCELL,CR2032	61058	CR2032
-9	343-1683-00			1	CLAMP, VERTICAL WIRE SADDLE, NYLON 6/6, VWS4274	06383	VWS4274-C
-10	211-1050-00			12	SCREW, MACHINE; 6-32 X 0.312 L, PNH, STL CAD PLT, T15	0KB01	211105000
-11	131-6417-00			4	CONTACT,ELEC; GROUNDING,0.600 L X 0.250 W X 0.220 D,ELECTROLESS NICKEL PLATE	99144205	131-6417-00
-12	174-4798-00			1	CA ASSY; 4 PIN P4 POWER (Connects between J5B1 on ATX board and J510 on Power PC Processor)	060D9	174-4798-00
-13	650-4691-01			1	ATX MOTHERBOARD W/XP PREP INSTALL; TDS6804B;TDS6604B		

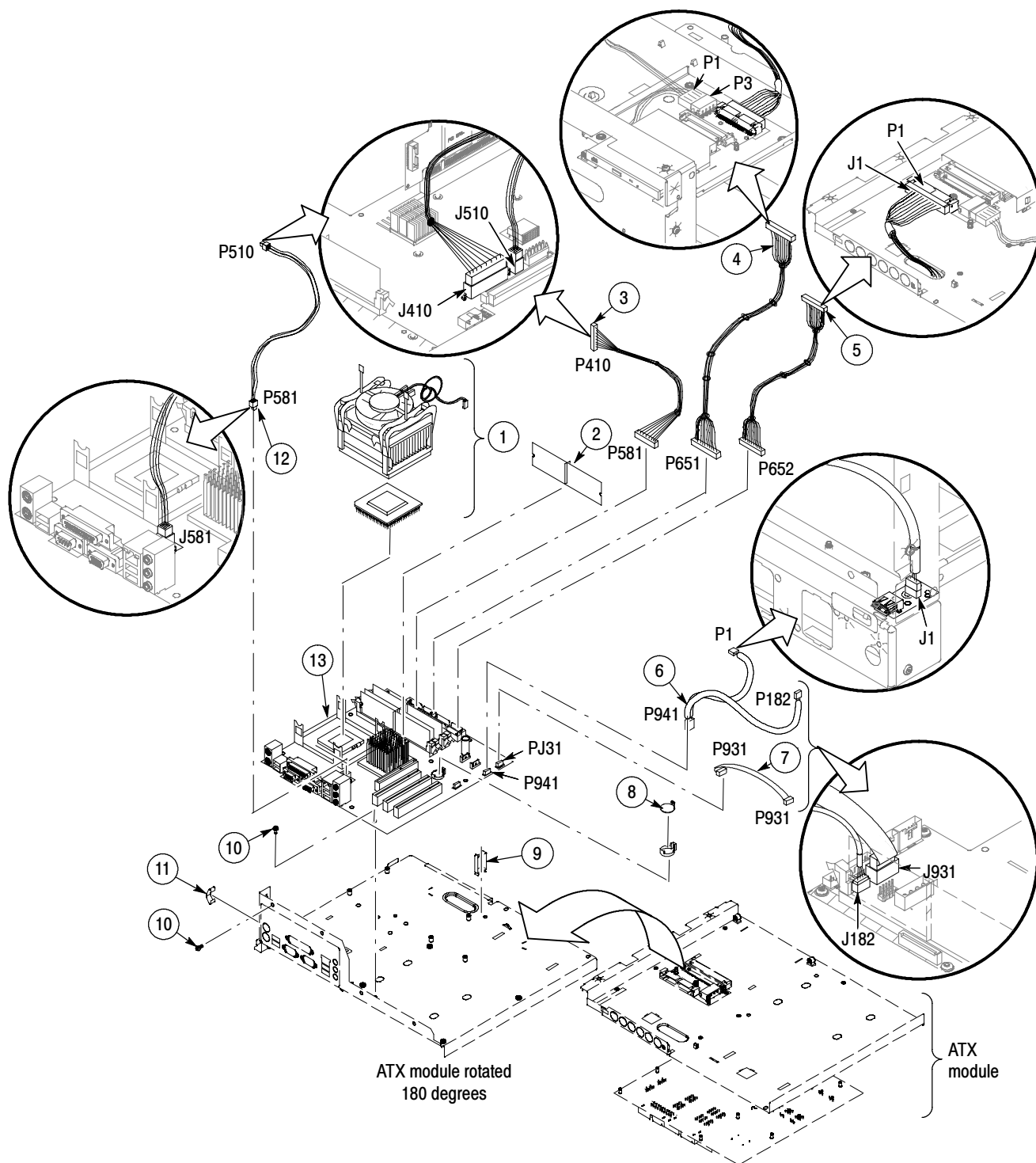


Figure 5- 5: ATX module detail

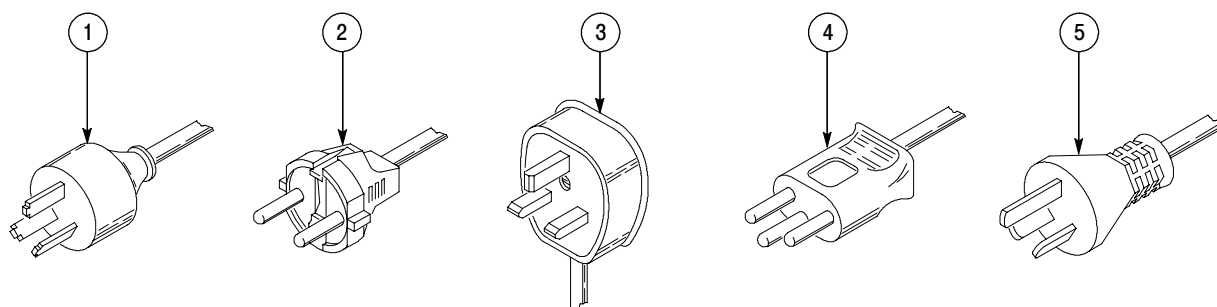


Figure 5-6: Accessories

Replaceable Parts List

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
STANDARD ACCESSORIES							
5-6					Accessories		
-1	161-0104-05			1	CA ASSY,PWR:3,1.0MM SQ,250V/10A,2.5 M (OPTION A3 - AUSTRALIAN)	S3109	198-010
-2	161-0104-06			1	CA ASSY,PWR:3,1.0MM SQ,250V/10A,2.5 M (OPTION A1 - EUROPEAN)	S3109	198-010
-3	161-0104-07			1	CA ASSY,PWR:3,1.0MM SQ,240V/10A,2.5 M (OPTION A2 - UNITED KINGDOM)	S3109	209010
-4	161-0167-00			1	CA ASSY,PWR:3,0.75MM SQ,250V/10A,2.5 M (OPTION A5 - SWITZERLAND)	S3109	ORDER BY DESC
-5	161-0306-00			1	CA ASSY,PWR:3,1.0MM SQ,250V/10A,2.5 M (OPTION AC - CHINA)	TK6253	92-2637-250BKH
	-----			1	CABLE ASSY,PWER:,3,18 AWG,92 L (STANDARD CABLE - SEE FIG 5-1-10)		
	-----			1	POUCH, PLASTIC (SEE FIG 5-1-3)	TK2582	TK1441 BLACK CORDURA
	020-2569-xx			1	SOFTWARE KIT, O/S EASY RESTORE,WINXP RESTORE CD	80009	020-2569-01
	067-1586-00			1	DESKEW FIXTURE; WITH INSTRUCTIONS	80009	067-0484-00
	020-2513-xx			1	ACCESSORY KIT; BASIC CONCEPTS MANUAL & SOFTWARE DEVELOPEMENT KIT; OPEN CHOICE SOLUTIONS	80009	020-2513-00
	071-1658-xx			1	MANUAL,TECH; USER;TDS6000B,TDS6000C	TK2548	071-1658-xx
	071-1643-xx			1	MANUAL,TECH; QUICK START USER;TDS6000B,TDS6000C	TK2548	071-1643-xx
	119-7083-00			1	KEYBOARD; USB W/ 2-PORT HUB; MINI (69 KEYS)	01963	G81-3505-LAAUS
	119-7054-00			1	MOUSE,MICROSOFT OPTICAL WHEELED,USB AND PS2	80009	119-7054-00
	-----			4	TEKCONNECT-TO SMA ADPATERS	80009	TCA-SMA

Replaceable Parts List (Cont.)

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
OPTIONAL ACCESSORIES							
	071-1798-xx				MANUAL,TECH:SERVICE	TK2548	071-7021-xx
	016-1951-00				KIT:RACKMOUNT (OPTION 1R)	80009	016-1951-00
	119-6297-00				KEYBOARD; USB;G81-3505-LAAUS, FULL SIZE	80009	119-6297-00