Instruction Manual

Tektronix

TDS Family
Option 13 RS-232/Centronics Hardcopy Interface

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Instrument Serial Numbers

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

B010000	Tektronix, Inc., Beaverton, Oregon, USA
E200000	Tektronix United Kingdom, Ltd., London
J300000	Sony/Tektronix, Japan
H700000	Tektronix Holland, NV, Heerenveen, The Netherlands

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

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

Printed in U.S.A.

WARRANTY

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

In order to obtain service under this warranty, Customer must notify Tektronix of the defect before the expiration of the warranty period and make suitable arrangements for the performance of 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; or c) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

THIS WARRANTY IS GIVEN BY TEKTRONIX WITH RESPECT TO THIS PRODUCT IN LIEU OF ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED. TEKTRONIX AND ITS VENDORS DISCLAIM ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. TEKTRONIX' RESPONSIBILITY TO REPAIR OR REPLACE DEFECTIVE PRODUCTS IS THE SOLE AND EXCLUSIVE REMEDY PROVIDED TO THE CUSTOMER FOR BREACH OF THIS WARRANTY. TEKTRONIX AND ITS VENDORS WILL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES IRRESPECTIVE OF WHETHER TEKTRONIX OR THE VENDOR HAS ADVANCE NOTICE OF THE POSSIBILITY OF SUCH DAMAGES.

Welcome

This instruction manual provides operating and service information for the TDS Family Option 13, RS-232/Centronics Hardcopy Interface. The information contained here applies to the TDS 400, TDS 500, TDS 600, and TDS 800 series digitizing oscilloscopes. This manual includes the following sections:

- *Related Manuals* (follows this introduction).
- *Operating Information* provides a product description and operating procedures for using the RS-232/Centronics Hardcopy Interface capabilities.
- *Service* contains module-level service information including a troubleshooting tree, removal and replacement instructions, and a replaceable parts list.

Related Manuals

Other documentation for the TDS Family of digitizing oscilloscopes includes the following:

- The User and Reference manuals give more detailed operating information for the oscilloscope.
- The Service manual provides extended module-level service information.

Contents

Operating Information

Service Information

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Safety

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

Symbols and Terms

These two terms appear in manuals:

- CAUTION statements identify conditions or practices that could result in damage to the equipment or other property.
- WARNING statements identify conditions or practices that could result in personal injury or loss of life.

These two terms appear on equipment:

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

This symbol appears in manuals:

Static-Sensitive Devices

These symbols appear on equipment:

DANGER
High Voltage

Protective
ground (earth)
terminal

ATTENTION
Refer to
manual

Specific Precautions

Observe all of these precautions to ensure your personal safety and to prevent damage to either the digitizing oscilloscope or other connected equipment.

Power Source

The digitizing oscilloscope operates from a power source that will not apply more than 250 V_{RMS} between the supply conductors or between either supply conductor and ground. A protective ground connection, through the grounding conductor in the power cord, is essential for safe system operation.

Grounding the Digitizing Oscilloscope

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

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

Use the Proper Power Cord

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

Use the Proper Fuse

To avoid fire hazard, use only the fuse specified in the parts list for your product, matched by type, voltage rating, and current rating.

Do Not Remove Covers or Panels

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

Electric Overload

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

Do Not Operate in Explosive Atmospheres

This equipment provides no explosion protection from static discharges or arcing components. Do not operate the digitizing oscilloscope in an atmosphere of explosive gases.

Do Not Service Alone

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

Use Care When Servicing With Power On

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

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

Operating Information

This section provides operating information for the TDS Family Option 13, RS-232/Centronics Hardcopy Interface. The following subsections are included:

- *Product Description* gives a general description of the RS-232/Centronics Hardcopy Interface and the basic hardware and firmware requirements.
- *Before You Begin* tells how to run the internal diagnostic routine.
- *Hardcopy Setup* tells how to set RS-232 and Centronics hardcopy parameters from the oscilloscope.
- *Communication, Hardware, and Software Setup* contains procedures for setting RS-232 communication, hardware, and software configurations from the oscilloscope. There are no optional settings for Centronics.
- *Connections* contains basic steps for connecting the oscilloscope to the printer or plotter.
- *Printing the Hardcopy* tells how to send the on-screen information to the printer or plotter.

Product Description

The TDS Family Option 13 adds Centronics and RS-232 hardcopy (talk only) capability to the TDS Family of digitizing oscilloscopes. The option consists of a single circuit board, its attached connectors, and rear panel labels.

The RS-232/Centronics Hardcopy Interface allows you to make hard copies of waveforms (and other on-screen information) to a variety of graphic printers and plotters from the scope front panel.

To make this option work, you must have both the RS-232/Centronics Hardcopy Interface hardware and Version 2.0 firmware (or future versions) installed on the oscilloscope.

Before You Begin

To ensure the hardcopy feature is working properly, execute the internal diagnostic routine by doing the following steps:

1. Power on the digitizing oscilloscope.

   The oscilloscope automatically executes a short internal diagnostic routine that checks oscilloscope functions. When finished, the oscilloscope displays an on-screen report of any failed modules or features.

2. If the hardcopy feature fails, refer to the *Troubleshooting* procedures starting on page 2-3.
3. If no failures are reported, go to *Hardcopy Setup*.

Hardcopy Setup

Hardcopy parameters must be set up before you can make a hardcopy through either the RS-232 or Centronics interface.

Setting Hardcopy Parameters

The **Format** menu lets you select the way the oscilloscope formats the hardcopy data.

1. Press **SHIFT HARDCOPY MENU** → **Format**(main).
2. Select **Thinkjet**, **Deskjet**, **Laserjet**, **Epson**, **Interleaf**, **TIFF**, **PCX**, **BMP**, **EPS Image**, **EPS Mono**, and **EPS Color** or **HPGL** (side). Press **−more−** (side) to see all choices. (See Figure 1-1.)

   EPS Mono and Color (EPS stands for Encapsulated Postscript) formats are compatible with the Tektronix Phaser Color Printer, HPGL is compatible with the Tektronix HC100 Plotter (or equivalent), and Epson is compatible with the Tektronix HC200 Printer (or equivalent dot matrix printer).

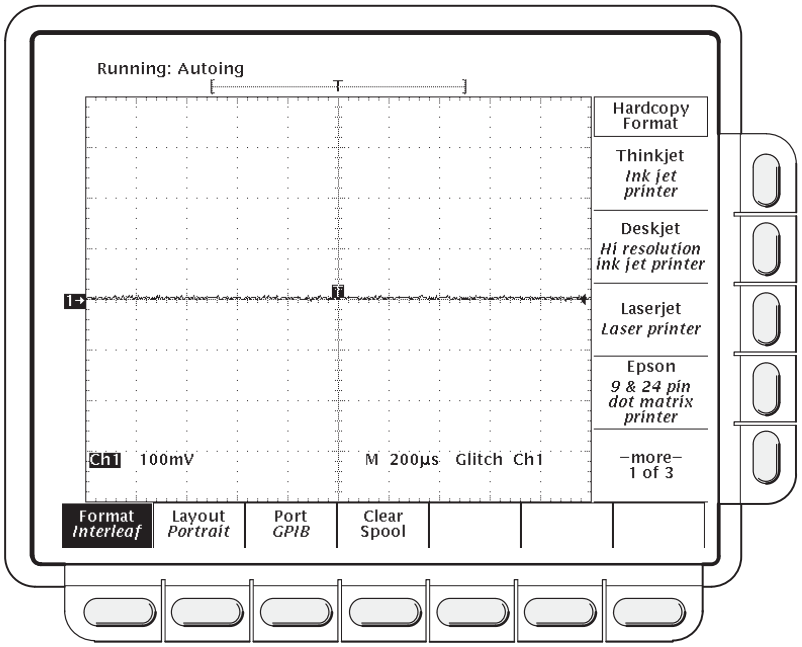
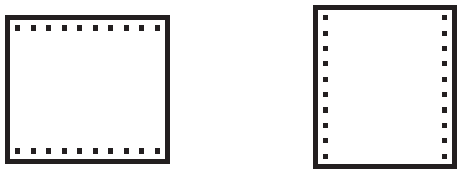


Figure 1-1: Hardcopy Format

The **Layout** menu lets you specify landscape or portrait format for the hardcopy.

Press **SHIFT HARDCOPY MENU** → **Layout** (main) → **Landscape** or **Portrait** (side) (see Figure 1-2).



Landscape Format *Portrait Format*

Figure 1-2: Hardcopy Layout Formats

The **Port** menu lets you choose the hardcopy output channel.

Press **SHIFT HARDCOPY MENU** → **Port** (main) → **RS-232** or **Centronics** (side).

If you select RS-232 as the hardcopy port, you must also set the communication, hardware, and software parameters starting on page 1-5. If you select Centronics as the hardcopy port, no further setup is required. Proceed to *Connections* on page 1-7.

Communication, Hardware, and Software Setup

The following communication, hardware, and software settings are only for the RS-232 interface. No optional settings are offered for the Centronics interface.

RS-232 Communication Setup

Press **SHIFT UTILITY** → **System** (main) → **I/O** (pop-up) → **Configure** (main) → **Hardcopy** (side) (see Figure 1-3).

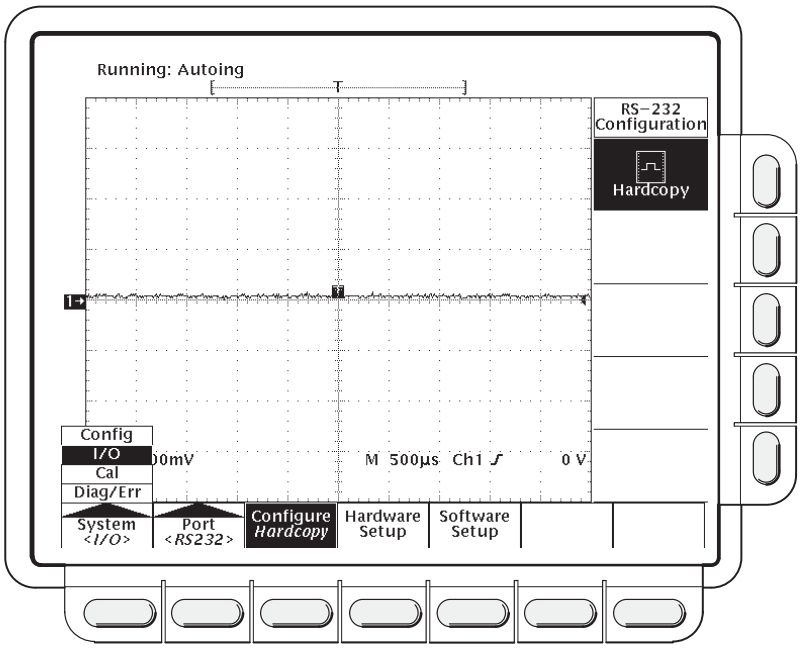


Figure 1-3: RS-232 Communication Setup

RS-232 Hardware Setup

The oscilloscope hardware settings must match the rear-panel parameter switch settings on the printer or plotter (see *Connections* on page 1-7).

1. Press **SHIFT UTILITY** → **Port** (main) → **RS-232** (pop-up) → **Hardware Setup** (main) (see Figure 1-4).
2. Press **Baud Rate** (side) → and toggle to select **300**, **600**, **1200**, **2400**, **4800**, **9600**, or **19200**. You can also use the general purpose knob (or the keypad, if available) to enter a selection.
3. Press **Stop Bits** (side) → and toggle to select **1** or **2**. You can also use the general purpose knob or the keypad to enter a selection.
4. Press **Parity** (side) and toggle to select **Even**, **Odd** or **None**.
5. Press **Hard Flagging** (side) and toggle to select **ON** or **OFF**.

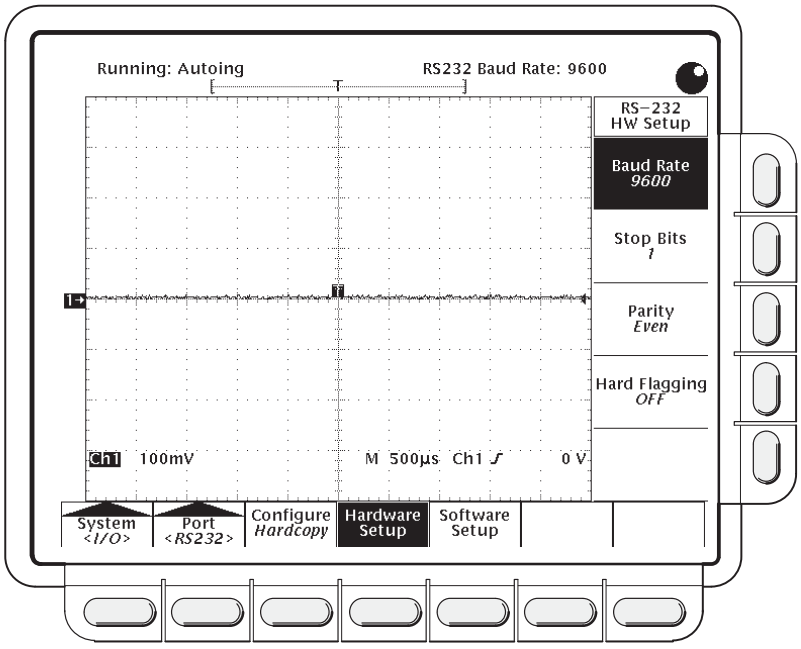


Figure 1-4: RS-232 Hardware Setup

RS-232 Software Setup

Press **Software Setup** (main) → **Soft Flagging** (side) and toggle to select **ON** or **OFF** (see Figure 1-5).

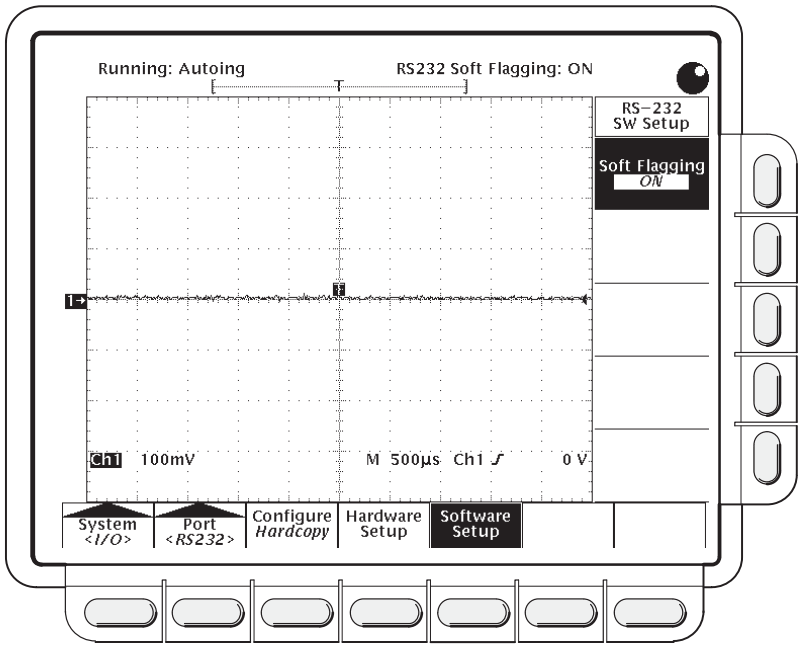


Figure 1-5: RS-232 Software Setup

Connections

To connect the oscilloscope directly to an RS-232 or Centronics-based printer or plotter (see Figure 1-6) do the following steps.

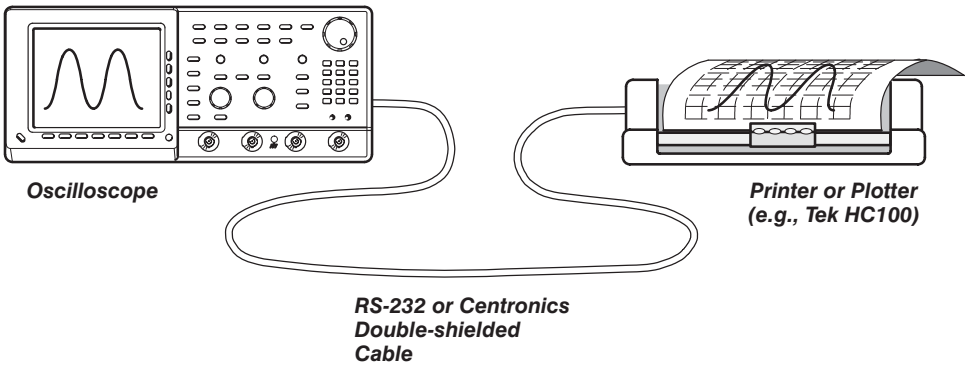


Figure 1-6: Connecting the Oscilloscope to the Printer or Plotter

1. Leave power on to the oscilloscope.
2. Power off the printer or plotter.
3. Set the parameter switches on the rear panel of the RS-232 or Centronics printer or plotter to match the oscilloscope hardware settings. Consult the printer or plotter instruction manual for help with setting the switches.
4. Power on the printer or plotter.
5. Connect a double-shielded RS-232 or Centronics-compatible cable to the corresponding ports on the printer or plotter and the oscilloscope. Below is a list of recommended cables for use with RS-232 and Centronics-based printers.

Printer	Tektronix Part Number	Printer Cable Description
RS-232	012-1298-00	Oscilloscope to 25-pin male RS-232 printer
Centronics	012-1250-00	Oscilloscope to Centronics printer

Printing the Hardcopy

Press **HARDCOPY**.

Refer to your oscilloscope user manual for more information on how to use the hardcopy command.

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 Information

This section contains information you need to troubleshoot and service the RS-232/Centronics Hardcopy Interface. It includes the following subsections:

- *Troubleshooting* contains information for determining whether the RS-232/Centronics Hardcopy Interface has failed. A troubleshooting tree and procedures for executing the oscilloscope short and extended internal diagnostic routines are included.
- *Removal and Replacement Procedures* gives step-by-step procedures for removal and replacement of the RS-232/Centronics Hardcopy Interface circuit board.
- *Replaceable Parts List* includes replacement part numbers with a corresponding exploded view and ordering information.

Before Servicing

To prevent injury to yourself or damage to the oscilloscope, do the following before you attempt service:

- Be sure you are a qualified service person.
- Read the section entitled *Safety* found at the beginning of this manual.
- Read the following *Strategy for Servicing* and *Preventing Electrostatic Discharge (ESD) Precautions* on page 2-2.

Strategy for Servicing

The *Troubleshooting* subsection starting on page 2-3, contains procedures to determine whether the RS-232/Centronics Hardcopy Interface feature has failed. If the hardcopy feature fails, replace the circuit board with a replacement part obtained from the factory. See the *Replaceable Parts List* starting on page 2-11, for replacement part numbers and ordering information.

Preventing Electrostatic Discharge (ESD)

CAUTION

Electrostatic discharge can damage any semiconductor component on this oscilloscope option circuit board.

Precautions

When performing any service that requires internal access to the oscilloscope, follow the following precautions to avoid damaging internal modules and their components due to ESD.

1. Minimize handling of static-sensitive modules.
2. Transport and store static-sensitive modules in their static protected containers or on a metal rail. Label any package that contains static-sensitive modules.
3. Discharge the static voltage from your body by wearing a grounded antistatic wrist strap while handling these modules. Perform service on static-sensitive modules only at a static-free work station.
4. Remove anything capable of generating or holding a static charge on the work station surface.
5. When possible, handle circuit boards by the edges.
6. Do not slide the modules over any surface.
7. Avoid handling modules in areas that have a floor or work-surface covering capable of generating a static charge.

Troubleshooting

This subsection contains information and diagnostic procedures to determine if the RS-232/Centronics Hardcopy Interface is faulty. The diagnostic routine checks oscilloscope functions but does not check printer function.

Troubleshooting

Use the troubleshooting tree in Figure 2-1 to determine if the RS-232/Centronics Hardcopy Interface is working properly.

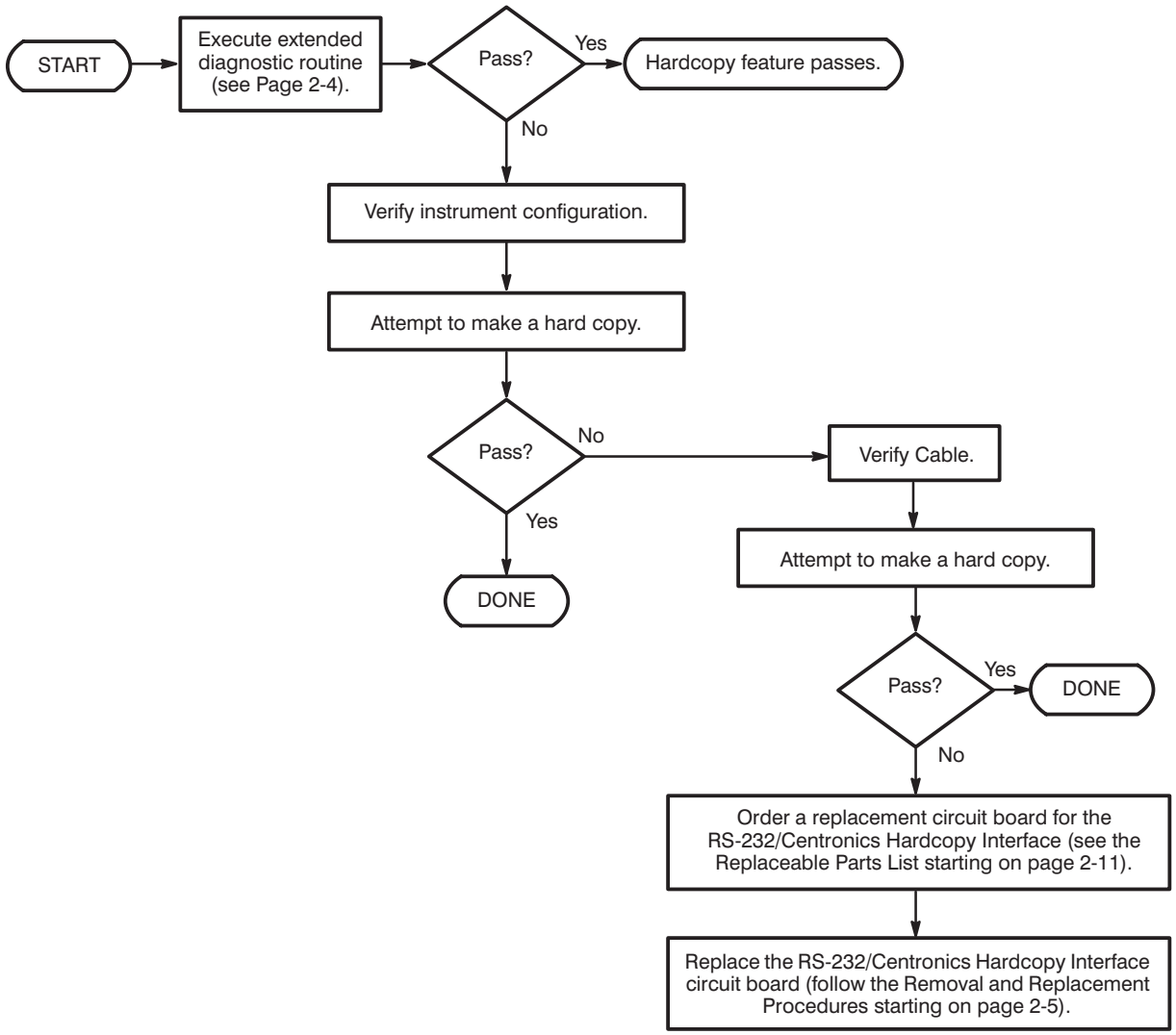


Figure 2-1: Troubleshooting Tree

Diagnostics

The oscilloscope has two levels of internal diagnostics: short confidence and extended. The oscilloscope automatically executes the short set at power on. If the hardcopy feature fails the short diagnostic routine, use the following procedure to execute the extended diagnostics:

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

Executing Extended Diagnostics Routine

1. Press **SHIFT UTILITY** → **System** (main) → **Diag**/**Err** (pop-up) → **Execute** (main) → **OK Confirm Run Test** (side).

   The internal diagnostics routine checks oscilloscope functions, but does not check printer function. When finished, the oscilloscope displays an on-screen report of any failed modules, features, or interfaces.

2. If the hardcopy feature fails, order a replacement RS-232/Centronics circuit board (see the *Replaceable Parts List* starting on page 2-11) then follow the *Removal and Replacement Procedures* starting on page 2-5.

Removal and Replacement Procedures

Use the procedures in this subsection to remove and replace a faulty RS-232/Centronics Hardcopy Interface circuit board.

Before You Begin

WARNING

To prevent possible injury to service personnel or damage to the product components, read the safety precautions found at the beginning of this manual, and read Before Servicing, Strategy for Servicing, and Preventing ESD found at the beginning of this section.

WARNING

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

Rear Cover and Cabinet Removal

TDS 500, 600, and 800 Oscilloscopes

Equipment Required: One screwdriver with a size T-20 Torx® tip.

1. Install the front cover. Set the oscilloscope face down with the front cover on the work surface and the bottom facing up (see Figure 2-2).
2. Unplug the power cord from its receptacle at the rear panel.
3. Using the screwdriver with size T-20 Torx® tip, remove the four screws (number 2 in Figure 2-2) securing the rear cover (number 1) to the oscilloscope. Lift off the rear cover.
4. Grasp the left and right edges of the cabinet (number 3) at the rear. Pull upward to slide the cabinet off the oscilloscope. Do not bind or snag the cabinet on the oscilloscope internal cabling as you remove it.

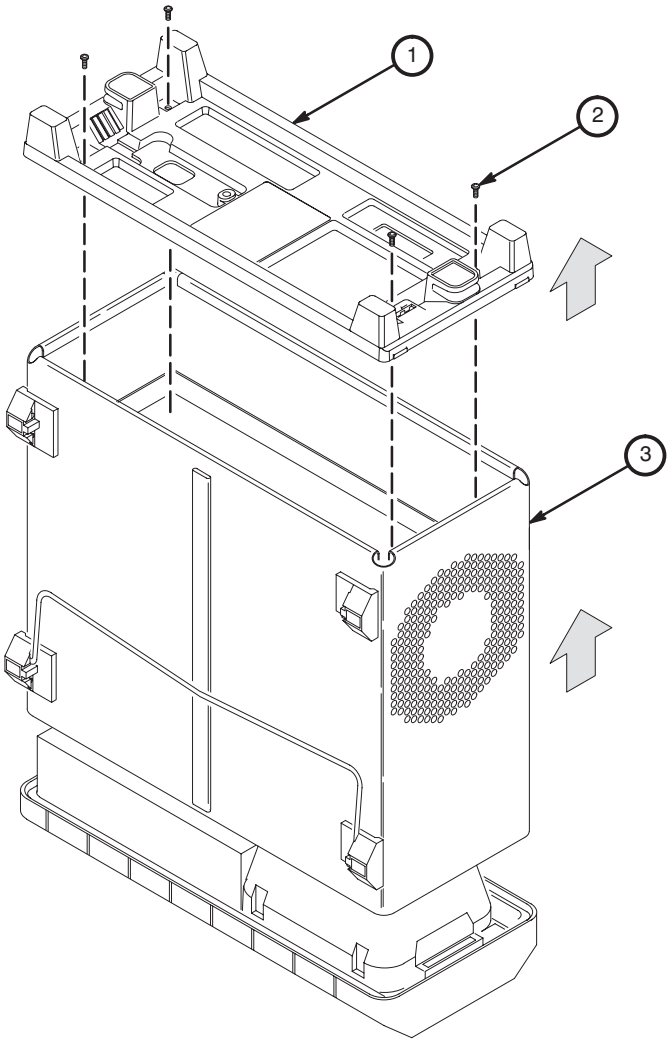


Figure 2-2: Rear Cover and Cabinet Removal (TDS 500, 600, and 800)

TDS 400 Oscilloscopes

Equipment Required: One screwdriver with a size T-15 Torx® tip.

1. Install the front cover. Set the oscilloscope face down with the front cover on the work surface and the bottom facing up (see Figure 2-3).
2. Unplug the power cord from its receptacle at the rear panel.
3. Using the screwdriver with size T-15 Torx® tip, remove the single T-15 Torx® screw at the left side of the oscilloscope (number 4).
4. Remove the four screws (number 2 in Figure 2-3) securing the rear cover (number 1) to the oscilloscope. Lift off the rear cover.
5. Lift the cabinet (number 3) upwards to slide it off the oscilloscope. Take care not to bind or snag the cabinet on the oscilloscope's internal cabling as you remove it.

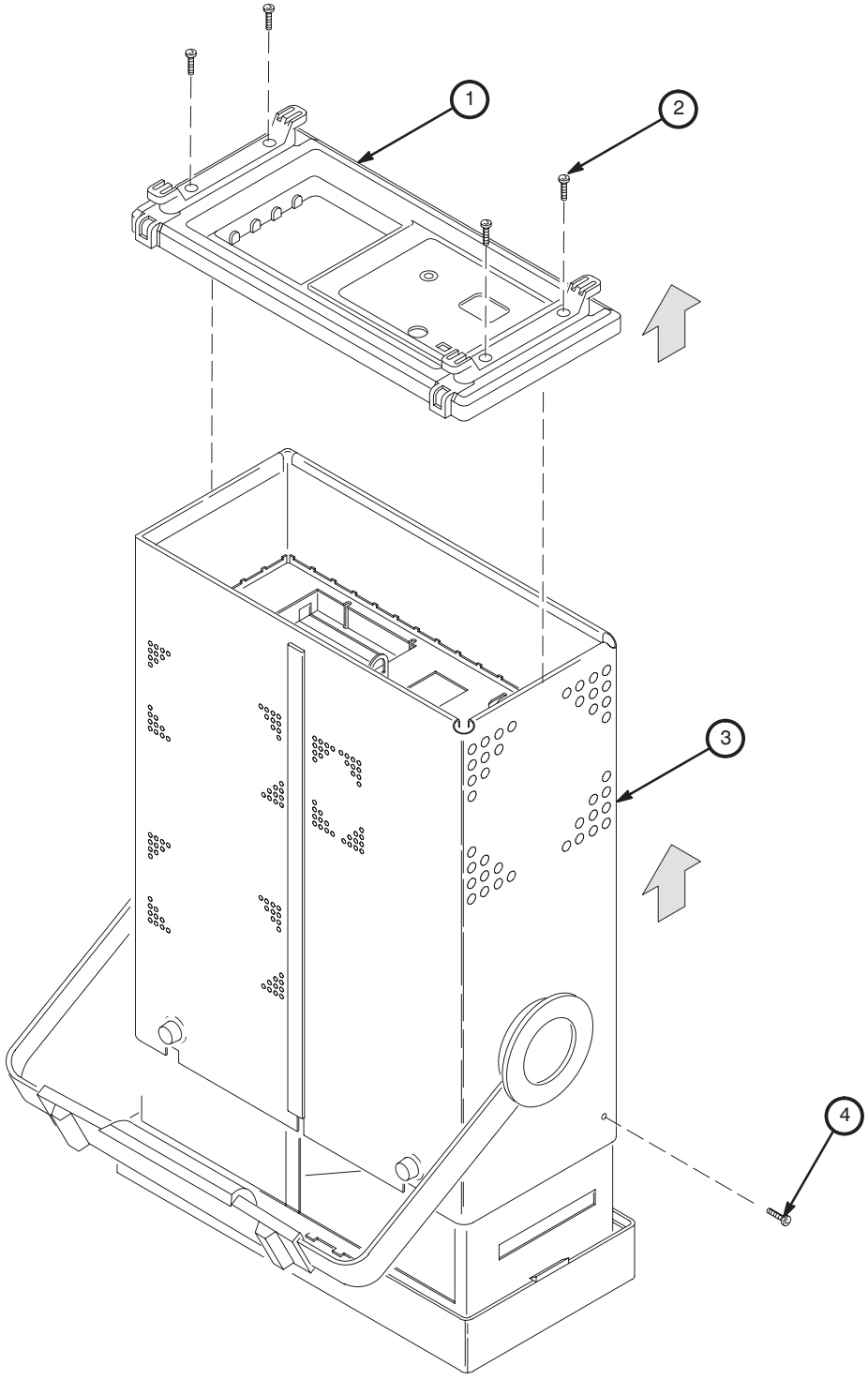


Figure 2-3: Rear Cover and Cabinet Removal (TDS 400)

Circuit Board Assembly Removal

TDS 500, 600, and 800 Oscilloscopes

Equipment Required: One screwdriver with a size T-20 Torx® tip.

1. Using the screwdriver with size T-20 Torx® tip, remove the two screws (number 4 in Figure 2-4) securing the rear plate of the circuit board assembly.
2. Disconnect the cable connector (number 2) from the connector on the processor-display circuit board (number 1).
3. Pull out the RS-232/Centronics Hardcopy Interface circuit board assembly (number 3).

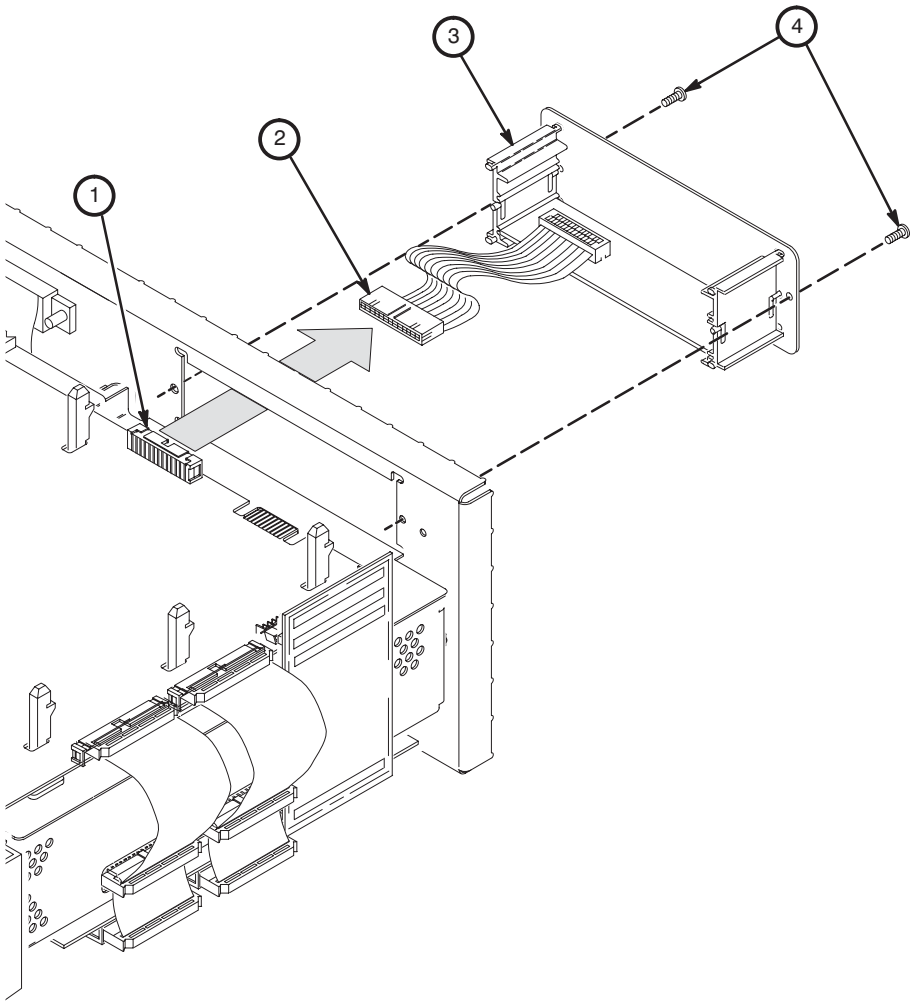


Figure 2-4: Circuit Board Assembly Removal (TDS 500, 600, and 800)

TDS 400 Oscilloscopes

Equipment Required: One screwdriver with a size T-15 Torx® tip.

1. Remove the three board supports (number 4 in Figure 2-5) by depressing the snap lock at the bottom end of the board support and tilting it outwards. The tabbed top end slips out of a notch in the top rail.
2. Using the screwdriver with size T-15 Torx® tip, remove the two screws on the back and the two screws on the side (numbers 1 and 2) securing the rear plate of the circuit board assembly.
3. Grasp the board (number 3) by its edge and pull outward to unplug it from J1 of the backplane assembly to complete the removal.

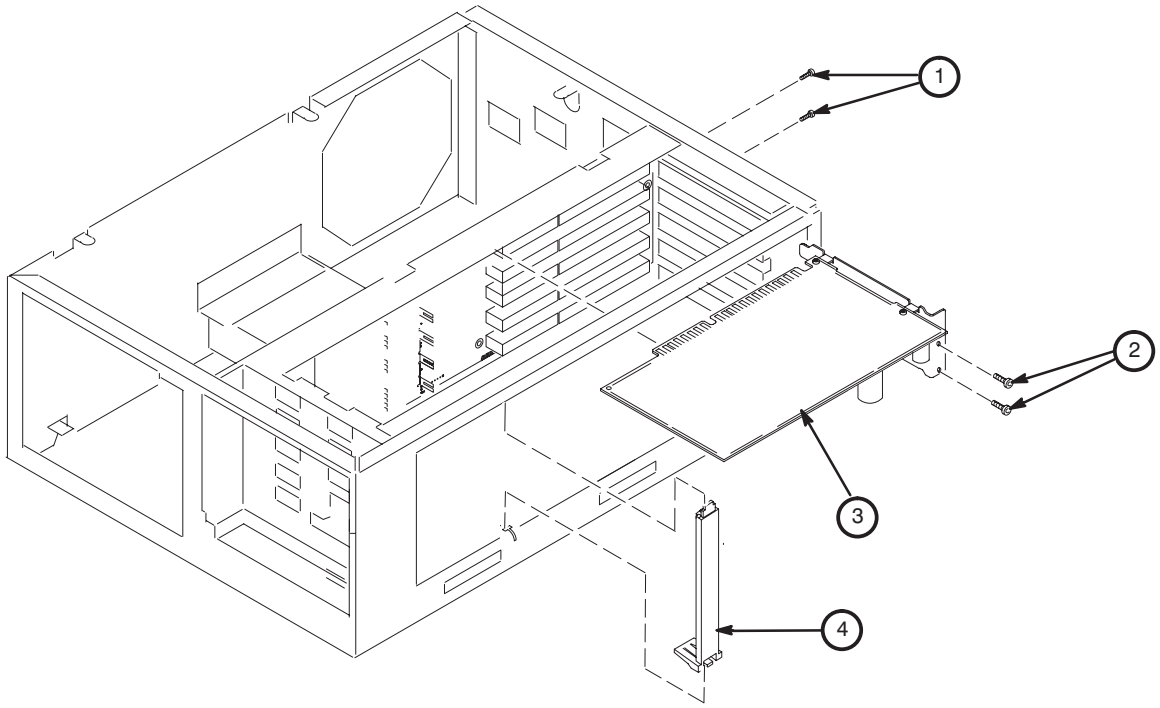


Figure 2-5: A23 Option 13 Assembly Removal (TDS 400)

Circuit Board Removal From Assembly

TDS 500, 600, and 800 Oscilloscopes

Equipment Required: One 3/16-inch nutdriver.

1. Using the nutdriver, remove the four lock connectors (number 3 in Figure 2-6) securing the circuit board to the rear plate.
2. Separate the circuit board with attached cable (number 1), from the rear plate with attached brackets (number 2).

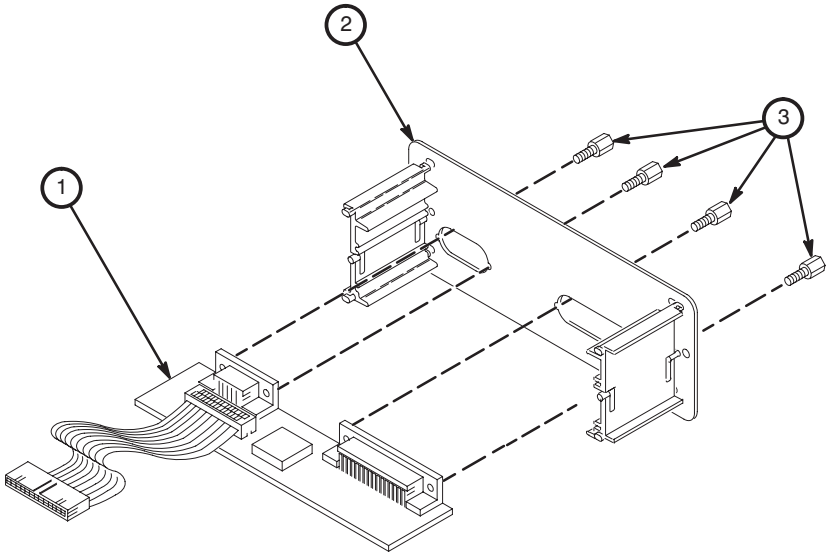


Figure 2-6: Removing Circuit Board From Assembly (TDS 500, 600, and 800)

TDS 400 Oscilloscopes

Equipment Required: One screwdriver with a size T-15 Torx® tip.

1. Unplug the two cable housings from the circuit board (numbers 3 and 5 in Figure 2-7).
2. Using the screwdriver, remove the two T-15 Torx® screws (number 4) and separate the rear plate (number 1) from the circuit board.

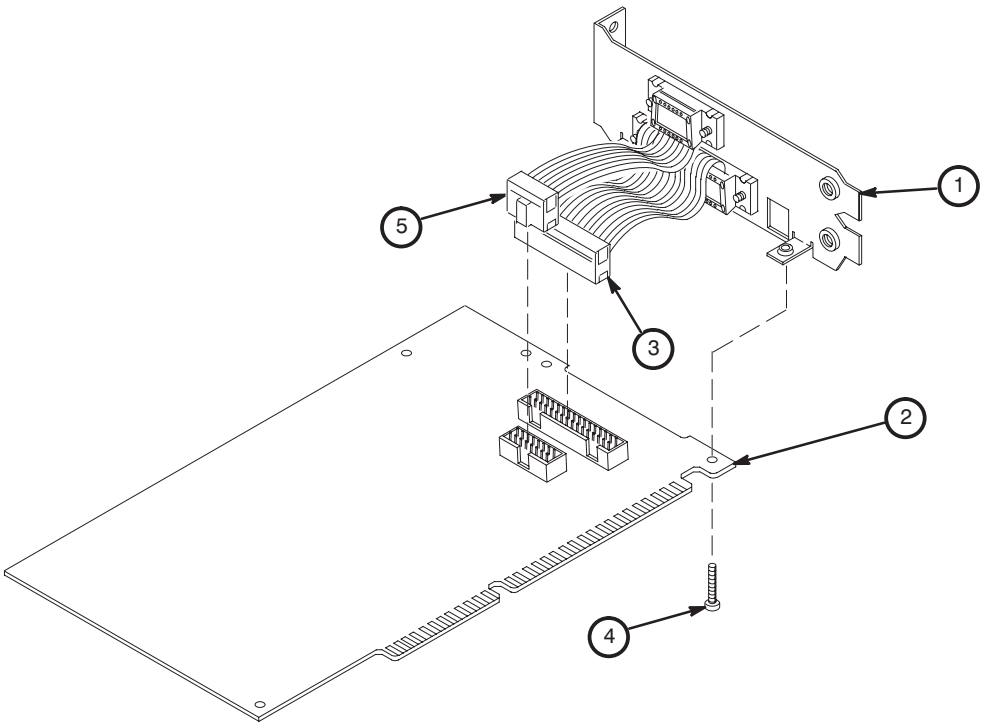


Figure 2-7: Removing Circuit Board From Assembly (TDS 400)

Replacement of Circuit Board

TDS 500, 600, and 800 Oscilloscopes

Equipment Required: One screwdriver with a size T-20 Torx® tip and one 3/16-inch nutdriver.

1. Replace the failed circuit board with a replacement RS-232/Centronics Hardcopy Interface circuit board ordered from the factory (see *Replaceable Parts List* starting on page 2-11 for ordering information). Do in reverse order steps 1 and 2 of the *Circuit Board Removal From Assembly* procedure on page 2-11.
2. Reinstall the RS-232/Centronics Hardcopy Interface circuit board assembly in to the oscilloscope. Do in reverse order steps 1, 2, and 3 of the *Circuit Board Assembly Removal* procedure on page 2-9.

TDS 400 Oscilloscopes

Equipment Required: One screwdriver with a size T-15 Torx® tip and one 3/16-inch nutdriver.

1. Replace the failed circuit board with a replacement ordered from the factory (see *Replaceable Parts List* starting on page 2-11 for ordering information). Do in reverse order steps 1 and 2 of the *Circuit Board Removal From Assembly* procedure on page 2-11.
2. Reinstall the RS-232/Centronics Hardcopy Interface circuit board assembly in to the oscilloscope. Do in reverse order steps 1, 2, and 3 of the *Circuit Board Assembly Removal* procedure on page 2-10

Replace Cabinet and Rear Cover

TDS 500, 600, and 800 Oscilloscopes

Equipment Required: One screwdriver with a size T-20 Torx® tip and one torque driver.

1. Do step 1 of the *Rear Cover and Cabinet Removal* procedure on page 2-6.
2. Do in reverse order steps 2, 3, and 4 of the *Rear Cover and Cabinet Removal* procedure on page 2-6.

NOTE

When reinstalling the four screws at the rear panel, use the torque driver to tighten the screws to 16 inch-lbs (18.4 cm-kg) torque.

TDS 400 Oscilloscopes

Equipment Required: One screwdriver with a size T-15 Torx® tip and one torque driver.

1. Do step 1 of the *Rear Cover and Cabinet Removal* procedure on page 2-7.
2. Do in reverse order steps 2 through 5 of the *Rear Cover and Cabinet Removal* procedure on page 2-7.

NOTE

When reinstalling the four screws at the rear panel, use the torque driver to tighten the screws to 8 inch-lbs (9.2 cm-kg) torque.

Execute Diagnostics

To ensure the RS-232/Centronics Hardcopy Interface is working correctly, perform the *Diagnostics* procedure on page 2-4.

Replaceable Parts List

This subsection contains a list of the components that are replaceable for the RS-232/Centronics Hardcopy Interface. As described below, use this list to identify and order replacement parts.

Parts Ordering Information

Replacement parts are available from or through your local Tektronix, Inc., service center or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available and to give you the benefit of the latest circuit improvements. Therefore, when ordering parts, it is important to include the following information in your order:

- Part number
- Instrument type or model number
- Instrument serial number
- Instrument modification number, if applicable

If a part you order has been replaced with a different or improved part, your local Tektronix service center or representative will contact you concerning any change in the part number.

Part Replacement

The RS-232/Centronics Hardcopy Interface is serviced by replacing the failed part. You may purchase these replacement parts in the same way as other replacement parts.

Using the Replaceable Parts List

The tabular information in the Replaceable Parts List is arranged for quick retrieval. Understanding the structure and features of the list will help you find all the information you need for ordering replacement parts.

Item Names

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

Indentation System

This parts list is indented to show the relationship between items. The following example is of the indentation system used in the Description column:

1 2 3 4 5 Name & Description
Assembly and/or Component
Attaching parts for Assembly and/or Component
(END ATTACHING PARTS)
Detail Part of Assembly and/or Component
Attaching parts for Detail Part
(END ATTACHING PARTS)
Parts of Detail Part
Attaching parts for Parts of Detail Part
(END ATTACHING PARTS)

Attaching parts always appear at the same indentation as the item it mounts, while the detail parts are indented to the right. Indented items are part of, and included with, the next higher indentation. Attaching parts must be purchased separately, unless otherwise specified.

Abbreviations

Abbreviations conform to American National Standards Institute (ANSI) standard Y1.1

Option 13 – TDS 500, 600, and 800 Oscilloscopes

CROSS INDEX – MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip Code
TK1163	POLYCAST INC	9898 SW TIGARD ST	TIGARD OR 97223
00779	AMP INC	2800 FULLING MILL PO BOX 3608	HARRISBURG PA 17105
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077–0001

Fig. & Index No.	Tektronix Part No.	Serial No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
2-8–1	671–2437–00			1	CIRCUIT BD ASSY:RS232/CENTRONIC	80009	671243700
2-8–2	407–3825–00			2	BRACKET,CKT BD:PLASTIC,REAR	TK1163	ORDER BY DESC
2-8–3	386–6182–00			1	PLATE,REAR:ALUMINUM,RS232/CENTRONIC	80009	386618200
2-8–4	131–0890–01			4	LOCK,CONNECTOR:4–40 X 0.312 L,HEX HD,STL	00779	205818–2
2-8–5	211–0730–00			2	SCREW,MACHINE:	80009	211073000
					ACCESSORIES		
	070–8567–01			1	MANUAL,TECH:INSTRUCTION,TDS FAMILY OPT13	80009	070856701

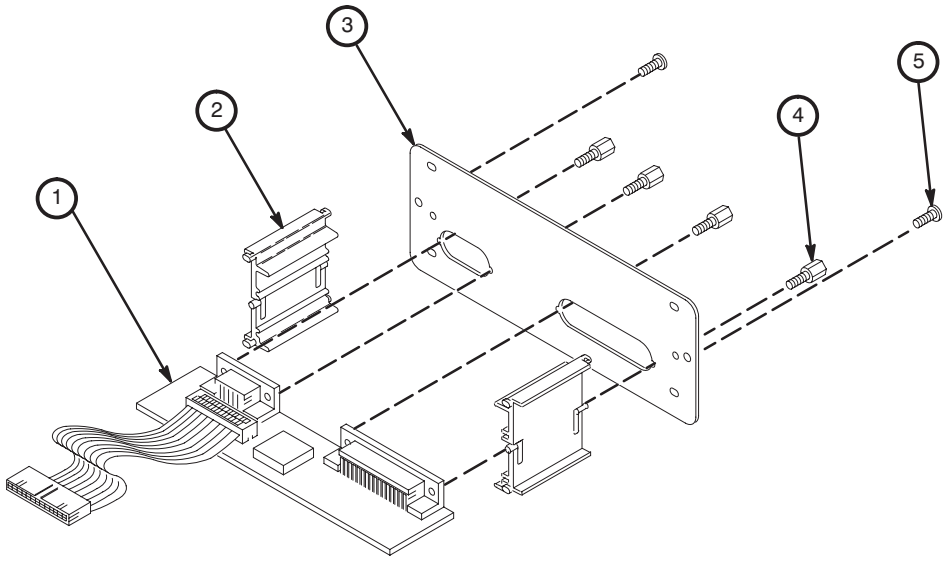


Figure 2-8: RS-232/Centronics Hardcopy Interface Replaceable Parts (TDS 500, 600, and 800)

Option 13 – TDS 400 Oscilloscopes

CROSS INDEX – MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip Code
0KB01	STAUFFER SUPPLY	810 SE SHERMAN	PORTLAND OR 97214
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077–0001

Fig. & Index No.	Tektronix Part No.	Serial No. Effective	Serial No. Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
2–9–1	671–2756–00			1	CIRCUIT BD ASSY:RS232/CENTRONIX	80009	671275600
–2	174–2612–00			1	CA ASSY,SP,ELEC:LOW PROFILE,RS232	80009	174261200
–3	407–4238–00			1	BRACKET,CKT BD:	80009	407423800
–4	348–1279–00			1	GASKET,EMI:VIDEO (OUT),SST	80009	348127900
–5	348–1350–00			1	GASKET,EMI:25 PIN D,CENTRONIX	80009	348135000
–6	214–3903–00			4	SCREW,JACK:4–40 X 0.312 L,HEX HD	80009	214390300
–7	174–3013–00			1	CA ASSY,SP,ELEC:CENTRONIX	80009	174301300
–8	213–0882–00			2	SCREW,TPG,TR:6–32 X 0.437 TAPTITE,PNH,STL	0KB01	ORDER BY DESC
–9	214–3796–00			1	HEATSINK,XSTR:ALUMINUM,VERT MOUNT	80009	214379600
					STANDARD ACCESSORIES		
	070–8567–01			1	MANUAL,TECH:INSTRUCTION	80009	070856701

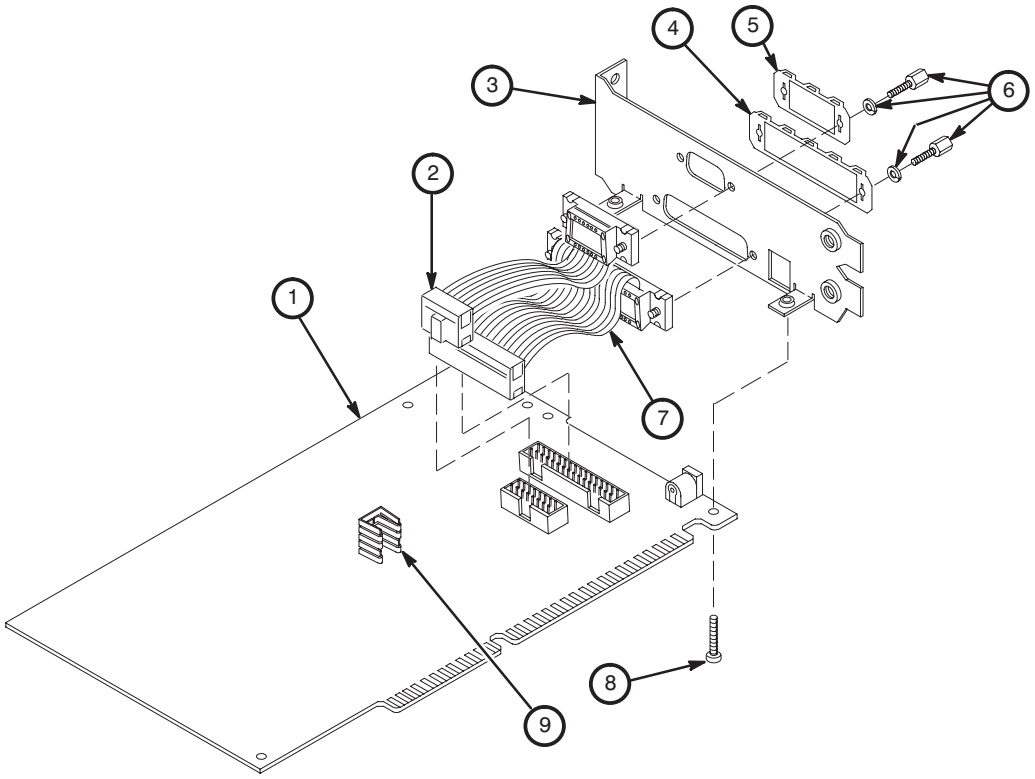


Figure 2-9: RS-232/Centronics Hardcopy Interface Replaceable Parts (TDS 400)