Instruction Manual

Tektronix

**TMS 802
SCSI Bus Support**

070-9835-00

There are no current European directives that
apply to this product. This product provides
cable and test lead connections to a test object of
electronic measuring and test equipment.

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.

SOFTWARE WARRANTY

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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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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 the system. Read the *General Safety Summary* in other system 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.

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

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

Use Proper AC Adapter. Use only the AC adapter specified for this product.

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

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

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

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

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in an Explosive Atmosphere.

Keep Product Surfaces Clean and Dry.

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

Symbols and Terms

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

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

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

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

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

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

CAUTION indicates a hazard to property including the product.

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

WARNING High Voltage	Protective Ground (Earth) Terminal	CAUTION Refer to Manual	Double Insulated

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, disconnect the main power by means of the power cord or, if provided, the power switch.

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.

Preface: Bus Support Documentation

This instruction manual contains specific information about the TMS 802 SCSI bus support and is part of a set of information on how to operate this product on compatible Tektronix logic analyzers.

If you are familiar with operating bus supports on the logic analyzer for which the TMS 802 SCSI support was purchased, you will probably only need this instruction manual to set up and run the support.

If you are not familiar with operating bus supports, you will need to supplement this instruction manual with information on basic operations to set up and run the support.

Information on basic operations of bus supports is included with each product. Each logic analyzer has basic information that describes how to perform tasks common to supports on that platform. This information can be in the form of online help, an installation manual, or a user manual.

This manual provides detailed information on the following topics:

- Connecting the logic analyzer to the system under test

- Setting up the logic analyzer to acquire data from the system under test

- Acquiring and viewing disassembled data

- Using the TMS 802 SCSI probe adapter

Manual Conventions

This manual uses the following conventions:

- The term disassembler refers to the software that disassembles bus cycles into instruction mnemonics and cycle types.

- The phrase "information on basic operations" refers to online help, an installation manual, or a basic operations of bus supports user manual.

- In the information on basic operations, the term XXX or P54C used in field selections and file names can be replaced with SCSI. This is the name of the bus in field selections and file names you must use to operate the SCSI support.

- The term system under test (SUT) refers to the bus-based system from which data will be acquired.

■ The term logic analyzer refers to the Tektronix logic analyzer for which this product was purchased.

■ The term module refers to a 68/102/136-channel or a 96-channel module.

■ SCSI refers to the SCSI I and SCSI II variations of the SCSI bus protocol unless otherwise noted.

■ An asterisk (*) following a signal name or a minus sign (-) preceding a signal name indicates an active low signal.

Logic Analyzer Documentation

A description of other documentation available for each type of Tektronix logic analyzer is located in the corresponding module user manual. The user manual provides the information necessary to install, operate, maintain, and service the logic analyzer and associated products.

Contacting Tektronix

Product Support	For application-oriented questions about a Tektronix measurement product, call toll free in North America: 1-800-TEK-WIDE (1-800-835-9433 ext. 2400) 6:00 a.m. – 5:00 p.m. Pacific time
	Or, contact us by e-mail: tm_app_supp@tek.com
	For product support outside of North America, contact your local Tektronix distributor or sales office.
Service Support	Contact your local Tektronix distributor or sales office. Or, visit our web site for a listing of worldwide service locations.
	http://www.tek.com
For other information	In North America: 1-800-TEK-WIDE (1-800-835-9433) An operator will direct your call.
To write us	Tektronix, Inc. P.O. Box 1000 Wilsonville, OR 97070-1000

Getting Started

This chapter provides information on the following topics and tasks:

- The TMS 802 SCSI bus support

- Logic analyzer software compatibility

- Your SCSI system requirements

- SCSI support restrictions

- Configuration of the SUT

- How to connect to the system under test (SUT)

- How to configure the probe adapter

- How to apply power to and remove power from the probe adapter

Support Description

The TMS 802 bus support disassembles data from 8- and 16-bit wide buses (with parity) that are based on the Amertican National Standard for Information Systems bus protocol and standards. The support runs on a compatible Tektronix logic analyzer equipped with a 68/102/136-channel module or a 96-channel module.

Refer to information on basic operations to determine how many modules and probes your logic analyzer needs to meet the minimum channel requirements for the TMS 802 bus support.

The TMS 802 bus product supports data transfers on up to eight of the ten device types described in the SCSI standards. Table 1–1 shows which SCSI standards and data transfer rates the TMS 802 product supports.

Table 1–1: Supported SCSI standard and transfer rate

ANSI standard	Transfer rate
SCSI I	4 Mbytes per second
SCSI II	20 Mbytes per second

A complete list of standard and optional accessories is provided at the end of the parts list in the *Replaceable Mechanical Parts* chapter.

To use this support efficiently, you need to have the items listed in the information on basic operations as well as the following items:

■ The *American National Standard for Information Systems – Small Computer System Interface (SCSI I)*, Amertican National Standard for Information Systems Inc., June 1986, X3.131.1986

■ The *American National Standard for Information Systems – Small Computer System Interface (SCSI II)*, Amertican National Standard for Information Systems Inc., March, 1993, X3T9.2/375R rev 10k

Information on basic operations also contains a general description of supports.

Logic Analyzer Software Compatibility

The label on the bus support floppy disk states which version of logic analyzer software the support is compatible with.

Logic Analyzer Configuration

To use the SCSI support, the Tektronix logic analyzer must be equipped with at least a 68/102/136-channel module or a 96-channel module. The module must be equipped with enough probes to acquire channel and clock data from signals in your SCSI-based system.

Refer to information on basic operations to determine how many modules and probes the logic analyzer needs to meet the channel requirements.

Requirements and Restrictions

You should review the general requirements and restrictions of bus supports in the information on basic operations as they pertain to your SUT.

You should also review electrical, environmental, and mechanical specifications in the *Specifications* chapter in this manual as they pertain to your system under test, as well as the following descriptions of other SCSI support requirements and restrictions.

SUT Power. Whenever the SUT is powered off, be sure to remove power from the probe adapter. Refer to *Applying and Removing Power* at the end of this chapter for information on how to remove power from the probe adapter.

Assert the -RST Signal Before Acquiring Data. The SCSI probe adapter contains an asynchronous state machine. To ensure proper synchronization with the disassembler, you must assert the -RST signal in your SCSI bus system before acquiring data.

Hardware Reset. If a hardware reset occurs on your SCSI bus during an acquisition and is not immediately followed by a BUS_FREED phase (the -BSY, -SEL signals are not asserted), the disassembler may acquire an invalid sample.

Any phase other than BUS_FREED on the SCSI bus after a reset may also need to be synchronized and can cause extra cycles to be acquired or cycles to be missed (not acquired).

To acquire all cycles on the SCSI bus immediately following a reset, you should change the start mode on the DAS from NORMAL to ATE. (The Start Mode menu is accessible through the Cluster Setup menu.) Refer to your DAS user manual for information on using the ATE selection.

Bus Freed Phase Data. Data acquired from the SCSI bus during a BUS_FREED phase could contain data for the ARBITRATION phase.

Commands Not Supported. The TMS 802 product does not support vendor unique commands shown in their instruction manuals.

Extra Cycles During Power Up. When powering up the SCSI device, the probe adapter might acquire extra BUS_FREED cycles before the probe adapter starts to acquire valid data.

Glitches and Narrow Pulses. Glitches and narrow pulses on the SCSI bus system might be logged in as BUS_FREED or unrecognized cycles.

Differential Signals. The TMS 802 product does not support differential signals.

Signal Quality. To ensure signal quality, you should plug the power supply for the probe adapter into the same power source as the SCSI device (for example, the same electrical outlet or power strip).

Cables Not Supported. The TMS 802 product does not support 32-bit B-cables or Q-cables.

Stub Length. The SCSI Unshielded Low-Density 8-Bit Interface cable (one of the standard accessories) adds an inch to the overall stub length.

Without Using the Probe Adapter. The TMS 802 product does not support Synchronous Data Transfers on the SCSI bus without using the probe adapter. The product does support Asynchronous Data Transfers if there is at least 11 ns between the falling edges of the -REQ and -ACK signals in your bus system.

The disassembler will acquire Selection phase data if the target device responds. If the target does not respond during a Selection phase, that Selection phase data will not be acquired.

Configuration of the System Under Test

Before you connect the probe adapter to any SCSI device, you must look at the configuration of the SCSI device (or devices) in your system and determine which device you will connect the probe adapter to. If you have several SCSI devices daisy-chained together or only a single SCSI device, you must always connect the probe adapter to the last port on the chain or device.

On SCSI devices with two ports, one port goes to the SCSI device from the host (or previous SCSI device in a daisy chain) and the other port goes from the SCSI device to the probe adapter.

Figure 1–1 shows which port you must connect the probe adapter to if the SCSI devices are daisy-chained together.
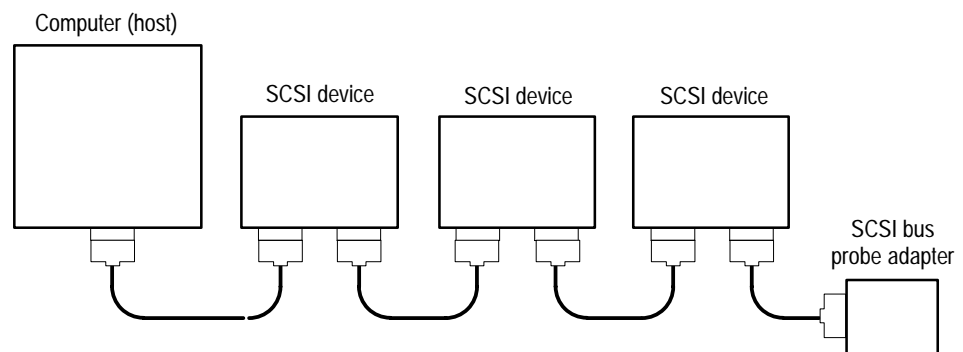
Figure 1–1: SCSI devices in a daisy-chain configuration

On a SCSI device with one port (usually an internal device), you actually connect your internal SCSI device cable to a connector on the Unshielded Low-Density 8-Bit Interface cable (a standard accessory for the TMS 802). For information about single, internal SCSI device configurations, refer to the *Connecting to an Internal SCSI Device* description beginning on page 2–1.

SCSI Interface Cables

Four SCSI interface cables are standard accessories for the TMS 802 product. One end of each cable connects to the SCSI probe adapter. The connector on the other end of each cable is different to accommodate the four most common types of SCSI port connectors.

Interface cables are named after the various types of SCSI port connectors to which one end of the interface cable connects. The interface cables you have to choose from are the following:

■ Shielded, High-Density 16-Bit

■ Shielded, High-Density 8-Bit

■ Shielded, Low-Density 8-Bit

■ Unshielded, Low-Density 8-Bit

Figure 1–2 shows the standard SCSI interface cables. Each cable is 12 inches long. For information on how to order additional cables, refer to the *Replaceable Mechanical Parts* section later in this manual.

Shielded high-density
16-bit interface cable

Shielded high-density
8-bit interface cable

Shielded low-density
8-bit interface cable

Unshielded low-density
8-bit interface cable
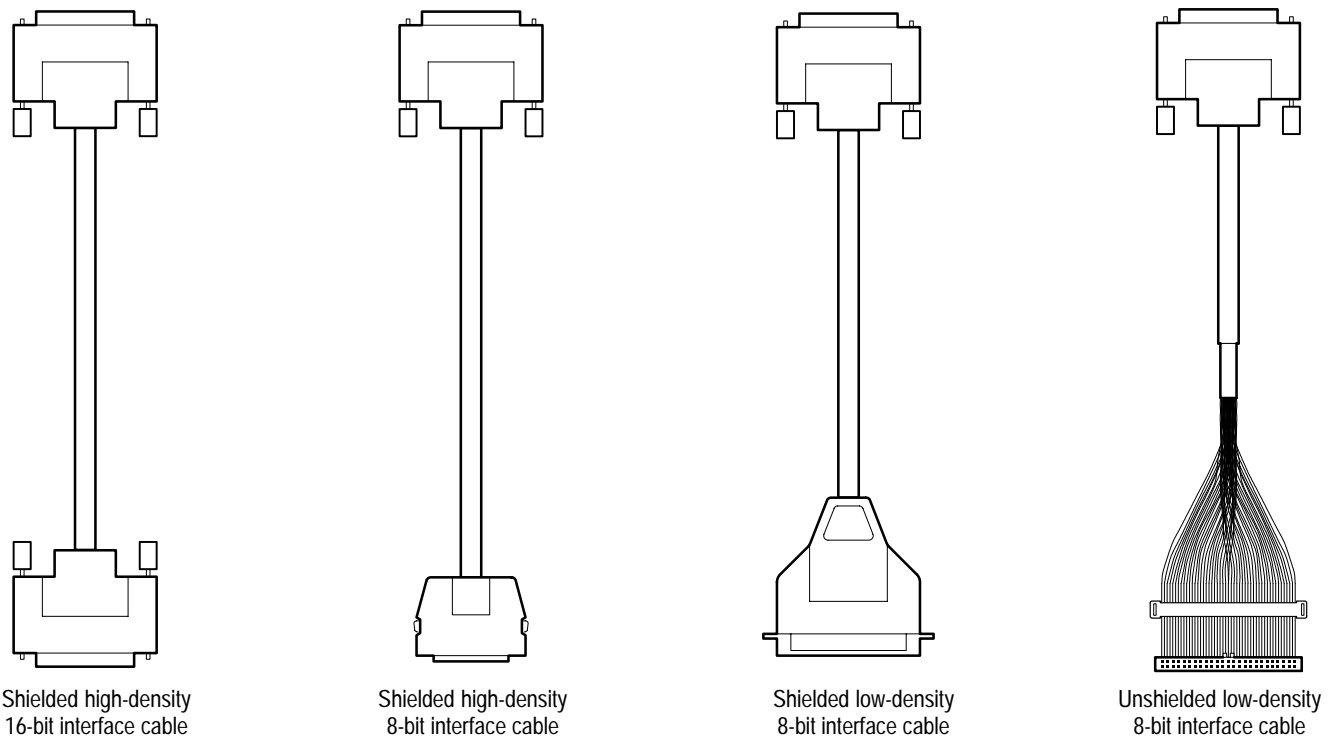
Figure 1–2: Standard SCSI interface cables

Connecting to the System Under Test

Before you connect the probe adapter to the SCSI device, you must do the following:

- Choose an appropriate SCSI interface cable

- Connect the standard probes to the Module

- Have a minimum amount of clear space surrounding the SCSI device to accommodate the probe adapter; refer to the *Specifications* section for the required clearances

- Remove termination from the SCSI bus system (or device) to which you are connecting

If you cannot remove termination from your SCSI bus system, then leave the Termination jumper in the Off position on the probe adapter. You should be aware that the stub length will be 12 inches when the Termination jumper is in the Off position.

The signal TEMPWR must be present in your SCSI bus system for the termination on the probe adapter to work correctly.

Your SCSI device may or may not be easily accessible. For example, your SCSI device may be external from the host (such as a printer or scanner) or it could be internal to the host (such as a hard disk drive). The following two procedures describe how to connect to SCSI devices in these situations.

To an External SCSI Device

To connect the logic analyzer to the SUT, do the following:

1. Turn off power to your SUT. It is not necessary to turn off power to the logic analyzer.

⚠

CAUTION. Static discharge can damage the probe adapter, the probes, or the module. To prevent static damage, handle all of the above only in a static-free environment.

Always wear a grounding wrist strap or similar device while connecting the probe adapter to the SCSI bus system.

2. To discharge your stored static electricity, touch the ground jack located on the back of the logic analyzer. Then, touch any of the ground pins on the back of the probe adapter to discharge stored static electricity from the probe adapter. Figure 1–3 shows the pins with section labels, such as D1 and D0; the lower row of pins connect to ground.
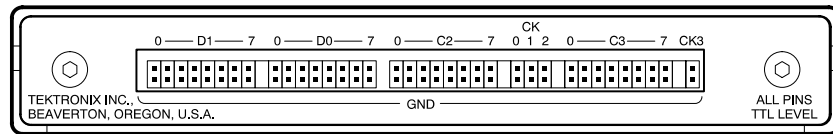
Figure 1–3: Probe pins on the SCSI probe adapter

3. Connect the clock and 8-channel probes to the groups of pins on the back of the probe adapter as shown in Figure 1–3. Match the channel groups and numbers on the probe labels to the corresponding pins on the probe adapter.

4. Connect the appropriate interface cable to the SCSI device and to the probe adapter as shown in Figure 1–4.
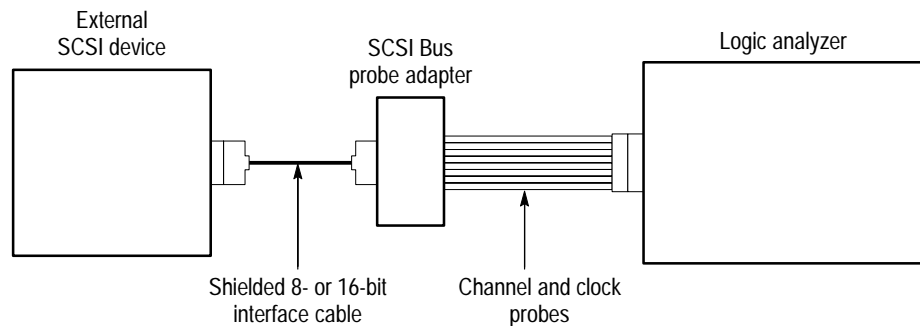
Figure 1–4: Connecting to an external SCSI device

5. Configure the Termination jumper on the probe adapter. Refer to *Configuring the Probe Adapter*, beginning on page 1–11, for information on how to position this jumper.

To an Internal SCSI Device   To connect the logic analyzer to the SUT, do the following:

1. Turn off power to your SUT. It is not necessary to turn off power to the logic analyzer.

CAUTION. Static discharge can damage the probe adapter, the probes, or the module. To prevent static damage, handle all of the above only in a static-free environment.

Always wear a grounding wrist strap or similar device while connecting the probe adapter to the SCSI bus system.

2. To discharge your stored static electricity, touch the ground connector located on the back of the logic analyzer. Then, touch any of the ground pins on the back of the probe adapter to discharge stored static electricity from the probe adapter. Figure 1–3 shows the pins with section labels, such as D1 and D0; the lower row of pins connect to ground.

3. Connect the clock and 8-channel probes to the groups of pins on the back of the probe adapter as shown in Figure 1–3. Match the channel groups and numbers on the probe labels to the corresponding pins on the probe adapter.
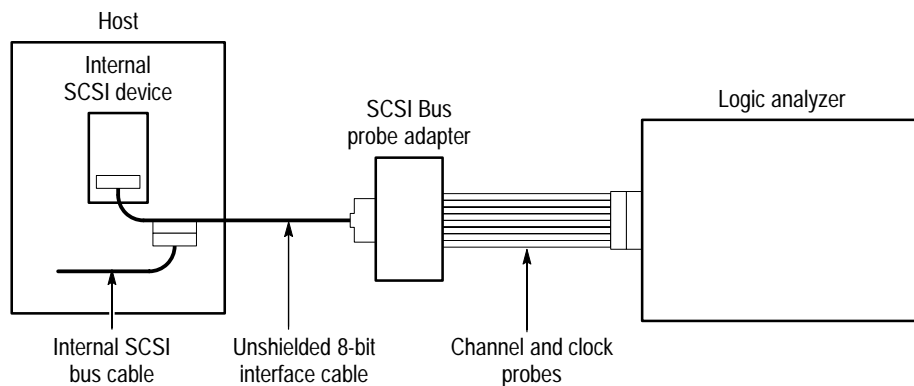
Figure 1–5: Connecting to an internal SCSI device

4. Open the host and locate the internal SCSI device. Disconnect the internal cable connecting the SCSI device to the host.

5. Connect the internal SCSI cable to the connector located about an inch from one end of the Unshielded Low-Density 8-bit Interface Cable as shown in Figure 1–5.

6. Connect the other connector on that same end of the interface cable to the internal SCSI device.

7. Connect the other end of the Unshielded Low-Density 8-bit Interface Cable to the probe adapter.

8. Configure the Termination jumper on the probe adapter. Refer to *Configuring the Probe Adapter*, beginning on page 1–11, for information on how to position this jumper.

Without a Probe Adapter   You can use channel probes, clock probes, and leadsets with a commercial test clip (or adapter) to make connections between the logic analyzer and your SUT.

The TMS 802 product does not support Synchronous Data Transfers on the SCSI bus without using the probe adapter. The product does support Asynchronous Data Transfers if there is at least 11 ns between the falling edges of the -REQ and ACK signals in your bus system.

The disassembler will acquire Selection phase data if the target device responds. If the target does not respond during a Selection phase, that Selection phase data will not be acquired.

To connect probes to SCSI signals using a Y-type adapter, follow these steps:

1. Buy or build a Y-type adapter and insert it at an appropriate point in your SCSI bus system. The Y-adapter functions as a tap that provides connection points for the probes. When determining where to install the Y adapter, keep the following in mind:

   ■ Termination should occur on the Y adapter

   ■ Stub length should be kept to a minimum

2. Turn off power to your SUT. It is not necessary to turn off power to the logic analyzer.

⚠ *CAUTION. Static discharge can damage the probe adapter, the probes, or the module. To prevent static damage, handle all of the above only in a static-free environment.*

Always wear a grounding wrist strap or similar device while connecting probes to the SCSI bus system.

3. To discharge your stored static electricity, touch the ground connector located on the back of the logic analyzer.

4. Use the channel assignments shown in Tables 1–2 and 1–3 to connect channel and clock probes to your Y adapter.

   An asterisk (*) following a signal name or a minus sign (-) preceding a signal name indicates an active low signal.

Table 1–2: SCSI signal connections for channel probes

Section: channel	Interface cable contact point (pin)				SCSI bus signal name	Displayed signal name[†]
	Shielded, high-density 16-bit	Shielded, high-density 8-bit	Shielded, low-density 8-bit	Unshielded, low-density 8-bit		
D1:7	38	none	none	none	-DB(15)	D15_B
D1:6	37	none	none	none	-DB(14)	D14_B
D1:5	36	none	none	none	-DB(13)	D13_B
D1:4	35	none	none	none	-DB(12)	D12_B
D1:3	68	none	none	none	-DB(11)	D11_B
D1:2	67	none	none	none	-DB(10)	D10_B
D1:1	66	none	none	none	-DB(9)	D9_B
D1:0	65	none	none	none	-DB(8)	D8_B
D0:7	47	33	33	16	-DB(7)	D7_B
D0:6	46	32	32	14	-DB(6)	D6_B
D0:5	45	31	31	12	-DB(5)	D5_B
D0:4	44	30	30	10	-DB(4)	D4_B
D0:3	43	29	29	8	-DB(3)	D3_B
D0:2	42	28	28	6	-DB(2)	D2_B
D0:1	41	27	27	4	-DB(1)	D1_B
D0:0	40	26	26	2	-DB(0)	D0_B
C3:3	none	none	none	none	none	BSY_D*[‡]
C3:2	60	46	46	42	-MSG	-MSG_B*
C3:1	55	41	41	32	-ATN	-ATN_B*
C3:0	61	47	47	44	-SEL	-SEL_BB*
C2:7	57	43	43	36	-BSY	-BSY_BBB*
C2:6[¶]	59	45	45	40	-RST	-RST_B*
C2:3	58	44	44	38	-ACK	-ACK_B*
C2:2	63	49	49	48	-REQ	-REQ_B*
C2:1	64	50	50	50	-I/O	-I/O_B*
C2:0[§]	62	48	48	46	-C/D	-C/D_B*

[†] **If you are not using the probe adapter, these signals will not be buffered and the _B will not appear in the display.**

[‡] **This signal is generated on the probe adapter. If you are not using the probe adapter, this signal will not be present in this channel group or in the display.**

[§] **If you are not using the probe adapter, connect this channel to the -RST signal on the SCSI bus. The displayed signal name will be RST*.**

[¶] **If you are not using the probe adapter, connect this channel to the -C/D signal on the SCSI bus. The displayed signal name will be C*_D.**

Table 1–3 shows the probe section and channel assignments for the clock probes (not part of any group), and the SCSI signal to which each channel connects when the probe adapter is not used.

Data is logged in on the falling edge of -ACK, the falling edge of -SEL, the falling edge of -REQ, the rising edge of -BSY, or the falling edge of -BSY.

Table 1–3: SCSI signal connections for clock probes without a probe adapter

Section: channel	Clock or Qualifier	SCSI bus signal name	Displayed signal name
CK:3	CLK & QUAL	-ACK	ACK*=
CK:2	CLK & QUAL	-SEL	SEL*=
CK:1	CLK & QUAL	-REQ	REQ*=
CK:0	CLK & QUAL	-BSY	BSY*=

These channels are used only to clock in data; they are not acquired or displayed. To acquire data from any of the signals shown in Table 1–3, you must connect another channel probe to the signal, a technique called double probing. An equals sign (=) following a signal name indicates that it is already double probed.

5. Match the colors on the probe labels to connect the probes to the logic analyzer.

6. You must connect at least one ground lead from each channel probe and the ground from each clock probe to ground pins on the Y adapter.

7. Add termination on the Y adapter for each channel and clock probe.

Configuring the Probe Adapter

There is a jumper on the probe adapter that is used for termination. After connecting the probe adapter to the SCSI bus system, you can position the Termination jumper.

⚠ *CAUTION. Termination should not occur more than once. If you have termination in your SCSI bus system and place the Termination jumper in the On position, you may damage the probes, probe adapter, SCSI device, and the bus system. To avoid this, use only one termination either on the probe adapter or in your SCSI bus system, but not in both places.*

The Termination jumper (JR450) is located on the front of the SCSI probe adapter. It should be placed in the On position to enable termination by the probe adapter. When placed in the Off position, termination does not occur on the probe adapter and needs to be made in your SCSI bus system.

If you cannot remove termination from your SCSI bus system, then leave the Termination jumper in the Off position on the probe adapter. You should be aware that the stub length will be 12 inches when the Termination jumper is in the Off position.

Figure 1–6 shows the location of the Termination jumper on the probe adapter.
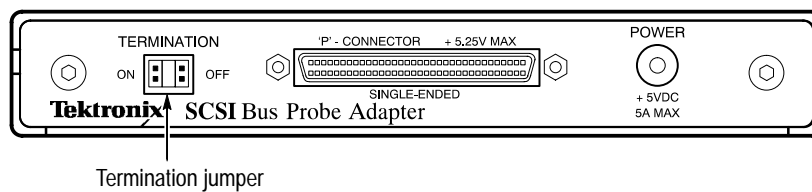
Figure 1–6: Termination jumper location

Applying and Removing Power

A power supply for the TMS 802 SCSI probe adapter is included with the support. The power supply provides +5 volts power to the probe adapter. The center connector of the power jack connects to Vcc.

NOTE. Whenever the SUT is powered off, be sure to remove power from the probe adapter.

To apply power to the SCSI probe adapter and SUT, follow these steps:

CAUTION. Failure to apply power to the SCSI probe adapter before applying power to your SCSI bus system may permanently damage the SCSI device.

1. Connect the +5 V power supply to the jack on the probe adapter. Figure 1–7 shows the location of the jack on the adapter board.
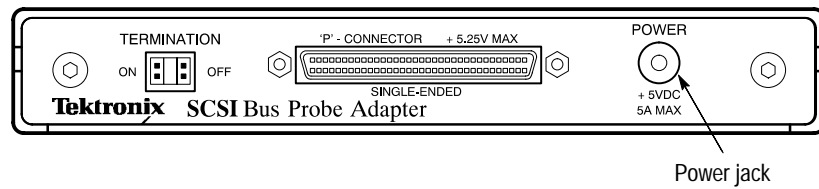
Power jack

Figure 1–7: Location of the power jack

2. Plug the power supply for the probe adapter into an electrical outlet.

3. Power on the SUT.

To remove power from the SUT and SCSI probe adapter, follow these steps:

⚠️ *CAUTION. Failure to power down your SUT before removing the power from the probe adapter may permanently damage the SCSI bus and SUT.*

1. Power off the SUT.

2. Unplug the power supply for the probe adapter from the electrical outlet.

Setting Up the Support

This section provides information on how to set up the support. Information covers the following topics:

- Channel group definitions

- Clocking options

- Symbol table files

Remember that the information in this section is specific to the operations and functions of the TMS 802 SCSI support on any Tektronix logic analyzer for which it can be purchased. Information on basic operations describes general tasks and functions.

Before you acquire and disassemble data, you need to load the support and specify setups for clocking and triggering as described in the information on basic operations. The support provides default values for each of these setups, but you can change them as needed.

Channel Group Definitions

The software automatically defines channel groups for the support. The channel groups for the SCSI support are Data, Control and Parity. If you want to know which signal is in which group, refer to the channel assignment tables beginning on page 3–5.

Clocking Options

The TMS 802 support offers a bus-specific clocking mode for the SCSI bus. This clocking mode is the default selection whenever you load the SCSI support.

The TMS 802 disassembler software provides two modes for acquiring SCSI data: Noise Filtered and Noise Unfiltered. Noise on the SCSI bus includes valid bus cycles, cycles occurring as the result of glitches, or illegal conditions caused by unrecognizable bus behavior. These types of cycles are acquired when you select Noise Unfiltered. Valid cycles are acquired, and glitches and illegal cycles are ignored when you select Noise Filtered. The default is Noise Filtered.

A description of how cycles are sampled by the module using the TMS 802 support and probe adapter is found in the *Specifications* chapter.

Symbols

The SCSI_Ctrl file replaces specific Control channel group values with symbolic values when Symbolic is the radix for the channel group.

Table 2–1 shows the name, bit pattern, and meaning for the symbols in the file SCSI_Ctrl, the Control channel group symbol table.

Table 2–1: Control group symbol table definitions

Symbol	BSY_D*	BSY_BBB*	SEL_BB*	ATN_B*	MSG_B*	C*_D_B	I*_O_B	REQ_B*	ACK_B*	RST_B*	Meaning
DATA_OUT	1	0	1	1	1	1	1	X	0	1	The target SCSI device requests that data be sent from the initiator to the target
DATA_IN	1	0	1	1	1	1	0	0	X	1	The target SCSI device requests that data be sent to the initiator from the target
COMMAND	1	0	1	X	1	0	1	X	X	1	The target SCSI device requests command information from the initiator
STATUS	1	0	1	X	1	0	0	X	X	1	The target SCSI device requests that status information be sent from the target to the initiator
MSG_OUT	1	0	1	X	0	0	1	X	X	1	The target SCSI device requests the message be sent from the initiator to the target
MSG_IN	1	0	1	X	0	0	0	X	X	1	The target SCSI device request the message be sent to the initiator from the target
BUS_FREED	1	1	1	X	1	1	1	1	1	1	No SCSI device is actively using the bus
ARBITRATE	0	0	1	X	1	1	1	1	1	1	One SCSI device controls the bus so that it can initiate or resume an I/O process
SELECTION	0	0	0	X	X	X	1	X	X	1	The initiator SCSI device selects a target to initialize some target function (such as a read or write operation)
RESELECT	0	0	0	X	X	X	0	X	X	1	The target SCSI device reconnects to an initiator for the purpose of continuing some operation that was previously started by the initiator, but was suspended by the target (such as when the target disconnects to allow a Bus Free phase to occur before the operation is complete).

Information on basic operations describes how to use symbolic values for triggering, and displaying other channel groups symbolically, such as the Address channel group.

Acquiring and Viewing Disassembled Data

This section describes how to acquire data and view it disassembled. Information covers the following topics and tasks:

- Acquiring data

- Viewing disassembled data in various display formats

- Phase type labels

- Changing the way data is displayed

Acquiring Data

Once you load the SCSI support, choose a clocking mode and specify the trigger, you are ready to acquire and disassemble data.

If you have any problems acquiring data, refer to information on basic operations in your online help or *Appendix A: Error Messages and Disassembly Problems* in the basic operations user manual.

Viewing Disassembled Data

You can view disassembled data in four different display formats: Hardware, Software, Control Flow, and Subroutine. The information on basic operations describes how to select the disassembly display formats.

NOTE. Selections in the Disassembly property page (the Disassembly Format Definition overlay) must be set correctly for your acquired data to be disassembled correctly. Refer to Changing How Data is Displayed *on page 2–8.*

Acquired data is disassembled according to the ANSI standards for SCSI I and SCSI II bus protocol. The titles of the SCSI standard documents on which the disassembler is based can be found on page 1-2. All data used in Command, Message, and Status phases will be displayed in hexadecimal.

Hardware Display Format

The Hardware display format shows all data transactions for Command, Status, Message, Arbitration, Selection, Bus Free, Reselection, and Data phases.

Arguments associated with the Command phases are also displayed. For example, the WRITE(10) command will be displayed as follows:

```
WRITE(10)
   LUN: 0 DPO: 0 FUA: 0 EBP: 0 RESERVED: 0 RELADR: 0
   LOGICAL BLOCK ADDRESS: 00000000
   LOGICAL ADDRESS BYTE
   LOGICAL ADDRESS BYTE
   LOGICAL ADDRESS BYTE
   RESERVED
   TRANSFER LENGTH: 0000
   TRANSFER LENGTH BYTE
   CONTROL
```

Table 2–2 shows these bus-phase type labels and gives a definition of the bus activity they represent.

Table 2–2: Bus-phase types definitions

Data transaction type	Definition
(BUS FREE)	The Bus Free phase indicates that no SCSI device is actively using the SCSI bus
(ARBITRATION)	The Arbitration phase allows one SCSI device to gain control of the SCSI bus so it can initiate or resume an I/O process
(SELECTION)	The Selection phase indicates that the SCSI device allows an initiator to select a target for the purpose of initiating a target function (such as a read or write).
(RESELECTION)	The Reselection phase is an optional phase that indicates that the SCSI device allows a target to reconnect to an initiator for the purpose of continuing some operation that was previously started by the initiator, but was suspended by the target (such as when the target disconnects to allow a Bus Free phase to occur before the operation is complete).
(COMMAND)	The Command phase indicates that the SCSI device allows the target to request information from the initiator.
(DATA IN)	The Data In phase indicates that the SCSI device allows the target to request data be sent to the initiator from the target.
(DATA OUT)	The Data Out phase indicates that the SCSI device allows the target to request data be sent from the initiator to the target.
(STATUS)	The Status phase indicates that the SCSI device allows the target to request that the status information be sent from the target to the initiator.
(MESSAGE IN)	The Message In phase indicates that the SCSI device allows the target to request that messages be sent to the initiator from the target.
(MESSAGE OUT)	The Message Out phase indicates that the SCSI device allows the target to request that messages be sent from the initiator to the target.
(UNKNOWN)	The combination of control bits is unexpected or unrecognized.

Figure 2–1 shows an example of the Hardware display.

```
    1        2     3                                                       4

  Sample  Data  Mnemonics                                             Control
  --------------------------------------------------------------------------------
     306  002E  ( DATA IN )                                           DATA_IN
     307  0039  ( DATA IN )                                           DATA_IN
     308  0020  ( DATA IN )                                           DATA_IN
     309  --00  GOOD                                                  STATUS
     310  --00  COMMAND COMPLETE                                      MSG_IN
     311  --00  ( BUS FREE )                                          BUS_FREED
     312  --80  ( ARBITRATION )                                       ARBITRATE
     313  --88  ( SELECTION )                                         SELECTION
     314  --C0  IDENTIFY    0                                         MSG_OUT
     315  --25  READ CAPACITY                                         COMMAND
     316  --00    LUN: 0 RESERVED: 00 RELADR: 0                       COMMAND
     317  --00    LOGICAL BLOCK ADDRESS: 00000000                     COMMAND
     318  --00    LOGICAL BLOCK ADDRESS BYTE                          COMMAND
     319  --00    LOGICAL BLOCK ADDRESS BYTE                          COMMAND
     320  --00    LOGICAL BLOCK ADDRESS BYTE                          COMMAND
     321  --00    RESERVED: 0000                                      COMMAND
     322  --00    RESERVED BYTE                                       COMMAND
     323  --00    RESERVED: 00 PMI: 0                                 COMMAND
     324  --00    CONTROL                                             COMMAND
     325  0000  ( DATA IN )                                           DATA_IN
```

Figure 2–1: Hardware display format

1 **Sample Column.** Lists logic analyzer memory locations for the acquired data.

2 **Data Group.** Lists data from channels connected to the SCSI Data bus.

3 **Mnemonics Column.** Lists SCSI bus protocol commands and phases (bus activity) that have been disassembled.

4 **Control Group.** Lists data from channels connected to SCSI bus signals assigned to the Control channel group.

Software Display Format   The Software display format shows all data transactions for Command, Status, Message, Arbitration, Selection, Bus Free, Reselection, and Data phases.

Data phases are compressed and arguments associated with the Command phases are not displayed. For example, the WRITE(10) command will be displayed as follows:

```
WRITE(10)
   LUN: O DPO: O FUA: O EBP: O RESERVED: O RELADR: O
   LOGICAL BLOCK ADDRESS: 00000000
   RESERVED
   TRANSFER LENGTH: 0000
   CONTROL
```

Figure 2–2 shows an example of the Software display.

```
   Sample  Data  Mnemonics                                          Control
   ------------------------------------------------------------------------------
      281  0051  DI: 0051 0055 0041 004E 0054 0055 004D 0020         DATA_IN
      289  0050  DI: 0050 0031 0030 0035 0053 0053 0020 0039         DATA_IN
      297  0031  DI: 0031 0030 002D 0031 0030 002D 0039 0034         DATA_IN
      305  0038  DI: 0038 002E 0039 0020                             DATA_IN
      309  --00  GOOD                                                STATUS
      310  --00  COMMAND COMPLETE                                    MSG_IN
      311  --00  ( BUS FREE )                                        BUS_FREED
      312  --80  ( ARBITRATION )                                     ARBITRATE
      313  --88  ( SELECTION )                                       SELECTION
      314  --C0  IDENTIFY    O                                       MSG_OUT
      315  --25  READ CAPACITY                                       COMMAND
      316  --00    LUN: O RESERVED: OO RELADR: O                     COMMAND
      317  --00    LOGICAL BLOCK ADDRESS: 00000000                   COMMAND
      321  --00    RESERVED: 0000                                    COMMAND
      323  --00    RESERVED: OO PMI: O                               COMMAND
      324  --00    CONTROL                                           COMMAND
      325  0000  DI: 0000 0003 0021 0012 0000 0000 0002 0000         DATA_IN
      333  --00  GOOD                                                STATUS
      334  --00  COMMAND COMPLETE                                    MSG_IN
      335  --00  ( BUS FREE )                                        BUS_FREED
      336  --80  ( ARBITRATION )                                     ARBITRATE
```

Figure 2–2: Software display format

Control Flow Display Format

The Control Flow display format shows all data transactions for Command, Status, and Message phases.

Figure 2–3 shows an example of the Control Flow display.

```
 Sample  Data  Mnemonics                                       Control

------------------------------------------------------------------------------
   269   --00    PAGE CODE                                      COMMAND
   270   --00    RESERVED                                       COMMAND
   271   --24    ALLOCATION LENGTH                              COMMAND
   272   --00    CONTROL                                        COMMAND
   309   --00  GOOD                                             STATUS
   310   --00  COMMAND COMPLETE                                 MSG_IN
   314   --C0  IDENTIFY    0                                    MSG_OUT
   315   --25  READ CAPACITY                                    COMMAND
   316   --00    LUN: 0 RESERVED: 00 RELADR: 0                  COMMAND
   317   --00    LOGICAL BLOCK ADDRESS: 00000000                COMMAND
   321   --00    RESERVED: 0000                                 COMMAND
   323   --00    RESERVED: 00 PMI: 0                            COMMAND
   324   --00    CONTROL                                        COMMAND
   333   --00  GOOD                                             STATUS
   334   --00  COMMAND COMPLETE                                 MSG_IN
   338   --C0  IDENTIFY    0                                    MSG_OUT
   339   --08  READ(6)                                          COMMAND
   340   --00    LUN: 0 LOGICAL BLOCK ADDRESS: 000000           COMMAND
   343   --01    TRANSFER LENGTH                                COMMAND
   344   --00    CONTROL                                        COMMAND
```

Figure **2–3: Control Flow display format**

Subroutine Display Format

The Subroutine display format shows all data transactions for Command phases.

Figure 2–4 shows an example of the Subroutine display.

```
 Sample  Data  Mnemonics                                       Control

------------------------------------------------------------------------------
   269   --00    PAGE CODE                                      COMMAND
   270   --00    RESERVED                                       COMMAND
   271   --24    ALLOCATION LENGTH                              COMMAND
   272   --00    CONTROL                                        COMMAND
   315   --25  READ CAPACITY                                    COMMAND
   316   --00    LUN: 0 RESERVED: 00 RELADR: 0                  COMMAND
   317   --00    LOGICAL BLOCK ADDRESS: 00000000                COMMAND
   321   --00    RESERVED: 0000                                 COMMAND
   323   --00    RESERVED: 00 PMI: 0                            COMMAND
   324   --00    CONTROL                                        COMMAND
   339   --08  READ(6)                                          COMMAND
   340   --00    LUN: 0 LOGICAL BLOCK ADDRESS: 000000           COMMAND
   343   --01    TRANSFER LENGTH                                COMMAND
   344   --00    CONTROL                                        COMMAND
   873   --00  TEST UNIT READY                                  COMMAND
   874   --00    LUN: 0 RESERVED: 00                            COMMAND
   875   --00    RESERVED: 000000                               COMMAND
   878   --00    CONTROL                                        COMMAND
```

Figure **2–4: Subroutine display format**

Changing How Data is Displayed

There are fields and features that allow you to further modify displayed data to suit your needs. You can make common and optional display selections in the Disassembly property page (the Disassembly Format Definition overlay).

Optional Display Selections

In addition to the common display selections (described in the information on basic operations), you can specify the type of device, by ID number, on the SCSI bus to acquire and display data from; up to eight SCSI devices can be specified.

The SCSI support has six additional fields: Device 0 Type, Device 1 Type, Device 2 Type, Device 3 Type, Device 4, 5 Type, and Device 6, 7 Type. These fields appear in the area indicated in the information on basic operations.

Device 0 Type. You can specify the type of SCSI device to acquire and display data from. The device type selected in this field must match the SCSI device assigned to ID 0 on the bus. Table 2–3 shows the SCSI device types from which you can choose.

Device 1 Type. This field is like the Device 0 Type field except the device type selected must match the SCSI device assigned to ID 1 on the bus.

Device 2 Type. This field is like the Device 0 Type field except the device type selected must match the SCSI device assigned to ID 2 on the bus.

Device 3 Type. This field is like the Device 0 Type field except the device type selected must match the SCSI device assigned to ID 3 on the bus.

Device 4, 5 Type. This field is like the Device 0 Type field except the device types selected must match the SCSI devices assigned to ID 4 and 5 on the bus.

Device 6, 7 Type. This field is like the Device 0 Type field except the device types selected must match the SCSI devices assigned to ID 6 and 7 on the bus.

In the Device Type fields, you can choose to acquire and display data from one of ten different types of SCSI devices (and up to eight devices total). Table 2–3 shows the selections and the SCSI device types the selections represent.

Table 2–3: **SCSI device type selections**

Selection	SCSI device type
Dir Acc	Direct Access device
Seq Acc	Sequential Access device
Printer	Printer device
Proc	Processor device
WORM	Write Once and Read Many times device
CD-ROM	CD-Read Only Memory device
Scanner	Scanner device
Opt Mem	Optical Memory device
Med Chg	Medium Changer device
Comm	Communications device

In the Device 4, 5 Type and Device 6, 7 Type fields, you can select any two of the ten SCSI devices types described in Table 2–3. This includes selecting two devices of the same type assigned to IDs 4 and 5, or to IDs 6 and 7 on the SCSI bus.

Marking Cycles   The disassembler does not have a Mark Cycle function.

Viewing an Example of Disassembled Data

A demonstration system file (or demonstration reference memory) is provided so you can see an example of how your SCSI bus cycles and instruction mnemonics look when they are disassembled. Viewing the system file is not a requirement for preparing the module for use and you can view it without connecting the logic analyzer to your SUT.

Information on basic operations describes how to view the file.

Specifications

This chapter contains the following information:

- Probe adapter description

- Specification tables

- Dimensions of the probe adapter

- Channel assignment tables

- Description of how the module acquires SCSI signals

- List of other accessible SCSI signals and extra acquisition channels

Probe Adapter Description

The probe adapter is a nonintrusive piece of hardware that allows the module to acquire data from one to eight SCSI devices on a SCSI bus in their own operating environment with little effect, if any, on that system. Information on basic operations contains a figure showing the logic analyzer connected to a typical probe adapter. Refer to that figure while reading the following description. Although the SCSI probe adapter is not a typical probe adapter, the probes still attach to pins on the back of the SCSI probe adapter in the same manner.

The SCSI probe adapter consists of a circuit board enclosed in a case with a connector for an interface cable, a jumper (for termination), a jack for the power supply on the front, and probe connection pins on the back. The probe adapter connects to any standard SCSI bus device through one of four standard SCSI interface cables. Signals from the bus-based system flow from the probe adapter to the channel groups and through the probe signal leads to the module.

All circuitry on the probe adapter, except the termination, is powered from the standard power supply. The termination is powered by the TEMPWR signal in your SCSI bus system.

Configuration

There is a jumper on the probe adapter that is used for termination. After connecting the probe adapter to the SCSI bus system, you can position the Termination jumper.

⚠ **CAUTION.** *Termination should not occur more than once. If you have termination in your SCSI bus system and place the Termination jumper in the On position, you may damage the probes, the probe adapter, the SCSI device, and the bus system. To avoid this, use only one termination, either on the probe adapter or in your SCSI bus system, but not in both places.*

The Termination jumper (JR450) is located on the front of the SCSI probe adapter. It should be placed in the On position to enable termination by the probe adapter. When placed in the Off position, termination does not occur on the probe adapter and needs to be made in your SCSI bus system.

If you cannot remove termination from your SCSI bus system, then leave the Termination jumper in the Off position on the probe adapter. The stub length will be 12 inches when the Termination jumper is in the Off position.

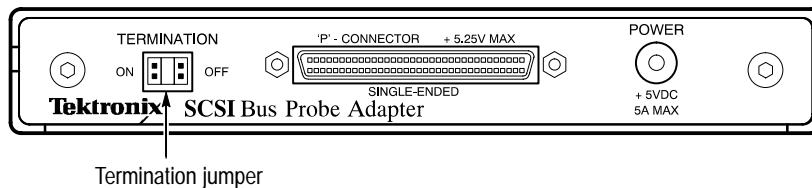Figure 3–1 shows the location of the Termination jumper on the probe adapter.

Figure 3–1: Termination jumper location

Specifications

These specifications are for a probe adapter connected to a compatible Tektronix logic analyzer, and the SUT. Table 3–1 shows the electrical requirements the SUT must produce for the support to acquire correct data.

In Table 3–1, for the 68/102/136-channel module, one podlet load is 20 kΩ in parallel with 2 pF. For the 96-channel module, one podlet load is 100 kΩ in parallel with 10 pF.

Table 3–1: Electrical specifications

Characteristics	Requirements
SUT DC power requirements	
Voltage	4.75-5.25 VDC
Shielded high-density 16-bit interface cable	
Termination on	I max (calculated), 750 mA
Termination off	I max (calculated), 300 μA

Table 3–1: Electrical specifications (cont.)

Characteristics	Requirements	
All other interface cables Termination on	I max (calculated), 500 mA I typ (measured), 115 mA	
Termination off	I max (calculated) 200 μA	
SUT data transfer rate		
SCSI I	Max., 4 Mbyte per second	
SCSI II	Max., 20 Mbyte per second	
Probe adapter power supply requirements		
Voltage	90-265 VAC	
Current	1.1 A maximum at 100 VAC	
Frequency	47-63 Hz	
Power	25 W maximum	
With probe adapter		
Minimum setup time required		
-DB(15):-DB(0), -DB(P), -DB(P1)	0 ns	
Remaining signals[†]	10 ns	
Minimum hold time required		
-DB(15):-DB(0), -DB(P), -DB(P1)	12.5 ns	
Remaining signals[†]	4 ns	
Without probe adapter		
Minimum setup time required		
-RST, -I/O	6.5 ns	
Remaining signals	5 ns	
Minimum hold time required, all signals	0 ns	
	Specification	
Measured typical SUT signal loading	**AC load**	**DC load**
-REQ, -ACK	31 pF	74ABT16244 + 2107A + 10H645
-DB(11):-DB(8)	28 pF	74ABT16244 + 2107A
Remaining signals	26 pF	74ABT16244 + 2107A

*   **With respect to the falling edges of the -REQ and -ACK signals.**

[†]   **With respect to the falling edges of the -REQ, -ACK, -SEL, and -BSY signals.**

Table 3–2 shows the environmental specifications.

Table 3–2: Environmental specification*

Characteristic	Description
Temperature	
Maximum operating	+50° C (+122° F)†
Minimum operating	0° C (+32° F)
Non-operating	–55° C to +75° C (–67° to +167° F)
Humidity	10 to 95% relative humidity
Altitude	
Operating	4.5 km (15,000 ft) maximum
Non-operating	15 km (50,000 ft) maximum
Electrostatic immunity	The probe adapter is static sensitive

* **Designed to meet Tektronix standard 062-2847-00 class 5.**

† **Not to exceed SCSI bus thermal considerations. Forced air cooling might be required across the CPU.**

Table 3–3 shows the certifications and compliances that apply to the probe adapter.

Table 3–3: Certifications and compliances

EC Compliance	There are no current European Directives that apply to this product.
Pollution Degree 2	Do not operate in environments where conductive pollutants might be present.

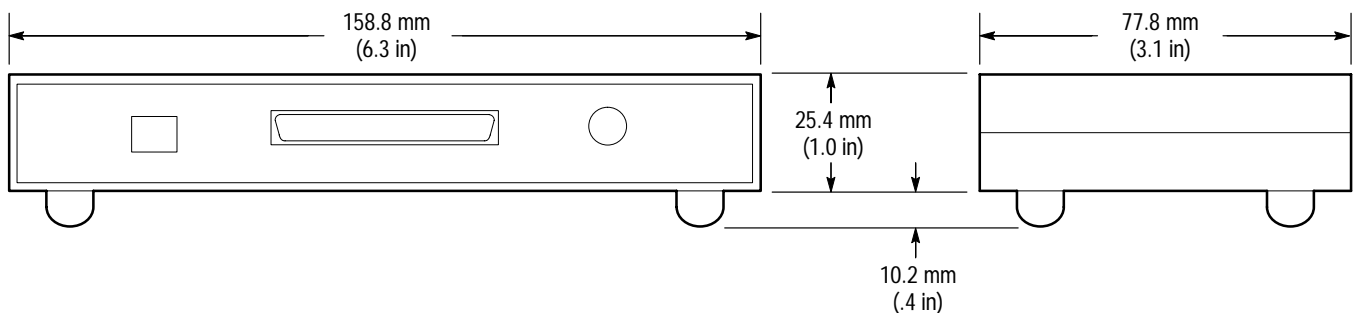Figure 3–2 shows the dimensions of the probe adapter.

Figure 3–2: Dimensions of the probe adapter

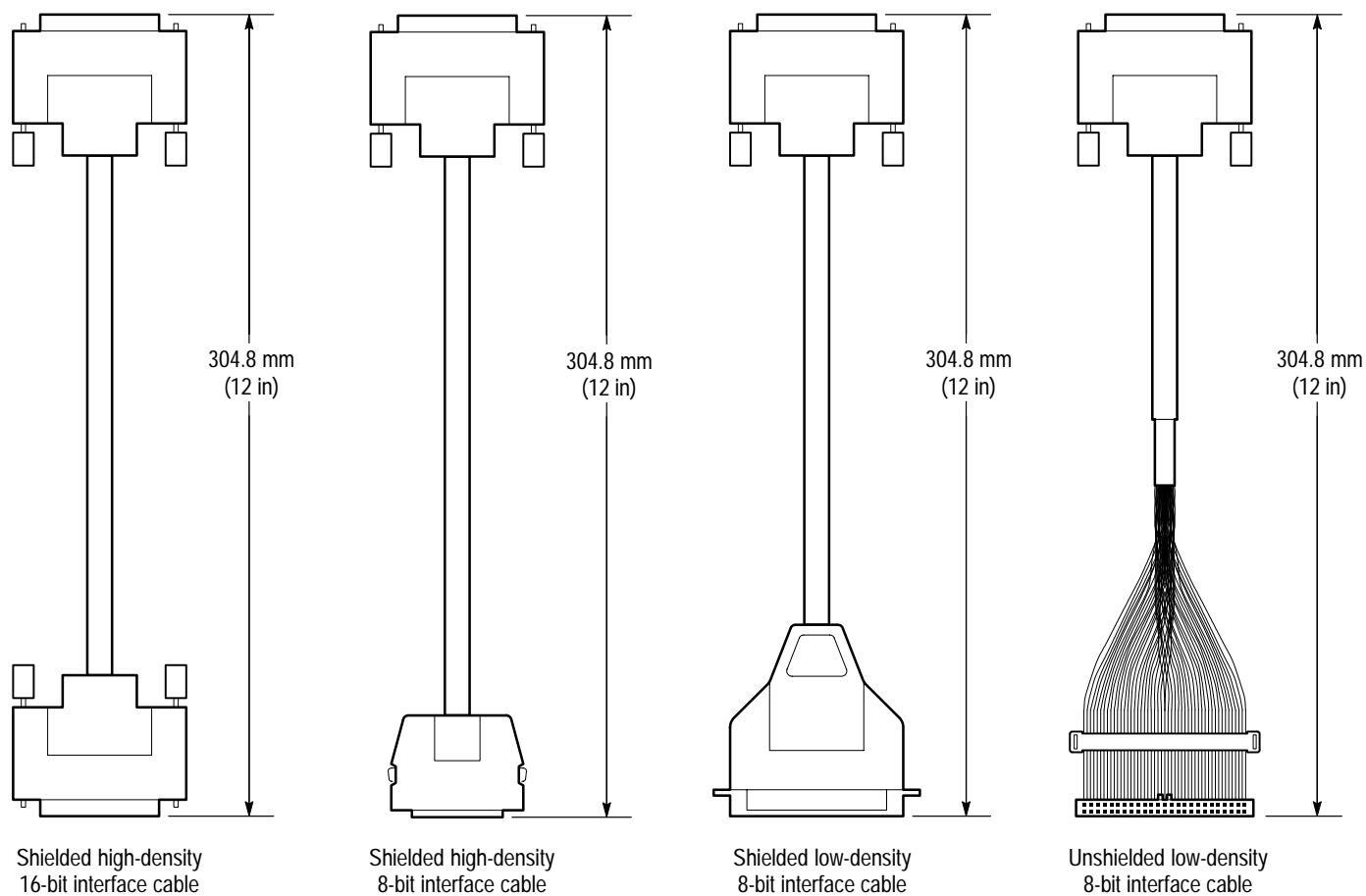Figure 3–3 shows the length of the standard SCSI interface cables.

| 304.8 mm (12 in) | 304.8 mm (12 in) | 304.8 mm (12 in) | 304.8 mm (12 in) |

Shielded high-density 16-bit interface cable   Shielded high-density 8-bit interface cable   Shielded low-density 8-bit interface cable   Unshielded low-density 8-bit interface cable

Figure 3–3: Length of SCSI interface cables

Channel Assignments

Channel assignments shown in Table 3–4 through Table 3–8 use the following conventions:

■ All signals are required by the support unless indicated otherwise.

■ Channels are shown starting with the most significant bit (MSB) descending to the least significant bit (LSB).

■ An asterisk (*) following a signal name or a minus sign (-) preceding a signal name indicates an active low signal.

■ An equals sign (=) following a signal name indicates that it is double probed.

Interface cables are named after the various types of SCSI port connectors to which one end of the cable can connect. The cables are the following:

- Shielded, high-density 16-bit

- Shielded, high-density 8-bit

- Shielded, low-density 8-bit

- Unshielded, low-density 8-bit

Table 3–4 shows the probe section and channel assignments for the Data group, and the bus signal to which each channel connects. By default, this channel group is displayed in hexadecimal.

Table 3–4: Data group channel assignments

Bit order	Section: channel	Interface cable contact point (pin)				SCSI bus signal name	Displayed signal name[†]
		Shielded, high-density 16-bit	Shielded, high-density 8-bit	Shielded, low-density 8-bit	Unshielded, low-density 8-bit		
15	D1:7	38	none	none	none	-DB(15)	D15_B
14	D1:6	37	none	none	none	-DB(14)	D14_B
13	D1:5	36	none	none	none	-DB(13)	D13_B
12	D1:4	35	none	none	none	-DB(12)	D12_B
11	D1:3	68	none	none	none	-DB(11)	D11_B
10	D1:2	67	none	none	none	-DB(10)	D10_B
9	D1:1	66	none	none	none	-DB(9)	D9_B
8	D1:0	65	none	none	none	-DB(8)	D8_B
7	D0:7	47	33	33	16	-DB(7)	D7_B
6	D0:6	46	32	32	14	-DB(6)	D6_B
5	D0:5	45	31	31	12	-DB(5)	D5_B
4	D0:4	44	30	30	10	-DB(4)	D4_B
3	D0:3	43	29	29	8	-DB(3)	D3_B
2	D0:2	42	28	28	6	-DB(2)	D2_B
1	D0:1	41	27	27	4	-DB(1)	D1_B
0	D0:0	40	26	26	2	-DB(0)	D0_B

[†]   **If you are not using the probe adapter, these signals will not be buffered and the _B will not appear in the display.**

Table 3–5 shows the probe section and channel assignments for the Control group, and the bus signal to which each channel connects. By default, this channel group is displayed symbolically.

Do not use this table to connect the probes to the SUT if you are not using the probe adapter.

Table 3–5: Control group channel assignments

Bit order	Section: channel	Interface cable contact point (pin)				SCSI bus signal name	Displayed signal name[†]
		Shielded, high-density 16-bit	Shielded, high-density 8-bit	Shielded, low-density 8-bit	Unshielded, low-density 8-bit		
9	C3:3	none	none	none	none	none	BSY_D*[‡]
8	C2:7	57	43	43	36	-BSY	BSY_BBB*
7	C3:0	61	47	47	44	-SEL	SEL_BB*
6	C3:1	55	41	41	32	-ATN	ATN_B*
5	C3:2	60	46	46	42	-MSG	MSG_B*
4	C2:0[§]	62	48	48	46	-C/D	C*_D_B
3	C2:1	64	50	50	50	-I/O	I*_O_B
2	C2:2	63	49	49	48	-REQ	REQ_B*
1	C2:3	58	44	44	38	-ACK	ACK_B*
0	C2:6[¶]	59	45	45	40	-RST	RST_B*

[†] If you are not using the probe adapter, these signals will not be buffered and the _B will not appear in the display.

[‡] This signal is generated on the probe adapter. If you are not using the probe adapter, this signal will not be present in this channel group or in the display.

[§] If you are not using the probe adapter, connect this channel to the -RST signal on the SCSI bus. The displayed signal name will be RST*.

[¶] If you are not using the probe adapter, connect this channel to the -C/D signal on the SCSI bus. The displayed signal name will be C*_D.

Table 3–6 shows the probe section and channel assignments for the Parity group, and the bus signal to which each channel connects. By default, this channel group is not visible.

Table 3–6: Parity group channel assignments

Bit order	Section: channel	Interface cable contact point (pin)				SCSI bus signal name	Displayed signal name[†]
		Shielded, high-density 16-bit	Shielded, high-density 8-bit	Shielded, low-density 8-bit	Unshielded, low-density 8-bit		
1	C2:4	39	none	none	none	-DB(P1)	D_P1_B
0	C2:5	48	34	34	18	-DB(P)	D_P_B

[†] **If you are not using the probe adapter, these signals will not be buffered and the _B will not appear in the display.**

Table 3–7 shows the probe section and channel assignments for the clock probes (not part of any group), and the SCSI signal to which each channel connects.

Data is logged in on the falling edge of REQ*_ACK*, the falling edge of SEL_BB*=, the rising edge of BSY_D*, or the falling edge of BSY_D*.

Table 3–7: Clock channel assignments

Section: channel	Clock or Qualifier	SCSI bus signal name	Displayed signal name
CK:3	CLK	none	REQ*_ACK*
CK:2	CLK & QUAL	-SEL	SEL_BB*=
CK:1	QUAL	-RST	RST_B*=
CK:0	CLK & QUAL	-BSY	BSY_D*=

These channels are used only to clock in data; they are not acquired or displayed. To acquire data from any of the signals shown in Table 1–3, you must connect another channel probe to the signal, a technique called double probing. An equals sign (=) following a signal name indicates that it is already double probed.

Table 3–8 shows the probe section and channel assignments for the clock probes (not part of any group), and the SCSI signal to which each channel connects when the probe adapter is not used.

Data is logged in on the falling edge of -ACK, the falling edge of -SEL, the falling edge of -REQ, the rising edge of -BSY, or the falling edge of -BSY.

Table 3–8: SCSI signal connections for clock probes without a probe adapter

Section: channel	Clock or Qualifier	SCSI bus signal name	Displayed signal name
CK:3	CLK & QUAL	-ACK	ACK*=
CK:2	CLK & QUAL	-SEL	SEL*=
CK:1	CLK & QUAL	-REQ	REQ*=
CK:0	CLK & QUAL	-BSY	BSY*=

These channels are used only to clock in data; they are not acquired or displayed. To acquire data from any of the signals shown in Table 1–3, you must connect another channel probe to the signal, a technique called double probing. An equals sign (=) following a signal name indicates that it is already double probed.

How Data is Acquired

This part of this chapter explains how the module acquires SCSI signals using the TMS 802 software and probe adapter. This part also provides additional information on bus signals accessible on or not accessible on the probe adapter, and on extra acquisition channels available for you to use for additional connections.

Custom Clocking

A special clocking program is loaded to the module every time you select the SCSI support. This special clocking is called Custom.

With Custom clocking, the module logs in signals from multiple groups of channels at different times when they are valid on the SCSI bus. The module then sends all the logged-in signals to the trigger machine and to the acquisition memory of the module for storage.

In Custom clocking, the module clocking state machine (CSM) generates one master sample for each SCSI bus cycle, no matter how many clock cycles are contained in the bus cycle.

Figure 3–4 shows the sample points and master sample points when acquiring SCSI bus data using the TMS 802 probe adapter.

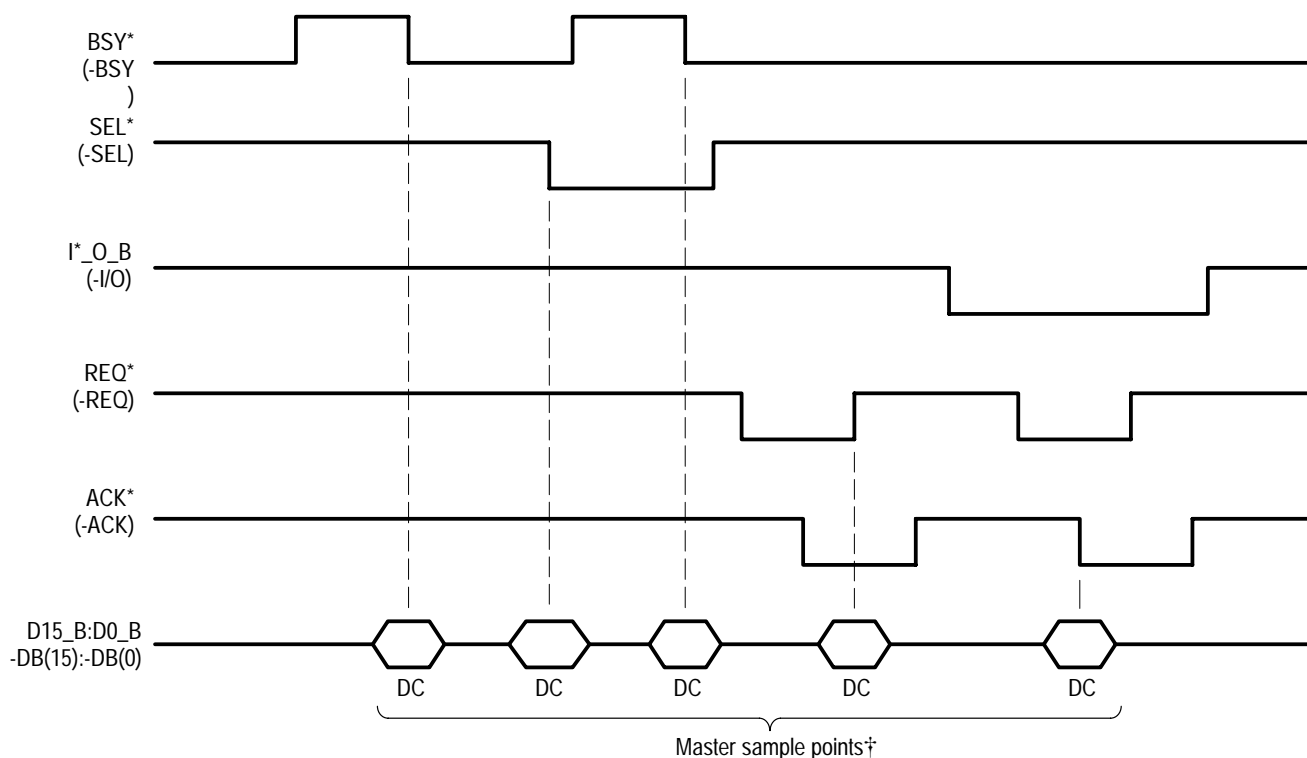DC represents the sample point for the Data, Control, and Parity group signals.
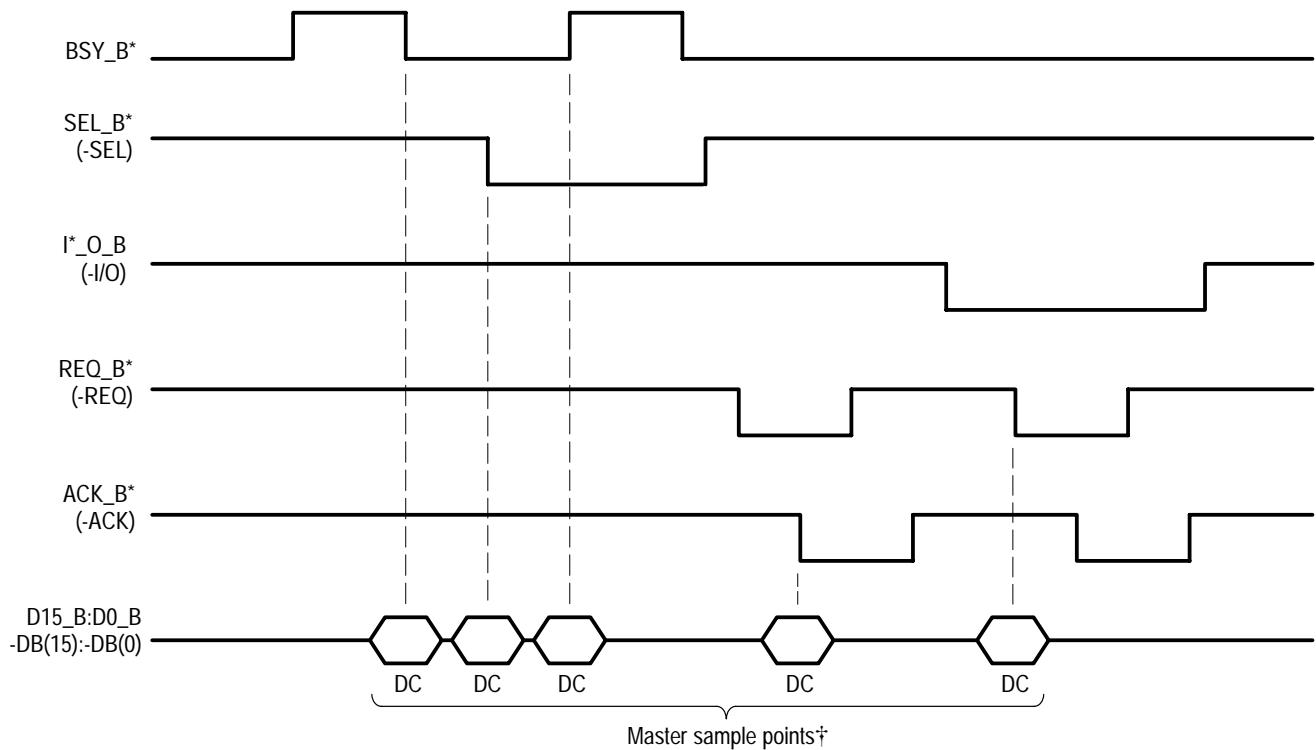
†Channels not set up in a channel group by the TMS 802 software are logged with the Master samples.

Figure 3–4: SCSI bus timing using the probe adapter

Figure 3–5 shows the sample points and master sample points when acquiring SCSI bus data without using the TMS 802 probe adapter.

DC represents the sample point for the Data, Control, and Parity group signals.

†Channels not set up in a channel group by the TMS 802 software are logged with the Master samples.

Figure 3–5: SCSI bus timing without using the probe adapter

Clocking Options   The clocking algorithm for the SCSI support has two variations: Noise Filtered and Noise Unfiltered.

Noise Filtered. Valid cycles are acquired, and glitches and illegal cycles are ignored when you select Noise Filtered.

Noise Unfiltered. All cycles are acquired when you select Noise Unfiltered, including valid bus cycles, cycles occurring as the result of glitches, or illegal conditions caused by unrecognizable bus behavior. .

Alternate SCSI Bus Signal Connections

You can connect to bus signals that are not required by the support so you can do more advanced timing analysis.

For a list of signals required or not required for disassembly, refer to the channel assignment tables beginning on page 3–5. Remember that these channels are already included in a channel group. If you do connect these channels to other signals, you should set up another channel group for them.

Signals On the Probe Adapter All SCSI bus signals are accessible on the probe adapter.

Extra Channels Table 3–9 lists extra sections and channels that are left after you have connected all the probes used by the support. You can use these extra channels to make alternate SUT connections.

Table 3–9: Extra module sections and channels

Module	Section: channels
68-channels	A3:7-0, A2:7-0, A1:7-0, A0:7, C3:7-4
96-channels	A3:7-0, A2:7-0, A1:7-0, A0:7, C3:7-4, D3:7-0, D2:7-0
102-channels	A3:7-0, A2:7-0, A1:7-0, A0:7, C3:7-4, D3:7-0, D2:7-0, QUAL:1–0
136-channels	A3:7-0, A2:7-0, A1:7-0, A0:7, C3:7-4, D3:7-0, D2:7-0, E3:7-0, E2:7-0, E1:7-0, E0:7-0, QUAL:3-0

These channels are not defined in any channel group and data acquired from them is not displayed. To display data, you will need to define a channel group.

Maintenance

This section contains information on the following topics:

- Probe adapter circuit description

- How to replace a fuse

Probe Adapter Circuit Description

The probe adapter is a circuit board enclosed in a case with the following external connections: SCSI interface cable connector, power supply jack, Termination jumper, and probe pins. The circuit board contains a tracking PAL, two buffers (74ABT16244), two multiplexers (10H645), and three active terminators (2107A). An external power supply provides +5 V to the probe adapter.

The buffers reduce the AC and DC loading placed on the SCSI bus system and multiplexers are used to select the correct clock edge on which to log in data.

The terminators improve signal quality. The TEMPWR signal in your bus system provides power to the terminators.

The PAL tracks the -SEL and -BSY signals in the SCSI bus system to determine when to log in valid cycles. The external power supply provides power to the PAL, buffers, and multiplexers.

Replacing Signal Leads

Information on basic operations describes how to replace signal leads (individual clock and channel probes).

Replacing the Fuse

If the fuse on the SCSI probe adapter board opens (burns out), you can replace it with a 5 Amp, 125 V fuse. To replace the fuse, refer to Figure 4–1 and follow these steps:

1. Remove the four feet from the underside of the probe, and set aside the screws and cover of the probe case.

2. Remove the four screws from the front panel and set aside the front panel.

3. Remove the two screws from the back panel and set aside the back panel.

4. Remove the two screws from the topside of the circuit board.

5. Remove the circuit board and, from the back of the board, unsolder the fuse.

6. Install a new 5 A, 125 V fuse.

7. Reassemble the probe adapter by reversing the steps used to take it apart.

1 Remove 4 feet and top cover

2 Remove 4 screws

3 Remove 2 screws

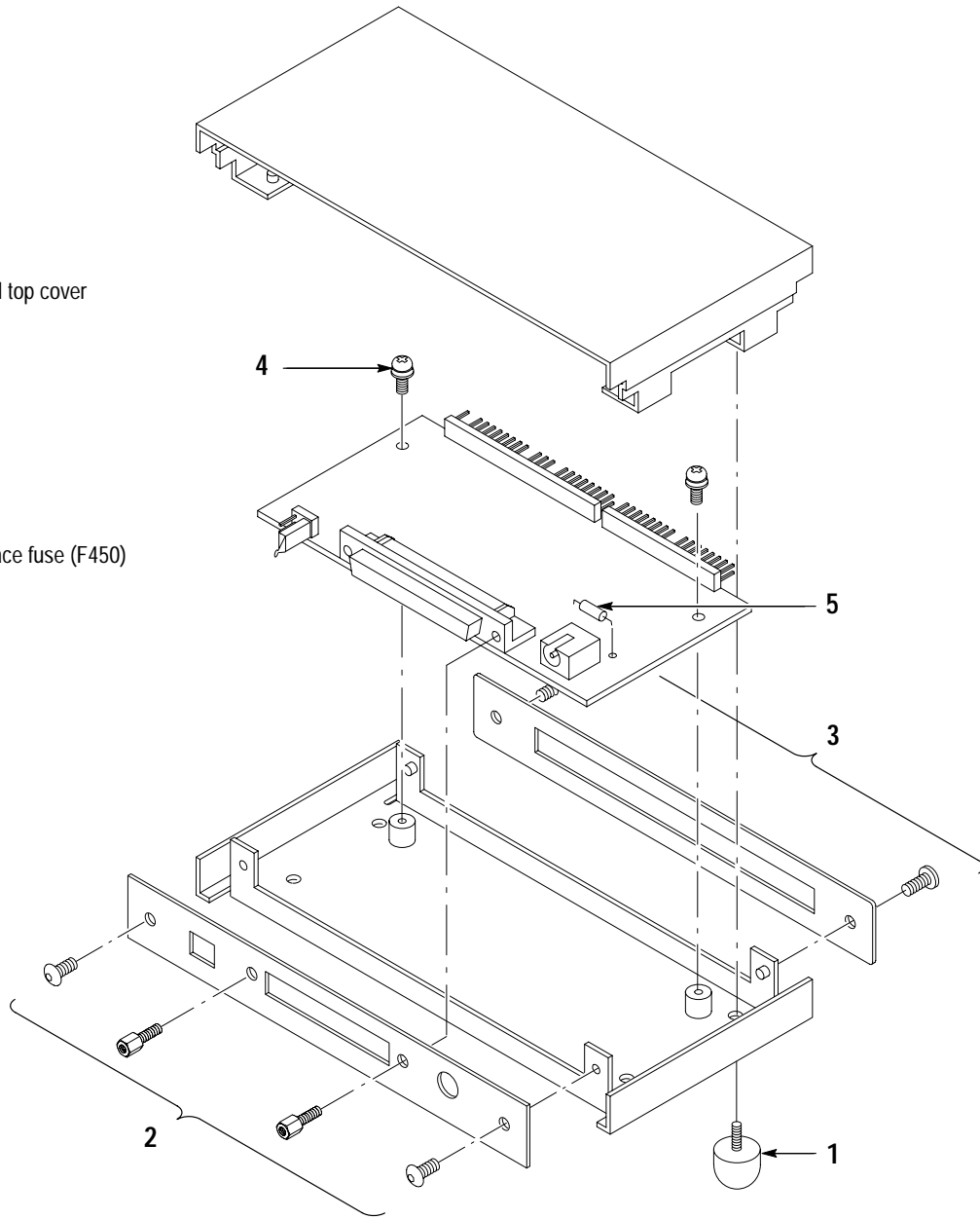**4** Remove 2 screws

5 Unsolder and replace fuse (F450)

Figure 4–1: Removing the fuse

Replaceable Electrical Parts

This chapter contains a list of the replaceable electrical components for the TMS 802 SCSI bus support. Use this list to identify and order replacement parts.

Parts Ordering Information

Replacement parts are available through your local Tektronix field office or representative.

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

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

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

Change information, if any, is located at the rear of this manual.

Using the Replaceable Electrical Parts List

The tabular information in the Replaceable Electrical Parts List is arranged for quick retrieval. Understanding the structure and features of the list will help you find all of the information you need for ordering replacement parts. The following table describes each column of the electrical parts list.
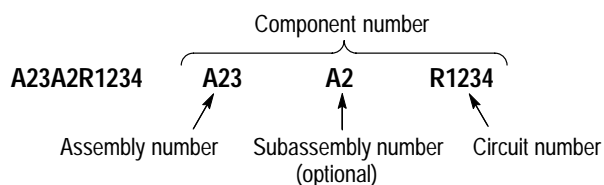
Parts list column descriptions

Column	Column name	Description
1	Component number	The component number appears on diagrams and circuit board illustrations, located in the diagrams section. Assembly numbers are clearly marked on each diagram and circuit board illustration in the *Diagrams* section, and on the mechanical exploded views in the *Replaceable Mechanical Parts* list section. The component number is obtained by adding the assembly number prefix to the circuit number (see Component Number illustration following this table). The electrical parts list is arranged by assemblies in numerical sequence (A1, with its subassemblies and parts, precedes A2, with its subassemblies and parts). Chassis-mounted parts have no assembly number prefix, and they are located at the end of the electrical parts list.
2	Tektronix part number	Use this part number when ordering replacement parts from Tektronix.
3 and 4	Serial number	Column three indicates the serial number at which the part was first effective. Column four indicates the serial number at which the part was discontinued. No entry indicates the part is good for all serial numbers.
5	Name & description	An item name is separated from the description by a colon (:). Because of space limitations, an item name may sometimes appear as incomplete. Use the U.S. Federal Catalog handbook H6-1 for further item name identification.
6	Mfr. code	This indicates the code number of the actual manufacturer of the part.
7	Mfr. part number	This indicates the actual manufacturer's or vendor's part number.

Abbreviations   Abbreviations conform to American National Standard ANSI Y1.1–1972.

Component Number

Component number

A23A2R1234   **A23**   **A2**   **R1234**

Assembly number   Subassembly number   Circuit number
(optional)

Read: Resistor 1234 (of Subassembly 2) of Assembly 23

List of Assemblies   A list of assemblies is located at the beginning of the electrical parts list. The assemblies are listed in numerical order. When a part's complete component number is known, this list will identify the assembly in which the part is located.

Chassis Parts   Chassis-mounted parts and cable assemblies are located at the end of the Replaceable Electrical Parts List.

Mfr. Code to Manufacturer Cross Index   The table titled Manufacturers Cross Index shows codes, names, and addresses of manufacturers or vendors of components listed in the parts list.

Manufacturers cross index

Mfr. code	Manufacturer	Address	City, state, zip code
TK0875	MATSUO ELECTRONICS INC	831 S DOUBLAS ST	EL SEGUNDO CA 92641
TK2058	TDK CORPORATION OF AMERICA	1600 FEEHANVILLE DRIVE	MOUNT PROSPECT, IL 60056
TK2427	A/D ELECTRONIC	2121 17TH AVE SE	BOTHELL WA 97021
0B0A9	DALLAS SEMICONDUCTOR CORP	4350 BELTWOOD PKWY SOUTH	DALLAS TX 75244
00779	AMP INC	2800 FULLING MILL PO BOX 3608	HARRISBURG PA 17105
01295	TEXAS INSTRUMENTS INC SEMICONDUCTOR GROUP	13500 N CENTRAL EXPY PO BOX 655303	DALLAS TX 75262–5303
04222	AVX/KYOCERA DIV OF AVX CORP	19TH AVE SOUTH P O BOX 867	MYRTLE BEACH SC 29577
04713	MOTOROLA INC SEMICONDUCTOR PRODUCTS SECTOR	5005 E MCDOWELL RD	PHOENIX AZ 85008–4229
50434	HEWLETT–PACKARD CO OPTOELECTRONICS DIV	370 W TRIMBLE RD	SAN JOSE CA 95131–1008
53387	3M COMPANY ELECTRONIC PRODUCTS DIV	3M AUSTIN CENTER	AUSTIN TX 78769–2963
61857	SAN–0 INDUSTRIAL CORP	91–3 COLIN DRIVE	HOLBROOK NY 11741
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077–0001
91637	DALE ELECTRONICS INC	2064 12TH AVE PO BOX 609	COLUMBUS NE 68601–3632

Replaceable electrical parts list

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A01	671–3097–00			CIRCUIT BD ASSY:SCSI 1&2,PROBE ADAPTER;	80009	671309700
A01C109	283–5004–00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	TK2058	C3216X7R1E104K–
A01C121	283–5187–00			CAP,FXD,CERAMIC:MLC;15PF,5%,100V,NPO,1206	04222	12061A0150JAT1A
A01C122	283–5004–00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	TK2058	C3216X7R1E104K–
A01C130	283–5004–00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	TK2058	C3216X7R1E104K–
A01C131	283–5004–00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	TK2058	C3216X7R1E104K–
A01C140	283–5004–00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	TK2058	C3216X7R1E104K–
A01C150	283–5004–00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	TK2058	C3216X7R1E104K–
A01C200	283–5004–00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	TK2058	C3216X7R1E104K–
A01C211	283–5004–00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	TK2058	C3216X7R1E104K–
A01C310	283–5004–00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	TK2058	C3216X7R1E104K–
A01C320	290–5027–00			CAP,FXD,ELCTLT:2.2UF,20%,20V	04222	TAJBZ25M020
A01C321	290–5017–00			CAP,FXD,TANT:4.7UF,20%,20V,6.0MM X 3.2MM;60 32,SMD	04222	TAJC475M020R
A01C322	283–5004–00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	TK2058	C3216X7R1E104K–
A01C330	290–5027–00			CAP,FXD,ELCTLT:2.2UF,20%,20V	04222	TAJBZ25M020
A01C331	290–5017–00			CAP,FXD,TANT:4.7UF,20%,20V,6.0MM X 3.2MM;60 32,SMD	04222	TAJC475M020R
A01C332	283–5004–00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	TK2058	C3216X7R1E104K–
A01C340	290–5027–00			CAP,FXD,ELCTLT:2.2UF,20%,20V	04222	TAJBZ25M020
A01C341	290–5017–00			CAP,FXD,TANT:4.7UF,20%,20V,6.0MM X 3.2MM;60 32,SMD	04222	TAJC475M020R
A01C342	283–5004–00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	TK2058	C3216X7R1E104K–
A01C350	290–5005–00			CAP,FXD,TANT:47UF,10%,10V,5.8MM X 4.6MM	TK0875	267M–1002–476–K
A01CR100	152–5045–00			DIODE,SIG:SCHTKY;20V,1.2PF,24 OHM	50434	HSMS–2810–T31
A01CR101	152–5045–00			DIODE,SIG:SCHTKY;20V,1.2PF,24 OHM	50434	HSMS–2810–T31
A01CR109	152–5045–00			DIODE,SIG:SCHTKY;20V,1.2PF,24 OHM	50434	HSMS–2810–T31
A01CR120	152–5045–00			DIODE,SIG:SCHTKY;20V,1.2PF,24 OHM	50434	HSMS–2810–T31
A01CR121	152–5045–00			DIODE,SIG:SCHTKY;20V,1.2PF,24 OHM	50434	HSMS–2810–T31
A01CR208	152–5045–00			DIODE,SIG:SCHTKY;20V,1.2PF,24 OHM	50434	HSMS–2810–T31
A01CR210	152–5045–00			DIODE,SIG:SCHTKY;20V,1.2PF,24 OHM	50434	HSMS–2810–T31
A01CR211	152–5045–00			DIODE,SIG:SCHTKY;20V,1.2PF,24 OHM	50434	HSMS–2810–T31
A01F450	159–0194–00			FUSE,WIRE LEAD:5A,125V,0.125 SEC,	61857	SP5–5A LEAD TAP
A01J120	131–5268–00			CONN,HDR:PCB;MALE,RTANG,2 X 40,0.1CTR,0.235 MLG X 0.110 TAIL,30 GOLD	53387	2480–5122–TB
A01J150	131–5268–00			CONN,HDR:PCB;MALE,RTANG,2 X 40,0.1CTR,0.235 MLG X 0.110 TAIL,30 GOLD	53387	2480–5122–TB

Replaceable electrical parts list (cont.)

Component number	Tektronix part number	Serial no. effective	Serial no. discont'd	Name & description	Mfr. code	Mfr. part number
A01J400	131–5268–00			CONN,HDR:PCB;MALE,RTANG,2 X 40,0.1CTR,0.235 MLG X 0.110 TAIL,30 GOLD	53387	2480–5122–TB
A01J430	131–5725–00			CONN,DSUB MINI:PCB,FEMALE,RTANG,68 POS, 0.05 INSERTS,BD RETENTION,SCSI 3;	00779	750737–7
A01JR450	131–5148–00			JACK,POWER DC:PCB;MALE,RTANG,2.0 MM DIA PIN,7 MM H X 3.3 MM TAIL,3COND,W/SWITCH,MTG POST,DC PWR JACK,1 AMP@12V	TK2427	ADC–016
A01R121	321–5006–00			RES,FXD:THICK FILM;100 OHM,1%,0.125W,TC=100 PPM;1206	91637	CRCW120618R2FT
A01U110	160–9735–00			IC,DIGITAL:CMOS,PLD;EEPLD,16L8,15NS,90MA,PRGM 156–5564–00	80009	160–9735–00
A01U200	156–6759–00			IC,DIGITAL:TTL,DRIVER;1–TO–9 TTL CLOCK DRIVER, INTERNAL ECL	04713	MC10H645FN
A01U220	156–6697–00			IC,DIGITAL:ABTCMOS,BUFFER;16–BIT,3–STATE	01295	SN74ABT16244ADL
A01U230	156–6697–00			IC,DIGITAL:ABTCMOS,BUFFER;16–BIT,3–STATE	01295	SN74ABT16244ADL
A01U310	156–6759–00			IC,DIGITAL:TTL,DRIVER;1–TO–9 TTL CLOCK DRIVER, INTERNAL ECL	04713	MC10H645FN
A01U320	156–6760–00			IC,LINEAR:TERMINATOR;9–BIT SCSI TERMINATOR ,WITH THERMAL SHUTDOWN	0B0A9	DS2107AS
A01U330	156–6760–00			IC,LINEAR:TERMINATOR;9–BIT SCSI TERMINATOR ,WITH THERMAL SHUTDOWN	0B0A9	DS2107AS
A01U340	156–6760–00			IC,LINEAR:TERMINATOR;9–BIT SCSI TERMINATOR ,WITH THERMAL SHUTDOWN	0B0A9	DS2107AS

Replaceable Mechanical Parts

This chapter contains a list of the replaceable mechanical components for the TMS 802 SCSI bus support. Use this list to identify and order replacement parts.

Parts Ordering Information

Replacement parts are available through your local Tektronix field office or representative.

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

- Part number

- Instrument type or model number

- Instrument serial number

- Instrument modification number, if applicable

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

Change information, if any, is located at the rear of this manual.

Using the Replaceable Mechanical Parts List

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

Parts list column descriptions

Column	Column name	Description
1	Figure & index number	Items in this section are referenced by figure and index numbers to the exploded view illustrations that follow.
2	Tektronix part number	Use this part number when ordering replacement parts from Tektronix.
3 and 4	Serial number	Column three indicates the serial number at which the part was first effective. Column four indicates the serial number at which the part was discontinued. No 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.
8	Mfr. part number	This indicates the actual manufacturer's or vendor's part number.

Abbreviations Abbreviations conform to American National Standard ANSI Y1.1–1972.

Chassis Parts Chassis-mounted parts and cable assemblies are located at the end of the Replaceable Electrical Parts List.

Mfr. Code to Manufacturer Cross Index The table titled Manufacturers Cross Index shows codes, names, and addresses of manufacturers or vendors of components listed in the parts list.

Manufacturers cross index

Mfr. code	Manufacturer	Address	City, state, zip code
TK0428	DLB INDUSTRIES		FRESNO CA
TK0435	LEWIS SCREW CO	4300 S. RACINE AVE	CHICAGO IL 60609–3320
TK1690	EAGLE INDUSTRIES	115 E SHERMAN ST	NEWBERG OR 97132
TK2427	A/D ELECTRONIC	2121 17TH AVE SE	BOTHELL WA 97021
0B445	ELECTRI–CORD MFG CO INC	312 EAST MAIN ST	WESTFIELD PA 16950
00779	AMP INC	2800 FULLING MILL PO BOX 3608	HARRISBURG PA 17105
1Y013	DEANCO, ACACIA DIVISION	3101 SW 153RD DRIVE	BEAVERTON OR 97006
14310	AULT INC	7300 BOONE AVENUE NORTH	MINNEAPOLIS MN 55428
26742	METHODE ELECTRONICS INC	7447 W WILSON AVE	CHICAGO IL 60656–4548
53387	3M COMPANY ELECTRONIC PRODUCTS DIV	3M AUSTIN CENTER	AUSTIN TX 78769–2963
61857	SAN–0 INDUSTRIAL CORP	91–3 COLIN DRIVE	HOLBROOK NY 11741
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077–0001

Replaceable mechanical parts list

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
1–1	380–1078–00			1	HOUSING,HALF:UPPER	80009	380107800
–2	–––– –––			1	CONN,HDR:PCB,;MALE,RTANG,2 X 40,0.1CTR, 0.235 MLG X 0.110 TAIL,30 GOLD (SEE REPL J120,J150,J400)		
–3	––– ––––			1	FUSE,WIRE LEAD:5A,125V,0.125 SEC, (SEE REPL F450)		
–4	––– ––––			1	JACK,POWER DC:PCB,;MALE,RTANG,2.0 MM DIAPIN,7 MM H X 3.3 MM TAIL,3COND,W/SWITCH, MTG POST,DC PWR JACK,1 AMP@12V (SEE REPL JR450)		
–5	333–4129–00			1	PANEL,REAR:SCSI 1 & 2 PROBE ADAPTER,ALUM	80009	333412900
–6	211–0626–00			4	SCREW,CAP:6–32 X 0.312,BTN HD,STL,BKOXD	TK0428	ORDER BY DESC
–7	348–0048–00			4	FOOT,CAMERA:BLACK VINYL W/6–32 STUD	80009	348004800
–8	213–1087–00			2	SPACER,POST:0.562 L,W/4–40 THD 0.405 L,2–56 INT THD,0.157 STAND O.157 STANDOFF,ACCOM SCSI CONNECTOR,SST;	00779	749087–1
–9	333–4128–00			1	PANEL,FRONT:SCSI 1 & 2 PROBE ADAPTER, ALUM	80009	333412800
–10	380–1079–00			1	HOUSING,HALF:LOWER	80009	380107900
–11	––– ––––			1	CONN,RCPT,ELEC:FIBER OPTIC,DIN 47256 BRASS ALLOY (SEE REPL J430)		
–12	131–4356–00			1	CONN,SHUNT:SHUNT/SHORTING,;FEMALE,1 X2,0.1CTR,0.630 H,BLK,W/HANDLE,JUMPER (P400)	26742	9618–302–50
–13	671–3097–00			1	CIRCUIT BD ASSY:SCSI 1&2,PROBE ADAPTER;	80009	671309700
–14	211–0658–00			4	SCR,ASSEM WSHR	TK0435	17691–300
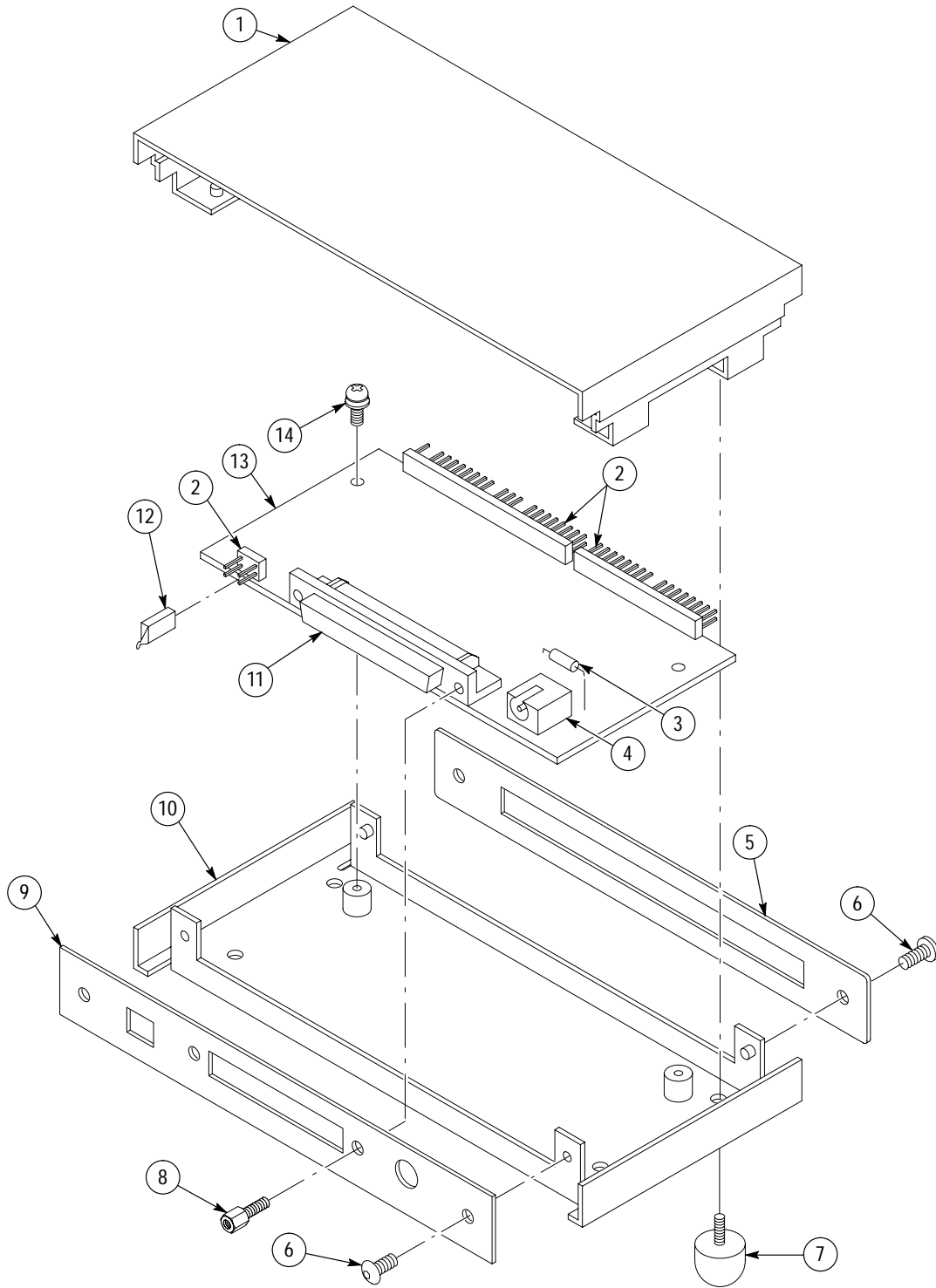
Figure 1: SCSI probe adapter exploded view

Replaceable mechanical parts list

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
					STANDARD ACCESSORIES		
2–1	012–1453–00			1	CA ASSY,SP:TW FLAT,SCSI III;CPR,25,TWPR,28 AWG,12.0 L,2 X 25,0.1 CTR,RCPT,W/PULL TAB X 2 X25,0.1 CTR,MALE X 68 POS,MI	1Y013	012–1453–00
–2	012–1454–00			1	CABLE INTCON:SHLD CMPST,SCSI;CPR/MLD, 25TW PR,12.0 L,50 POS,0.085 CTR,RIBBON,MALE X 68 POS,MINID,SCSI III	1Y013	012–1454–00
–3	012–1455–00			1	CABLE INTCON:SHLD CMPST,SCSI;CRC/MLD, 25TW PR,12.0 L,68 POS,MINID,0.05 X 0.1 CTR,SCSI III X 50 POS,MINID,SCSI II	1Y013	012–1455–00
–4	012–1456–00			1	CA ASSY,INTCON:SHLD CMPST,SCSI III;CRC, 30AWG,12.0 L,34 TWPR,68 POS,MINID,W/THUMB SCREWS,MALE BOTH ENDS	1Y013	012–1456–00
	070–9835–00			1	MANUAL,TECH:INSTRUCTION,SCSI,DISSASEMBLER, TMS 802	80009	070–9835–00
	070–9803–00			1	MANUAL, TECH:TLA 700 SERIES MICRO SUPPORT INSTALLATION	80009	070–9803–00
	119–5061–01			1	POWER SUPPLY:25W,5V 5A,CONCENTRIC 2MM,90–265V,47–63HZ (NOT SHOWN)	14310	SW106KA002F01
	161–0104–00			1	CA ASSY,PWR:3,18 AWG,98 L,250V/10AMP,98 INCH, RTANG,IEC320,RCPT X STR,NEMA 15–5P,W/CORD GRIP	S3109	ORDER BY DE-SCRIPTION
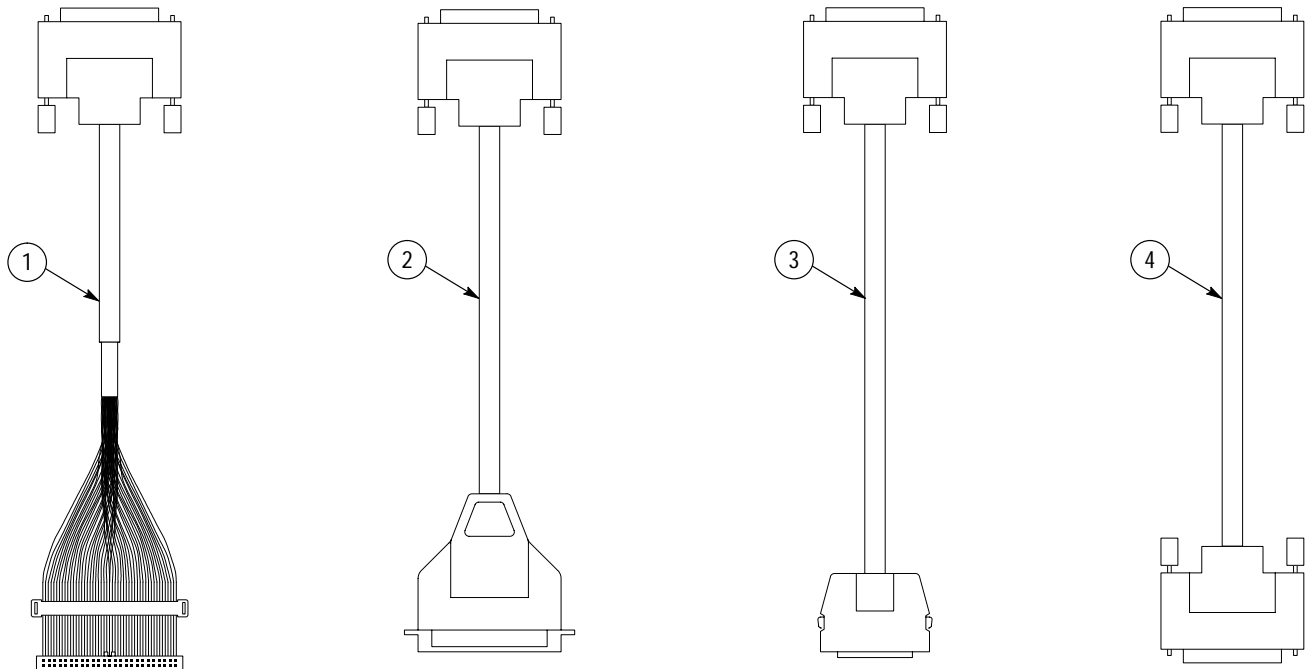
Figure 2: SCSI interface cables

Replaceable mechanical parts list

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
					OPTIONAL ACCESSORIES		
	070–9802–00			1	MANUAL, TECH:BASIC OPS MICRO SUP ON DAS/TLA 500 SERIES LOGIC ANALYZERS	80009	070–9802–00
	161–0104–06			1	CA ASSY,PWR:3,1.0MM SQ,250V/10AMP,2.5 METER, RTANG,IEC320,RCPT, EUROPEAN,SAFETY CONTROLLED (OPT A1)	S3109	ORDER BY DE-SCRIPTION
	161–0104–07			1	CA ASSY,PWR:3,1.0MM SQ,240V/10AMP,2.5 METER, RTANG,IEC320,RCPT X 13A, FUSED, UK PLUG, (13A FUSE), UNITED KINGDOM,SAFETY CONTROL (OPT A2)	S3109	ORDER BY DE-SCRIPTION
	161–0104–05			1	CA ASSY,PWR:3,1.0MM SQ,250V/10AMP,2.5 METER, RTANG,IEC320,RCPT, AUSTRALIA,SAFETY CONTROLLED (OPT A3)	S3109	ORDER BY DE-SCRIPTION
	161–0167–00			1	CA ASSY,PWR:3,0.75MM SQ,250V/10AMP,2.5 METER, RTANG,IEC320,RCPT, SWISS,NO CORD GRIP, SAFETY CONTROLLED (OPT A5)	S3109	ORDER BY DE-SCRIPTION

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