Instructions

Tektronix

SIU 800
Static Isolation Unit

070-8066-02

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 the Safety Summary prior to performing service.

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 one (1) year from the date of shipment. If any such product proves defective during this warranty period, Tektronix, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

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.

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Safety Summary

The safety information in this summary is for both operating and servicing personnel. Specific warnings and cautions will be found throughout the manual where they apply, but may not appear in this summary.

Terminology

CAUTION statements in manuals identify conditions or practices that could result in damage to the equipment or other property.

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

CAUTION on equipment means a personal injury hazard not immediately accessible as one reads the marking, or a hazard to property, including the equipment itself.

DANGER on equipment means a personal injury hazard immediately accessible as one reads the marking.

Symbols

Static Sensitive Devices

DANGER
High Voltage

Protective ground (earth) terminal

ATTENTION
Refer to manual

General Information

The Static Isolation Unit (hereafter referred to as SIU) is a two-channel device that protects sensitive sampling head input circuitry from harmful static discharge.

The SIU is installed between the DUT (Device Under Test) and sampling head and is controlled by a foot switch. When the foot switch is in the normal position (not pressed), the DUT is grounded through a 50 Ω termination resistor. This will discharge any static charge stored in the DUT. Pressing the foot switch connects the DUT to the sampling head input allowing a measurement to be made. Both channels switch simultaneously when the foot switch is pressed.

The SIU will **not** protect the sampling head input from static discharge while the foot switch is pressed. Example: If you want to touch a transmission line on a circuit board to identify the location of a discontinuity, you **must** be grounded through a wrist strap or similar device.

To use the SIU, you will need two 50 Ω coaxial cables with SMA compatible connectors. In addition to your normal DUT cables or probes, we recommend you use Tektronix part number 015-0560-00. The quality of the coaxial cables is important for meeting performance specifications. You also need two 50 Ω terminations (Tektronix part number 015-1022-00) which are supplied with the SIU.

Power is supplied to the SIU using a 12 V DC power supply

The SIU contains the following components and assemblies:

1. the Static Isolation Unit
2. a 12 V DC power supply
3. two SMA MF adaptors
4. a foot switch
5. two 50 Ω terminations

Installation

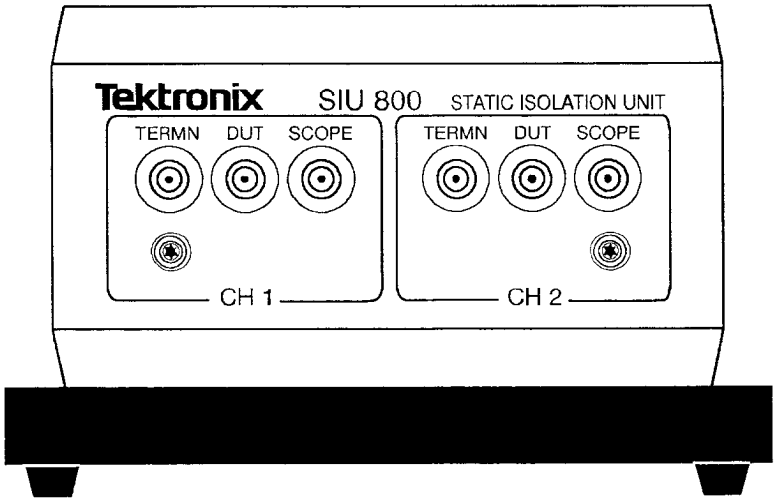
This section contains information for installing the SIU. The procedures are:

- Connecting the SIU's power supply and foot switch, or using a TTL source in place of the foot switch
- Checking the performance.
- Connecting coaxial cables between the SIU, scope and DUT.

Front and Rear Panel Connections

The following illustrates front and rear panel connections for the SIU.

Front Panel



Rear Panel

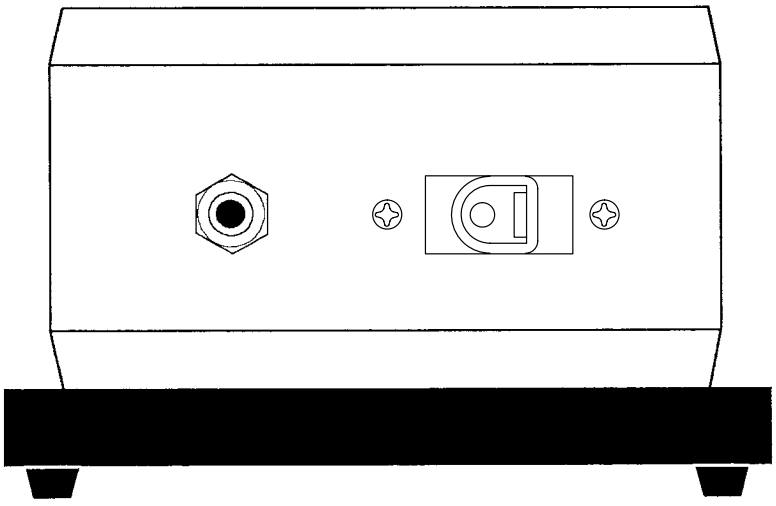


***Figure 1** — Front and Rear Panel Connections*

Connecting the Power Supply and Foot Switch

This procedure describes how to connect the SIU's power supply and foot switch.

☐ Step 1: Connect the 12 VDC power supply between the SIU's multi-pin power connector and a 110 VAC receptacle. Optional power supplies are available for Asia and Europe.

☐ Step 2: Connect the foot switch cable to the foot switch or TTL input connector.

Note: *A single microphone jack is supplied with the unit. It is intended for use in connecting a TTL driver to the SIU-800 in place of the foot switch.*

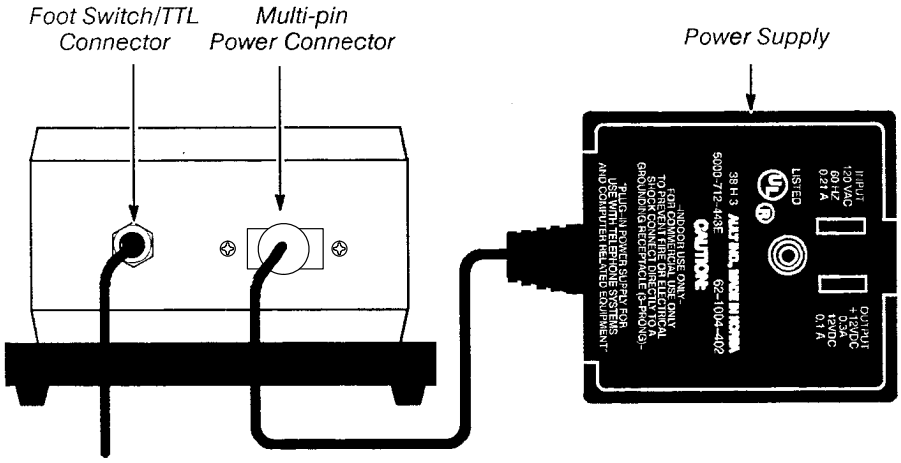


Figure 2 *— Power Supply and Foot Switch/TTL Connections*

Using a TTL Source in place of the Foot Switch

A TTL source can be used in place of the foot switch by performing the following procedure:

☐ Step 1: Disconnect the foot switch cable from the foot switch or TTL input connector.

☐ Step 2: Using the microphone jack supplied with the SIU, Tektronix part number 134-0079-00, connect a cable from the foot switch plug to a TTL drive card (supplied by user).

☐ Step 3: Activate with TTL low (< .8 V @ 5 mA).

Functional Check

Required test equipment:

- Sampling oscilloscope with TDR capability (Tektronix 11800 or CSA 803 with SD 24).
- SMA – male short circuit termination (Tektronix part number 015-1020-00).
- SMA – male 50 Ω termination (Tektronix part number 015-1022-00).

Check 1

Step 1: Set up the scope for TDR operation (see oscilloscope operators manual).

Vertical: 400 mρ/div

Horizontal: 1 ns/div

Step 2: Connect a coaxial cable from the sampling head input to the connector labeled SCOPE on the SIU and connect a 50 Ω termination to the connector labeled DUT on the SIU. Remove any devices from the connector labeled TERMN.

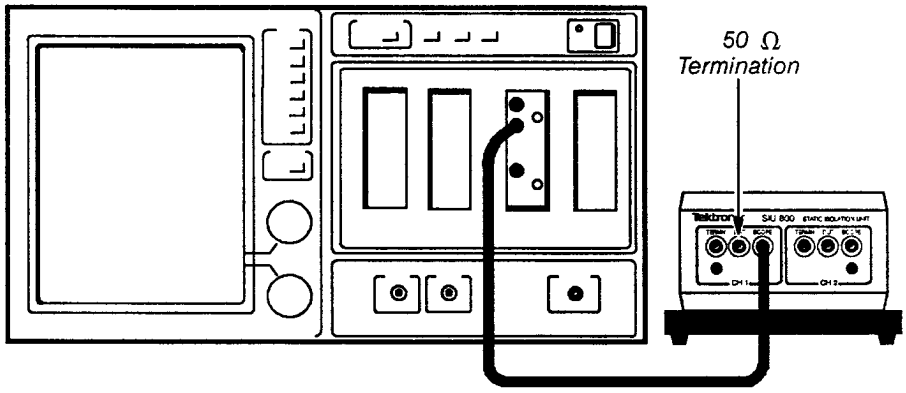


***Figure 3** – Setup Connections*

Step 3: With the foot switch in its normal position (not pressed), locate the reflection from the open circuit end of the cable on the displayed TDR waveform (see Fig. 4).

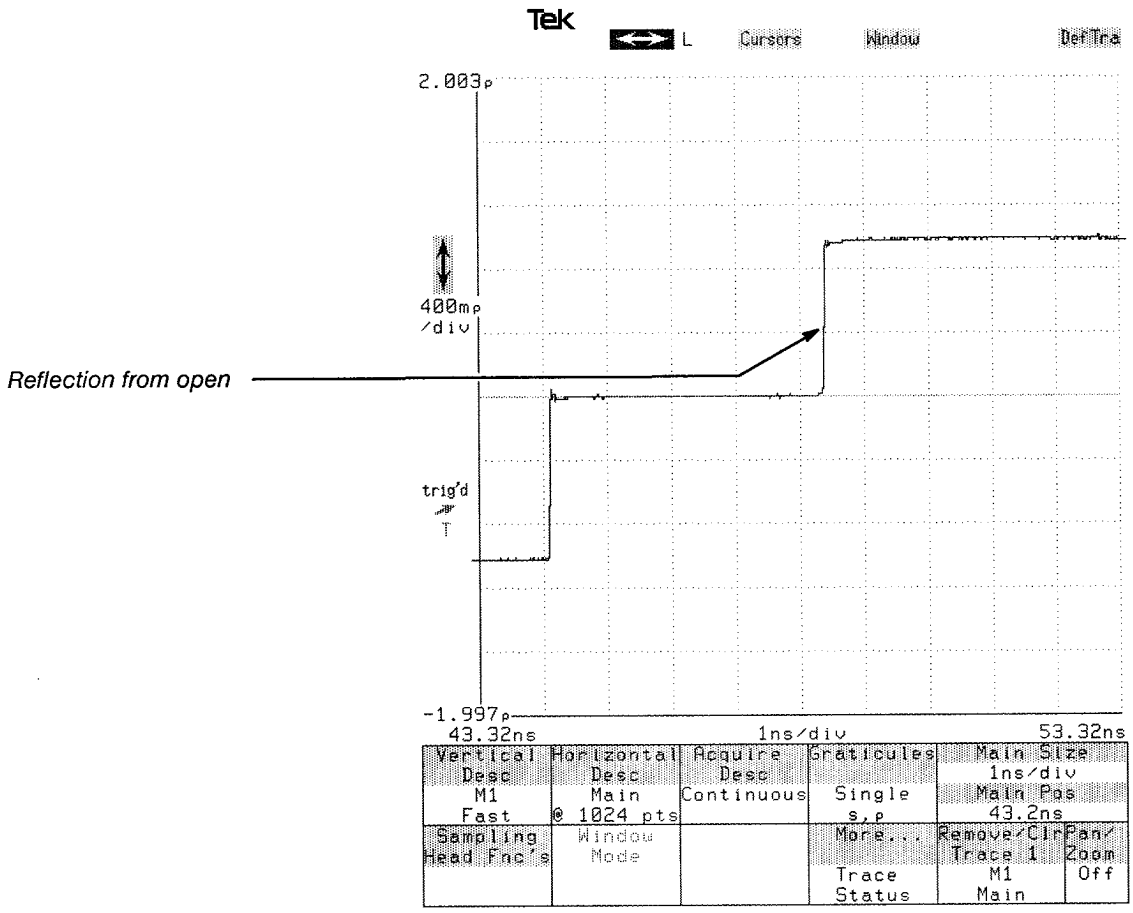


***Figure 4** — Foot Switch in Normal Position (not pressed)*

Step 4: Press the foot switch and verify the cable is now terminated in 50 Ω (see Fig. 5). The reflection from the open circuitry should disappear leaving a flat pulse top after the incident step.

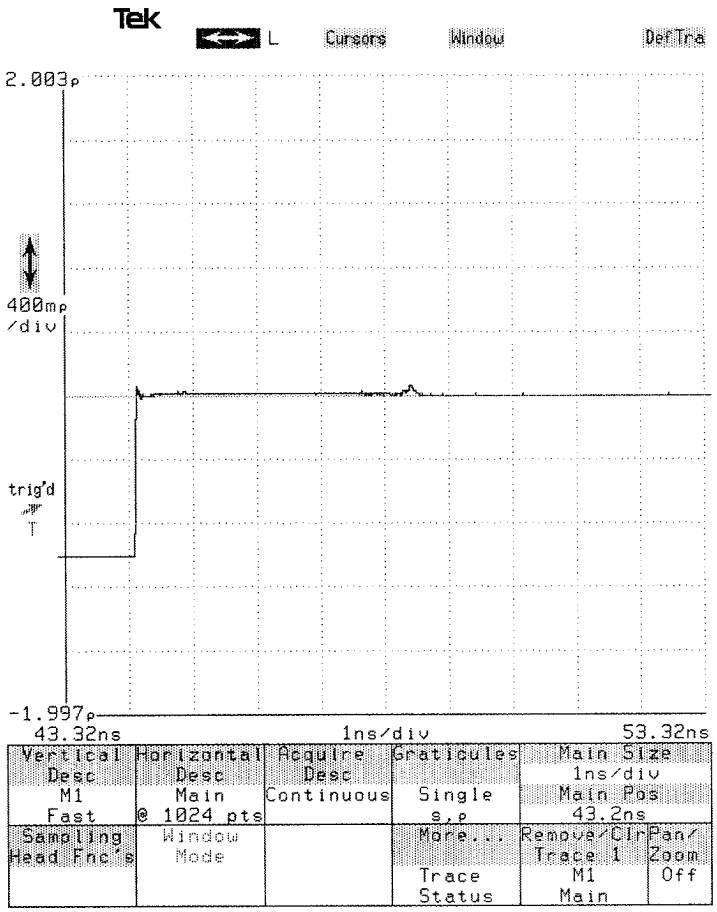


***Figure 5** — Foot Switch Pressed, Cable Terminated in 50 Ω*

Step 5: Repeat steps 1 through 4 for the second channel.

Check 2

Step 1: Set up the scope for TDR operation (see oscilloscope operators manual), with vertical size set to 400 mρ/div and horizontal size set to 1 ns/div.

Step 2: Connect a coaxial cable from the sampling head input to the connector labeled DUT on the SIU and connect a 50 Ω termination to the connector labeled TERMN.

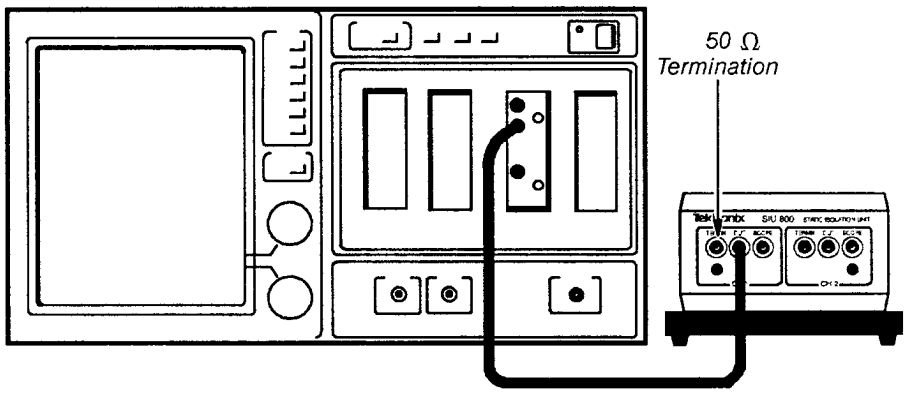


***Figure 6** — Setup Connections*

Step 3: Press the foot switch and find the open circuit end of the cable on the oscilloscope display (see Fig. 7).

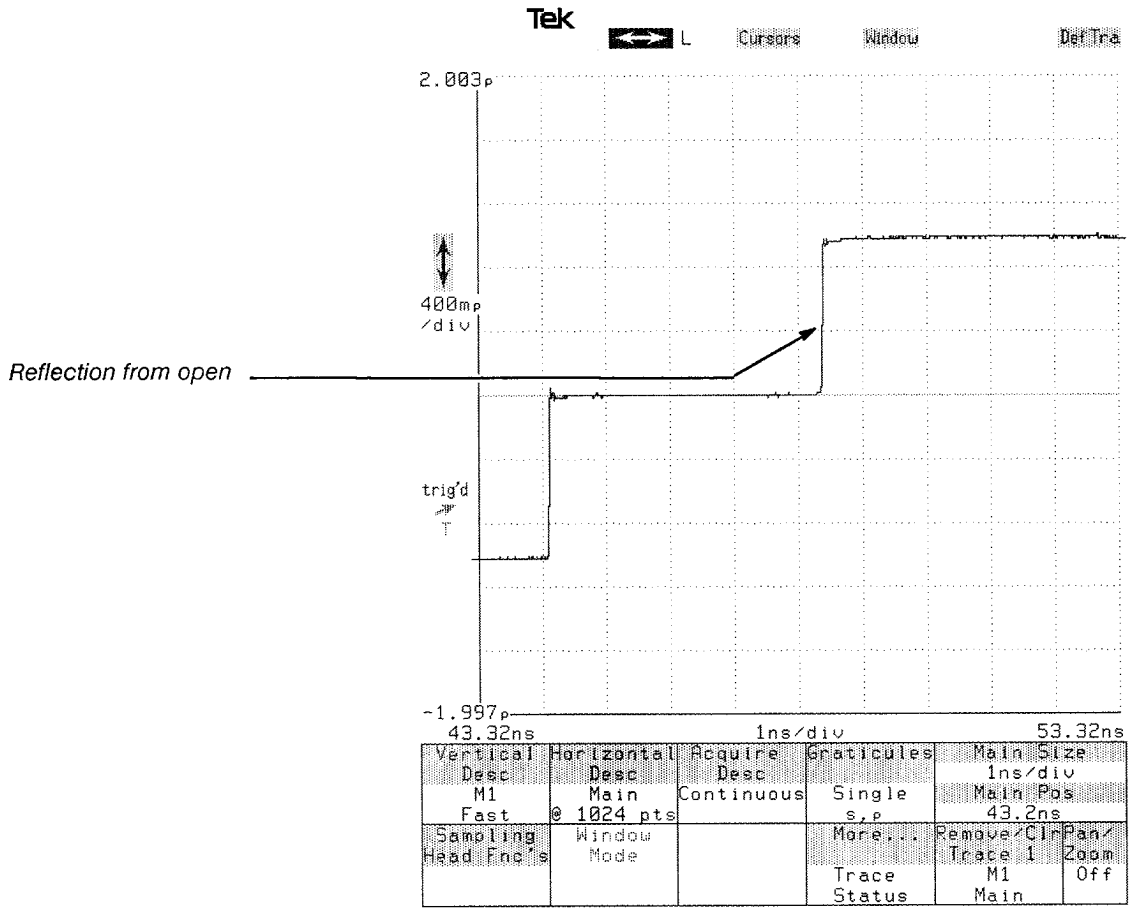


Figure 7 *— Foot Switch Pressed*

Step 4: Release the foot switch and verify that the cable is now terminated in 50 Ω (see Fig. 8).

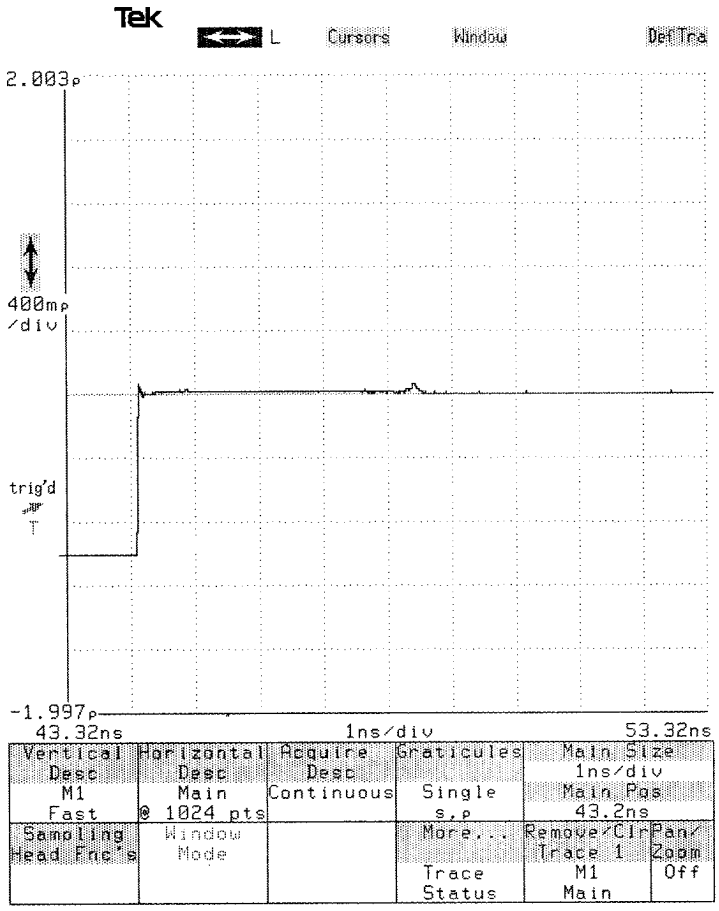


***Figure 8** — Foot Switch in Normal Position (not pressed), Cable Terminated in 50 Ω*

Step 5: Repeat steps 1 through 4 for the second channel.

Connecting Coaxial Cables and Terminations

This procedure describes how to connect the SIU's coaxial cables and terminations.

Step 1: If the 50 Ω terminations (Tektronix part number 015-1022-00) are not attached to both TERMN connectors on the SIU, attach them before performing the following tasks.

Step 2: Attach a coaxial cable (Tektronix part number 015-0560-00) from the SIU connector labeled SCOPE (CH 1) to the sampling head input connector (CH 1).

Step 3: If you require both channels, connect a second coaxial cable from the SIU connector labeled SCOPE (CH 2) to the sampling head input connector (CH 2).

Step 4: Attach a coaxial cable or probe from the SIU connector labeled DUT (CH 1) to the DUT's CH 1 input connector.

Step 5: Attach another coaxial cable or probe from the SIU connector labeled DUT (CH 2) to the DUT's CH 2 input connector.

Note: *A 50 Ω termination must be installed to discharge static that may be present in the DUT. When the foot switch is pressed, both channels are connected to their respective DUT's. In the normal position (not pressed), both channels are connected to the 50 Ω terminations.*

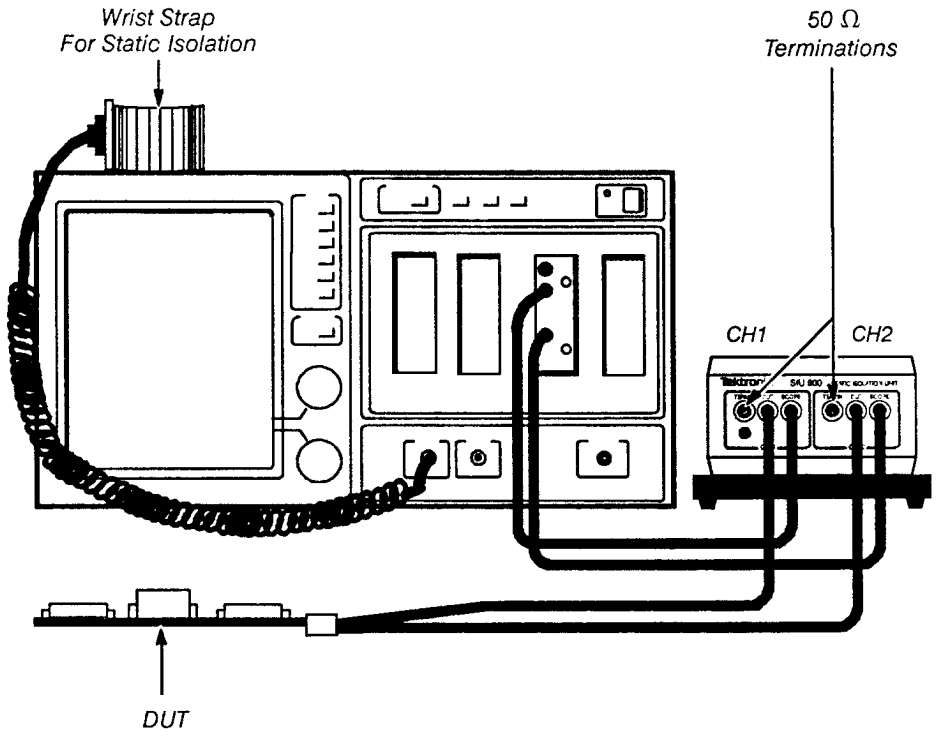


Figure 9 *— Connecting Coaxial Cables and Terminations*

Performance Verification

Performance Verification

Required test equipment:

- Sampling oscilloscope with TDR capability (Tektronix 11800 or CSA 803 with SD 24).
- SMA – male short circuit termination (Tektronix part number 015-1020-00).
- SMA – female-female adapter (Tektronix part number 015-1012-00).
- SMA – male 50 Ω termination (Tektronix part number 015-1022-00).

Reflected Rise Time

Specification limit: $t_r \leq \sqrt{(20\ ps)^2 + (t_{TDR})^2}$ where t_{TDR} is the reflected rise time of the TDR system.

☐ Step 1: Set up the oscilloscope for TDR operation (see oscilloscope operators manual).

Vertical: 400 mρ/div

Horizontal: 1ns/div

☐ Step 2: Connect a coaxial cable from the sampling head input to the connector on the SIU labeled SCOPE. Connect a short circuit termination to the connector on the SIU labeled DUT.

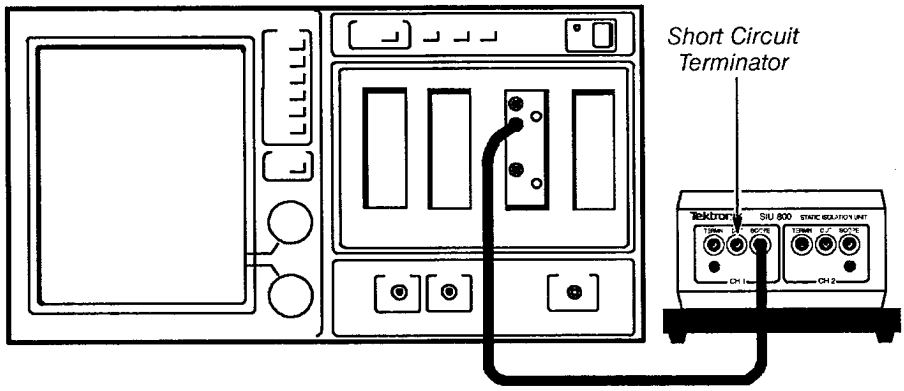


Figure 10 *– Setup Connections*

Step 3: Press the foot switch and locate the falling edge reflection from the short circuit termination on the TDR waveform display by using the oscilloscope's horizontal position control (see Fig. 11).

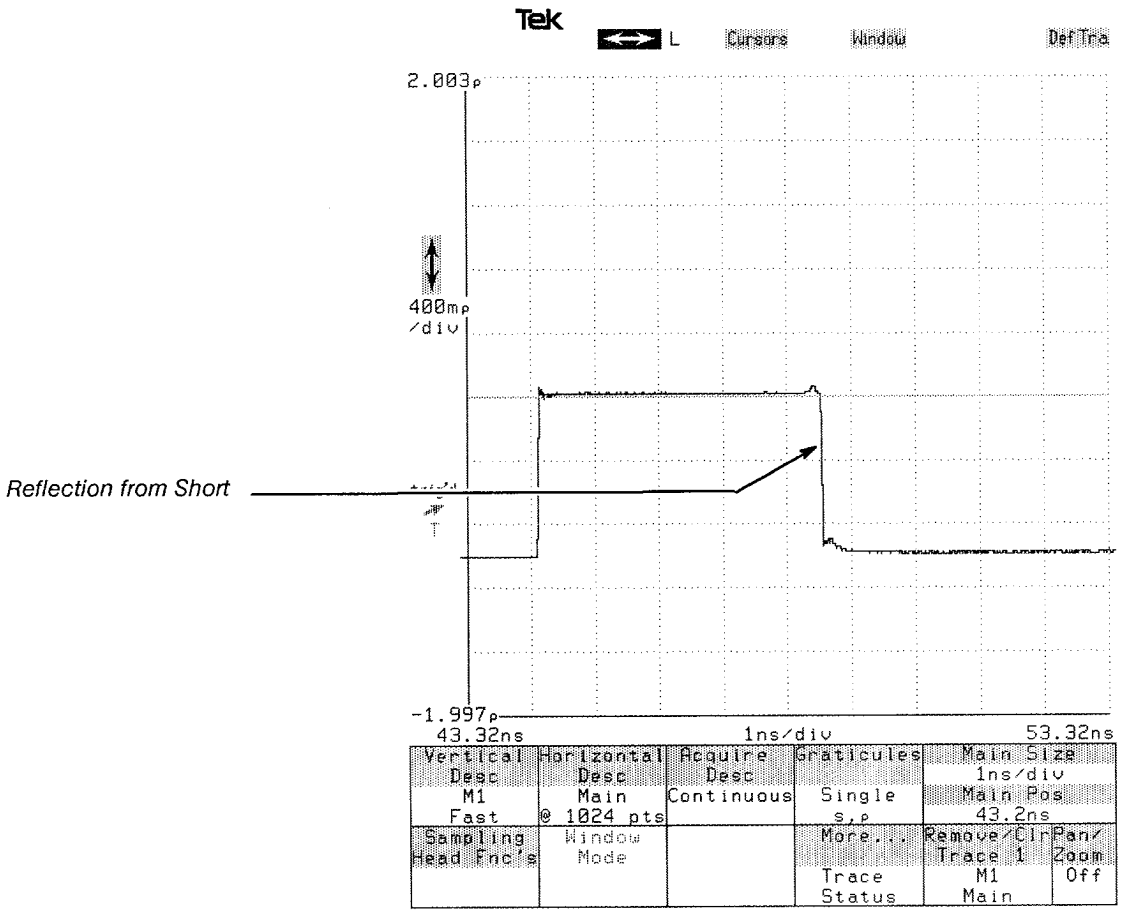


***Figure 11** — Foot Switch Pressed*

Step 4: Using the ***Main Size*** and ***Position*** knobs on the oscilloscope, position the falling edge of the waveform to the center of the display with the horizontal ***Time/Div*** set to 50 ps/div.

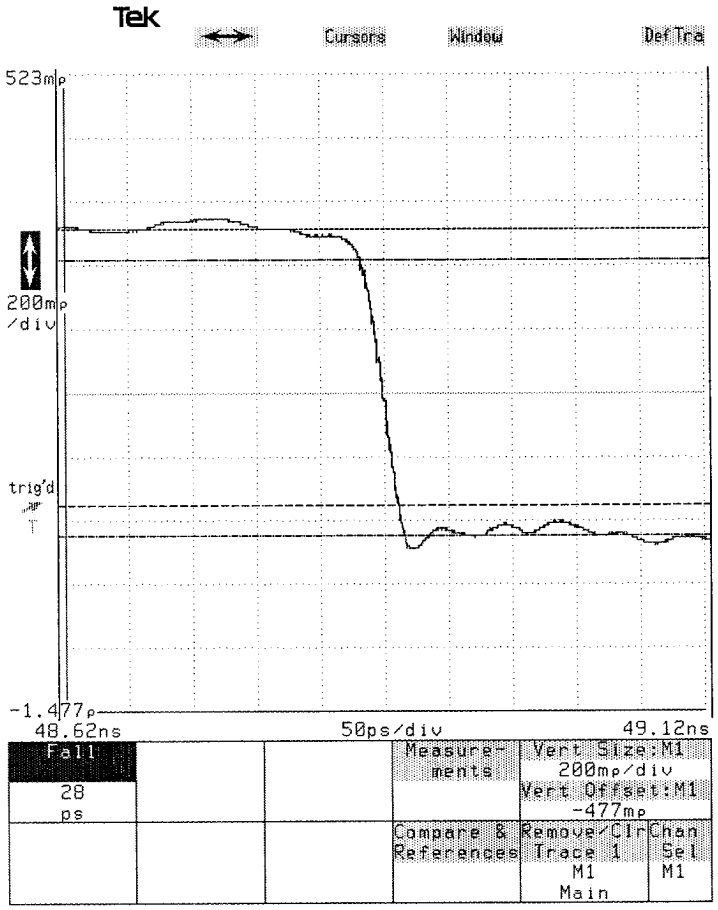


Figure 12 — *Measuring Fall Time, Foot Switch Pressed*

Step 5: Set the vertical size to 200 mρ/div.

Step 6: Measure the fall time (90% to 10%) and write it down for later use.

Step 7: Disconnect the cable from the connector on the SIU labeled SCOPE. Connect the female to female adapter to the cable and the short circuit termination to the adapter.

Step 8: Position the falling edge of the waveform in the center of the display and measure the fall time (90% to 10%). This is the TDR system refelected rise time (t_{TDR}).

Step 9: Compute the specification limit $t_{spec} = \sqrt{(20\ ps)^2 + (t_{TDR})^2}$. The measured reflected rise time through the SIU should be less than the calculated specification limit.

Step 10: Repeat steps 1 through 6 for the second channel.

Input Reflection Coefficient

Specification limit: Maximum reflection $\leq \pm 80$ mρ when measured with a 35 ps rise time TDR system.

Step 1: Set up the oscilloscope for TDR operation (see oscilloscope operators manual).

Vertical: 400 mρ/div

Horizontal: 1ns/div

Step 2: Connect a coaxial cable from the sampling head input to the connector on the SIU labeled SCOPE. Connect the 50 Ω termination to the connector on the SIU labeled DUT. Remove any device from the connector on the SIU labeled TERMN.

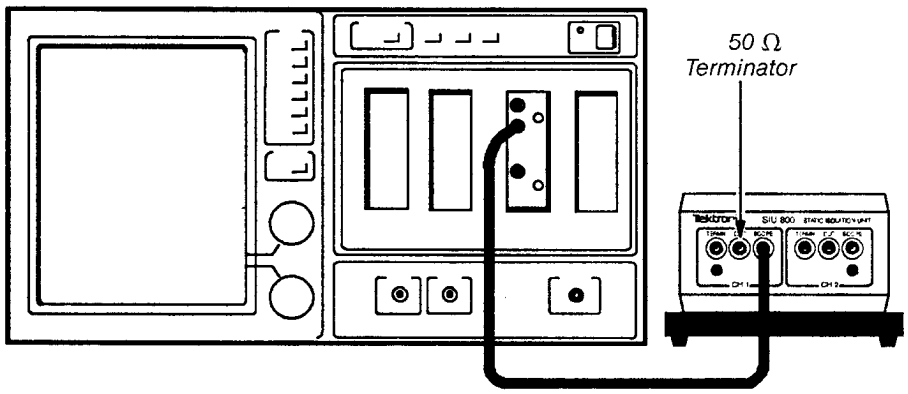


Figure 13 *– Setup Connections*

Step 3: Locate the rising edge reflection from the open circuit at the end of the coaxial cable (see Fig. 14).

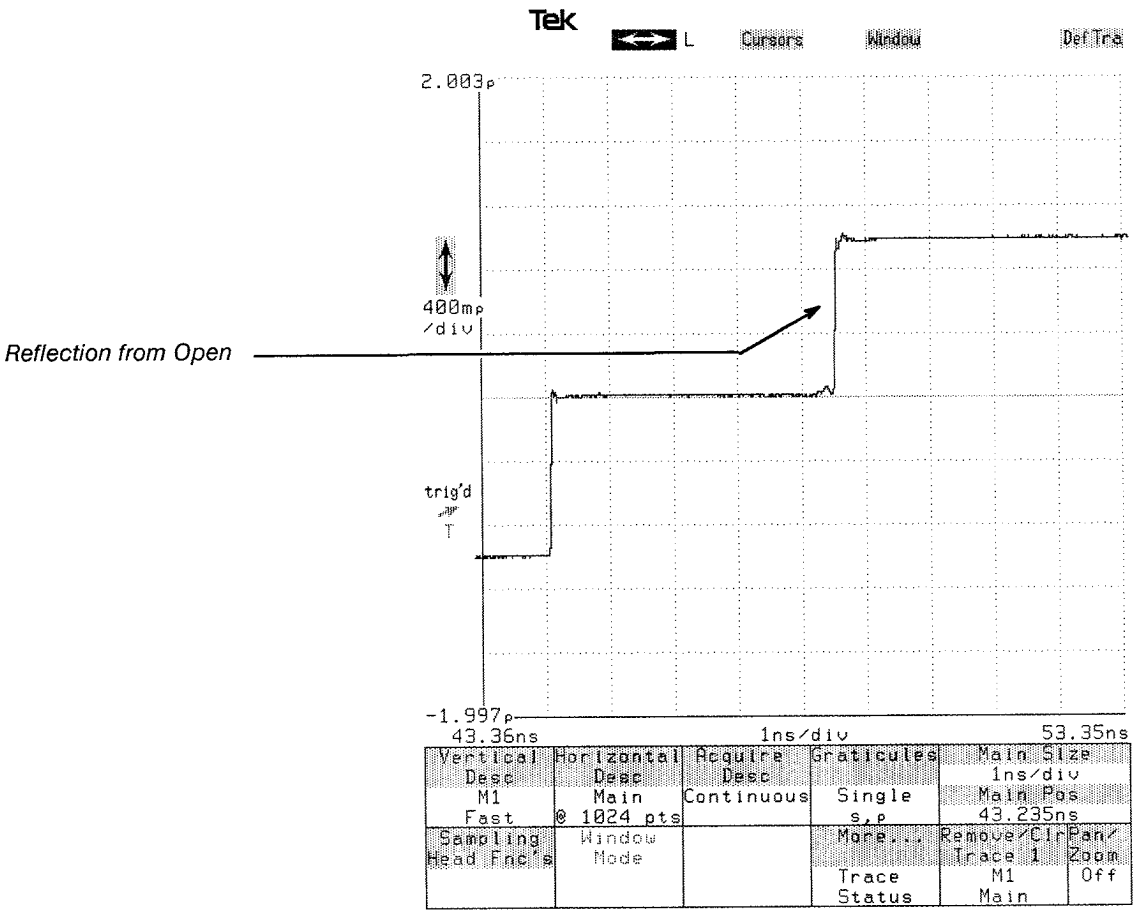


Figure 14 *— Foot Switch In Normal Position (not pressed)*

Step 4: Using the horizontal size and position knobs, position the reflected step on the center graticule line with the horizontal time/div set to 200 ps/div.

Step 5: Press the foot switch and use the vertical size and position knobs to center the display with vertical size set to 20 mρ/div (see Fig. 15).

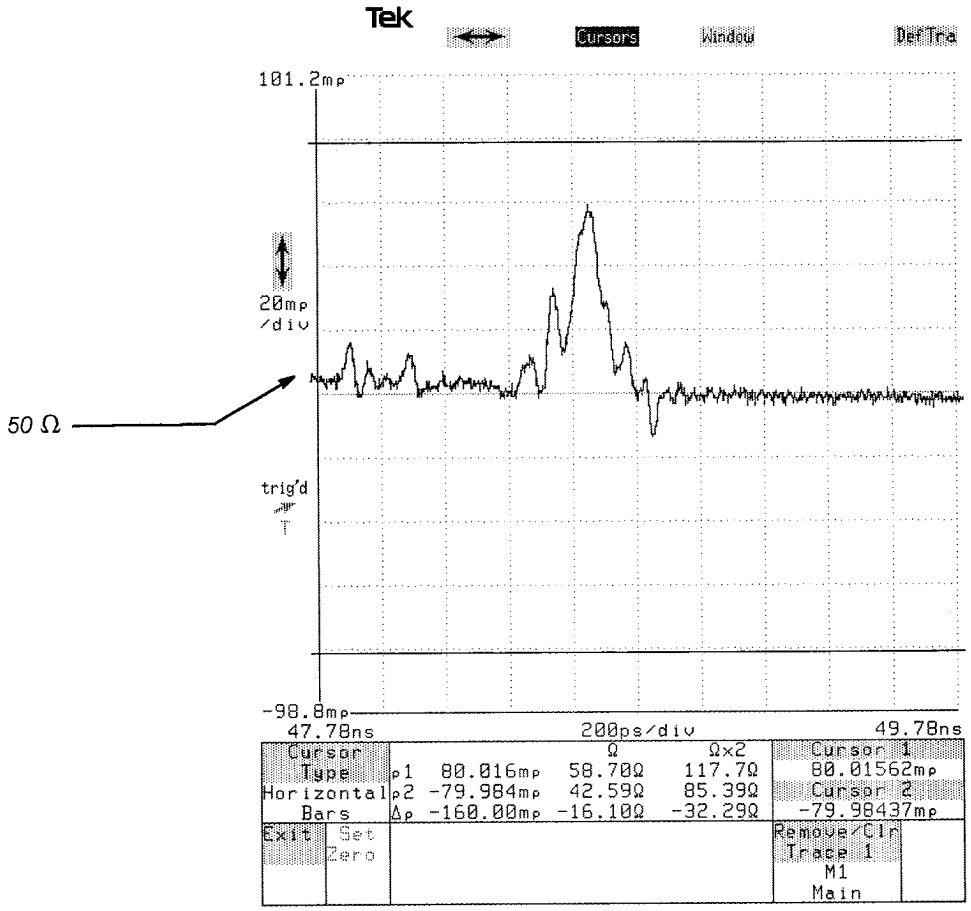


Figure 15 *— Foot Switch Pressed*

Step 6: Measure the maximum deviation from the 50 Ω level (the flat part of the displayed waveform toward the right edge of the display). All deviations should be less than ±4 div (80 mρ).

Step 7: Repeat steps 1 through 6 for the second channel.

Specifications

Table 1 *— Environmental and Mechanical Specifications*

Characteristic	Specification
Weight	3 lb. 8 oz.
Height	2.6″
Width	4.0″
Depth	5.8″
Ambient Temperature	
Operating	0° to 50°C (32° to 122°F)
Non-Operating	–40° to 75°C (–40° to 167°F)
Altitude	
Operating	to 4.5 km (15,000 feet)
Non-Operating	to 15 km (50,000 feet)
Humidity	to 95% relative humidity at up to 50°C (122°F)
MilSpec	Meets MIL-T-2800C, Type III, Class 3
Electromagnetic Compatibility	
United States	MIL-STD-461B: CE-03 Pt 4 Curve 1, CS-01 Pt 7, CS-02 Pt 4, CS-06 Pt 5, RE-02 Pt 7, RS-01 Pt 4, RS-02 Pt 5, RS-03 Pt 7 (limited to 1 GHz)
Germany	Meets VDE 0871/6.78 Class B

Table 2 *— Electrical Specifications*

Characteristic	Specification
Reflected Rise Time through SIU	Less than 40 ps (TDR system Reflected Rise Time less than 35 ps) or $\sqrt{(20\ ps)^2 + (t_{TDR})^2}$ where t_{TDR} is the TDR system reflected rise time
Reflection Coefficient	Less than ± 80 mρ
Series Contact Resistance	
DUT to SCOPE	
Initially	Typical 0.01 Ω
End of Life (10^6 Cycles)	Typical 0.10 Ω
TTL Control Requirements	
Input High	DUT connected to TERM.
Input Low	DUT connected to SCOPE
Input High Level	$V_{IH} \geq 2.0$ V or open. SIU-800 has a pull-up resistor
Input Low Level	$V_{IL} \leq 0.8$ V @ -5 mA

Replaceable Parts

This section contains a list of the components that are replaceable for the SIU-800 Static Isolation Unit. 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.

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

Module Replacement

The SIU-800 Static Isolation Unit is serviced by module replacement so there are three options you should consider:

- **Module Exchange.** In some cases you may exchange your module for a remanufactured module. These modules cost significantly less than new modules and meet the same factory specifications. For more information about the module exchange program, call 1-800-TEKWIDE, ext. BVJ5799.
- **Module Repair.** You may ship your module to us for repair, after which we will return it to you.
- **New Modules.** You may purchase new replacement modules 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 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

CROSS INDEX - MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip Code
TK0435	LEWIS SCREW CO	4300 S RACINE AVE	CHICAGO IL 60609-3320
TK0503	AIMSCO INC	600 SW 10TH	BEAVERTON OR 97005
TK1465	BEAVERTON PARTS MFG CO	1800 NW 216TH AVE	HILLSBORO OR 97124-6629
TK1741	COLMAN FASTENERS CO LTD	HATTONS ROAD OFF WESTINGHOUSE RD TRAFFORD PARK	MANCHESTER M17 1DF ENGLAND
0GZV8	HUBER AND SUHNER INC	500 WEST CUMMINGS PARK	WOBURN MA 01801
0J260	COMTEK MANUFACTURING OF OREGON (METALS)	PO BOX 4200	BEAVERTON OR 97076-4200
0J9P9	GEROME MFG CO INC	PO BOX 737	NEWBERG OR 97132
0KB01	STAUFFER SUPPLY	810 SE SHERMAN	PORTLAND OR 97214
00779	AMP INC	2800 FULLING MILL PO BOX 3608	HARRISBURG PA 17105
12598	RLC ELECTRONICS INC	83 RADIO CIRCLE	MT KISCO NY 10549-2611
18203	ENGELMANN MICROWAVE DIV DIV OF KDI ELECTRONICS INC	60 S JEFFERSON RD	WHIPPANY NJ 07981-1001
53387	MINNESOTA MINING MFG CO	PO BOX 2963	AUSTIN TX 78769-2963
55170	SUMMAGRAPHICS CORP	777 STATE ST EXT	FAIRFIELD CT 06430-5451
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077-0001
82389	SWITCHCRAFT INC SUB OF RAYTHEON CO	5555 N ELSTRON AVE	CHICAGO IL 60630-1314
93907	TEXTRON INC CAMCAR DIV	600 18TH AVE	ROCKFORD IL 61108-5181
97918	LINEMASTER SWITCH CORP	74 PLAINE HILL RD	WOODSTOCK CT 06281

Fig. & Index No.	Tektronix Part No.	Serial No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
16-1	334-8015-00			1	MARKER,IDENT:SIU800	80009	334801500
-2	200-3901-00			2	COVER:TOP/BASE (ATTACHING PARTS)	0J260	ORDER BY DESC
-3	211-0744-00			4	SCREW,MACHINE:6-32 X 2.0,PNH,TORX,STL (END ATTACHING PARTS)	TK0435	ORDER BY DESC
-4	380-0998-00			1	HOUSING:STATIC PROTECTOR,0.050,AL	0J9P9	ORDER BY DESC
-5	200-3902-00			1	BASE PLATE:0.375,AL	TK1465	ORDER BY DESC
-6	348-0037-00			4	FOOT:BLACK RUBBER (ATTACHING PARTS)	TK0503	1059-W-26012
-7	211-0380-00			4	SCREW,MACHINE:4-40 X 0.375,FLH,CD PL,T-9 (END ATTACHING PARTS)	0KB01	ORDER BY DESC
-8	361-1450-00			1	SPACER,BLOCK:NUT (ATTACHING PARTS)	TK1465	ORDER BY DESC
-9	211-0409-00			2	SCR,ASSEM WSHR:4-40 X 0.312,PNH,STL,T10 (END ATTACHING PARTS)	93907	829-06888-024
-10	671-1900-01			1	CIRCUIT BD ASSY:SIU800 (ATTACHING PARTS)	80009	671190001
-11	211-0409-00	B010100	B010124	2	SCR,ASSEM WSHR:4-40 X 0.312,PNH,STL,T10	93907	829-06888-024
	211-0325-00	B010125		2	SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,T9 (END ATTACHING PARTS)	0KB01	ORDER BY DESC
	015-1022-00	B010125		2	TERMN,COAXIAL:50 OHM,0.5W,SMA	18203	T198CS
-12	131-0407-00			1	JACK,TELEPHONE:2 COND OPEN OR SGL CLSD	82389	TR-2A
-13	211-0180-00			4	SCR ASSY WSHR 2-56X 0.25, PNH	80009	211018000
-14	050-3207-00			1	KIT, CONNECTOR, DC POWER	80009	050320700
-15	361-1579-00			1	NUT BAR:0.250 AL (ATTACHING PARTS)	TK1465	ORDER BY DESC
-16	211-0409-00			2	SCR,ASSEM WSHR:4-40 X 0.312,PNH,STL,T10	93907	829-06888-024
-17	211-0260-00			4	SCR,ASSEM WSHR:2-56 X 0.687,PNH,STL,POZ (END ATTACHING PARTS)	TK0435	ORDER BY DESC
-18	210-0201-00			1	TERMINAL,LUG:0.12 ID,LOCKING,BRZ	TK1741	2004-4 PHOSPHOR
-19	148-0234-00			2	RELAY ARMATURE:COAXIAL,COIL 12VDC	12598	MFR-12598-5-510

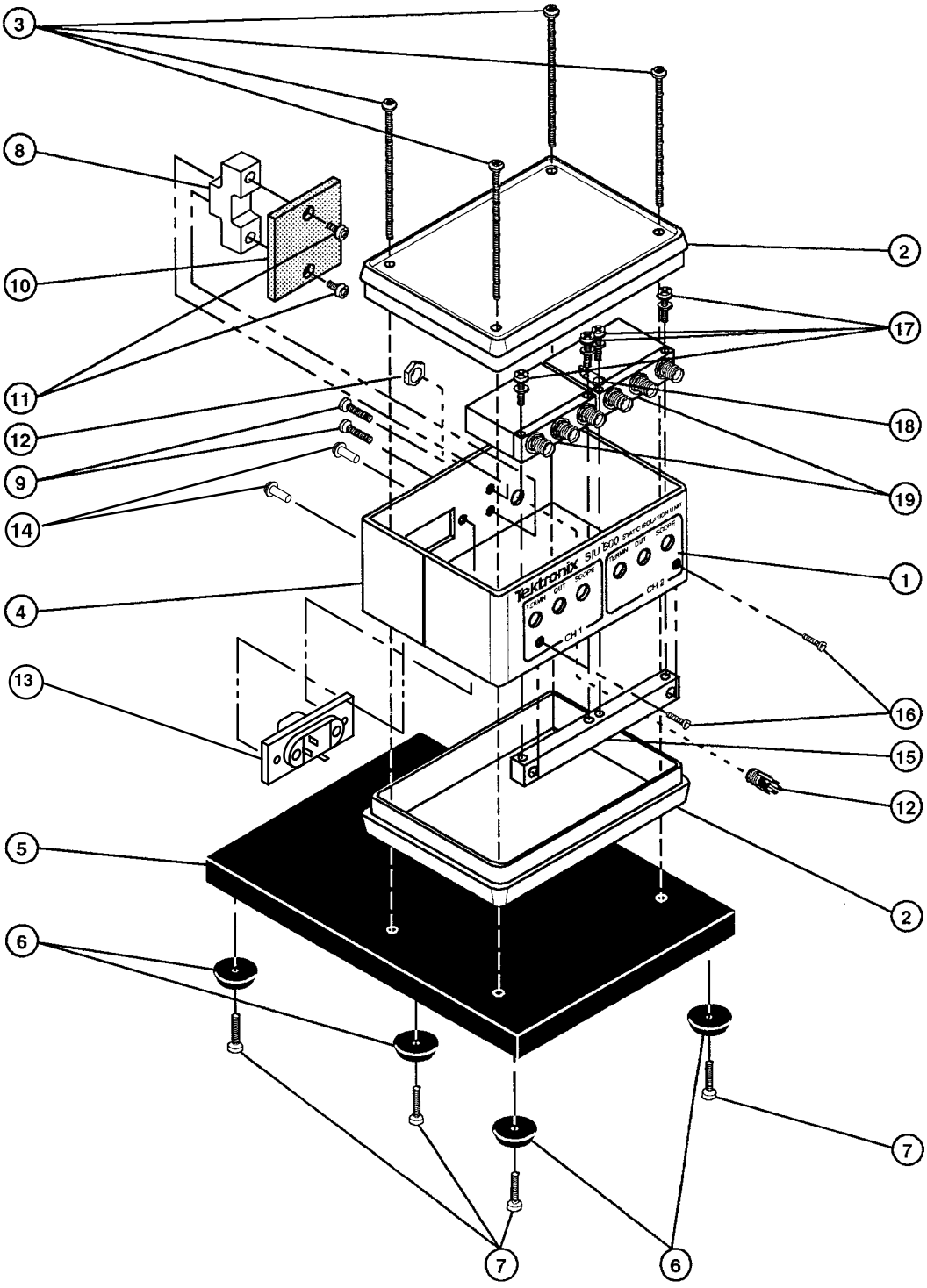


Figure 16 — *Exploded Static Isolation Unit*

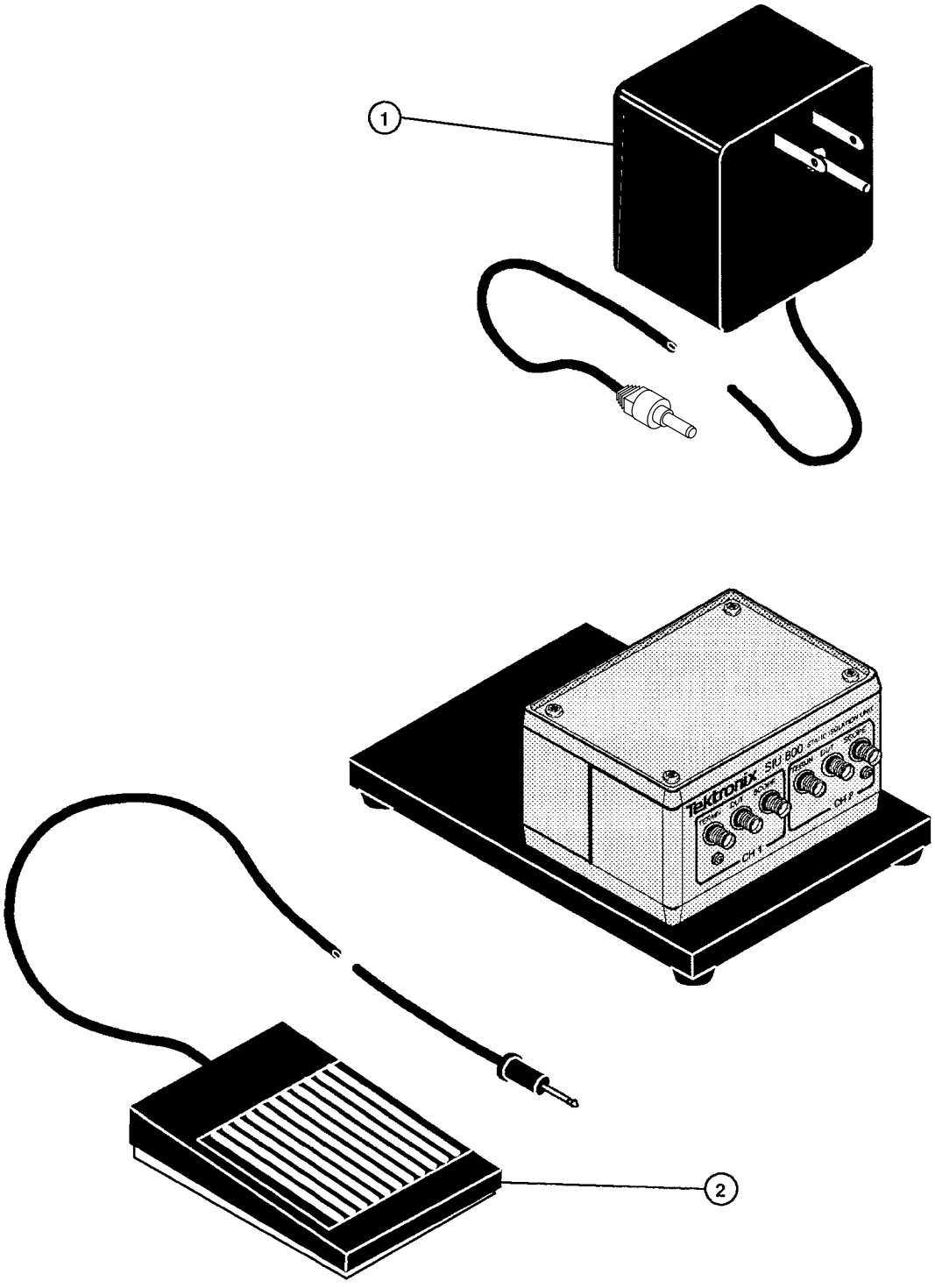


Figure 17 — Standard Accessories

Fig. & Index No.	Tektronix Part No.	Serial No. Effective	Serial No. Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
17 -					STANDARD ACCESSORIES		
-1	119-4812-01			1	POWER SUPPLY:PLUG IN,115 VAC (NORTH AMERICAN ONLY)	80009	119481201
	119-4813-01			1	POWER SUPPLY:220/240V (EUROPEAN ONLY)	80009	119481301
	119-4922-01			1	POWER SUPPLY:220/240V (UNITED KINGDOM ONLY)	80009	119492201
	119-4923-01			1	POWER SUPPLY:JAPANESE,100V (JAPANESE ONLY)	80009	119492301
-2	260-1189-02			1	SWITCH,FOOT:SPDT,7A,125VAC	97918	SP-515-265-7
	015-0549-00			2	ADPTR,ELEC:MALE TO FEMALE,SMA	0GZV8	33SMA-50-0-1
	070-8066-01			1	MANUAL,TECH:USERS,SIU800	80009	070-8066-01