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Instructions

Tektronix

TLS Logic Scope and TDS Series Oscilloscopes (TLS 216, TDS 500 Series, TDS 600 Series, TDS 700 Series, and TDS 820)

Rackmount Installation

070-8432-04

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

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General Safety Summary

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

Only qualified personnel should perform service procedures.

To Avoid Fire or Personal Injury

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

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

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

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

Do Not 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.

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

General Information

This introduction describes the TLS Logic Scope & TDS Oscilloscope Rack Adapter Kit, discusses its effects on oscilloscope performance, and lists its clearance requirements. *Please read these topics before attempting to rackmount your oscilloscope.*

The remainder of this document refers to the the TLS Logic Scope and TDS Oscilloscopes generically as oscilloscopes.

Rack-Adapter Kit Description

The rack adapter kit is a collection of parts that, once installed, configure the oscilloscope for mounting in a standard 19-inch equipment rack.

NOTE. *A standard equipment rack has rails with universal hole spacing. If you use a rack with other than universal hole spacing, you may have to drill additional mounting holes in the rack*

The rack-adapter kit can be obtained in two ways:

- Customers with a standard-version TLS or TDS Oscilloscope can order the kit by part number and install it to adapt the oscilloscope for rackmounting.
- Customers who purchase a new TLS or TDS Oscilloscope can order it with option 1R. Tektronix will ship option 1R oscilloscopes with the rack adapter kit hardware already installed on the oscilloscope.

The instructions in this document cover the installation of option 1R oscilloscopes, as well as rack-adapting and installation of standard oscilloscopes.

The dimensional drawing in Figure 2 on page 4 illustrates the rack-adapted oscilloscope.

Warranted Characteristics

When the oscilloscope is installed according to the instructions in this document, the rackmounted oscilloscope meets all warranted requirements except for those listed in *Environmental Requirements* below. *Oscilloscopes mounted using methods other than those described in these instructions may cause the oscilloscope to not meet its warranted requirements.*

Cooling air enters on the bottom and right sides as shown in Figure 1. You assume responsibility to provide adequate cool air to meet the exhaust temperature requirements independent of ambient temperature.

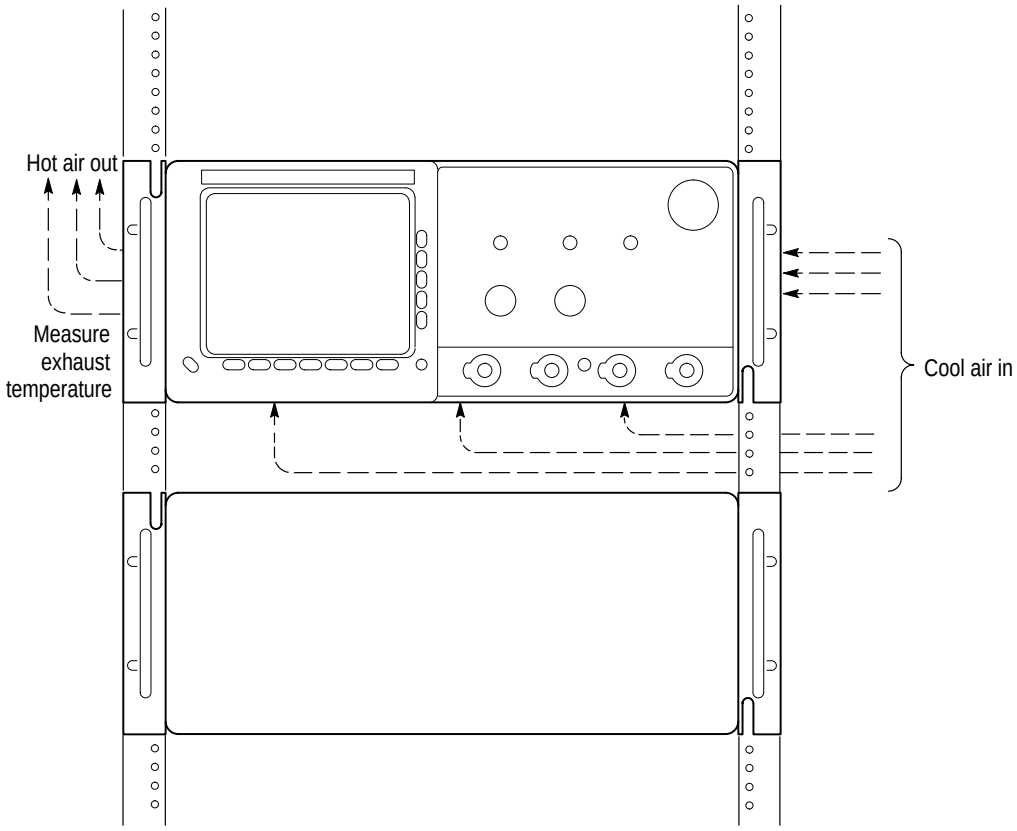


Figure 1: Oscilloscope cooling

See *Specification* in the user/tutorial, technical reference, or service manual that applies to your oscilloscope model for tables of the warranted characteristics.

Environmental Requirements

The following environmental characteristics supercede those listed in the user or service manual for your oscilloscope.

Table 1: Warranted characteristics

Characteristic	Description
Temperature, Operating	
Inside Rack Cabinet	TDS 694C: +4° C to +40° C TDS 600: +4° C to +45° C TDS 500/700/800: +0° C to +50° C
Inside Rack Cabinet (with Floppy Disk drive derating)[1]	TDS 600: +10° C to +45° C TDS 500/700: +10° C to +50° C
Fan Exhaust Temperature	≤60° C

Table 1: Warranted characteristics (cont.)

Characteristic	Description
Vibration	Not currently rated. May be derated; derating not yet determined
Shock	Not currently rated. May be derated; derating not yet determined

1 **Derating applies only to oscilloscope models equipped with Floppy Disk drives.**

Clearance Requirements

The rack in which the rack adapted oscilloscope is mounted must provide the following clearance requirements:

- A minimum of seven inches (177 mm) of vertical space.
- A minimum width of 17 5/8 inches (448 mm) between the left- and right-front rails in the rack.
- A minimum inside height depth of at least 20 inches (508 mm).



WARNING. *Adhering to these clearance requirements mounts the rack adapted oscilloscope with sufficient for air circulation and accommodation of the power cord and mounting hardware. Failure to provide these clearances can result in overheating and can cause the oscilloscope to not operate properly and/or fail.*

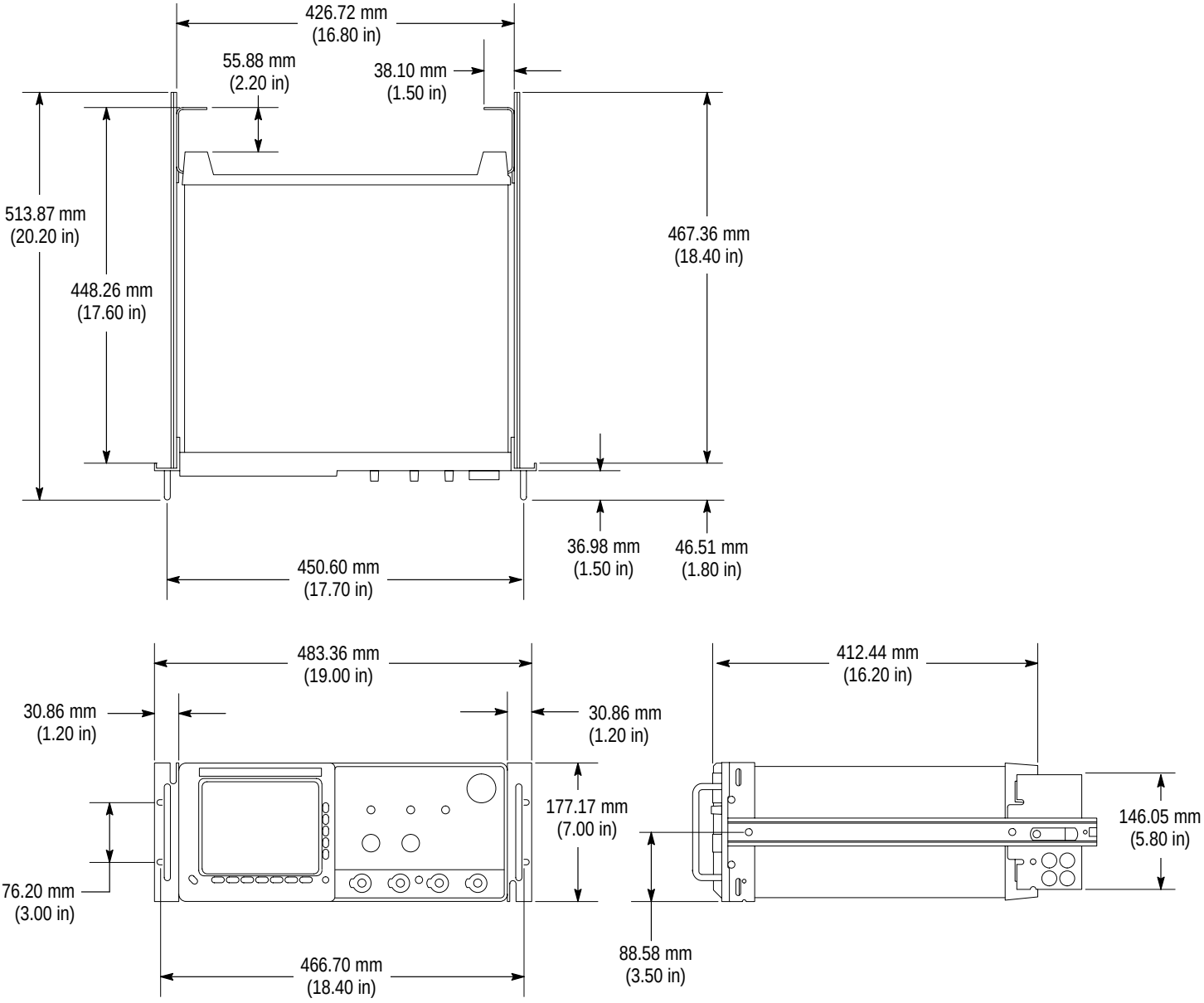


Figure 2: Oscilloscope with Rack Adapter Installed

Installation Instructions

This section contains all procedures needed to rackmount the TDS or TLS Oscilloscope. Begin with *General Instructions*, on page 6.

***NOTE**. Throughout this document, TDS or TLS Oscilloscopes are referred to as either "standard" or "option 1R" versions. Standard versions are simply TDS or TLS Oscilloscopes not equipped with option 1R. (The option-1R oscilloscopes are shipped from the factory already configured for rackmounting.)*

Equipment List

The following tools are required to attach the rack-adapter kit hardware, install cabling hardware, and mount the rack-adapted oscilloscope into a standard equipment cabinet. All tools are standard tools that are readily available.

Depending on the type of installation you are doing, *you may not need every item in this list*. See *General Instructions* on page 6 to determine which equipment your particular installation requires.

Table 2: Tools required for rackmount installation

Item no.	Name	Description	Installation type required for
1	Screwdriver handle (magnetic)	Accepts ¼ inch hex-head driver tips	All
2	No. 2 Pozidrive tip	Pozidrive®-driver tip for number 2 size screw heads	All
3	T-20 Torx tip	Torx®-driver tip for T-20 size screw heads	Field conversion only
4	Needle-nose pliers	Pliers used to remove the cabinet handle	Field conversion only
5	Retaining ring pliers	Pliers used to spread the cabinet handle caps during removal	Field conversion only
6	Hammer, plastic heads	Hammer used to remove the cabinet feet	Field conversion only
7	⅝ inch wrench	Wrench used to install BNCs	All[1]

[1] **The TLS 216 Logic Scope and TDS 800 Oscilloscope do not use BNCs; therefore, the wrench is not required for installing these two products.**

General Instructions

First do these *General Instructions* to determine the type of installation, which procedures to perform, and what tools are required.

Equipment Required: None

Procedure:

1. *Prepare for installation:* Be sure the rack meets the *Clearance Requirements* on page 3.
2. *Determine your installation type:*
   a. **Field Conversion:**
      - You have acquired the rack adapter kit, Tektronix part number 016-1236-00 (TLS 216) or 016-1136-00 (all other models).
      - You are using the kit to adapt and install a standard version TDS or TLS Oscilloscope in a standard 19-inch equipment rack.

   b. **Option 1R Installation:**
      - You have acquired an option-1R version TDS or TLS Oscilloscope. (Option-1R oscilloscopes are configured for rackmounting from the factory.)
      - You are installing the slide-out track assemblies shipped with the option-1R oscilloscope to an equipment rack and mounting the option-1R oscilloscope in the rack.

   c. **Reinstallation:** Your oscilloscope has been removed from the rack and you wish to reinstall it.
3. *Perform the installation according to type:*
   a. **Field Conversions:** Gather items 1 through 7 listed in *Equipment List.* Then do, in the order listed, the following procedures.
      - *Install the Rack Adapter Kit*
      - *Install Rear Panel BNC Cabling* (omit for TLS 216 and TDS 800 models)
      - *Rackmount the Rack-Adapted Oscilloscope*

   b. **Option 1R Installation:** Gather only items 1 through 3 and 7 in *Equipment List.* Then, do in the order listed, the following procedures:
      - *Install Rear Panel BNC Cabling* (omit for TLS 216 and TDS 800 models)

- *Rackmount the Rack-Adapted Oscilloscope*

c. Reinstallation: If reinstalling a rack-adapted oscilloscope, only a screwdriver and a number two Pozidrive tip (Items 1 and 2) are required. Just do step 3, substeps a and c, of *Rackmount the Rack-Adapted Oscilloscope.*

Install the Rack Adapter Kit

Be sure you have done the procedure *General Instructions.*

The instructions found here accomplish the following:

- Strips the standard oscilloscope of hardware not used when it is rack-adapted
- Installs those hardware items from the rack-adapter kit that attach directly to the oscilloscope

NOTE. *All parts removed from the oscilloscope in this procedure should be kept. Some of those parts will be needed to perform this rack conversion and the remainder will be needed if reconversion to a standard oscilloscope configuration is desired at a later time.*

Strip the Oscilloscope for Conversion

Equipment Required: One pair of needle-nose pliers (Item 4), one pair of retaining ring pliers (Item 5), and one hammer with plastic heads (Item 6).

Procedure:

1. *Remove Line Cord:*

a. *Orient the oscilloscope:* Set the oscilloscope so its bottom is down on the work surface and its rear is facing you.

b. *Unplug and detach cord:* Follow the instructions in Figure 3.

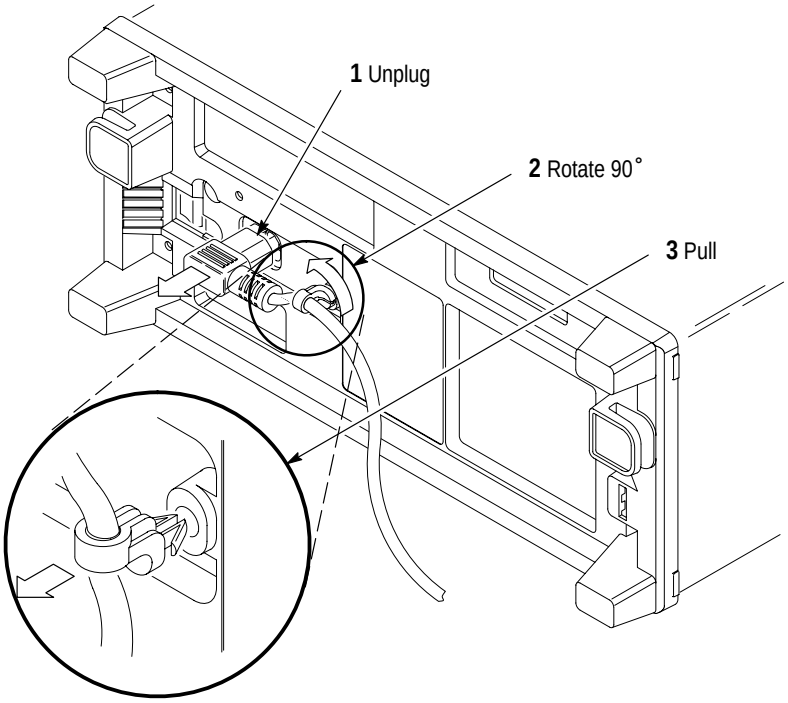


Figure 3: Line Cord Removal

2. *Change the trim ring:*

a. *Orient the oscilloscope:* Rotate the oscilloscope so its front panel is facing you.

b. *Remove the front cover (if installed):* Grasp the front cover by its left and right edges and snap it off of the front subpanel.



CAUTION. *DO NOT touch the carbon contact points on the menu buttons installed in the trim ring. Also, do not touch the contacts on the flex circuit exposed when you remove the trim ring.*

c. *Remove the standard trim ring:* Grasp the trim ring by its top edge; then pry it up and lift it forward to snap it off of the front subpanel. Set the trim ring aside face down on the work surface. See Figure 4.

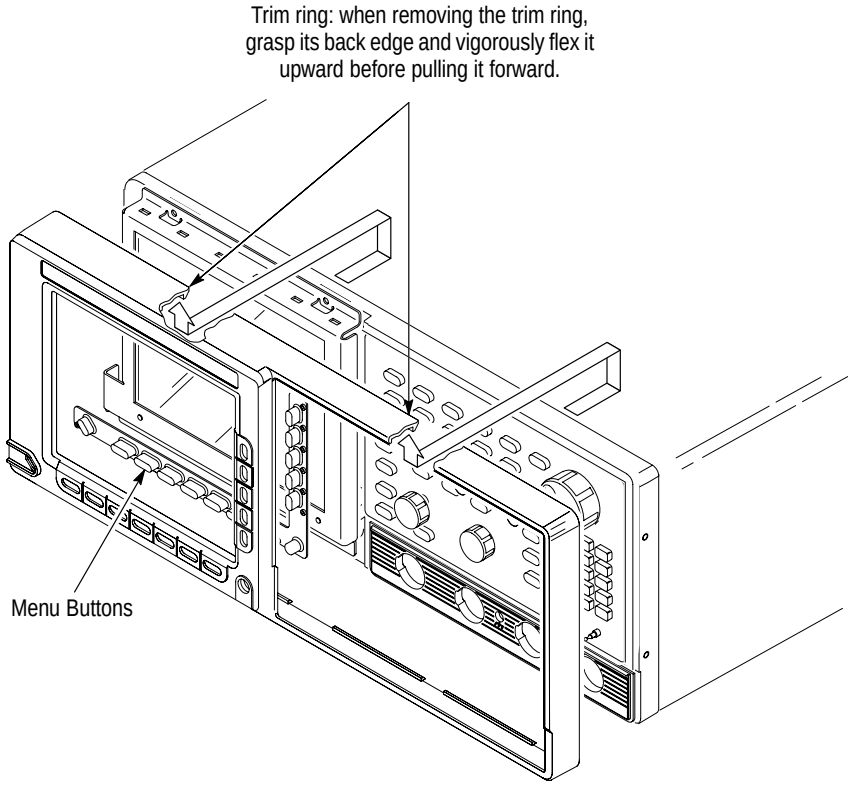


Figure 4: Trim Ring Removal

d. *Install the trim ring from the rack adapter kit:*

- Lay the trim ring supplied with the kit face down on the work surface next to the standard trim ring.
- Without touching the carbon contact points on the menu buttons, lift the menu buttons from the standard trim ring and install them in the kit trim ring.
- Align the kit trim ring to the front subpanel and install. Firmly seat the trim ring on the front subpanel.
- Find the front trim label that matches the one on the trim ring you removed (the one that matches the model number of your oscilloscope). Remove its adhesive backing and align to the trim ring you have just installed to match its location on the one you removed. Press it firmly to install.
- If your oscilloscope does not contain a floppy drive, install the drive cover in the trim ring.

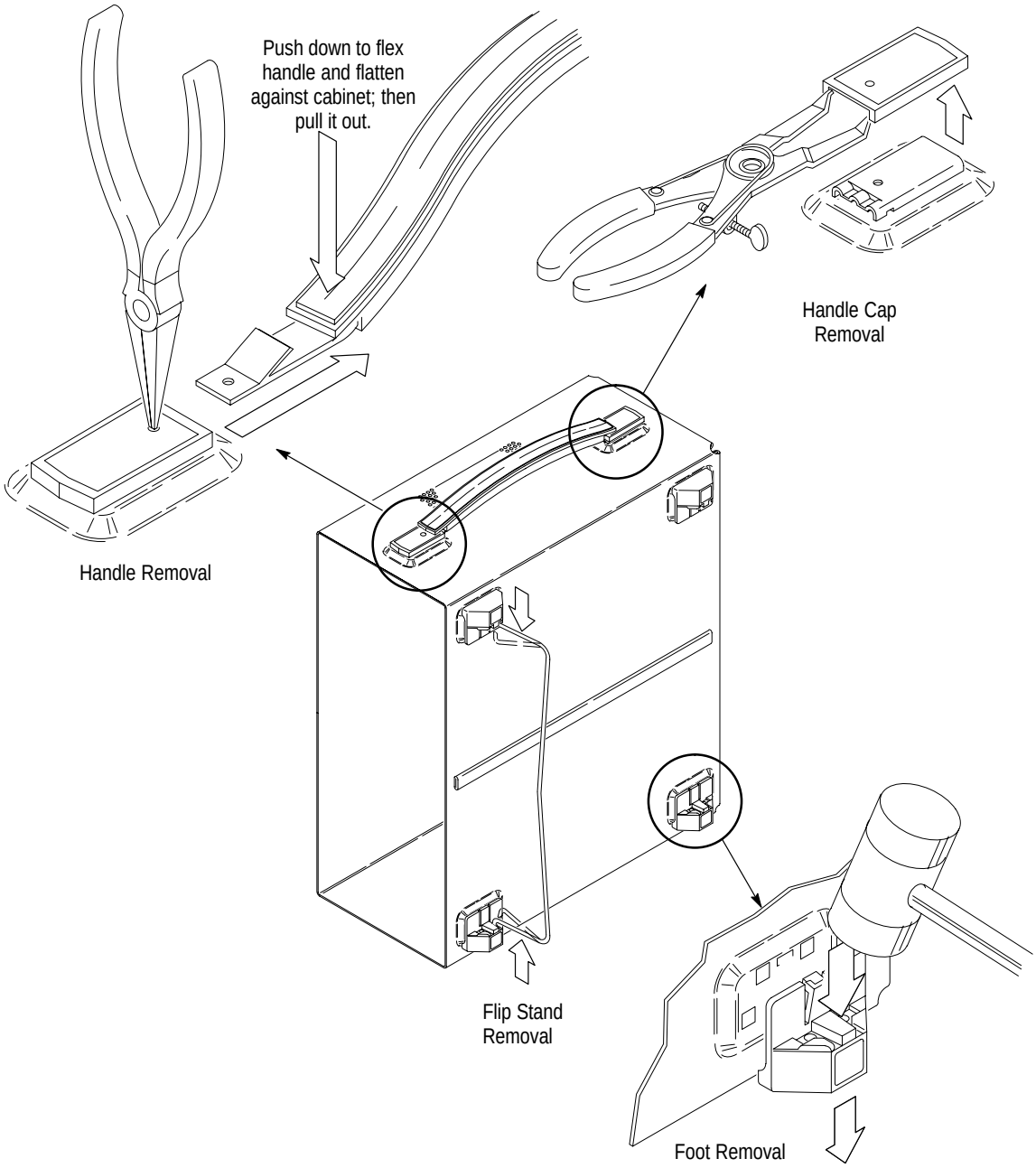


Figure 5: Cabinet Hardware Removal

3. *Remove cabinet hardware (cabinet removal is not required):*

a. *Orient the oscilloscope:* Set the oscilloscope so its left side (when facing the front of the oscilloscope) is down on the work surface as shown in Figure 5. Reference Figure 5 as you do substeps b through e.

b. *Remove the handle:*

- Insert the tips of a pair of needle-nose pliers (Item 4) into the hole of either handle cap. Push and hold to depress the handle release.
- While holding the handle released, pull it out of the slot in the handle cap. Repeat procedure to remove the handle from the other handle cap.

c. *Remove the handle caps:*

- Insert the retaining ring pliers (Item 5) into the opening created in the handle cap when you removed the handle.
- While using the pliers to expand the handle cap outward, grasp it and snap it off.
- Repeat procedure to remove the remaining cap.

d. *Remove the flip stand:* Grasp the flip stand by both sides near where it joins each flip stand foot. Now compress the flip stand until the flip stand ends clear the flip stand feet to complete the removal.

e. *Remove the cabinet feet:* Using a plastic-headed mallet (Item 6), strike each foot on its inside edge until it releases from the cabinet. Remove all four feet.

Install Kit Hardware

Equipment Required: One screwdriver handle (Item1), one T-20 Torx tip (Item 3), and one number two pozidrive tip (Item 2).

Procedure:

1. *Assemble the hardware:* Unpackage and identify the hardware shown in Figure 6. Refer to Figure 6 as you perform the following steps. (The parenthesized numbers appearing with the hardware items in the figure refer to the quantity of the item used to install the kit hardware.)

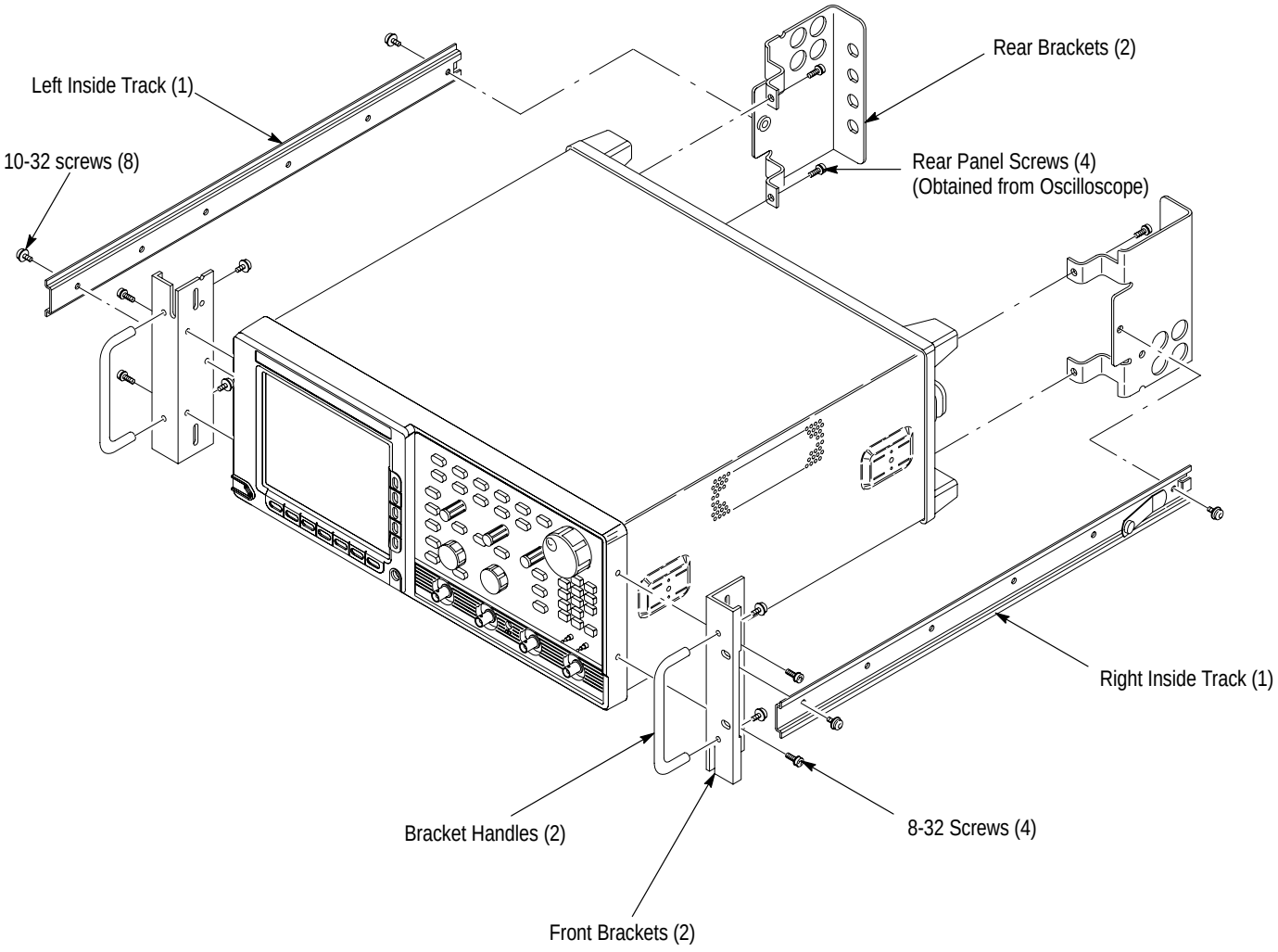


Figure 6: Installation of Kit Hardware to Oscilloscope

2. *Install the rear brackets:*

   a. *Orient the oscilloscope:*

      - Make sure the oscilloscope front cover is installed; if it is not, install it by snapping its edges over the trim ring.
      - Set the oscilloscope face down with its front cover on the work surface and its bottom facing you.

   b. *Remove rear-cover screws:* Using a screwdriver with a T-20 Torx tip (Items 1 and 3), remove the four screws (8-32) securing the rear cover to the oscilloscope. Leave the rear cover installed.

   c. *Attach the brackets:* Using the screws removed in step b, install the two rear brackets as shown in Figure 6. When reinstalling the four screws at the rear panel, tighten them to 16 inch-lbs torque.

3. *Install front brackets:*

   a. *Orient the oscilloscope:*

      - Remove the oscilloscope front cover by snapping its edges off the trim ring.
      - Set the oscilloscope so its bottom is down and its right side is facing you.



CAUTION. *When attaching the brackets to the trim ring in step b that follows, be sure to use the correct size screws as called out (8–32). Installing longer screws may damage the internal floppy disk drive of those products so equipped.*

   b. *Attach the brackets:*

      - Locate the two front brackets and the four T-20 Torx mounting screws (8-32) in Figure 5. Also locate the two front bracket handles and the four number two pozidrive screws (10-32) used to mount them to the front brackets.
      - Align the two access holes on the bracket to the two mounting holes in the right side of the trim ring.
      - Using a screwdriver with a T-20 Torx tip (Items 1 and 3), install two screws (8-32) to secure the bracket to the oscilloscope. When installing the screws, tighten them to 16 inch-lbs of torque.
      - Align the front-bracket handle to the front bracket. Using a screwdriver with a number two pozidrive tip (Items 1 and 2), install the two screws (8-32) to secure the handle to the bracket. When installing the screws, tighten them to 28 inch-lbs torque.

- Rotate the oscilloscope so that you face the left side and repeat the three subparts just performed to install the left bracket.

4. *Install the inside tracks:*

a. *Identify the left and right inside tracks:*

- Locate the two inside tracks in Figure 6.
- Using Figure 7, identify the right from the left inside track.

b. *Attach the tracks:*

- Align the two mounting holes on the track to the two mounting holes, one each in the right rear and the right front bracket.
- Using a screwdriver with a Pozidrive tip (Items 1 and 3), install the right inside track to the front and rear brackets using two screws (10-32). (Tighten the screw using 28 inch-lbs. of torque.) Note the button latch should be facing away from the oscilloscope and towards its rear. Use Figure 6 as a guide.
- Rotate the oscilloscope to face the left side and repeat subparts to install the left inside rail.

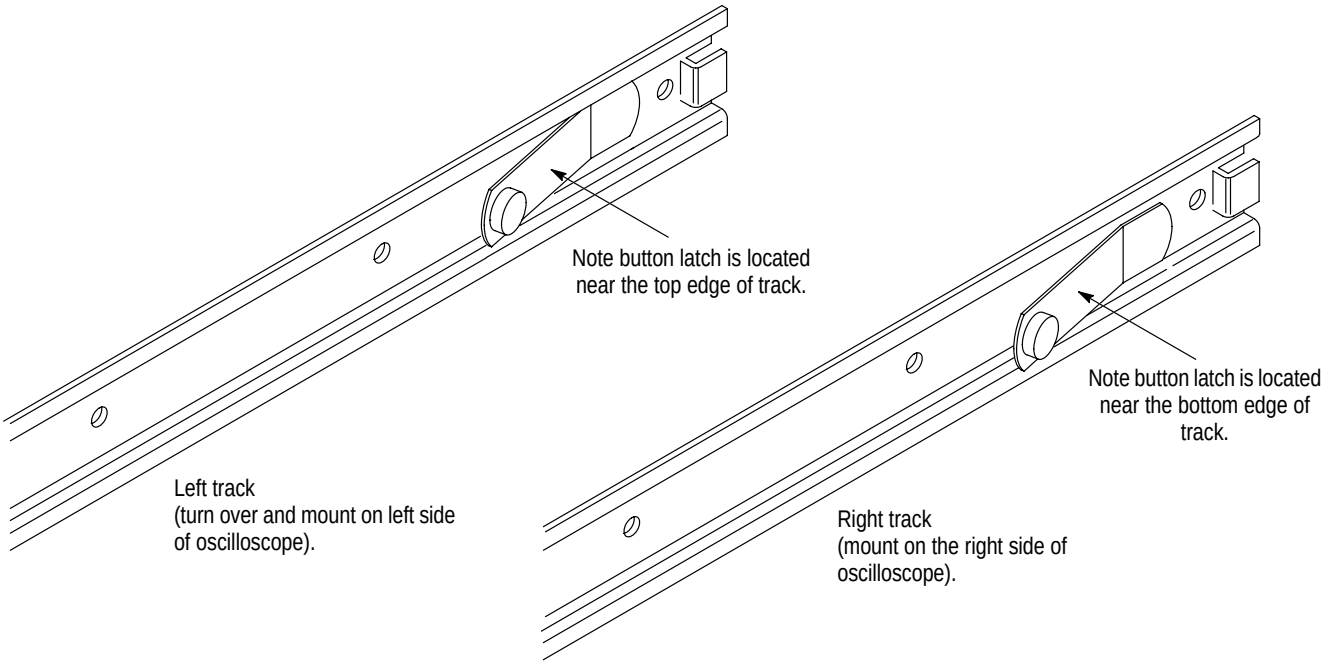


Figure 7: Left and Right Inside Track Identification

This completes the installation of the rack-adapter hardware to the oscilloscope. To complete the installation, do the procedures *Rear-Panel BNC Cabling* (optional; omit for TLS 216 and TDS 800 models) and *Install Rack-Adapted Oscilloscope.*

Rear-Panel BNC Cabling

Perform this procedure if you wish to route the four front-panel inputs to the rear panel.

NOTE*. This procedure does not apply to the TLS 216 or the TDS 820, which is a sampling oscilloscope having SMA front-panel connectors. SMA cables and feed-through connectors are not included in this kit because rackmounted installations of sampling oscilloscopes typically do not route cables to the rear. If you wish to order SMA cables for that purpose, Tektronix part number 174–1428–00 is suitable.*

Install Cabling Hardware

Equipment Required: One 5/8 inch wrench (Item 7).

Procedure:

1. *Install hardware on rear bracket:*

a. *Orient the oscilloscope:* Set the oscilloscope so its bottom is down with its right side facing you.

b. *Assemble the hardware:* Unpackage and identify the BNC connector hardware in the cable feed-through kit using Figure 8 as a guide. Use Figure 9 to identify the remaining hardware in the kit.

c. *Mount the BNCs:*

- Insert a rubber washer over the threaded end of a BNC.
- Insert the threaded end of a BNC through one of the four holes in the *right* rear bracket so it protrudes out the back of the bracket.
- Install a 5/8 inch lock washer over the threads; the install the 5/8 inch nut. Tighten the nut using a 5/8 inch wrench.
- Repeat the subparts just performed to mount the remaining three BNCs.

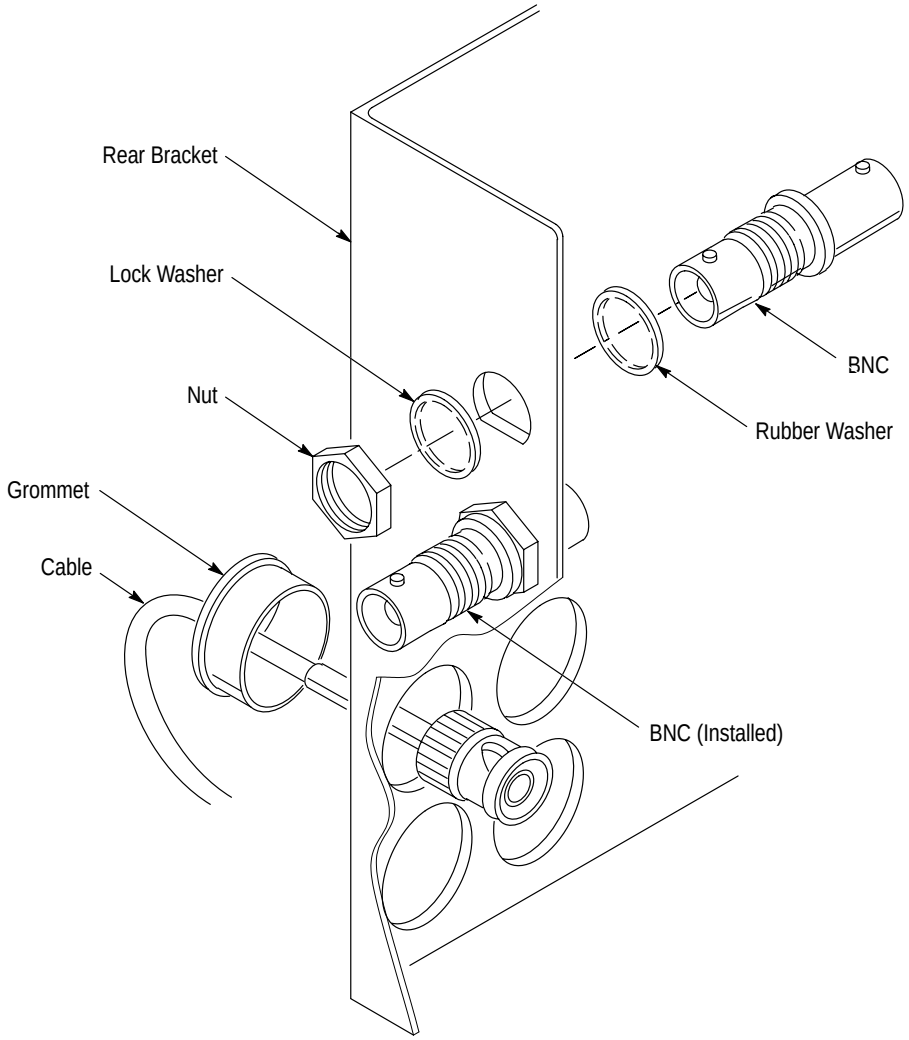


Figure 8: BNC and Grommet Installation

2. *Install the cabling:*

a. *Install cable holder:* Remove the adhesive backing from the cable holder and install it on the right side of the oscilloscope at the location indicated on Figure 9.

b. *Route cabling to rear bracket:*

- Examine Figure 9. In order to prevent stress on the cables, be sure each cable is routed as shown with respect to its grommet and its rear bracket BNC as you do the following subparts.

- Insert a cable through one of the grommets, and then insert the cable and grommet into the hole. Press the grommet into the hole to seat it in the bracket. (See Figure 8.)
- Connect the cable to the proper BNC as show in Figure 9.
- Repeat for the remaining three grommets and cables, matching the cables to the proper BNC.

c. *Route cabling to front panel inputs:* Again, using Figure 9 as a guide, route each cable connected in substep b through the slot in the bottom of the front bracket and connect it to the indicated input BNC.

3. *Dress Cabling:*

a. *Install the cable ties:*

- Thread a cable tie through the two cable tie holes in the front bracket. Secure the four cables with the cable tie, but leave the cable ties loose enough to allow later adjustment.
- Thread a cable tie through the two cable tie holes in the cable holder. Secure the four cables with the cable tie, but leave the cable tie loose enough to allow later adjustment.
- Thread a cable tie through the two cable tie holes in the rear bracket. Secure the four cables with the cable tie, but leave the cable tie loose enough to allow later adjustment.

b. *Adjust the cables:*

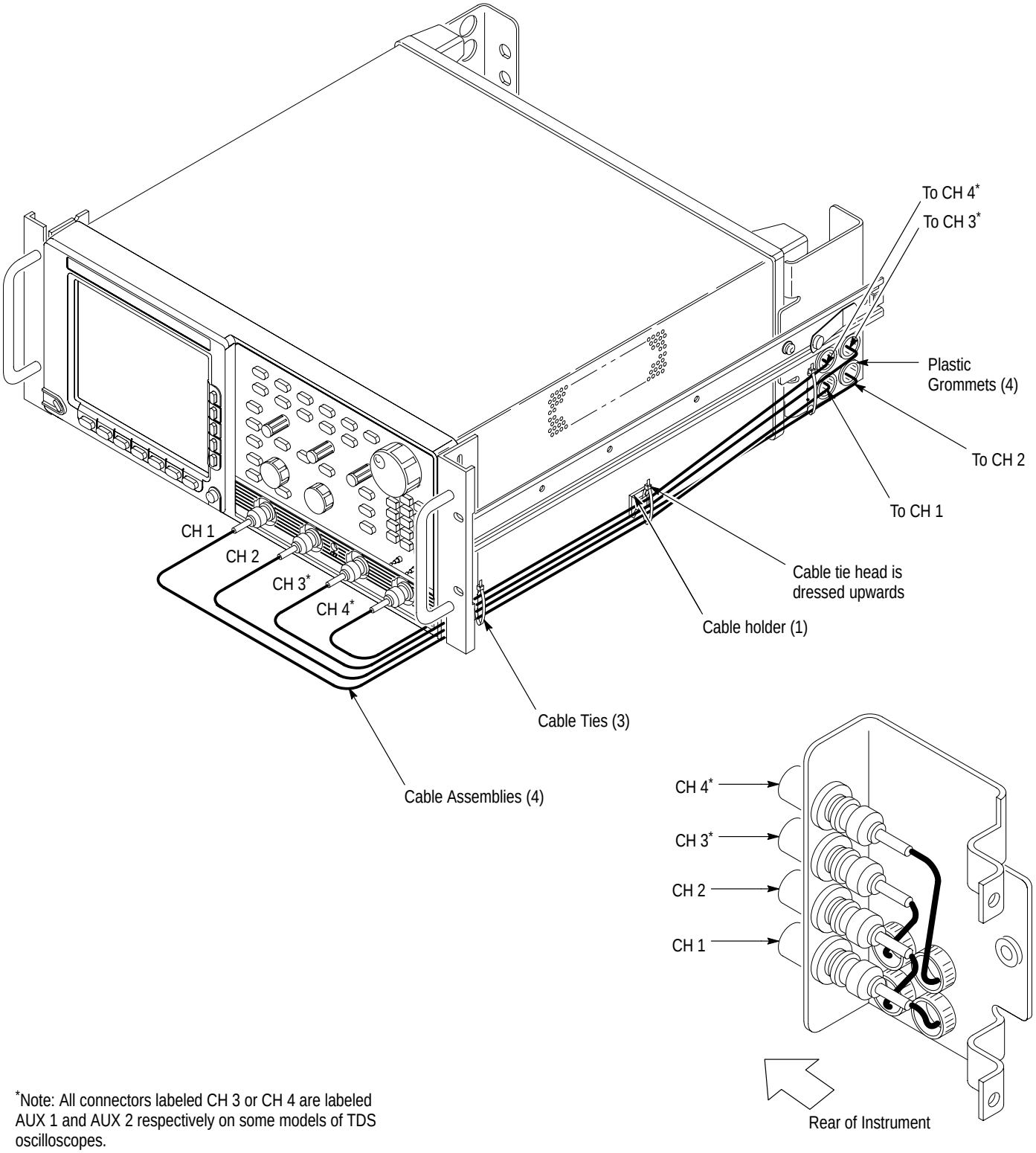
- Adjust (slide) each cable so there is as little stress on the cable as possible.
- Dress each cable so any excess length (slack) is at either the front or rear of the oscilloscope as desired.

NOTE. *When tightening the cable ties, make sure the head of the cable tie is pointing towards the top of the oscilloscope. If it points away from or towards the bottom of the oscilloscope, it can interfere with the rack or other instruments in the rack as it is slid in and out of the rack.*

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c. *Fix the cables in place:*

- Dress the cables so they are within the groove at the bottom of the right front bracket and are laying flat as possible against the side of the oscilloscope cabinet.
- Tighten the cable tie at the right front bracket to fix the cables in place at that point.



*Note: All connectors labeled CH 3 or CH 4 are labeled AUX 1 and AUX 2 respectively on some models of TDS oscilloscopes.

Figure 9: BNC Cable Dress and Routing

- At the right rear bracket, dress the cables to remove any slack in the cables between that bracket and the front bracket. Dress the cables flat against the cabinet.
- Tighten the cable tie at the right rear bracket to fix the cables in place at that point.
- Dress the cables at the cable holder into a bundle and tighten the cable tie to fix the cables in place at that point.
- Clip off the excess length from all three cable ties.

Field conversion of the oscilloscope is now complete. To install the rack-adapted oscilloscope into a standard 19-inch rack, do the procedure *Rackmount the Rack-Adapted Oscilloscope* that follows.

Rackmount the Rack-Adapted Oscilloscope

This procedure assembles and installs the slide-out tracks in the equipment rack, and then installs the rack-adapted oscilloscope in the rack.

The slide-out tracks permit the rack-adapted TLS or TDS Oscilloscope to be extended out of the rack for rear-panel and connector maintenance without removing the oscilloscope from the rack.

NOTE. *The rack hardware kit contains hardware needed for mounting the oscilloscope in several configurations. All of the hardware in the kit will not be needed.*



WARNING. *If slide-out track assemblies are disassembled for maintenance, do not interchange the left and right inner tracks when reinstalling them in the left and right outer tracks. If you do so, you will defeat the extension stop (safety latch) feature of the tracks. Equipment could, when extended, come out of the slides and fall from the rack, possibly causing personal injury and equipment damage.*

Install Track Assembly and Oscilloscope into the Rack

Equipment Required: One screwdriver handle (Item1), one number two pozidrive tip (Item 2).

***NOTE**. The slide-out track assemblies that are included in the rack-adapter kit come partially assembled with the inner tracks inside of the outer tracks. Leave them partially assembled to simplify their installation and to avoid accidental swapping of their inner tracks. (See WARNING above.) If assemblies are disassembled, use Figure 10 to match left and right slides. (Note that when the left and right tracks are oriented as shown, the round cutout is below the square cutout at the end of the both inner tracks.)*

Procedure:

1. *Assemble the slide-out track:*

a. Identify the right vs. left slide-out track assemblies: find the date code label on each assembly. The assembly to be mounted in the left side of the equipment rack (the side nearest the left side of the oscilloscope when it is rackmounted) has a date code that ends with “LH,” for left hand. The right assembly has a date code ending with “RH.”

b. Measure the distance between the front and rear rail of the equipment rack.

c. Align the rear bracket to the right slide-out track as shown in Figure 10. Note the rear bracket has multiple pairs of mount-through holes. When aligning the bracket and track, be sure to select a pair of holes that mount the rear bracket so the flange-to-flange distance (see figure) matches the front rail to rear rail spacing just measured.

d. Using a screwdriver with a number two pozidrive tip, secure the rear bracket to the right slide out track using two screws (10-32) and a bar nut as illustrated. Leave the screws loose so that the overall length of the slide out track assembly can be adjusted when installing it in the rack.

e. Repeat substeps c and d to assemble the left slide-out track assembly.

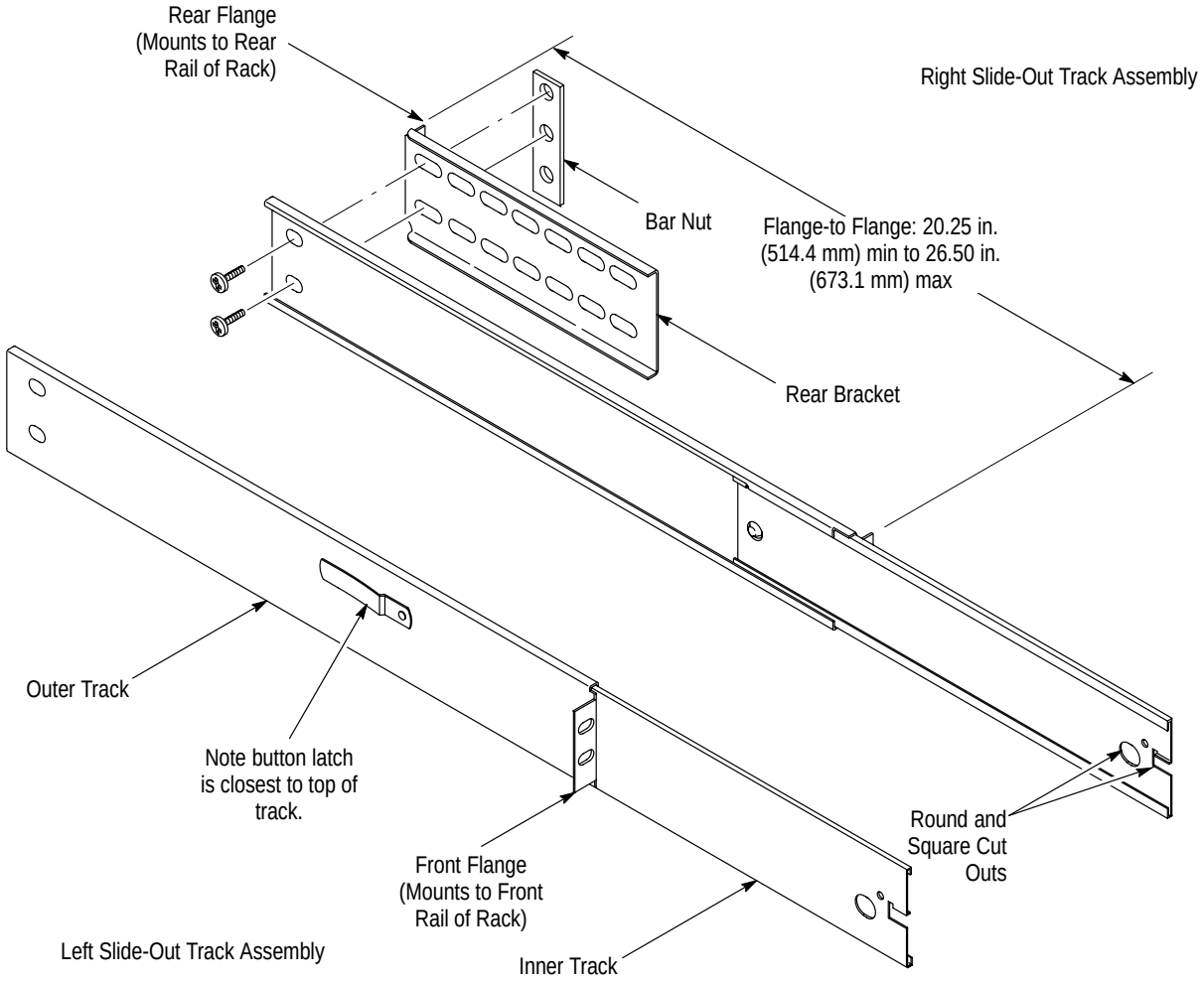


Figure 10: Assembly of Slide-Out Track Assemblies

2. *Mount the slide-out track assemblies:*

a. *Select the mounting position in rack:* Select two ½ inch spaced holes in the front rail. Verify that the 3¼ inch and 7 inch clearances exist relative to those mounting holes. See Figure 11.

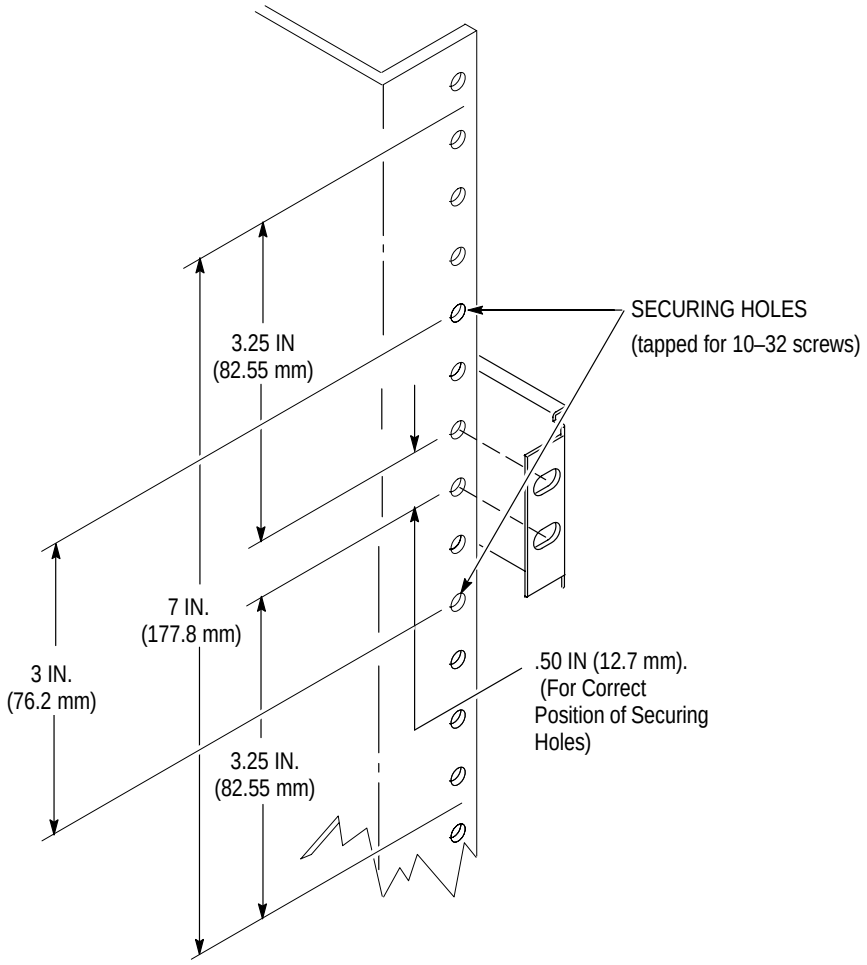


Figure 11: Vertical Clearances for Rack Installation (Left-Front Rail Shown)

b. *Select mounting method according to rack type:*

- To mount the slide-out tracks with their front and rear flanges outside of the front and rear rails, use the method A shown in Figure 12 when doing substep c. Add a bar nut to the installation only if the rails have untapped holes.
- To mount with front and rear flanges inside of rails, use the mounting method B outlined in Figure 12. This mounting method assumes untapped holes.

c. *Install in rack:* Using the method and hardware determined from substep b, secure the right slide-out track assembly to its front and rear rails. The screws should be fully, but lightly, seated so mounting can be adjusted later.

d. *Fix the length of the slide-out track assembly:* Tighten the screws left loose in step 1, substep d to fix the front to rear flange spacing of the slide-out track assembly.

e. *Mount the left slide-out track assembly:* Repeat substeps a through d to mount the left slide-out track assembly.

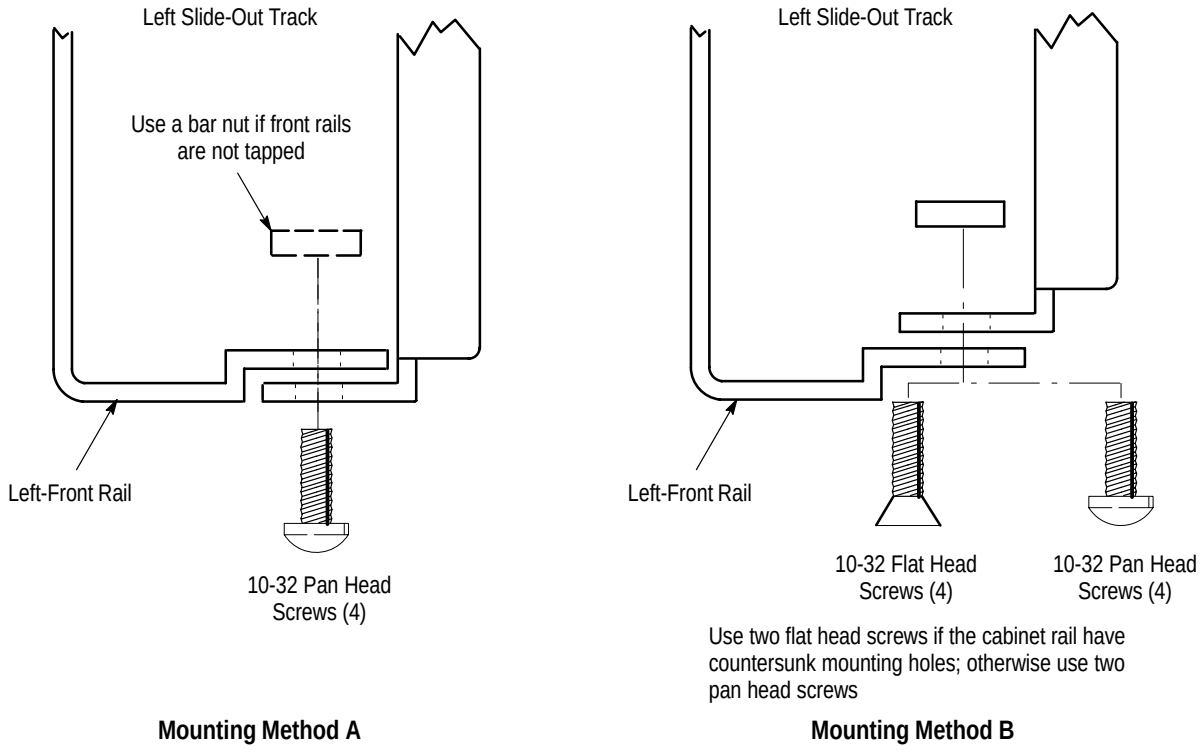


Figure 12: Installation of Slide-out Track Assemblies in Rack (Top View)

3. *Mount oscilloscope in rack:*

a. *Install the oscilloscope:*

- Working from the front of the rack, slide the inner track of each slide-out track assembly until it extends out the front of the rack. Continue to slide them out until they lock.
- Insert the left and right tracks that extend from the rear of the oscilloscope into the ends of the tracks just extended. Make sure the tracks mounted on the oscilloscope slip inside the inner tracks extended earlier.
- Slide the rear of the oscilloscope backwards until it stops.

- Push to release the button latches, located on the outside of the each track, and continue to slide the oscilloscope all the way into the cabinet.

b. *Level the rackmounted oscilloscope:*

- Tighten the four screws that were left loose at the rear of the rack when you did step 2, substep c. then pull the oscilloscope part way out of the rack. (Tighten 10-32 screws using 28 inch-lbs of torque.)
- Be sure the four screws that were left loose at the front of the rack are loose enough to allow the slide-out track assemblies to seek their normal positions.
- Retighten the four screws and push the oscilloscope all the way into the rack. If the tracks do not slide smoothly, readjust the level using the method just detailed.
- When leveling is completed, tighten the 10-32 screws using 28 inch-lbs of torque.

c. *Secure the oscilloscope and install the line cord:*

- Unpackage the 016-0099-00 hardware kit.
- Locate the four 10-32 screws. Insert each screw through its recessed washer, its metal flat washer, and its plastic flat washer as shown on the data sheet included with the hardware kit.
- Using a number two pozidrive screwdriver, install the screw/washer assembly in one of the two mounting holes in the right front bracket. Repeat for the second mounting hole. Tighten both screws using 28 inch-lbs of torque.
- Install the two remaining screw/washer assemblies in the left front bracket using the method just described.
- See page 7 for instructions on how to reinstall the power cord.

Replaceable Mechanical Parts

This section contains a list of the replaceable components and accessories that are used to adapt the TLS or TDS Oscilloscope for mounting in a standard 19-inch (48.3 mm) rack. Use this list, as described below, to identify and order replacement rackmounting hardware. See the service manual for your TLS or TDS Oscilloscope for lists of all replaceable mechanical parts not related to rackmounting.

Parts Ordering Information

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

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 all the information you need for ordering replacement parts.

Item Names

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

Indentation System

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

1 2 3 4 5 Name & Description

Assembly and/or Component
Attaching parts for Assembly and/or Component
(END ATTACHING PARTS)

Detail Part of Assembly and/or Component
Attaching parts for Detail Part
(END ATTACHING PARTS)

Parts of Detail Part
Attaching parts for Parts of Detail Part
(END ATTACHING PARTS)

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

Abbreviations

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

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
TK1163	POLYCAST INC	9898 SW TIGARD ST	TIGARD OR 97223
TK1321	BERGFORD & ASSOCIATES	2705 WESTWIND DR NW	OLYMPIA WA 98502
TK1465	BEAVERTON PARTS MFG CO	1800 NW 216TH AVE	HILLSBORO OR 97124–6629
TK1719	NEDELCO BV (THOMAS & BETTS)	POSTBUS 6431	3002 AK ROTTERDAM THE NETHERLANDS
0J9P9	GEROME MFG CO INC	PO BOX 737 403 NORTH MAIN	NEWBERG OR 97132
0KB01	STAUFFER SUPPLY	810 SE SHERMAN	PORTLAND OR 97214
06383	PANDUIT CORP	17301 RIDGELAND	TINLEY PARK IL 07094–2917
06666	GENERAL DEVICES CO INC	1410 S POST RD PO BOX 39100	INDIANAPOLIS IN 46239–9632
28520	HEYCO MOLDED PRODUCTS	750 BOULEVARD P O BOX 160	KENILWORTH NJ 07033–1721
74868	AMPHENOL CORP R F CONNECTORS (OPNS)	1 KENNEDY AVE	DANBURY CT 06810–5803
76814	NORTHERN ENGRAVING CORP	803 S BLACK RIVER ST	SPARTA WI 54656–2221
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077–0001

Fig. & index no.	Tektronix part no.	Serial no. effective dscont	Qty	Name & description	Mfr. code	Mfr. part no.
13–	016–1236–00		1	MOUNTING KIT:RACK MOUNT KIT	80009	016123600
–1	101–0142–01		1	.TRIM,DECORATIVE:FRONT	TK1163	ORDER BY DESC
–2	367–0022–00		2	.HANDLE,BOW:4.579 L,BRS CRPL	TK1465	ORDER BY DESC
–3	212–0500–00		8	.SCR,ASSEM WSHR:10–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
–4	212–0189–00		4	.SCREW,MACHINE:8–32 X 0.500,PAN HEAD,T–20	0KB01	ORDER BY DESC
–5	407–4020–00		2	.BRACKET,SUPPORT:FRONT,ALUMINUM	0J9P9	ORDER BY DESC
–6	351–0313–00		1	.GUIDE,RACKMOUNT:19.218 L,PAIR	06666	ORDER BY DESC
–7	351–0241–01		1	.SLIDE,DWR,EXT:W/CLOSED MOUNTING SLOTS,PAIR	TK1321	ORDER BY DESC
–8	407–4021–00		2	.BRACKET,SUPPORT:REAR,ALUMINUM	0J9P9	ORDER BY DESC
–9	346–0128–00		3	.STRAP,TIEDOWN,E:8.0 L X 0.1 W,NYLON	TK1719	TY232M
–10	103–0070–00		4	.ADAPTER,CONN:BNC FEMALE TO BNC FEMALE	74868	31–3220
–11	348–0532–00		4	.GROMMET,PLASTIC:BLACK,ROUND,0.625 ID	28520	2096
–12	352–0482–00		1	.HOLDER,CA TIE:0.75 SQ,STICKY BACK,PLASTIC	06383	ABMM–AT–D
Not shown	200–4095–00		1	.COV,DISK DRIVE	TK1163	ORDER BY DESC
–13	012–0117–00		4	.CABLE ASSY,RF:50 OHM COAX,30.0 L	80009	012011700
				ACCESSORIES		
	016–0099–00		1	HDW KIT,ELEK EQ:RACKMOUNTING HDW	80009	016009900
	070–8432–xx		1	MANUAL,TECH:RACKMOUNTING	80009	070843202

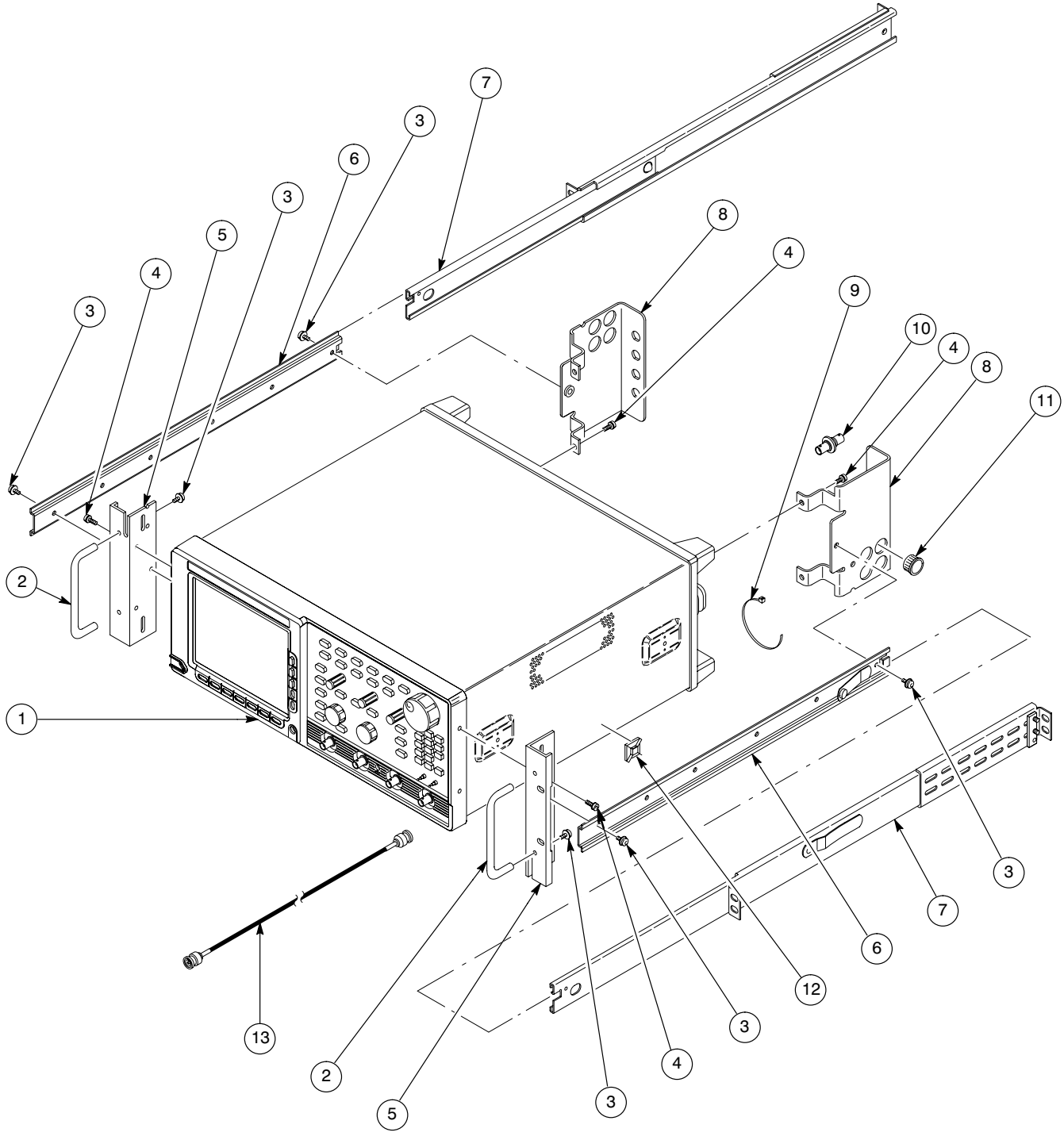


Figure 13: Exploded View

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