

**Tektronix BitAlyzer BA1500, BA1600**  
**Bit Error Rate Analyzer**  
**Declassification and Security**  
**Instructions**

[www.tektronix.com](http://www.tektronix.com)



077-0681-00

**Tektronix**

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- In North America, call 1-800-833-9200.
- Worldwide, visit [www.tektronix.com](http://www.tektronix.com) to find contacts in your area.

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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 a larger system. Read the safety sections of the other component manuals for warnings and cautions related to operating the system.

### To avoid fire or personal injury

**Use proper power cord.** Use only the power cord specified for this product and certified for the country of use.

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

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

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

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

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

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

**Do not operate without covers.** Do not operate this product with covers or panels removed.

**Do not operate with suspected failures.** If you suspect that there is damage to this product, have it inspected by qualified service personnel.

**Avoid exposed circuitry.** Do not touch exposed connections and components when power is present.

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

**Do not operate in wet/damp conditions.**

**Do not operate in an explosive atmosphere.**

**Keep product surfaces clean and dry.**

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

### Terms in this manual

These terms may appear in this manual:



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



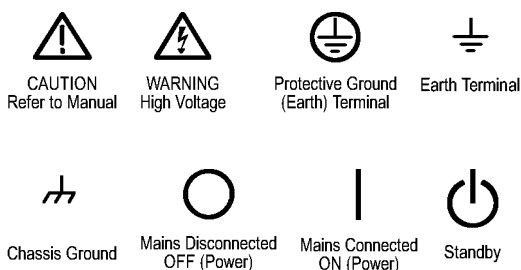
**CAUTION.** *Caution statements identify conditions or practices that could result in damage to this product or other property.*

### Symbols and terms on the product

These terms may appear on the product:

- DANGER indicates an injury hazard immediately accessible as you read the marking.
- WARNING indicates an injury hazard not immediately accessible as you read the marking.
- CAUTION indicates a hazard to property including the product.

The following symbol(s) may appear on the product:



## Service safety summary

Only qualified personnel should perform service procedures. Read this *Service Safety Summary* and the *General Safety Summary* before performing any service procedures.

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

**Disconnect power.** To avoid electric shock, switch off the instrument power, then disconnect the power cord from the mains power.

**Use care when servicing with power on.** Dangerous voltages or currents may exist in this product. Disconnect power, remove battery (if applicable), and disconnect test leads before removing protective panels, soldering, or replacing components.

To avoid electric shock, do not touch exposed connections.

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# Preface

This document helps customers with data security concerns to sanitize or remove memory devices from the Tektronix BA1500 and BA1600 BitAlyzer Bit Error Rate Analyzers.

These products have data storage (memory) devices and data output devices (USB ports). These instructions tell how to clear or sanitize the memory devices and disable the data output devices. The instructions also tell how to declassify an instrument that is not functioning.

- Reference** The procedures in this document are written to meet the requirements specified in:
- NISPOM, DoD 5220.22–M, Chapter 8
  - ISFO Process Manual for Certification & Accreditation of Classified Systems under NISPOM
- Products** The following Tektronix products are covered by this document:
- BA1500
  - BA1600
- Terms** The following terms may be used in this document:
- **Clear.** This removes data on media/memory before reusing it in a secured area. All reusable memory is cleared to deny access to previously stored information by standard means of access.
  - **Erase.** This is equivalent to clear.
  - **Instrument Declassification.** A term that refers to procedures that must be undertaken before an instrument can be removed from a secure environment. Declassification procedures include memory sanitization and memory removal, and sometimes both.
  - **Media storage/data export device.** Any of several devices that can be used to store or export data from the instrument, such as a USB port.
  - **Nonvolatile memory.** Data is retained when the instrument is powered off.
  - **Power off.** After a normal Windows shutdown, push the front panel ON/OFF button or disconnect the power source from the instrument.
  - **Remove.** This is a physical means to clear the data by removing the memory device from the instrument. Instructions are available in the product Service Manual.
  - **Sanitize.** This eradicates the data from media/memory so that the data cannot be recovered by other means or technology. This is typically used when the

device will be moved (temporarily or permanently) from a secured area to a non-secured area.

- **Scrub.** This is equivalent to sanitize.
- **User Accessible.** User is able to directly retrieve the memory device contents.
- **User-modifiable.** The user can write to the memory device during normal instrument operation, using the instrument interface or remote control.
- **Volatile memory.** Data is lost when the instrument is powered off.



# Clear and sanitize Procedures

## Memory devices

The following tables list the volatile and nonvolatile memory devices. Detailed procedures to clear or sanitize these devices, if any, are shown following each table.

### Terminology

The following terms are used in the tables in this section:

- User data – Describes the type of information stored in the device. Refers to waveforms or other measurement data representing signals connected to the instrument by users.
- User settings – Describes the type of information stored in the device. Refers to instrument settings that can be changed by the user.
- Both – Describes the type of information stored in the device. It means that both user data and user settings are stored in the device.
- None – Describes the type of information stored in the device. It means that neither user data nor user settings are stored in the device.
- Directly – Describes how data is modified. It means that the user can modify the data.
- Indirectly – Describes how data is modified. It means that the instrument system resources modify the data and that the user cannot modify the data.

**Table 1: Volatile memory devices**

Type and min. size	Function	Type of user info stored	Backed-up by battery	Method of modification	Data Input method	Location	User accessible	To clear	Process to sanitize
SDRAM 1 GB (std)	Microprocessor system memory	User data, user settings	No	Directly	Written by processor system	Socket, computer board	Yes	Remove power from the instrument for at least 20 seconds.	Remove power from the instrument for at least 20 seconds.
SRAM 8 MB	User pattern memory	user data patterns	No	Thru application	Written by processor system	Generator board	Yes	Remove power from the instrument for at least 20 seconds.	Remove power from the instrument for at least 20 seconds.
SRAM 8 MB	User pattern memory	user data patterns	No	Thru application	Written by processor system	Detector board	Yes	Remove power from the instrument for at least 20 seconds.	Remove power from the instrument for at least 20 seconds.

Table 2: Nonvolatile memory devices

Type and min. size	Function	Type of user info stored	Method modification	Data Input method	Location	User accessible	To clear	To sanitize
Fixed hard disk drive	Holds operating system and application software. Holds all user-storable data patterns, measurement results, and instrument settings	User data, user settings	Indirect	Manufacturing operations, user input	Internal	Yes	Erase the hard disk drive with commercial erasure software. Remove the hard disk drive. (See page 8, <i>Remove the hard disk drive.</i> ) When the hard disk drive is erased, the instrument is disabled.	Erase the hard disk drive with commercial erasure software. Remove the hard disk drive. (See page 8, <i>Remove the hard disk drive.</i> ) When the hard disk drive is erased, the instrument is disabled.
EEPROM 4 KB	Holds instrument manufacturing data	None	Indirect	Firmware operations	Generator board	No	N.A., does not contain user data or settings. Clearing would disable instrument functionality.	N.A., does not contain user data or settings. Sanitizing would disable instrument functionality.
EEPROM 4 KB	Holds instrument calibration data	None	Indirect	Firmware operations	Generator input/output board	No	N.A., does not contain user data or settings. Clearing would disable instrument functionality.	N.A., does not contain user data or settings. Sanitizing would disable instrument functionality.
EEPROM 4 KB	Holds instrument calibration data	None	Indirect	Firmware operations	Delay measurement board	No	N.A., does not contain user data or settings. Clearing would disable instrument functionality.	N.A., does not contain user data or settings. Sanitizing would disable instrument functionality.
EEPROM 4 KB	Holds instrument manufacturing data and instrument serial number	None	Indirect	Firmware operations	Detector board	No	N.A., does not contain user data or settings. Clearing would disable instrument functionality.	N.A., does not contain user data or settings. Sanitizing would disable instrument functionality.
EEPROM 4 KB	Holds instrument calibration data	None	Indirect	Firmware operations	Detector input/output board	No	N.A., does not contain user data or settings. Clearing would disable instrument functionality.	N.A., does not contain user data or settings. Sanitizing would disable instrument functionality.

Table 2: Nonvolatile memory devices (cont.)

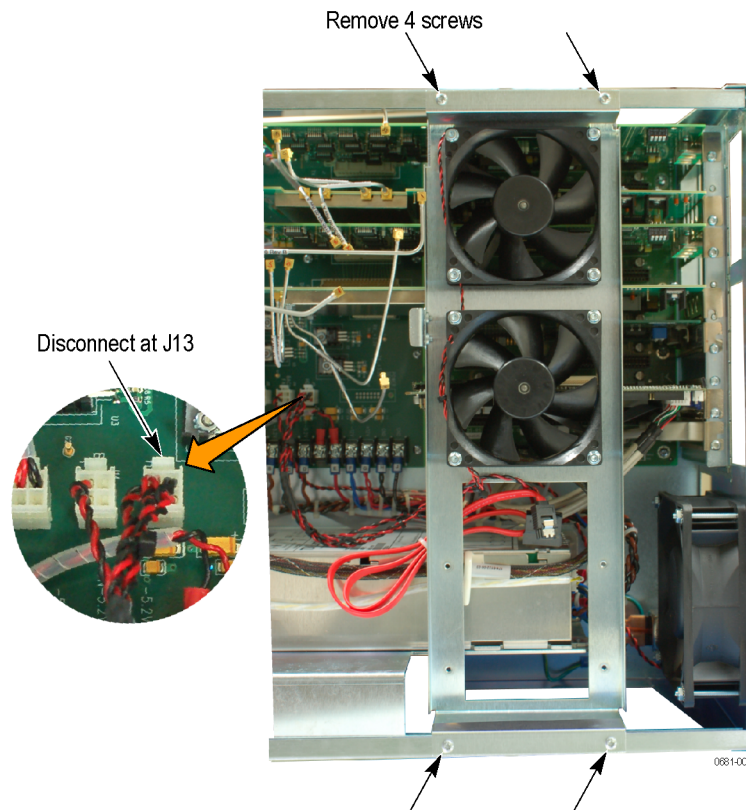
Type and min. size	Function	Type of user info stored	Method modification	Data Input method	Location	User accessible	To clear	To sanitize
EEPROM 4 KB	Holds instrument calibration data, option data, and serial number	None	Indirect	Firmware operations	Clock board	No	N.A., does not contain user data or settings. Clearing would disable instrument functionality.	N.A., does not contain user data or settings. Sanitizing would disable instrument functionality.
NVRAM	Computer BIOS	None	User Interface	Written by processor system	Single board computer	No	N.A., does not contain user data or settings. Clearing would disable instrument functionality.	N.A., does not contain user data or settings. Clearing would disable instrument functionality.
NVRAM	Computer BIOS, CMOS settings	User settings	User interface	Written by processor system	Single board computer	Yes	(See page 4, <i>Clear or sanitize the CMOS settings.</i> ) Clearing would disable instrument functionality.	(See page 4, <i>Clear or sanitize the CMOS settings.</i> ) Clearing would disable instrument functionality.

### Clear or sanitize the CMOS settings

The single-board computer (SBC) contains a jumper that can erase CMOS data and reset the system BIOS information. To access this jumper, you need to disassemble the instrument.

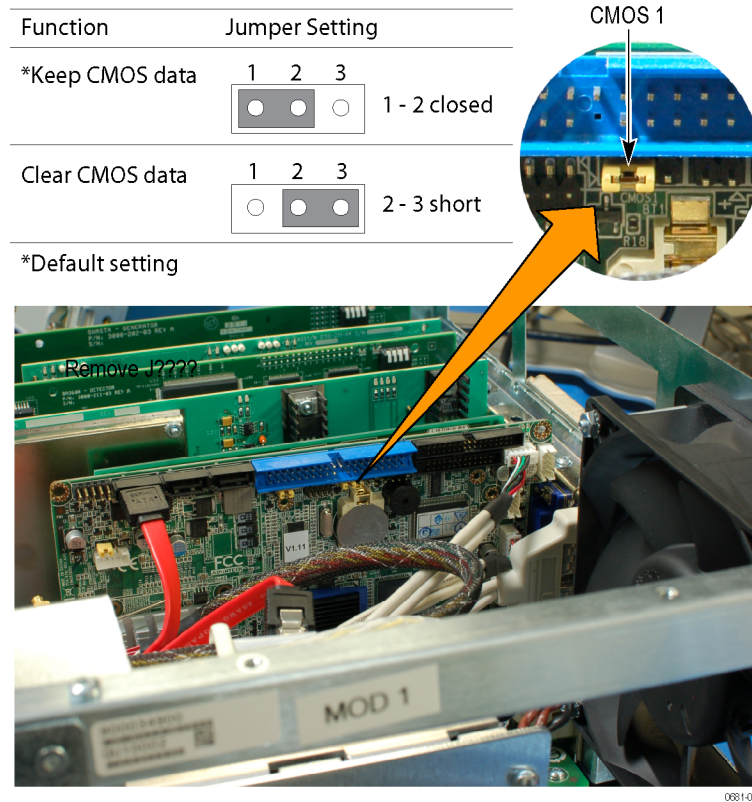
1. Refer to the procedures to remove the chassis from the instrument enclosure. (See page 11, *Disassemble the instrument.*)
2. Remove fan assembly from the top of the instrument by removing the four T15 screws that secure the assembly to the chassis. Then disconnect the fan power cable at J13 on the circuit board underneath.

You must remove the fan assembly to access the SBC in the chassis.



3. Locate the CMOS jumper on the SBC as shown in the following illustration.

**NOTE.** If necessary to access the jumper, remove the SBC from the chassis by removing the one T15 screw securing the SBC to the chassis.



4. Move the jumper to the pin 2–3 position.

Moving the jumper to the pin 2–3 position disconnects the battery from the CMOS memory and drains the residual voltage.

5. Move the CMOS jumper back to the pin 1–2 position.

If you removed the SBC from the chassis to access the jumper, reinstall the SBC in the chassis and install the T15 screw to hold the SBC in place.

6. Reinstall the fan assembly on the top of the chassis using the four T15 screws that you removed earlier.

7. Reconnect the fan power connector at J13.

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**NOTE.** *If you need to remove the hard disk drive from the instrument, do so before reassembling the instrument.*

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8. Refer to the procedures to reinstall the chassis in the instrument while being careful not to damage any circuit boards or cables. (See page 12, *Reassemble the instrument.*)

### Clearing hard disk drives

If your organization's security protocols allow the use of software to purge or sanitize hard drives, you can use commercial software to erase free space on the hard drive before sending the instrument out for upgrades or repair. Follow the instructions that come with the software to ensure that the erasure of sensitive data from the hard drive complies with your organization's security protocols.

## Media and data export devices

The following table lists the data export devices in the instrument.

**Table 3: Media and data export devices**

Type and min. size	Function	Method of modification	Data Input method	Location	Process to disable
RS-232 port		Directly		Rear panel (COM1)	The RS-232 port can be disabled. (See page 7, <i>Disable the RS-232 port, USB functions, and the LAN controller.</i> )
USB host port (supports removable USB flash drive)	User storage of reference waveforms, screen images, and instrument setups	Directly	User writeable	Rear of instrument	Files can be deleted or overwritten on the BitAnalyzer or on a PC, or USB flash drive can be removed or destroyed. The USB ports can be disabled. (See page 7, <i>Disable the RS-232 port, USB functions, and the LAN controller.</i> )
LAN Ethernet connector	Transfer data	Directly	N.A.	Rear panel	Ethernet port can be disabled. (See page 7, <i>Disable the RS-232 port, USB functions, and the LAN controller.</i> )
GPIO connector	Transfer data	Directly	N.A.	Rear panel	N.A.

**Disable the RS-232 port,  
USB functions, and the  
LAN controller**

Complete the following steps to disable the RS-232 port on the instrument:

1. Press Delete on the keyboard during Boot Up to go to the BIOS configuration menu.
2. Go to **Advanced tab > Super IO Configuration** and press **Enter**.
3. Go to the Serial Port 1 Configuration.
4. Set Serial Port to **Disable**.
5. Press **Esc** to go back a menu.

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**NOTE.** Do not disable Serial Port 2. it is used (COM2) internally (only) for the touch screen.

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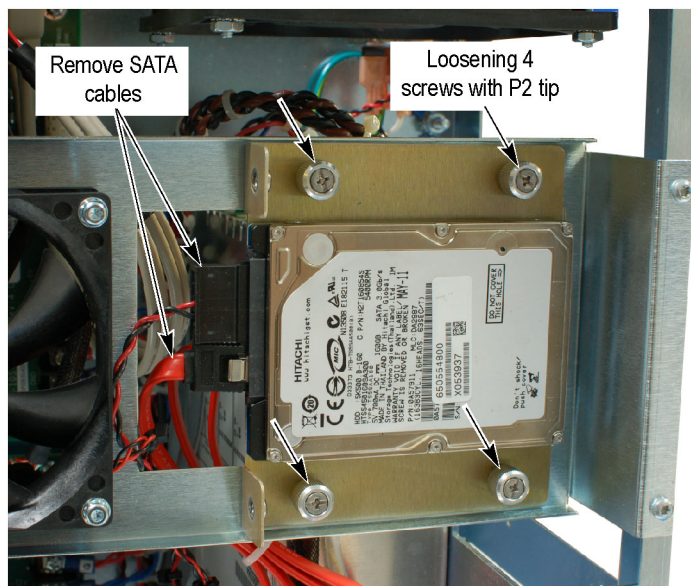
6. Go to the Chipset tab, select **South Bridge Configuration**, and then press **Enter**.
7. Select **USB Functions** and then press **Enter**.
8. Select **Disabled** and then press **Enter**.
9. Select **USB 2.0 Controller** and then press **Enter**.
10. Select **Disabled** and then press **Enter**.
11. Select **LAN1 Controller** and then press **Enter**.
12. Select **Disabled** and then press **Enter**.
13. Press **Esc**.
14. Press **F10** and then select **Yes** to save and exit.



## Remove the hard disk drive

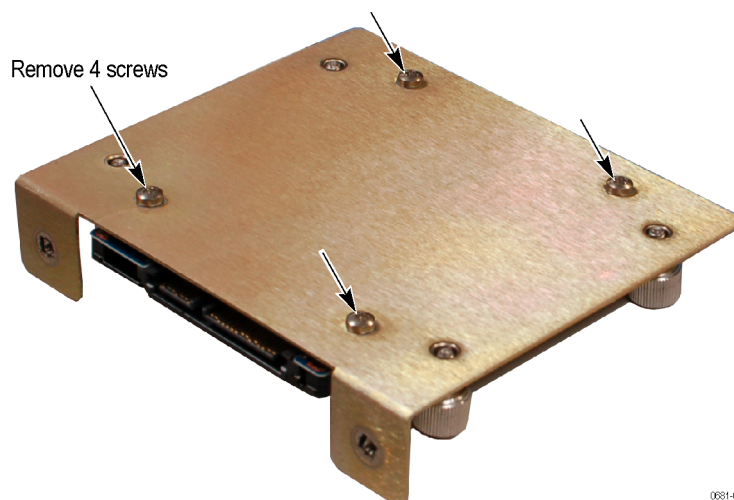
Remove the hard disk drive and return the instrument to Tektronix. A new hard disk drive will be installed and the instrument will be repaired and adjusted as necessary.

1. Refer to the procedures to remove the chassis from the instrument enclosure. (See page 11, *Disassemble the instrument.*)
2. Locate the hard disk drive assembly on the top side of the instrument and disconnect the SATA cables.



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3. Remove the hard disk drive and the hard disk drive bracket from the fan bracket by loosening the four screws using a P2 tip.
4. Remove the hard disk drive from the hard disk drive plate by removing the four screws with a P1 tip.



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5. Follow your company's internal procedures for storing or disposing the hard disk drive.
6. Reinstall the hard disk drive bracket (without the hard disk drive) on the fan bracket and then tighten the four screws using the P2 tip.
7. Refer to the procedures to reinstall the chassis in the instrument while being careful not to damage any circuit boards or cables. (See page 12, *Reassemble the instrument.*)



# Product disassembly procedures

Follow the procedures in this section to disassemble the instrument to remove the hard disk drive and to access the SBC.

You will need a screwdriver or screwdriver handle with the following tips: P1, P2, and T15 to disassemble and reassemble the instrument.



**WARNING.** To avoid electric shock, always power off the instrument and disconnect the power cord before cleaning or servicing the instrument.



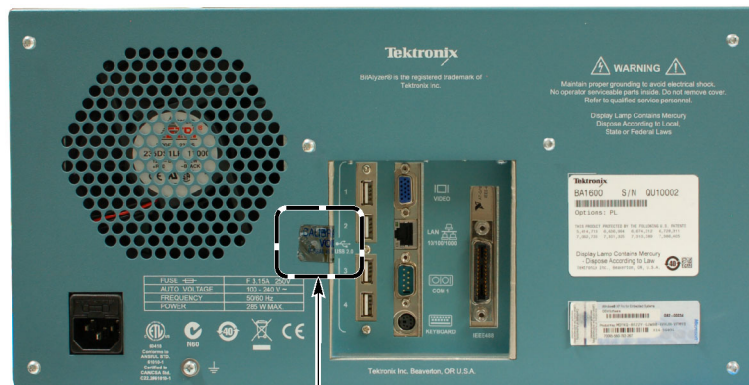
**CAUTION.** Many components within the chassis are susceptible to static discharge damage. Service the chassis only in a static-free environment.

Observe standard handling precautions for static-sensitive devices while servicing the chassis.

Always wear a grounded wrist strap, or equivalent, while servicing the chassis.

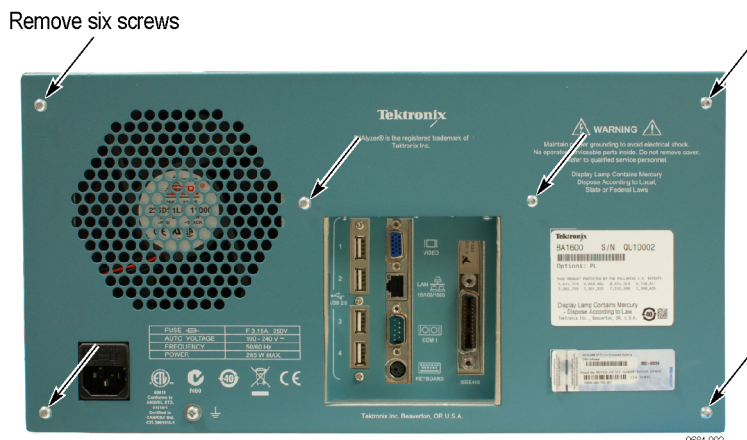
## Disassemble the instrument

1. Disconnect the power cord from the instrument and set the instrument on a static-free, soft surface.
2. Remove the **Warranty is Void** label from the rear of the instrument.



Remove warranty label

3. Remove the six screws from the rear of the chassis, one screw from each corner and two screws in the center of the rear panel.



4. Slide the instrument chassis out from the enclosure and set it aside.

## Reassemble the instrument



**CAUTION.** The circuit boards and cables can be damaged if you incorrectly install the cover/enclosure. Make sure that you do not damage any circuit boards or cables when you slide the chassis into the instrument enclosure.

Make sure that you have correctly installed the hard disk drive bracket or the fan assembly before continuing the following steps:

1. Carefully slide the chassis into the cover shell making sure that none of the cables get pinched outside the shell.



**CAUTION.** To avoid damaging the power cord connector, center the power connector in the hole as you tighten the screws.

2. Attach the chassis to the cover shell using the six screws that you removed earlier. Do not tighten the screws until all of them have started.
  - a. Install one of the center screws while moving the chassis as needed to align the screw holes; install the second center screw.
  - b. Attach the four outside screws moving the chassis as needed to align the screws.
  - c. Tighten all of the screws to 10.0 in.-lbs using a T15 tip.

# Troubleshooting

## How to clear or sanitize a nonfunctional instrument

If your instrument is not functioning, perform the following actions and return the instrument for Tektronix for repair. Describe the initial problem with the product. Tektronix will install replacement parts and then repair and return the instrument.

**External memory devices** Remove any USB flash drives or external hard drives from the instrument.

**Charges** Replacement of any missing hardware will be charged according to the rate at the time of replacement.

## Recover from clearing or removing the instrument memory

After the hard disk drive has been sanitized, the operating system, directory structure, single board computer (SBC) drivers, and the BitAlyzer software must be reinstalled. Replace the hard disk drive with a new preprogrammed hard disk drive from Tektronix Customer Service.

Complete the following steps to reset the single-board computer settings to the default values:

1. Power on the instrument.
2. Press and hold the Delete key when the system powers on to enter the BIOS settings.
3. Press the right arrow key and select the **Exit** tab.
4. Press the down arrow key and select **Load Optimal Defaults**.
5. Press the Enter key.
6. Select **OK** by pressing the Enter key.
7. To disable the USB, RS-232, and LAN settings refer to the procedures earlier in this document. (See page 7, *Disable the RS-232 port, USB functions, and the LAN controller.*)
8. Select **Save Changes and Exit** and then press **Enter** twice.

The single-board computer automatically restarts.