Agilent X-Series Signal Analyzer

This manual provides documentation for the following analyzers:

PXA Signal Analyzer N9030A

MXA Signal Analyzer N9020A

EXA Signal Analyzer N9010A

CXA Signal Analyzer N9000A

Security Features and Certificate of Volatility

Agilent Technologies

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Documentation is updated periodically. For the latest information about these products, including instrument software upgrades, application information, and product information, see the following URLs:

http://www.agilent.com/find/pxa

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2 Contacting Agilent Sales and Service Offices

Assistance with test and measurement needs, and information to help you find a local Agilent office, is available via the internet at, http://www.agilent.com/find/assist. If you do not have internet access, please contact your designated Agilent representative.

NOTE In any correspondence or telephone conversation, refer to the instrument by its model number and full serial number. With this information, the Agilent representative can determine whether your unit is still within its warranty period.

3 Products Covered by this Document

Product Family Name	Product Names	Model Numbers
X-Series Signal Analyzers	PXA Signal Analyzer	N9030A-503, -508, -513, -526
	MXA Signal Analyzer	N9020A-503, -508, -513, -526
	EXA Signal Analyzer	N9010A-503, -507, -513, -526
	CXA Signal Analyzer	N9000A-503, -507

This document describes instrument memory types and security features. It provides a statement regarding the volatility of all memory types, and specifies the steps required to declassify an instrument through memory clearing, sanitization, or removal.

For additional information, go to:

http://www.agilent.com/find/security

IMPORTANT

Be sure that all information stored by the user in the instrument that needs to be saved is properly backed up before attempting to clear any of the instrument memory. Agilent Technologies cannot be held responsible for any lost files or data resulting from the clearing of memory.

Be sure to read this document entirely before proceeding with any file deletion or memory clearing.

X-Series Processor and Disk Drive Configurations

This document describes alternative Processor and Disk Drive Configurations for X-Series analyzers. Due to continuous improvement of the X Series Analyzer range, configurations may vary according to such factors as: manufacturing date, product name, and installed options. Processor and disk drive configurations are considered separately, due to the large number of possible combinations.

Processor Assembly Configuration

There are three possible processor assembly configurations: a single-core microprocessor with non-removable (fixed) disk drive, a single-core microprocessor with removable disk drive, or a dual-core processor with removable disk drive. The relationship between processor assembly type and product name is detailed in Table 3-1 below. (For details of how to determine installed options, see "Determining Installed Options" on page 15)

Table 3-1 Processor Assembly & Product Name

Type	Configuration	Product Names & Installed Options
1	**Single-Core, Fixed Disk**	The disk is referred to as "fixed", because it can only be removed by removing and opening the instrument's processor assembly. This configuration is standard for: a. MXA instruments without Option PC2, b. EXA instruments without Option PC2 or PC3, c. CXA instruments without Option PC3.
2	**Single-Core, Removable Disk**	The disk may be removed from the instrument's rear panel, without removing or opening the processor assembly. This configuration is standard for: a. EXA instruments with Option PC3, b. CXA instruments with Option PC3.
3	**Dual-Core, Removable Disk**	The disk may be removed from the instrument's rear panel, without removing or opening the processor assembly. The Dual-Core processor unit is standard for: a. all PXA instruments, b. MXA instruments with Option PC2, c. EXA instruments with Option PC2.

Disk Drive Configuration

There are several possible disk drive configurations, as listed below in Table 3-2. The actual configuration depends on the instrument's Product Name and installed options (Option SSD, Option PC2, Option PC3). For details of how to determine installed options, see "Determining Installed Options" on page 15.

For details of the capacities of each of the drive types listed below, see "Non-Volatile Memory" on page 20.

Table 3-2 Disk Drive Configurations

Type	Configuration	Product Names & Installed Options
Fixed Magnetic	Fixed Magnetic Drive	This configuration applies to: a. MXA instruments without Option PC2, b. EXA instruments without Option PC2 or PC3, c. CXA instruments without Option PC3.
Removable Magnetic	Standard Removable Magnetic Drive	This configuration applies to: a. PXA instruments without Option SSD, b. MXA instruments with Option PC2, but without Option SSD. c. EXA instruments with Option PC2 or PC3, but without Option SSD.
Removable Solid-State	Removable Solid-State Drive (**Flash** drive)	This configuration applies to all instruments with Option SSD. Originally an option, a solid-state disk drive cartridge is now supplied by default with X-Series Analyzers.

Option SSD

You can obtain a Removable Solid-State disk drive for your instrument, either as an upgrade to replace a Removable Magnetic disk drive, or as an additional solid-state drive, by ordering Option SSD. You can order Option SSD either at the time that you purchase the instrument, or at any later time.

If your instrument's current processor assembly configuration is Single-Core, Fixed Disk, in order to be able to use the removable disk you will need to upgrade the instrument to a Dual-Core, Removable Disk or Single-Core, Removable Disk processor assembly, by ordering Option PC2 or PC3 respectively.

Note that Removable Solid-State disk units exist in **two** capacities. Earlier disks had a total capacity of 32 GB, while newer units have a total capacity of 80 GB.

Determining Instrument Configuration based on Product Name

Use the following procedures to determine the processor assembly and disk drive configurations of your instrument, starting from its Product Name.

Processor Assembly Configuration

The following procedure allows you to determine whether your instrument has a Single-Core, Fixed Disk, Single-Core, Removable Disk or Dual-Core, Removable Disk processor assembly.

Step	Procedure
1	What is the Product Name of your instrument? PXA: Go to Step 8. MXA: Go to Step 2. EXA: Go to Step 3. CXA: Go to Step 5.
2	Examine the instrument's rear panel and compare with the illustrations in "Rear Panel Configurations" on page 14. Does it resemble or Figure 3-1 (Fixed Disk) or Figure 3-2 (Removable Disk)? Fixed Disk: Go to Step 6. Removable Disk: Go to Step 8.
3	Examine the instrument's rear panel and compare with the illustrations in "Rear Panel Configurations" on page 14. Does it resemble or Figure 3-1 (Fixed Disk) or Figure 3-2 (Removable Disk)? Fixed Disk: Go to Step 6. Removable Disk: Go to Step 4.
4	Are Options PC2 or PC3 installed? (To determine whether Options PC2 or PC3 are installed, see "Determining Installed Options" on page 15 below.) PC2 installed: Go to Step 8. PC3 installed: Go to Step 7.
5	Examine the instrument's rear panel and compare with the illustrations in "Rear Panel Configurations" on page 14. Does it resemble or Figure 3-1 (Fixed Disk) or Figure 3-2 (Removable Disk)? Fixed Disk: Go to Step 6. Removable Disk: Go to Step 7.
6	Your instrument has a Single-Core, Fixed Disk processor assembly.
7	Your instrument has a Single-Core, Removable Disk processor assembly.

Step	Procedure
8	Your instrument has a Dual-Core, Removable Disk processor assembly.

Disk Drive Configuration

The following procedure allows you to determine your instrument's disk drive configuration

Step	Procedure
1	What is the Product Name of your instrument? PXA: Go to Step 5. MXA: Go to Step 3. EXA: Go to Step 3. CXA: Go to Step 2.
2	Examine the instrument's rear panel and compare with the illustrations in "Rear Panel Configurations" on page 14. Does it resemble or Figure 3-1 (Fixed Disk) or Figure 3-2 (Removable Disk)? Fixed Disk: Go to Step 4. Removable Disk: Go to Step 6.
3	Examine the instrument's rear panel and compare with the illustrations in "Rear Panel Configurations" on page 14. Does it resemble or Figure 3-1 (Fixed Disk) or Figure 3-2 (Removable Disk)? Fixed Disk: Go to Step 4. Removable Disk: Go to Step 5.
4	Your instrument has a 40 GB Fixed Magnetic disk drive.
5	Check the instrument's installed options (see "Determining Installed Options" on page 15). If the list includes "N90X0A-IDE", your instrument has a 160 GB Removable Magnetic disk drive. If the list includes "N90X0A-SSD", your instrument has a 32 GB or 80 GB Removable Solid-State disk drive.
6	Your instrument has a 32 GB or 80 GB Removable Solid-State disk drive.

Rear Panel Configurations

Figure 3-1 Rear Panel of Instrument with Fixed Magnetic Disk

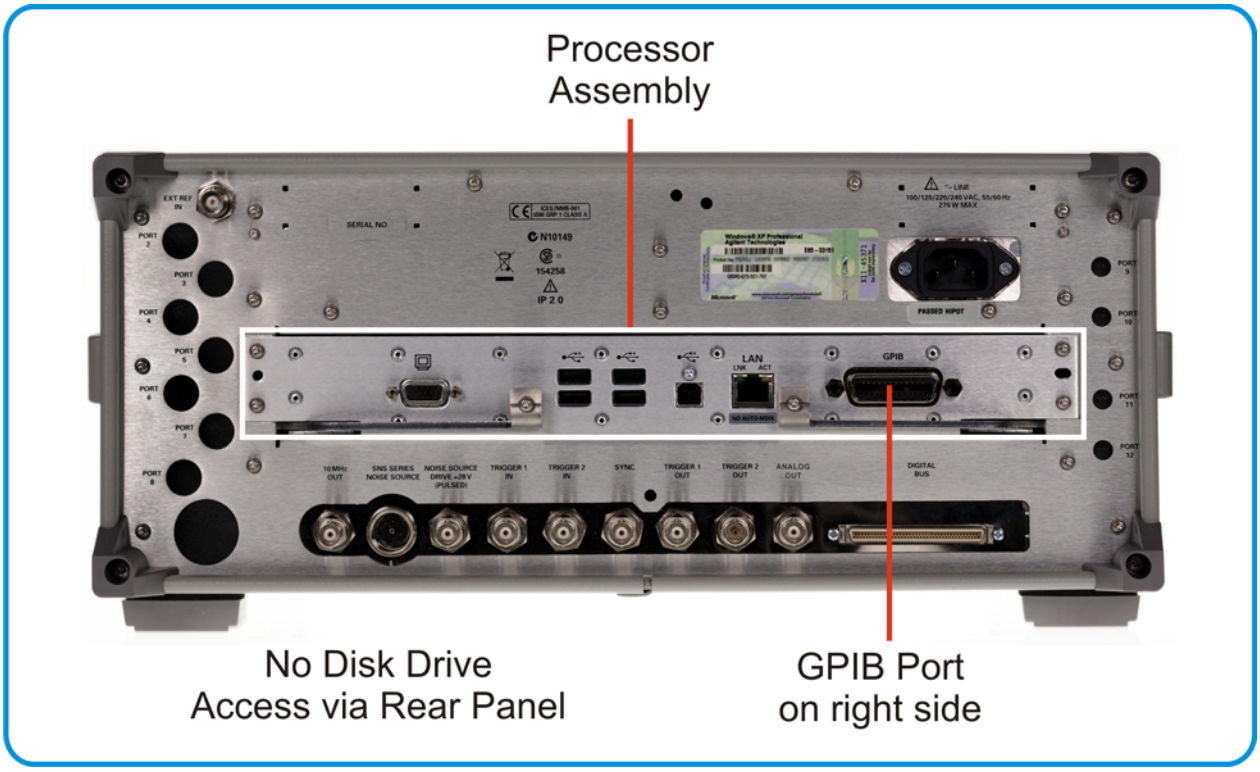
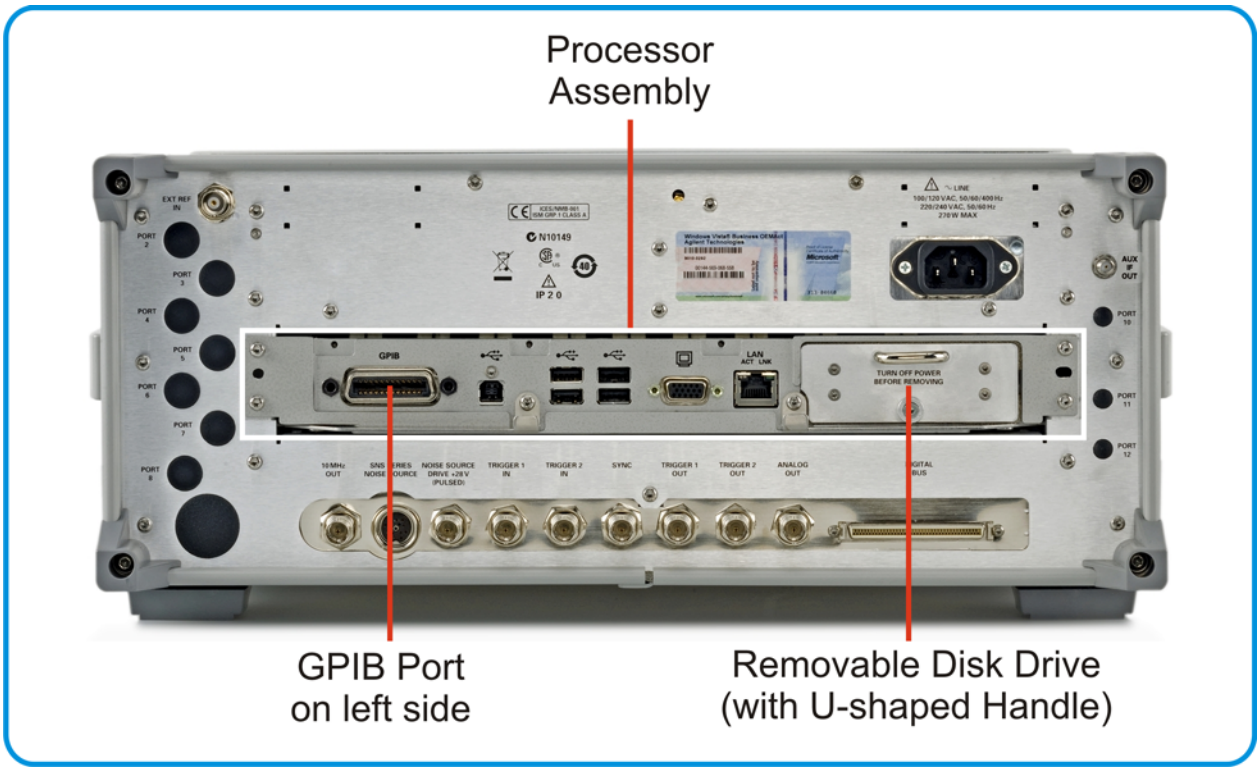


Figure 3-2 Rear Panel of Instrument with Removable Magnetic or Removable Solid-State Disk

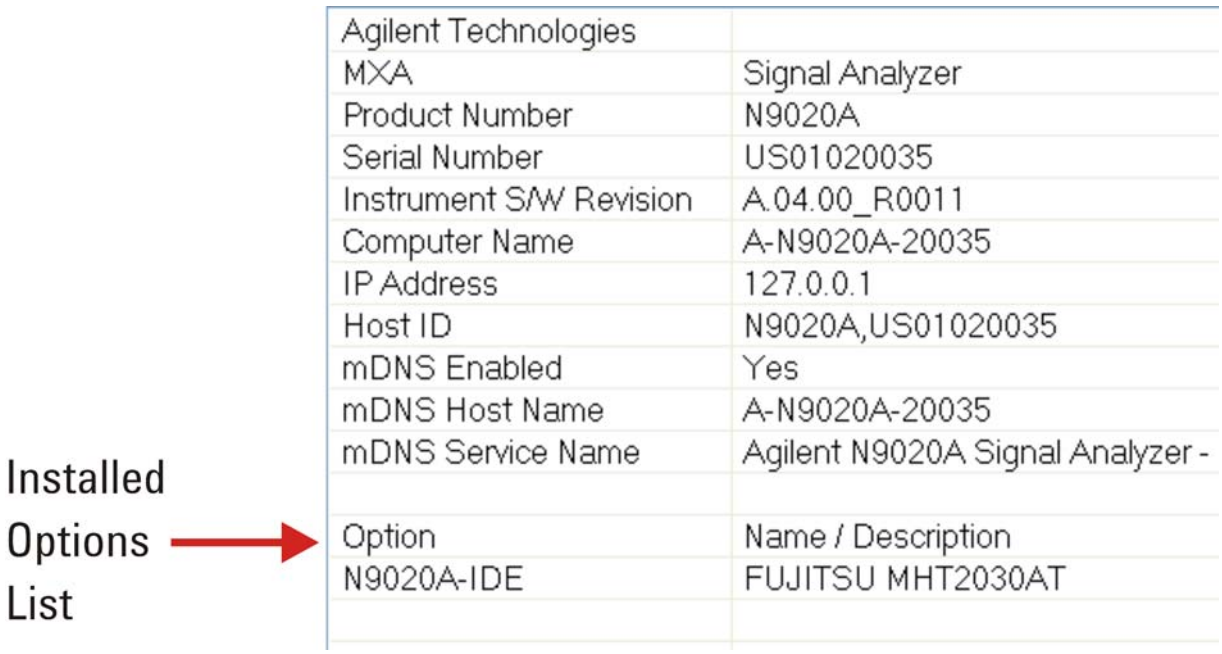


Determining Installed Options

Use the following procedure to determine whether your instrument has a magnetic or solid-state disk drive, and whether Options PC2 (Dual-Core Processor), or PC3 (Single-Core High-Performance Processor) are installed.

1. Using the instrument front panel and softkey menus, press **System** > **Show** > **System**.
2. The "Show System" display appears. Look for start of the "Option" listing, a few lines below the top of the table, as shown in Figure 3-3 below.

Figure 3-3 Show System Display: Option Listing



Agilent Technologies	
MXA	Signal Analyzer
Product Number	N9020A
Serial Number	US01020035
Instrument S/W Revision	A.04.00_R0011
Computer Name	A-N9020A-20035
IP Address	127.0.0.1
Host ID	N9020A,US01020035
mDNS Enabled	Yes
mDNS Host Name	A-N9020A-20035
mDNS Service Name	Agilent N9020A Signal Analyzer -
Option	Name / Description
N9020A-IDE	FUJITSU MHT2030AT

3. If the Option list includes "N90X0A-SSD" (where "X" is a digit between 0 and 3, according to the Model Number), then a Removable Solid-State disk drive is installed (either because the instrument was supplied with this drive, or because Option SSD has been installed).

   If your instrument has a Fixed Magnetic or Removable Magnetic disk drive, then "N90X0A-IDE" is listed, as shown in Figure 3-3 above.
4. If the Option list includes "N90X0A-PC2" (where "X" is a digit between 1 and 3, according to the Model Number), then Option PC2 is installed.
5. If the Option list includes "N90X0A-PC3" (where "X" is a digit between 0 and 1, according to the Model Number), then Option PC3 is installed.
6. To dismiss the "Show System" display, press any other front-panel or menu key.

Determining Instrument Configuration based on Product Name

4 Security Terms and Definitions

Term	Definition
Clearing	As defined in Section 8-301a of DoD 5220.22-M, "National Industrial Security Program Operating Manual (NISPOM)", clearing is the process of eradicating the data on media before reusing the media so that the data can no longer be retrieved using the standard interfaces on the instrument. Clearing is typically used when the instrument is to remain in an environment with an acceptable level of protection.
Instrument Declassification	A term that refers to procedures that must be undertaken before an instrument can be removed from a secure environment, such as is the case when the instrument is returned for calibration. Declassification procedures include memory sanitization or memory removal, or both. Agilent declassification procedures are designed to meet the requirements specified in DoD 5220.22-M, "National Industrial Security Program Operating Manual (NISPOM)", Chapter 8.
Sanitization	As defined in Section 8-301b of DoD 5220.22-M, "National Industrial Security Program Operating Manual (NISPOM)", sanitization is the process of removing or eradicating stored data so that the data cannot be recovered using any known technology. Instrument sanitization is typically required when an instrument is moved from a secure to a non-secure environment, such as when it is returned to the factory for calibration. Agilent memory sanitization procedures are designed for customers who need to meet the requirements specified by the US Defense Security Service (DSS). These requirements are specified in the "Clearing and Sanitization Matrix" in Appendix O of the ODAA Process Guide for C&A of Classified Systems under NISPOM.
Secure Erase	Secure Erase is a term that is used to refer to either the clearing or sanitization features of Agilent instruments.

5 Instrument Memory & Certificate of Volatility

This chapter summarizes all memory types in the instrument, for the following processor assembly and disk drive configurations:

a. Single-Core, Fixed Disk processor assemblies,

b. Single-Core, Removable Disk and Dual-Core, Removable Disk processor assemblies.

For definition of terms, and to determine the configuration of your instrument, based on its Product Name and installed options, see "X-Series Processor and Disk Drive Configurations" on page 10.

The descriptions below are divided between:

1. Non-Volatile Memory,
2. Volatile Memory.

Non-Volatile Memory

This section contains information on the memory components available in your instrument.

Table 5-1 on page 20 describes memory components that are present in all instruments.

Table 5-2 on page 25 describes additional memory components that are present only in PXA instruments.

Both tables provide details of the size of each memory component, its type, how it is used, its location, volatility, and the sanitization procedure.

NOTE The instrument contains no user-accessible non-volatile memory, except for the Disk Drive described in Item 1 of Table 5-1 on page 20. For this reason, as indicated in the tables below, no sanitization procedure is required for any memory component except the Disk Drive.

Table 5-1 *Summary of Non-Volatile instrument memory - All Instruments (Single-Core and Dual-Core Processors)*

Memory Component, Type and Size	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
1. Disk Drive Fixed Magnetic: 40 GByte Removable Magnetic: 160 GByte Removable Solid-State Original: 32 GByte New: 80 GByte This drive is partitioned, as detailed in "Disk Drive Partitioning" on page 26.	Yes	Yes	Contains Operating System, Instrument Software, Factory Calibration Data, Diagnostic software, Crash recovery image, user instrument states, user data files, user trace data and any user installed third party software.	Programmed before installation or by factory/service center calibration procedure software, or by upgrade installation software. Also programmed via operations and by the user.	Single-Core, Fixed Disk: A4 Processor Assy. Single-Core, Removable Disk and Dual-Core, Removable Disk: Rear Panel (Removable) Contains user data.	See Table 6-1 on page 29.

Table 5-1 *Summary of Non-Volatile instrument memory - All Instruments (Single-Core and Dual-Core Processors)*

Memory Component, Type and Size	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
2. CPU BIOS (CMOS NVRAM) 256 Byte (battery backed)	No	Yes	Contains default BIOS settings to use when booting the Processor Assembly.	Programmed by factory. Settings can be toggled by user.	A4 Processor Assy. Battery backed to maintain Windows calendar time. Contains no user data.	None.
3. License Storage Memory (EEPROM) 512 kbit	No	Yes	Contains instrument serial number and license keys for measurement applications. License keys are encrypted.	Programmed before installation and by installing new license keys.	A7 Midplane Assy. Contains no user data.	None.
4. Config & Cal Memory (EEPROM) 8 kbit (1024 x 8)	No	Yes	Header EEPROM used to identify the assembly.	Programmed before installation.	A14 Synthesizer Assy. Contains no user data.	None.
5. Config Memory (EEPROM) 8 kbit (1024 x 8)	No	Yes	Contains measurement and control software, which is preloaded into FPGA during instrument power-up.	Programmed before installation.	A14 Synthesizer Assy. Contains no user data.	None.
6. Config & Cal Memory (EEPROM) 8 kbit (1024 x 8)	No	Yes	Header EEPROM used to identify the assembly.	Programmed before installation.	A15 Front End Control Assy. Contains no user data.	None.

Table 5-1 *Summary of Non-Volatile instrument memory - All Instruments (Single-Core and Dual-Core Processors)*

Memory Component, Type and Size	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
7. Config Memory (Flash) 2 Mbit	No	Yes	Contains measurement and control software, which is preloaded into FPGA during instrument power-up. Primarily YTF, attenuator, and front end switch control.	Programmed before installation.	A15 Front End Control Assy. Contains no user data.	None.
8. Config & Cal Memory (EEPROM) 8 kbit (1024 x 8)	No	Yes	Header EEPROM used to identify the assembly.	Programmed before installation.	A2 Analog IF Assy. Contains no user data.	None.
9. Control Logic Memory (CPLD) 1600 Gates	No	Yes	Contains control algorithms to optimize filter performance.	Programmed before installation.	A2 Analog IF Assy. Contains no user data.	None.
10. Config & Cal Memory (EEPROM) 8 kbit (1024 x 8)	No	Yes	Header EEPROM used to identify the assembly.	Programmed before installation.	A3 Digital IF Assy. Contains no user data.	None.
11. Config Memory (Flash) 8 Mbit	No	Yes	Contains measurement and control software, which is preloaded into FPGA during instrument power-up.	Programmed before installation.	A3 Digital IF Assy. Contains no user data.	None.

Table 5-1 *Summary of Non-Volatile instrument memory - All Instruments (Single-Core and Dual-Core Processors)*

Memory Component, Type and Size	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
12. Control Logic Memory (CPLD) 6400 Gates	No	Yes	Contains measurement and control algorithms to optimize digital filtering.	Programmed before installation.	A3 Digital IF Assy. Contains no user data.	None.
13. Serial Presence Detect Memory (EEPROM) 2 Mbit	No	Yes	Used on commercial SDRAM Module, programmed by chip vendor. Contains module identification information.	Programmed by IC vendor only.	A3 Digital IF Assy. Contains no user data.	None.
14. Config & Cal Memory (EEPROM) 8 kbit (1024 x 8)	No	Yes	Header EEPROM used to identify the assembly.	Programmed before installation.	A16 Reference Assy. Contains no user data.	None.
15. FPGA Config Memory (EEPROM) 2 Mbit	No	Yes	Contains measurement and control software.	Programmed before installation.	A16 Reference Assy. Contains no user data.	None.
16. Digital Potentiometer (EEPROM) 112 bits (14 Bytes)	No	Yes	Contains default data to preset digital potentiometers during power-up.	Programmed before installation.	A16 Reference Assy. Contains no user data.	None.

Table 5-1 *Summary of Non-Volatile instrument memory - All Instruments (Single-Core and Dual-Core Processors)*

Memory Component, Type and Size	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
17. Front Panel EEPROM 64 kbit	No	Yes	Contains software for running front panel microcontroller. Operates front panel LEDs, and transmits key presses to processor.	Programmed before installation.	A1A2 Front Panel Interface Board Contains no user data.	None.
18. Front Panel CPLD 800 Gates	No	Yes	Contains fixed digital logic associated with front panel keyboard button operation and LEDs.	Programmed before installation at the factory only.	A1A2 Front Panel Interface Board Contains no user data.	None.
19. EDID Memory (EEPROM) 2 kbit	No	Yes	Extended Display Identification Data is a VESA standard data format that contains basic information about a monitor and its capabilities, including vendor information, maximum image size, color characteristics, factory pre-set timings, frequency range limits, and character strings for the monitor name and serial number.	Programmed before installation.	A1A2 Front Panel Interface Board. Contains no user data.	None.

Table 5-2 *Summary of Non-Volatile instrument memory - Additional Components for PXA Instruments Only (Dual-Core Processor)*

Memory Component, Type and Size	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
1. Boot ROM (Flash) 8 MByte	No	Yes	Contains the boot ROM, operating system and run-time code for the WBDIF CPU.	Programmed by factory at installation time, or during firmware upgrade.	A26 WBDIF assembly Contains no user data.	None.
2. (Flash) 16 MByte (2 x 64 Mbit)	No	Yes	Contains up to 3 WBDIF FPGA images.	Programmed by factory at installation time, or during FPGA upgrade process.	A26 WBDIF assembly Contains no user data.	None.
3. (EEPROM) 512 Byte	No	Yes	Contains header information used to identify the assembly, and configuration information used to initialize the PCI bus.	Programmed before installation.	A26 WBDIF assembly Contains no user data.	None.
4. (EEPROM) 1024 byte	No	Yes	Contains configuration information used during initialization of the PCI bus. This component is currently unprogrammed.	Programmed before installation.	A26 WBDIF assembly Contains no user data.	None.
5. (CPLD) 256 Macrocells	No	Yes	Contains critical hardware control algorithms.	Programmed before installation.	A26 WBDIF assembly Contains no user data.	None.

Disk Drive Partitioning

The instrument's disk drive is divided at the factory into three visible partitions, labeled C:, D: and E:, plus a fourth hidden partition.

The sizes of each partition vary according to the instrument's Disk Drive Configuration.

Details of the sizes and functions of all partitions are provided in Table 5-3 below.

Table 5-3 Disk Drive Partitions

Partition Label	Size (GBytes)	Purpose
C:	Fixed Magnetic: 15 GB Removable Magnetic: 62 GB Removable Solid-State: (Original) 16 GB (New) 32 GB	Primary partition for applications and secondary data.
D:	Fixed Magnetic: 6 GB Removable Magnetic: 23 GB Removable Solid-State: (Original) 3.75 GB (New) 17 GB	Default location for user data.
E:	Fixed Magnetic: 6 GB Removable Magnetic: 2.3 GB Removable Solid-State: (Original) 1.6 GB (New) 2 GB	Calibration data.
Hidden	Fixed Magnetic: 6.5 GB Removable Magnetic: 54 GB Removable Solid-State: (Original) 8.2 GB (New) 23 GB	Factory recovery image of the C: partition.

Volatile Memory

The volatile memory in the instrument does not have battery backup. It does not retain any information when AC power is removed.

Removing power from this memory meets the memory sanitization requirements specified in the "Clearing and Sanitization Matrix" in Appendix O of the ODAA Process Guide for C&A of Classified Systems under NISPOM.

Table 5-4 *Summary of Volatile Instrument Memory - Instruments with Single-Core and Dual-Core Processors*

Memory Type and Size	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
1. Processor SDRAM Single-Core, Fixed Disk: 1 GByte or 2 GByte Single-Core, Removable Disk or Dual-Core, Removable Disk: 4 GByte	Yes	No	Main dynamic RAM memory for processor. Contains working copies of Operating System, instrument measurement applications, calibration data, and measurement data.	Programmed before installation, or by factory/service center calibration procedure software, or by firmware upgrade installation software. Also programmed via firmware operations and by user.	A4 Processor Assy. Contains user data. This memory is not battery backed-up or connected to standby power.	Turn off instrument power.
2. SDRAM 256 MByte	Yes	No	Contains measurement data from data acquisition system.	Programmed by firmware. Not accessible by user.	A3 Digital IF Assy. Contains raw measurement data. This memory is not battery backed-up or connected to standby power.	Turn off instrument power.

6 Memory Clearing, Sanitization and/or Removal Procedures

This section explains how to clear, sanitize, and remove memory from your instrument, for all types of non-volatile memory that can be written to during normal instrument operation.

Table 6-1 *Disk Drive*

Description and purpose	The Disk Drive is the main memory for the instrument. It has very large storage capacity, plus fast read and write times. There are no limitations on the number of read/write cycles. It contains the Operating System, Instrument Software, Factory Calibration Data, Diagnostic software, Crash recovery image, user instrument states, user data files, user trace data and any user-installed third party software. The Disk Drive is written to frequently by the Operating System and other application software.
Size	Fixed Magnetic magnetic disk drive: 40 Gigabytes Removable Magnetic disk drive: 160 Gigabytes Removable Solid-State disk drive: 32 Gigabytes (original) or 80 Gigabytes (new)
Memory clearing	Software utilities are available that comply with the clearing requirements specified for Magnetic Disks in the “Clearing and Sanitization Matrix” in Appendix O of the ODAA Process Guide for C&A of Classified Systems under NISPOM.
Memory sanitization	We recommend always removing the Disk Drive to achieve sanitization. For program classifications lower than Top Secret, this media type can be sanitized using method "d" as defined in the "Clearing and Sanitization Matrix" in Appendix O of the ODAA Process Guide for C&A of Classified Systems under NISPOM“. For Top Secret and higher program classifications, Disk Drive removal is the only acceptable sanitization procedure.

Table 6-1 *Disk Drive*

Memory removal	Single-Core, Fixed Disk Processor assembly: see "Instruments with Non-Removable Drives" on page 46, in the Chapter "Disk Drive Removal Procedure". Single-Core, Removable Disk or Dual-Core, Removable Disk Processor assemblies: see "Instruments with Removable Drives" on page 47, in the Chapter "Disk Drive Removal Procedure".
Write protecting	The Disk Drive cannot be write protected. The operating system and software must be able to read from and write to the drive during normal operation.
Memory validation	The Disk Drive memory can be validated using third-party Windows utilities.

Table 6-2 *CPLD, CMOS Programmable Logic Devices*

Description and purpose	These memory devices are used to execute timing, control, and measurement functions. No user data is contained in these devices. This memory cannot be written to during instrument operation.
Size	1600 to 6400 logic gates.
Memory clearing	Not applicable. This memory does not contain user information and is not accessible by the user.
Memory sanitization	Not applicable. This memory does not contain user information and is not accessible by the user.
Memory removal	Not applicable.
Write protecting	Not applicable.
Memory validation	Not applicable.
Remarks	These devices are programmed in the factory via diagnostic connectors on the PCB assemblies. After instrument assembly, the diagnostic connectors are not physically accessible and not electrically connected.

Table 6-3 *EEPROM Memories*

Description and purpose	These memories are used to identify the assemblies (header info) and store option configuration data. Some are also used to hold factory software for FPGAs. The software is loaded when the instrument powers up. This memory cannot be written to during instrument operation.
Size	2 Kbit to 8 Mbit
Memory clearing	Not applicable. This memory does not contain user information and is not accessible by the user.
Memory sanitization	Not applicable. This memory does not contain user information and is not accessible by the user.
Memory removal	Not applicable.

Table 6-3 EEPROM Memories

Write protecting	Not applicable.
Memory validation	Not applicable.
Remarks	With one exception, as described below, these memories are only writable by factory/service center software, or upgrade installation software. These memories are internally connected to proprietary internal control data busses (as opposed to standard computer busses such as IDE, PCI, USB). They are not accessible by the Operating System or by third-party software, or by the user, to protect the measurement accuracy and consistency of the instrument. They are rarely modified, to ensure no degradation of instrument performance. These memories contain no user data. Many of these memories have long write times, and limited write endurance, so they are not intended to be written to dynamically by software. The sole exception applies to the EEPROM on the A7 Midplane Assembly. Inserting a USB memory device containing a valid license key file into the instrument causes the key file to be copied to both the C: drive and the EEPROM on the A7 Midplane Assembly.

Instrument Sanitization Procedures

This section includes flowcharts that describe how to sanitize an instrument by physical removal and replacement of either the Processor Assembly or Disk Drive.

- For Single-Core, Fixed Disk instruments, see "Replacement of Processor Assembly" on page 32.
- For Single-Core, Removable Disk and Dual-Core, Removable Disk instruments, see "Replacement of Disk Drive" on page 34.

Application License Key Storage

Note that License keys for most Applications are stored in EEPROM on the A7 Midplane Assembly (as described in Item 3 of Table 5-1 on page 20). Therefore, when replacing either the Processor Assembly or Disk Drive, you do **not** need to back up and restore the license keys.

The sole exception is the 89601A VSA Application, which uses a Site Key license. For information on how to regenerate a Site Key, see Regenerating a Site Key License for 89601A VSA Application below.

Regenerating a Site Key License for 89601A VSA Application

When replacing a Processor Assembly or Disk Drive for an instrument that includes the 89601A VSA Application, you must request a new Site Key License, as if installing 89601A VSA for the first time. Details of how to do this are provided in the following article, available on the Agilent web site:

How do I recover my VSA 89600S license after a hard drive crash?

NOTE This requirement applies only to the 89601**A** VSA Application. It does **not** apply to the newer 89601B.

Replacement of Processor Assembly

This procedure applies only to Single-Core, Fixed Disk instruments.

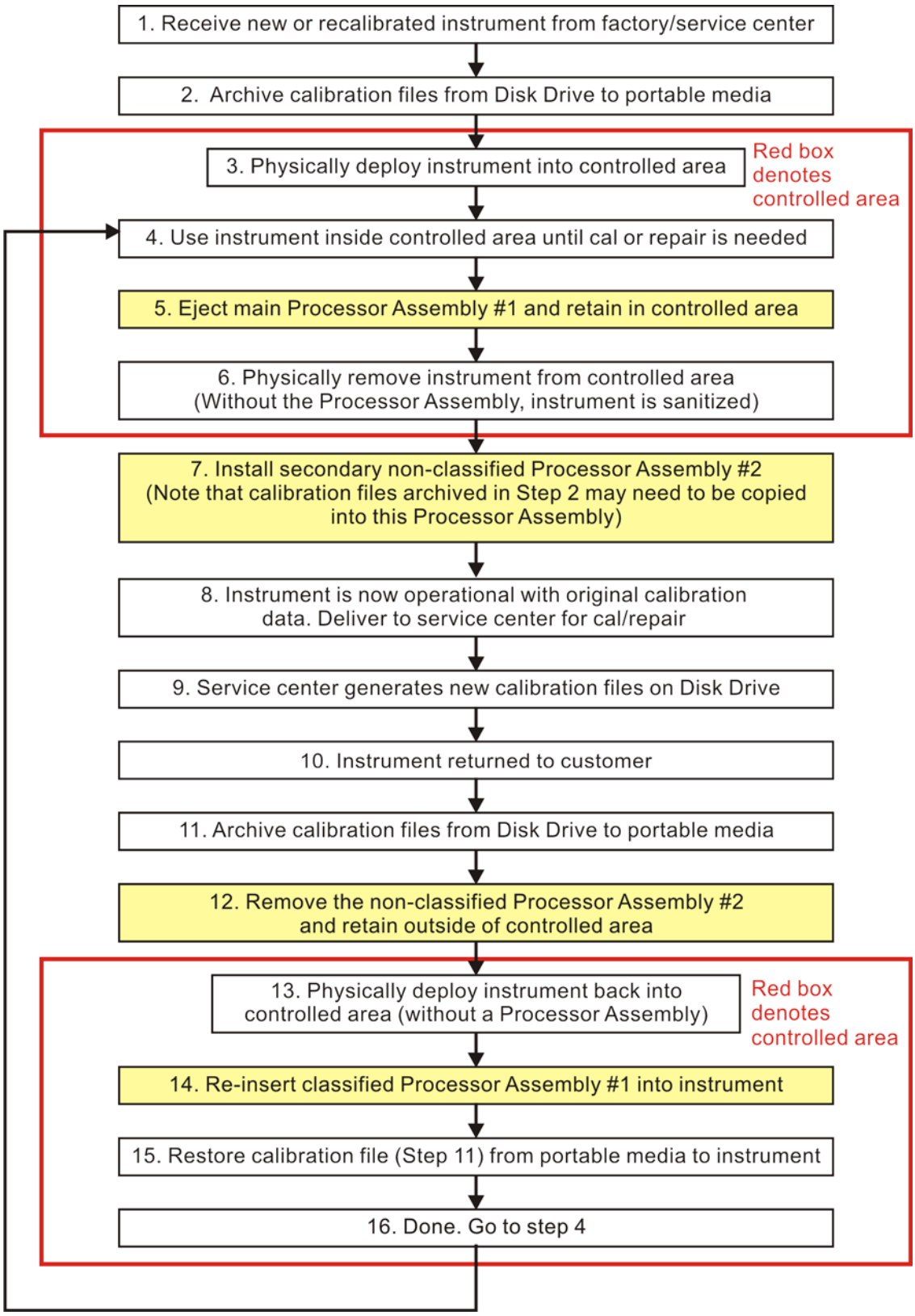
Refer to the flowchart in Figure 6-1 for details of how to perform this procedure.

Note that this flowchart differs from that for replacement of the Disk Drive only in that the entire Processor Assembly is replaced. The steps that differ between the two procedures are marked in yellow in the flowcharts.

For details of how to archive or restore the instrument's calibration files (Steps 2, 11 and 15 in the flowchart), see "Archiving and Restoring Factory Calibration Data Files" on page 36.

For details of how to remove the Processor Assembly (Step 5), see "Processor Assembly Removal Procedure" on page 43.

Figure 6-1 *Flowchart for Instrument Sanitization Process by Processor Removal*



Replacement of Disk Drive

This procedure applies to Single-Core, Removable Disk and Dual-Core, Removable Disk instruments.

Refer to the flowchart in Figure 6-2 for details of how to perform this procedure.

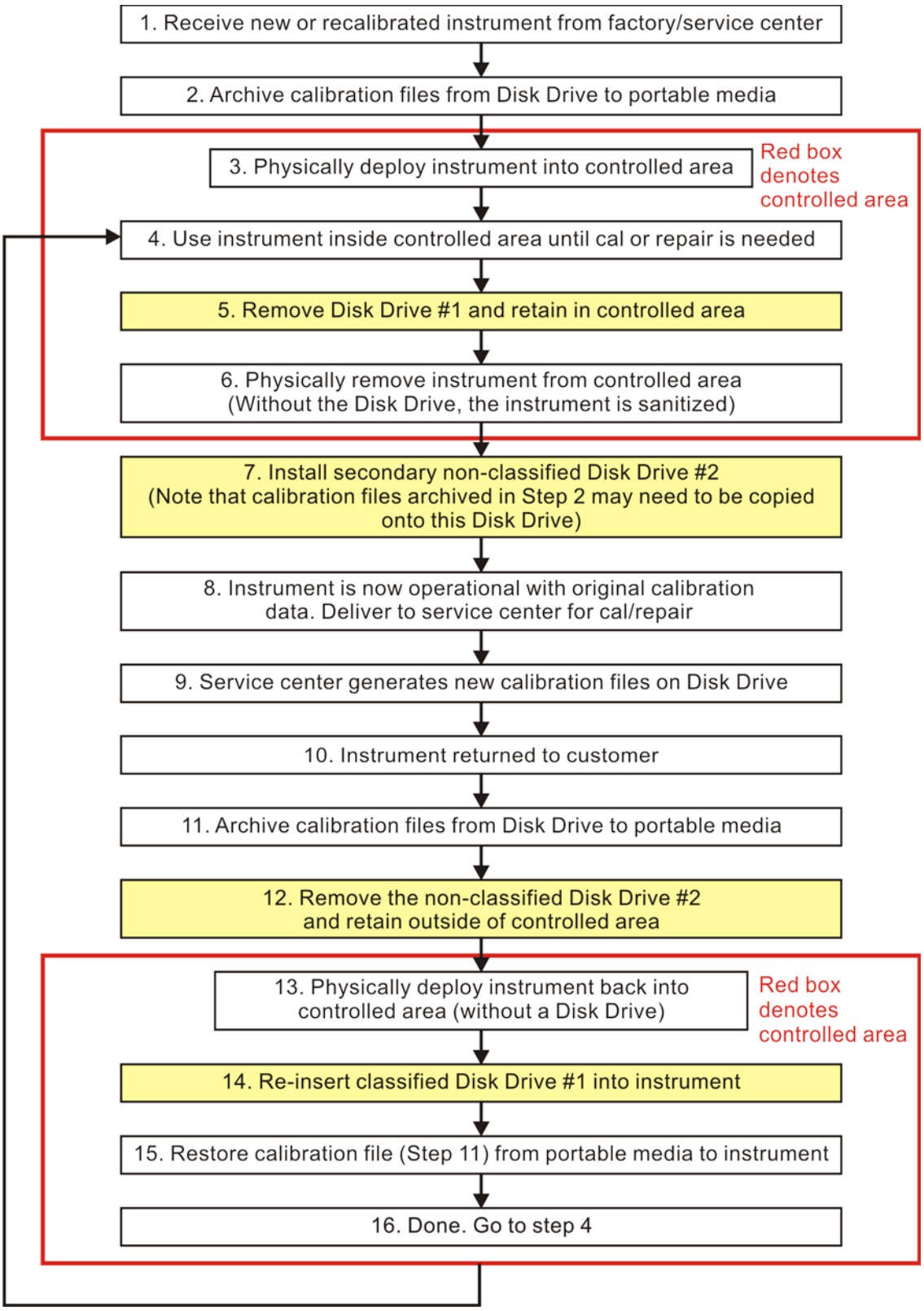
Note that this flowchart differs from that for replacement of the Processor Assembly only in that the removable Disk Drive is replaced. The steps that differ between the two procedures are marked in yellow in the flowcharts.

For details of how to archive or restore the instrument's calibration files (Steps 2, 11 and 15 in the flowchart), see "Archiving and Restoring Factory Calibration Data Files" on page 36.

For details of how to remove the Disk Drive (Step 5), see "Disk Drive Removal Procedure" on page 45.

IMPORTANT When installing a replacement Disk Drive, ensure that the instrument software revision on the replacement drive matches that of the original drive.

Figure 6-2 *Flowchart for Instrument Sanitization Process by Disk Drive Removal*



Archiving and Restoring Factory Calibration Data Files

This section describes how to archive ("back up") the instrument's factory calibration data to an external USB memory device, or restore the calibration data from an external memory device.

The backup and restore procedures differ according to the instrument software revision. This section describes the three possible pairs of procedures.

To determine the instrument software revision, follow the procedure "Determining Instrument Software Revision" on page 37 below.

To determine which backup or restore procedures should be used, according to the instrument software revision, see Table 6-4 on page 38.

Tools Required

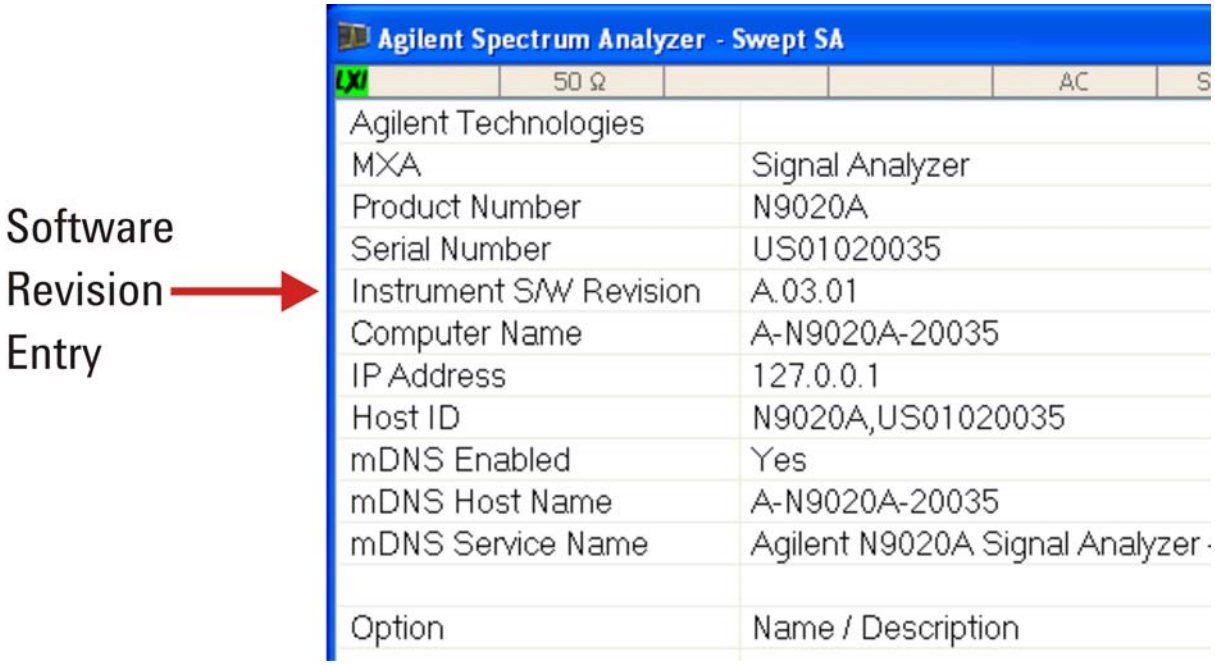
To perform backup or restore operations, you need:

- a mouse with a USB interface
- a portable memory device with a USB interface
- an alphanumeric keyboard with a USB interface

Determining Instrument Software Revision

1. On the instrument front panel, press **System** > **Show** > **System**.
2. The "Show System" display appears, as shown in Figure 6-3 below. Look for the Software Revision number specified in the "Instrument S/W Revision" entry.

Figure 6-3 Show System Display



3. To dismiss the "Show System" display, press any other front-panel or menu key.

When you have obtained the instrument Software Revision number, refer to Table 6-4 on page 38 below for the appropriate backup or restore procedure.

Table 6-4 Backup & Restore Procedures for all Instrument Software Revisions

Instrument Software Revision	Backup Procedure	Restore Procedure
A.01.55 or lower	See "Data Backup using XML File" on page 38.	See "Data Restore using XML File" on page 38.
Greater than A.01.55; lower than A.02.00	See "Data Backup using Utility Program" on page 39.	See "Data Restore using Utility Program" on page 40.
A.02.00 or greater	See "Data Backup or Restore using Alignment Data Wizard" on page 40.	See "Data Backup or Restore using Alignment Data Wizard" on page 40.

Software Revision A.01.55 or Lower

If the instrument software revision is A.01.55 or lower, the calibration data is stored in an XML database file.

Data Backup using XML File

Follow the steps below:

1. Close the instrument application software by pressing **File** > **Exit** > **Enter**.
2. Plug the mouse's USB cable into one of the instrument's USB ports.
3. Plug the USB memory device into another of the instrument's USB ports.
4. Using the mouse, double-click on the Windows Explorer icon on the desktop and navigate to the following folder:

   `E:\AlignDataStorage`

5. Copy the following file onto the USB memory device:

   `CurrentDataSet.xml`

Data Restore using XML File

The data can be restored from a USB memory device containing the XML database file, by using the following process.

1. Close the instrument application software by pressing **File** > **Exit** > **Enter**.
2. Plug the mouse's USB cable into one of the instrument's USB ports.
3. Plug the USB memory device into another of the instrument's USB ports.
4. Using the mouse, double-click on the Windows Explorer icon on the desktop and navigate to a folder on the USB memory device containing a previously-saved calibration data file named:

   `CurrentDataSet.xml`

5. Select the calibration data file, then copy it to the Windows clipboard by selecting **Edit** > **Copy** from the Windows Explorer pull-down menu.
6. Navigate to the folder below and paste the file by selecting **Edit** > **Paste** from the Windows Explorer pull-down menu:

   `E:\AlignDataStorage`
7. Verify that the file `CurrentDataSet.xml` was copied to the new location.
8. Cycle the instrument power.

Software Revision Greater than A.01.55 and Lower than A.02.00

If the instrument software revision is greater than A.01.55, the calibration data is stored in an SQL database file.

For software revisions greater than A.01.55, but lower than A.02.00, the SQL file is written and read by a utility program called `BackupAndRestore.exe`.

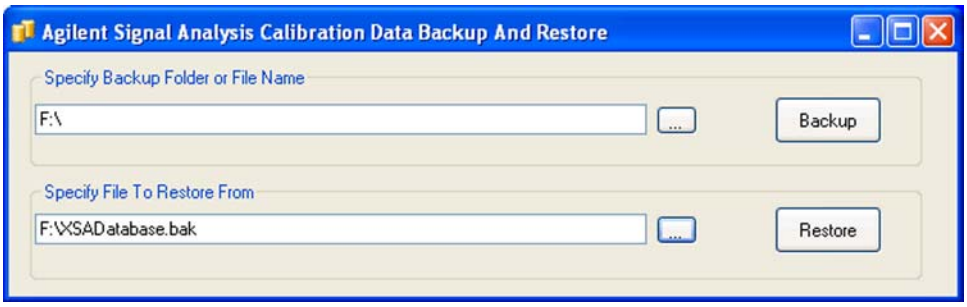
Data Backup using Utility Program

Follow the steps below:

1. Close the instrument application software by pressing **File** > **Exit** > **Enter**.
2. Plug the mouse's USB cable into one of the instrument's USB ports.
3. Plug the USB memory device into another of the instrument's USB ports.
4. Plug the USB keyboard into another of the instrument's USB ports.
5. Using the mouse double-click on the Windows Explorer icon on the desktop and navigate to the following folder:

   `C:\Program Files\Agilent\SignalAnalysis\Physics`
6. Double-click on `BackupAndRestore.exe`. The "Calibration Data Backup And Restore" dialog shown in Figure 6-4 appears.

Figure 6-4 Calibration Data Backup



7. In the group box "Specify Backup Folder or File Name" use the mouse to press the "**...**" button to open the "Browse For Folder" dialog.

8. In the "Browse For Folder" dialog, select or create the desired folder on the USB memory device, then press **OK**.
9. Press **Backup**, then wait for the calibration database to be backed up.
10. When the backup has completed, close the "Calibration Data Backup And Restore" dialog.

Data Restore using Utility Program

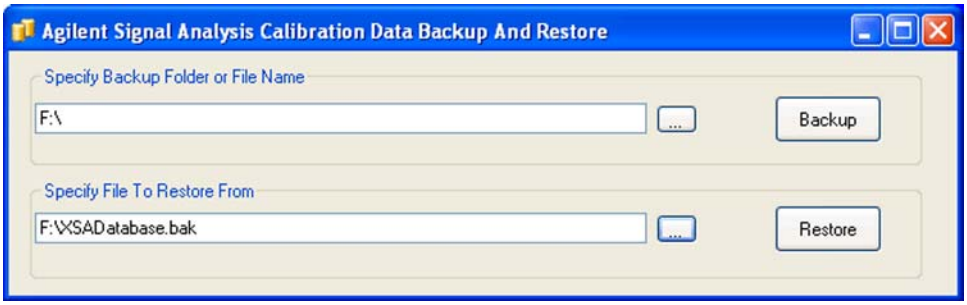
Follow the steps below:

1. Close the instrument application software by pressing **File** > **Exit** > **Enter**.
2. Plug the mouse's USB cable into one of the instrument's USB ports.
3. Plug the USB memory device into another of the instrument's USB ports.
4. Using the mouse double-click on the Windows Explorer icon on the desktop and navigate to the following folder:

   `C:\Program Files\Agilent\SignalAnalysis\Physics`

5. Double-click on `BackupAndRestore.exe`: the "Calibration Data Backup And Restore" dialog shown in Figure 6-4 appears.

Figure 6-5 Calibration Data Backup



6. In the group box "Specify File To Restore From" use the mouse to press the "**...**" button to open the "Browse For File" dialog.
7. In the "Browse For File" dialog, select the desired file on the USB memory device, then press **OK**.
8. Press **Restore**, then wait for the calibration database to be restored.
9. When the restore has completed, close the "Calibration Data Backup And Restore" dialog.

Software Revision A.02.00 or Greater

For software revisions A.02.00 or greater, the SQL calibration data file is read and written by the Alignment Data Wizard.

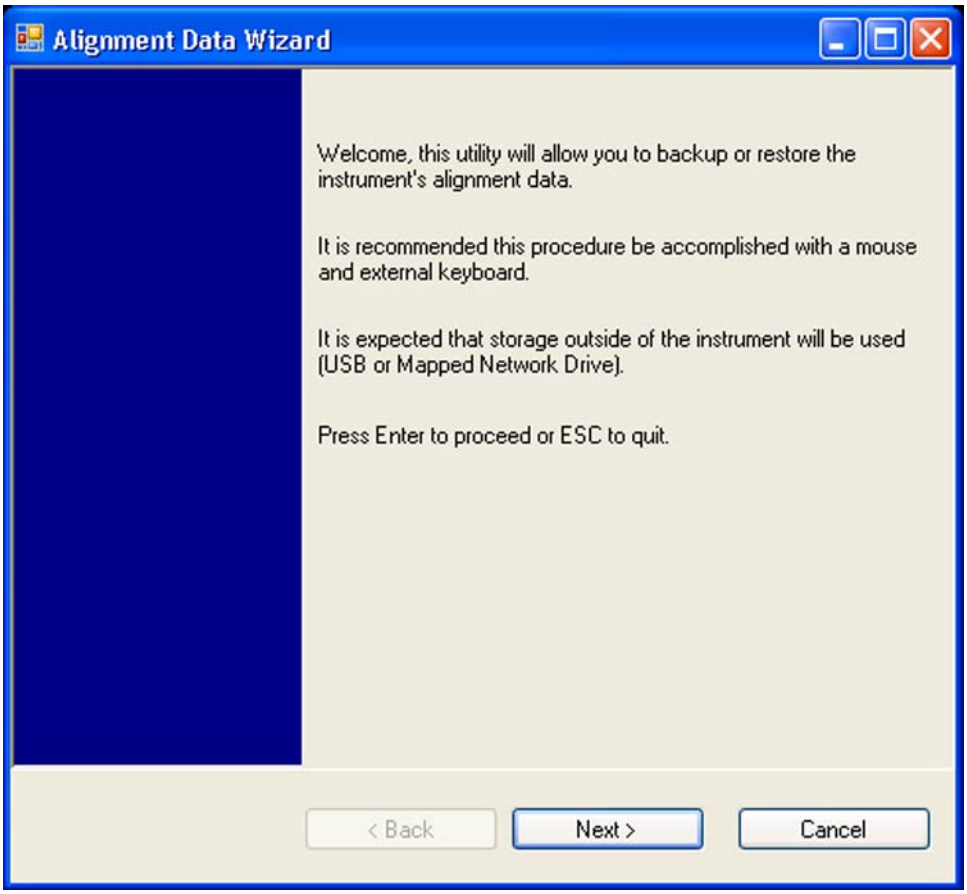
Data Backup or Restore using Alignment Data Wizard

The Alignment Data Wizard is launched directly from the instrument application software interface, so you do **not** need to exit the application software before proceeding.

Follow the steps below to start the wizard:

1. Plug the mouse's USB cable into one of the instrument's USB ports.
2. Plug the USB memory device into another of the instrument's USB ports.
3. Plug the USB keyboard into another of the instrument's USB ports.
4. Press **System** > **Alignments** > **Backup or Restore Align Data...**
5. The Alignment Data Wizard dialog appears, as shown in Figure 6-6 below:

Figure 6-6 Alignment Data Wizard Dialog



6. Follow the wizard's on-screen instructions to back up the calibration data to the external USB memory device, **or** restore the data from the device.

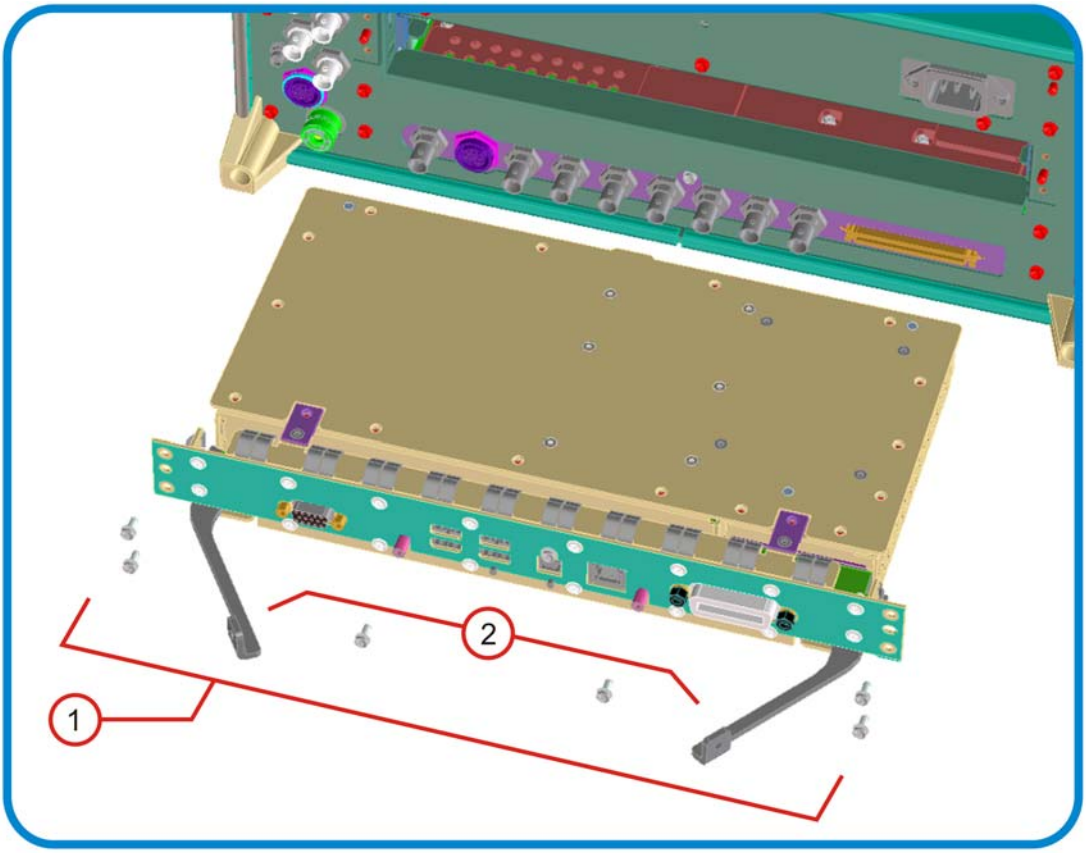
7 Processor Assembly Removal Procedure

To remove the processor board assembly, follow the procedure below, while referring to Figure 7-1, which shows the rear panel of instruments with Single-Core, Fixed Disk processor assemblies.

The procedure for instruments with Single-Core, Removable Disk or Dual-Core, Removable Disk processor assemblies is identical, although the appearance of the rear panel differs from that shown in Figure 7-1. (For comparative illustrations of the rear panel types, see "Rear Panel Configurations" on page 14.)

CAUTION Before removing the Processor Assembly, ensure that the instrument's power is turned off.

Figure 7-1 Processor Assembly Removal Procedure



1. Locate and remove the Processor Assembly from the instrument, by removing the 6 rear panel screws (part number 0515-0372, M3 x 0.5, 8 mm long).
2. The assembly can be removed from the chassis by pulling it straight out. Use the two ejector arms to remove the Assembly from the instrument

TIP

Most Application License keys are stored in EEPROM on the A7 Midplane Assembly (as described in Item 3 of Table 5-1 on page 20). Therefore, when replacing the Processor Assembly, you do **not** need to back up and restore the license keys.

The sole exception is the license key for the 89601A VSA Application. For information about how to regenerate these licenses, see "Regenerating a Site Key License for 89601A VSA Application" on page 32.

8 Disk Drive Removal Procedure

This chapter describes the procedures for physical removal of the disk drive from:

a. Instruments with Non-Removable Drives (generally, older MXA, EXA and CXA instruments),

b. Instruments with Removable Drives (generally, all PXA instruments, and newer MXA, EXA and CXA instruments).

For detailed information about the drive types installed in each instrument type, see the section "X-Series Processor and Disk Drive Configurations" on page 10, in the Chapter Products Covered by this Document.

TIP

Most Application License keys are stored in EEPROM on the A7 Midplane Assembly (as described in Item 3 of Table 5-1 on page 20). Therefore, when replacing the Disk Drive, you do **not** need to back up and restore the license keys.

The sole exception is the license key for the 89601A VSA Application. For information about how to regenerate these licenses, see "Regenerating a Site Key License for 89601A VSA Application" on page 32.

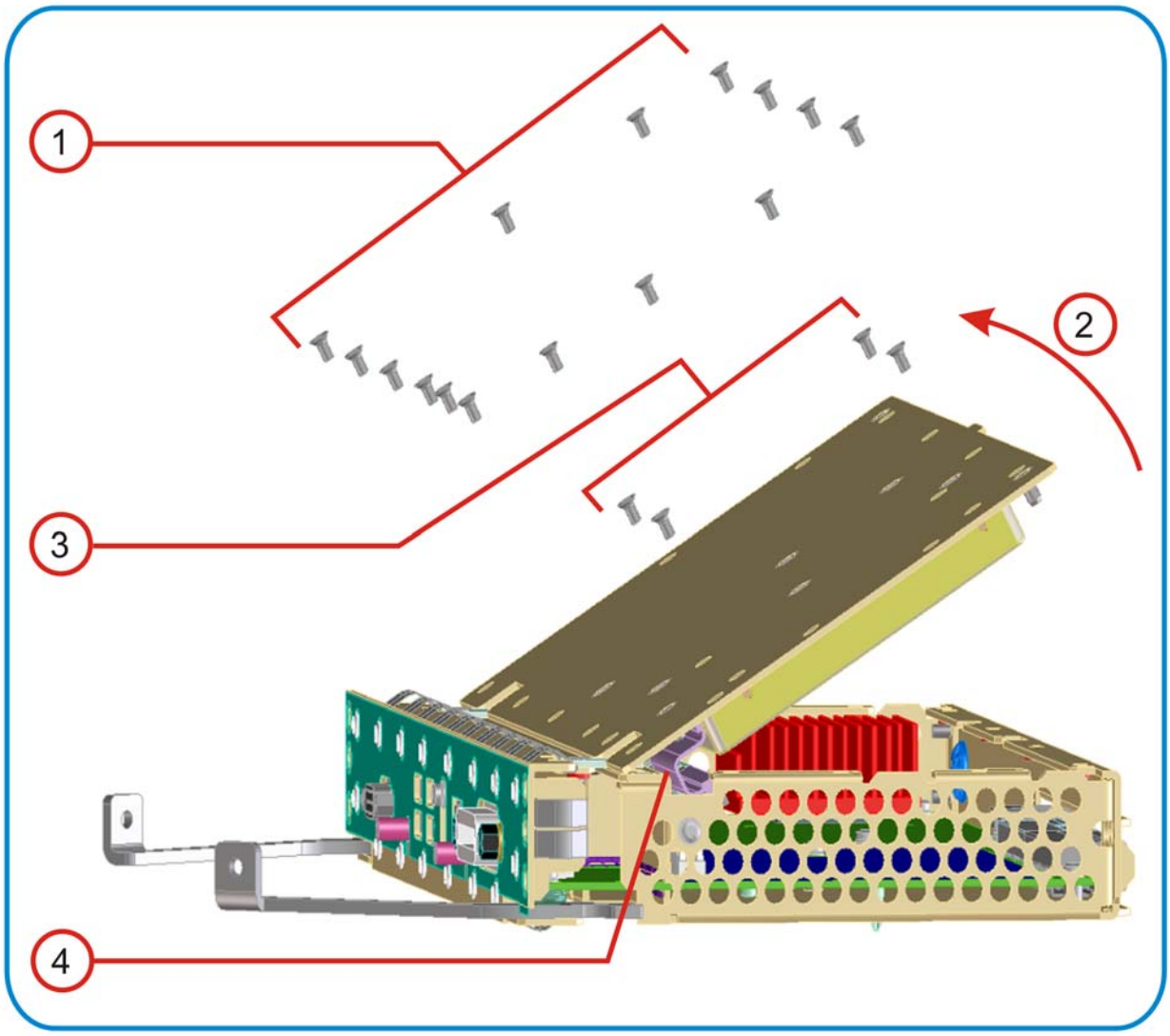
When installing a replacement Disk Drive, ensure that the instrument software revision on the replacement drive matches that of the original drive.

Instruments with Non-Removable Drives

To remove the disk drive, follow the procedure below, while referring to Figure 8-1. The numbered items in the figure correspond to the step numbers in the procedure.

Before commencing this procedure, remove the complete Processor Assembly from the instrument, following the procedure described in the chapter Processor Assembly Removal Procedure.

Figure 8-1 Disk Drive Removal Procedure



1. Remove 15 screws from the top lid of the Processor Assembly.
2. Tilt the lid up.
3. While holding the disk drive to prevent it from falling, remove the 4 drive retaining screws.
4. Disconnect the drive cable from the disk drive.

Instruments with Removable Drives

To remove the disk drive, follow the procedure below. You do **not** need to remove the Processor Assembly from the instrument before removing the drive.

The numbered items in the figures below correspond to the step numbers in the procedure.

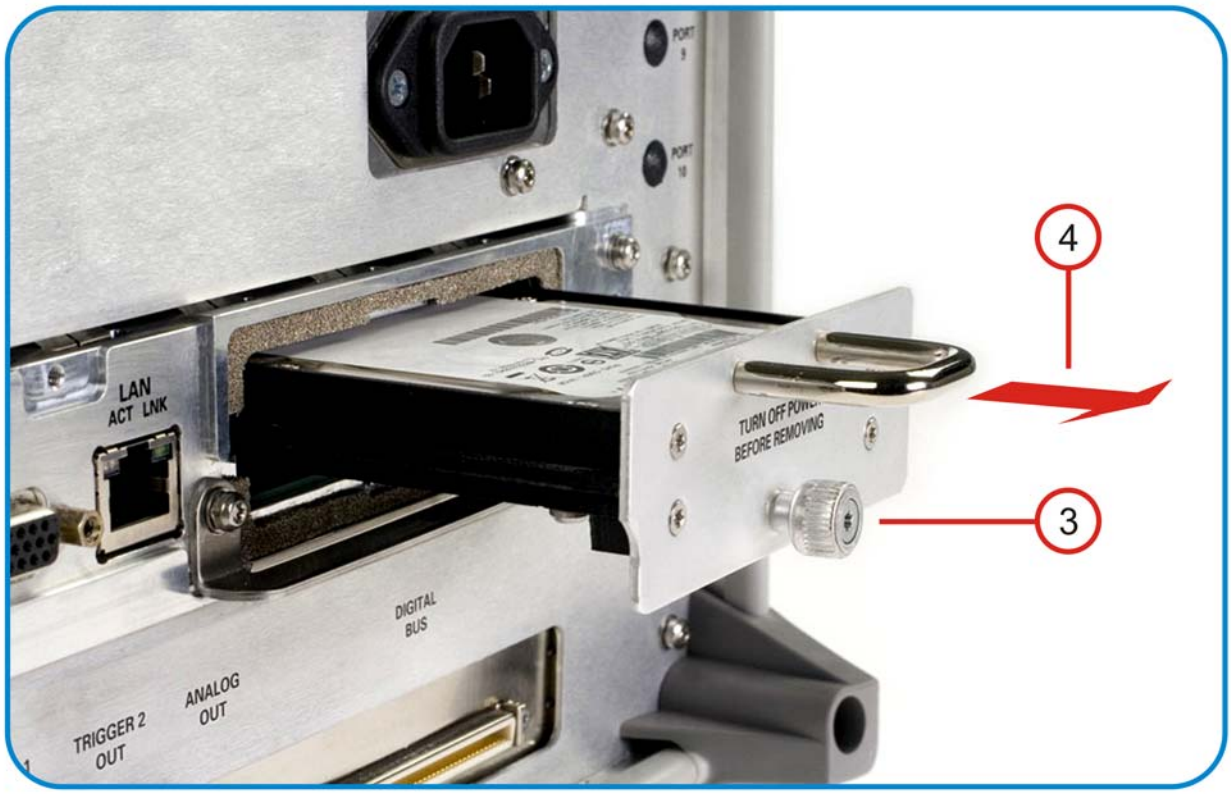
CAUTION Before removing the disk drive, ensure that the instrument's power is turned off.

1. Locate the Processor and Disk Drive Assembly on the instrument's rear panel, as shown in Figure 3-2 in the section "Rear Panel Configurations" on page 14. In Figure 8-2 below, the processor assembly is shown removed from the rear panel for clarity.

Figure 8-2 Processor Assembly with Removable Disk Drive

2. Locate the removable drive, and its retaining thumbscrew, as shown in Figure 8-2.
3. Turn the thumbscrew to release the drive from the panel, as shown in Figure 8-3 below. If the thumbscrew is too tight to turn by hand, use a TORX T10 screwdriver to loosen it.

Figure 8-3 Removable Disk Drive Unit partially extracted



4. Pull the U-shaped handle attached to the drive unit, to remove the drive from the Processor Assembly, as shown in Figure 8-3.

9 User and Remote Interface Security Measures

This chapter discusses options that are available to you to control and configure remote access to the instrument, including:

- SCPI/GPIB Control of Interfaces
- Operating System Security Features
- USB Interfaces. This topic includes information about how to set the instrument's USB ports to read-only.

IMPORTANT Users are responsible for providing security for the I/O ports for remote access, by controlling physical access to the I/O ports. The I/O ports must be controlled because they provide access to most user settings, user states, and the display memory.

SCPI/GPIB Control of Interfaces

The GPIB command LLO (local lockout) can be sent by the controller to disable operation of the instrument's front-panel keys and softkey menus.

However, sending the LLO command does **not** disable access to the instrument via its USB ports. For details of how to restrict the operation of the USB ports, see "Configuring USB for Read-only" on page 53 below.

Operating System Security Features

The instrument's Windows operating system includes a variety of features that you can invoke or modify to enhance system security. These include the following:

- The ability to create custom user accounts, and assign different security levels to each account by adding it to an existing group. The group types predefined by Windows are: Administrator, Power User, User, Backup Operator, and Guest, but you can also define new group types.
- To provide additional protection for instruments that have a network (or internet) connection, the standard Windows Firewall is enabled by default.

- You can install standard third-party antivirus and spyware detection software designed for use with Windows XP. If your instrument uses a network (or internet) connection, this may be advisable.

CAUTION Running any third-party program while making measurements may adversely affect the instrument's performance.

Details of all these features are provided in the "Windows Security" chapter of the Agilent X-Series Signal Analyzer: Getting Started Guide.

USB Interfaces

The instrument's Microsoft Windows operating system can be configured to improve the security of the USB interfaces.

Disabling or Enabling Autorun/Autoplay

Autorun, and the associated **Autoplay**, are Windows features that assist users in selecting appropriate actions when new media and devices are detected. The Autorun feature is disabled in the instrument by default, for improved security, unless the Administrator account is running. (In Administrator mode, Autorun is enabled, to aid with program installation.)

You can change the Autorun configuration by editing the value of one of two Windows Registry keys. The Windows Registry is a database that stores critical configuration information for the instrument's operating system.

CAUTION Exercise extreme caution whenever you edit the Windows Registry. Entering an incorrect Registry value, or accidentally deleting Registry keys, may have serious consequences that can prevent the system from starting, or require that you reinstall Windows. The instructions in "Disable & Enable Procedure" on page 51 below assume that you are familiar with the use of the Windows Registry Editor to modify Registry settings.

Registry Key Definitions

Autorun can be configured per-machine or per-user.

NOTE If the per-machine Registry key is present, its settings override those of the per-user Registry key.

The Registry key that controls the **per-machine** Autorun settings is:

```
HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer\NoDriveTypeAutoRun
```

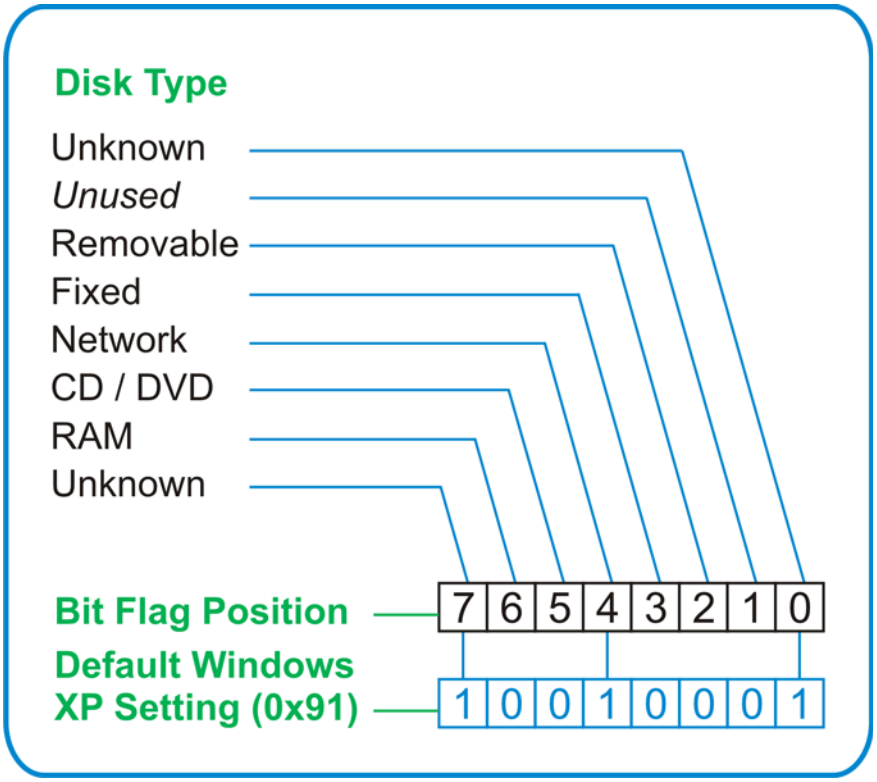
The Registry key that controls the **per-user** Autorun settings is:

`HKEY_CURRENT_USER\SOFTWARE\Microsoft\Windows\CurrentVersion\policies\Explorer\NoDriveTypeAutoRun`

In the following discussions, we use the industry-standard abbreviation HKLM for the root key HKEY_LOCAL_MACHINE, and the industry-standard abbreviation HKCU for the root key HKEY_CURRENT_USER.

The DWORD value of either of these entries represents a set of single-bit flags. Each flag specifies the Autorun setting for a specific drive type, as shown in Figure 9-1 on page 51. Setting a bit flag to 1 disables Autorun for that drive type.

Figure 9-1 Autorun Flag Definitions for NoDriveTypeAutoRun Registry entry



As shown in Figure 9-1 on page 51 above, the default Windows XP (post-SP2) value for this entry is `0x91` (under the entry HKCU\...\NoDriveTypeAutoRun). This setting disables Autorun for `Unknown` and `Network` drives, but enables Autorun for `Removable`, `Fixed`, CD/DVD or RAM drives.

You can disable Autorun for all drive types by changing the value to `0xFF`, as described in the following section.

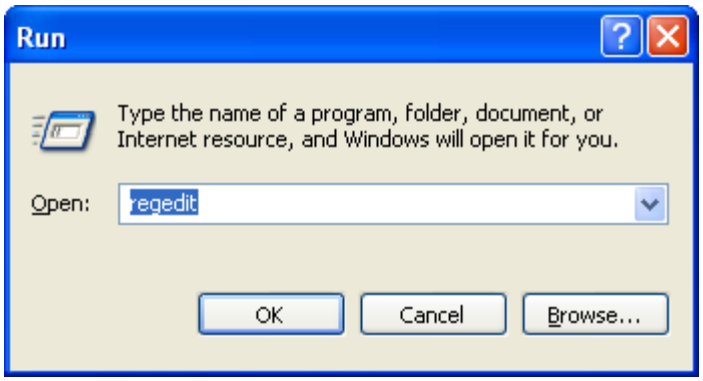
Disable & Enable Procedure

In view of the interaction between the per-machine and per-user Registry settings, as described above, it is recommended that, if both keys exist in your instrument's Registry, you should alter the settings of **both** Registry keys to the same value at the same time.

Use the following procedure to disable Autorun for all drive types, or to revert all Autorun settings to their Windows XP default values.

1. Open the Windows Registry editor. Generally, the easiest way to do this is to select **Run...** from the Windows Start menu. Then, type `regedit` into the Windows Run dialog box, as shown in Figure 9-2 below, and click **OK**.

   Figure 9-2 Windows Run Dialog



2. The Registry Editor window appears. Using the tree view control on the left of the window, navigate to the per-machine (HKLM) key: `HKLM\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer`.
3. To **disable** Autorun for all drive types, set the value of entry `NoDriveTypeAutoRun` to `0xFF`.

   To **revert** Autorun settings to the Windows default values, set `the value of entry NoDriveTypeAutoRun` to `0x91`.
4. Again using the tree view control on the left of the Registry Editor window, navigate to the per-user (HKCU) key: `HKCU\SOFTWARE\Microsoft\Windows\CurrentVersion\policies\Explorer`.
5. To **disable** Autorun for all drive types, set `the value of entry NoDriveTypeAutoRun` to `0xFF`.

   To **revert** Autorun settings to the Windows default values, set the value of entry `NoDriveTypeAutoRun` to `0x91`.
6. From the Registry Editor menu, select **File** > **Exit** to save the settings and exit the editor.
7. Shut down and restart the instrument, to enable the new settings to take effect.

Microsoft AutoRun Patch

There is a defect in Windows XP that compromises the ability to disable Autorun. This defect has been fixed by a patch from Microsoft, as described in the Microsoft Knowledge Base Article ID: 967715.

This patch has been included in new instrument shipments from the factory since revision A.03.00.

After the patch has been applied, there will be a Registry entry at:

`HKLM\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer\HonorAutorunSetting` with a default value of 1.

More Information

The following Wikipedia articles provide more information about AutoRun and AutoPlay:

http://en.wikipedia.org/wiki/AutoRun

http://en.wikipedia.org/wiki/AutoPlay

Configuring USB for Read-only

As from instrument software revision A.04.00, a convenient mechanism is provided to set the instrument's USB interfaces to read-only, thus preventing transfer of files from the instrument onto USB devices.

You can change this setting only when you are logged on as the Administrator. For details of how to log on to the instrument as the Administrator, see the Agilent X-Series Signal Analyzer: Getting Started Guide. To change the setting, do the following:

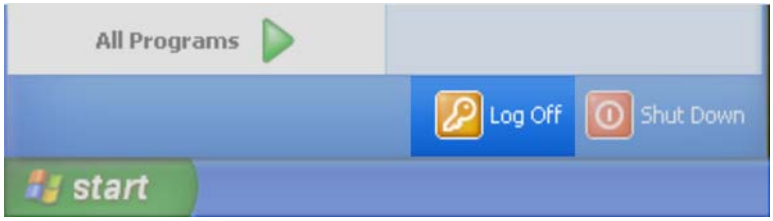
1. If you are **not** currently logged on to the instrument as the Administrator, you must log out.

   If you are currently logged on to the instrument as the Administrator, and the Agilent XSA application is already running, go to Step 4.

   The log-off procedure executes more quickly if you first exit the Agilent XSA application, but you can also log off without exiting the application.

2. Select **Log Off** from the Windows Start menu (as highlighted in Figure 9-3 below), then click **Log Off** in the Log Off Windows dialog that appears.

   Figure 9-3 Log Off Button in Windows Start Menu

3. After you have logged on to the instrument as the Administrator, restart the Agilent XSA application.
4. When the XSA application has fully initialized (that is, when the main results view and softkey menu are visible), press the **System** front-panel key.
5. From the System softkey menu, select: **More** > **Security** > **USB**.
6. Select the option **Read Only**.
7. To activate the configuration change, either log out and then back in under your usual user name (which by default is "instrument"), or cycle the instrument power.

10 Procedure for Declassifying a Faulty Instrument

Even if the instrument is not able to power on, it may be declassified by removing the disk drive from the instrument, using the appropriate procedure as described in "Disk Drive Removal Procedure" on page 45.

A: References

1. **DoD 5220.22-M, "National Industrial Security Program Operating Manual (NISPOM)"**

   United States Department of Defense. Revised February 28, 2006.

   May be downloaded in Acrobat (PDF) format from:

   http://www.dss.mil/isp/fac_clear/download_nispom.html

2. **ODAA Process Guide for C&A of Classified Systems under NISPOM**

   Defense Security Service.

   DSS-cleared industries may request a copy of this document via email, by following the instructions at:

   http://www.dss.mil/isp/odaa/request.html

3. **Agilent X-Series Signal Analyzer: Getting Started Guide**

   Agilent Technologies Inc. 2008-2011. Part Number: subject to change as document is revised.

   A printed copy of this document is supplied with each Agilent X-Series Analyzer.

   It is also available in Acrobat (PDF) form:

   - on the Documentation DVD supplied with each instrument,
   - on the instrument's disk drive at the following location:

     C:\Program Files\Agilent\SignalAnalysis\Infrastructure\Help\bookfiles\getstart.pdf
   - via download from:

     www.agilent.com/find/xseries_getting_started_guide

4. **Microsoft Knowledge Base Article ID: 967715**

   "How to disable the Autorun functionality in Windows": may be viewed at:

   http://support.microsoft.com/kb/967715

   Note that a second article, at: http://support.microsoft.com/kb/953252, "How to correct 'disable Autorun registry key' enforcement in Windows", redirects to article ID 967715.

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