The SAS® System
Release 6.12 (TS070)
Windows®, Windows NT®, Windows® 95

This document provides requirements for installing and running the SAS System for Windows, Windows NT, and Windows 95. You must update your system to meet the minimum requirements before running the SAS System. The major requirements listed in the document are:

- ❑ Software Requirements
- ❑ Hardware Requirements
- ❑ Additional Features
- ❑ Space Requirements
- ❑ Specific Product Requirements
- ❑ Graphics Hardware and Software Compatibility

For additional information and to view the latest system requirements for your system, access the SAS Institute Web site at:

http://www.sas.com/software/enclosures/system_req.html

or contact SAS Institute Technical Support (refer to Contacting SAS Institute Technical Support in the installation instructions included in your package).

For information about Year 2000 compliance, see http://www.sas.com/techsup/download/technote/y2kcomp.html.

Software Requirements

Operating System

Windows:

Release 6.12 (TS070) of the SAS System is compatible with the Microsoft Windows 95, 98, and Millennium operating systems. Windows 98 must be updated *with* Service Pack 1 or *to* Windows 98, Second Edition.

Windows WIN32s

- DOS 5.0 or later, Windows 3.1 or Windows for Workgroups 3.11

  Note: The Microsoft Windows WIN32s Operating System Extension 1.30.166 is provided on the SAS System installation media. You will need 3.5 MB of disk space to upgrade to WIN32s. This product will not run in the OS/2 environment because OS/2 does not support the correct level of WIN32s.

If `SHARE.EXE` is being used, then the statement used to run `SHARE.EXE` should be modified to include the options shown:

```
C:\DOS\SHARE.EXE /L:500 /F:5100
```

`SHARE.EXE` is not required to run the SAS System, but may be required by other applications.

Windows NT

Running the SAS System under Windows NT requires Windows NT, Version 3.51 with Service Pack 5 or Version 4.0 with Service Pack 3 or Service Pack 4.

Windows 2000:

Release 6.12 (TS070) of the SAS System is compatible with Windows 2000.

Hardware Requirements

Machines Supported

- Any PC using an Intel or Intel-compatible 80386 33 MHz or higher CPU
- A 33 MHz or faster 80486 or Pentium machine improves performance

    Note: Windows NT 4.0 and greater does not support running on a 386 processor.

Floating Point Unit or Math Coprocessor

A floating point unit or math coprocessor (e.g., the Intel 80387 for 386 machines) is strongly recommended. Be sure to install a math coprocessor with the appropriate MHz rating.

A floating point unit or math coprocessor is assumed present in the PC and the SAS System is optimized for it presence. Microsoft Windows provides floating point emulation software with decreased performance in the absence of a floating point unit or math coprocessor.

Memory Requirements

Windows WIN32s

- 8 MB minimum
- 12 MB for mid-range use
- 16 MB or more for maximum performance, depending on your applications
- 15 MB of swapfile space for Base SAS software required
- 25 MB or more swapfile space for other components (particularly SAS/AF software and SAS/EIS software) required

Windows NT

- 16 MB minimum or more for improved performance
- 15 MB of swapfile space for Base SAS software required
- 25 MB or more swapfile space for other components (particularly SAS/AF software and SAS/EIS software) required

- 16 MB minimum
- 15 MB of swapfile space for Base SAS software required
- 25 MB or more swapfile space for other components (particularly SAS/AF software and SAS/EIS software) required

Monitors Supported

- VGA
- 8514
- XGA
- SBGA
- EGA is not supported

Devices Supported

- A mouse is required

Additional Features

SAS System ODBC Support

Base SAS software supplies the 16- and 32-bit ODBC (Open DataBase Connectivity) Drivers, as well as a SAS ODBC server that allow you to access, update, or manipulate SAS data on your local or remote SAS System from any Windows ODBC-compliant application. The SAS ODBC Drivers also allow you to access, but not update, local or remote SAS server data views that describe data stored in other databases, such as DB2/2. The SAS ODBC Driver requires 1.7 MB of disk space.

If you will be accessing remote SAS data using ODBC, you will need to have SAS/SHARE software and SAS/SHARE*NET software licensed and installed on your remote SAS System. The SAS ODBC Drivers that come with Base SAS software are the same ODBC drivers that are distributed with SAS/SHARE*NET software.

SAS System Viewer

The SAS System Viewer is an application intended for the Windows 95 or Windows NT 4.0 Explorer environment as a Quick Viewer for SAS data sets and catalogs. The application lets you view the contents of SAS data set and catalog files without using the SAS System or without requiring the SAS System to be installed on your machine. You are free to distribute this application to allow other people to view your SAS data.

The application lets you view the following types of SAS data sets and SAS catalogs:

- SAS data sets generated by Release 6.04 and later of the SAS System for Windows, OS/2, or DOS. These SAS data sets can be compressed and/or encrypted.
- SAS catalogs created by the SAS System for Windows or OS/2.
- SAS programs (.sas files), output listings (.lst files), logs (.log files), text files (.txt files), and RTF files (.rtf files).
- Files created by SAS Institute's JMP product (.jmp files) that reside on local or network disk.

If you have the SAS System for Windows installed with SAS/CONNECT software, you can also view cross-platform data sets and catalogs (VMS, Macintosh, UNIX, OS/2, Windows, and DOS) that you can access from a disk, file server, or using the HTTP and FTP network protocols.

About 1 MB of disk space is required to install the SAS System Viewer and also about 1.1 MB of Microsoft runtime libraries that are probably already installed on your machine.

The SAS System Viewer is included on the installation media. You can run setup from the first SAS System Viewer setup disk (\SASVIEW\DISK1 on the CD) or setup will be launched as part of the SAS System core installation.

See the readme.wri file on the first setup disk or the help information after installation for more information on the SAS System Viewer.

Dynamic Data Exchange

Dynamic Data Exchange (DDE) allows for the exchange of data between the SAS System and any other application supporting DDE. The SAS System will act as a client only.

Object Linking and Embedding

Object Linking and Embedding (OLE 2.0) container support is available in SAS/AF software and SAS/EIS software. Container support includes the ability to create embedded/linked objects, script OLE Automation servers, and embed OLE controls. Visual editing and drag and drop support are also included.

The SAS System also provides OLE Automation server support. This support is provided in Base SAS software to push commands to the command line of the SAS System and submit procedural code. The Automation server can be driven from other OLE Automation controllers such as Microsoft Visual Basic.

Electronic Mail

`Send...` is provided as a menu item in the `File` pull-down menu. `Send...` allows electronic mail messages to be initiated from the SAS System. It is also possible to send mail using a data step file access method or SCL via SAS/AF software. The following mail APIs are supported - MAPI and VIM. This requires installation of third party products such as MSExchange, MSMail 3.2+, Lotus ccMail 2.01+, or Lotus Notes 3.0+. On Windows 95 and Windows NT, the SAS System also provides SMTP email support. This requires an Internet connection that supports a SMTP email server.

Lotus Notes

The Lotus Notes access method, NOTESDB, allows populating new documents directly to Lotus Notes from the SAS System. An installed license of Lotus Notes Desktop is required. Running on Windows WIN32s, the SAS System supports Lotus Notes 3.3x and the 16-bit version of Lotus Notes 4.0. On Windows 95 and Windows NT, the SAS System supports the 32-bit version of Lotus Notes 4.0.

FTP, Socket, and Catalog Access Methods

Enhancements to the external access methods will bring remote data to local processing via the FTP and Socket access methods. FTP will allow access to remote external files using the TCP/IP ftp service. Access to remote data is further enhanced with the Socket access method, which brings TCP/IP socket programming to the SAS Data Step and SAS/SCL. In addition, SAS catalogs can now be read as external files using the new Catalog access method.

Re-installation Support

Re-installation support is provided as a component during a Custom install and requires 7.9 MB of disk space. Using re-installation support on a shared network location enables the SAS System to be installable from that location. The installation media would not be referenced during future installs from the shared network location. The following files are copied as part of re-installation support: `SETUP.EXE`, ODBC Setup files, Indeo drivers, and Win32s upgrade files.

Intel Indeo Video for Microsoft Windows

The Intel Indeo Video for Microsoft Windows is included in the installation media. This software update is provided to enhance your existing Indeo Video drivers and requires 1.5 MB of disk space.

Space Requirements

The media you received is customized for your site and contains all of the SAS software products for which you are licensed.

The following list contains space requirements in MB for all of the products available with this release of the SAS System for Windows, Windows NT, and Windows 95. Use this information to help you determine how much free disk space you must have available before you can install the SAS System.

Software Product	Disk Space (in MB)
Base SAS Software	16.5
Core of the SAS System (required)	60.9
SAS/ACCESS Interface to ODBC Software	0.1
SAS/ACCESS Interface to ORACLE Software	0.6
SAS/ACCESS Interface to PC File Formats Software	1.0
SAS/ACCESS Interface to SYBASE and SQL Server Software	0.4
SAS/AF Software	1.1
SAS/ASSIST Software	7.8
SAS Business Intelligence 400 Software	0.1
SAS/CALC Software	2.6
SAS/EIS Software	28.5
SAS/ENGLISH Software	3.9
Enterprise Reporter Software	24.0
SAS/ETS Software	10.4
SAS/FSP Software	0.7
SAS/GIS Software	36.0
SAS/GRAPH Software	16.9
SAS/GRAPH Map Data Sets	39.8
SAS/IML Software	2.8
SAS/INSIGHT Software	2.7
IT Service Vision Software	160.0
SAS/LAB Software	3.8
SAS/MDDB Server Software	0.1
SAS/OR Software	18.9
SAS/PH-Clinical Software	28.5
SAS/QC Software	10.0
SAS/SHARE Software	0.4
SAS/SPECTRAVIEW Software	12.2
SAS/STAT Software	11.1
SAS/TOOLKIT Software	1.7
SAS/TUTOR Software: Fundamentals of the SAS System (CBT101)	4.0
SAS/TUTOR Software: Reading Raw Data and Formatting Values with the DATA Step (CBT102)	2.2
SAS/TUTOR Software: Creating, Modifying and Processing Variables with the DATA Step (CBT103)	2.0
SAS/TUTOR Software: Developing Custom Data Entry Applications (CBT104)	2.2
SAS/TUTOR Software: Creating and Enhancing SAS/GRAPH Output (CBT105)	3.6
SAS/TUTOR Software: Creating Tables with PROC TABULATE (CBT106)	2.1
SAS ODBC Driver	1.7
SAS/Warehouse Administrator Software	15.3
TS070 Maintenance Files	125.0

Specific Product Requirements

SAS/ACCESS Interface to ODBC Software

Products Required:

- Base SAS software
- SAS/ACCESS Interface to ODBC software

DBMS Products Required:

An ODBC driver for the data source from which you want to access data is required. These drivers are often available from the DBMS vendor and other third party ODBC driver developers. The driver you choose may require additional DBMS software in order to access the data.

For Windows 95 or Windows NT installations, 32-bit ODBC drivers are required.

For Windows WIN32s installations, 16-bit ODBC drivers can be used. However, to use these drivers, the ODBC redistributable files that support 32-bit applications under Windows WIN32s must be installed on the systems running SAS software. These redistributable files are generally installed when ODBC 2.0 drivers are installed on the machine. However, some driver vendors did not redistribute the files required to support 32-bit applications under Windows WIN32s.

After installing the SAS/ACCESS Interface to ODBC software and ODBC driver software, if you are unable to connect to an ODBC data source on Windows WIN32s, it may be because the ODBC files supporting 32-bit applications are not installed or are incorrect. This problem can be corrected by installing the SAS ODBC Driver for the SAS System that ships with Base SAS software.

SAS/ACCESS Interface to ORACLE Software

Products Required:

- Base SAS software
- SAS/ACCESS Interface to ORACLE software

Operating System Restrictions:

SAS/ACCESS Interface to ORACLE software operates only under the Windows 95 and Windows NT operating systems.

DBMS Products Required:

The following software must be installed on the client Windows 95 or Windows NT workstation:

- ORACLE SQL*Net, Version 1 or 2 for Windows NT and Windows 95
- ORACLE Net8, Version 8.0x Client Software for Windows NT and Windows 95

If you are installing ORACLE SQL*Net for Windows NT, Version 1, one of the following configurations should be installed:

- ORACLE for Windows NT Required Support Files, Version 7.0 (Version 7.0.15.5.2A recommended) *and* ORACLE for Windows NT SQL*Net for TCP/IP Client, Version 1.1 (Version 1.1.6.5 recommended) *or*

  ORACLE for Windows NT SQL*Net for Named Pipes Client, Version 1.1 (Version 1.1.1.7 recommended)

- ORACLE for Windows NT Required Support Files, Version 7.1 (Version 7.1.3.3.6 recommended) *and* ORACLE Windows NT SQL*Net for TCP/IP Client, Version 1.1 (Version 1.1.6.8 recommended) *or*

  ORACLE for Windows NT SQL*Net for Named Pipes Client, Version 1.1 (Version 1.1.1.8 recommended)

- ORACLE for Windows NT Required Support Files, Version 7.2 (Version 7.2.2.4.0 recommended) *and* ORACLE Windows NT SQL*Net for TCP/IP Client, Version 1.1 (Version 1.1.6.9.0 recommended) *or*

  ORACLE for Windows NT SQL*Net for Named Pipes Client, Version 1.1 (Version 1.1.1.8.0 recommended)

If you are installing ORACLE SQL*Net for Windows NT, Version 2, one of the following configuration should be installed:

- ORACLE for Windows NT Required Support Files, Version 7.1 (Version 7.1.3.3.6 recommended) *and* ORACLE for Windows NT SQL*Net, Version 2.1 (Version 2.1.3.0.0 recommended) *and* ORACLE for Windows NT TCP/IP Protocol Adapter, Version 2.1 (Version 2.1.3.0.0 recommended) *or*

  ORACLE for Windows NT Named Pipes Protocol Adapter, Version 2.1 (Version 2.1.3.0.0 recommended)

- ORACLE for Windows NT Required Support Files, Version 7.2 (Version 7.2.2.4.0 recommended) *and* ORACLE for Windows NT SQL*Net Client, Version 2.2 (Version 2.2.2.1.0 recommended) *and* ORACLE for Windows NT TCP/IP Protocol Adapter, Version 2.2 (Version 2.2.2.1.0 recommended) *or*

  ORACLE for Windows NT Named Pipes Protocol Adapter, Version 2.2 (Version 2.2.2.1.0 recommended) *or*

  ORACLE for Windows NT SPX/IPX Protocol Adapter, Version 2.2 (Version 2.2.2.1.0 recommended)

If you are installing ORACLE SQL*Net for Windows 95, Version 1, the following configuration should be installed:

- ORACLE for Windows 95 Required Support Files, Version 7.2 (Version 7.2.2.3.1 recommended) *and* ORACLE for Windows 95 SQL*Net for TCP/IP Client, Version 1.1 (Version 1.1.6.9.0 recommended)

If you are installing ORACLE SQL*Net for Windows 95, Version 2, one of the following configurations should be installed:

- ORACLE for Windows 95 Required Support Files, Version 7.2 (Version 7.2.2.3.1 recommended) *and* ORACLE for Windows 95 SQL*Net Client, Version 2.2 (Version 2.2.2.1.0A recommended) *and* ORACLE for Windows 95 TCP/IP Protocol Adapter, Version 2.2 (Version 2.2.2.1.0 recommended) *or*

  ORACLE for Windows 95 Named Pipes Protocol Adapter, Version 2.2 (Version 2.2.2.1.0 recommended) *or*

  ORACLE for Windows 95 SPX/IPX Protocol Adapter, Version 2.2 (Version 2.2.2.1.0 recommended)

Depending on the ORACLE configuration used, the following ORACLE DLLs should be found in the Windows NT system32 subdirectory or some other directory that is included in the search path.

If ORACLE for Windows NT Required Support Files, Version 7.0 have been installed, the following files should be found - ORA7NT.DLL, CORENT.DLL, KGNT.DLL, and SQL15NT.DLL.

Note: The `SQL15NT.DLL` should have been with the ORACLE for Windows NT Required Support Files, Version 7.0. If you are unable to locate this file, it can be installed from ORACLE for Windows NT Pro*C, Version 1.5 (Version 1.5.6.2.1 recommended), or contact ORACLE technical support.

If ORACLE for Windows NT Required Support Files, Version 7.1 have been installed, the following files should be found - `ORANT71.DLL`, `CORENT23.DLL`, `KGNT71.DLL`, and `SQLNT16.DLL`.

Note: The `SQLNT16.DLL` should have been with the ORACLE for Windows NT Required Support Files, Version 7.1. If you are unable to locate this file, it can be installed from ORACLE for Windows NT Pro*C, Version 1.6 (Version 1.6.4.0.1 recommended), or contact ORACLE technical support.

If ORACLE for Windows 95 or Windows NT Required Support Files, Version 7.2 have been installed, the following files should be found - `ORA72.DLL`, `CORE34.DLL`, `CORE34O.DLL`, `KG72.DLL`, and `SQLLIB17.DLL`.

Note: The `SQLLIB17.DLL` should have been with the ORACLE for Windows 95 or Windows NT Required Support Files, Version 7.2. If you are unable to locate this file, it can be installed from ORACLE for Windows NT Pro*C, Version 2.2 (Version 2.1.2.0.3 recommended), or ORACLE for Windows 95 Pro*C, Version 2.1 (Version 2.1.2.0.5 recommended), or contact ORACLE technical support.

SAS/ACCESS Interface to SYBASE and SQL Server Software

Products Required:

- Base SAS software
- SAS/ACCESS Interface to SYBASE and SQL Server software

DBMS Products Required:

One of the following releases of DBMS client software is required:

For Windows WIN32s:

- Microsoft SQL Server Client, Release 4.20.50 or subsequent releases
- SYBASE Open Client, Release 4.20.50 or 10.03 or subsequent releases

For Windows NT:

- Microsoft SQL Server Client, Release 4.20.50 or subsequent releases
- SYBASE Open Client, Release 10.02 or subsequent releases
- SYBASE Open Client, Release 11.1 or later

For Windows 95:

- Microsoft SQL Server Client, Release 6.0 or subsequent releases
- SYBASE Open Client, Release 10.03 or subsequent releases
- SYBASE Open Client, Release 11.1 or later

SAS/AF Software

Products Required for Build Mode:

- Base SAS software
- SAS/AF software
- SAS/GRAPH software (to create and display graphics objects)
- SAS/FSP software (to create and display SAS/FSP objects)

Products Required for Run Mode:

- Base SAS software
- SAS/GRAPH software (to create and display graphics objects)
- SAS/FSP software (to create and display SAS/FSP objects)
- Other products may be required depending on the application

Printers:

- For printing graphics-based objects, a color or gray scale printer is required.
- Certain non-graphic objects may require SAS/GRAPH software to print depending on the object.
- The quality of printed output may be less than desirable on true pen plotter type devices.

Video Player Object in SAS/AF Software

Memory:

- 8 MB RAM required
- 16 MB RAM recommended

Hardware:

- 500 MB hard disk
- Minimum screen resolution - 640x480
- 486dx2-66 or higher
- SoundBlaster-compatible audio board
- External speakers
- MCI Microsoft Video for Windows driver
- Intel Indeo 3.1 and 3.2 driver
- MCI-compliant MPEG boards are supported
    - Reelmagic-type MPEG board recommended
- Minimum of 256 colors
    - Video board supporting true color mode (65K or 16.7m colors) recommended

SAS/ASSIST Software

Memory:

- 12 MB RAM required
- 16 MB RAM recommended

Base SAS Software

Video Player in Base SAS Software

A Video Player utility has been added to Base SAS software with Release 6.12. This will allow users to play video clips on their workstations. The Video Player Object (Class) is actually part of SAS/AF software. The Video Player utility based on the Video Player Object is included with Base SAS software.

Memory:

- 8 MB RAM required
- 16 MB RAM recommended

Hardware:

- 500 MB hard disk
- Minimum screen resolution - 640x480
- 486dx2-66 or higher
- SoundBlaster-compatible audio board
- External speakers
- MCI Microsoft Video for Windows driver
- Intel Indeo 3.1 and 3.2 driver
- MCI-compliant MPEG boards are supported
  - Reelmagic-type MPEG board recommended
- Minimum of 256 colors
  - Video board supporting true color mode (65K or 16.7m colors) recommended

SAS/CONNECT Software

Windows WIN32s

APPC Access Method

With the APPC access method, a Windows user is provided access to an SNA network. SAS/CONNECT software uses the Microsoft Windows Open Services Architecture (WOSA) standard (WinAPPC). Therefore, you should be able to use software from any vendor that supports this standard. One of the following software packages is required:

- Microsoft's SNA Server, Version 3.0 SP3 (Service Pack 3) or subsequent versions
- Any program that supports WOSA (Windows Open Services Architecture) APPC (WinAPPC) standard

CPIC Access Method

With the CPIC access method, a Windows user is provided access to a SNA network. SAS/CONNECT software uses the Microsoft Windows Open Services Architecture (WOSA) standard (WinCPIC) or the CPIC 2.0 standard. Therefore, you should be able to use software from any vendor that supports these standards. One of the following software packages is required:

- Microsoft's SNA Server, Version 3.0 SP3 (Service Pack 3)
  This software package supports the WOSA (Windows Open Services Architecture) specification (WinCPIC)

- Wall Data's Rumba APPC Engine, Version 2.0 with corrective maintenance (ZB0APC10) applied
  This software package supports the CPIC 2.0 specification with WinCPIC extensions

- Any program that supports the WOSA CPIC (WinCPIC) or CPIC 2.0 standards

DECnet Access Method

SAS Institute has verified the following package:

- Digital Equipment Corporation's Pathworks for DOS and Windows, Version 5.1 or subsequent versions

EHLLAPI Access Method

The EHLLAPI access method requires one of the following emulation packages:

- Attachmate's EXTRA for Windows, Version 4.3 or subsequent versions
- IBM's Personal Communications/3270, Version 4.0 or subsequent versions
- Wall Data's Rumba, Version 3.1 or subsequent versions
- Any 16-bit emulation program that supports the EHLLAPI or WinHLLAPI standards

NetBIOS Access Method

For the NetBIOS access method, SAS/CONNECT software uses the Windows interface to the IBM-compatible NetBIOS that is loaded into DOS. Therefore, you should be able to use software from any vendor providing a NetBIOS product. SAS Institute has verified the following packages:

- IBM's LAN Support Program
- Novell's NetWare Requestor for DOS

TELNET and TCP/IP Access Methods

The TCP/IP access method requires ones of the following emulation packages:

- Novell's LAN Workplace for DOS, Version 4.2 or subsequent versions
- Microsoft's LAN Manager, Version 2.1 or subsequent versions
- Any TCP/IP package that provides a Winsock Version 1.1 or subsequent version's API

Windows 95

APPC Access Method

With the APPC access method, a Windows user is provided access to an SNA network. SAS/CONNECT software uses the Microsoft Windows Open Services Architecture (WOSA) standard (WinAPPC). Therefore, you should be able to use software from any vendor that supports this standard. One of the following software packages is required:

- Microsoft's SNA Server, Version 3.0 SP3 (Service Pack 3) or subsequent versions
- IBM's Personnal Communications, Version 4.11 or subsequent versions
- Any program that supports WOSA (Windows Open Services Architecture) APPC (WinAPPC) standard

DECnet Access Method

The DECnet access method requires the following software:

- Digital Equipment Corporation's Pathworks, Version 3.2 with Microsoft's Winsock, Version 2.0

EHLLAPI Access Method

The EHLLAPI access method requires one of the following emulation packages:

- Wall Data's Rumba 95/NT, Version 5.2+
- Attachmate's EXTRA Personal Client, Version 6.3 or subsequent versions
- McGill Systems TCP3270, Version 3.0 or subsequent versions
- IBM's PCOM (Personal Communications), Version 4.2 or subsequent versions
- Any Windows 95 32-bit emulation program that supports the EHLLAPI or WinHLLAPI standards

NetBIOS Access Method

For the NetBIOS access method, SAS/CONNECT software supports the IBM-compatible or NetWare-compatible NetBIOS that is included with Windows 95.

SPX Access Method

For the SPX access method, SAS/CONNECT software supports the IPX/SPX protocol included with Windows 95.

TELNET and TCP/IP Access Methods

For the TCP/IP access method, SAS/CONNECT software supports Microsoft's TCP/IP System Driver, which is provided with Windows 95.

Windows NT

APPC Access Method

With the APPC access method, a Windows user is provided access to an SNA network. SAS/CONNECT software uses the Microsoft Windows Open Services Architecture (WOSA) standard (WinAPPC). Therefore, you should be able to use software from any vendor that supports this standard. One of the following software packages is required:

- Microsoft's SNA Server, Version 3.0 SP3 (Service Pack 3) or subsequent versions
- Any program that supports WOSA (Windows Open Services Architecture) APPC (WinAPPC) standard

DECnet Access Method

SAS Institute has verified the following packages:

For Windows NT, Version 3.5, you must have:

- Digital Equipment Corporation's Pathworks for Windows NT, Version 5.1 or subsequent versions

For Windows NT, Version 4.0, you must have:

- Digital Equipment Corporation's Pathworks, Version 3.2 with Microsoft's Winsock, Version 2.0

EHLLAPI Access Method

The EHLLAPI access method requires one of the following emulation packages:

- Wall Data's Rumba 95/NT, Version 5.2+
- Attachmate's EXTRA Personal Client, Version 6.3 or subsequent versions
- Any Windows NT 32-bit emulation program that supports the EHLLAPI or WinHLLAPI standards

NetBIOS Access Method

For the NetBIOS access method, SAS/CONNECT software supports the IBM-compatible or NetWare-compatible NetBIOS that is included with Windows NT.

SPX Access Method

For the SPX access method, SAS/CONNECT software supports the IPX/SPX protocol included with Windows NT.

TELNET and TCP/IP Access Methods

For the TCP/IP access method, SAS/CONNECT software supports Microsoft's TCP/IP System Driver, which is provided with Windows NT.

SAS/EIS Software

Products Required for Build Mode:

- Base SAS software
- SAS/AF software
- SAS/FSP software
- SAS/GRAPH software
- SAS/EIS software
- Other products may be required depending on the application

Products Required for Run Mode:

- Base SAS software
- SAS/GRAPH software
- SAS/EIS software
- Other products may be required depending on the application

Memory:

- 24 MB minimum
- 32 MB recommended

Hardware:

- Minimum configuration of a 33 MHz, 80386 machine with 8514, VGA, SVGA, or XGA monitor.
- Performance can be improved by using a 33 MHz or faster 80486 or Pentium machine.
- EGA is not recommended.

Printers:

- The quality of printed output may be less than desirable on true pen plotter type devices.

SAS/ENGLISH Software

Products Required:

- Base SAS software
- SAS/ASSIST software
- SAS/ENGLISH software

Enterprise Reporter Software

Operating System:

SAS System Edition and Standard Edition

- Windows 95
  or
- Windows NT, Version 4.0 with Service Pack 3

Products:

SAS System Edition

- Base SAS Software required
- SAS/FSP Software required
- SAS/GRAPH Software required
- SAS/CONNECT Software *optional*
- Family of SAS/ACCESS Software products *optional*
- SAS/MDDB Server Software *optional*

Standard Edition

- No SAS Software is required.
- A license for SAS Software is required on any machine that serves data to Enterprise Reporter Software.

System Configuration:

SAS System Edition and Standard Edition

- Pentium processor
- VGA monitor minimum
- SVGA monitor recommended

Memory:

SAS System Edition and Standard Edition

- 24 MB RAM minimum
- 32 MB RAM recommended for optimal performance

Disk Space Requirements:

SAS System Edition

Network Install:

- 40 MB on network (includes Enterprise Reporter Software with samples)
- 2 MB on each local PC

Local PC Install:

- 40 MB for Enterprise Reporter Software with samples
- 20 MB for Enterprise Reporter Software without samples

Standard Edition

Network Install:

- 100 MB on network
- 2 MB on each local PC

Local PC Install:

- 100 MB on each local PC

SAS/GIS Software

Products Required:

- Base SAS software
- SAS/GRAPH software
- SAS/FSP software
- SAS/GIS software
- Other products may be required depending on the application

Printers:

- A color gray scale printer is required. The list of possible printers can be found in the **Graphics Hardware and Software Compatibility** section.
- The quality of printed output may be less than desirable on true pen plotter type devices.

Memory:

- 12 MB minimum
- 16 MB recommended
- 25 MB or more of swapfile space

Display:

- 16 color display adapter required
- 256 color display adapter strongly recommended

Video Extensions in SAS/GRAPH Software

Video processing capabilities have been incorporated into SAS/GRAPH software. There are two components, a Non Linear Editor and a Text Compositor. Using these components, SAS System users can build their own video clips with superimposed textual annotation and audio. These video clips can then be included into any SAS application by using the video frame object technology to create a multimedia presentation. The editor supports AVI files (with uncompressed or Intel Indeo 3.1 and 3.2 video compression), WAV (audio) files, and TIFF files.

The text compositor component of the software allows users to add textual annotation to video clips. The text compositor is designed to allow creation and animation of text blocks for credit rolls, subtitles, etc. Users can compose blocks of text and assign attributes such as fonts, sizes, and spacing. Users can assign surface attributes, such as color and transparency (visibility).

Memory:

- 8 MB RAM required
- 16 MB RAM recommended

Hardware:

- 500m hard disk
- Minimum screen resolution - 800x600
- 486dx2-66 or higher
- SoundBlaster-compatible audio board
- External speakers
- MCI Microsoft Video for Windows driver
- Intel Indeo 3.1 and 3.2 driver
- MCI-compliant MPEG boards are supported
    - Reelmagic-type MPEG board recommended
- Minimum of 256 colors
    - Video board supporting true color mode (65K or 16.7m colors) recommended

SAS/LAB Software

Products Required:

- Base SAS software
- SAS/GRAPH software
- SAS/LAB software
- SAS/FSP software is recommended but not required

SAS/MDDB Server Software

The memory requirements for SAS/MDDB Server software are dependent upon the complexity of the hierarchies generated. While the minimum requirement of 8 MB will allow the creation of simple hierarchies, more complex hierarchies will require additional RAM.

SAS/SHARE Software

Windows WIN32s

APPC Access Method

With the APPC access method, a Windows user is provided access to an SNA network. SAS/SHARE software uses the Microsoft Windows Open Services Architecture (WOSA) standard (WinAPPC). Therefore, you should be able to use software from any vendor that supports this standard. One of the following software packages is required:

- Microsoft's SNA Server, Version 3.0 SP3 (Service Pack 3) or subsequent versions
- Any program that supports WOSA (Windows Open Services Architecture) APPC (WinAPPC) standard

CPIC Access Method

With the CPIC access method, a Windows user is provided access to a SNA network. SAS/SHARE software uses the Microsoft Windows Open Services Architecture (WOSA) standard (WinCPIC) or the CPIC 2.0 standard. Therefore, you should be able to use software from any vendor that supports these standards. One of the following software packages is required for use with the REMOTE engine and `PROC OPERATE`:

- Microsoft's SNA Server, Version 3.0 SP3 (Service Pack 3)

  This software package supports the WOSA (Windows Open Services Architecture) specification (WinCPIC)

- Wall Data's Rumba APPC Engine, Version 2.0 with corrective maintenance (ZB0APC10) applied

  This software package supports the CPIC 2.0 specification with WinCPIC extensions
- Any program that supports the WOSA CPIC (WinCPIC) or CPIC 2.0 standards

  Note: SAS Institute has verified no packages for use with PROC SERVER under Windows WIN32s.

DECnet Access Method

SAS Institute has verified the following package:

- Digital Equipment Corporation's Pathworks for DOS and Windows, Version 5.1 or subsequent versions

NetBIOS Access Method

For the NetBIOS access method, SAS/SHARE software uses the Windows interface to the IBM-compatible NetBIOS that is loaded into DOS. Therefore, you should be able to use software from any vendor providing a NetBIOS product. SAS Institute has verified the following packages:

- IBM's LAN Support Program
- Novell's NetWare Requestor for DOS

TCP/IP Access Method

Using the TCP/IP access method, a Windows user can connect to any supported platform that is on the TCP/IP network, is running a SAS System release that has the corresponding access method support, and has SAS/SHARE software licensed.

The TCP/IP access method requires ones of the following emulation packages:

- Novell's LAN Workplace for DOS, Version 4.2 or subsequent versions
- Microsoft's LAN Manager, Version 2.1 or subsequent versions
- Any TCP/IP package that provides a Winsock Version 1.1 or subsequent version's API

APPC Access Method

With the APPC access method, a Windows user is provided access to an SNA network. SAS/SHARE software uses the Microsoft Windows Open Services Architecture (WOSA) standard (WinAPPC). Therefore, you should be able to use software from any vendor that supports this standard. One of the following software packages is required:

- Microsoft's SNA Server, Version 3.0 SP3 (Service Pack 3) or subsequent versions
- IBM's Personnal Communications, Version 4.11 or subsequent versions
- Any program that supports WOSA (Windows Open Services Architecture) APPC (WinAPPC) standard

DECnet Access Method

The DECnet access method requires the following software:

- Digital Equipment Corporation's Pathworks, Version 3.2 with Microsoft's Winsock, Version 2.0

NetBIOS Access Method

For the NetBIOS access method, SAS/SHARE software supports the IBM-compatible or NetWare-compatible NetBIOS that is included with Windows 95.

SPX Access Method

For the SPX access method, SAS/SHARE software supports the IPX/SPX protocol included with Windows 95.

TCP/IP Access Method

Using the TCP/IP access method, a Windows user can connect to any supported platform that is on the TCP/IP network, is running a SAS System release that has the corresponding access method support, and has SAS/SHARE software licensed.

The following TCP/IP product is supported:

- Any TCP/IP package that provides a Winsock Version 1.1 or subsequent version's API

Windows NT

APPC Access Method

With the APPC access method, a Windows user is provided access to an SNA network. SAS/SHARE software uses the Microsoft Windows Open Services Architecture (WOSA) standard (WinAPPC). Therefore, you should be able to use software from any vendor that supports this standard. One of the following software packages is required:

- Microsoft's SNA Server, Version 3.0 SP3 (Service Pack 3) or subsequent versions
- Any program that supports WOSA (Windows Open Services Architecture) APPC (WinAPPC) standard

DECnet Access Method

SAS Institute has verified the following packages:

For Windows NT, Version 3.5, you must have:

- Digital Equipment Corporation's Pathworks for Windows NT, Version 5.1 or subsequent versions

For Windows NT, Version 4.0, you must have:

- Digital Equipment Corporation's Pathworks, Version 3.2 with Microsoft's Winsock, Version 2.0

NetBIOS Access Method

For the NetBIOS access method, SAS/SHARE software supports the IBM-compatible or NetWare-compatible NetBIOS that is included with Windows NT.

SPX Access Method

For the SPX access method, SAS/SHARE software supports the IPX/SPX protocol included with Windows NT.

TCP/IP Access Method

Using the TCP/IP access method, a Windows user can connect to any supported platform that is on the TCP/IP network, is running a SAS System release that has the corresponding access method support, and has SAS/SHARE software licensed.

The following TCP/IP product is supported:

- Microsoft's TCP/IP System Driver provided with Windows NT

SAS/SPECTRAVIEW Software

SAS/SPECTRAVIEW software, one of the SAS System's newest data visualization and modeling tools, allows you to create, analyze, and modify geometric images representing multidimensional data. This software is useful for a variety of applications, including medical imaging, oil exploration, environmental sciences, chemical analysis, pharmaceutical studies, and financial analysis.

Memory:

- 12 MB minimum
- 16 MB recommended

Hardware:

- Minimum screen resolution - 800x600
- Minimum of 256 colors

SAS/Warehouse Administrator Software

Products Required for Build Mode:

- Base SAS software
- SAS/AF software (required only for API usage)
- SAS/FSP software

Products Required for Run Mode:

- Base SAS software
- SAS/FSP software
- Other products depending on application (e.g., SAS/ACCESS software for access to DBMS tables, SAS/CONNECT software for access to remote data, or SAS/AF software to access warehouse via method calls)

Note: It is recommended that SAS/Warehouse Administrator software be run on a minimum hardware configuration of 133 MHz processor, 24 MB memory, with a VGA, SVGA, or XGA monitor.

Printers:

- For printing graphics-based objects, a color or gray scale printer is required.
- Certain non-graphic objects may require SAS/GRAPH software to print depending on the object.
- The quality of printed output may be less than desirable on true pen plotter type devices.

Graphics Hardware and Software Compatibility

Printers

SAS/GRAPH software supports any graphics printer that has a Microsoft Windows device driver available. This support is provided via the WINPRTM (for monochrome printers), WINPRTG (for printers that support gray-scale shading), and WINPRTC (for color printers) device drivers.

As an alternative to the WINPRTx series of drivers, SAS/GRAPH native device drivers are available for all Hewlett-Packard printers (and compatibles), and printers that support PostScript, HP-GL, HP PCL, and other printer languages.

Here is a partial list of printers that SAS/GRAPH software supports with native device drivers:

CalComp ColorMaster, ColorMaster Plus, PlotMaster
Canon Bubble Jet, Laser Shot
Digital printers which support either SIXEL, HP PCL, Tektronix, or PostScript emulation modes
Epson FX and LQ series printers (and all printers running in Epson emulation mode)
Hewlett-Packard LaserJet, DeskJet, PaintJet, ThinkJet, and DesignJet printers (and compatibles)
IBM Graphics, Proprinter, and ColorJet printers
PostScript printers (including color and gray-scale PostScript printers)
QMS Colorgrafix with CGM interpreter
QMS 800, 1200, 1500, 2200, and 2400 using QUIC or Tektronix emulation modes
Talaris 800, 802, 1200, 1500, and 2400 using QUIC or Tektronix emulation modes
Talaris printers using the EXCL language
Tektronix Phaser printers (all models)
Tektronix 4695, 4696, 4697 (ColorQuick)
Tektronix 4691, 4692 and 4693 printers with Tektronix 4510 rasterizer
Xerox 2700 and 4045 printers with a GRAPHX cartridge
Xerox 3700 (with imaging board and at least 1M of memory)
Xerox 4030 (contact Technical Support), 4213, 4235, and 4700
Xerox 4700 printer
Xerox 5775 color copier with an EFI Fiery attachment

Native drivers may also be available for additional printers not listed above and that do not support PostScript, HP-GL, or HP PCL. For additional information on these drivers, contact SAS Institute Technical Support.

Plotters

SAS/GRAPH software supports any plotter that has a Microsoft Windows plotter driver available. This support is provided via the WINPLOT device driver.

As an alternative to the WINPLOT device driver, SAS/GRAPH software also provides native device drivers for all HP plotters supporting HP-GL or HP-GL/2, and plotters from other manufacturers that support the HP-GL or HP-GL/2 language. SAS/GRAPH software also supports Houston Instruments plotters using the DMPL language and ZETA plotters that support the GML language.

Film Recorders

SAS/GRAPH supports any film recorder that has a Microsoft Windows driver available. This support is provided via the WINPRTC device driver. As an alternative to the WINPRTC device driver, SAS/GRAPH software also provides native device drivers that support the following film recorders:

General Parametrics Videoshow display system
Genigraphics Masterpiece Camera System with SCODL interface
Lasergraphics MPS 2000 film recorder with a Lasergraphics UI-100 or RASCOL rasterizer
Matrix QCR and PCR cameras with Matrix QVP, MVP, or Lasergraphics rasterizers
Polaroid Palette CI-3000 and CI-5000
Presentation Technologies Montage film recorder

Support may be available for other film recorders not listed here. For details, contact SAS Institute Technical Support.

Interfaces to Other Graphics Software

Included with SAS/GRAPH software is a series of drivers that can produce Computer Graphics Metafiles (CGM) in binary, character, and clear-text formats. These drivers can be used to transfer SAS/GRAPH output to other products that support CGM input, such as Word for Windows, WordPerfect for Windows, Harvard Graphics, and Lotus Freelance, or to devices that can process CGM input.

SAS/GRAPH software can also generate encapsulated PostScript vector files, which can be exported to word processing packages such as Microsoft Word, WordPerfect, and several others.

SAS/GRAPH software can also generate Windows metafiles that can be exported to numerous packages including Microsoft Office, Lotus Smart Suite, and Perfect Office. Contact Technical Support for details.

Many other graphics and word processing applications can process files in Hewlett-Packard (HP-GL) format. The HPGL driver can be used to produce files that can be transferred to most applications that can process HP-GL files. In addition, there are drivers for PBM, PPM, GIF, JPEG, and PaintBrush image formats.

SAS/GRAPH software can also export graphics in the following formats:

BMP - Microsoft Windows Bitmap
DIB - Device Independent Bitmap
EPSI - Encapsulated PostScript Interchange
GIF - Graphics Interchange Format
PBM - Portable Bitmap
PS - PostScript Bitmap
TIF - Tagged Image File Format
WMF - Microsoft Windows Metafile Format

In addition, SAS/GRAPH software can import graphics in the following formats:

BMP - Microsoft Windows Bitmap
CGM - Computer Graphics Metafile
DIB - Device Independent Bitmap
EPSI - Encapsulated PostScript Interchange
GIF - Graphics Interchange Format
PBM - Portable Bitmap
PCX - PC PaintBrush
TGA - TARGA Format
TIF - Tagged Image File Format
WMF - Microsoft Windows Metafile Format
XWD - X Window Dump

Writing Your Own Device Driver

SAS Institute's Metagraphics driver facility can be used to develop driver support for virtually any device you choose. The Metagraphics driver facility is device-intelligent and supports most hardware features. A user-written program is required to translate the metafile into the appropriate graphics language recognized by the hardware. SAS/GRAPH software will, optionally, perform device I/O. For details, contact SAS Institute Technical Support.

The Macintosh Meta Application

The Macintosh Meta Application is a free program that can be installed on your Macintosh. A metafile produced by the SAS/GRAPH Metagraphics driver can be transferred to the Macintosh from your host system and viewed on the screen. Images can then be stored in PICT or clipboard format to be used by other applications or printed on an attached Apple LaserWriter (or compatible) printer. Images can be saved into the Macintosh clipboard and used by MacDraw and other Macintosh packages. For details, contact SAS Institute Technical Support.