

System Requirements

The SAS[®] System Release 6.09 Enhanced (TS475) MVS

This document provides requirements for installing and running the SAS System under MVS. 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
- ☐ 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/service/admin/admindoc.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

- MVS/SP, Version 2 or subsequent releases, including MVS/XA and MVS/ESA

Hardware Requirements

Machines Supported

- IBM 370/30xx/43xx/93xx and compatible machines

Tape Drives Supported

- 9-track (1600 bpi and 6250 bpi)
- IBM 3480 compatible drives

Distribution Media

- 9-track (1600 bpi and 6250 bpi)
- Cartridges for IBM 3480 drives

Memory Requirements

Because the Version 6 SAS System is designed to take advantage of MVS/XA architecture, most of the memory used is above the 16 MB line and memory constraints should not be an issue for SAS sessions in MVS/XA and MVS/ESA environments. In any environment, SAS System initialization requires about 2500K in batch and under TSO without the display manager.

If you install the bundles into the LPA, the SAS System initialization requires approximately 770K in batch and under TSO without the display manager. The display manager requires an additional 550K - or 200K if you install the bundles into the LPA. (This includes memory both above and below the 16 MB line on MVS/XA and MVS/ESA systems.)

The total memory needed depends on the work done in the SAS session and the system options that are active.

Mouse Requirements

- IBM 3179, 3192, and 3472
- IBM PS/2 with OS/2 Communications Manager
- Tektronix CX-4200 Series Terminals
- Other emulation products may work (contact Technical Support for an updated list)

Space Requirements

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

Approximate space requirements for all of the products available with Release 6.09 Enhanced (TS475) of the SAS System are listed below. Amounts reflect estimated space usage on 3380 disk packs following a default install of all libraries associated with each product. To allow for the effect of rounding to cylinders and secondary allocations, add another 10 percent to the totals for your products. To convert to cylinders, multiply your totals by .184 for 3330 DASD, .078 for 3350 DASD, .067 for 3380 DASD, .058 for 3390 native mode DASD, and round up.

Software Product	All Libraries 3380 Tracks (or equivalent)
Control Data Set	45
Base SAS Software ¹	2,774
SAS/ACCESS Interface to ADABAS Software	24
SAS/ACCESS Interface to CA-DATACOM/DB Software	27
SAS/ACCESS Interface to CA-IDMS Software	25
SAS/ACCESS Interface to DB2 Software	26
SAS/ACCESS Interface to IMS Software	26
SAS/ACCESS Interface to ORACLE Software	25
SAS/ACCESS Interface to SymfoWARE Software	3
SAS/ACCESS Interface to System 2000 Software	111
SAS/AF Software	34
SAS/ASSIST Software	163
SAS/CALC Software	158
SAS/CONNECT Software ²	33
SAS/EIS Software	178
SAS/ENGLISH Software	138
SAS/ETS Software	210
SAS/FSP Software	90
SAS/GRAPH Software	1,478
SAS/IML Software	94
SAS/INSIGHT Software	120
IT Service Vision Software or SAS/CPE Software ³	3,320
SAS/LAB Software	128
SAS Notes, Zap Library	335
SAS/OR Software	231
SAS/QC Software	310
SAS/SESSION Software	4
SAS/SHARE Software ²	31
SAS/STAT Software	400
SAS/TOOLKIT Software	276

1. The SAS System install uses a cataloged temporary datalib on your installation volume. 1500 tracks will be released at the conclusion of the install.
2. SAS/CONNECT software and SAS/SHARE software share the SAS/C Transient Library. If your site does not already have the SAS/C compiler, add 60 tracks.
3. This figure only includes space to install the included demonstration PDB and program libraries. Number and size of actual user PDBs vary widely. Some installations may require a volume of 3380 DASD. If you are installing PDBs to 3390 DASD, add 600 tracks for installation that will be freed at the completion of the install.

SAS/TUTOR Software Course	All Libraries 3380 Tracks (or equivalent)
SAS/TUTOR Software: Fundamentals of the SAS System (CBT Course 101)	119
SAS/TUTOR Software: Reading raw data and formatting values with the DATA Step (CBT Course 102)	66
SAS/TUTOR Software: Creating, modifying and processing variables with the DATA Step (CBT Course 103)	58
SAS/TUTOR Software: Developing custom data entry applications (CBT Course 104)	55
SAS/TUTOR Software: Creating and enhancing SAS/GRAPH output (CBT Course 105)	93
SAS/TUTOR Software: Creating tables with proc tabulate (CBT Course 106)	62

1. Add 45 tracks only for the first SAS/TUTOR software course installed (common programs and student records).

Specific Product Requirements

SAS/ACCESS Interface to ADABAS Software

DBMS Products Required:

- ADABAS, Release 5.2 (SM03) or subsequent releases

DBMS Products Optional:

- NATURAL, Release 2.1 (SM04) or subsequent releases
- NATURAL Security, Release 2.1 (SM04) or subsequent releases
- PREDICT, Release 2.3 or subsequent releases

SAS/ACCESS Interface to CA-DATACOM/DB Software

DBMS Products Required:

- CA-DATACOM/DB, Release 7.5 or subsequent releases
- CA-DATADictionary, Release 2.4 or subsequent releases

SAS/ACCESS Interface to CA-IDMS Software

DBMS Products Required:

- CA-IDMS, Release 10.2 or subsequent releases

SAS/ACCESS Interface to DB2 Software

DBMS Products Required:

- DB2, Release 2.2 or subsequent releases

SAS/ACCESS Interface to IMS Software

DBMS Products Required:

- IMS/VS, Version 4.1 or subsequent versions

SAS/ACCESS Interface to ORACLE Software

DBMS Products Required:

- Oracle, Version 6.0.27 or subsequent Version 7 releases

SAS/ACCESS Interface to SymfoWARE Software

DBMS Products Required:

- SymfoWARE, Version 10, Level 10 or subsequent releases

SAS/ACCESS Interface to SYSTEM 2000 Software

DBMS Products Required:

- SYSTEM 2000, Release 11.6 with Field Fix 1 or subsequent releases

SAS/ASSIST Software

Memory Required:

- 10 MB minimum

SAS/CALC Software

Terminals Required (for chart utility):

- IBM 3179 Model G
- IBM 3192 Model G
- IBM 3278 (Models 2, 3, and 4 only)
- IBM 3279 Model G

SAS/CONNECT Software

APPC Access Method:

With the APPC access method, the following software is required:

- VTAM, Version 3, Release 2 or subsequent releases

MVS/ESA, Version 4, Release 2 or subsequent releases (with APPC/MVS configured) is required to support SAS/CONNECT access from CMS, MVS, OS/2 (without a TSO logon), AIX/6000, HP-UX, SunOS 4 and Solaris 2, VSE, Windows 95, Windows NT, or Windows 32s.

NCP, Version 4, Release 3 or subsequent releases for 3725 communications controllers or Version 5, Release 2 or subsequent releases for 3745 communications controllers is recommended for peripheral node attachment.

TCP/IP Access Method:

SAS/CONNECT software requires SAS/C Transient Library, Release 5.50 or later and one of the following levels of system software to support the TCP/IP access method:

- IBM TCP/IP, Version 2, Release 2.1 or subsequent releases, with PTFs UN58155, UN70533, UN70537, UN70873, and UN74451 applied
- IBM TCP/IP, Version 3, Release 1 with PTFs UN67461, UN70539, UN70877, and UN74451 applied
- Interlink's SNSTCP, Version 2.1 or subsequent versions

Note: The SAS/C Transient Library is provided with SAS/CONNECT software.

IT Service Vision Software (supersedes SAS/CPE Software)

Terminals Required:

- 32-line terminal
- Terminal emulation package with graphics capability
- Terminal that supports vector graphics and uses a mouse recommended

IT Service Vision software supports MXG releases beginning with Release 11.06. New MXG releases are supported within a few months of their shipment.

SAS/EIS Software

Memory Required:

- 10 MB

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

To edit any object utilizing FRAME entries, you must be using either an IBM 3179G, 3192G, or 3472G (InfoWindow) terminal. A mouse is also strongly recommended. You may be able to run SAS/EIS software on a PC running 3270 emulation, if the emulation software is IBM 3179G-compatible.

SAS/ENGLISH Software

Memory Required:

- 10 MB

SAS/GRAPH Graphics Editor

Terminals:

- IBM 3179
- IBM 3192
- IBM 3472
- Tektronix CX42xx series terminals

SAS/IML Software

SAS/IML software can optionally access IBM's Engineering and Scientific Subroutine Library (ESSL). The Fortran runtime library necessary to support your version of ESSL is required.

SAS/INSIGHT Software

Terminals Required:

- IBM 3179 Model G
- IBM 3192 Model G
- IBM 3472 InfoWindow Graphics-5
- Tektronix CX42xx-series

SAS/LAB Software

Products Required:

- Base SAS software
- SAS/GRAPH software
- SAS/FSP software recommended

Memory Required:

- 8 MB recommended above the 16 MB line

SAS/OR Software

SAS/OR software can optionally access IBM's Optimization Subroutine Library (OSL). The Fortran runtime library necessary to support your version of OSL is required.

SAS/SESSION for CICS Software

Products Required:

- MVS/ESA, Version 4, Release 2 or subsequent versions
- CICS/ESA, Version 3, Release 2.1 or subsequent versions
- VTAM/ESA, Version 3, Release 4 or subsequent versions

SAS/SHARE Software

Products Required:

- SAS SVC Routine, Release 6.07 or subsequent releases

VTAM LU 0 Access Method:

With the VTAM LU 0 access method, the following software is required in the environments described:

- IBM ACF VTAM, Version 2.1 or subsequent versions (for supporting SAS/SHARE software across CPUs in a multi-CPU, SNA network environment)
- IBM ACF/NCP/VS, Version 1.3 or subsequent versions (for supporting a link connection in your network)

APPC Access Method:

With the APPC access method, the following software is required:

- VTAM, Version 3, Release 2 or subsequent releases
- NCP, Version 4, Release 3 or subsequent releases for 3725 communications controllers or Version 5, Release 2 or subsequent releases for 3745 communications controllers is recommended for peripheral node attachment

TCP/IP Access Method:

SAS/SHARE software requires SAS/C Transient Library, Release 5.50 or later and one of the following levels of system software to support the TCP/IP access method:

- IBM TCP/IP, Version 2, Release 2.1 or subsequent releases, with PTFs UN58155, UN70533, UN70537, UN70873, and UN74451 applied
- IBM TCP/IP, Version 3, Release 1 with PTFs UN67461, UN70539, UN70877, and UN74451 applied
- Interlink's SNSTCP, Version 2.1 or subsequent versions

Note: The SAS/C Transient Library is provided with SAS/SHARE software.

RACF:

RACF Release 1.8 or beyond (or the equivalent) is required for MVS SAS/SHARE sites making use of the cross-host or cross-architecture capabilities available in Release 6.08, TS410 and beyond. Note that this is only required if the MVS SAS/SHARE server runs in a "secured" mode. For more information on the cross-architecture capabilities and modes of server execution, refer to Appendix N - "Implementing SAS/SHARE Software" in the **Installation Instructions and System Manager's Guide for the SAS System under MVS, Release 6.09 Enhanced (TS475)** and *SAS Technical Report P-260, SAS/SHARE Software for the MVS Environment, Release 6.08*.

Graphics Hardware and Software Compatibility

Terminals and Displays

SAS/GRAPH software supports standard IBM graphics terminals (such as the IBM 3179G, IBM 3192G, and IBM 3472G terminals).

SAS/GRAPH software should also be able to support most 3270 emulation packages as long as the 3270 emulation software is configured to provide host graphics support.

SAS/GRAPH software supports UNIX workstations running Emulus software. Emulus software, available from SAS Institute, provides full IBM 3179G terminal emulation from IBM, Sun, and Hewlett-Packard UNIX-based workstations. In addition to supporting all features of the IBM 3179G terminal, Emulus software provides several extended capabilities, including the capability to display user-defined colors and the capability to move and resize graphics objects in real time. For further information on Emulus software, contact your SAS Support Consultant.

Printers

SAS/GRAPH software should be able to support almost any graphics printer on the market (provided that the graphics format that a printer supports is compatible with the graphics format written out by SAS/GRAPH device drivers). SAS/GRAPH software is compatible with most (if not all) printers that support HP-PCL, HP-GL, HP-GL/2, and PostScript languages. SAS/GRAPH software supports most printers from manufacturers such as Hewlett-Packard, Xerox, QMS, and Tektronix.

SAS/GRAPH software supports most IBM printers (such as the IBM 3800, IBM 3812, IBM 3816, IBM 3820, IBM 3900, and IBM 4224). SAS/GRAPH software support for some IBM printers (such as the IBM 3800 and 3900 printers) may require the GDDM base product. For more information on which printers require the GDDM base product, contact SAS Institute Technical Support.

To view a complete list of all SAS/GRAPH device drivers, submit the following SAS program:

```
proc gdevice c=sashelp.devices nofs;
  list _all_;
run; quit;
```

The device driver list is sent to the SAS Output window (if running interactively) or to the SASLIST file (if running in batch).

Plotters and Film Recorders

SAS/GRAPH software should be able to support most plotters and film recorders on the market today. SAS/GRAPH software supports all HP and HP-compatible plotters that support HP-GL and HP-GL/2 languages. SAS/GRAPH software should also be able to support most film recorders that support HP-GL, Scodl, and Lasergraphics languages.

To view a complete list of all SAS/GRAPH device drivers, submit the following SAS program:

```
proc gdevice c=sashelp.devices nofs;
  list _all_;
run; quit;
```

The device driver list will be sent to the SAS Output window (if running interactively) or to the SASLIST file (if running in batch).

Protocol Converters

SAS/GRAPH supports the following 3287-type protocol converters:

- Agile
- Andrew Data Systems
- Avatar
- Axis
- Cablenet
- I-Data
- IDEX
- I/O Corporation
- IRMAprint and IRMAprint2
- ISI 87
- KMW 3287
- Local Data Interlynx 3287
- NetCommander

Use of most graphics printers with 3287-type protocol converters listed above requires special communications software (such as VPS) that can access these types of devices through the JES subsystem. Contact SAS Institute Technical Support for more information.

SAS/GRAPH supports the following 3270-type protocol converters:

- Commtext C-80
- Datastream
- IBM 7171
- KMW 3270-FS
- Local Data Datalynx
- Micom 7400
- PCI 1071, 1076
- Renex
- Hydra

Interfaces with other Graphics Software

Included with SAS/GRAPH software is a series of device drivers that can produce output in Computer Graphics Metafile (CGM) format. These files can be used to transfer SAS/GRAPH output to other products that can import CGM files, such as Harvard Graphics, Microsoft Word, and Microsoft PowerPoint.

SAS/GRAPH software also provides device drivers to create output in various other graphics file formats, such as HP-GL, PostScript, Encapsulated PostScript, GIF, JPEG, TIFF, and PDF format.

To view a complete list of all SAS/GRAPH device drivers, submit the following SAS program:

```
proc gdevice c=sashelp.devices nofs;  
  list _all_;  
run; quit;
```

The device driver list will be sent to the SAS Output window (if running interactively) or to the SASLIST file (if running in batch).

The GIMPORT procedure, part of SAS/GRAPH software, can be used to convert CGM files produced by other applications to graphics entries in a SAS catalog. You can use this feature to display output from other applications using SAS/GRAPH device drivers.

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