

**Paper 251-25****IN-HOUSE SAS ® USER'S GUIDES: SITE-SPECIFIC INFORMATION  
AND CONVERSION GUIDES**

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**INTRODUCTION**

At the Federal Reserve Board (the Board), several in-house SAS ® User's Guides have been written. These manuals document SAS-related information specific to the Board, and supplement rather than replace SAS Institute's manuals.

The objectives, scope, beneficiaries, and contents of an in-house user's guide were discussed in detail in the paper "Writing an In-house SAS User's Guide" (Proceedings of the Nineteenth Annual SAS Users Group International Conference, p.1277), and are summarized in this paper.

One type of in-house user's guide, a conversion guide for a new SAS software release, can be tailored to a site's SAS software products and computing environment, and might include the following sections.

1. A conversion timetable that includes a timeline for installation, testing, and cutover.
2. A changes and enhancements guide that documents compatibility issues and new and enhanced products.

The author of this paper wrote an in-house conversion guide for Version 6 in 1991, and is writing an in-house conversion guide for Version 8. Some examples from these guides are presented and discussed.

**IN-HOUSE SAS USER'S GUIDE:  
OBJECTIVES**

1. Document site-specific information about the SAS system, such as in-house utilities, macros in an in-house macro library, and in-house consulting assistance.
2. Help SAS users convert to a new platform, operating system, or release of SAS software by explaining how the SAS system differs in the old and new environments.
3. Provide standards, guidelines, or recommendations for coding and documentation.
4. Present examples using site-specific data, directory names, file names, and variable names.

**IN-HOUSE SAS USER'S GUIDE: SCOPE**

In-house SAS user's guides can include material for one operating system or multiple operating systems. At the Board, most site-specific information was also operating system-specific, so the in-house SAS user's guides contain material for only one operating system.

**IN-HOUSE SAS USER'S GUIDE: WHICH  
SAS SITES CAN BENEFIT?**

1. Sites that have customized their SAS system configuration or developed site-specific software, documentation, or utilities.
2. Sites converting experienced SAS users to a new platform, operating system, or release of SAS software.
3. Sites with outside SAS consultants, who can benefit from finding site-specific information in one manual.
4. Sites that hire employees on a cyclical basis. Consolidating site-specific information in one manual reduces the impact of this turnover.

**IN-HOUSE SAS USER'S GUIDE: CONTENT**

1. System computing environment.
  - A. System resource limits. Examples at the Board include MVS ® batch job limits that vary based on the time of day for region size, job time, and number of print lines; and UNIX disk space limits for the /tmp directory (the default location for WORK libraries).
  - B. Available graphics devices, and how to use them.
  - C. Available tape drives, and how to use them.
  - D. Differences between workstations and keyboards used to execute the SAS system.
  - E. Host (operating system) commands commonly used by SAS users.
2. SAS computing environment.

- A. SAS invocation methods such as MVS clists or batch procedures, PC batfiles or icons, UNIX scripts or pull-down menus, or the equivalent for other operating systems. Invocation methods could also exist for test versions, backup versions, or other special versions.
  - B. In-house options added to the programs (clists, procedures, scripts, etc.) that invoke SAS.
  - C. SAS options that differ from the default settings provided by SAS Institute because they have been modified at the site.
  - D. The current production release of SAS software, and a list of currently licensed SAS products.
  - E. A list of SAS-related directories, files, and programs, such as load libraries, executable programs, macro libraries, and format libraries.
3. Documentation of in-house enhancements and utilities.
- A. In-house macro library. Macros developed in-house can be documented, and information can be provided about macro autocall libraries.
  - B. User-written SAS procedures.
  - C. In-house print form library.
  - D. In-house format library.
  - E. Function key customization.
  - F. In-house SAS utilities.
4. Interaction with other languages, packages, and operating systems.
- A. SAS/CONNECT<sup>®</sup> software customization. At the Board, this includes changes to the SAS/CONNECT invocation script and a macro that invokes SAS/CONNECT software using a password file, so that users are not prompted for their logon password.
  - B. Copying SAS files between two operating systems. The examples in the Board's in-house user's guides are more specific to the Board's computing environment than the examples in SAS Institute's manuals. They include examples of allocating a transport file on MVS and using the File Transfer Protocol (FTP) to copy a transport file between two operating systems.
  - C. Copying data between the SAS system and other packages and languages.
5. Programming standards and guidelines.

Standards can be provided for coding technique, code alignment, and documentation. Naming conventions can be provided for directories, files, programs, and variables.

6. Information for users converting to a new operating system.

Basic knowledge of the SAS system can be assumed. The documentation can focus on differences between the old and new environments, such as SAS products licensed only on the new operating system and differences in look-and-feel, invocation, and file organization.

7. How to get help.

A. The phone number, e-mail address, and location of an in-house SAS help desk or consulting group.

B. How to obtain manuals.

C. Brief summaries of SAS manuals that are operating system-specific or can benefit users of a particular operating system.

D. Brief summaries of non-SAS manuals that benefit SAS software users of a particular operating system.

E. How to use the SAS system's on-line Help facility and sample library.

F. How to subscribe to SAS Institute's SAS Communications<sup>®</sup> magazine.

G. How to subscribe to and read the Usenet SAS news group, comp.soft.sys.sas.

H. In-house SAS mailing lists.

I. In-house, local, regional, and national SAS users groups.

J. In-house training, including classes, computer-based training (CBTs), and videos.

K. SAS-related web pages at the site.

## CONVERSION TIMETABLE

The next section contains a slightly abridged version of the Board's MVS SAS Release 6.07 conversion timetable. This section contains information about the timetable.

1. Notes about the Board's MVS environment as it relates to the timetable.

A. One interactive clist and two JCL batch procedures

invoke the production release of the SAS system.

(1) The "SAS" clist and batch procedure.

(2) A batch procedure, "SASDB2T", that differs from "SAS" because it accesses the Board's DB2 test system instead of the DB2 production system.

B. Omitted from the paper to save space were a few infrequently used clists and batch procedures and Release 6.06, which was available for testing at the Board but never put into production. These omissions do not substantively change the timetable.

2. Each stage of the timetable includes the following.

A. The start and end date.

B. All clists and batch procedures that invoke the SAS system. The production clist (SAS) and batch procedures (SAS and SASDB2T) are listed first. A blank line separates them from other clists and batch procedures.

C. What will take place during that stage.

3. Some applications might need to continue executing the old release after the cutover. Users responsible for these applications might have to follow update procedures requiring a period of time. The clists and batch procedures used by applications remaining in Release 5.18 after the cutover were made available three months before the Release 6.07 cutover, as noted in Section IV.G, allowing ample time to change the applications.

At the Board, two types of applications continued executing Release 5.18 after the cutover to Release 6.07.

A. Large production applications scheduled to be removed from production soon. Even if these applications are upwardly compatible, the time needed to test and recertify them might make it impractical to convert them to the new release.

B. Applications using a SAS software product that is not yet available or has known problems. Release 6.07 for MVS was put into production at the Board on June 5, 1993, but SAS/IMS-DL/I ® software was not released for Version 6 until September 1995. This paper shows version one of the timetable, which was later updated to tell SAS/IMS-DL/I users to continue using Release 5.18 after the cutover to Release 6.07.

## THE BOARD'S MVS SAS RELEASE 6.07 CONVERSION TIMETABLE

I. Arrival date.

A. Release 6.07 received at the Board on May 1, 1992.

II. Installation and limited testing.

A. Dates: 3 months, May 1 - August 2, 1992.

B. Systems Programming staff and the Board's SAS consulting group install Release 6.07 and modify clists, batch procedures, in-house utilities, and documentation.

C. SAS consulting group conducts extensive testing and updates conversion documents frequently.

D. ZAPs (machine code changes to SAS code) are applied and other changes are made as needed, and the software can be modified at any time. Only the SAS consulting group and selected users working with the SAS consulting group can use Release 6.07.

III. Preliminary test stage.

A. Dates: 1 month, August 3 - September 7, 1992. At end of stage, 4 months since software arrived.

B. The following clists are available.

SAS            Release 5.18 (the default)

SAS607        Release 6.07

C. The following batch procedures are available.

SAS            Release 5.18 (the default)

SASDB2T      Release 5.18 DB2 test

SAS607        Release 6.07

SAS607DT     Release 6.07 DB2 test

D. ZAPs are applied and other changes are made as needed, and the software can be modified at any time. Conversion documents are updated frequently.

E. All users are encouraged to try Release 6.07, test existing software, and identify problem areas.

F. No production systems should use Release 6.07.

IV. Parallel run and conversion stage.

A. Dates: 9 months, September 8, 1992 - June 4, 1993. At end of stage, 13 months since software arrived.

B. The following clists are available.

SAS            Release 5.18 (the default)

SAS5           Release 5.18 (see section IV.G.)

SAS607 Release 6.07

Note: The SAS and SAS5 clists are identical.

C. The following batch procedures are available.

SAS	Release 5.18 (the default)
SASDB2T	Release 5.18 DB2 test
SAS5	Release 5.18 (see section IV.G.)
SAS5DB2T	Release 5.18 DB2 test (see section IV.G.)
SAS607	Release 6.07
SAS607DT	Release 6.07 DB2 test

Note: The following procedures are identical: SAS and SAS5, SASDB2T and SAS5DB2T.

D. SAS users convert applications to Release 6.07.

E. ZAPs and other changes are tested before being applied. Users are notified in advance of any changes.

F. Conversion memos are frequently updated.

G. At the end of six months, the SAS5 clist and SAS5 and SAS5DB2T batch procedures are made available for use in applications that will remain in Version 5.

V. Cutover point.

A. Date: June 5, 1993.

B. Release 6.07 put into production.

C. The following clists are available.

SAS	Release 6.07 (the default)
SAS5	Release 5.18
SAS607	Release 6.07

Note: The SAS and SAS607 clists are identical.

D. The following batch procedures are available.

SAS	Release 6.07 (the default)
SASDB2T	Release 6.07 DB2 test
SAS5	Release 5.18
SAS5DB2T	Release 5.18 DB2 test
SAS607	Release 6.07
SAS607DT	Release 6.07 DB2 test

Note: The following procedures are identical: SAS and SAS607, SASDB2T and SAS607DT.

VI. Cutover stage.

A. Dates: 2.5 months, June 5 - August 20, 1993. At end of stage, 15.5 months since software arrived.

B. The following clists are available.

SAS	Release 6.07 (the default)
SAS5	Release 5.18
SAS607	Release 6.07

Note: The SAS and SAS607 clists are identical.

C. The following batch procedures are available.

SAS	Release 6.07 (the default)
SASDB2T	Release 6.07 DB2 test
SAS5	Release 5.18
SAS5DB2T	Release 5.18 DB2 test
SAS607	Release 6.07
SAS607DT	Release 6.07 DB2 test

Note: The following procedures are identical: SAS and SAS607, SASDB2T and SAS607DT.

D. At the end of this stage, the SAS5 and SAS607 clists and the SAS5, SAS5DB2T, SAS607, and SAS607DT procedures will be removed.

E. This stage will be extended if any problems cannot be resolved.

VII. Releases other than 6.07 available by permission only.

A. Dates: 2.5 months, August 21 - October 30, 1993. At end of stage, 18 months since software arrived.

B. The SAS clist and the SAS and SASDB2T batch procedures are available. They execute Release 6.07.

C. If necessary, a Release 5.18 clist or batch procedure will be made available for a strictly limited period of time. This stage will be extended if any problems cannot be resolved.

VIII. Permanent removal of Release 5.18.

A. Date: October 31, 1993.

B. Release 5.18 is removed from the system.

## CHANGES AND ENHANCEMENTS GUIDE

A changes and enhancements guide documents

compatibility issues and new and enhanced products.

### Changes and enhancements guides: objectives

1. Collect information from many sources in one manual.

The Board's in-house changes and enhancements guide for Release 6.07 on MVS included information from SAS manuals, SAS conference proceedings, course notes from SAS Institute's Version 6 conversion class, discussions with SAS Institute staff at SAS conferences and on the telephone, discussions with Board systems programming staff about JCL and clist changes, and preliminary in-house testing. For Version 8, an additional source of information is the Usenet SAS news group, comp.soft.sys.sas.

2. Summarize information, provide references to the details.

SAS Institute provides extensive documentation about the changes and enhancements in a new release of SAS software. However, most users will not read manuals or large documents. An in-house changes and enhancements guide can summarize the information and provide references or HTML links to the complete information.

3. Tell users if new or enhanced products are a good fit for the site.

An example of a new product not likely to be widely employed at the Board is Cross-Environment Data Access (CEDA), which allows Version 8 SAS data files created on a directory-based host to be read by a SAS session on another directory-based host. Most copying of SAS data files at the Board is between MVS and PCs or MVS and UNIX, but MVS is not a directory-based host.

4. Document statements, procedures, or products that still work but are no longer supported by SAS Institute.

In Version 5, PROC MATRIX was incorporated into SAS/IML<sup>®</sup> software but continued to work. When Version 6 was put into production, Board applications that included PROC MATRIX stopped working. A Version 5 changes and enhancements guide could have told users to convert from PROC MATRIX to SAS/IML software.

In Version 8, implicit arrays and DO OVER statements are supported but not documented. In a future release, they could stop working. The Board's Version 8 changes and enhancements guide recommends that new SAS code not include implicit arrays or DO OVER statements, and that users consider changing existing code. It also includes the following simple example.

```
/* arrayexim.txt: simple array example done first with
an implicit array and then with an explicit array.
```

Implicit arrays and the DO OVER statement are supported in Version 8 but not documented, and might not work in future releases. Use explicit arrays and the DO statement instead. \*/

```
/* create data */
data one;
  input var1 var2;
  cards;
1 2
3 4
5 6
;run;
```

```
/* Example w/implicit array, DO OVER statement */
data two;
  set one;
  array blah var1 var2 ; /* SAS figures out size */
  do over blah ; /*loop through all array elements */
    /* Do something trivial to each element */
    blah = blah * 2 ;
  end;
run;
```

```
/* Same example with explicit array, DO statement */
data three;
  set one;
  drop i ; /* cleanup of index variable */
  array blah (*) var1 var2 ; /* SAS figures out size */
  /*DIM gives number of elements
  in 1 dimensional array. DO loops
  through all array elements. */
  do i = 1 to dim(blah) ;
    /* Do something trivial to each element */
    blah(i) = blah (i) * 2;
  end;
run;
```

```
/* These two steps generate the same output */
proc print data= two; run;
proc print data= three; run;
```

### Changes and enhancements guides: recommendations

1. Document compatibility issues separately from changes and enhancements.

For users, the first (and sometimes only) priority is to determine if their program still executes and returns the same result. It is easy to be enthusiastic about new and enhanced features, but if you interleave compatibility issues with information about new and enhanced features, users might not read the document.

2. Update changes and enhancements guides as new information becomes available.

Changes and enhancements guides should be updated whenever new information becomes available or new problems are identified, which can happen frequently during a major conversion.

For Release 6.07, the Board's changes and enhancements guide was a hard copy document that was periodically updated, reprinted, and distributed.

The Version 8 changes and enhancements guide is an HTML document on the Board's Intranet, FedWeb. HTML documents can be updated quickly and easily as new information becomes available. At most, users will check the guide periodically. If they cannot easily determine what has changed since they last read the guide, they might miss important information, and might stop checking the guide. To avoid confusion, the Board's changes and enhancements guide includes a publication date and a "Changes to this document" section.

3. Decide how much effort that you believe the users at your site are willing to expend to incorporate new and enhanced features, and tailor the document accordingly.

For example, consider the Output Delivery System (ODS) in Version 8. Many Board users might make the following small change to their application to generate HTML output.

```
ODS HTML BODY= file-information ;
<existing SAS code>
ODS HTML CLOSE ;
```

Many Board users might use options to the ODS HTML statement (CONTENTS=, FRAME=, PATH=, and NEWFILE=) to create a table of contents file, frame file, and one or more body files. Some (but fewer) Board users might create customized output with the ODS SELECT or ODS OUTPUT statement, but very few will use templates.

To accommodate different classes of users, the Board's Version 8 changes and enhancements guide includes separate examples for each of the following: the ODS HTML statement with just the BODY= option, the ODS HTML statement with additional options, the ODS SELECT statement, and the ODS OUTPUT statement. Template examples are not included, though a brief explanation of templates and references to template documentation from SAS Institute might be added.

4. Limit content to products that the site currently licenses or might consider adding.

## CONCLUSION

This paper provided information about writing an in-house SAS user's guide. It focused on a specific type of in-house

user's guide, a conversion guide for a new release of SAS software. The author hopes that this paper will benefit SAS sites converting to Version 8 of the SAS system.

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## REFERENCES

Gilson, Bruce, and Shankman, Bert (1992), "Improving SAS System Support (Version 6) at a Large Site," in the Proceedings of the Seventeenth Annual SAS Users Group International Conference, 17, 1459-1468.

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## TRADEMARK INFORMATION

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