

What's New in SYSTEM 2000[®] Software for Version 1

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Table of Contents

Overview.....	1
Migration to Version 1.....	2
Review User Exits and Special Zaps.....	2
Modify Multi-User and Single-User Params Files.....	2
Re-Assemble XBUF Macros.....	2
S2KDBCNT Table.....	2
Allocate Database Files.....	3
Convert Existing Databases to Version 1.....	3
VSAM in Version 1.....	4
Why VSAM?.....	4
New POOL Sizes.....	4
Dynamic Allocation and VSAM.....	4
S2KPAD Requirements.....	4
New Features.....	5
DBA Tools.....	5
User Exit 45 – Security Authorization by Database.....	5
Improved Termination Processing.....	5
CVRTV1 – Database Conversion Program.....	6
S2KSETI Program DISPLAY Parameter.....	6
Multi-User Accounting Enhancements.....	6
Changes Since the Last Release.....	7
COBOL Compiler Compatibility.....	7
DATABASE or DATA BASE.....	7
DECIMAL and MONEY Components Can Be 13 Digits.....	7
Extended Date Capacity.....	7
PLEX SAVE and RESTORE Syntax Changes.....	8
PRELNK Macro and Overlaid System Obsolete.....	8
Logical Record Length Increased for Report and Message Files.....	8
SCF Comment Delimiters.....	9
XBUF Allows Memory Caching Only.....	9
YEARCUTOFF Default.....	9
Enhancements in the Interface to CICS.....	10
TOR-AOR Terminal Error Cleanup.....	10
Improved Termination Processing.....	10
Event-Logging Feature.....	10

What's New in SYSTEM 2000 Software for Version 1

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Overview

In addition to introducing the new features in Version 1 of SYSTEM 2000 software, this document also describes the changes made since Release 12.1 that are not described in other publications.

New Version Number – Version 1 Instead of making this new release 12.2 or 13.0, we are following the SAS software convention and referring to this release, both internally and externally, as Version 1. One of the major enhancements in Version 1 is the change from BDAM to a VSAM file structure. This major change is reflected in the version number. See section “Migration to Version 1” for details about how the change from Release 12.1 to Version 1 affects SYSTEM 2000 operations.

New Publications In addition to this document, three other SYSTEM 2000 books are new with Version 1.

- *SYSTEM 2000 Software: Product Support Manual, Version 1, First Edition* — For users who prepare jobs, maintain the software, and monitor the status of database and job activities at their site, this book has a new, topic-driven organization that better serves you.
- *SYSTEM 2000 Software: Messages and Codes, Version 1, First Edition* — Many new messages were added, and the obsolete messages were deleted. All messages and codes that can be issued by SYSTEM 2000 software, the interface to CICS, XBUF, and various utility programs are incorporated into this book.
- *SYSTEM 2000 Software: Interface to CICS, Version 1, First Edition* — This book was re-written and re-organized.

VSAM Access Method See the section “VSAM in Version 1” for details about the change to VSAM from BDAM and the benefits it offers.

New Features

- **DBA Utility Tools** – These are the CFIND, DUMPXX, EXAMINDX, EXAMINE, F2BUILD, INDEXRPT, and RECHAIN programs. A full suite of diagnostic and reporting programs offers a range of methods for detecting and resolving database problems.
- **User Exit 45** – Security Authorization by Database
- **Improved Termination Processing**
- **CVRTV1 Database Conversion Program**
- **New Multi-User Accounting Reporting Programs ARPMAIN and AQUMAIN**
- **S2KSETI Program “DISPLAY” Parameter.**

Changes Since the Last Release The section “Changes Since the Last Release” describes a variety of improvements to the way SYSTEM 2000 software executes. In some cases, these changes are documented in the new *Product Support Manual*, but in others, you will need to refer to the changes described in this document because these changes update the information in your existing manuals.

Enhancements in the Interface to CICS The SYSTEM 2000 interface to CICS, which in Version 1 supports only CICS Release 4.1 and higher, contains several enhancements, including a new event-logging capability.

Migration to Version 1

You must do a complete installation using the new *Installation Instructions* document shipped with your Version 1 software. After you have installed Version 1 and executed the validation programs, you can use the following information as a guide for migrating your current databases and applications. In all cases, be sure to contact SYSTEM 2000 Technical Support if you have questions or want to discuss your upgrade to Version 1.

Review User Exits and Special Zaps

Be sure that

- all your user exits have been copied into the V1 LOAD library.
- the V1 version of S2KEXIN has been modified to include all the user exits that you want.
- S2KEXIN has been re-assembled and relinked into your V1 LOAD library.
- any SYSTEM 2000 special zaps that your site requires have been applied to your V1 system. Special zaps for earlier releases of SYSTEM 2000 may no longer apply in V1. Whatever function the zap performed in earlier releases might now be a permanent change, or it might be invoked by using an OPT nnn execution parameter. Check with the SYSTEM 2000 Technical Support staff to find out if you still need special zaps.

Modify Multi-User and Single-User Params Files

Review the SYSTEM 2000 params files and give special attention to new params and to existing params that might have changed.

For example, the POOL parameter specifications have the following changes:

- POOL0 through POOL6 are for database usage, and POOL7 is for work files.
- The S2KUSERS file has a required CISIZE of 12288. Be sure to specify one POOL parameter that has this CISIZE.
- The PADUNIT parameter should be removed if it is in your current params file(s) because it is no longer used.

See Chapter 5 in the *Product Support Manual* for detailed information about buffer pools. See Chapter 15 for details about the Version 1 execution parameters.

Re-Assemble XBUF Macros

If you are using the XBUF caching feature, you need to make some changes and re-assemble the macros.

- The BLKSIZE parameter of the XBMEMORY macro has been changed to CISIZE.
- You must change the BLKSIZE values to the new V1 CISIZE values.
- After you make these changes, re-assemble and relink XBUFTBL into your V1 LOAD library.

See Chapter 14 in the *Product Support Manual* for details about implementing XBUF.

S2KDBCNT Table

If you have changed the data set names of your SYSTEM 2000 database files and you are using the S2KDBCNT table, be sure to modify the table to reflect the new names.

Allocate Database Files

Use job JCLALLOC to create new V1 database files for each database to be used in the production environment. Pay attention to the CISIZE and RECORDSIZE parameters of the file definitions. The RECORDSIZE value must be 7 bytes less than the CISIZE value. See Table 1.1 for valid CISIZE and RECORDSIZE values.

Table 1.1 Valid Values for CISIZE and RECORDSIZE

CISIZE	RECORDSIZE
4096	4089
7168	7161
12288	12281
18432	18425
22528	22521
26624	26617

If you are using a value other than one of those shown in Table 1.1 as your current database page size, you can determine how many pages will be used for each database file when they are converted to V1. For example, if your current database blocksize is 6216 and your V1 CISIZE is 7168, and File 6 of your database contains 1000 pages,

1. Divide 6216 by 7168 (to get the percentage difference in size).

$$6216 / 7168 = .8671875 \text{ (round to .87)}$$

2. Now multiply 1000 (the number of pages used currently by File 6) by .87.

$$1000 \times .87 = 870.$$

The V1 version of File 6 will use 870 pages. This same formula can be used for each database file.

See Chapter 3 in the *Product Support Manual* for details about database file capacities and CISIZE.

Convert Existing Databases to Version 1

Create Savefiles of current production databases, and execute program CVRTV1 to convert the production Savefiles to V1 databases. (See Chapter 16 in the *Product Support Manual* for details about executing CVRTV1). You can also use the PLEX or SCF UNLOAD and LOAD process to convert your databases.

VSAM in Version 1

Database, S2KPAD n , and S2KUSERS files are now Entry-Sequenced Data Sets, referred to as ESDS VSAM files. This change in access method is inconspicuous to the end user. PLEX programs compiled and linked using SYSTEM 2000 R12.1 libraries will run without change when using V1 libraries, and the Self-Contained Facility (SCF) syntax is identical.

The system administrator will see minor differences, such as POOL size requirements and the way files must now be defined. You must use IDCAMS to define a VSAM file. When you use the SCF ALLOC command to create new database files, a programmatic call is made to IDCAMS to make the allocation. The necessary JCL for file definitions is generated during installation and is also shown in Chapter 6 of the *Product Support Manual*.

Why VSAM?

VSAM is the most widely used IBM access method for both batch and online applications. It is fast and reliable. Equally important is the fact that VSAM allows SYSTEM 2000 to take advantage of new technologies. VSAM offers the following advantages:

- 31-bit addressing for programs, as well as for buffers and control blocks. This can provide much-needed relief from storage problems.
 - In conjunction with System Managed Storage (SMS), VSAM data set capacity can be extended, which greatly increases the capacity of SYSTEM 2000 databases. File 6 can be more than twice as large, up to a maximum of 8 billion characters.
 - VSAM data sets are device independent.
 - IDCAMS commands can be executed as time-sharing option (TSO) commands.
-

New POOL Sizes

The new POOL sizes are listed in “Migration to Version 1” on page 2. For a complete discussion of buffers, POOL execution parameters, and CISIZE, see Chapter 5 in the *Product Support Manual*.

Dynamic Allocation and VSAM

The dynamic allocation of files allows your jobs to execute with minimal JCL statements. Both database and work files can be dynamically allocated. New parameters PADVOL and TPVOL were introduced in Version 1 for S2KPAD n and S2KUSERS files because IDCAMS requires a VOLUME specification when allocating new files.

New database files can only be dynamically allocated with the SCF ALLOC command. Work files are allocated at job initialization. New work files that are created and allocated dynamically are deleted at job termination. New database files that are created and allocated dynamically are not deleted at job termination.

See Chapter 7 in the *Product Support Manual* for a complete discussion of dynamic allocation.

S2KPAD Requirements

In any job stream, all S2KPAD n files must be the same CISIZE as S2KPAD00, or they will not be used. When an invalid CISIZE is detected, the scan for additional pads stops. Because an S2KPAD n file cannot be reformatted by using a different CISIZE, the CISIZE and the buffer size in POOL7 must be identical. If they are not the same, the buffer size in POOL7 is changed to equal the S2KPAD00 CISIZE. Also, S2KPAD n files can be multi-volume. See Chapter 4 in the *Product Support Manual* for complete information about work files.

New Features

DBA Tools

Three new database analysis programs are delivered with Version 1: EXAMINE, EXAMINDX, and INDEXRPT. These programs join CFIND, DUMPXX, F2BUILD, and RECHAIN to provide an extensive set of tools for examining, diagnosing, and fixing database file and index problems. See Chapter 15 in the *Product Support Manual* for more information about the SYSTEM 2000 utility programs.

CFIND

inspects, diagnoses, and corrects structural errors in database File 5 (the Hierarchical Table).

DUMPXX

allows you to snap selected pages of files by specifying block numbers.

EXAMINE

analyzes and reports on statistics for Files 1, 3, 5, and 6. This tool documents character and text overflow usage.

EXAMINDX

compares data values in the index files with values in the data file, File 6.

F2BUILD

rebuilds an existing database File 2 to eliminate wasted space caused by page splitting.

INDEXRPT

analyzes and reports on database indexes in Files 2 and 4.

RECHAIN

counts records and reusable space entries in database Files 1 and 5, and counts and corrects erroneous entries in File 5. This is the fastest way to get a count of all record types.

User Exit 45 – Security Authorization by Database

This new exit provides enhanced database security. EXIT45 allows you to control access to each database based on the criteria you choose. To restrict the type of access for each user, set action codes in the exit. See Chapter 8 in the *Product Support Manual* for more information.

Improved Termination Processing

Abnormal terminations in a Multi-User environment are handled more efficiently in Version 1. Our ESTAE process traps program abends and operator cancels. Immediate communication with Multi-User terminates the user from Multi-User, and then the dependent region resources are freed.

In fact, it is now more efficient to cancel the dependent region than it is to issue a Multi-User console or S2OP console CANCEL command. If the user is not active in Multi-User when the console cancel is issued, the dependent region is notified after the next Multi-User request.

CVRTV1 – Database Conversion Program

The Version 1 conversion utility allows you to convert databases from SYSTEM 2000 Releases 11.5 through 12.1 to Version 1 format. The program reads a Savefile and writes out VSAM database files, which converts the entire database and its indexes. The program also converts DATE values to the new internal format. You can change the block size of a saved database by using the REBLOCK option. See Chapter 15 in the *Product Support Manual* for details about the conversion process.

S2KSETI Program DISPLAY Parameter

You can determine your current SETINIT values by specifying the new parameter DISPLAY in your JCLSET job. DISPLAY must be enclosed in single quotation marks. For example,

```
//SETSTEP EXEC PGM=S2KSETI , PARM=' DISPLAY'
```

Multi-User Accounting Enhancements

Here is a summary of what has changed.

- The Accounting Log access method was changed from BSAM to QSAM.
- Some of the Accounting Log record layouts are changed. Types 4, 5, 6, and 8 records all share the same format for the first 104 bytes of the record. Only the variable INFORMATION is different. The change in record formats may affect existing Accounting Log processors that you have at your site.
- The lost-record record has been dropped. In its place, a WTO is issued that reports the number of records lost during a Multi-User session.
- Accounting is now suspended rather than disabled when both logs are full. You can dump the full logs and then re-start accounting by using a START ACCOUNTING console command.
- Unformatted data sets can be used for Accounting Logs. You no longer need to initialize new logs using the ACTUTIL program.

See Chapter 9 in the *Product Support Manual* for details about all of the new Accounting Log features.

AQUMAIN and ARPMAIN Programs Two new COBOL programs are available for printing the contents of your Multi-User Accounting Log. Source and executable versions of AQUMAIN and ARPMAIN are provided to generate reports about the information in your Accounting Log.

AQUMAIN qualifies a subset of Accounting Log records and puts them into a sequential file that can be used as input to the ARPMAIN print program. ARPMAIN prints the contents of either an Accounting Log or a sequential data set built by AQUMAIN. You can modify either of these programs to fit your specific environment, or run them the way they are delivered to your site.

You also have the ACTIO program source. This driver program for Multi-User Accounting contains the logic to write the accounting records to the Accounting Log. You can modify this program to write the same records to your own log or to do whatever you want with the accounting record information. This is an Assembler program with well-documented block comments.

Changes Since the Last Release

COBOL Compiler Compatibility

The programs that create PLEX UNLOAD and LOAD programs have been upgraded to support the latest versions of the PL/I and COBOL compilers. These programs now run with COBOL II and COBOL for OS/390 and the latest version of PL/I. They generate COBOL code that is compatible with COBOL II and COBOL for OS/390.

Genius software has also been upgraded to run with COBOL II and COBOL for OS/390.

Using DATABASE or DATA BASE

When using the word DATABASE in a command, such as `SAVE DATABASE/ :` or `DATABASE NAME IS xxx:`, you can use DATABASE (one word) or DATA BASE (two words). Either form is valid.

DECIMAL and MONEY Components Can Be 13 Digits

DECIMAL and MONEY components can be defined with 13 digits to the left of the decimal point up to a maximum of 15 digits (13.2 or 12.3).

System and ad hoc functions now allow increased picture size by dynamically reducing the number of decimal places in the output to accommodate larger integer portion values, as shown in Table 1.2.

Table 1.2 Decimal Places Decrease as Integer Portion Values Increase

Number of digits in the integer portion	Number of decimal places displayed
<= 12	3
13	2
14	1
15	0

Extended Date Capacity

The maximum value allowable in DATE fields has been extended from 12/31/2499 to 12/31/9999.

PLEX SAVE and RESTORE Syntax Changes

There is new SAVE and RESTORE command syntax for single-user and Multi-User PLEX jobs.

Additions to syntax: `SAVE database [[ON Savefile] [/[Keepfile]]]`.
`RESTORE database [[FROM Savefile] [/[Keepfile]]]`.

Examples of new syntax: `SAVE EMPLOYEE.`
`SAVE EMPLOYEE/.`
`RESTORE EMPLOYEE.`
`RESTORE EMPLOYEE/.`

The new syntax is in addition to the existing syntax. See the *PLEX Manual, Version 12, First Edition*, pp. 11-3 to 11-11, for more details about these commands.

If you specify a Savefile by using either the volume, DSN, or the DS parameters and you use a slash (/) to activate update logging, you must use either volume, DSN, or DS syntax for the Keepfile.

PRELNK Macro and Overlaid System Obsolete

The load module S2KPLI no longer exists because its functionality has been incorporated into SYS2K. You no longer have to use PRELNK to configure your system or to relink SYS2K and S2KPLI after applying problem fixes. See Chapter 1 in the *Product Support Manual* for more information.

Logical Record Length Increased for Report and Message Files

The maximum line size for Report and Message File output is increased to 256 bytes. The minimum line size for Report and Message File output is set at 44 bytes.

The UNLOAD command output is formatted to the Report File LRECL size.

New informative messages are issued when LIST specifies a page width or REPORT generates a report that exceeds the Report File LRECL value.

Dynamically allocated (no S2KMSG DD statement)

Report and Message Files that are dynamically allocated to a TSO terminal use the terminal line size as their LRECL and BLKSIZE. Files not allocated to a terminal have LRECL=133 and BLKSIZE=13300.

Allocated (DD statement exists)

Report and Message Files allocated to a TSO terminal with LRECL=0 use the terminal line size for LRECL and BLKSIZE. If they are allocated to disk or to tape and LRECL=0, the DCB is updated with LRECL=133 and BLKSIZE=13300.

Report and Message Files allocated with LRECL less than 44 are changed to LRECL=80 and BLKSIZE=6160. Files allocated with LRECL greater than 256 are changed to LRECL=256 and BLKSIZE=4096.

If the allocated Report or Message File is a PDS, no DCB updating occurs. If LRECL is less than 44 or LRECL is greater than 256, an error message is issued.

SCF Comment Delimiters

You must begin a comment with the characters `/*` and terminate a comment with `*/`. No other special character for the SCF comment delimiter can be used (as was allowed in previous releases of SYSTEM 2000). This change makes SYSTEM 2000 comment delimiters compatible with other software and prevents some of the problems caused by the old methods. This change may impact existing command files at your site.

Note: This change applies to all SCF processors, including CONTROL, DEFINE, QUEST, QUEUE, and REPORT.

XBUF Allows Memory Caching Only

The dual-logging and caching-to-disk features provided in previous releases of XBUF are not supported in Version 1. The functions of these two features are better provided by current, more sophisticated hardware.

The XBUF Technical Report S2-107 has been replaced by the information in Chapter 13 of the *Product Support Manual*.

YEARCUTOFF Default

On January 1, 2000, the default YEARCUTOFF date was changed from 1900 to 2000. Version 1 sets the default to a value most sites will not have to modify, that is, 1920.

Enhancements in the Interface to CICS

Brief descriptions of new features in the interface to CICS are given here. See *SYSTEM 2000 Software: Interface to CICS, Version 1, First Edition* and the *Installation Instructions* for more information.

Note: The interface now runs only with CICS Release 4.1 and higher.

TOR-AOR Terminal Error Cleanup

Termination logic has been added to the TOR DFHZNEP program to notify AOR regions when a terminal error has occurred.

Improved Termination Processing

Abnormal terminations in the CICS region are handled more efficiently in Version 1. First, all terminations, both SCF and PLEX, are executed through the single routine S2KTERM. Second, immediate communication with Multi-User terminates the user from Multi-User, and then the CICS interface resources are freed.

The preferred way to manually terminate a SYSTEM 2000 user in CICS is to use one of the terminate transactions: TALL, TPLX, or TSCF. The SYSTEM 2000 interface handles both active and inactive transactions. If the CICS transaction is still active, the interface executes a CICS PURGE request for you. This is helpful in pseudo-conversational transactions where the CICS task may not be active.

Event-Logging Feature

A new feature referred to as "CICS logging" has been added to the interface for Version 1. CICS Transient Data Services is used to log information that can help in problem resolution.

Four different types of log records are written: Initialization, Abend, Shutdown, and Detailed. The first three types occur automatically, whereas Detailed logging is optional and can be turned on or off at your discretion by using transaction S2KL. Detailed logging is useful for providing additional information when a problem cannot be resolved by using automatic logging only. Detailed logging may also be helpful in determining whether interface resources are adequate. See *SYSTEM 2000 Software: Interface to CICS*.