IBM

Hourglass Usage and Administration Guide

Version 5.0 Release 2

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> **Note:**
> Before using this information and the product it supports, read the information on the next page.

HourGlass

Usage and Installation Guide

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Princeton Softech's *HourGlass* Version 5.2.

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Table of Contents

About this Manual

This manual describes how to install and use Princeton Softech's *HourGlass*.

Organization of the Manual

This manual is organized into sections documenting the steps required to install or upgrade *HourGlass*. This information is followed by details on using *HourGlass* to suit your site specifications. The sections are as follows:

1. Introduction	Provides an overview of *HourGlass*.
2. Installing *HourGlass*	Describes the steps needed to unload the tape and install *HourGlass*.
3. Using *HourGlass*	Discusses the use of *HourGlass.*
4. Messages	Describes messages generated by *HourGlass.* Additionally, discusses methods of troubleshooting problems.

Summary of Amendments – Release 5.2

The following enhancements have been made to *HourGlass* for release 5.2:

- The CICS support facilities have been updated so that all modules adhere to the CICS Threadsafe coding standard

- Support for CICS Transaction Server Version 2.2 has been added.

- Many *HourGlass* messages have been re-numbered and changeds to make them easier to understand.

- Two new CICS transaction programs have been added: HGDL6 and HGDR6. These programs provide functional verification for *HourGlass* in the CICS/DB2 environment.

Summary of Amendments – Release 5.1

The following enhancements have been made to *HourGlass* for release 5.1:

- Enhanced IMS IOPCB support no longer requires application re-linking

- Easier interfaces to third-party products with new patch installer

Summary of Amendments – Release 5.0

Release 5.0 of *HourGlass* includes the following features:

- New Scheduling Facility to create multi-step/job rolling dates (Relative Time Manager)

- Support for DB2 DDF applications

- User-level support for IDMS V12/V14 ADS/O and DC COBOL applications

- Support for IMS 6.1 Expanded IOPCB date field

- Support for CICS Transaction Manager Version 1.2

- Added CANCEL command ability in the HG ISPF Dialog

- Added 'ADD' and 'DEL' functions in the HGBCUST utility. Also added calls to the HGTSOSEC security exit.

- New callable routine to manage date requests from user applications

- Additional security exit capabilities in HGRCHECK to return current date and call external security managers.

Summary of Amendments – Release 4.1

Release 4.1 of *HourGlass* includes the following enhancements:

- Removed all RCT restrictions to receive DB2 Dates by Userid in CICS

- Enhanced HGBCUST to allow addition of entries without deleting old entries

- Enhanced COPE support by identifying non-COPE transactions

- Support of '?' and '*' wildcards in JOBPREF and JOBPRE2

- Support in CICS for SVC 11 to honor HGUC and HGCC settings

- New security exit (HGSEC) for the HGCC and HGSC transactions

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- ISPF dialog enhancements for advanced security options in administrator mode.

1. Introduction

HourGlass allows you to temporarily alter the system date and/or time for a given application program to any date into the future through September 17, 2042 (the date that the mainframe computer time of day clock wraps).

HourGlass will allow you to easily test changes to your time-sensitive application programs. Investigating this impact manually can be very time consuming and error prone.

Included with the *HourGlass* software is an audit trail facility that allows you to recognize applications that request the system date/time. Audit trail reports show the frequency of requests, organized by job step and showing the date and time actually returned. The audit trail facility can be used to track the job steps that must be tested for date or time compatibility. Later, it can be utilized to report on job steps making use of altered dates through the *HourGlass* product.

HourGlass can be used to test applications that perform certain processes according to the system date. For example, end-of-week, end-of-quarter or end-of-year processes that are triggered by the system date, may be tested at any convenient time.

Using test system scripts with *HourGlass*, you can help ensure that your test environment has the same conditions, the same data and the same date for each test. This can make auditing system changes easier and more reliable.

With *HourGlass*, you can adjust the time of day forward or backward from the current time by as much as 23 hours and 59 minutes. This facility is generally used to run time-sensitive jobs for a customer residing in a time zone different from that of the CPU. You can also simulate start times for specific steps as well as force the time to remain constant.

Setting dates in the past, while extremely useful in troubleshooting situations, may be undesirable in your shop from an audit perspective. If your shop would like to prevent jobs from setting

dates in the past, contact Technical Support for a zap to implement this.

HourGlass does not interfere with your tape management system or the system catalog. These services run as facilities of, or extensions to, the operating system and *HourGlass* leaves these alone.

HourGlass intercepts all system date requests that internally issue SVC 11 (TIME macro with LINKAGE=SVC) or the TIME macro with LINKAGE=SYSTEM. These techniques are used by most software packages and programming languages that provide some sort of CURRENT DATE or CURRENT TIME function and will satisfy all but a very few application systems. *HourGlass* does not automatically intercept the STCK instruction since it is a hardware instruction. But, *HourGlass* is able to intercept these requests when made from one of the several products for which we have developed interfaces, such as Enterprise Cobol for z/OS and OS/390, Enterprise PL/I for z/OS and OS/390, NATURAL, IDEAL, and IEF. For other products, you can reassemble the module using a supplied version of the STCK macros. If source is not available, or a reassemble is undesireable, the STCK instructions in the load module can be patched easily to allow interception.

HourGlass is used for batch jobs and on-line transactions. Full support for IMS message regions (on-line IMS), CICS, IDMS and COM-PLETE regions is provided. In an IMS DC environment, all transactions can receive altered dates or each user can have a date/time. *HourGlass* does not automatically intercept the IOPCB date/time or the MFS date keywords. To ensure that *HourGlass* intercepts the IOPCB date and time, follow the instructions in SAMPLIB member IMSIOPCB. The MFS date keywords are generally display only and should not affect application logic. In a CICS environment, the altered date can apply to all applications and users or it can be limited to specific users. Also, each user can have a date/time. In a COM-PLETE environment, each user can have a date/time. In an IDMS/CV environment, each ADS/O or DC COBOL user can have a date/time.

HourGlass operates properly in DB2 programs that obtain the date and time from the programming language or from DB2 (through SELECT CURRENT DATE FROM... or UPDATE tbl SET col = CURRENT DATE... or INSERTs for columns not specified and have NOT NULL WITH DEFAULT).

You can set the *HourGlass* date/time combination for a batch job in one of four ways. In the most straightforward method, you add a simple DD statement, indicating the date and/or time, to the JCL step. You can also change the job statement to affect the entire job.

Using the second method, you can set the dates interactively, using an ISPF dialog, with no JCL changes required. This is the best

method for system testing and is very flexible and provides wildcard capabilities. However, this method does not require a deliberate action to alter a date as the JCL change does.

The third method allows for system testing of one or more multi-step jobs to create a continuous 'rolling time' between jobs and job steps. The Scheduling Facility allows a 'schedule' to start at any requested date and time. All date/time requests for any job in the schedule will receive a date/time relative in time to this requested date/time.

Lastly, for shops with remote users, the hard-coded date/time method may be of use. In this method, jobs with names matching the listed prefixes will automatically receive altered dates/times. This technique is implemented using the HourGlass customization process.

2. Installing *HourGlass*

HourGlass has the following software requirements:

1. MVS/ESA 4.2.2 or higher release.

   Use of the HG Exec to set dates for jobs without JCL changes requires an ISPF/PDF level that supports dynamic panels.

2. For OS/390 R4, IBM PTF UW41132. Later versions of OS/390 do not require a PTF.

3. An APF Authorized Library from which to activate the software.

4. Approximately 185K of available Extended CSA (ECSA) to install all options.
   With STCLINK=N, subtract 26K; with STATS=N, subtract 12K.

To install *HourGlass*, you will need the following:

1. One 3480 cartridge tape drive to download the *HourGlass* installation data.

2. The equivalent of four cylinders of 3380 DASD.

3. Knowledge of and authority to run IBM's IEBCOPY Utility program.

4. Authority to run IBM's AMASPZAP Utility to customize *HourGlass* for your organization (AMASPZAP is invoked internally by the *HourGlass* customization procedure).

5. If the IMS optional features are to be installed, authority to create a new tran code and gen PSBs and MFS.

6. If the CICS optional features are to be installed, authority to create new resources (PPT, PCT, etc.).

7. The *HourGlass* install tape, *VOLSER=HG52*

8. This Guide.

2.1 Migration Notes

When migrating from a prior version of **HourGlass**, the following considerations apply. These differ, depending upon the release of **HourGlass** currently in use.

Migrating from Version 5.1

1. Review member @INDEX52 in SAMPLIB to familiarize yourself with all examples and utilities.

2. Review member LANGUAGE in SAMPLIB for any newly supported language environments that you may be running.

3. If the optional CICS support feature is to be used, please review the SAMPLIB members CICSTS11 and CICSTS13. These members contain sample CICS System Definition Utility jobstreams with the resource definitions necessary for HourGlass, for non-Threadsafe implementation, or for Threadsafe implementation, respectively.

4. The file size for the HGSCDS has changed from RECZ(22500,22500) to RECZ(28665,28665). A SAMPLIB member, MIGHGSC2, has been supplied to convert an existing HGSCDS with RECSZ(22500,22500) to the new format. The supplied jobstream allocates the new VSAM KSDS file and converts the contents of an existing HGSCDS into the new VSAM KSDS in the new format.

    NOTE: Please check the record size of your existing HGSCDS file to determine if the above job needs to be run.

Migrating from Version 5.0:

When migrating from Version 5.0 of **HourGlass**:

1. Review member @INDEX52 in SAMPLIB to familiarize yourself with all examples and utilities.

2. Review member LANGUAGE in SAMPLIB for any newly supported language environments that you may be running.

3. **Always shutdown *HourGlass* using PGM=HGINSTL from the same release that it was brought up with.**

4. This release cannot be run at the same time on the same LPAR as any other release of **HourGlass**. In other words, all components of **HourGlass** must be upgraded together.

5. All **HourGlass** CICS PLT entries should follow any entry already in the PLT for modules DSNCOM1 or DSN2COM0.

Migrating from Version 4.1:

When migrating from Version 4.1 of *HourGlass*:

1. CICS PPT/PCT/FCT entries may have been added/changed. Ensure that all entries are included/merged.

2. Review member @INDEX52 in SAMPLIB to familiarize yourself with all examples and utilities.

3. Review member LANGUAGE in SAMPLIB for any newly supported language environments that you may be running.

4. **Always shutdown *HourGlass* using PGM=HGINSTL from the same release that it was brought up with.**

5. This release cannot be run at the same time on the same LPAR as any other release of *HourGlass*. In other words, all components of *HourGlass* must be upgraded together.

6. All *HourGlass* CICS PLT entries should follow any entry already in the PLT for modules DSNCOM1 or DSN2COM0.

7. If you have implemented the HGRCHECK security exit, this exit has changed to expand its capabilities. Please review SAMPLIB member HGRCHECK for details.

8. If you are implementing DB2 DDF support, see the INCLUDE PGM= keyword in the HGCUSTOM job for details on DDF considerations.

Migrating from Version 3.3:

When migrating from Version 3.3 of *HourGlass* to this release, the following considerations should be reviewed:

1. CICS PPT/PCT/FCT entries have been added/changed. Ensure that all entries are included/merged.

2. Ensure that your applied DB2 patch expands the CSECT by 320 bytes. If yours expands it by only 256 bytes, you should re-apply the newest patch. See member $DB2 in MODLIB.

3. Review member LANGUAGE in SAMPLIB for any newly supported language environments that you may be running.

4. **Always shutdown *HourGlass* using PGM=HGINSTL from the same release that it was brought up with.**

5. If you are running CICS with a normal batch *HourGlass* DD statement (e.g. //HG103365) in order to successfully intercept SVC 11's, you will no longer need this. *HourGlass* now honors the CICS HGCC and HGUC date settings for SVC 11's in CICS.

6. In a CICS environment, you should no longer be using the ***HourGlass*** or the HG Clist to set the CICS date. CICS support has been upgraded to now permit individual dates and times and thus the normal HGCC and HGUC transactions should be used to set the dates.

7. Note that some of the ***HourGlass*** message numbers have changed to assist with Automated Operations packages. The message numbers are in the back of the manual.

8. The file size for the HGSCDS has changed from RECZ(6500,6500) to RECZ(28865,28865). For an HGSCDS dataset with a RECSZ(6500,6500), it will be necessary to execute SAMPLIB member MIGHGSC1 to convert to RECSZ(22500,22500) and then execute SAMPLIB member MIGHGSC2 to convert to the RECSZ(28865,28865) format.

    NOTE: Please check the record size of your existing HGSCDS file to determine if the above job needs to be run.

9. This release cannot be run at the same time on the same LPAR as any other release of ***HourGlass***. In other words, all components of ***HourGlass*** must be upgraded together.

10. All ***HourGlass*** CICS PLT entries should follow any entry already in the PLT for modules DSNCOM1 or DSN2COM0.

11. Review all points in the Migration Notes from Version 4.1 to this release.

2.2 Installation Steps

To install *HourGlass*, perform the following steps.

Step 1: Download the Tape

Diskette or email   If you received *HourGlass* on diskette, from our FTP site, or by
eMail:

1. Allocate four sequential files with the following attributes:

    DCB=(RECFM=FB,LRECL=80,BLKSIZE=3120,DSORG=PS).

2. Upload the four .BIN files to your mainframe using a BINARY
    protocol (do not use ASCII CRLF options).

3. Modify the following JCL to transform these files into
    partitioned datasets:

```
//RECEIVE  EXEC PGM=IKJEFT01,REGION=6M,DYNAMNBR=50
//SYSTSPRT DD   SYSOUT=*
//SYSTERM  DD   SYSOUT=*
//SYSPRINT DD   SYSOUT=*
//SYSUDUMP DD   SYSOUT
//SYSUT1   DD   UNIT=VIO,SPACE=(CYL,(1,1))
//SYSUT2   DD   UNIT=VIO,SPACE=(CYL,(1,1))
//SYSUT3   DD   UNIT=VIO,SPACE=(CYL,(1,1))
//SYSTSIN  DD    *
 RECEIVE    INDSNAME('userid.hgload.bin')
 DSNAME('HG52.LOADLIB') NEW SPACE(2 2) CYLINDERS UNIT(SYSDA) +
  DIRECTORY(25)
 RECEIVE    INDSNAME('userid.hgsamp.bin')
 DSNAME('HG52.SAMPLIB') NEW SPACE(2 2) CYLINDERS UNIT(SYSDA) +
  DIRECTORY(25)
 RECEIVE    INDSNAME('userid.hgmod.bin')
 DSNAME('HG52.MODLIB') NEW SPACE(2 2) CYLINDERS UNIT(SYSDA) +
  DIRECTORY(25)
 RECEIVE    INDSNAME('userid.hgdbrm.bin')
 DSNAME('HG52.DBRMLIB') NEW SPACE(2 2) CYLINDERS UNIT(SYSDA) +
  DIRECTORY(25)
/*
```

4. Continue with **Step 2: Run the Customization JOB**.

3480 Cartridge   To install *HourGlass* from a 3480 cartridge:

1. Download the libraries using the IBM IEBCOPY Utility. The
    Tape has Standard Labels and contains four datasets.

HG52.LOADLIB	Executable form of *HourGlass* support modules.
HG52.SAMPLIB	Source members of examples and setup JCL.
HG52.MODLIB	JCL and PARM members to install interfaces to third-party products.

HG52.DBRMLIB   DBRM needed for the DB2 binds for HourGlass transaction programs, HGDL and HGDR.

These members will be referenced throughout this guide.

2. Modify the following JCL to download the libraries:

```
//DOWNLOAD EXEC PGM=IEBCOPY
//SYSPRINT DD   SYSOUT=*
//INPUT01  DD   DSN=HG52.LOADLIB,DISP=(OLD,PASS),
//              UNIT=TAPE,VOL=(,RETAIN,SER=HG52),
//              LABEL=(1,SL,EXPDT=98000)
//INPUT02  DD   DSN=HG52.SAMPLIB,DISP=OLD,
//              UNIT=TAPE,VOL=REF=*.INPUT01,
//              LABEL=(2,SL,EXPDT=98000)
//INPUT03  DD   DSN=HG52.MODLIB,DISP=OLD,
//              UNIT=TAPE,VOL=REF=*.INPUT01,
//              LABEL=(3,SL,EXPDT=98000)
//INPUT04  DD   DSN=HG52.DBRMLIB,DISP=OLD,
//              UNIT=TAPE,VOL=REF=*.INPUT01,
//              LABEL=(4,SL,EXPDT=98000)
//OUTPUT01 DD   DSN=your.load.library,DISP=(,CATLG),
//              UNIT=SYSDA,SPACE=(CYL,(1,1,15)),
//              DCB=(RECFM=U,LRECL=0,BLKSIZE=19069,DSORG=PO)
//OUTPUT02 DD   DSN=your.sample.library,DISP=(,CATLG),
//              UNIT=SYSDA,SPACE=(CYL,(1,1,25)),
//              DCB=(RECFM=FB,LRECL=80,BLKSIZE=6080,DSORG=PO)
//OUTPUT03 DD   DSN=your.modlib.library,DISP=(,CATLG),
//              UNIT=SYSDA,SPACE=(CYL,(1,1,25)),
//              DCB=(RECFM=FB,LRECL=80,BLKSIZE=6080,DSORG=PO)
//OUTPUT04 DD   DSN=your.dbrmlib.library,DISP=(,CATLG),
//              UNIT=SYSDA,SPACE=(CYL,(1,1,25)),
//              DCB=(RECFM=FB,LRECL=80,BLKSIZE=3120,DSORG=PO)
//SYSUT3   DD   UNIT=SYSDA,SPACE=(TRK,(1))
//SYSUT4   DD   UNIT=SYSDA,SPACE=(TRK,(1))
//SYSIN    DD   *
   COPY INDD=INPUT01,OUTDD=OUTPUT01
   COPY INDD=INPUT02,OUTDD=OUTPUT02
   COPY INDD=INPUT03,OUTDD=OUTPUT03
   COPY INDD=INPUT04,OUTDD=OUTPUT04
/*
```

Step 2: Run the Customization JOB

To customize **HourGlass** for your installation, one or more customization Zaps must be applied to the **HourGlass** Load Modules. For your convenience, these patches are automatically generated and applied by an **HourGlass** Installation Job.

HourGlass optionally allows you to define exactly the jobs that are eligible to have their dates altered. This provides maximum protection for your production systems by preventing jobs from inadvertently asking for altered dates. The eligibility can be based on the job name (leftmost 1 to 8 characters) and/or the job class. **HourGlass** allows the specification of up to 100 jobnames or jobname prefixes that will identify jobs eligible to use the **HourGlass** facilities. Also, up to 36 job classes can be specified.

Most often, prefixes or job classes for application programmer jobs will be specified here, e.g. **TEST*** or **DEV***.
The jobname and/or job class protection is optional.

Date Parm DD Statement

For eligible jobs, each jobstep that desires to participate in the date manipulation can optionally specify a Date Parm DD statement that specifies the desired date to use. This DD statement is of the format:

//xxCYYDDD   DD   DUMMY

xx   Two-character prefix defined at install time. Choose two characters that will guarantee a unique DDname when combined with the CYYDDD.

c   Century indicator. Valid values are **0** for the twentieth century (19xx) and **1** for the twenty-first century (20xx).

YY   Year to use (00 through 99).

DDD   Julian day to use (001 through 366).

Time Parm DD Statement

For eligible jobs, each jobstep that desires to participate in the time of day manipulation can optionally specify a Time Parm DD statement that specifies the desired time offset to use. This DD statement is of the format:

//xxdhhmm   DD   DUMMY

xx   Two-character prefix defined at install time. Choose two characters that will guarantee a unique DDname when combined with the dhhmm.

D   Direction to offset the time (i.e., add to the time or subtract from the time). Valid values are:

             P for plus, **M** for minus, **F** for fixed step start time, and **A** for absolute static time. Also allowed is **E** for East (plus) and **W** for West (minus).

             P   Plus
             M   Minus
             F   Fixed step start time
             A   Absolute static time
             E   East (plus)
             W   West (minus)

hh	Number of hours to offset the time or the actual hour (00 thru 23).
mm	Number of minutes to offset the current time or the actual minutes (00 thru 59).

HGCUSTOM   Edit member HGCUSTOM in the *HourGlass* SAMPLIB dataset. In the following discussion, the phrase "the jobstep requests an altered date/time" refers to the use of the Date Parm DD statement of the proper format, or the JOB statement Date Parm of the proper format or the use of the *HourGlass* ISPF panel to specify an altered date or time.

Add an appropriate JOB statement and customize the SYSIN control statements in the following way:

DDPREF   1)   Edit the DDPREF=HG control statement replacing the HG with a two-character DDname prefix that will be used for the date and/or time DD statements.. Enter DDPREF=NOPREF to disallow the use of DD statements by *HourGlass.*

JOBPREF   2)   From 1 to 100 JOBPREF=xxx control statements must be created to identify jobs, started tasks, and TSO job names eligible for *HourGlass*. Only job names that begin with one of the JOBPREF prefixes will be eligible to have their internal dates/times altered.

An asterisk (*)denotes a wildcard meaning "zero or more characters" and may be specified anywhere in the prefix. A question mark (?)denotes a wildcard meaning "exactly one characters" and may be specified anywhere in the prefix. For example, specifying JOBPREF=TEST denotes that a job named TEST is eligible to receive altered dates, whereas specifying JOBPREF=TEST* denotes that all jobs whose names start with TEST are eligible.

Only when a JOBPREF match occurs AND the jobstep requests an altered date/time will the internal dates ever be modified**.** Jobnames specified in the *HourGlass* ISPF dialog (HG) must conform to the JOBPREF specifications here to receive altered dates.

To allow all jobs to be eligible to *HourGlass*, code JOBPREF=*. TIP: Be sure to include IMS message region names when designing your JOBPREF criteria**.**

Recommendation: Use the JOBPREF during the *HourGlass* evaluation period. Thereafter, use it if you wish to limit access to *HourGlass*.

JOBCLASS	3)	A JOBCLASS=xxx control statement can be optionally created to identify jobs eligible for *HourGlass*. Only jobs that are running in one of the specified job classes will be allowed to have their internal dates/times revised. Only when a JOBCLASS match occurs AND the jobstep requests an altered date/time will the internal dates ever be modified**.** To allow all jobs to be eligible to *HourGlass*, code JOBCLASS=*. Up to 36 classes can be specified on the JOBCLASS= control statement. Example: JOBCLASS=ADI4 (classes A, D, I, and 4). TIP: Be sure to include IMS message region classes if these tasks are not Started tasks.

Recommendation: Use the JOBCLASS if you wish to limit by job class the jobs that can use *HourGlass.*

USERID	4)	As an additional level of security, you may code one or more USERID=xxxxxxx control statements that will be validated against the userid that submitted the batch job, or is associated with a started task or TSO user. If any of these control statements are present, *HourGlass* will only allow altered dates/times for jobs that meet all other criteria and have been submitted by one of the userids listed. Userid prefixes may contain an asterisk as the last character of the prefix.

Recommendation: This operand is not generally needed.

INCLUDE	5)	AREA (CSA,MLPA,LPA) are by default excluded from being intercepted by *HourGlass*. This prevents system modules such as the tape management system from receiving altered dates. If you desire a particular module in COMMON to receive an altered date/time, add an INCLUDE PGM=xxxxxxxx control statement where xxxxxxxx is the program name. Up to 20 of these control statements may be added. Additionally, this control statement is used to include DB2 subsystems into the DB2 DDF support. The format of the control statement is 'INCLUDE PGM=@DB2nnnn, where nnnn is the one to four character DB2 subsystem name that will be allowed to participate in *HourGlass* date/time setting in a DDF environment.

Recommendation: This operand is not generally needed except for DDF support.

EXCLUDE	6)	If there are particular modules you do not want to receive altered dates/times, you may add up to 300 EXCLUDE PGM=xxxxxxxx control statements. Some programs are automatically excluded by *HourGlass*. These include IMS logging modules, IMS's DBRC modules, and SyncSort SMF

record cutting modules.

Recommendation: This operand is not generally needed. This option is not supported under MVS/XA.

TSO	7)	To prevent TSO users from receiving altered dates, add a **TSO=NO** control statement. The default is TSO=YES.

Recommendation: TSO=YES

DATE	8)	To set a hard-coded date that will be passed to all eligible jobs without the need to use the date DD statement, add a DATE=yyyy-mm-dd control statement.

Recommendation: Use this feature only when all eligible jobs are to always automatically receive the same date. An example would be for use on a QA system test. The JOBPRE2= parameter designates the jobname prefixes that will receive the hard-coded date. A date DD statement overrides a hard-coded date.

To run a job step in which the date always remains the same, even if the time passes midnight, use a hard-coded time (see the TIME= parameter below) and a JCL date override.

TIME	9)	To set a hard-coded time offset that will be passed to all eligible jobs without the need to use the time statement, add a TIME=dhhmm control statement.

Recommendation: Use this feature only when all eligible jobs are to always automatically receive the same time offset. An example would be for use on all jobs run on a remote site in another time zone. The JOBPRE2= parameter designates the jobname prefixes that will receive the hard-coded time. A time DD statement overrides a hard-coded time.

JOBPRE2	10)	1 to 10 JOBPRE2=xxx control statements can be optionally created to identify jobs eligible for hard coded dates and/or times. Only jobnames that begin with one of the JOBPRE2 prefixes will automatically have their internal dates and/or time revised to the hard-coded values without the need for a date/time statement. The coding rules for this keyword are the same as those for JOBPREF=. To allow all jobs to receive the hard-coded date/time, code JOBPRE2=*.

Recommendation: Use the JOBPRE2 only if your shop has special needs to set hard-coded dates and/or times.

STATS	11)	*HourGlass* comes with an audit trail facility that collects statistics on job steps using altered dates or times and optionally, all job steps that request the system date/time. This facility is optional. By default, no statistics are collected. To activate statistics gathering, code STATS=x where valid values for x are: A (collect statistics for all jobs), H (collect statistics for jobs receiving *HourGlass* altered

dates/times only), and N (do not collect statistics). STATS=A or STATS=H is required for WTO=Y or CUTSMF=Y (described below).

Recommendation: Activate statistics gathering using option A for initial application analysis. Afterwards, use option H for internal reporting on all uses of altered dates through the WTO feature and/or the CUTSMF feature.

STATSTABLE   12)   If statistics are being collected by specifying STATS=A or STATS=H, an internal table is kept in extended CSA to temporarily store the statistics. The default size of this table is 12K. Each entry is 92 bytes and holds information for 1 active job step. If *HourGlass* runs out of available entries, stats will not be collected for that job step and therefore, no WTO or SMF record can be produced. To alter the size of this table, code STATSTABLE=nnn where nnn is the number of K-bytes to allocate for the table in the range of 0 to 999.

Recommendation: Increase this parameter accordingly if you have more than 125 batch initiators. Example: 200 initiators * 92 bytes per entry = 18K.

WTO   13)   If statistics are being collected by specifying STATS=A or STATS=H, and a provided SMF exit HGACTRT is implemented, *HourGlass* can write a message to the job log for each batch step that receives an altered date or time. If this feature is desired, code WTO=Y, otherwise code WTO=N. Changes to this option alter the contents of module HGACTRT. If you have made a copy of this into LPALIB, re-copy it after the HGCUSTOM run.

Recommendation: Code WTO=Y.

CUTSMF   14)   *HourGlass* will write the statistics records to SMF using the SMF record type specified in the SMFTYPE parameter. If statistics output is desired, code CUTSMF=Y, otherwise code CUTSMF=N**.** Changes to this option alter the contents of module HGACTRT. If you have made a copy of this into LPALIB, re-copy it after the HGCUSTOM run.

Recommendation: Only code CUTSMF=Y if a permanent audit trail is desired.

SMFTYPE   15)   If statistics are being collected by specifying STATS=A or STATS=H, CUTSMF=Y is specified, and a provided SMF exit HGACTRT is implemented, *HourGlass* will write *HourGlass* statistic records to SMF using the SMF record type specified here. Code SMFTYPE=nnn where nnn is the three digit user SMF record type between 128 and 255.

Changes to this option alter the contents of module HGACTRT. If you have made a copy of this into LPALIB, re-copy it after the HGCUSTOM run.

Recommendation: Consult your Technical Support staff.

STC   16)   To prevent *HourGlass* from altering the date and time for started tasks (even if they have the required DDstatements), code STC=NO   This provides an extra level of protection from accidental use of altered dates. Note that many IMS message regions are started tasks.

IMSUSER   17)   For IMS Message Region Support, userids (full ids or generic ids) can be automatically set up in advance to receive altered date/times. To accomplish this, code control statements in the format:

IMSUSER=xxxxxxx DATE=yyyy-mm-dd TIME=dhhmm

where xxxxxxx is the userid or prefix and yyyy-mm-dd is the altered date and dhhmm is the altered TIME. All parameters are required and must be separated by only one space. To only set the date, code P0000 for the time. IMSUSER prefixes may user the asterisk ('*') as the last character of the prefix.

Recommendation: This parameter will generally only need to be coded to perform generic time offsets to handle time zone issues where the user is in a different time zone from the CPU. The HGIMS transaction allows individuals to set their own date/time while IMS is up.

:CICSTEST   18)   If you will be using the *HourGlass* CICS Global Control component (HGCC), optionally choose a different algorithm for the CICS eligibility test. Code CICSTEST=1 or 2 or 3 to select one of the following algorithms:

1 ″First Test″ - This is the default and the original algorithm shipped with the product. CICS Userids, Tranids, and Termids are tested in that order but only if valid selection criteria has been specified for any one category. Only one category is tested, the first one containing valid criteria. The result determines eligibility of the current transaction to receive the *HourGlass* altered date and/or time.

2 ″AND Test″ - Multiple categories of selection criteria (i.e., Userids, Tranids, Termids) may be specified and the CICS transaction must pass the test for all specified categories to be eligible to receive the *HourGlass* altered date and/or time.

3 ″OR Test″ - Same as for the ″AND Test″ except that if any of the specified category tests is passed, the CICS transaction is considered eligible.

STCLINK   19)   In order to automatically support TIME LINKAGE=SYSTEM time requests, a started task is activated. The default name of this started task is HGLINK. To alter this name, code STCLINK=name where name is the 1 to 8 character started task name that *HourGlass* will start. If you do not wish to activate this support, code STCLINK=N. THIS SUPPORT IS REQUIRED FOR DB2 SUPPORT, LE/370 SUPPORT, NATURAL SUPPORT, IEF SUPPORT, SAP SUPPORT, AND CICS SVC 11 SUPPORT.

This option requires MVS/ESA 4.2.2 or above. *HourGlass* will automatically start and stop this task as it is activated and disabled**.** IT IS NOT RECOMMENDED TO CANCEL THIS TASK. If you wish to stop just the LINKAGE=SYSTEM support without shutting down SVC11 support, you may issue the MVS stop command (P taskname). To restart it again later, issue the MVS start command (S taskname).

Recommendation: Make use of LINKAGE=SYSTEM support.

PASSWORD   20)   If your vendor has provided you with a security key (9 characters/digits), add a PASSWORD=xxxxxxxxx control statement, specifying the provided key. Otherwise, *HourGlass* will automatically expire after a 35-day trial period.

Recommendation: This parameter is only needed if you wereinitially running *HourGlass* under a trial license agreement and have subsequently purchased it.

RLOCNAME   21*)*   If the CICS transaction HGDR is to be used, specify the DB2 remote location name, to which HGDR is to connect, from which the DB2 Special Registers will be retrieved. A DB2 remote location name, up to sisteen characters in length, may be entered. This value will be inserted into the HGDR6 program by HGCUSTOM.

STEPLIB DD   21)   Alter the STEPLIB DD statement to point to the *HourGlass* LOAD Library.

22)   SAVE this member. SUBMIT this member. Exit the dataset.

**SAMPLE JCL FOR
HGCUSTOM**

```
//STEP01   EXEC PGM=HGCUST
//STEPLIB  DD   DSN=HG52.LOADLIB,DISP=SHR
//SYSUDUMP DD   SYSOUT=*
//REPORT   DD   SYSOUT=*
//SYSPRINT DD   SYSOUT=*
//SYSLIB   DD   DSN=HG52.LOADLIB,DISP=SHR
//CUSTJOB  DD   DSN=&&ZAPCTRL,DISP=(,PASS),
//              UNIT=SYSDA,SPACE=(TRK,(1,1))
//SYSIN    DD   *,DCB=BLKSIZE=80
DDPREF=HG
JOBPREF=TEST*
JOBPREF=DEV*
JOBCLASS=ABCD
TSO=NO
```

The customization job will produce a report showing the options that
have been chosen. Check this carefully to be sure it matches your
desired options. Once the HGCUSTOM job has successfully
completed, proceed to the next installation step.

Step 3: Make the ISPF Interfaces Available

HourGlass provides a REXX ISPF Edit Macro and an ISPF dialog to
generate the proper *HourGlass* Date DD statement to add to a
jobstep that is to receive an altered date. This is provided since the
DD statement contains the date in Julian format. Both dialogs
prompt for the desired date in YYYY-MM-DD format and then
generate the *HourGlass* DD statement. The Edit Macro places the
generated statement in your JCL while the CLIST simply displays
the DD statement to use. To make these dialogs generally available:

1. Edit members HGDD and HGDDNAME in the SAMPLIB
    dataset.

2. Follow the directions to alter the ISPEXEC LIBDEF and CALL
    statements to reference the *HourGlass* SAMPLIB and
    LOADLIB, respectively.

3. Copy these members into any dataset concatenated to the
    SYSPROC DD of the TSO logon procedures. Member HGDD
    can also be placed in the SYSEXEC DD concatenation. Be sure
    not to add the entire SAMPLIB to the SYSEXEC concatenation
    (however, it can be on the SYSPROC concatenation).

HourGlass also provides an ISPF Dialog that allows date/time
setting to be performed on behalf of selected jobs without any JCL
changes in those jobs. This dialog has two modes, one that only
allows editing of jobs owned by the current TSO user, and an
administrative mode that allows editing of any job. Dates/times set
through this ISPF dialog can be overridden by JCL for specific jobs
or steps. To make this dialog generally available:

1. Edit members HG and HGOPT in the SAMPLIB dataset.

2. Follow the directions to alter the ISPEXEC LIBDEF and ALLOC statements to reference the ***HourGlass*** SAMPLIB and LOADLIB, respectively.

3. Copy members HG, HGALLOCR, HGALLOCW, and HGOPT into any dataset concatenated to the SYSPROC DD of the TSO logon procedures.

If you would like to secure any of the options or control the specific jobs a user is allowed to set dates for, see SAMPLIB member HGTSOSEC for an example security exit provided in the facility. This exit can easily interface with RACF or other security package. The same exit protects options selected when using program HGBCUST, which provides a batch facility for activating changes to automatic date handling (see SAMPLIB member HGBCUST). You may wish to use your external security manager to protect program HGSCHED, which allows a series of jobs to be set up with a 'rolling' date/time (see SAMPLIB member HGSCHED).

Step 4: APF Authorization for *HourGlass*

To activate or deactivate ***HourGlass***, an APF authorized library is required. Either make the ***HourGlass*** LOAD Library APF Authorized, or copy the modules from LOADLIB to an APF Authorized Library. Once activated, application programs need not add any JCL to reference the ***HourGlass*** load library.

Step 5: Prepare the LINKAGE=SYSTEM or Audit Trail

If statistics gathering was chosen during the customization, an SMF exit must be activated either to write the statistics to SMF or to issue the job log message reporting on altered date/time usage (or both). The SMF exit name being invoked is IEFACTRT and the ***HourGlass*** module name is HGACTRT (which should be copied to a LINKLST Library). Be aware that HGCUSTOM options WTO=, SMFTYPE=, and CUTSMF= alter module HGACTRT and a fresh copy should be placed in LINKLST after these HGCUSTOM options are changed. The easiest way to cause the exit to become activated (if you are at MVS Version 5 or later) is to place an **EXIT ADD** statement in your **PROGnn** member of SYS1.PARMLIB. Activation can be performed anytime by issuing the MVS operator command **T PROG=nn** where nn is the two digit suffix of the member name in PARMLIB. The suggested control statement is:

```
EXIT ADD EXITNAME(SYS.IEFACTRT) MODNAME(HGACTRT) ABENDNUM(1)
```

Note: If your SYS1.PARMLIB(SMFPRMnn) member contains a **SUBSYS** parameter that contains **JES2** and **EXITS(IEFACTRT)**, then the SYS.IEFACTRT shown above should state SYSJES2.IEFACTRT.

For MVS Versions prior to Version 5, member **IEFACTRT** in SAMPLIB contains a sample IEFACTRT exit that calls the *HourGlass* HGACTRT exit and your existing IEFACTRT exit.

If LINKAGE=SYSTEM support was chosen during customization, the started task JCL must be made available in a JES Procedure Library. Default JCL is in member **HGLINK** of SAMPLIB. Follow the directions to customize the JCL for your shop. To prevent this task from being canceled (recommended), add a PPT entry to the appropriate SCHEDnn member of SYS1.PARMLIB (e.g. SCHED00). A sample entry contains:

```
PPT PGMNAM(HGLSSTC) KEY(0) PRIV NOCANCEL SYST NOSWAP
```

Step 6: Activating/Deactivating *HourGlass*

To activate *HourGlass*, run the jobstep supplied in member **HGON**, in the Sample Library. This JCL dynamically installs the *HourGlass* code. Once installed, *HourGlass* remains inactive until a job with one of the allowed jobnames enters the system that either contains a date parm DD statement in the current job step, a date parameter in the JOB statement, or has a date set from the ISPF dialog or hard-coded date facilities. Only then will *HourGlass* substitute the requested altered date/time for that jobstep only. HGON will automatically start the HGLINK started task. For multiple MVS systems with shared DASD, it may be necessary to pass a parameter to the HGLINK task to ensure that the SAVELINK dataset is unique between systems.

To deactivate *HourGlass*, run the jobstep supplied in member **HGOFF**. This JCL will totally remove *HourGlass* from your system. Normally, it is not necessary to run HGOFF as it only becomes active for jobs that meet the stringent criteria.

It is important to know that HGON needs to be run after each IPL to activate it as the INSTALL function is not permanent.

Sample JCL for HGON is:

```
//STEP01   EXEC PGM=HGINSTL,PARM='INSTALL'
//STEPLIB  DD   DSN=HG52.LOADLIB,DISP=SHR
//SYSUDUMP DD   SYSOUT=*
```

Sample JCL for HGOFF is:

```
//STEP01   EXEC PGM=HGINSTL,PARM='REMOVE'
//STEPLIB  DD   DSN=HG52.LOADLIB,DISP=SHR
//SYSUDUMP DD   SYSOUT=*
```

Step 7: Verifying the Install

To verify that the install was successful, run the sample job from member HGSAMPLE in SAMPLIB. This job contains a date parm override of February 5, 2000. Modify the *HourGlass* DD statements to match your DD prefix before submitting. After executing, the job log will contain a display of the current date and time. If the override was successful, it should show the overridden date and the time should be one hour ahead of the actual time. The JCL looks like:

```
//STEP01    EXEC PGM=HGVRFY
//STEPLIB   DD   DSN=HG52.LOADLIB,DISP=SHR
//SYSUDUMP  DD   SYSOUT=*
//HG100036  DD   DUMMY        Febrary 5, 2000
//HGP0100   DD   DUMMY        Plus one hour
/*
```

Step 8: CICS Setup (Optional)

HourGlass for CICS is optional. If you wish to have your command level CICS applications receive an alternate date/time for **EXEC CICS ASKTIME** (including ASKTIME ABSTIME) commands, LE/370 Date/Time functions, COBOL ACCEPTs, NATURAL support, and DB2 Date/Time/Timestamp SQL accesses, then follow the instructions in this section.

HourGlass provides two levels of control in the CICS environment. **Global Levelor CICS Control** causes a single date and/or time specification to be applied only to groups of users, terminals, or transactions within the CICS region (DB2 SQL ignores global terminal name specifications). **User Control** provides each individual user with the ability to specify an *HourGlass* date and/or time that is unique to their own session. Dates and times entered with User Control always take precedence over global settings.

HourGlass for CICS can be run with CICS TransactionServer Version 1.1 or higher. Two SAMPLIB members are supplied to define the transactions, programs, mapsets, and files. The table below summarizes the required entries.

Notes

1   If your CICS V5 or V6 region specifies RENTPGM=PROTECT, run member APINLNK in SAMPLIB.

2   If your CICS is using LPA=YES as a SIT parameter, you must also specify the appropriate PRVMOD= SIT if tran HGFE will be used:

Version 5/6: PRVMOD=DFHAPIN.

The following table summarizes the CICS requirements. Refer to member CICSMIGn to install.

Tran Codes	V5/6 Programs	Mapsets
HGCC	HGCC4	HGCCMS
-------	HGCCGX4	
HGUC	HGUC4	HGUCMS
HGCV	HGCCVR4	
HGFE	HGFTCH	
HGFD	HGFTCH	
-------	HGXPCF	
-------	HGXTRUE	
HGSC	HGSC4	HGSCMS
HGSU	HGSC4	
HGAE	HGFTCH	
HGAD	HGFTCH	
------	HGAUDIT	
------	HGSEC	
------	HGCSQL	
HGDL	HGDL6	
HGDR	HGDR6	

Please note that additional entries may be required for optional *HourGlass* CICS features. Transaction HGCC is the main or global level control transaction. Transaction HGUC is used to specify User Control date/time values. HGCV is the installation verification transaction. Transactions HGFE and HGFD enable or disable the EIB priming facility. This feature can be used to pre-set the CICS EIB date/time at the beginning of each transaction without requiring an EXEC CICS ASKTIME. Transactions HGSC and HGSU compose the HourGlass CICS Settings Control facility. This feature allows an installation to create snapshots of CICS settings,both the Global Control and User Control, and save them to a VSAM KSDS. Once saved, the settings groups can be displayed, edited, deleted and restored.When a settings group is restored, the global and user settings in effect at the time the setting group was saved become the active settings, replacing any settings that were in effect at the time of the restore request. Transactions HGAE and HGAD enable/disable the CICS Audit Trail Facility. Transactions HGDL and HGDR provide verification of CICS/DB2 functionality for local and remote (using DDF) access, respectively.

For more detail and examples of usage for each of these transactions, please see **Section 3.5 Using *HourGlass* with CICS**.

Make sure that the modules installed above are in a load library contained in the CICS DFHRPL DD concatenation. Also, add the **//HGSCDS** DD containing the Setting Control Dataset to the CICS JCL. This dataset is used by the HGSC transaction to view/update/save/restore various configurations of date/time settings.

HourGlass CICS provides an optional, but recommended Automatic Startup capability during CICS initialization. Some reasons for using this facility are:

1. You have a CICS region dedicated to a group of users running in a different time zone. You want the date and time seen by this group of users to always reflect the local date and time. Automatic Startup can be used to specify the time offset between sites each time the CICS region is recycled.

2. You wish to use User Control but do not want to give users the authority to use the Global Control transaction, HGCC. User Control requires *HourGlass* CICS to have been previously initialized. This initialization can be done either by using transaction HGCC or Automatic Startup. Use of Automatic Startup allows you to initialize *HourGlass* CICS without giving users access to the HGCC transaction.

3. To make NATURAL and/or LE/370 and LINKAGE=SYSTEM support available immediately at CICS startup.

4. To automatically start the CICS Audit Trail Facility at CICS Startup.

PLT programs   Three PLT programs are provided.

1. HGPLT4 activates *HourGlass* in the CICS region and optionally, reads a file in the CICS Startup JCL, allocated using the //HGDATEDD statement, that can specify the global date and time. The HGDATE DD statement can be used to coordinate a common date among several CICS regions (see SAMPLIB member HGDATE) for details. (recommended)

2. HGFTCH enables the **EIB Priming Facility** (EPF). EPF provides support for altered date/time values for CICS application programs that retrieve date/time values from the CICS EIB, without having previously executed an EXEC ASKTIME request. It also optionally activates the CICS Audit Trail Facility if module HGAUDIT contains INIT=Y.

   Note: If HGFTCH is run as a PLT program, you must make load module HGETSS, which resides in the HourGlass Version 5.2

LOADLIB library, available to the CICS region via the STEPLIB library concatenation.

3. HGSC4 (which must run after HGPLT4) activates a settings group named **STARTUP**. The STARTUP settings group, which must be previously created using the HGSC transaction, is used to initially set the global and user level controls in the CICS region.

Installing Automatic Startup

To install Automatic Startup please follow these steps:

1. Add the HOURGLAS CEDA group to the list of groups auto-installed during CICS initialization.

2. Add an entry for HGPLT4, HGFTCH, and optionally HGSC4 to the PLTPI table. For CICS versions 5, and 6 these entries must follow the DFHDELIM entry. HGPLT4 must execute during stage 3 of CICS initialization processing and before HGSC4 (if specified). All entries should follow any entry already in the PLT for modules DSNCOM1 or DSN2COM0.

3. Optionally, add the HGDATE DD statement to the CICS Startup JCL.

4. Recycle the CICS region to verify successful installation. HourGlass messages appearing in the CICS message log indicates a successful initialization.

CICS Audit Trail

Another optional feature, available as part of the HourGlass CICS support, is the Audit Trail Facility. This facility can be used to track the activation/deactivation of *HourGlass* in a CICS environment, to track the users changing date/time settings in CICS, and to track the various uses of date/time in user transactions.

Transactions HGCC, HGUC, HGSC, HGFE, HGFD, HGAE, and HGAD each cut audit records reflecting the changes made with those transactions. Additionally, the PLT programs HGPLT4, HGFTCH, and HGSC4 also cut records. The record layouts of these audit records are available in SAMPLIB member HGAUDRC.

CICS Audit Trail records can be written to any CICS resource. Audit records are written by an audit exit that can be customized by the customer. By default, the supplied audit exit writes all audit records to a TD Queue that is directed to a sequential file. To implement the CICS Audit Trail Facility, the Audit Exit program HGAUDIT must be assembled. Follow the instructions provided in SAMPLIB member HGAUDIT for details on this exit. Its purpose is to provide three functions, to open the audit dataset, to write audit records to the audit dataset, and to close the audit dataset.

To enable the CICS Audit Trail exit at CICS startup time, enable program HGFTCH at PLT time and modify the literal near the start of the HGAUDIT exit to specify a value of 'INIT=Y'. The HGAE transaction enables the Audit Trail Facility at any time. The HGAD transaction disables the Audit Trail Facility at any time. Transaction HGFE or PLT HGFTCH must be active to run the CICS Audit Trail Facility.

CICS Security

The HGCC and HGSC transactions contain options that you may not wish all users to have access to. We have provided an optional exit that can be implemented to control access to each option. This exit gets control for each menu item selected. The exit can make use of any security system to grant or deny access. The default exit allows full access. See SAMPLIB member HGSEC for details.

CICS MRO Considerations

HourGlass must be installed in every CICS region where transactions may be expected to receive an altered date/time. This is also true for MRO configurations.

When multiple CICS MRO regions are in use and *HourGlass* transactions are defined with unique transaction identifications in each region, it will be possible, using routing, to set the *HourGlass* date in each region from within the TOR without the use of manual routing through the CRTE transaction.

For each *HourGlass* transaction, a unique numeric identifier could be used to identify each CICS region. This identifier would be used in the transaction PCT name, which would be routed to the individual CICS AOR regions. For example:

TOR PCT entry HGCC routes to AOR1 PCT entry HGCC,
TOR PCT entry HGUC routes to AOR1 PCT entry HGUC,
TOR PCT entry H2CC routes to AOR2 PCT entry H2CC, and
TOR PCT entry H2UC routes to AOR2 PCT entry H2UC.

Note: When renaming *HourGlass* transaction codes, do not change the last two characters, as *HourGlass* uses these internally.

As an alternative, date and time settings from one CICS can be copied to one or more other CICS regions to coordinate the settings across regions. SAMPLIB member HGGETDT contains a sample transaction program which may be customized and implemented to accomplish this.

Step 9: IMS DC Setup (Optional

Setting up *HourGlass* for use with on-line IMS transactions is optional. If you wish to have your IMS DC applications receive an alternate date, then follow these instructions.

If a given IMS Message Region should have the same altered date/time for every user in the Message Region, then the only task that must be completed is to add the *HourGlass* override DD statement to the Message Region JCL, just as you would with a batch application. However, if it is desired to allow each user to specify their own date/time, follow the instructions below. In any case, ensure that the HGCUSTOM JOBPREF= and STC= and JOBCLASS= parameters are set appropriately.

Add an HGIMS Tran Code and PSB to your IMS gen. Member HGIMSTRN in SAMPLIB shows a sample IMS definition. Adjust the class number to run in the message region of your choosing. The tran name can be altered if so chosen. Perform an IMS gen to make this tran and PSB known to IMS.

Generate the HGIMS PSB and ACB. Member HGIMSPSB in SAMPLIB contains a sample PSB to use. Generate the MFS screen used by *HourGlass* by running member HGIMSMFS in SAMPLIB after customizing the JCL for your shop's needs.

Make module HGIMS from LOADLIB available to the STEPLIB of the IMS message region in which *HourGlass* will alter dates. Add to the JCL for each message region that is to support altered date/time requests, a special DD statement of the format //HGIMSMSG DD DUMMY where HG is the two-character prefix chosen at install time.

To alter the date or time, clear the IMS screen and enter: HGIMS followed by a space and hit ENTER. A screen will appear that will show the current user, and any current date/time override for that specific user (generic overrides are not shown). At the bottom of the screen will be the current date/time for this user (generic overrides are reflected here). If no changes are to be made, simply hit the CLEAR key. Otherwise, set the new date/time and hit ENTER. Clear the fields to receive the current date and/or time.

If your shop is interested in causing the IOPCB date/time to reflect the *HourGlass* date, follow the instructions in SAMPLIB member IMSIOPCB.

Note: By default, dates set through the HGIMS Transaction will apply to ANY message region running in ANY IMS control region that contains the HGIMSMSG DD statement.

To limit the altered date to the specific control region in which the HGIMS transaction was run, each message region containing the HGIMSMSG DD statement must contain a module named **HGIMSREG**. This module is generated by running SAMPLIB member HGIMSREG. This module contains a literal of your choice that identifies the control region or group of control regions that will be affected by running HGIMS in a message region containing this

module. In other words, the message regions in each control region can be set up to have a unique HGIMSREG module that identifies their control region name. **HourGlass** will match the IMS userid along with the Region name to choose an altered date. Likewise, two or more control regions can share dates by sharing the same HGIMSREG module.

Note: Module HGIMSREG must be pre-loaded in the IMS message region.

Step 10: DB2 Setup (Optional)

If you will be using *HourGlass* with DB2, a simple procedure can be used to enable *HourGlass* to intercept DB2's date/time requests when processing the SQL Special Registers **CURRENT DATE, CURRENT TIME**, and **CURRENT TIMESTAMP** and default date/times when inserting rows. The procedure involves re-linking a single DB2 module and applying a small patch to that module. This altered module gets added to the DSNDBM1 regions of the DB2 subsystems you wish *HourGlass* to interface to. No other special run-time procedures are needed unless DDF is also involved. For complete details, see member $DB2 in MODLIB.

HourGlass can also provide altered date/time values to DB2 time requesters serviced by a remote DB2 subsystem, through DDF. Each DB2 subsystem which participates with *HourGlass* through DDF must be identified at *HourGlass* customization. A special form of the INCLUDE PGM statement is used for this purpose. These statements are of the form:

        INCLUDE PGM=@DB2ssss,

where ssss is the DB2 subsystem name. See the description of the INCLUDE PGM= statement of HGCUSTOM for details.

Step 11: COM-PLETE Setup (Optional)

If you will be using *HourGlass* with the TP monitor COM-PLETE from Software AG, a small amount of setup is required. *HourGlass* will intercept calls to COM-PLETE (e.g. CALL DATEJ) and COBOL or NATURAL language date/time verb requests (e.g. COBOL ACCEPT, COBOL FUNCTION CURRENT DATE, NATURAL *DATE).

Add the DD statement **//HGCOMPLT DD DUMMY** to any COM-PLETE region JCL that will participate in *HourGlass* altered dates (where HG is the appropriate DD prefix that your shop has chosen).

Step 12: IDMS Setup (Optional)

If you will be using *HourGlass* in an IDMS CV (Central Version) and you are running IDMS V12 or V14, then each user will be able to control their own date and time by simply setting the value of a variable HG52 using the DCUF command (e.g. DCUF SET HG52 'DATE=2000-01-31,TIME=P0100').

To add *HourGlass* support, IDMS must have the appropriate maintenance on it that creates a user exit called EXIT24. If your maintenance level does not have EXIT24 support, see SAMPLIB member IDMSV12 for version 12 of IDMS, or SAMPLIB member IDMSV14 for version 14 of IDMS to add this support.

Next, create a system or user profile in a system dictionary using OCF (Online Command Facility) that contains the attribute HG52. You will need SYSADM and security ADMIN privledges to accomplish this. The profile is needed to enable users to enter the 'DCUF SET HG52' command to set their requested date and time. This profile can be activated with the 'DCUF SET PROFILE newname' command.

Finally, implement an IDMS EXIT24 by following the instructions for doing so as described in the IDMS Systems Operations Manual in the section on Numbered Exits. Samplib member IDMSEX24 contains further information on this topic.

Step 13: Language Setup

If you will be using *HourGlass* with programming languages that utilize the STCK instruction to internally retrieve the system date, a patch or other action must be applied to interface that product with *HourGlass*. Some of these languages are COBOL/370 (also referred to as 'LE COBOL', 'COBOL/LE', and 'COBOL for MVS and VM'), C/370, PLI/370, NATURAL, IDEAL on-line, and IEF). For details on language issues, see member LANGUAGE in SAMPLIB.

3. Using *HourGlass*

Once **HourGlass** has been activated, it intercepts all requests for the system date and time that are made through the interfaces supported by **HourGlass.** Each date and time request is checked to determine if it is eligible to receive an **HourGlass**-altered date/time value. This eligibility checking code is highly optimized and designed to use minimum system resources, in order to reduce system overhead. If a date/time request is eligible for an **HourGlass**-altered date/time value, **HourGlass** calculates the altered date/time value according to the control information that corresponds to that request. Otherwise, the request is simply handed off to the operating system service that would normally handle that type of request. The following sections provide detailed information about the several methods available to specify an altered date/time value for various environments, and to control the operation of **HourGlass**.

3.1 Override DD Statements

Date Override   The format of the date override DD statement is:

//xxCYYDDD   DD   DUMMY

    xx   Two character prefix defined at install time. See the *HourGlass* installer to determine these characters.

    C   Century indicator. Valid values are 0 for the twentieth century (19xx) and 1 for the twenty-first century (20xx).

    YY   year to use (00 thru 99).

    DDD   Julian day to use (001 thru 366).

    OR

//xxYdnn   DD   DUMMY

    xx   Two character prefix defined at install time. See the *HourGlass* installer to determine these characters.

    Y   Letter 'Y' standing for: number of years to add/subtract to date.

    d   Direction of the year change, **P** for plus nn years, **M** for minus nn years.

    nn   Number of years to add/subtract from current date.

Examples   The following are examples of these DD statements:

//HG100001 DD DUMMY   Specifies January 1, 2000

HG	DD statement prefix
1	21st Century indicator.
00	Year indicator as 00 It is combined with century indicator to designate 2000.
001	Julian day 001, that is, January 1st.

//HG095032 DD DUMMY   Specifies February 1, 1995

HG	DD statement prefix.
0	20th Century indicator.
95	Year indicator as 95. It is combined with 20th century indicator to designate 1995.
032	Julian day 032, that is, February 1st.

//HGYP05 DD DUMMY   Specifies that 5 years are to be added to the current date.

HG	DD statement prefix.
Y	Required literal to designate years.
P	Direction for adjustment. P for plus, M for minus years to add.
05	Number of years by that to adjust the date.

Time Override   The format of the time override DD statement is:

//xxdhhmm   DD   DUMMY

xx   Two character prefix defined at install time.

D   Direction to offset the time (i.e., add to the time or subtract from the time). Valid values are:

P	plus
M	minus
F	fixed step start time
A	absolute static time
E	East (plus)
W	West (minus)

hh   Number of hours to offset the time (00 thru 23).

mm   Number of minutes to offset the current time (00 thru 59).

Examples   The following are examples of these DD statements:

//HGP0230 DD DUMMY   Increases the time by 2 hours and 30 minutes.

HG	DD statement prefix.
P	Plus time indicator.
02	2 hours.
30	30 minutes.

//HGF0320 DD DUMMY	Starts the step at 03:20
	HG DD statement prefix.
	F Fixed Step Start time. Valid only in batch steps.
	03 Set hour to 3.
	0320 Set step start time to 03:20 (current seconds are kept).

/HGA1150 DD DUMMY	Provides an absolute or "frozen" time at 11:50 am
	HG DD statement prefix.
	A Absolute time. Valid for batch steps, CICS, and IMS.
	11 Set hour to 11.
	50 Set minutes to 50.

Using REXX Exec HGDD

HourGlass DD statements can be generated automatically by using the provided REXX Exec HGDD. From the EDIT Command line, enter:

HGDD

after placing an A (after) or B (before) line command designating the desired location for the generated *HourGlass* DD statement. Optionally, the desired date can be passed on the command line as a parameter in the format CCYY-MM-DD. Without any parameters, an ISPF panel will be presented prompting for the desired date.

To simply display the correct *HourGlass* DD statement without adding it to your current EDIT session, enter from any ISPF Command line:

TSO %HGDDNAME

The user will be prompted for the date in **CCYY-MM-DD** format and/or the time in **dHHMM** format. After hitting ENTER, the appropriate *HourGlass* DD statement will be shown. Hit **PF3** to exit this dialog. Sample screens follow.

```
                    Generate HourGlass DD
COMMAND===>

 Enter Desired Runtime Date (ccyy-mm-dd):  1997-12-06

Enter Desired Time: Plus/Minus (P/M): P  HoursMinutes (hhmm): 0100
                                   East/West (E/W)
                                   Fixed Step Start (F)
                                   Absolute Constant Time (A)

                        Hit PF3 to Exit
```

```
                    Generate HourGlass DDStatement
 COMMAND===>

           Desired Runtime Date (ccyy-mm-dd): 1997-12-06
           DD statement to use: //HG097340 DD DUMMY

           Desired Runtime Time (d  hhmm): P  0100
           DD statement to use: //HGP0100 DD DUMMY

                    Hit ENTER to Continue
```

Job Stream Example

To demonstrate *HourGlass* in an actual job stream, assume that *HourGlass* has been set up to allow only jobnames beginning with **TEST** to alter their dates. Also assume that the job consists of four steps and that we would like to alter the dates being received by step 1 and step 3. For the first step, we want the date to be February 5, 1998. For the third step, we would like the date to be December 31, 2001. We would also like the first two steps to run with times set ahead one hour. The JCL for our job will look similar to the following. (*HourGlass*-dependent JCL is in bold):

```
//TESTX1   JOB 909680300,'MY TEST JOB',
//         CLASS=1,MSGCLASS=L,NOTIFY=OSSGSN
//*
//STEP01   EXEC PGM=P911345,PARM='MONTHLY'
//STEPLIB  DD   DSN=PROD.LOADLIB,DISP=SHR
//SYSPRINT DD   SYSOUT=*
//SYSOUT   DD   SYSOUT=*
//I911345A DD   DSN=FIN.INPUT.DATA,DISP=SHR
//O911345A DD   DSN=FIN.OUTPUT.DATA,DISP=(,CATLG,DELETE),
//         UNIT=DISK,SPACE=(CYL,(10,10),RLSE),
//         DCB=(RECFM=FB,LRECL=123,BLKSIZE=26937)
//HG098036 DD   DUMMY
//HGP0100  DD   DUMMY
//*
//STEP02   EXEC PGM=P912610
//STEPLIB  DD   DSN=PROD.LOADLIB,DISP=SHR
//SYSPRINT DD   SYSOUT=*
//SYSOUT   DD   SYSOUT=*
//I912610A DD   DSN=FIN.DAILY.FILE1,DISP=SHR
//HGP0100  DD   DUMMY
//*
//STEP03   EXEC PGM=P52231
//STEPLIB  DD   DSN=PROD.LOADLIB,DISP=SHR
//SYSPRINT DD   SYSOUT=*
//SYSOUT   DD   SYSOUT=*
//I52231A  DD   DSN=FIN.PROMO.FILE,DISP=SHR
//O52231A  DD   DSN=FIN.PROMO.RPT,DISP=(,CATLG,DELETE),
//         UNIT=DISK,SPACE=(CYL,(1,1),RLSE),
//         DCB=(RECFM=FBA,LRECL=133,BLKSIZE=26999)
//HG101365 DD   DUMMY
//*
//STEP04   EXEC PGM=P51111
//STEPLIB  DD   DSN=PROD.LOADLIB,DISP=SHR
//SYSPRINT DD   SYSOUT=*
//I51111A  DD   DSN=FIN.PROMO.FILE,DISP=SHR
//O51111A  DD   DSN=FIN.PROMO.RPT,DISP=SHR
//*
```

3.2 Specifying the Date and Time at the JOB Level

If preferable, *HourGlass* date and time overrides can be specified at
the job level by placing the override DDnames within the JOB
statement programmer name field. Either the date, the time, or both
can be specified here. If overriding both date and time, separate the
two with a space. Using this technique alters the date/time for the
entire job unless overridden with a step level DD statement..

Examples

```
//TESTA  JOB  909680300,'//HG098015 //HGP0100',CLASS=A,MSGCLASS=Q
//TESTB  JOB  909680300,'//HG100215',CLASS=A,MSGCLASS=Q
```

3.3 Using the *HourGlass* Date/Time ISPF Dialog

Without any JCL changes to a batch job, a date/time alteration can be
enabled by specifying the jobname/userid criteria along with the
desired date/time. This interface can be updated dynamically while
HourGlass is active on your system. To invoke the dialog, enter
TSO HG from any ISPF command line. The following screen will
appear:

```
HourGlass Date/Time Selection
      COMMAND===>
            1) View or Set Date/Time For Your Own Jobs
            2) View or Set Date/Time For Any Job
            3) Restore Previously Saved Date/Time Settings
            4) View Date/Time Settings For All Job
            5) View HourGlass Installed Options (Memory)
            X) Exit
               Select Option or End to Exit
```

Select one of the following options:

1   TSO user can set up date/time criteria for own jobs or jobs
         whose names prefixed with the TSO ID for the user.

2   Administrator mode. Enables setting date/time criteria for
         any job (a security exit can control the entries that each user
         is allowed to edit). Care should be taken in using this
         option.

3   User can edit and later activate a previously saved set of job
         date/time criteria. This option can be used for activating the
         same criteria each time at the start of system testing.

4   Users can browse all date settings. They cannot update.

Any of the options displays the screen shown below. The data being
viewed from options 1, 2 and 4 are current live criteria from the

active **HourGlass**. Using option 1 shows a subset of the live criteria (where jobname or userid is your userid). The criteria from option 3 comes from a previously saved dataset with the name 'userid.HG52.EDITS'.

```
                HourGlass Date/Time Selection
Command ===>                               Rows: 001 to 012 of 500

Jobname      Userid      Date       Time     Jobname     Userid      Date       Time

OSS*A___     OSS*_____   2005-01-11  P0400    OSSGSNA_   OSS*____   2005-08-22 P0200
_____     _____    _____  _____    _____   _____   _____ _____
_____     _____    _____  _____    _____   _____   _____ _____
_____     _____    _____  _____    _____   _____   _____ _____
_____     _____    _____  _____    _____   _____   _____ _____
_____     _____    _____  _____    _____   _____   _____ _____
_____     _____    _____  _____    _____   _____   _____ _____
_____     _____    _____  _____    _____   _____   _____ _____
_____     _____    _____  _____    _____   _____   _____ _____
_____     _____    _____  _____    _____   _____   _____ _____
Make Desired Changes (Scroll with UP/DOWN), Then Hit End for Update options
```

HourGlass allows up to 1000 total active entries using this mechanism. Each entry consists of jobname criteria, userid criteria (from the USER= JOB statement parameter), the desired date, and the desired time. Jobname and userid are required fields. A date, time, or both date and time must also be specified.

Jobname and Userid criteria have the ability to contain wildcard characters to represent groups of jobs and users. The question mark (?) can be used as a single character place holder, while the asterisk (*) can be used to signify 'zero to many characters'. For example, '???E*' could be used to specify that the 4th character of a jobname must equal 'E'. The asterisk is generally meant to be placed on the end of a specification, but may be placed in the beginning or middle with one limitation: the search continues only until the character following the asterisk is found. For example, if '*AB' was specified, and the jobname was 'DACAB', the test would fail due to the fact that an 'A' was found that was not followed immediately by a 'B'.

Care should be taken when setting the jobname/userid criteria to ensure that only the desired jobs are affected.

TO AFFECT THE DATE/TIME FOR A TSO USER, the exact 'userid' must be specified for the jobname, with '*' specified in the USERID column. 'PartialUserid*' or 'Userid*' will not result in an altered date for a TSO user. The specific userid must be specified.

The date and time specified through the ISPF facility can be overridden with JCL DD statements**.** It may be desirable to globally add one hour to all jobs starting with 'W', except for a small handful. Those exceptions can specify another time override or '//HGP0000 DD DUMMY' to signify current time. The date can be overridden in this same way by using a date DD statement with another date or with '//HG000000 DD DUMMY' to signify the current date.

Once all date edits have been completed, simply hit the END key to display the following options screen:

```
                         HourGlass Date/Time Selection
 COMMAND===>

                         1) Activate Changes
                         2) Save Edits to Disk for Later Activation
                         X) Exit

                         Select Option or End to Exit
```

Select an option.

1   Activates the changes. If the user was in Administrative mode, then all currently active date criteria entries are replaced with the entries just edited. Otherwise, only the entries pertaining to that user will be replaced.

2   Saves the current entries to disk in a file named 'userid.HG52.EDITS'. Once saved, this menu is re-displayed and the user may choose to activate the changes also. After the current entries have been saved to disk, these changes may be automatically re-activated each time *HourGlass* is enabled on a system.

          Member HGBCUST of SAMPLIB contains sample JCL to run the batch utility to activate previously saved entries. This job step may be run as part of the *HourGlass* activation jobstream or at any time to cause the desired changes to take effect.

X   Cancels the changes, or exits after choosing another option.

3.4 Specifying Date/Time Using the Scheduling Facility

To perform system testing where multiple jobs or a multi-step job requires the simulated date/time to continuously 'roll', use the Scheduling Facility of *HourGlass*. Run SAMPLIB member HGSCHED to create or drop schedules (full instructions are contained within the member). Simple control statements set the *HourGlass* schedule start date/time along with the jobs participating in the schedule. By default, *HourGlass* allows 100 active schedules, each with up to 100 jobs in a schedule. Each active schedule is kept unique by providing a schedule name and owner.

A sample schedule containing three jobs is created using the following JCL:

```
//STEP01   EXEC PGM=HGSCHED
//STEPLIB  DD  DISP=SHR,DSN=HG52.LOADLIB
//SYSUDUMP DD  SYSOUT=*
//SYSPRINT DD  SYSOUT=*
//HGOUT    DD  SYSOUT=*
//HGIN     DD  *
SCHEDULE CREATE NAME=MYSCHED1 OWNER=OPS511 DATE=2005-01-01 TIME=P0000
JOB=TESTS01
JOB=TESTS02
JOB=TESTS03
/*
```

The NAME and OWNER keywords are used to ensure that the schedule has a unique name from other schedules. The DATE and TIME keywords specify the *HourGlass* date and time that will be used to designate the step start date and time of the first job run from the schedule.

The following control statement is later used to remove the schedule from *HourGlass* control:

```
SCHEDULE DROP   NAME=MYSCHED1 OWNER=OPS511
/*
```

3.5 Using *HourGlass* with CICS

HourGlass CICS supports both global control and user-level control. **Global Control,** also called **CICS Control**, provides the capability to specify an *HourGlass* date/time value that is in effect for the entire CICS region. If desired, this global date/time value can be restricted to particular users, terminals, or transactions.

User Control provides the capability to specify a unique *HourGlass* date/time value for each individual user within the CICS region.

The HGCC transaction manages the CICS Global Control facility, while the HGUC transaction is used to manage the CICS User Control facility. Both the User Control facility and the Global Control facility can be active simultaneously in the CICS region. In that case, date/time values specified using User Control take precedence over date/time values specified using Global Control.

HourGlass must first be initialized in a CICS region before User Control can be invoked. This initialization can be accomplished either through use of the HGCC transaction or through the Automatic Startup facility (see **Step 8: CICS Setup (Optional)** in **Section 2.2 Installation Steps** for details on Automatic Startup).

In a CICS environment, *HourGlass* affects the system date/time when it is retrieved usingany of the following interfaces:

- the EIBDATE field

- the EXEC CICS ASKTIMEcommand;

- a DB2 SQL Date/Time/Timestamp;

- a COBOL or LE/370 Date/Timefunction;

- an SVC 11 request ;

- a TIME LINKAGE=SYSTEM service request.

Global Control   As stated above, the *HourGlass* date/time value set using the Global Control facility can apply to all transactions in the CICS region, or it can be restricted to specific users, terminals or transactions. Wildcards are allowed in the specification of this criteria for maximum flexibility. The eligibility of any particular CICS transaction is dependent on the Userids, Tranids, and/or Termids you enter, and the test algorithm selected during customization. (See **Step 2: Run the Customization JOB** in **Section 2.2 Installation Steps**.) Note: termids are ignored in Global Control when processing DB2 SQL requests.

If HGCC abends for any reason (e.g. automatic logoff from CICS), a temporary storage record may be left pending in the CICS region. This object is used to serialize the execution of the HGCC transaction. In the event this occurs, the following message will be displayed to any subsequent user of the HGCC transaction:

```
HGCC18E ONLY ONE ACTIVE USER ALLOWED FOR THIS TRAN. PLEASE TRY
LATER
```

If this happens, the situation can be corrected by simply deleting the pending temporary storage record. Issue the following command from a cleared CICS screen:

```
        CECI DELETEQ TS QUEUE(HGCCTSR1)
```

To set a global system date for CICS, enter HGCC from a cleared CICS screen. The following screen is displayed.

```
--------------  HOURGLASS CICS CONTROL PRIMARY OPTIONS V5.2  ---------------

        OPTION ===>

              1    SPECIFY GLOBAL DATE/TIME VALUE

              2    SPECIFY GLOBAL USERID SELECTION CRITERIA

              3    SPECIFY GLOBAL TRANID SELECTION CRITERIA

              4    SPECIFY GLOBAL TERMID SELECTION CRITERIA

              5    ENABLE/UPDATE HOURGLASS CICS CONTROL

              6    DISABLE HOURGLASS CICS CONTROL

              X    EXIT
```

As stated above, the HGCC transaction is serialized to permit only one user at a time to access the transaction.. Select from the following options:

1   Allows the specification of the desired date and/or the
           desired time.

2   Allows the altered date/time to be limited to specific userids.
           Wild cards are permitted to specify generic ids.

3   Allows the altered date/time to be limited to specific
           transaction ids. Wild cards are permitted to specify generic
           transaction codes.

4   Allows the altered date/time to be limited to specific
           terminals. Wild cards are permitted to specify generic
           terminal ids.

5	Activates the *HourGlass* date and/or time entered using option 1 along with any selection criteria entered using options 2, 3, and 4.
6	Disables *HourGlass*. Use it to reset the date and time back to the current date and time.
X	Exits the HGCC Transaction. If this option is selected, all changes entered using options 1 through 4 will be lost unless option 5 enable/update has been performed first.
	PF3 or Clear may also be used to exit HGCC.

Note the following guidelines:

- Options 1 through 4 allow data entry. Any changes take effect when option 5 is selected.

- Select Option 5 after entering all Option 1 through 4 changes. It is not necessary to select option 5 after completing each option panel.

The option screens for the HGCC Transaction are shown below:

OPTION 1

```
----------  HOURGLASS CICS CONTROL: SPECIFY GLOBAL DATE/TIME VALUE  ----------

        SPECIFY THE HOURGLASS GLOBAL DATE WITH TIME OFFSET. THE DATE APPLIES
        TO THE ENTIRE CICS REGION AND TIME VALUES (PLUS OR MINUS) OFFSET THE
        CURRENT TIME FOR ALL ELIGIBLE TRANSACTIONS.


        HGCC GLOBAL DATE ===> 1999-12-31
                                          FORMAT IS ccyy-mm-dd,  WHERE:
                                            ccyy = FULL 4 DIGIT YEAR
                                            mm = 2 DIGIT MONTH
                                            dd = 2 DIGIT DAY

        HGCC GLOBAL TIME ===> A2359
                                          FORMAT IS dhhmm,  WHERE:
                                            d = "P" OR "E" FOR PLUS OFFSET
                                            d = "M" OR "W" FOR MINUS OFFSET
                                            d = "A" FOR ABSOLUTE TIME VALUE
                                            hh = HOURS (00-23)
                                            mm = MINUTES (00-59)
```

OPTION 2

```
-----   HOURGLASS CICS CONTROL: SPECIFY GLOBAL USERID SELECTION CRITERIA   -----

        SPECIFY UP TO 42 ENTRIES, USING WILDCARDS AS NEEDED. USERID ENTRIES
        ARE A MAXIMUM OF 8 CHARACTERS AND PREFIX ENTRIES ARE A MAXIMUM OF
        7 CHARACTERS FOLLOWED BY AN ASTERISK. USERID ELIGIBILITY IS TESTED
        IN THE ORDER OF THE ENTRIES.


        ENTER GLOBAL USERIDS AND/OR PREFIXES:

01:         02:         03:         04:         05:         06:

07:         08:         09:         10:         11:         12:

13:         14:         15:         16:         17:         18:

19:         20:         21:         22:         23:         24:

25:         26:         27:         28:         29:         30:

31:         32:         33:         34:         35:         36:

37:         38:         39:         40:         41:         42:
```

OPTION 3

```
-----   HOURGLASS CICS CONTROL: SPECIFY GLOBAL TRANID SELECTION CRITERIA   -----

        SPECIFY UP TO 42 ENTRIES, USING WILDCARDS AS NEEDED. TRANID ENTRIES
        ARE A MAXIMUM OF 4 CHARACTERS AND PREFIX ENTRIES ARE A MAXIMUM OF
        3 CHARACTERS FOLLOWED BY AN ASTERISK. TRANID ELIGIBILITY IS TESTED
        IN THE ORDER OF THE ENTRIES.


        ENTER GLOBAL TRANIDS AND/OR PREFIXES:

01:         02:         03:         04:         05:         06:

07:         08:         09:         10:         11:         12:

13:         14:         15:         16:         17:         18:

19:         20:         21:         22:         23:         24:

25:         26:         27:         28:         29:         30:

31:         32:         33:         34:         35:         36:

37:         38:         39:         40:         41:         42:
```

OPTION 4

```
-----   HOURGLASS CICS CONTROL: SPECIFY GLOBAL TERMID SELECTION CRITERIA   -----

        SPECIFY UP TO 42 ENTRIES, USING WILDCARDS AS NEEDED. TERMID ENTRIES
        ARE A MAXIMUM OF 4 CHARACTERS AND PREFIX ENTRIES ARE A MAXIMUM OF
        3 CHARACTERS FOLLOWED BY AN ASTERISK. TERMID ELIGIBILITY IS TESTED
        IN THE ORDER OF THE ENTRIES.


        ENTER GLOBAL TERMIDS AND/OR PREFIXES:

 01:        02:        03:        04:        05:        06:

 07:        08:        09:        10:        11:        12:

 13:        14:        15:        16:        17:        18:

 19:        20:        21:        22:        23:        24:

 25:        26:        27:        28:        29:        30:

 31:        32:        33:        34:        35:        36:

 37:        38:        39:        40:        41:        42:
```

OPTION 5

```
-HGCC05I ENABLE/UPDATE SUCCESSFUL
```

OPTION 6

```
-HGCC06I DISABLE SUCCESSFUL
```

OPTION X

```
-HGCC12I EXITING HOURGLASS CICS CONTROL. NO CHANGES PROCESSED
```

User Control

User Control provides the capability to associate an *HourGlass* date/time value with a particular CICS userid, or group of userids, that is unique to the user or group. Date/time values specified using User Control take precedence over any values specified using Global Control. The Global Control facility must be activated, with of without a date/time value specified, before the User Control can be accessed. The Global Control facility is activated through the HGCC transaction or, optionally, at CICS initilization using the HGPLT4 program.

To activate the Global Control facility without a date/time value, invoke transaction HGCC, select option 5 to Enable, and then option X to exit.

The HGUC transaction manages the User Control facility. Enter
HGUC from a cleared CICS screen. The following panel will be
displayed:

```
--------  HOURGLASS USER CONTROL: SPECIFY USER DATE/TIME VALUE V5.2  ---------

       CICS USERID ========> PSTRJP

       ENTER YES TO DELETE PREVIOUSLY ENTERED USER CONTROL INFO ==>

             USER DATE ===>               FORMAT IS ccyy-mm-dd,  WHERE:
                                            ccyy = FULL 4 DIGIT YEAR
                                            mm = 2 DIGIT MONTH
                                            dd = 2 DIGIT DAY

             USER TIME ===>               FORMAT IS dhhmm,  WHERE:
                                            d = "P" OR "E" FOR PLUS OFFSET
                                            d = "M" OR "W" FOR MINUS OFFSET
                                            d = "A" FOR ABSOLUTE TIME VALUE
                                            hh = HOURS (00-23)
                                            mm = MINUTES (00-59)

       ENTER TRANIDS AND/OR PREFIXES (optional):

                   01:     02:     03:     04:     05:     06:
```

This panel allows entry of an *HourGlass* date/time to be used by a
specific user or group of users. Optionally, tranids or tranid prefixes
can be entered to control the transactions for this specific user or
group that are eligible to receive the specified *HourGlass* date/time.

The asterisk ('*') can be used as the last character in the USERID
field to specify a wildcard in order to create a group date/time.

To delete a previously-entered entry for a specific user, type the
userid and reply yes where requested on the panel. The user will be
deleted from User Control and will now be eligible for the global
date/time if present.

Transaction HGCV can be used to verify the correct installation of
HourGlass CICS**.** To use it enter tranid HGCV from a cleared CICS
screen. If you have previously enabled *HourGlass* CICS with an
HourGlass date and/or time, these should be reflected in the screen
output returned by HGCV. If HGCV returns the current date or time
when it should be returning the *HourGlass* date or time, make sure
that no selection criteria (i.e., Termids, Tranids, or Userids) have
been specified that would exclude HGCV, and that the *HourGlass*
activation was successful.

Using the EIB Date/Time without ASKTIME

Some installations may have applications that do not perform an
EXEC CICS ASKTIME before making use of the date/time located
in the EIB. For those applications, *HourGlass* provides a facility,
known as the EIB Priming facility, which gets control at the start of
each task and inserts the *HourGlass* date/time value into the EIB
date/time fields. Transactions HGFE and HGFD control the

operation of this facility, which enable and disable the facility, respectively.

Special Considerations

- If your CICS is using LPA=YES as a SIT parameter, you must also specify the appropriate PRVMOD= SIT parameter, which is PRVMOD=DFHAPIN for CICS Versions 5 or 6.

- If your CICS region specifies RENTPGM=PROTECT, ensure that the installer has run member APINLNK in SAMPLIB before using this facility.

Enable/Disable

To enable the EIB Priming facility many shops place program HGFTCH in the CICS PLT. Alternatively, invoke the HGFE transaction from a cleared screen. Once activated, the facility will prime the EIB with the appropriate*HourGlass* date/timevalue, based on the specifications made using the Global Control or User Control facilities.

To disable the EIB Priming facility, invoke the **HGFD** transaction from a cleared screen. It can be re-enabledat any time by invoking the HGFE transaction.

Using the CICS Settings Control Facility

Often, it may be desirable to display the Global Control and User Control settings that are in effect in a CICS region. Additionally, it may be useful to save the currentGlobal Control and User Control settings and later restore them. The *HourGlass* Settings Control Facility provides a mechanism to display the current settings or any set of previously saved settings, save the current settings to an external dataset, or activate a saved set of previously saved settings. When activating a previously saved set, the user has the flexibility to restore just the Global Control settings, just the User Control settings, or both.

The main menu for the Settings Control Facility is invoked using transaction **HGSC.** Once invoked, the following menu appears:

```
-------------- HOURGLASS SETTINGS CONTROL PRIMARY OPTIONS V5.2 -------------

        OPTION ===>


              1    DISPLAY SETTINGS

              2    SAVE CURRENT SETTINGS

              3    ACTIVATE SAVED SETTINGS

              4    DELETE SAVED SETTINGS

              5    LIST AVAILABLE SETTINGS

              6    MODIFY EXISTING USER SETTINGS

              X    EXIT
```

Select one of the following options:

1   Allows the user to either display the currently active settings
            (by entering a key of CURRENT), or to display a previously
            saved set of settings (by entering the key of the saved set).

2   Allows the user to save the currently active settings to a file
            by specifying the key of the saved set.

3   Restores and activates the settings previously saved. Any
            previously saved key can be used. The user is given a choice
            to activate just the global settings, just the user control
            settings, or both.

4   Allows the user to delete a previously saved set of settings
            when they are no longer useful.

5   Lists the keys of all previously saved settings.

6   Allows a user to edit his/her user settings from a previously
            saved record.

Note: Options 2, 3, 4 and 6 run internally under transaction HGSU,
            and can thus be secured.

By saving settings to a key of STARTUP, and then specifying
program HGSCn in the CICS PLT (following the HGPLTn
program), **HourGlass** will activate the settings in STARTUP during
CICS Initialization.

3.6 Using the CICS Audit Trail

The CICS Audit Trail Facility can be used to track the activation/deactivation of **HourGlass** in a CICS environment, to track the users changing date/time settings in CICS, and to track the various uses of date/time in user transactions.

If the CICS Audit Trail Facility has not been activated at CICS startup time, the HGAE transaction can be used to enable it. The HGAD transaction can later be used to disable it. This facility requires transaction HGFE or PLT HGFTCH to be active. Once active, the Facility LINKs to program HGAUDIT to write the record out. A supplied exit is provided on SAMPLIB in member HGAUDIT. The record layouts of the audit records are described in SAMPLIB member HGAUDRC.

The customer is responsible for creating reports against these audit records.

3.7 Using *HourGlass* with IMS Message Regions

If a given IMS Message Region should have the same altered date/time for every user in the Message Region, then the only task that must be completed is to add the ***HourGlass*** override DD statement to the Message Region JCL, just as you would with a batch application. However, if it is desired to allow each user to specify their own date/time, follow the instructions below.

Make module HGIMS from LOADLIB available to the STEPLIB of the IMS message region in which ***HourGlass*** will alter dates. Add to the JCL for each message region which is to support altered date/time requests, a special DD statement of the format //HGIMSMSG DD DUMMY where HG is the two character prefix chosen at install time.

To alter the date or time for yourself, clear the IMS screen and enter: /FOR HGIMS and hit ENTER twice. The screen shown below will appear and will show the current user, and any current date/time override for that specific user (generic overrides are not shown). At the bottom of the screen will be the current date/time for the signed on user (generic overrides are reflected here). If no changes are to be made, simply hit the CLEAR key. Otherwise, set the new date/time and hit ENTER. Key the word DELETE in the date field to remove the shown entry and receive the current date and time.

```
HGIMS              ***** HOURGLASS *****
                   IMS DATE/TIME ALTERATION

 USERID: OSSGSN

 DATE(CCYY-MM-DD OR BLANK FOR CURRENT DATE): 1998-01-11
    EXAMPLE: JAN 2, 1998 = 1998-01-02
    EXAMPLE: FEB 5, 2004  = 2004-02-05

 TIME(DHHMM OR BLANK FOR CURRENT TIME): P0100
    EXAMPLE: ADD 1 HOUR, 20 MINUTES = P0120
    EXAMPLE: SUBTRACT 2 HOURS = M0200

 HIT <CLEAR> TO ACCEPT DISPLAYED DATE/TIME
     OR CHANGE DATE/TIME AND HIT <ENTER>
        DATE IS: 1998-01-11, TIME IS: 08:04
```

Note: Dates set using the HGIMS Transaction will apply to **ANY** message region running in ANY IMS control region that contains the HGIMSMSG DD statement.

If your IMS COBOL, PL/I, or assembler MPP application programs are retrieving the time and date from the IOPCB instead of issuing a date/time request, it is still possible to receive an ***HourGlass*** altered date without re-linking your application programs. SAMPLIB member IMSIOPCB contains complete details.

3.8 Using *HourGlass* with DB2 Applications

Once the **HourGlass** /DB2 Installation has been performed, use **HourGlass** in the normal manner for the environment you are running (e.g. Batch, TSO, IMS, CICS). **HourGlass** will automatically intercept the SQL CURRENT DATE/TIME/TIMESTAMP special registers and set default values on INSERTS with the **HourGlass** date and time.

The only exception to this rule is when running applications in a DB2 DDF environment, which may be two DB2's passing information to each other, or applications running on another platform requesting information from DB2. In this environment, the **HourGlass** date and time should be specified in the HG ISPF dialog on the cpu where the DB2 satisfiying the date request will run. The JOBNAME column should contain the DB2 plan name. The USERID column should contain the DB2 SQLID (often your userid). No wildcards are allowed in these columns.

Each DB2 subsystem that participates with **HourGlass** through DDF must be identified at **HourGlass** customization. A special form of the INCLUDE PGM statement is used for this purpose. These statements are of the form:

> INCLUDE PGM=@DB2ssss,

where ssss is the DB2 subsystem name. See the description of the INCLUDE PGM= statement of HGCUSTOM for details.

3.9 Using *HourGlass* with COM-PLETE

HourGlass allows users running in Software AG's COM-PLETE regions to each receive their own altered date/time for COBOL and NATURAL applications asking either COM-PLETE or the programming language for the date/time. The TSO HG ISPF dialog is used to set the date for each user, where the jobname equals the COM-PLETE region job name and the userid equals the COM-PLETE userid.

Each COM-PLETE region that will participate in possible *HourGlass* date alterations must have a special DD statement added to the JCL that takes the format //HGCOMPLT DD DUMMY, where HG is the two character prefix chosen at install time.

For Assembler TIME macro support in a COM-PLETE region, add the following line of code immediately after each TIME macro to be intercepted:

```
DC    5X'0700'
```

and reassemble the module.

3.10 Using *HourGlass* with IDMS

HourGlass works normally with IDMS batch applications (single user) where the date/time is being requested by the programming language (e.g. COBOL).

When running CV (Central Version), such as in ADS/O or DC COBOL, all applications that internally use the GETTIME macro will receive *HourGlass*-altered date/time values specified through the User Control facility, provided the supplied IDMS EXIT24 has been implemented as a part of the *HourGlass* installation process. The install process allows certain task codes to be always given the current date.

To initially set or change a date and/or time, simply issue the IDMS command:

```
DCUF SET HOURGLASS 'DATE=yyyy-mm-dd,TIME=dhhmm'
```

Where the date and time operands are normal *HourGlass* date and time specifications. The DATE= and TIME= parameters are optional, one or both can be specified.

3.11 Using *HourGlass* with STCK

In-house assembler applications that use the STCK assembler instruction are not automatically intercepted by ***HourGlass***, since it is a CPU instruction rather than a service call. However, ***HourGlass*** provides two safe methods of intercepting these. The first is through a simple reassembly procedure to change the STCK instructions to a TIME STCK macro. Often, however, the source code either cannot be changed or is not available (e.g. packaged software). Therefore, the second method patches the STCK instructions on a copy of the load module to call an ***HourGlass*** provided User SVC that returns a STCK value.

Method 1 (re-assemble): To re-assemble code using the STCK instruction to be intercepted by ***HourGlass***, concatenate member STCK from SAMPLIB ahead of your source code on the SYSIN DDname. This causes each occurrence of the STCK instruction to be converted to a format of SVC 11. This will return the TOD value just as the STCK instruction does and ***HourGlass*** will be able to intercept it. Be aware, however, that the use of the SVC causes registers 0, 1, 14, and 15 to be altered. If your application requires that these registers remain intact, concatenate member STCKSAVE instead. Member STCKSAVE contains a non-reentrant version of the replacement macro that saves and restores these registers so that no register alteration is done. Applications requiring re-entrancy should use Method 2, below. Example:

```
//ASM.SYSIN  DD DSN=HG52.SAMPLIB(STCK),DISP=SHR
//           DD DSN=your.bal.source,DISP=SHR
```

Method 2 (patch load module): To patch STCK instructions with a user SVC, make sure the supplied ***HourGlass*** SVC has been installed (SAMPLIB member HGINSVC) using an available SVC number. A report of available SVC's can be created by running SAMPLIB member HGSVCRPT. **Remember, that HGINSVC must be run after each IPL to ensure that the SVC code is always active**. Patch any STCK instructions (x'B205') with an SVC call to the user SVC (x'0Axx', where xx is the hex value of the SVC number chosen). Once the application load module has been patched, the application can be run using ***HourGlass*** dates in the normal way. The only restriction is that the application code must not run in AR mode (since SVC's are not allowed in cross-memory mode). The symptom will be a system S0F8 ABEND if you attempt this.

3.12 Using the *HourGlass* Audit Trail Facility

If statistics gathering was requested during *HourGlass* customization using STATS=A or STATS=H, CUTSMF=Y was specified, and the SMF exit HGACTRT was implemented, then *HourGlass* will write date/time usage statistics out to the SMF datasets. Included in these statistics is the date and time the record was written, job name, job number, step name, proc step name, *HourGlass* date/time, a total counter of the number of times the system date/time was requested, and if possible, a breakdown of these counts by program name. Member HGCOBRP in SAMPLIB contains a sample COBOL program that reports the system date/time usage (compile this and run the JCL provided in member HGCOBRP$.

Statistics collection can be terminated at any time without disabling *HourGlass* (for MVS Version 5 and later) by stopping the SMF exit HGACTRT. This exit can be stopped by issuing the MVS command 'T PROG=nn' where nn is the two letter suffix to a SYS1.PARMLIB member PROGnn that contains a 'EXIT DELETE EXITNAME(SYS.IEFACTRT) MODNAME(HGACTRT)' There should normally be no reason to stop statistics collection between IPLs. See your Technical Support staff for instructions on making the SMF user records available to you for reporting.

The statistics record contains the following information (this is not a record layout):

Length	Format	Description
8	Char	Jobname
1	Char	Jobtype: J=Job, T=TSO, S=Started Task
5	Char	JES Job Number
8	Char	Step Name
8	Char	Proc Step Name
10	Char	*HourGlass* Altered Date if Job Step was eligible. Format is YYYY MM DD.
5	Char	*HourGlass* Altered Time offset if Step was eligible. Format is DHHMM.

4	Binary Integer	Count of Total Date/Time Requests Issued
8	Char	Program Name 1 issuing requests
4	Binary Integer	Count of Program 1 Date/Time Requests
8	Char	Program Name 2 issuing requests
4	Binary Integer	Count of Program 2 Date/Time Requests
8	Char	Program Name 3 issuing requests
4	Binary Integer	Count of Program 3 Date/Time Requests
8	Char	Program Name 4 issuing requests
4	Binary Integer	Count of Program 4 Date/Time Requests

4. Messages

Many HourGlass messages in Version 5, Release 2, have been updated to make them more informative and easier to understand. A message identifier has been added to these updated messages. The format of the message identifier is:

HG*mmnnt*

In the message identifier, *mm* identifies the module from which the message originates; *nn* is the message sequence number; and *t* is the message type. Message types are:

E	Error Message
S	Severe Error Message
I	Informational Message

The text of Error and Informational messages generally provide information needed to determine a response. Severe Error messages usually indicate an internal HourGlass or system error and the typical user response is to contact technical support at Princeton Softech for assistance.

The HourGlass module identifiers with corresponding module name and HourGlass component are:

Mod ID	Module Name	HourGlass Component
AU	HGAUDIT	CICS Audit
BR	HGBLMRU	Patch Installer
CC	HGCC	CICS Control
DT	HGGETDT	CICS Date/Time Propagation
FE	HGFTCH	CICS EIB Priming
FR	HGFRONT	MVS Support
IN	HGINSTL	MVS Support Activation

Mod ID	Module Name	HourGlass Component
LV	MWINIT	License Verification
PD	HGPIND	Patch Installer
PI	HGPINS	Patch Installer
PL	HGPLT	CICS Support Activation
RU	HGLMRU	Patch Installer
SC	HGSC	CICS Settings Control
ST	HGLSSTC	MVS Support Activation
SY	SYSTEM	Generic System Messages
TS	HGTSUA	SCDS Conversion Utility
UC	HGUC	CICS User Control
VR	HGVRFY	MVS Support Verification

Activation and De-activation

HourGlass returns one of the following codes in the event of an activation failure:

0011   *HourGlass* support is already active in this system.

0012   The version of the HGINSTL module referenced by the HGON process does not match the *HourGlass* support modules being activated.

0013   Verification of the MVS-supplied time request processor was unsuccessful. (Another product may be active.)

0014   The *HourGlass* load library failed to open.

HourGlass returns one of the following codes in the event of a de-activation failure:

0021   *HourGlass* support is not currently active in this system.

0022   Release mismatch. The version of the HGINSTL module referenced by the HGOFF process does not match the HourGlass MVS support modules being deactivated.

0023   Another product may be active. Verification of the HourGlass time request processor was unsuccessful.

**PC Time Service
Support Activation**

HourGlass returns one of the following codes in the event activation for PC Time Service support fails:

0011	*HourGlass* PC Time Service support is already active in this system.
0012	*HourGlass* (SVC11) support not active. PC Time Service support cannot be activated unless *HourGlass* support is already active.
0015	Verification of the *HourGlass* (SVC11) support module was unsuccessful.
0016	OSLVL error. MVS V4R2.2 or higher required for activation of the *HourGlass* PC Time Service support.
0017	Another product may be active. The LX/EX value for the PC Time Service was not the expected value. Another software product may have co-opted the PC Time Service PC number.

4.1 Environment Verification

Here is a list of the most common environments with tests you can run to verify the installation of *HourGlass* and that the product is working properly:

TSO ENVIRONMENT

1. Log on to TSO

2. Key in TSO HG from a command line to bring up the HG interface.

3. Using option 1, key in a jobname of your full userid, a userid of '*', and a date of 2005-01-01'. Hit ENTER. Hit PF3. Select ACTIVATE CHANGES. PF3 until you are out of the HG interface.

4. From a TSO command line, issue TSO TIME   This should get the altered date.

DB2 ENVIRONMENT

1. From the same TSO session above (or repeat steps 1-3 of TSO ENVIRONMENT), go into DB2 INTERACTIVE and select the SPUFI option.

2. Execute a SPUFI Query that reads 'SELECT CURRENT DATE FROM SYSIBM.SYSDATABASE;'

3. The resulting report should contain the altered date.

CICS ENVIRONMENT

1. Log onto CICS using your userid

2. From a cleared screen, key in HGCC

3. Select Option 5 to activate *HourGlass*

4. From a cleared screen, key in HGUC

5. Type your userid and a date of 2005-01-01. Hit ENTER

6. From a cleared screen, key in HGCV. The resulting display should contain the altered date.

CICS/DB2 ENVIRONMENT

Set up and run CICS transaction programs HGDL6 and HGDR6 which provide verification for local and remote DB2 functionality, respectively. SAMPLIB members BINDHGDL and BINDHGDR contain sample DB2 BIND jobstreams for these programs.BATCH ENVIRONMENT

1. Submit member HGSAMPLE from SAMPLIB

2. The job output should contain a message showing the TEST DATE and it should be the altered date requested by the DD statement //Hgcyyddd

IMS/DC ENVIRONMENT

1. Log onto IMS using your userid

2. From a cleared screen, key in HGIMS followed by a space and hit ENTER

3. Your userid should appear in the USERID field unless your shop does not use signon security, in which case it should contain your lterm name.

4. In the date field, enter a date of 2005-01-01. Hit ENTER

5. The screen will reappear. The bottom line should show the altered date.

4.2 Troubleshooting—Altered Date Does Not Appear

To verify that *HourGlass* is installed, run SAMPLIB member HGOPTS$ to print a report of options that will be needed for diagnosis. Ensure that the subsystem is active and the EXEC PARM is set to PARM=MEMORY. If HGOPTS$ fails, *HourGlass* is not up.

For TSO problems:

- Does the JOBPREF= parameters include your userid?

- Is TSO=Y

- If the USERID= parameter is specified, does it include your userid?

For DB2 problems:

- Does the JOBPREF= parameters include your userid?

- Is TSO=Y

- Is STCLINK=Y or STCLINK=HGLINK as required for DB2 Support. If not, recustomize, run HGOFF, then HGON and make sure that the started task HGLINK is now running.

- Has the member DB2 from SAMPLIB been run to create a new DB2 load module? Has this module been placed in the top of the STEPLIB of the DB2 DBM1 started task for the DB2 you are connecting to? Has DB2 been cycled since the module was made available?

- If the USERID= parameter was specified, does it include your userid?

For CICS problems:

- Have the PPT and PCT entries been created as specified in **Step 5: Prepare the LINKAGE=SYSTEM or Audit Trail** and **Step 8: CICS Setup (Optional)**? Also ensure that the modules activated match your release of CICS (e.g. suffix 3 for version 3 of CICS)

- If running STORAGE PROTECT in your CICS, make sure that the HGCCn and HGUCn programs are defined with CICSKEY.

- If running CICS Version 5 or 6, and CICS RENTPGM=PROTECT is specified, be sure you have run member APINLNK from SAMPLIB.

- Has the *HourGlass* Loadlib been added to the DFHRPL?

- If your application is DB2, NATURAL or LE/370, is the HGLINK started task active?

- Is HGFTCH in the CICS PLT or have you run the HGFE transaction?

- Is the program name in the CICS startup DFHSIP or start with DFHSIP?

- Use the HGCV transaction to verify that the various date settings work

- Use the HGSC transaction to verify the CURRENT date/time settings.

For Batch problems:

- Does JOBPREF= include this job?

- Does JOBCLASS= include the class this job was run under?

- If the USERID= parameter was specified, did one of these users submit the job?

For IMS Message Region problems:

- Have the message regions been altered to contain the //HGIMSMSG DD DUMMY DD statement? Include all message regions in the control region that could possibly run transactions you wish to provide altered dates.

- Does the JOBPREF= include the IMS message region jobs?

- If the Message Regions are jobs, does the JOBCLASS= include the message region jobs?

- If the Message Regions are started tasks, is the STC=Y parameter set?

For Language problems (when dates from a programming language are not altered):

- If the language requires special install considerations (member LANGUAGE in the *HourGlass* SAMPLIB), have these procedures been followed?

- If a separate STEPLIB is required for the language, is this at the top of list?

For continued problems, contact *HourGlass* Support.

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