



THE  
POWER  
TO KNOW.

# **SYSTEM 2000<sup>®</sup> V2**

## **CGI Web Interface**

### **Administrator's Guide**



The correct bibliographic citation for this manual is as follows: SAS Institute Inc. 2007. *SYSTEM 2000® V2 CGI Web Interface: Administrator's Guide*. Cary, NC: SAS Institute Inc.

## **SYSTEM 2000® V2 CGI Web Interface: Administrator's Guide**

Copyright © 2007, SAS Institute Inc., Cary, NC, USA

All rights reserved. Produced in the United States of America.

**For a hard-copy book:** No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior written permission of the publisher, SAS Institute Inc.

**For a Web download or e-book:** Your use of this publication shall be governed by the terms established by the vendor at the time you acquire this publication.

**U.S. Government Restricted Rights Notice:** Use, duplication, or disclosure of this software and related documentation by the U.S. government is subject to the Agreement with SAS Institute and the restrictions set forth in FAR 52.227-19, Commercial Computer Software-Restricted Rights (June 1987).

SAS Institute Inc., SAS Campus Drive, Cary, North Carolina 27513.

1st printing, September 2007

SAS® Publishing provides a complete selection of books and electronic products to help customers use SAS software to its fullest potential. For more information about our e-books, e-learning products, CDs, and hard-copy books, visit the SAS Publishing Web site at [support.sas.com/pubs](http://support.sas.com/pubs) or call 1-800-727-3228.

SAS® and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc. in the USA and other countries. ® indicates USA registration.

Other brand and product names are registered trademarks or trademarks of their respective companies.

# Table of Contents

Chapter 1: Introduction .....	1
Chapter 2: System Setup and Installation Considerations .....	3
Requirements .....	3
Timeout Multi-User Execution Parameter CGIEXP.....	3
Browser Requirements .....	3
JavaScript.....	3
Cookies .....	4
Security .....	4
Web Userids.....	4
Chapter 3: Invoking SYSTEM 2000 Applications .....	5
URL Setup .....	5
Database Access -- Sign-on SYSTEM 2000.....	6
Operator Communication.....	8
Chapter 4: Messages and Codes.....	9
S2KCGIDB AND S2KCGIOP .....	9
Unrecoverable Errors .....	10
Chapter 5: Installation.....	11



## **Chapter 1: Introduction**

The SYSTEM 2000 CGI Web interface provides direct access to SYSTEM 2000 databases via the Internet. CGI (Common Gateway Interface) is a standard, supported by almost all Web servers, that defines how information is exchanged between a Web server and an external program (CGI program). CGI programs are stored in the CGI-BIN subdirectory, which is an HFS file under OS/390 UNIX.



## **Chapter 2: System Setup and Installation Considerations**

Requirements .....	3
Timeout Multi-User Execution Parameter CGIEXP .....	3
Browser Requirements .....	3
JavaScript.....	3
Cookies .....	4
Security .....	4
Web Userids.....	4

---

### **Requirements**

In order to use the CGI interface, your site must have an OS/390 Web server such as the IBM HTTP server. A CGI-BIN subdirectory and userid and security authorizations must be defined by your OS/390 UNIX system services administrator.

---

### **Timeout Multi-User Execution Parameter CGIEXP**

Having a large number of idle Web sessions can lead to storage problems, so a timeout mechanism to purge inactive Web users has been provided. SYSTEM 2000 control blocks that contain timestamp information for every Web user are scanned periodically. Users inactive for a set period, specified in the CGIEXP parameter, have their sessions terminated and the resources freed.

CGIEXP specifies the number of minutes a Web user can be inactive before being considered timed out. SYSTEM 2000 adds this value to the time of the last SYSTEM 2000 command issued to determine whether a user's session should be terminated. Allowable values are 0–999 minutes. The default is 0. A value of 0 disables timeout processing.

---

### **Browser Requirements**

The SYSTEM 2000 Web interface functions under both Microsoft Internet Explorer and Netscape. You should have installed at least version 4.0 of Internet Explorer and version 6.0 of Netscape, and security settings must allow JavaScript to execute and cookies to be written.

---

### **JavaScript**

JavaScript is a scripting language written into SYSTEM 2000 Web pages to help manage and control the pages. JavaScript is a Netscape product that executes in Internet Explorer as well. SYSTEM 2000 uses JavaScript for simple functions such as cursor placement and editing forms data, and for more complex functions such as button manipulation. One of the main uses of JavaScript is for the retrieval and writing of cookies. Screen customization data and certain forms data are saved by using cookies. User JavaScript functions can be added for such things as security and customization.

---

## Cookies

SYSTEM 2000 uses cookies to maintain customized session information and to retain prior SCF and operator commands. If values other than the defaults are used for session customization—such as screen width, maximum output lines, or case—a cookie is created.

In order to minimize the number of cookies created, session cookies are set to expire after one hour, and Prior Command cookies are set to expire after 12 hours.

**Note:** Browsers sometimes limit the number of cookies that can be created. SYSTEM 2000 will not create more than five cookies.

---

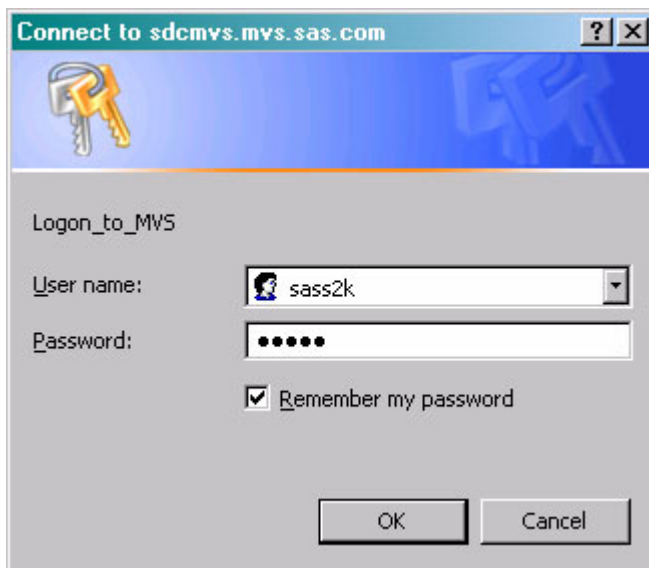
## Security

In order to control access to Web resources on MVS, the Web server provides extensive access control support, including system validation of userids and passwords. In addition, encryption and authentication techniques, although beyond the scope of this discussion, can be employed to provide a secure network. SYSTEM 2000 provides yet another layer of security by requiring a password before any database can be accessed.

---

## Web Userids

The first time the browser attempts to access MVS, it prompts the user for a user name and password. The user name and password are validated by a security manager such as RACF. This user name (userid) is also used by SYSTEM 2000 to uniquely identify each user.





## **Chapter 3: Invoking SYSTEM 2000 Applications**

URL Setup .....	5
Database Access.....	6
Operator Communication.....	8

---

### **URL Setup**

After starting up your browser of choice, enter the URL in the following format to execute the required CGI program:

```
//S2KCUST.MVS.COM/CGI-bin/CGI-program
```

where

- S2KCUST.MVS.COM is the name of the MVS system on which your Multi-User software is executing. You can also use the TCP/IP address of S2KCUST.MVS.COM.
- CGI-bin is the name of your CGI-BIN subdirectory. s2k-bin is the default.
- CGI-program is the name of the SYSTEM 2000 CGI program to be executed. For SCF access, the default name is s2kcgid. For operator access, the default name is s2kcgio.

**Note:** For security reasons, each CGI program can access only one Multi-User, which is designated at installation time (see *SYSTEM 2000 V2 Basic, Multi-User, QueX, and Interface to CICS: Installation Guide*). For sites with multiple Multi-Users—for instance, a production and a test Multi-User—a unique subdirectory for each Multi-User is required.

To access your test Multi-User, the URL might be as follows:

```
//S2KCUST.MVS.COM/s2k-testbin/s2kcgid
```

To access your production Multi-User, the URL might be as follows:

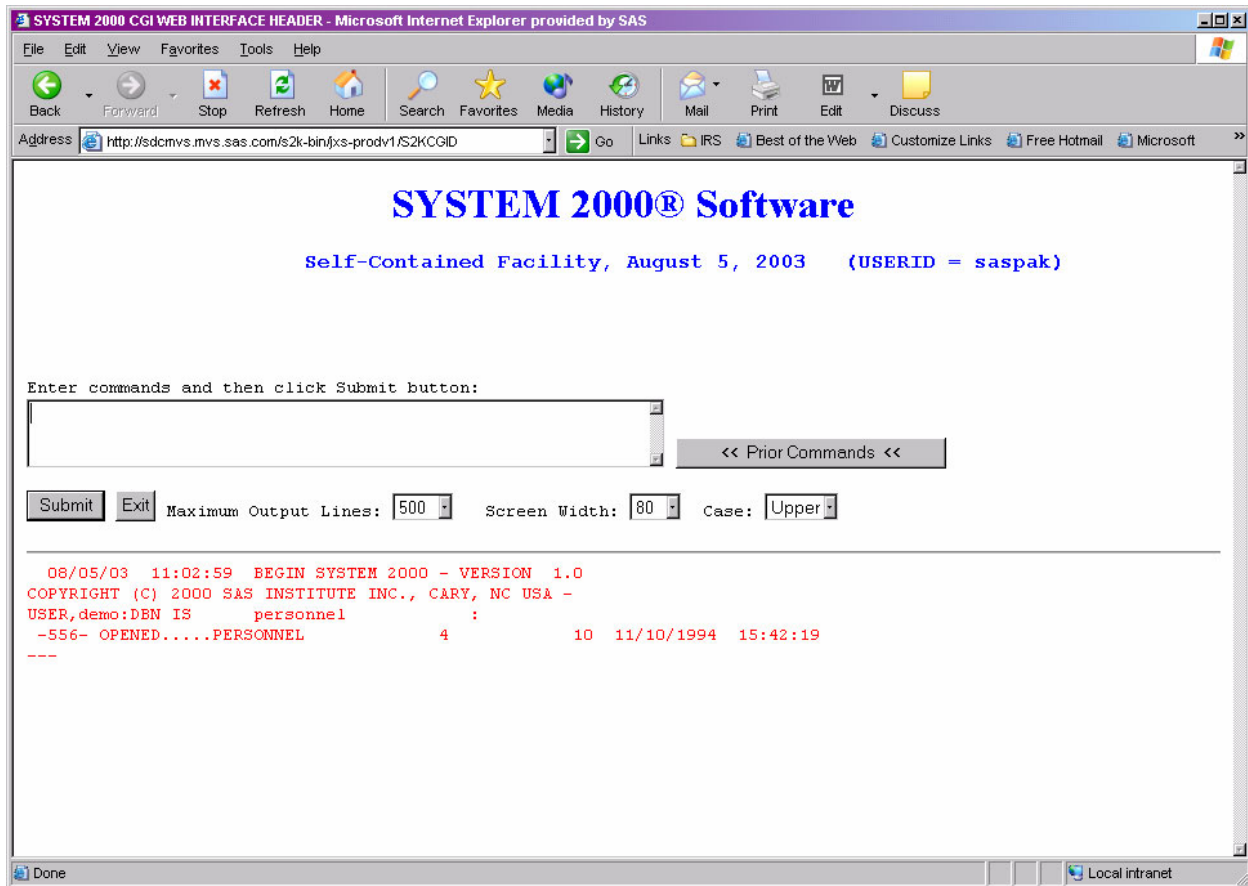
```
//S2KCUST.MVS.COM/s2k-prodbin/s2kcgid
```

## Database Access -- Sign-on SYSTEM 2000

To begin Database Access, enter the required URL for SCF access. You will receive the following sign-on screen:

The screenshot shows a web browser window titled "S2KU WEB INTERFACE HEADER - Microsoft Internet Explorer provided by SAS". The address bar contains the URL "http://sdcmvs.mvs.sas.com/s2k-bin/S2KCGID". The main content area displays the "SYSTEM 2000® Software" logo and a sign-on form titled "SYSTEM 2000 SCF WEB INTERFACE". The form is a self-contained facility for entering sign-on information. It includes fields for "USER PASSWORD" (masked with dots), "DATABASE NAME TO ACCESS" (containing "personnel"), and two dropdown menus for "ARE YOU CREATING A NEW DATABASE ?" and "DO YOU NEED EXCLUSIVE USE OF THE DATABASE ?" (both set to "NO"). A "Submit" button and a "Reset" button are located at the bottom of the form. The browser's status bar at the bottom shows "Done" and "Local intranet".

After the required information is entered, you click the **Submit** button to transfer data (known as a *form* in HTML terms) to your MVS Web server. To clear all the data in the form and restore the original values, click the **Reset** button. After sign-on, the following screen is displayed in your browser:



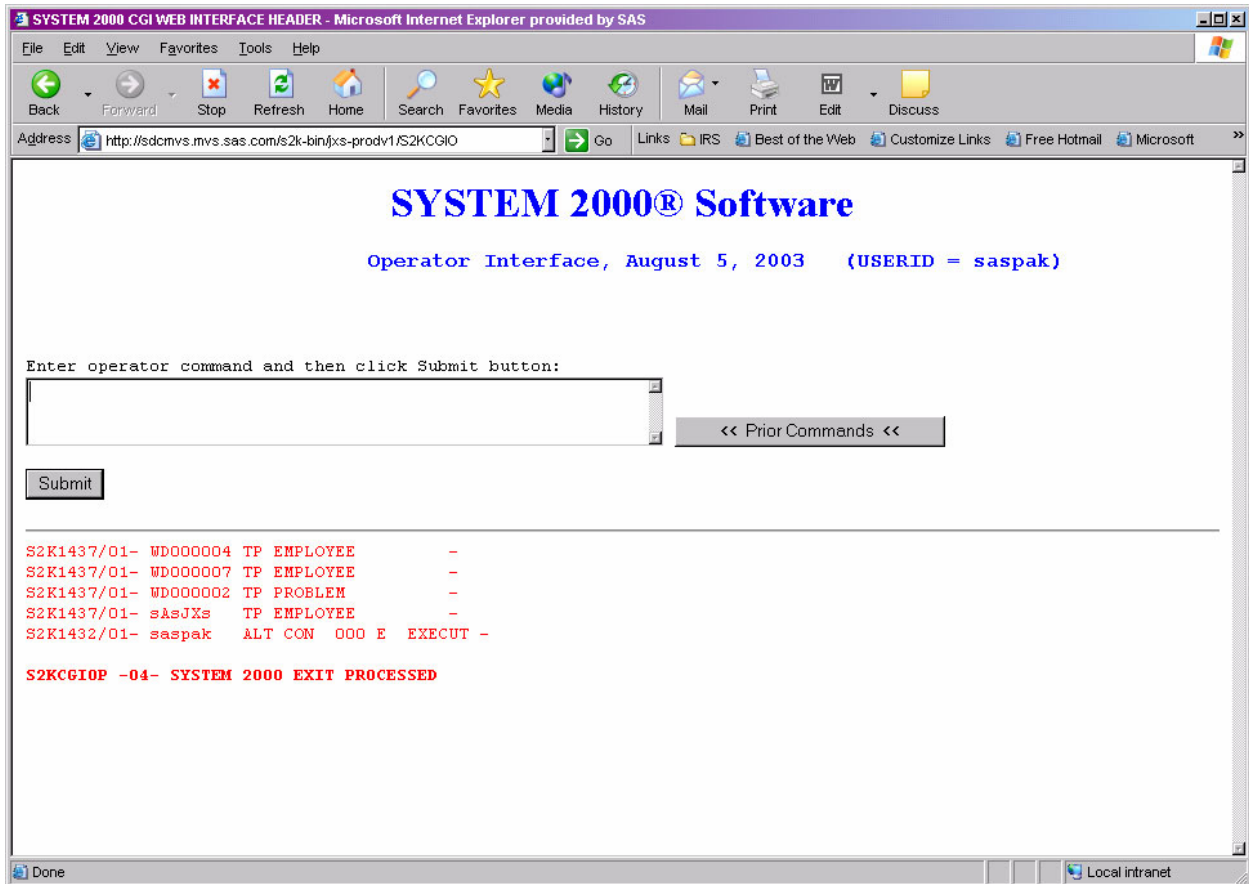
Type in your SCF commands and click the **Submit** button. To exit, click the **Exit** button. Three pull-down menus enable each user to customize the session and you can change these values as often as needed.

- **Maximum Output Lines** enables the user to limit the number of lines sent from SYSTEM 2000 to the browser.
- **Screen Width** enables the user to change screen width from the default of 80.
- **Case** enables the user to change the default case (upper) to mixed.

One additional button, **Prior Commands**, enables the user to view and select previous commands for editing and then submission. Extraneous blanks are removed from text when saved in **Prior Commands**. They are not restored when the command is retrieved.

## Operator Communication

To begin operator access, enter the required URL. You will see the following screen. The initial request issues a D A command.



To process your request, type a SYSTEM 2000 operator command and click the **Submit** button. Prior operator commands can be viewed and edited for submission by clicking the **Prior Commands** button. For further information, see the *SYSTEM 2000 Software: Product Support Manual* for operator command descriptions.

## **Chapter 4: Messages and Codes**

S2KCGIDB AND S2KCGIOP.....	9
Unrecoverable Errors.....	10

---

### **S2KCGIDB AND S2KCGIOP**

XX = "DB" OR "OP"

S2KCGIXX -01- UNABLE TO ALLOCATE STORAGE- TRY AGAIN

The CGI interface is unable to acquire sufficient storage to continue processing. Your region size might need to be increased.

S2KCGIXX -02- MULTI-USER COMMUNICATION ERROR. UNABLE TO CONTINUE, RC=

RC08 = Invalid SVC request code  
 RC12 = Invalid URB for this call  
 RC16 = No such SVC return code  
 RC20 = User found/not found in SVC table  
 RC24 = Multi-User TP busy ... try again  
 RC28 = IRA space not available for user

The CGI interface could not communicate with the Multi-User region. The return codes provide more detail.

S2KCGIXX -03- SYSTEM 2000 BUSY, PLEASE TRY AGAIN

The Multi-User region did not respond to a CGI request in a timely fashion. Try again.

S2KCGIXX -04- SYSTEM 2000 EXIT PROCESSED

A request to exit SYSTEM 2000 was successful.

S2KCGIXX -05- ERROR ENCOUNTERED IN SYSTEM 2000, UNABLE TO CONTINUE, RC=

RC04 = Request cancelled- S2K TP being quiesced  
 RC08 = TP terminal table is full  
 RC12 = User already active in Multi-User  
 RC16 = User Logon previously started  
 RC20 = Discrepancy in URB address  
 RC24 = Unknown error

Multi-User encountered an unexpected condition. The return codes provide more detail.

S2KCGIXX -06- -800- SYSTEM 2000 ERROR CODE ----

See the *SYSTEM 2000 Software Messages and Code* manual for an explanation of the error code.

S2KCGIXX -07- USER NO LONGER ACTIVE, PLEASE SIGN-ON

Your session was terminated due to a lack of activity. Please sign on to SYSTEM 2000 again.

S2KCGIXX -08- RESOURCE SHORTAGE, TRANSACTION ABORTED

A request generated an excessive amount of output that could not be processed because of a storage shortage. Your region size might need to be increased, or you might need to reduce the Maximum Output Lines limit.

S2KCGIXX -09- MULTI-USER TP NOT ACTIVE. UNABLE TO CONTINUE

Multi-User is probably not executing.

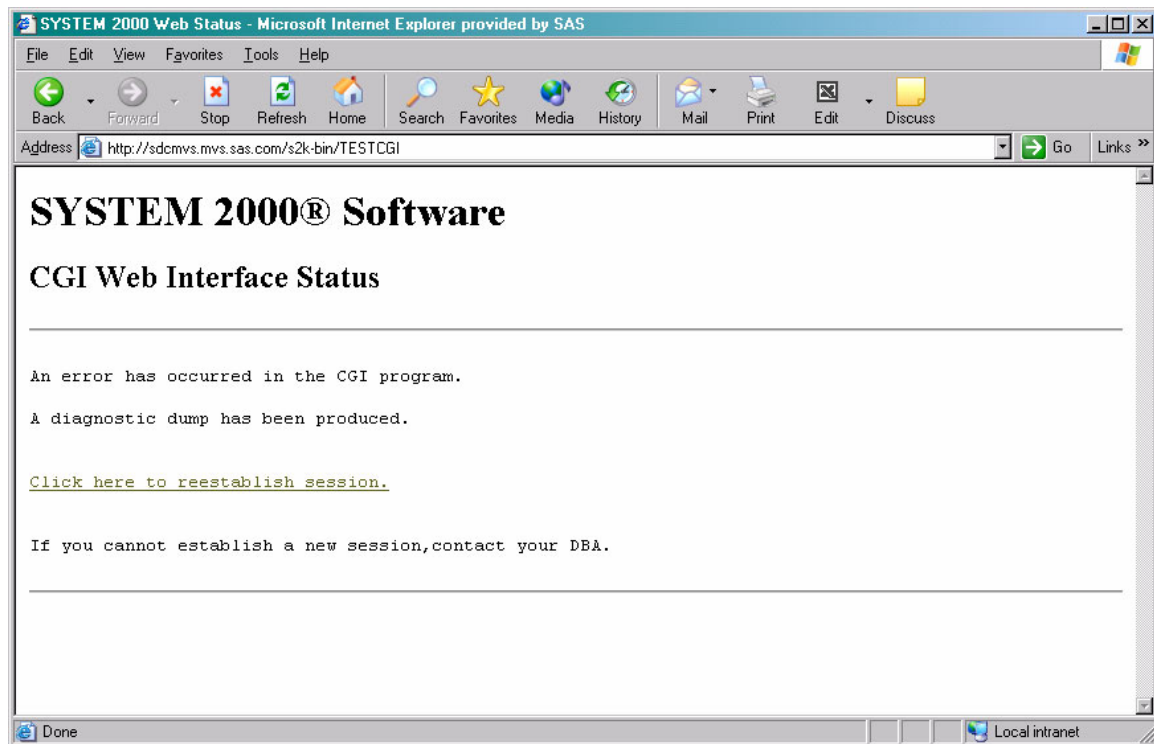
S2KCGIXX -10- S2KCOM FILE INVALID, VERIFY INSTALLATION

The Multi-User com file data set name is invalid. Please see the *SYSTEM 2000 V2 Basic, Multi-User, QueX and Interface to CICS: Installation Guide*.

---

## Unrecoverable Errors

When an unrecoverable error has occurred, SYSTEM 2000 executes a diagnostic dump to aid in problem determination. The following screen is sent to the browser:



## **Chapter 5: Installation**

To install the CGI Web interface, you must create two load modules—S2KCGID (CGI SCF interface) and S2KCGIO (CGI operator interface)—from object modules provided in your source library, and then zap the name of your Multi-User com file into the load modules you've created.

The following jobs, JCLCGID and JCLCGIO, are generated in your S2K.V1.CNTL library during installation.

The only modification you must make to the generated jobs is to supply the name of the HFS cgi-bin subdirectory that holds the CGI programs. Edit the SYSLMOD in STEP1 and the SYSLIB in STEP2. Consult your HFS or OpenEdition administrator for the proper PATHMODE and PATHOPTS settings.

Notes for more than one Multi-User:

Each CGI program can access only one Multi-User, which is specified by the com file that is zapped in STEP2. If your site wants to access multiple Multi-Users with CGI, you should have a unique CGI subdirectory for each Multi-User to be accessed. Change the CGI subdirectory name in STEP1 and STEP2, change the Multi-User com file data set name, and then rerun the job.

An alternative is to change the CGI program name to allow access to different Multi-Users. Change all occurrences of S2KCGID in STEP1 and STEP2 to a unique name, change the com file data set name in STEP2, and rerun the job. The URL entered in your browser must reflect any changes to the subdirectory or program names.

For example, to access Multi-User "A," the CGI program name might be S2KMUDA. To access Multi-User "B," the program name might be S2KMUDB. Each program will have a unique data set name.

```
//JCLCGID JOB
//*
//* LINK OBJECT MODULES THAT COMPOSE SYSTEM 2000 CGI SCF
//* INTERFACE INTO HFS DIRECTORY WITH MEMBER NAME S2KCGID.
//* CHANGE SYSLMOD TO YOUR SITE'S CGI-BIN DIRECTORY.
//* CONSULT YOUR HFS ADMINISTRATOR FOR APPROPRIATE SETTINGS
//* FOR CORRECT PATHMODE
//*
//STEP1 EXEC PGM=IEWBLINK,REGION=500K,
// PARM=(LIST,NOREUS,NORENT,LET,MAP,
// 'CASE=MIXED','AMODE(31)','RMODE(ANY)')
//SYSPRINT DD SYSOUT=A
//INLIB DD DSN=S2K.V1.SOURCE,DISP=SHR
//*
//SYSLIB DD DSN=CEE.SCEELKEX,DISP=SHR
// DD DSN=CEE.SCEELKED,DISP=SHR
//SYSLMOD DD PATH='/www/s2k-bin',
// PATHOPTS=(OWRONLY,OCREAT,OTRUNC),
```

## 12 SYSTEM 2000 V2 CGI Web Interface: Administrator's Guide

```
//  PATHMODE=(SIRWXO,SIRWXG,SIRWXU)
//*
//SYSLIN DD *
    INCLUDE INLIB(S2KCGID)
    INCLUDE INLIB(S2KCGIDB)
    INCLUDE INLIB(S2KCGIDH)
    INCLUDE INLIB(S2KCGICH)
    ENTRY CEESTART
    NAME S2KCGID(R)
/*
//*****
//* APPLY ZAP TO CGI WEB HFS MEMBER S2KCGID
//*****
//*
//* ZAP THE DSN NAME OF YOUR SYSTEM 2000 MULTI-USER COM FILE.
//* CHANGE THE SYSLIB DD STATEMENT TO THE CGI-BIN DIRECTORY
//* USED IN STEP1. THE REP STATEMENT SHOULD BE THE HEX
//* REPRESENTATION OF YOUR COM FILE.
//* I.E. S2K.COM.FILE = X'E2F2D24BC3D6D44BC6C9D3C5'
//*
//STEP2 EXEC PGM=IMASPZAP,
//  PARM='IGNIDRFULL'
//SYSPRINT DD SYSOUT=A
//SYSLIB DD PATH='/www/s2k-bin',
//  PATHDISP=(KEEP,KEEP),PATHOPTS=(ORDWR)
//*
//SYSIN DD *
*
* ZAP CARDS FOR CGI WEB
*
* S2KCOM DATASET NAME IS
* S2K.COM.FILE
*
  NAME S2KCGID S2KCGICM
  REP 0000 E2F2,D24B,C3D6,D44B,C6C9,D3C5
//*

//JCLCGIO JOB
//*
//* LINK OBJECT MODULES THAT COMPOSE SYSTEM 2000 CGI OPERATOR
//* INTERFACE INTO HFS DIRECTORY WITH MEMBER NAME S2KCGIO.
//* CHANGE SYSLMOD TO YOUR SITE'S CGI-BIN DIRECTORY.
//* CONSULT YOUR HFS ADMINISTRATOR FOR APPROPRIATE SETTINGS
//* FOR CORRECT PATHMODE
//*
//STEP1 EXEC PGM=IEWBLINK,REGION=500K,
//  PARM=(LIST,NOREUS,NORENT,LET,MAP,
//  'CASE=MIXED','AMODE(31)','RMODE(ANY)')
//SYSPRINT DD SYSOUT=A
//INLIB DD DSN=S2K.V1.SOURCE,DISP=SHR
//*
//SYSLIB DD DSN=CEE.SCEELKEX,DISP=SHR
//  DD DSN=CEE.SCEELKED,DISP=SHR
//SYSLMOD DD PATH='/www/s2k-bin',
//  PATHOPTS=(OWRONLY,OCREAT,OTRUNC),
```



```

//  PATHMODE=(SIRWXO,SIRWXG,SIRWXU)
// *
//SYSLIN DD *
    INCLUDE INLIB(S2KCGIO)
    INCLUDE INLIB(S2KCGIOP)
    INCLUDE INLIB(S2KCGIOH)
    INCLUDE INLIB(S2KCGICH)
    ENTRY CEESTART
    NAME S2KCGIO(R)
/*
//*****
// * APPLY ZAP TO CGI WEB HFS MEMBER S2KCGIO
//*****
// *
// * ZAP THE DSN NAME OF YOUR SYSTEM 2000 MULTI-USER COM FILE.
// * CHANGE THE SYSLIB DD STATEMENT TO THE CGI-BIN DIRECTORY
// * USED IN STEP1. THE REP STATEMENT SHOULD BE THE HEX
// * REPRESENTATION OF YOUR COM FILE.
// * I.E. S2K.COM.FILE = X'E2F2D24BC3D6D44BC6C9D3C5'
// *
//STEP2 EXEC PGM=IMASPZAP,
//     PARM='IGNIDRFULL'
//SYSPRINT DD SYSOUT=A
//SYSLIB DD PATH='/www/s2k-bin',
// PATHDISP=(KEEP,KEEP),PATHOPTS=(ORDWR)
// *
//SYSIN DD *
*
*   ZAP CARDS FOR CGI WEB
*
* S2KCOM DATASET NAME IS
* S2K.COM.FILE
*
NAME S2KCGIO S2KCGICM
REP 0000 E2F2,D24B,C3D6,D44B,C6C9,D3C5
// *

```



# Your Turn

---

We want your feedback.

- If you have comments about this book, please send them to **yourturn@sas.com**. Include the full title and page numbers (if applicable).
- If you have comments about the software, please send them to **suggest@sas.com**.



# SAS® Publishing gives you the tools to flourish in any environment with SAS!

Whether you are new to the workforce or an experienced professional, you need to distinguish yourself in this rapidly changing and competitive job market. SAS® Publishing provides you with a wide range of resources to help you set yourself apart.

## SAS® Press Series

Need to learn the basics? Struggling with a programming problem? You'll find the expert answers that you need in example-rich books from the SAS Press Series. Written by experienced SAS professionals from around the world, these books deliver real-world insights on a broad range of topics for all skill levels.

[support.sas.com/saspress](http://support.sas.com/saspress)

## SAS® Documentation

To successfully implement applications using SAS software, companies in every industry and on every continent all turn to the one source for accurate, timely, and reliable information—SAS documentation. We currently produce the following types of reference documentation: online help that is built into the software, tutorials that are integrated into the product, reference documentation delivered in HTML and PDF—free on the Web, and hard-copy books.

[support.sas.com/publishing](http://support.sas.com/publishing)

## SAS® Learning Edition 4.1

Get a workplace advantage, perform analytics in less time, and prepare for the SAS Base Programming exam and SAS Advanced Programming exam with SAS® Learning Edition 4.1. This inexpensive, intuitive personal learning version of SAS includes Base SAS® 9.1.3, SAS/STAT®, SAS/GRAPH®, SAS/QC®, SAS/ETS®, and SAS® Enterprise Guide® 4.1. Whether you are a professor, student, or business professional, this is a great way to learn SAS.

[support.sas.com/LE](http://support.sas.com/LE)



**THE  
POWER  
TO KNOW®**

