FOCUS® for S/390®

CMS Installation Guide
Version 7.0

Contents

Preface

This is the installation guide for Release 7.0 of the VM/CMS system version of FOCUS. It defines the VM/CMS configurations required for the operation and maintenance of FOCUS, and takes you through the installation process step by step. It is written for the VM/CMS user support group, not for the community of FOCUS end users. You will find that FOCUS is very easy to install because it is an application-level product, and every effort has been made to keep the installation procedures simple. A working copy of FOCUS can be installed with only a user-level knowledge of VM/CMS and these instructions, without any prior knowledge of FOCUS.

This installation manual is organized as follows:

- Chapter 1 is a brief description of the components which can be installed and the environment required for their execution.

- Chapter 2 contains the step-by-step installation procedures.

- Chapter 3 describes various customization issues.

- Chapter 4 describes the installation of User Exits.

- Chapter 5 describes Interface Installation.

- Chapter 6 deals with various maintenance topics.

- Chapter 7 describes utilities.

- Appendix A describes some common mistakes made during FOCUS installation.

- Appendix B shows a Hexadecimal to decimal conversion chart.

Each FOCUS 7.0 release tape comes with a specific version of the *FOCUS VM/CMS Installation Guide*, identified by the date on the cover. A new version of the installation guide is published only when additions or corrections are needed, and it may not change with each PUT Level.

Read this manual before you start the installation, and if you have any questions, call your local IBI representative or the IBI Installation Services Department in New York. The telephone number is (212) 736-4433.

1 FEATURES AND COMPONENTS

This chapter describes the installation options and the CMS configurations required for the installation and execution of FOCUS. The actual installation steps are detailed in Chapter 2.

1.1 Mainframes and Operating Systems

The CMS version of FOCUS 7.0 runs on any IBM or plug-compatible mainframe running the VM/ESA (ESA feature) operating system (i.e., not VM/ESA 1.5). All versions of VM/ESA that are supported by the operating system manufacturers are compatible with FOCUS 7.0.

Note: 370 mode is not supported.

1.2 Installed Features

In order to make the installation as easy as possible, all but one or two of the FOCUS features that you ordered are delivered fully enabled. The few choices that you have to make relate to mutually exclusive options or to considerations of run-time efficiency. This manual covers the installation of all the available options and configurations of FOCUS. If you obtain additional FOCUS products, you will receive installation manuals for them.

This manual covers the installation of the following components:

- The basic FOCUS system.

- Changes to FOCUS defaults.

- High-resolution graphics on IBM 3270 type terminals, along with the ICU Interface.

- User exits.

- Interface installation.

These options are described in the following sections.

The major database interfaces and products whose installation is covered in separate manuals are:

ADABAS	ORACLE	XMI/DB2	XMI/VSAM
FOCCALC	SQL/DS	XMI/IDMS	
IDMS	SYSTEM 2000	XMI/IMS	
INTELLECT	TERADATA	XMI/SQL/DS	
MODEL 204	XMI/DATACOM	XMI/TOTAL	

The basic FOCUS system contains all the FOCUS features needed for the majority of all applications and its installation requires only user-level knowledge of CMS utilities. All other installation steps are optional and they can be deferred until you have installed the basic system and have become familiar with it.

1.2.1 The Basic FOCUS System

From an installation standpoint, the basic FOCUS system consists of many FOCUS features installed in several steps. The basic system contains everything except graphics support for IBM 3270 type terminals and interfaces to complex databases created by other DBMS systems. It contains all the FOCUS data management functions, including FIDEL (the FOCUS full screen data entry facility), and the entire FOCUS query language and report writer. The report writer works with FOCUS databases, and also with sequential, ISAM, and VSAM files. The basic system includes high resolution graphics for a limited set of ASCII graphics terminals, but not for IBM 3270 type terminals.

The basic system is a prerequisite for the use of all other FOCUS features.

1.2.2 High-Resolution Graphics on IBM 3270 Type Terminals

FOCUS high-resolution graphics are supported on a variety of ASCII devices, in asynchronous mode, and also on graphics terminals such as the IBM 3270 series. For the supported ASCII terminals, FOCUS graphics will be enabled in all cases, without any action on your part.

For 3270 type terminals, FOCUS requires the assistance of the IBM GDDM graphics support product. If GDDM is installed at your site and you want to include 3270 type graphics support in FOCUS, make sure that the ADMNLIB TXTLIB, which contains the GDDM code, is accessible during the subsequent execution of the CMS EXEC that generates FOCUS. At most sites this TXTLIB resides on a CMS system disk that is automatically accessed from all CMS virtual machines. In that case no further action on your part is required. The CMS EXECs that generate FOCUS will always install 3270 type graphics support if the required TXTLIB is accessible when they are executed.

1.2.3 The FOCUS/ICU Interface

FOCUS can be used to generate graphs in conjunction with IBM's Interactive Chart Utility (ICU). The normal FOCUS GRAPH syntax is used and all of its capabilities are available. The ICU Interface can either place the user directly in the ICU Environment or can save the graph format and data for subsequent ICU processing. The installation requirements are the same as the IBM 3270 type graphics option. See Chapter 5 for execution time requirements.

1.2.4 User Exits

Two user exits can be installed with FOCUS:

- The Usage Accounting Exit.

- The FOCUS Password User Exit.

The Usage Accounting Exit (UACCT) can be used to capture FOCUS usage statistics, such as the number of records retrieved and lines printed, aggregated at the FOCUS command level rather than at the user ID level. The Usage Accounting Exit will be alerted to log attempted violations of FOCUS security, and it can also be used to limit access to FOCUS procedures and files. Detailed information on the Usage Accounting Exit is available in Chapter 4.

The FOCUS Password User Exit (FOCUSID) enables an external security system to set passwords automatically. With this exit, users need not know the password for an application. Detailed information on the FOCUS Password User Exit is available in Chapter 4.

The distributed version of FOCUS contains dummy routines that resolve the exit calls, and if you are not interested in these exits you simply do nothing. They are independent of one another and they can always be added later on.

1.3 Virtual Machine Size Requirements

The minimum and recommended virtual machine sizes required to run FOCUS are:

		with MAINTAIN
minimum	2700K	5200K
recommended	5000K	6500K

The smaller configurations are adequate for dealing with simple files and modest maintenance procedures. The recommended size can accommodate all but the most extreme production level applications.

NOTE: MAINTAIN is a new FOCUS 7.0 facility for maintaining data files. MAINTAIN can be used instead of the MODIFY facility when developing applications.

If you will also be using IBM 3270 type terminals for high-resolution FOCUS graphics, you should add about 512K to each of these configurations, unless the GDDM graphics support program is implemented as a Saved Segment. If it is a Saved Segment, the use of GDDM will not increase the virtual machine size requirements in any significant way.

If you are accessing non-FOCUS databases (e.g., SQL/DS) you will also need additional memory

MAINTAIN application developers who use the FOCUS Painter to create WINFORMs should increase their definition by 1M.

1.4 Required CMS Disks

You need two CMS minidisks for storing FOCUS. We refer to them as the FOCUS maintenance and production disks. You also need space for the NSSs. Any disk device acceptable to VM will do, and the CMS minidisks should be formatted in blocksize 4096 bytes.

1.4.1 The Maintenance Disk

The maintenance disk is the CMS minidisk onto which you unload the FOCUS distribution tape. Initially this disk should be empty and you should not store any other files on it.

You must have different maintenance disks for different FOCUS releases. This is a critical requirement: you may generate a defective copy of FOCUS if you load a maintenance tape for one release onto the maintenance disk of another release. When you phase out an older FOCUS release and want to reuse its maintenance disk for the next release, you must erase all the files on it. A simple way to do that is to use the CMS FORMAT command: it erases all the files on the disk and at the same time assigns a CMS label to it. Although you can label this disk any way you like, we suggest a name such as FMnnnn, where nnnn is the FOCUS release signature. For example, FM7001 is a good descriptive name for the maintenance disk for FOCUS Release 7.0, Put Level 01.

The maintenance disk should not be accessed by FOCUS users. This will make it possible to do the greater part of FOCUS maintenance and new release testing while end users are still using the current production release.

1.4.2 The Production Disk

After installation, the production CMS minidisk will contain an executable copy of FOCUS. This is the disk to which all FOCUS users must be linked when they invoke FOCUS, and it will contain all files necessary for execution of the FOCUS version that you have installed. Most of the files on this disk will be created by the CMS EXECs that create the installed version of FOCUS: FOCUS load modules, the text of FOCUS error messages, etc. You can add your own locally developed files, such as text of user-written subroutines, or CMS EXECs of interest to all FOCUS users. The set of files created by the FOCUS installation process on the production disk can vary from release to release.

As with the maintenance disk, the CMS label of the production disk is immaterial to FOCUS, but we suggest FOCUS as the label of the production disk of the current version of FOCUS to which all users should be linked by default. If you have more than one version of FOCUS installed, we suggest a descriptive label such as FCnnnn for the FOCUS production disk. Thus FC7001 is a good label for the production disk of FOCUS Release 7.0, Put Level 01.

1.5 Shared Storage

The NSSs, are dynamically defined and no special preparation is necessary. Shared storage conserves system resources such as real storage, paging devices, and paging. Because many virtual machines use the same FOCUS modules, only one copy of the modules, rather than many, must be paged in and out of real storage. Thus, the system uses real storage more efficiently, there is less need for space on paging devices, there is less contention for paging and users can define smaller virtual memory sizes.

The FOCDFSEG EXEC is used to define the FOCUS, DLL and HLI NSSs. Chapter 2 of this manual details the use of this EXEC.

2 BASIC INSTALLATION

This chapter describes the installation procedures step by step, and assumes that you have already read Chapter 1.

The steps for installing a new release of FOCUS are:

1. Define the FOCUS production and maintenance disks.

2. Unload the FOCUS distribution tape.

3. Modify the CMS EXECs that generate FOCUS.

4. Install the FOCUS site code.

5. Select FOCUS default startup options.

6. Generate FOCUS.

7. Test the generated version of FOCUS.

8. Move FOCUS to the production disk.

9. Test FOCUS on the production disk.

10. Link user IDs to the production disk.

If you are installing the FOCUS Menu, see Chapter 3 for installation instructions.

If you are installing the FOCUS ToolKit, see Chapter 3 for installation instructions.

If you are installing translated FOCUS error messages (NLS), see Chapter 3 for installation instructions.

2.1 Define the FOCUS Production and Maintenance Disks

The total disk space requirements for the various versions of FOCUS are summarized in the following table:

Maintenance disk, all FOCUS versions	28,800 4K blocks
Production disk,	11,250 4K blocks

For SFS directories, allow the number of 4K blocks specified above.

Note: For National Language support (NLS), the maintenance requirements increase by 1000 4K blocks for each language on the tape. Production disk requirements increase by 1000 4K blocks for each language used.

For FBA disks (3370, 9335, etc.) which are allocated in 512-byte blocks, take the number above and multiply by 8.

For CKD devices, allocate the appropriate number of cylinders to give the required amount of space. The table below lists common CKD devices from IBM and the number of 4K blocks that fit on a cylinder.

Device	4K Blocks/Cylinder
3330	57
3340	24
3350	120
3375	96
3380	150
3390	180
9345	150

The production and maintenance disks should be two distinct CMS minidisks and must have no files on them. If you are defining new CMS disks for these functions they must be formatted by the CMS FORMAT command. The sizes above are calculated for disks formatted in 4K blocksizes. You may use blocksizes of 1K or 2K, but you may need to increase the disk sizes for CKD devices.

The CMS label is immaterial to FOCUS, but refer to Chapter 1 for suggested disk labels.

2.2 Unload the FOCUS Distribution Tape

The FOCUS distribution tape is an unlabeled 6250 BPI 9-track tape, or a 3480 cartridge, created by the VMFPLC2 command. This step moves the contents of the tape or cartridge onto the maintenance disk defined in Section 2.1.

To unload the tape:

- Mount the tape on a 6250 BPI drive as virtual 181, or the cartridge on a 3480 drive as 181.

- Access the maintenance disk as your A disk, in READ/WRITE mode.

- Issue the VMFPLC2 command to unload the tape or cartridge to unload all files onto the maintenance disk:

```
VMFPLC2 LOAD * * A
```

If you are installing FOCCALC, see Chapter 5.

If you are installing National Language messages, see Chapter 3.

If you are installing other features, such as the Application Control Environment (ACE), the current installation instructions should be included with your tape, and are available from your IBI representative.

- When the tape or cartridge is unloaded, detach virtual 181.

2.3 Modify the CMS EXEC that Generates FOCUS

The FOCDFSEG EXEC defines the FOCUS, HLI and DLL NSSs to VM. By default, the NSSs are called FOCSEGXA, HLISEGXA and DLLSEGXA.

The shared part of each NSS is defined by the SR attribute of the DEFSEG command, and the nonshared part is defined by one or more EW attributes.

Change the FOCNAME.XA, FOCADDR.XA, HLINAME.XA, HLIADDR.XA, DLLNAME.XA, and DLLADDR.XA values. These NSSs must reside above the 16M line and not overlay any other NSS used during a FOCUS session or the running of an HLI program..

During the installation, the mode is checked and the appropriate values from the XA variables are used. 370 mode is not supported.

NOTE: If you edit FOCDFSEG EXEC, the record format must remain F and the record length must remain 80. You may change the NSS addresses, but do not change the size. Do not change any other lines in FOCDFSEG EXEC.

.The distributed sample FOCDFSEG EXEC is:

```
/* Name and addresses for FOCUS and HLI segments for VM/XA       */

    /* exploitive mode execution (machine XA or ESA).                */

    /* Please modify the next 6 statements with:                     */

    /*  -->  your chosen segment(s) name                             */

    /*  -->  the addresses selected for the segment(s)               */

    /* Do not change the spaces in these lines.                      */

    /* Do not put quotes around segment names.                       */

    /*****************************************************************/


     FOCNAME.XA = FOCSEGXA
     FOCADDR.XA = '1800-1AFF SR 1B00-1DFF EW'


     HLINAME.XA = HLISEGXA
     HLIADDR.XA = '1E00-1EFF SR 1F00-1FFF EW'


     DLLNAME.XA = DLLSEGXA
     DLLADDR.XA = '2800-2BFF SR 2C00-2FFF EW'
  /*****************************************************************/

    /* End of user modifications.                                    */
```

2.4 Install the FOCUS Site Code

A unique identifying site code is assigned to each site where FOCUS is installed. This code, of the form nnnn.nn, is displayed in the FOCUS release signature whenever FOCUS is first entered, and also by the ? RELEASE command. You need to know your site code whenever you call IBI with any question regarding FOCUS service or maintenance. It is the key to all our service and maintenance records.

The site code is embedded into FOCUS itself, at installation time. FOCUS will run properly without an embedded site code, but the release signature will show a blank where the site code would be.

The site code of your installation is shown on the packing list that accompanied your installation package. If you do not know your site code, you can always obtain it by calling Installation Services Department in New York, at (212) 736-4433.

Using the CMS editor, create a new file on your FOCUS maintenance disk named FOCSITE CODE. The record format must be F and the record length must be 80.

Enter your site code as the first seven characters of the first and only record of this file. Do not enter any other characters on the record.

The site code is always of the form nnnn.nn and must include the period.

2.5 Select FOCUS Default Startup Options

Some installations may wish to change the startup options for FOCUS. FOCUS provides two means for implementing site-wide configuration parameters.

1. FOCPARM ERRORS is executed before each user's PROFILE FOCEXEC, and may only include FOCUS SET commands. FOCUS SET commands are documented in the *FOCUS for IBM Mainframe Users Manual Release 7.0.*

    The sample FOCPARM ERRORS provided on the FOCUS tape is shown below:

```
-*-------------------------------------------------------------------*
-*  THIS SECTION CONSISTS SOLELY OF SET COMMANDS, USED TO CUSTOMIZE   *
-*  THE BEHAVIOR OF FOCUS AT YOUR SITE.  PLEASE NOTE THAT ONLY SET    *
-*  COMMANDS ARE SUPPORTED, AND THAT ANY OTHER FOCUS COMMANDS ARE     *
-*  NOT PERMITTED AND WILL FORCE YOU OUT OF FOCUS.  THIS MEMBER MAY   *
-*  NOT BE USED AS A PROFILE EXCEPT FOR SET COMMANDS.                 *
-*-------------------------------------------------------------------*
```

```
SET EMPTYREPORT=OFF

SET FIELDNAME=NEW

SET QUALCH=.

SET QUALTITL=OFF

SET HOLDSTAT=OFF

SET HOTMENU=OFF

SET IMMEDTYPE=OFF

SET AUTOPATH=ON

SET AUTOINDEX=ON

.
```

2. An assembly language file called FOCPARM has also been provided, which enables sites to change startup default options, including some which may not be specified in SET commands. Instructions have been provided for changing the following startup options for FOCUS:

- Displaying the FOCUS banner (BANNER).

- Clearing the screen (CLRSCRN).

- National Language Support Defaults (LANG).

- Selecting an alternative PROFILE or no PROFILE (PROFOPT).

- Continental Decimal Notation (CDN).

The options may be changed by replacing old options with new ones, and then assembling and linking the options into FOCUS. The default values in the sample FOCPARM provided with FOCUS are shown below. A value of '1' enables an option; a value of '0' disables an option.

```
      * This file is used to change startup options                    *
      *                                                                 *
      FOCPARM  CSECT                                                    *
      BANNER  DC     F'1'            1. Indicates display banner        *
      CLRSCRN DC     F'1'            2. Indicates clear screen at startup *
      *                                                                 *
      * NATIONAL LANGUAGE SUPPORT DEFAULTS                              *
      *                                                                 *
      LANG    DC     F'1'            3. Indicates Language Number  (INTLCM) *
      JTERM   DC     CL8'IBM3270'  4,5.Indicates J-Terminal       (INTLCM) *
              DC     F'0'            6. Available                        *
              DC     F'0'            7. Available                        *
              DC     F'0'            8. Available                        *
      *                                                                 *
      PROFOPT DC     F'0'            9. NOPROF/PROFILE 0=not allowed,1=allow*
      CDN     DC     F'0'           10. CDN SETTING 0=OFF 1=ON           *
      XDBSC   DC     CL4'@  '       11. CHARACTER FOR EXT. DB SECUR. (7975) *
      PCHOLD  DC     F'1'           12. PCHOLD FLAG                (11108) *
      TTFEX   DC     CL4'PDS '      13. DSORG OF TABLTALK FOCEXEC  (11516) *
      DATTIM  DC     CL4'EDA '      14. DATE/TIME FORMAT           (13619) *
      *----------------------------------------------------------------*
      * A value of '1' enables an option, a value of '0' disables an option *
      * Other values are defaults for the option.                      *
      *                                                                 *
      * DO NOT ADD, DELETE, OR CHANGE ORDER OF THE OPTIONS ABOVE!       *
      *                                                                 *
```

NOTE: Since each installation of FOCUS generates its own version of the FOCPARM options, the procedures outlined below must be performed each time a new version or PUT Level of FOCUS is installed.

- Edit the file FOCPARM ASSEMBLE (using XEDIT or your system's equivalent), to revise the options as needed.

- After making the change, file FOCPARM back onto the maintenance disk.

- Assemble the file FOCPARM ASSEMBLE with the following command, ensuring that the resulting TEXT file is located on the maintenance disk:

    ```
    ASSEMBLE FOCPARM
    ```

    Make sure the new version of FOCPARM ASSEMBLE precedes the old version in the CMS search order.

2.6 Generate FOCUS

This step creates a core of FOCUS load modules on the production disk with the majority of code in the FOCUS NSS defined in Section 2.3 It also creates your FOCUS site code.

Before you execute this step you should know:

- Whether or not you need graphics support for 3270-type graphics terminals.

- If user exits will be installed.

You need to log on to a Class E virtual machine to generate FOCUS. You cannot create FOCUS from a general user class G virtual machine.

2.6.1 Spool the console for documentation purposes:

```
CP SPOOL CON START
```

2.6.2 Define Storage.

Use the DEF STOR command to set the virtual machine size to at least 5 megabytes higher than the ending address of the highest of the three segments.

2.6.3 Set Machine.

```
SET MACHINE ESA
```

Note: 370 mode is not supported.

2.6.4 IPL CMS

```
IPL CMS
```

2.6.5 Release Disks

Release all unused CMS mini disks. This list includes all mini disks which are not required for the installation of FOCUS. The FOCUS maintenance disk and the CMS system disks are required. The maintenance disk must be accessed as A, in READ/WRITE mode. The CMS system disks will most likely be 190 and 19E, accessed as S and Y/S respectively.

2.6.6 Locate the ADMNLIB TXTLIB for GDDM support (optional).

If you are not including graphics support for IBM 3270 type terminals or the ICU Interface, which require GDDM, proceed to Section 2.6.7.

If you are including graphics support, verify the accessibility of the required GDDM library by issuing the CMS command:

```
LISTFILE ADMNLIB TXTLIB *
```

If you cannot locate this file on the currently accessed disks, you must determine where it is and explicitly access the disk on which it is found. If you fail to do this, the next step will create FOCUS without graphics support for IBM 3270 type terminals.

See Chapter 5 for considerations for running the ICU Interface.

2.6.7 Installing user exits and changing FOCUS limits (optional)

If you are not including user exits or changing FOCUS limits, proceed to Section 2.6.8.

If you are including any user exit, the disk containing the compiled program(s) must be accessed. See Chapter 4 for additional information.

If you are changing FOCUS limits the appropriate files must be edited and assembled.

2.6.8 Execute GENFS

The FOCUS NSS and other files needed by FOCUS are generated by the GENFS EXEC on the maintenance disk.

NOTE: You must have edited FOCDFSEG EXEC on the maintenance disk See Section 2.3.

Invoke the GENFS EXEC:

```
GENFS
```

The GENFS EXEC writes messages to the terminal as it proceeds. If you receive any CMS error messages during this step, call the IBI Installation Services Department in New York, at (212) 736-4433, or your local FOCUS representative.

2.6.9 Close the terminal console spool

```
CP SPOOL CON CLOSE STOP
```

This will cause the terminal console input and output commands to be printed on the high-speed printer unless directed elsewhere by the SPOOL CON START command described in Section 2.6.1. Save this output for your own documentation and have it on hand if you call the IBI Installation Services Department in New York or your local FOCUS representative regarding any installation problems.

2.7 Test the Generated Version of FOCUS

This step tests the version of FOCUS residing on the maintenance disk in the smallest virtual machine on which it can run.

- Define the minimum operational virtual machine (see Chapter 1).

- IPL CMS.

- Release all CMS disks except the production disk, the maintenance disk and the CMS system disks.

- The maintenance disk must be accessed as A, in READ/WRITE mode.

2.7.1 Enter FOCUS

Enter FOCUS via the CMS EXEC named FOCUS:

        FOCUS

FOCUS is always entered via this CMS EXEC, which is created by GENFS EXEC which inserts your FOCUS segment name. When FOCUS is entered it displays the release banner. You should see a single caret (>).

2.7.2 Test the terminal I/O.

Press ENTER without typing anything else, not even a blank. The response you should receive is simply the word FOCUS.

2.7.3 Execute the FOCUS test procedure.

Next, enter the following command:

    EX CARTEST

This test FOCEXEC runs through the major test areas and prints reassuring messages if all is well. Use ENTER in full-screen mode and CLEAR to page through the test. The end of this short test is signaled by the message:

        AT END OF TEST MAJOR AREAS OK

You can return to the CMS command level by typing the FOCUS command FIN when you receive the above message.

2.7.4 Online Release Information

Release statistics, installation and operation changes, program temporary fix (PTF) information, and release notes are available online. To view the online release information, issue the following command from the FOCUS prompt:

```
>> EX READMEF
```

This FOCEXEC allows you to choose what release information you are interested in (PTFs, Installation information, New Features, etc.). These reports contain all of the information that was previously published in the Maintenance Log for each FOCUS PUT level, and replace the Maintenance Log.

2.8 Move FOCUS to the Production Disk

This step moves all the components required for FOCUS execution from the maintenance disk to the production disk. If any FOCUS users are linked to the production disk, you must wait until they all log off or they all detach it.

- Access the maintenance disk as A.

- Access the production disk as C, in READ/WRITE mode.

- Release all other CMS disks, except for the system disks.

- Copy FOCUS and the executable FOCUS components. Execute the COPYFS EXEC on the FOCUS maintenance disk:

      COPYFS

If you wish to install the FOCUS Menu, FOCUS TOOLKIT, National Language messages, perform the instructions in Chapter 3.

2.9 Test FOCUS on the Production Disk

You can test FOCUS on the production disk as follows:

- Define the virtual machine size as in the first bullet in Section 2.7.

- IPL CMS.

- Access 2 cylinders of temporary storage as A, in READ/WRITE mode.

- Access the production disk as B/B, which makes it read only.

- Release all other disks except the CMS system disks.

- Repeat instructions in Sections 2.7.1 through 2.7.3.

2.10 Link User IDs to the Production Disk

End users must access the FOCUS production disk in order to execute FOCUS. Recall that the production disk contains executable FOCUS modules, files of error messages, useful FOCEXECs, etc., and also the CMS EXEC named FOCUS, through which FOCUS must be entered.

The link and the access to this disk are routine CP/CMS functions and FOCUS has no special requirements in this area, but you should make it easy and transparent to your users. The link must be READ-only and it should not require a READ password.

The required CP LINK command can be placed in each user's VM directory, in which case it becomes effective immediately after the logon, or it can be issued from each user's PROFILE EXEC. In either of these two cases the PROFILE EXEC should also issue the associated CMS ACCESS command.

If you want to give users access to several FOCUS releases, use the method outlined above to access the default release and create special EXECs on the CMS S or Y disks to access all other releases. For example:

```
/*
 *  This is the XFOCUS EXEC.  It resides on the
 *  CMS S disk and it executes FOCUS &releasee
 *  whose production disk is FOC70T.
 *
 *  The default FOCUS release is linked as 301
 *  and it is accessed as F
 */
arg parms
'RELEASE 301'
'CP LINK FOC70T 191 401 RR'
'ACCESS 401 F'
'EX FOCUS' parms
'RELEASE 401'
'CP DETACH 401'
'ACCESS 301 F'
```

3 Customizing FOCUS

3.1 Changing FOCUS Limits

3.1.1 Limiting the Number of Active FOCUS Databases Allowed

The default maximum number of FOCUS databases that can be active at one time is 255 files.

Active Files

An active file is defined as a file that appears in a USE statement or a file that is referenced by a FOCUS command (e.g., MODIFY FILE fn). All files mentioned in the USE command are added to the current list of files. These files remain in the list until a subsequent USE either replaces them or clears them.

Files not previously referenced in a USE statement are added to the list if they appear in the following FOCUS commands:

DEFINE	MATCH	TABLEF
FSCAN	MODIFY	? FDT
GRAPH	REBUILD	? FILE
HOLD FORMAT FOCUS	SCAN	
JOIN	TABLE	

Files that are referenced in the above FOCUS commands, but not in a USE command, successively replace each other in the file table. This allows you to execute FOCUS commands against many more files than the installed limit.

The following files also count as open active files: the logical file created by the COMBINE command, files referenced by LOCATION segments, cross-reference files, and files mentioned in the MODIFY FIND and LOOKUP functions.

FOCSTACK counts as an open file when MODIFY is executed. In local mode, FOCSORT is counted toward the limit. In SU mode, both FOCSORT and FOCUSSU are active files.

Memory Requirements

When files are opened, users need up to 500 bytes of memory for operating system control information and an additional 4K bytes of memory for each file opened. If FOCUS shadow writing is on (SET SHADOW=ON/OLD), the memory requirements are approximately 500 bytes for operating system control information plus 20K bytes for each file opened.

The Sink Machine

In SU mode, the Sink Machine has its own file table which counts the active files. If the maximum number of active files allowed is exceeded, the sink session terminates. This can happen if multiple users each request different files on the sink.

Files are activated on the sink when a source machine issues a FOCUS command against a file on the sink. If more than one user requests the same file on the sink, that file is counted only once in the file table.

The USE command issued by a source machine against a sink file does not activate the file in the sink's file table, but it does activate the file in the user's file table. If an individual user references more than the maximum number of files allowed, an error message appears only for that user and SU processing is not affected.

Error Messages

(FOC297) THE NUMBER OF FILES EXCEEDS MAXIMUM:

The number of files provided in the FOCUS 'USE' command exceeds the current maximum allowed (usually 255). If the file has dynamically loaded sections (LOCATION or CRFILE) these must also be counted. However, files mentioned in a USE...LOCAL statement are not counted.

Occurs when a FOCUS user exceeds the limit of active files via a USE command. The user can reduce the number of active files with another USE command or a USE CLEAR command.

(FOC494) FOCUS INSTALLATION ERROR

A FOCUS installation option was incorrectly installed, or an attempt was made to execute an unlicensed copy of FOCUS in VM/PC. Contact your FOCUS representative or your company FOCUS coordinator.

This message appears when you attempt to execute FOCUS and the option to increase the number of active files is installed incorrectly. This is most likely due to incorrect editing of the files or members, as specified in the installation instructions below.

(FOC683) TOO MANY DATABASES ARE IN USE. FOCUS SESSION TERMINATED

FOCUS has a default limit of 255 databases that can be in use at one time. One database USE entry is created for each file mentioned in a USE command and one for each FOCUS or XMI file accessed. A file has been opened that exceeds the limit.

Occurs if the file table is full and the user activates a file in a way other than a USE command. This message is followed by an exit from FOCUS.

Installation

If you are installing the option to decrease the number of active files, you must first edit the files BASCM ASSEMBLE and FILCTL ASSEMBLE on the FOCUS maintenance disk and assemble each file.

1. Edit the file BASCM ASSEMBLE and change the line that reads:

    ```
    NUMFIL    EQU       255
    ```

    to read

    ```
    NUMFIL    EQU       52
    ```

    Do not change any other lines in this program. After you make the change to NUMFIL, file BASCM ASSEMBLE back onto the FOCUS maintenance disk.

    If you change the value of NUMFIL in BASCM ASSEMBLE, you must make the same change to the value of NUMFIL in FILCTL ASSEMBLE below.

2. Assemble BASCM with the CMS command:

    ```
    ASSEMBLE BASCM
    ```

3. Edit the file FILCTL ASSEMBLE and change the line that reads

    ```
    NUMFIL    EQU       255
    ```

    to read:

    ```
    NUMFIL    EQU       52
    ```

Do not change any other lines in this program. After you make the change to NUMFIL, file FILCTL ASSEMBLE back onto the FOCUS maintenance disk.

4. Assemble FILCTL with the CMS command:

    ```
    ASSEMBLE FILCTL
    ```

5. Generate FOCUS with the GENFS EXEC. Ensure that the new BASCM TEXT and FILCTL TEXT are located before the old versions in the CMS search order.

3.1.2 Setting the Maximum Number of Cache Pages

FOCUS sites may limit the maximum number of cache pages allowed per FOCUS session. The limit may be set during the installation of FOCUS to a value between 3 and 524288 pages (the hardware maximum), where each cache page is 4096 bytes in length. The default limit is 524288 pages. To change the limit on the maximum number of cache pages that can be requested, follow the installation instructions below.

An individual user or batch job may specify cache pages up to one less than the site-selected maximum with the SET CACHE command:

```
SET CACHE = <0>

           <n>
```

where:

   0   Allocates no space to cache; this is the default. Cache is inactive.

   n   Is the number of 4K-byte pages of contiguous storage allocated to cache
          memory. The minimum is two pages. The maximum value is 524287, or one
          less than the site-selected maximum that was specified during installation.

In normal use, the number of pages requested by users should be far less than the hardware maximum; otherwise the paging subsystem may be unfavorably affected.

Installation

1. After unloading the FOCUS distribution tape onto your maintenance disk, and before
    actually generating FOCUS, edit the file CCHCOM ASSEMBLE (using XEDIT or your
    system's equivalent), to specify your site's new maximum number of cache pages. Do this
    by locating the line that reads:

    ```
    MAXPAGES EQU    524288
    ```

    replacing 524288 with the maximum number of cache pages you want to allow. This
    value of MAXPAGES must be a value from 3 to 524288. Do not change any other lines in
    the file. After you make the change, file CCHCOM back onto the maintenance disk.

2. Assemble the file CCHCOM ASSEMBLE with the following command, ensuring that the
    resulting TEXT file is located on the maintenance disk:

    ```
    ASSEMBLE CCHCOM
    ```

3. Continue with the installation procedure outlined Chapter 2

NOTE: If you wish to change the maximum number of cache pages after you have already generated FOCUS, you will have to re-generate after performing Steps 1 and 2 above, in order to use the new maximum cache limit. Perform the steps in Chapter 2 starting with Section 2.6, Generate FOCUS. Before re-genning, ensure that the new version of CCHCOM TEXT is located before the old version in the CMS search order.

3.1.3 Resetting the Maximum Allowed Data Exceptions

FOCUS by default allows for ten data exception interrupts to occur before terminating with the following error:

```
(FOC204)  TOO MANY INTERRUPTS.   RUN TERMINATED.
```

This imposed limit of ten may be changed using the steps below.

The data exception limit may be changed by using the ZAP command to alter it. This is performed by the following CMS commands, which back up the existing FOCUS text, generate a new module, and zap the text with the new limit. The specific steps are as follows:

1. Access the FOCUS maintenance disk as A and the FOCUS production disk as C, both in writable mode.

2. Back up the current FOCUS text:

    ```
    COPYFILE FOCUS TEXT A FOCUS BACKUP A (OLDD REPL
    ```

3. Put FOCUS TEXT into a temporary TXTLIB on the maintenance disk called TEMPLIB:

    ```
    TXTLIB GEN TEMPLIB FOCUS
    ```

4. Zap the new TXTLIB file with your changes. For example, you might want to change the limit from 10 to 20.   You would ZAP the existing limit of x'0000000A' with x'00000014'. It is important to verify the contents of the bytes to be zapped before changing. The following CMS commands perform this:

    ```
    ZAP TXTLIB TEMPLIB

    NAME   FOCUS  LIMIT  <--- Specify the module and CSECT.

    VER   00  0000000A  <--- Verify that pos 0 contains x'0000000A'.

    REP   00  00000014  <--- Replace the fullword with x'00000014'.

    END     <--- End of control statements.
    ```

    REP will replace the existing x'0000000A' with x'00000014'.

5. Copy TXTLIB member FOCUS of TEMPLIB back to the CMS file FOCUS TEXT. For example:

    ```
    FILEDEF INMOVE DISK TEMPLIB TXTLIB A (MEMBER FOCUS

    FILEDEF OUTMOVE DISK FOCUS TEXT A

    MOVEFILE INMOVE OUTMOVE
    ```

6. Install FOCUS using GENFS.

If you want unlimited data exceptions, change the allowable data exception limit to zero.

A version of FOCUS can have only one limit. If you need more than one limit, create more than one copy of FOCUS giving each a different value for the limit.

Since each installation of FOCUS generates the original FOCUS TEXT file, the aforementioned procedures must be performed each time a new version or PUT Level of FOCUS is installed.

3.1.4 Increasing the Field Buffer Size

The default maximum size of any record handled by FOCUS is 16,384 bytes. The size of a record is determined by adding together the internal lengths of the fields in the file, after word alignment. Include all real fields, all virtual fields (cross-referenced or joined segment data), and all temporary fields (defined or computed fields).

It is possible to increase the record buffer from 16K bytes up to a maximum of 32K bytes in increments of 4K bytes. This feature is necessary for a few very large applications involving large numbers of temporary fields.

The number of Dialogue Manager variables (& variables) allowed is dependent on the size of the record buffers. The default size of 16K in FOCUS allows 512 Dialogue Manager variables (about 40 of these are reserved by FOCUS). Each additional 4K added to the record buffer size will increase the number of Dialogue Manager variables by 128, allowing a maximum of 1024 variables when the record buffer is set to 32K.

The total length of all Dialogue Manager variables must also fit within the record buffer size. With 16K buffers, we could have 512 variables of 32 bytes each or only 163 variables where the average length was 100 bytes (16300 bytes used of the total of 16*1024).

The buffer size of LINREC and of DATREC must be the same and may be any multiple of 4K between 16K and 32K.

NOTE: This is for those sites that increased the default maximum in their previous release or are now going to increase the maximum: All compiled MODIFY procedures must be recompiled if the maximum field buffer size is different then when the MODIFY procedure was compiled

Installation

1. Edit the file LINREC ASSEMBLE and change the line that reads:

   ```
   DS  XL(16*1024)   CURRENT SIZE IS 16K
   ```

   replacing the 16 (for 16K bytes) with any multiple of 4 (e.g., 20, 24) up to a maximum of 32. For instance:

   ```
   DS  XL(24*1024)   CURRENT SIZE IS 24K
   ```

   File LINREC ASSEMBLE back onto the FOCUS maintenance disk.

2. Assemble LINREC with the CMS command:

   ```
   ASSEMBLE LINREC
   ```

3. Edit the file DATREC ASSEMBLE and change the line that reads:

   ```
   DS  XL(16*1024)   CURRENT SIZE IS 16K
   ```

   replacing the 16 (for 16K bytes) with any multiple of 4 (e.g., 20, 24) up to a maximum of 32. For instance:

   ```
   DS  XL(24*1024)   CURRENT SIZE IS 24K
   ```

   File DATREC ASSEMBLE onto the maintenance disk.

4. Assemble DATREC with the CMS command:

   ```
   ASSEMBLE DATREC
   ```

5. Generate FOCUS with the GENFS EXEC. Ensure that the new LINREC TEXT and DATREC TEXT are located before the old versions in the CMS search order.

3.2 Installing the FOCUS Menu

The FOCUS Menu is a convenient way to access FOCUS facilities using windows. A few installation steps are required to enable the menu.

1. After moving FOCUS to the production disk, execute the COPYSHL EXEC. This step copies the additional files for the FOCUS Menu from the maintenance disk to the production disk.

2. Continue the FOCUS installation with Chapter 2 section Test FOCUS on the Production Disk

3. To enable the FOCUS Menu, edit the file SHELPROF FOCEXEC. This file resides on the production disk, but it may be located on any disk.

    The FOCEXEC contains the following commands:

    ```
    -* This FOCEXEC will be executed only after PROFILE FOCEXEC

    -* execution has been completed.

    -* INCLUDE FMMAIN
    ```

    Remove the comment from the line with the INCLUDE command:

    ```
    -* This FOCEXEC will be executed only after PROFILE FOCEXEC

    -* execution has been completed.

    -INCLUDE FMMAIN
    ```

4. Test the FOCUS Menu by entering FOCUS via the CMS EXEC named FOCUS. The FOCUS Menu will appear:

    The cursor should be positioned next to the first option on the menu, "Next, Next Menu Option."

    You can return to the CMS command level by pressing PF3 to go to the Quit Menu:

    Move the cursor next to the last option on the menu, "Quit FOCUS," and press ENTER.

5. Continue the installation of CMS FOCUS with Chapter 2, section Link user Ids to the Production Disk.

3.3 Installing the FOCUS Toolkit

The FOCUS ToolKit is a convenient way to access FOCUS facilities using windows. A few installation steps are required to enable the menu.

1. After moving FOCUS to the production disk, execute the COPYISH EXEC. This step copies the additional files for the ToolKit from the maintenance disk to the production disk.

2. Continue the FOCUS installation with Chapter 2 the section, Test FOCUS on the Production Disk.

3. Customize the ToolKit with site-specific information.

    To prepare the background window for the ToolKit, you will be asked to provide the company name, a support center phone number, the installation date, the IBI FOCUS Site Code, a default printer destination, and a list of optional printer destinations. The company information will be displayed on the background of the ToolKit Menuing system. The printer information will be used to assign a default printer when first executing the ToolKit and allow the users to easily change the destination of printed output. You will be asked for this information in simple fill in the blank screens.

    This installation will create two files on the production FOCUS disk. The first will contain a site specific background for the ToolKit (ISHFPROF DATA) and user selections for print destination (ISHDPNTR DATA).

    NOTE: The ToolKit can be customized for user groups by creating a separate ISHFPROF and ISHDPNTR files for each group on different minidisks. This minidisk should be accessed in a search order prior to the FOCUS production disk. Step &gen must be executed for each of these minidisks.

3a. Attach the FOCUS Production disk as your writable A minidisk and enter FOCUS.

3b. Execute the ToolKit Installation Procedure.

        EX ISHFINST

    Enter company name at the prompt and press ENTER.

    Enter telephone number for support at the prompt and press ENTER.

    Enter install date (in MM/DD/YY format) at the prompt and press ENTER.

    Enter the FOCUS site code at the prompt and press ENTER.

    Enter the default printer at the prompt and press ENTER.

    The printer value is the CP TAG value desired for the company default printer. (NOTE: The user's printer device must be spooled to RSCS for the print options to be effective).

Reply to the prompt asking for additional company printer IDs that can be selected by the user. If the reply is no, installation is complete. If the reply is yes, enter the Note that the first printer in the list will be assigned as the user's default printer. You may also designate a disk file as the output by providing a TAG value of 'DISKFILE' and the disk filename, filetype, and filemode as the description. userid will be prefixed to this name. The disk file MUST be typed in capital letters, as it will not be translated. Up to 18 printers can be added at this time, including the default printer. Changes can be made after the installation by accessing the FOCUS production disk in write mode and executing ISHFPNTR, or by editing the member ISHDPNTR DATA on the FOCUS production disk (be sure to maintain columnar spacing).

Upon completion of the installation, the ToolKit will be executed. Move the cursor next to the last option on the menu, "Exit", and press ENTER.

4. Customize database allocations.

The ToolKit will attempt to dynamically access FOCUS, sequential, and comma delimited files that have been identified to the ToolKit. This is accomplished by creating a FOCEXEC that performs the necessary accesses and USE statements for a given file. This FOCEXEC is named 'filename ISHFALOC', where filename is the name of the file (as used by FOCUS).

For example, to allow the ToolKit to access the CAR FOCUS file, create a FOCEXEC named CAR. This FOCEXEC may appear as follows:

```
CMS CP LINK CARDATA 191 201 RR

CMS ACCESS 201 B

USE ADD

CAR FOCUS B

END

-EXIT
```

Note that any FOCUS commands may be included within this FOCEXEC.

5. To provide automatic execution of the ToolKit upon the user's entry to FOCUS, edit the file SHELPROF FOCEXEC (this step is optional). This file resides on the production disk, but it may be located on any disk.

The original FOCEXEC contains the following commands, which support automatic execution of the FOCUS Menu:

```
-* This FOCEXEC will be executed only after PROFILE FOCEXEC

-* execution has been completed.

-* INCLUDE FMMAIN
```

Change the FOCEXEC to read:

```
EX ISHFSHLL

-EXIT
```

This will allow the ToolKit to execute online only; it will be bypassed in batch.

NOTE: You may give the user the option to execute the ToolKit, the FOCUS Menu, or exit to native FOCUS with this FOCEXEC.

6. To execute the ToolKit, enter FOCUS via the CMS EXEC named FOCUS:

```
FOCUS
```

If the SHELPROF option is not incorporated, the ToolKit may be executed from command line by issuing:

```
EX ISHFALOC
```

NOTE: The SQL/DS Interface must already be installed to take advantage of ToolKit SQL/DS features.

3.4 Install National Language (NLS) messages

FOCUS includes the ability for sites to provide FOCUS messages in a variety of languages. NLS messages are not available for Release 7.0 PUT Level 1. However, all FOCUS distribution tapes DO NOT contain IBI-translated messages.

The steps below describe how to unload the IBI-translated messages from the FOCUS tape:

1. Follow the installation steps in Chapter 2 through Section 2.2 (do not detach virtual 181).

2a. For 6250-BPI tapes, issue the following commands immediately after unloading the FOCUS distribution tape in Chapter 2:

```
VMFPLC2 REW

VMFPLC2 FSF 6

VMFPLC2 LOAD
```

2b. For 1600-BPI tapes, the National Language files are on a second tape. Immediately after unloading the FOCUS distribution tape mount this second tape and issue the following commands:

```
VMFPLC2 REW

VMFPLC2 LOAD
```

3. Complete the FOCUS installation.

4. After completing the execution of COPYFS in Chapter 2:

Copy the IBI-translated messages from your maintenance disk to your production disk.

NLS messages can be copied by executing the COPYNLS EXEC on the FOCUS maintenance disk:

```
COPYNLS
```

Note: The degree of NLS support (data display, messages, menus, and help files) varies from language to language. Please contact your local representative for availability of support for a particular language.

4 User Exits

4.1 Usage Accounting Exit: UACCT

Several user exits are available which allow you to customize FOCUS for your site. XA-compatible versions of any user exits must be used; otherwise, unpredictable results may occur.

4.1.1 Usage Accounting Exit: UACCT

FOCUS contains a user exit designed to log FOCUS usage statistics, to capture attempted violations of the DBA provisions as specified in the Master File Description, and to trap violations detected by external security systems such as RACF and ACF2. Usage statistics are provided following the completion of FOCUS commands which access data, such as TABLE, MATCH, MODIFY, etc., whether entered live or executed from a procedure, and DBA violations are logged as detected. External security violations can be trapped before any data is accessed and cause an orderly exit from FOCUS. The exit routine is also called once at the start of the FOCUS session and once at the end, to permit orderly initialization and wrap-up procedures. It should be understood that FOCUS itself merely provides the necessary information in the exit routine calling sequence, but it does not write an accounting or security log. The responsibility for managing these files and any other resource needed by this facility resides with the installation-written accounting exit.

The distributed copy of FOCUS contains a dummy version of this exit routine. To activate a live version, a small interface routine and the user code are link edited into FOCUS. The user code can be written in any language or mixture of languages, and it can issue all system macros except STAI and STAX. It is entered through a standard IBM CALL macro, at entry point UACCT. Since this code becomes an integral part of the FOCUS code, name conflicts with FOCUS routines must be avoided and it is suggested that all user-written programs start with the letters UA.

UACCT Calling Sequence

The UACCT exit is called at different times for different purposes, but the calling sequence is the same in all cases. The first argument indicates which type of call is being made. For example, in COBOL the UACCT calling sequence is:

```
ENTRY  UACCT USING CALLTYPE ATCB BILLCODE

       COMMAND FILE LINENO PROCEDURE STATS UACVT
```

All arguments are input arguments and must not be modified by the called program, except as noted in the section dealing with external security violations.

CALLTYPE   4-byte binary integer

-1   Initialization call, made at start of job or session.

-2   Wrap-up call, made at end of job or session.

0   Usage statistics call, made following the completion of most FOCUS commands.

1   DBA violation call, made as detected.

2   FOCUS starting processing call, made after parsing but before data access.

ATCB   4-byte address

The address of the FOCUS task control block. The TSO userid or batch job name and various other items can be obtained from this standard IBM control block. Not meaningful under CMS.

The ATCB parameter is present in all calls. The remaining arguments are also present but they are meaningful only when the CALLTYPE is 0, 1 or 2.

BILLCODE   8 characters

FOCUS billing code, set by the FOCUS command SET BILLCODE=value. This argument is included to enable accounting distinctions within a user ID.

COMMAND   8 characters

FOCUS command name to which the exit call applies.

FILE   8 characters

FOCUS filename.

LINENO   4-byte binary integer

The current FOCEXEC procedure line number.

PROCEDURE   8 characters

The name of the FOCEXEC containing the command that triggers the call to the Usage Accounting exit. Dialogue Manager commands and comment lines do not trigger calls to Usage Accounting. If the command that triggers the call is terminal input, PROCEDURE will be blank.

STATS   17 fullword binary integers

Contains either usage statistics or DBA violation data. Ignore it if the call is to signal start of processing (CALLTYPE = 2)

UACVT   Not currently in use.

Usage Statistics Calls (CALLTYPE=0)

The UACCT exit will be called with CALLTYPE=0 for the following FOCUS commands:

> * TABLE
>
> * TABLEF
>
> * MODIFY
>
> * GRAPH
>
> * SCAN
>
> * MATCH
>
>   HOLD
>
>   SAVE
>
>   SAVB
>
>   ANALYSE
>
>   REBUILD
>
>   CMS/TSO
>
>   CREATE
>
>   RETYPE
>
>   REPLOT

The commands marked with an asterisk also generate a start of processing call to UACCT (CALLTYPE=2).

When CALLTYPE is 0 the 17 STATS words contain the information displayed by the ? STATS command. These statistics are also posted as Dialogue Manager parameters, under the &name shown. All statistics are per command, not cumulative over the FOCUS session.

STATS(1)   &RETCODE

FOCUS return code posted by the command (this is not the return code posted when FOCUS exits). Zero indicates that the command executed successfully.

STATS(2)   &RECORDS

The number of records retrieved by a TABLE, TABLEF or GRAPH command. When more than one segment is referenced by the command, a record is a path in the referenced subtree.

STATS(3)   &LINES

The number of lines created by the report, or the number of records SAVED or HELD, before the application of IF TOTAL tests.

STATS(4)   Reserved.

STATS(5)   &BASEIO

The number of 4096 bytes pages read or written in the FOCUS database. The value will be zero for non-FOCUS files.

STATS(6)   The number of reads issued when reporting from a non FOCUS file. The value will be zero for FOCUS files. Each read is a QSAM GET, ISAM GET, or one call to the interface module, as the case may be. In the case of data interfaces, such as the IMS/DB, IDMS, TOTAL, ADABAS, and FOCSAM interfaces, each call produces one instance of one segment.

STATS(7) to STATS(16) are statistics posted by the MODIFY and the SCAN commands. These statistics will have the value zero for all other commands.

STATS(7)   &TRANS

STATS(8)   &ACCEPTS

STATS(9)   &INPUT

STATS(10)   &CHANGED

STATS(11)   &DELETED

STATS(12)   &NOMATCH

STATS(13)   &DUPLS

STATS(14)   &FORMAT

STATS(15)   &INVALID

STATS(16)   &REJECTS

STATS(17)   &SORTIO

The number of reads and writes to the FOCSORT scratch file. Zero indicates that the sort phase of the report is executed entirely in core.

NOTE: FOCUS databases and the FOCSORT scratch file are BDAM datasets and as such must be formatted before they can be used. Formatting occurs when the CREATE command is issued or when the FOCUS database is extended in the course of a MODIFY command; FOCSORT is formatted by the first write into it. The formatting I/O activity is not included in the &BASEIO or in the &SORTIO statistics.

DBA Violation Calls (CALLTYPE=1)

Execution time DBA violations arising from insufficient access rights. generate one of several FOCUS error messages, depending on the nature of the violation, and the accounting exit routine is called with CALLTYPE=1 to log this event. The call to log the violation occurs before the corresponding error message is displayed (i.e., before the user is made aware that the violation was detected). All the calling arguments are as documented above, except the STATS area, which in lieu of statistics contains the following items:

STAT(1)	4 byte binary integer	
	The FOCUS error message number (e.g. 47, 56, etc.).	
STAT(2)	4-byte binary integer	
	The length, in bytes, of the variable portion of the error message.	
STAT(3)	A character string of the length indicated by STAT(2), the variable portion of the error message. This will be the FOCUS filename or fieldname to which the message refers.	

The possible error messages are listed below. The variable portion of the message is shown in brackets.

```
(FOCO47)  USER DOES NOT HAVE SUFFICIENT ACCESS RIGHTS TO FILE:<file>

(FOCO52)  USER DOES NOT HAVE ACCESS TO THE FIELD:<fieldname>

(FOCO54)  THE FILE IS PROTECTED BY DIFFERENT DBA ADMINISTRATOR:<file>

(FOCO56)  THE USER'S ACCESS RIGHTS DO NOT ALLOW INCLUDE OR DELETE:<file>
```

Error messages 54 and 56 can occur only with FOCUS databases, but 47 and 52 can occur in any FOCUS readable file protected by the DBA feature.

Start of Processing Calls (CALLTYPE=2)

These exit calls are made following the completion of the parsing and verification of the retrieval commands (TABLE, TABLEF, GRAPH, MATCH) and of the SCAN and MODIFY commands, but before any attempt is made to access the data. For retrieval commands the start of the processing call is made for all types of data -- sequential and VSAM files, IMS databases, FOCUS databases -- and, in the case of VSAM and QSAM files, before they are opened. The CALLTYPE is 2 and all other arguments are exactly as for the Usage Statistics call which will follow, except, of course, that the STATS argument is not available.

External Security Violations

The UACCT exit routine can perform any type of accounting or logging activity, and it can also interrogate external security systems such as RACF or ACF2 to determine if the current FOCUS command is dealing with secured files or datasets. If a security violation is detected UACCT can terminate FOCUS gracefully by changing the input COMMAND argument to 8 bytes of binary zeroes. In this event FOCUS will return to the operating system with a return code of 8.

The COMMAND argument is the only modifiable argument in the UACCT calling sequence; all other arguments must be left as they were.

FOCUS can be terminated in this way in all UACCT calls in which the CALLTYPE is 0, 1 or 2, but the most logical time to do it is in a type 2 call, after all the parsing has been done and before any data access is attempted.

4.1.2 Installing the Usage Accounting Exit (UACCT)

To install the Usage Accounting exit routine (UACCT) on CMS, you must replace a dummy version of the code that calls UACCT with a working version. This is achieved by copying the files on the maintenance disk. The distribution tape contains the dummy code as file UAINT TEXT and the working version as UAINTSYS TEXT. Take the following steps to install the UACCT exit routine on CMS:

1. Ensure that the FOCUS maintenance disk is the A disk.

2. Make a copy of the dummy exit-calling routine by entering the command:

       COPYFILE UAINT TEXT A UAINTDUM TEXT A (REPL OLDD)

3. Move the working version of the exit-calling routine into place by entering the command:

       COPYFILE UAINTSYS TEXT A UAINT TEXT A (REPL OLDD)

4. Ensure that the disks containing your compiled UACCT TEXT file and all routines that it calls are accessed.

5. Generate FOCUS using the GENFS EXEC.

4.2 Installing and Using an External Password Security System

In FOCUS you can write your own security interface.

The FOCUS password (normally set by the FOCUS command SET PASS=) can also be set automatically by an external security system such as RACF, CA-ACF2 or TOP SECRET. Passwords issued this way are set when FOCUS is first entered and may be permanent (i.e., not overridable by subsequent SET USER, PASS or -PASS commands) or they may be defaults and may be subsequently overridden. They may be permanent for some users, defaults for other users, or not set at all for yet other users. The advantage of setting FOCUS passwords externally is that the password need not be known by the user and does not have to be prompted for or be embedded in a PROFILE FOCEXEC or in an encrypted FOCEXEC.

The FOCUS passwords set this way must, of course, match the FOCUS password in the Master File Descriptions of the files being accessed.

The FOCUS password is set by a CSECT in FOCUS called FOCUSID, which is a dummy in the distributed version of FOCUS. In all cases, the FOCUS password is inferred from your FOCUSID code. The function of the FOCUSID CSECT is to provide FOCUS with an overridable or non-overridable FOCUS password.

NOTE: Any external exits used must be XA-compatible and available for use by FOCUS; otherwise, unpredictable results may occur.

4.2.1 FOCUSID Calling Sequence

```
CALL FOCUSID(ENV,REG1,FOCID,LOGID,RC)
```

where:

Fullword binary integer.

Environment from which call is made.

0	CMS
1	TSO
2	MVS batch job
3	CICS
4	open
5	IMS/DC MP region
6	IMS/DC BMP region

Fullword binary integer. (MVS only.)

Register 1 as passed to FOCUS. Useful only when it points at an IMS PSB.

8 characters.

8-byte FOCUS password returned by FOCUSID. Left-justified, trailing blanks. Upper-case printable EBCDIC character only. Leading and embedded blanks respected. Trailing blanks ignored. The last non-blank character of FOCID determines whether the FOCID is overridable:

If the last non-blank character of FOCID is a period (.) or if the eighth character is not a blank then the FOCUS password is not overridable. If the last non-blank character is not a period and the password is less than eight characters then the password may be overridden using standard PASS, -PASS or SET PASS commands.

The FOCID returned, less the period if any, is set as the user's FOCUS password. The FOCUS password must match the USER= declarations stored in the appropriate Master File Descriptions.

8 characters.

Not used at present.

Fullword binary integer.

Return code posted by FOCUSID.

0   FOCID and LOGID posted by FOCUSID.

4   External Security System not installed.

8   No FOCID field (FOCUS Password) for this user.

16   Fatal error in FOCUSID (FOCUS exits via BDEXIT).

Note that the FOCUS password will not be set if RC is non-zero.

4.2.2 FOCUSID Installation

1. Write and compile/assemble your FOCUSID code. It must have an entry point FOCUSID and the compiler/assembler output must be named FOCUSID TEXT.

2. Append to this FOCUSID TEXT the text of all routines it calls, using COPY APPEND or XEDIT GET.

3. Append ACFINT TEXT to FOCUSID TEXT using COPY APPEND or XEDIT GET, replace the FOCSECUR TEXT file on the maintenance disk with the new interface.

   ```
   COPYFILE FOCUSID TEXT fm1 ACFINT TEXT fm2 FOCSECUR TEXT fm2 (REPL
   ```

   where fm1 is the disk where the FOCUSID TEXT file resides, and fm2 is your maintenance disk.

4. Generate FOCUS using the GENFS EXEC.

Note that if you decide at some point that you no longer want to use the security interface, issue the following command

```
COPYFILE ACFDUM TEXT fm1 FOCSECUR TEXT fm2 (REPLACE
```

and regenerate FOCUS. This will replace the active FOCUSID code with the dummy interface.

NOTE: If your FOCUSID program (together with all of the programs it calls) is fairly large, you may have to increase the size of the non-shared part of the FOCUS NSS.

5 Interface Installation

5.1 Installing the FOCCALC Graphics Facility

FOCALC includes a Graphics facility that enables the display of spreadsheet data as graphics. The Graphics facility requires a 3270 type terminal fitted for graphics with access to the IBM Graphics Data Display Manager (GDDM) software product.

The FOCALC Graphics facility is installed separately from GDDM graphics support for FOCUS high-resolution graphics. A minimum of 2500K bytes of virtual memory is required to run FOCCALC with the Graphics facility.

5.1.1 Installation

The installation process for the FOCCALC Graphics facility should be performed when FOCUS is installed.

1. Follow the installation steps in Chapter 2 through Section 2.2, Unload the FOCUS distribution tape. (do not detach virtual 181).

2. Immediately after unloading the FOCUS distribution tape in Section 2.2 , Unload the FOCUS distribution tape. issue the following commands:

        VMFPLC2 REW

        VMFPLC2 FSF 3

        VMFPLC2 LOAD

3. Complete the FOCUS installation.

    If you are not installing the FOCCALC Graphics facility, the installation process is now complete.

    If you are installing FOCCALC with the Graphics facility, perform the following steps:

4. Locate the ADMRLIB TXTLIB. Verify the accessibility of the required GDDM library by issuing the CMS command:

        LISTFILE ADMRLIB TXTLIB *

    If this file cannot be located on the currently accessed disks, you must determine where it is and explicitly access the disk on which it resides. If you fail to do this, the next step will render FOCCALC unusable.

5. To install FOCCALC Release 2 with the Graphics facility, execute the LINKCA2G EXEC.

5.2 Considerations for Running the ICU Interface

The terminal must have extended attributes and PS storage or Vector Graphics capability in order to be able to run GDDM graphics. (See the IBM GDDM manuals for model numbers.)

The GDDM disk must be attached and a global TXTLIB command issued as follows:

```
GLOBAL TXTLIB ADMNLIB ADMPLIB ADMGLIB
```

Enough main memory must be available to execute ICU with FOCUS. ICU usually requires a minimum virtual storage of 4MB.

6 MAINTENANCE

This chapter deals with a number of topics concerning the maintenance of FOCUS after installation.

6.1 FOCUS Release Numbering

FOCUS release numbers are in the form:

```
V.R
```

V.R represents the version and release or put level of FOCUS.

6.2 The Release Signature

FOCUS runs in a number of operating environments, and in some of them it can be configured in different ways. These differences are what we mean when we speak of different versions: the MVS version or the CMS version. Each of these versions can be created at each release level, sometimes with options selected at installation time. The release signature identifies the most significant of all these possible combinations.

The release banner is always displayed when FOCUS is first entered. In the CMS version, it consists of the release number followed by the current date and time and your site code. For example:

```
FOCUS  7.0     mm/dd/yy  hh.mm.ss  sitecode
```

The release signature can be displayed on demand any time you are within FOCUS by the ? RELEASE command. For the CMS version, ? RELEASE shows the release number follows /XA<CP/A> the date on which the version was generated, your site code, and the PUT Level for the version:

```
FOCUS  7.0.5     CREATED mm/dd/yy  sitecode
```

6.3 PUT Levels

Each FOCUS release tape has a program update level associated with it,.

Following the creation of major new releases, PUT Levels are generated periodically and are available to all users. In general, PUT Levels correct a number of significant problems. The PUT Level may be seen by issuing a "? RELEASE" command within FOCUS. To review the record of prior releases, issue HELP README and select the Release Statistics option on the menu that appears.

PUT tapes are complete FOCUS distribution tapes with corrective service preapplied and tested.

6.4 Corrections to Reported Problems

If you encounter a problem that requires a correction to FOCUS rather than to your own procedures, the correction will become part of the next PUT Level. In some situations, you will receive the correction to your problem as soon as it is available, regardless of when the next PUT Level is scheduled. We call these corrections individual PTFs or reach-ahead service, and they are identified by a PTF number and an Update Level.

You will receive individual PTFs only in response to a specific problems that you yourself report. The solution to problems reported by other users will reach your installation by way of the next PUT Level. The accompanying documentation will tell you how to apply it, identify the problem being corrected, and most importantly, state the range of PUT Levels into which the PTF can be incorporated. It is critical that you do not apply a PTF outside the indicated PUT Level range. If you do, you will probably damage the copy of FOCUS that you are trying to correct.

If you apply more than one PTF to a release, you must apply them in Update Level order. For this reason, please keep a record of all PTFs applied to each of your copies of FOCUS.

The application of individual PTFs does not require that the FOCUS NSSs be redefined to CP.

6.5 Expiration Dates

All production FOCUS releases expire in two years from the date of their creation. The expiration date is clearly noted on the label of the full release distribution tape for your initial installation, and also on the maintenance tapes generated when a new PUT Level is available.

In the last 30 days of its life, each time you enter FOCUS it will issue a warning message that displays the remaining life of the module. If you have to extend the life of a copy of FOCUS, either before or after it has expired, notify the IBI Installation Services Department in New York, or your local FOCUS representative, and you will receive written instructions on how to proceed.

6.6 The Online Release Information

FOCUS distribution tapes contain online information which summarize the new features and error corrections install notes, operational notes, and known problems included in the release.

This information may be viewed online by issuing the command:

```
>>EX READMEF
```

This is a cumulative listing of features added to each FOCUS release.

The summary of error corrections for the release are also included in the problems corrected selection. These are cumulative for each PUT Level.

6.7 Release Tapes

All FOCUS tapes that you receive from IBI are one of two types:

A full release distribution tape. An individual PTF tape.

These tapes are unlabeled 6250-BPI 9-track tapes, or 3480 cartridges, in VMFPLC2 format. You unload them onto the maintenance disk by following the instructions in Chapter 2.

NOTE: If you are using any of the optional interfaces listed in Chapter 1, you must reinstall these interfaces after installing a new PUT Level of FOCUS.

6.8 How to Apply an Individual PTF

An individual PTF changes the contents of one of the standard FOCUS modules. The correction may also affect the error message files.

Each PTF also shows an Update Level number. If you have several PTFs to apply, process each one individually, in ascending Update Level sequence, not in the PTF number sequence. The PTF number is merely a substitute name with no intrinsic significance.

The application of individual PTFs will not be reflected in the FOCUS release signature.

The following procedure should be used to apply the PTFs to your systems:

Step 1   Mount tape or cartridge as 181 on the FOCUS maintenance ID.

Step 2   Access your FOCUS maintenance disk as A in READ/WRITE mode.

Step 3   Issue the CMS command

```
VMFPLC2 LOAD * *
```

If there are special instructions accompanying the PTF tape, follow those steps. If no special instructions accompany the tape, continue with Step 4 below.

Step 4   Execute the GENFS EXEC to create FOCUS (only if it has been previously installed). Please refer to Chapter 2 for further details if needed.

Step 5   If any files of the form GENxxxxx EXEC were unloaded from the PTF tape, as part of this PTF, execute those EXECs now. If more than one PTF is being installed, or more than one GENxxxxx EXEC unloaded, run them in update order.

Step 6   After the FOCUS module has been generated and tested, the new modules can be moved to the FOCUS production disk by executing the COPYFS EXEC.

7 Utilities

7.1 External Sort Considerations

In CMS, you can use one of the following external sort products with any TABLE, EMR, MATCH or GRAPH report request: DFSORT, Syncsort, and VMSORT. The sort must be 31-bit addressable. FOCUS always respects your sort product's installation parameters.

We recommend that you issue a GLOBAL TXTLIB command to identify the location of the sort software. If FOCUS cannot locate the sort is issues a GLOBAL TXTLIB SORTLIB command. If FOCUS still cannot locate the sort software, it terminates with the following error message:

```
 (FOC909) CRITICAL ERROR IN EXTERNAL SORT. RETURN CODE IS: 16
```

You also get a CMS error message if the system sort is DFSORT/CMS and your temporary disk is not large enough for your sort requirements. With DFSORT/CMS, the maximum temporary disk obtainable for a 3380 device is 16 cylinders. If this is not large enough for your sort requests, you may need to modify the DUFMAC MACRO to add space for sort work files. Consult the *IBM DFSORT/CMS* manual for your release of DFSORT.

A Common Mistakes During FOCUS Installations.

Problem 1:		GENFS completes without errors but FOCUS is not working.
	Cause:	Loading a new FOCUS Release tape onto a maintenance disk which contains a previous FOCUS release.
	Action:	Define a new maintenance disk and reinstall. Or, erase all the old files from the maintenance disk via the CMS format command, and reinstall.
Problem 2:		GENFS ABORTS with DMSLIO109S error.
	Cause:	Virtual storage exceeded.
	Action:	Issue the command CP DEF STOR for a larger virtual storage size and re-ipl.
Problem 3:		After successful GENFS, FOCUS ABORTS with an addressing exception 141T in routine FOCMAIN and you are returned to CMS.
	Cause:	Your FOCUS DLL or NSS is overlaying another active NSS,
	Action:	1. Check the disk space allocated for the NSSs. They must conform to sizes specified in Chapter 2.
		2. If you have selected your own name for the NSSs, verify that the references to FOCSEG and DLLSEG in the FOCMAIN EXEC have been changed to reference your NSS names in the FOCUS EXEC.
		3. Reread section and verify the following:
		• FOCUS' NSSs, do not overlap other NSSs, defined to CP.
		• Starting address of FOCUS' NSSs are above highest address of any virtual machine using FOCUS.
		• Based on starting address of each NSS, that the current segment definitions have been calculated and entered.
Problem 4:		GENFS prompts for the address of the FOCUS NSS.
	Cause:	The FOCDFSEG EXEC is missing, does not specify the NSS that you are attempting to install, or does not have fixed-length, 80-byte records.
	Action:	Check that the FOCDFSEG EXEC is available and that it includes the appropriate NSS. The record format must be fixed with a record length of 80.
Problem 5:		GENFS gives the message STORAGE IN USE.
	Cause:	CMS is using storage where the segment is to be loaded.
	Action:	Define more storage and IPL CMS. FOCUS should always be installed from a newly IPL'ed virtual machine.

Problem 6:   GENFS indicates the DLL segment failed to load properly

Action: Redefine the DLL segment using values found in FOCDFSEG. If DLLSEG
                    fails, this segment is purged. Issue the following commands:

```
IPL CMS

ACC  (NOPROF
```

Access the disk with FOCLIB LOADLIB

```
GENLLSEG dllname
```

NOTE: FOCUS will execute without DLLSEG. User storage may need to be
increased.

B Hexadecimal to Decimal Conversion Chart

From hex: Locate each hex digit in its corresponding column position and note the decimal equivalents. Add these to obtain the decimal value.

From decimal: (1) Locate the largest decimal value in the table that will fit into the decimal number to be converted, and (2) note its hex equivalent and hex column position. (3) Find the decimal remainder. Repeat the process on this and subsequent remainders.

NOTE: Decimal, hexadecimal, (and binary) equivalents of all numbers from 0 to 255 are listed in the code table below.

HEXADECIMAL COLUMNS											
6		**5**		**4**		**3**		**2**		**1**	
HEX=DEC		HEX=DEC		HEX=DEC		HEX=DEC		HEX=DEC		HEX=DEC	
0	0	0	0	0	0	0	0	0	0	0	0
1	1,048,576	1	65,536	1	4,096	1	256	1	16	1	1
2	2,097,152	2	131,072	2	8,192	2	512	2	32	2	2
3	3,145,728	3	196,608	3	12,288	3	768	3	48	3	3
4	4,194,304	4	262,144	4	16,384	4	1,024	4	64	4	4
5	5,242,880	5	327,680	5	20,480	5	1,280	5	80	5	5
6	6,291,456	6	393,216	6	24,576	6	1,536	6	96	6	6
7	7,340,032	7	458,752	7	28,672	7	1,792	7	112	7	7
8	8,388,608	8	524,288	8	32,768	8	2,048	8	128	8	8
9	9,437,184	9	589,824	9	36,864	9	2,304	9	144	9	9
A	10,485,760	A	655,360	A	40,960	A	2,560	A	160	A	10
B	11,534,336	B	720,896	B	45,056	B	2,816	B	176	B	11
C	12,582,912	C	786,432	C	49,152	C	3,072	C	192	C	12
D	3,631,488	D	851,968	D	53,248	D	3,328	D	208	D	13
E	14,680,064	E	917,504	E	57,344	E	3,584	E	224	E	14
F	15,728,640	F	983,040	F	61,440	F	3,840	F	240	F	15
0 1 2 3		4 5 6 7		0 1 2 3		4 5 6 7		0 1 2 3		4 5 6 7	
BYTE				BYTE				BYTE			

C User Written Subroutines

Users can write their own non-FOCUS subroutines and then execute them from FOCUS requests.

If FOCUS end users have their own User-written subroutines, they must be accessed as LOADLIB members. Existing LOADLIB members can be used with new releases of FOCUS (unless otherwise stated in the release notes for that release).

The GENSUBLL EXEC helps you generate the user subroutines as LOADLIB members. The resulting LOADLIB must be GLOBALed for individual user's FOCUS session.

C.1 The GENSUBLL EXEC

An EXEC called GENSUBLL is available on the FOCUS production disk to create/add to a LOADLIB.

The CMS command

```
   EX GENSUBLL ?
```

will generate the following description:

```
GENSUBLL EXEC

   Creates or adds members to a CMS LOADLIB, suitable for running

   as user subroutines while inside FOCUS.  A subroutine created in

   this way may contain HLI calls.  This method of creating sub-

   routines is mandatory for execution under VM/XA or VM/ESA in XA

   or ESA mode, and is recommended for use in 6.5 and above.


Syntax:

   GENSUBLL libraryname txt1 <txt2...txtn> <( <lked_parms>

                                            <PLI | COBOL> >


Where:

   libraryname  Name of the LOADLIB in which the member will be added

                or replaced. Required.

   txt1         TEXT file to be included first in the module. Required.

                'Txt1' will also be used as the module name and as the

                ENTRY name.
```

```
      txt2...txtn  Optional additional TEXT files to be included in the
                   module.

      lked_parms   Any valid parameters for the CMS LKED command, except
                   NAME and LIBE.  See CMS documentation or HELP.

      PLI          Specify this option if source language of txt1 is PLI.
                   This causes GENSUBLL to include FSPLIOPT TEXT in the
                   module.  FSPLIOPT specifies an ISASIZE value suitable
                   for running under FOCUS.

      COBOL        Specify this option if the source language of txt1 is
                   COBOL II.  This causes GENSUBLL to include FSCOBOPT
                   TEXT in the module.  FSCOBOPT specifies RTEREUS=YES,
                   so that the module may be run repeatedly under FOCUS.


   Note on TXTLIBs and autocall:
      If any of the txt1-txtn TEXTs contain references to members of
      TXTLIBs, issue GLOBAL TXTLIB libraryname1 libraryname2, etc.
      before running GENSUBLL.  All globalled TXTLIBs will be searched
      if you are running on any of the following versions of VM:
         VM/XA SP2.1 + APAR VM38698
         VM/SP6 + APAR VM45132
         VM/ESA 1.0 + APAR VM45133
         VM/ESA 1.1 and above
      If you are running an earlier release of VM, only the first
      globalled TXTLIB will be searched.


   Output:
      libraryname LOADLIB A with member txt1
      txt1 LKEDIT A


   Usage note:
      To run GENSUBLL-created modules, before entering FOCUS, issue:
        GLOBAL LOADLIB libraryname
   Example:
```

```
   GLOBAL TXTLIB VFORTLIB CMSLIB

  GENSUBLL MYLIB DEMO DEMOX DEMOY (AMODE 31

Will create or replace member DEMO in MYLIB LOADLIB A.

This module will be a linkedit of DEMO, DEMOX, and DEMOY TEXTs,

plus any HLI objects needed to execute as an HLI program while

inside FOCUS, plus TEXTs from VFORTLIB & CMSLIB TXTLIBs needed

to resolve references.  The module will have AMODE 31.

Before entering FOCUS, issue

  GLOBAL LOADLIB MYLIB

Then you may use DEMO as you would any other user-subroutine

in FOCUS.
```

The generated LOADLIB should be made available before entering FOCUS with the CMS command

```
     EX FOCADLIB LOADLIB libraryname
```

or from within FOCUS with the command:

```
 CMS EX FOCADLIB LOADLIB libraryname
```

The FOCADLIB and FOCDELIB commands are fully documented in the

FOCUS for IBM Mainframe User Manual.

HLI Programs

HLI programs called from within FOCUS as user subroutines must be made into LOADLIB members and the appropriate FOCADLIB LOADLIB command issued. See GENSUBLL EXEC for details.

No special action is needed for HLI programs called from outside FOCUS and the normal GENHLI procedure should be used.

User Exit Availability

XA-compatible versions of any user exits must be available, otherwise unpredictable results may occur.

Reader Comments

In an ongoing effort to produce effective documentation, the Documentation Services staff at Information Builders welcomes any opinion you can offer regarding this manual.

Please use this form to relay suggestions for improving this publication or to alert us to corrections. Identify specific pages where applicable. Send comments to:

> Corporate Publications
> Attn: Manager of Documentation Services
> Information Builders
> 1250 Broadway
> New York, NY 10001-3782

or FAX this page to (212) 967-6406, or call at (212) 736-4433.

Name: _____

Company: _____

Address: _____

Telephone: _____ Date: _____

Comments:

Reader Comments