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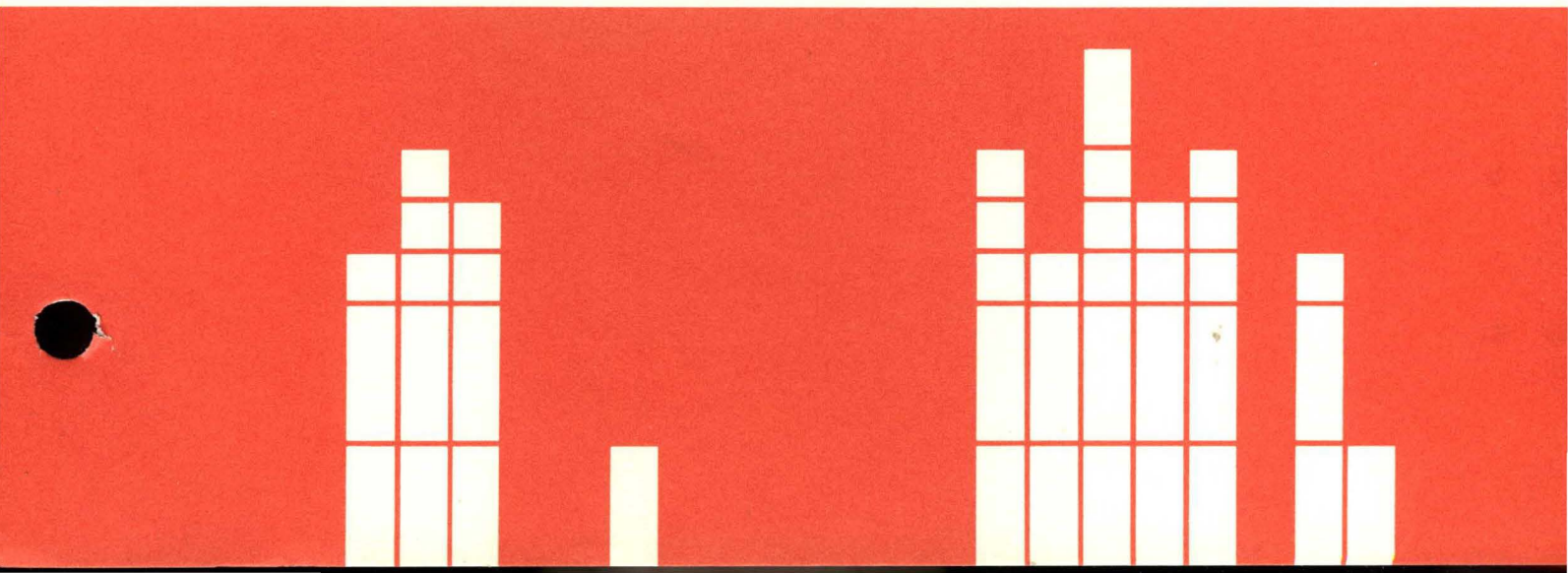
4700 Finance Communication System

Subsystem Operating Procedures

IBM



4700 Finance Communication System

Subsystem Operating Procedures

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Third Edition (June 1983)

This edition, GC31-2032-2, is a major revision of, and obsoletes, GC31-2032-1. It incorporates new and enhanced 4700 features and functions, and has been rewritten in its entirety.

It is the responsibility of the user to establish and maintain appropriate operating procedures for the equipment and system, including those related to the integrity and security of the system, together with audit and control measures.

Changes occur often to the information herein; before using this publication in connection with the installation or operation of IBM equipment, consult the latest *IBM System/370 Bibliography of Industry Systems and Application Programs, GC20-0370,* for the editions that are applicable and current.

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How To Use This Book

This manual is a guide and reference for using the system monitor to control and test the IBM 4700 Finance Communication System. There are procedures to guide you in logging onto, starting, and using the installation diskette and the system monitor, and there are explanations of system messages, controller LED displays, and status information. This manual can be used by the system operator, system programmer, system engineer, and other network operators, both for operating instructions and to supplement the troubleshooting information contained in the *IBM 4700 Finance Communication System Problem Determination Guide*.

The first few chapters of this manual contain procedures that you can follow to perform daily operating tasks. Use these procedures to learn how to use the commands that control the system. After you have mastered these procedures, you will refer to this part of the book less frequently, and will instead use the reference information in the later chapters.

The remainder of this manual contains reference information describing the system monitor's commands, the commands you use to debug application programs, and the various kinds of messages you will receive from the system. As you become more experienced in using the 4700 system monitor, you will use this reference information when you need to be reminded of the format of a command, or the meaning of a specific message.

The appendixes contain information such as statistical counters and status bytes, information used less frequently in operating the 4700 system.

Chapter 1, "Starting Your System," tells you how to start the system for the first time using the IBM-provided installation diskette, how to build your own customized operating diskette, and how to start the system using that operating diskette.

Chapter 2, "The 4700 Installation Diskette," teaches you how to log on using the IBM-provided installation diskette, and how to select and use each installation-diskette function to manipulate data sets and disk and diskette volumes. You also use the installation diskette to change your password, to patch the system microcode, to test an output personal identification number (PIN) protection key, and to log onto the local configuration facility.

Chapter 3, "System Monitor Procedures," describes procedures that rely on system monitor commands. Although you can enter many system monitor commands based only on the reference information contained in Chapter 4, "Command Reference" on page 4-1, some system monitor commands require more complex procedures involving several commands and prompting messages.

Chapter 4, "Command Reference," provides reference information for all system monitor commands (system monitor commands are 3-digit numbers). The commands are listed here in numeric order. Each command description states the purpose of the command, shows the command syntax, describes each operand, lists any special considerations, and provides a sample command and sample output.

Chapter 5, "Debugging Commands," describes the 2-digit debugging commands that you use to troubleshoot an application program. They are listed here in numeric order. To issue these commands, you first issue the system monitor 123 command.

Chapter 6, "Controller Messages," lists all 4-digit controller display messages, and all 5-digit system monitor messages in numeric order.

Chapter 7, "Controller Log Messages," lists all system messages written to the system message log data set.

Appendix A, "Status Messages," describes the status information you can obtain from the system.

Appendix B, "Statistical Counters," describes the statistical counters for 4700 components.

Appendix C, "Loop Terminal Addressing," discusses setting the address switches on your terminal.

Appendix D, "Communications Network Management (CNM/CS)," contains information on using CNM/CS to monitor and control your 4700 system.

For operating instructions for an individual 4700 terminal, you should refer to that device's operating instruction manual.

For problem determination procedures, you should refer to the *IBM 4700 Finance Communication System Problem Determination Guide*

Related Reading

The following publications describe related aspects of the 4700 system and its attached devices:

- *IBM 4700 Finance Communication System, System Summary*, GC31-2016.
- *IBM 4701 Controller Setup and Subsystem Installation Instructions*, GC31-2021.
- *IBM 4704 Display Station Operating Instructions*, GC31-2025.
- *IBM 4710 Receipt/Validation Printer Operating Instructions*, GC31-2028.
- *IBM 4701 Controller Operating Instructions*, GC31-2022.
- *IBM 4701 Controller Models 1, 2, and 5 Repair Manual*, SC31-3511.
- *IBM 4700 Finance Communication System, Problem Determination Guide*, GC31-2033.
- *IBM 4700 Finance Communication System, Controller Programming Library Volume 1: General Controller Programming*, GC31-2066.
- *IBM 4700 Finance Communication System, Controller Programming Library Volume 2: Disk and Diskette Programming*, GC31-2067.

- *IBM 4700 Finance Communication System, Controller Programming Library Volume 3: Communication Programming*, GC31-2068.
- *IBM 4700 Finance Communication System, Controller Programming Library Volume 4: Loop and DCA Programming*, GC31-2069.
- *IBM 4700 Finance Communication System, Controller Programming Library Volume 5: Cryptographic Programming*, GC31-2070.
- *IBM 4700 Finance Communication System, Controller Programming Library Volume 6: Control Program Generation*, GC31-2071.

Summary of Amendments

GN31-7312

This Technical Newsletter supplements GC31-2032-2. It includes changes to the Installation Diskette procedures, as well as to the 061, 070, 071, and 999 commands.

GC31-2032-2

GC31-2032-2 replaces GC31-2032-1. You should read the entire manual. It has been rewritten and reorganized.

This edition supports the current release of the 4700 Finance Communication System, and has new information for operating a system with disk storage devices, the IBM 4720 Printer, and the IBM 4704 Models 2 and 3.

Contents

Figures

Chapter 1. Starting Your System

PLEASE DO NOT START YOUR SYSTEM UNTIL YOU READ THIS ENTIRE CHAPTER. Then, read chapters 2 and 3 before you try to use the system. These chapters will give you the basic procedures for starting and using the system monitor.

The IBM 4700 Finance Communication System consists of a controller with attached printers and display devices. Usually, the controller is attached to a central computing system (the host system). The controller is a processing unit where your programs reside. The programs that receive, process, and display financial data are called application programs, and are written especially for your institution. You use another program in the controller, the 4700 system monitor, to control and monitor the system. The system monitor can do such things as start and stop the printers and display stations, start and stop communications with the host system, test devices and their components, help in debugging your application programs, and manage the disk and diskette files.

The operator who uses the system monitor is called the control operator. There can be only one control operator at a time. The control operator can use a 3604 or 4704 terminal attached directly to the controller, or the control operator can use a terminal attached to the same host system to which the 4700 system is attached. In this latter case, the control operator is called the remote operator.

This manual is *not* directed specifically to the control operator or to the remote operator, but rather to the programming and operations people who write directions (run books) to be followed by these operators.

Before discussing the steps you take to start your system, let's agree on some important terms and concepts that we will use repeatedly throughout this book.

The *system monitor* is an IBM-supplied program, sometimes called the system application program, with which you control the system. You enter commands from your terminal to ask the system monitor to do various system tasks, such as starting the link to your host computer, printing dumps, and starting the loops to which terminals are attached. The system monitor displays messages at your terminal.

The *installation diskette* is provided by IBM, and contains all of the 4700 functions that you need to start your own system. The installation diskette contains, along with the basic 4700 system, the system monitor, and a package of programs to help you with routine tasks such as formatting and copying data on diskettes. You can use the installation diskette in two ways. First, you will use it to copy selected 4700 functions, along with your own programs and data, to a diskette that will be your operating diskette. Then, you might on occasion use the installation diskette to perform routine tasks such as formatting and copying the data on a diskette.

You create an *operating diskette* by combining selected system functions with your own programs and data. After you create an operating diskette, as described shortly, use the installation diskette functions to make copies of the operating diskette. If something goes wrong with an operating diskette, you will have a backup.

An operating diskette can be *operational* in the sense that you reserve it for productive use, not for testing. If you code DSKOP=Y on the STARTGEN macro during configuration, the operating diskette is operational and cannot be patched. If you code DSKOP=N, the diskette is *non-operational*, and can be tested and patched.

The *diagnostic diskette* contains system functions that you use to detect and isolate problems in your system.

Startup refers to the process of transferring the 4700 system, along with its configuration information, application programs, and your data, from a diskette to the controller. You can start the system from an installation diskette, a diagnostic diskette, or your own operating diskette.

Starting Up the First Time

This section tells you how to use the installation diskette to start your 4700 system for the first time, and how to build your own customized operating diskette. (You can later start the system from that operating diskette.) Piease do not start your system yet. Just read these steps to become familiar with the procedure. We will use the following sequence:

1. Start up with the installation diskette to load all system functions into the controller.

2. Log on using the installation diskette.

3. When the system displays the installation-diskette menu, select "Enter System Monitor."

4. Use the 999 command to create an operating diskette.

5. Log off and remove the installation diskette.

6. Insert your new operating diskette.

7. Start up using your new operating diskette, selecting those system functions that you need to run your applications.

Now, insert the installation diskette in the controller's diskette drive, and switch the power on to the controller. During this time, the system is being loaded from the diskette, and the 4-digit message display on the controller flashes a sequence of messages. When this controller display shows the code I699, the system displays message 00001 at a display monitor.

Note: The system displays the 00001 message at the terminal on loop 1, address 1 if you have a powered-on 4704 Model 1 at that address. Otherwise, the system displays 00001 at a powered-on 3604 on loop 1, address 2. If you do not have a powered-on terminal at either address, the system loads itself automatically.

You have 2 minutes in which to respond to 00001 from your keyboard. If you do not respond in 2 minutes, the system performs a warm start, and activates the link to the host computer.

This is called the *default startup*. You can press Enter before the 2 minutes are up to request this same default startup without waiting. You may prefer to enter an 8, for a cold start with no host-link activation. Later, you can enter the 041 command to activate the link yourself. The 4700 controller finishes loading, and displays:

```
PRESS LOWER-LEFT KEY
```

Press the lower left-hand key. This tells the installation diskette which keyboard you are using and thus which keyboard translation table to use. Figure 1-1 on page 1-10 shows how the keys on each terminal are translated when used with the installation diskette. Figure 1-2 on page 1-11 shows how the keys on each terminal are translated by the universal translation table when you communicate with the 4700 system monitor.

The system then asks you to:

```
ENTER PASSWORD
```

Enter the password using the translation table definition for your keyboard. The installation diskette comes from IBM with a password of 12345. "Change Your Password" shows how you can change the password. For now, if you have not changed the password, enter:

```
12345
```

If you enter an invalid password, the system displays:

```
INVALID PASSWORD,
RE-ENTER
```

The system continues to display this message until you enter the correct password.

Starting Up From a 3604: You cannot use the installation-diskette menus from a 3604. Instead, press Reset three times in succession. When the system displays 90000, log onto the system monitor as described, later in this section, under "Logging onto the System Monitor."

Starting Up From a 4704: When you enter the correct password from a 4704, the system displays the 4700 Installation Menu:

```
+-----------------------------------------+
|     ***  4700 INSTALLATION MENU  ***     |
|          01 - DISKETTE FUNCTIONS         |
|          02 - DISK FUNCTIONS             |
|          03 - DATA SET FUNCTIONS         |
|          04 - DIRECTORY FUNCTIONS        |
|          05 - PIN PAD KEY TEST           |
|          06 - CHANGE PASSWORD            |
|          07 - ENTER SYSTEM MONITOR       |
|          08 - MICROCODE PATCH            |
|          09 - TRANSFER AP                |
|          0A - SYSTEM CUSTOMIZER          |
|     ENTER 2 DIGIT SELECTION NUMBER _     |
+-----------------------------------------+
```

To select a function from the menu, key in the number of the desired option and press the Enter key.

Because this is the first time through, you do not have a customized operating diskette with which to operate your system. In this section, then, we will immediately invoke the system monitor to create an operating diskette. In Chapter 2, "The 4700 Installation Diskette," you will learn how to use the rest of the services on this installation diskette. Enter 07 on the menu:

```
+----------------------------------------+
|     ***  4700 INSTALLATION MENU  ***    |
|         01 - DISKETTE FUNCTIONS         |
|         02 - DISK FUNCTIONS             |
|         03 - DATA SET FUNCTIONS         |
|         04 - DIRECTORY FUNCTIONS        |
|         05 - PIN PAD KEY TEST           |
|         06 - CHANGE PASSWORD            |
|         07 - ENTER SYSTEM MONITOR       |
|         08 - MICROCODE PATCH            |
|         09 - TRANSFER AP                |
|         0A - SYSTEM CUSTOMIZER          |
|     ENTER 2 DIGIT SELECTION NUMBER 07_  |
+----------------------------------------+
```

When you select the system monitor, the following message is displayed.

```
TO ENTER SYSTEM MONITOR
PRESS RESET KEY 3 TIMES
(PRESS ENTER KEY FOR 4700 INSTALLATION MENU)
```

Logging onto the System Monitor

Press the Reset key (RE on some engraved keyboards) three times in succession. The system monitor clears the screen and displays:

```
90000
```

Enter your assigned password for the system monitor, just as you entered a password to log onto the installation diskette. Of course, these two passwords might be different. If you have not changed the IBM-supplied password, it is still 12345.

Note: Use the keyboard as it is defined by the universal translation table. There is no application program yet, so you use a basic keyboard layout understood by the 4700 system.

Press the enter key.

If the system displays:

```
91005
```

you entered your password incorrectly. Begin this procedure again.

If you enter the correct password, the system displays:

```
91111 01 01
```

indicating successful logon from a 4704, or:

```
91111 01 02
```

indicating successful logon from a 3604.

Logon is now complete. Because you have not yet established a working system, you will want to create an operating diskette that contains the system functions you want, along with your own application programs and data sets.

Read the section under "Creating an Operating Diskette" on page 3-4 to see the various ways you can use the system monitor to create an operating diskette. When you have used one of those procedures, and created your operating diskette, return here for the next step.

Now that you are back, you have a good operating diskette ready to insert in the drive.

Enter 000 to log off. Remove the installation diskette and insert your new operating diskette. You can now use the following startup procedure to start your customized system from the operating diskette.

Starting from the Operating Diskette

After you create your operating diskette, you will use it to load the system. First, insert the operating diskette in the controller's diskette drive. The drive from which you load the system is referred to as the IPL or primary drive. The other drive, in this case the auxiliary drive, is referred to as the secondary drive.

The controller begins loading information from the operating diskette, and flashes messages on the controller's display. These messages indicate the tests being run and the modules being loaded. The controller displays each message for a moment, then displays the next message. When an error is detected, the system displays an Exxx or Xxxx message. Record the message, and notify your service personnel. Refer to the procedures described in the *4700 Problem Determination Guide*.

During startup, the system activates the terminals attached to loops. If the controller cannot start a loop, the startup process might take several minutes. After loading the system modules, the controller then loads your data from the operating diskette.

When the system is loaded, it displays the 00001 message to let you change system variables such as the time of day, and the model number of your display screen. The system displays:

```
00001
```

Note: The system displays the 00001 message at the first powered-on keyboard/display defined in the CPGEN by DEFADDR macros. However, if your operating diskette was created by LCF, the system displays 00001 at the terminal on loop 1, address 1. (If you do not have a powered-on terminal at that address, the results are unpredictable.)

Enter one of these codes to specify the type of startup you want. (If you do not respond in the time-out period, or if you just press the Enter key, the controller performs an automatic startup.) Enter:

Code	Function
1	The system activates the host-communication link, but discards log messages and temporary files from a previous startup. (This is a cold start.)
2	The system activates the host link and retains previous log messages and temporary files (a warm start). If you do not specify a startup type, this is the automatic startup.
4	The system prompts you for system variables, such as the control unit address (CUA), a dump option, a control operator ID, and a node ID (XID) for this diskette.
5	The system prompts you to identify the optional modules you want to load.
6 xx	The system changes the model number associated with your control operator display station. For example, if you respond to the 00001 message with 6 4, the system treats your display as if it were a 3604-4. If you respond 6 11, the system treats your 4704 as if it had a 480-character display screen. And if you respond 6 12, the system treats your 4704 as if it had a 1920-character screen. See the 048 command in chapter 4 for a list of acceptable model numbers, and what they mean.
8	The system performs a cold start, and does not activate the host link.
9	The system performs a warm start, but does not activate the host link.
B yyyy mm dd hh mn ss	The system sets the date and time. The system provides standard default separators.
C x ttttt	You specify the CNM/CS processing type.

Note: If you do not press a key within the time-out period, the system performs an automatic startup (like response 2, above). When entering your response, use the universal translation table keyboard locations.

If you enter option 4, 5, 6, or B, the system prompts you for further information but does not start the system. If you enter response 1, 2, 8, or 9, the system completes startup, initiates any application programs at their startup entry points, and waits for you to log onto the system monitor.

Specifying System Variables (Code 4)

The system prompts you to change the control unit address, the dump option, your control operator ID, and the node ID (XID) for an X.21 network. You can end the process at any point by pressing the Reset key twice in succession. The system then displays 00001 again, so that you can complete startup.

The system first displays:

```
00002
```

Enter a new control unit address, or press Enter to retain the old CUA.

```
00003
```

Enter a new dump option, or press Enter to retain the old dump option. Dump options are:

0 DO NOT request the dump option.
1 Request the dump option.

```
00004
```

Enter a new system monitor password (also called the control operator ID), or press Enter to retain the old password. A system monitor password can be from 1 to 16 characters, consisting of the characters 0-9, A-F, X, and blank. If you enter a new password, the system displays:

```
90000
```

Enter your current (old) password to let the system know that you are authorized to change the password.

```
00006
```

Enter a new XID, or press Enter to retain the old XID. An XID is a 5-character transmission ID.

When this process is complete, the system again displays:

```
00001
```

asking you to choose a startup option. Again, you can chose 1, 2, 8, or 9 to start the system, or you can choose another option to modify system information.

Loading Optional Modules (Code 5)

When the system displays the 00001 message, you tell the system what kind of startup you want. When you started the system previously, you selected an automatic startup that loaded all optional modules into the system. Now, let's use a more selective startup procedure; the system will prompt you to designate the optional modules you want loaded. When your programming staff configured your system, they selected which optional modules would be placed on your operating diskette. Now, you can choose to load all of them, or only some of them. However, you can only load those modules that were included in the configuration process. In response to the 00001 message, enter:

```
5
```

The system displays:

```
00005
```

requesting you to enter the IDs of those optional modules you want to load for this startup.

You can respond:

00 to load NONE of the optional modules.

FF to load all of the optional modules.

To load only one module, type in that module's ID, and press Enter twice in succession.

To load several optional modules, type in an ID, press Enter, type in the next ID, and press Enter, and so on. Type and enter each ID separately. When you have specified all modules, press Enter one final time.

If at any time you want to stop specifying optional modules, press Reset twice; the system again displays 00001.

For example, let's load the EDAM modules (1B, 1D, 1E), and the diskette utility modules (40, 41, 5E). When the system prompts, you respond by typing one ID, pressing Enter, entering the next ID, pressing Enter, and so on.

```
00005
1B (Enter)
1D (Enter)
1E (Enter)
40 (Enter)
41 (Enter)
5E (Enter)
```

Now press Enter again to signal the system that you are finished designating optional modules. The system displays:

```
00001
```

Completing Startup

After you change system information, you have not yet started your system. Respond to the 00001 message with a 1, 2, 8, or 9 as described earlier.

If your programming staff used the CPYAP option of the FILES macro, the system copies the system monitor and your application programs to a disk. (The system displays 00019 after a successful copy, or 90012 after an unsuccessful copy.) The system then starts application programs, and you can log onto the system monitor.

If the system copied the system monitor and your programs successfully, you can remove the diskette from which you loaded the system. The system monitor and the application programs will run from the disk. However, you have to decide whether the system will later need the operating diskette for reading and writing log messages, and for performing other diskette-oriented operations. These operations cannot be performed with the system running from the the disk.

Changing the Date and Time-of-Day (Code B)

Respond to the 00001 message by entering the:

```
B yyyy mm dd hh mn ss
```

format to set the date and time-of-day.

yyyy	The year, as in 1981.
mm	The month, as in 06.
dd	The day of the month, as in 28.
hh	The hour of the day, as in 02.
mn	The minute, as in 45,
ss	The second, as in 52.

To set the system to March 25, 1945, at 10:05:46, enter:

```
B 1945 03 25 10 05 46
```

The system then prompts with the 00001 message to proceed with startup.

Specifying CNM/CS Processing

Respond to the 00001 message by entering the:

```
C x ttttt
```

format to specify CNM/CS processing.

Specify the *x* operand as:

0	No CNM/CS processing and no Alert
1	CNM/CS without Alert
2	Alert without CNM/CS
3	CNM/CS and Alert

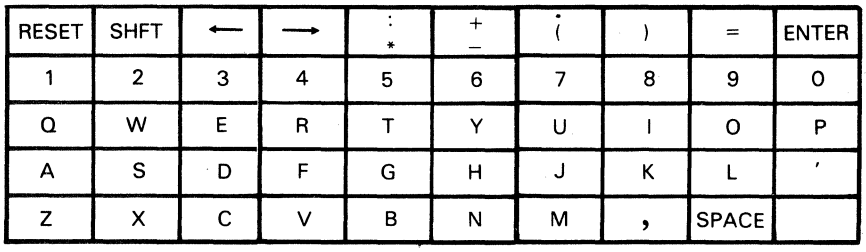
Replace *ttttt* with the number of seconds for the Alert interval processing.

Loading from the Auxiliary Drive

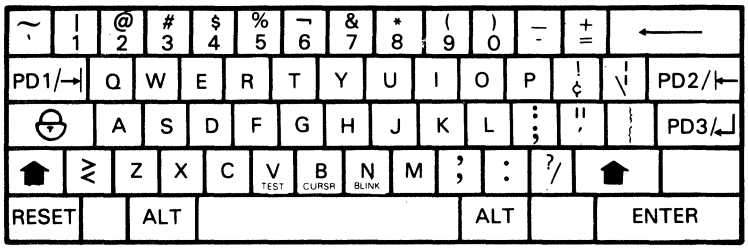
You can load your system from the operating diskette on the auxiliary drive. This makes the auxiliary drive the primary drive (the controller drive becomes the secondary drive).

1. Make sure that the controller drive is empty.
2. Insert your operating diskette in the auxiliary drive.
3. Press the Reset button.
4. When the system flashes the D001 message, open the door on the controller; press the Interrupt button.
5. The system loads the operating diskette from the auxiliary drive.

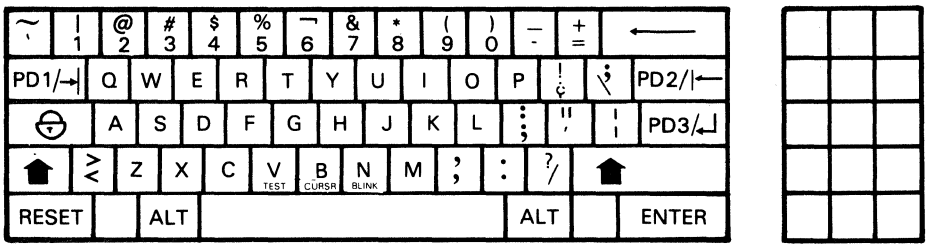
When the system is loaded, the auxiliary diskette drive is the primary (or IPL) drive; the controller diskette drive is the secondary drive.



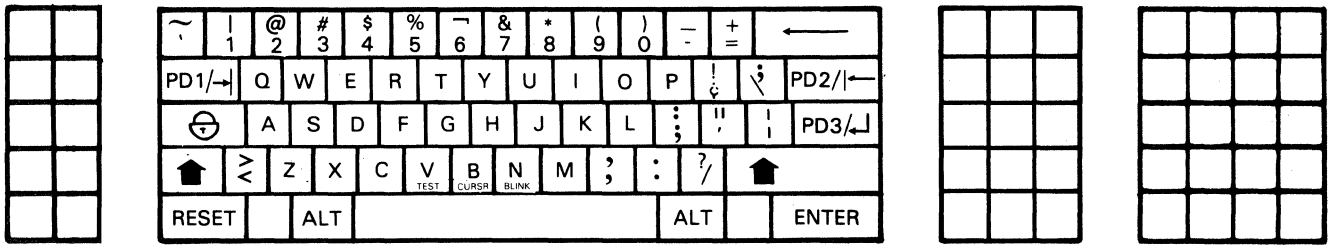
4704 Function Keyboard (Model 100) (Keyboard is not Engraved)



4704 Alphameric Keyboard (Model 200)

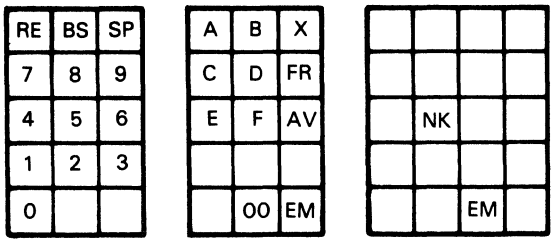


4704 Expanded Alphameric Keyboard (Model 300)

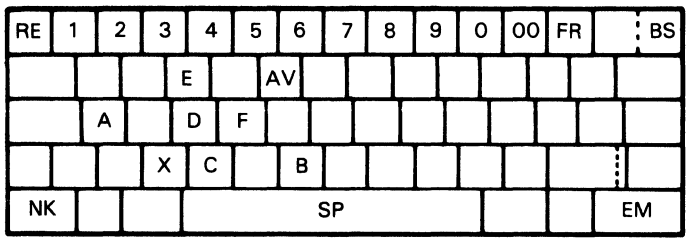


4704 Administrative Keyboard (Model 400)

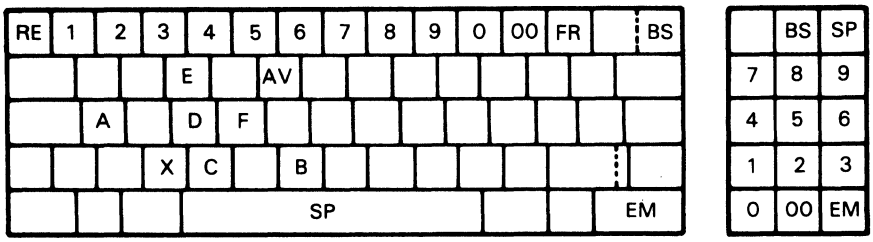
Figure 1-1. Installation Diskette Keyboard Translation Tables.



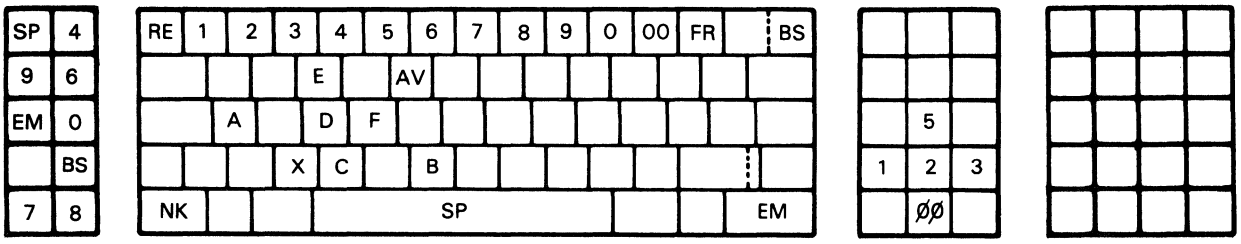
A. 4704 Function Keyboard (Model 100)



B. 4704 Alphameric Keyboard (Model 200)

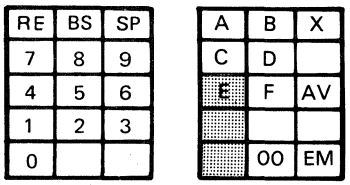


C. 4704 Expanded Alphameric Keyboard (Model 300)

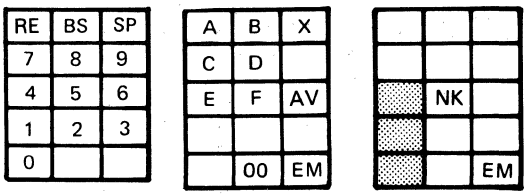


D. 4704 Administrative Keyboard (Model 400)

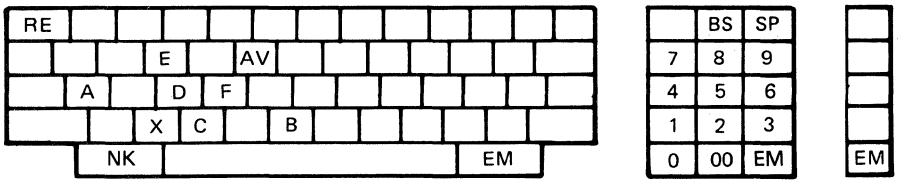
Figure 1-2 (Part 1 of 2). The Universal Translation Table



D. 3604 30-Key Keyboard



E. 3404 45-Key Keyboard



F. 3604 74-Key Keyboard

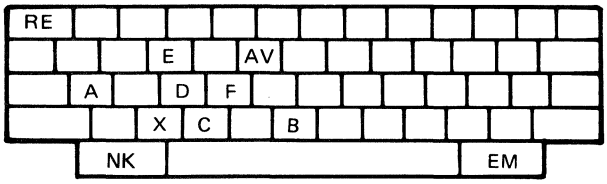
Legend:

BC = blink cursor**
BS = back space
FR = free key*
RE = reset
EM = end of message
NK = return to normal keyboard = 045
SP = space
AV = advance/clear key*
AC = alternate cursor**
CK = clicker**

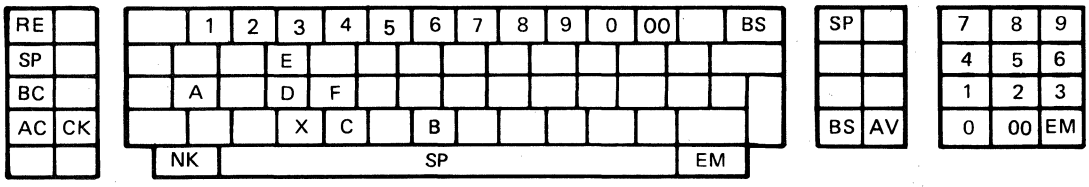
= motor bar available

*available only with disk file facilities diskette

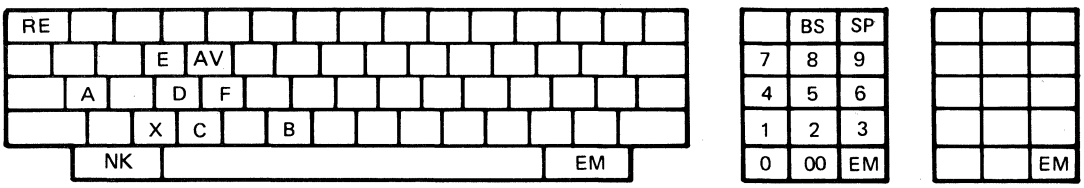
**available only with DCA 3278 devices



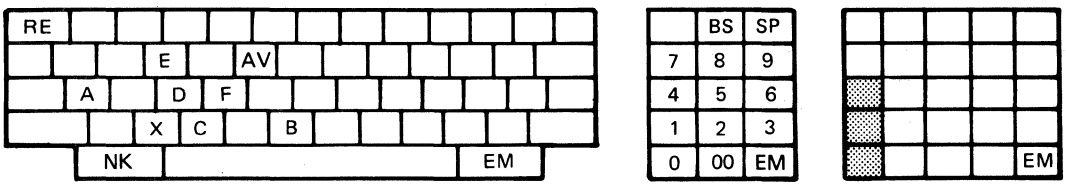
G. 3604 77-Key Keyboard



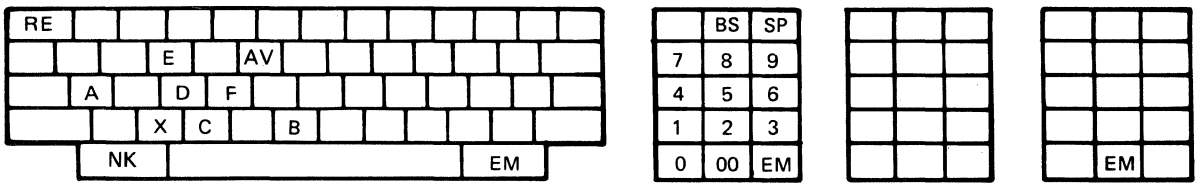
H. 3278/3279 87-Key Keyboard



I. 3604 92-Key Keyboard



J. 3604 94-Key Keyboard



K. 3604 99-Key Keyboard

Figure 1-2 (Part 2 of 2). The Universal Translation Table

Chapter 2. The 4700 Installation Diskette

In the previous chapter, you used the installation diskette to start the system the first time, and you used the system monitor to create your first operating diskette. This chapter shows you how to use the other functions on the installation diskette. Before proceeding, use the information in the previous chapter to insert the installation diskette and start the system. Return here when you receive the display screen that shows this Installation Menu:

```
+-----------------------------------------+
|     ***  4700 INSTALLATION MENU  ***     |
|          01 - DISKETTE FUNCTIONS         |
|          02 - DISK FUNCTIONS             |
|          03 - DATA SET FUNCTIONS         |
|          04 - DIRECTORY FUNCTIONS        |
|          05 - PIN PAD KEY TEST           |
|          06 - CHANGE PASSWORD            |
|          07 - ENTER SYSTEM MONITOR       |
|          08 - MICROCODE PATCH            |
|          09 - TRANSFER AP                |
|          0A - SYSTEM CUSTOMIZER          |
|     ENTER 2 DIGIT SELECTION NUMBER _     |
+-----------------------------------------+
```

Notes:

1. The actual menus displayed by the installation diskette DO NOT contain framing characters. We often use the frames here to simulate the edges of a display screen, and to enclose the displayed data.

2. Throughout this manual, the diskette drive that you use to load (IPL) the installation diskette is called the primary diskette drive or IPL drive. The other drive is the secondary diskette drive.

3. If you have only one disk drive, specify that drive as disk drive A. If you have two disk drives, specify the disk on the left as disk drive A, and specify the disk on the right as disk drive B.

   When the system asks you to specify a drive number, enter one of these:

1	Primary diskette drive
2	Secondary diskette drive
A	Disk drive A
B	Disk drive B

4. Your Installation Diskette might not contain all of the functions described in this chapter.

General Procedures

You can use the installation-diskette functions to duplicate many of the system monitor's functions. Enter a function code over the cursor, and the system prompts you to complete the request. In summary, these functions are:

Code	Function
01	Format a diskette, copy the contents of one diskette to another, and compress the data on a diskette.
02	Format the disk, override the current disk format, or initialize the disk for EDAM data sets.
03	Define, delete, allocate and deallocate, copy, rename, reorganize, print, and display data sets on disk or diskette volumes.
04	Display and print directory information from a disk or diskette volume.
05	Verify the input PIN protection key.
06	Change the password that you use when you log onto the installation diskette. The 4700 installation diskette is delivered with password 12345. You can use this option to change that password for future terminal sessions. (Note that this IS NOT the ID you use with the system monitor.)
07	Log onto the system monitor.
08	Patch the IBM microcode on a diskette.
09	Transfer application programs from a diskette to your operating diskette.
0A	Select optional installation-diskette modules to load during subsequent IPLs.

Note: For more information on 4700 data sets, their creation and management, see the *4700 Controller Programming Library, Volume 2: Disk and Diskette Programming*.

There is a standard procedure for using the functions on the installation diskette. When you enter a code to select a function:

```
+-----------------------------------------+
|     ***  4700 INSTALLATION MENU  ***     |
|          01 - DISKETTE FUNCTIONS         |
|          02 - DISK FUNCTIONS             |
|          03 - DATA SET FUNCTIONS         |
|          04 - DIRECTORY FUNCTIONS        |
|          05 - PIN PAD KEY TEST           |
|          06 - CHANGE PASSWORD            |
|          07 - ENTER SYSTEM MONITOR       |
|          08 - MICROCODE PATCH            |
|          09 - TRANSFER AP                |
|          0A - SYSTEM CUSTOMIZER          |
|     ENTER 2 DIGIT SELECTION NUMBER 01_   |
+-----------------------------------------+
```

the system displays a menu of what's available for that function. For example, if you enter 01 on the command line of the Installation Menu (shown above), the system displays this Diskette Function menu,

```
+-----------------------------------------+
|   ***  4700 DISKETTE FUNCTIONS  ***      |
|                                          |
|        10 - FORMAT DISKETTE              |
|        11 - COPY DISKETTE                |
|        12 - COMPRESS DISKETTE            |
|                                          |
|        00 - MAIN MENU                    |
|                                          |
|                                          |
|                                          |
|                                          |
|   ENTER 2 DIGIT SELECTION NUMBER _       |
+-----------------------------------------+
```

which asks whether you want to format a diskette, copy a diskette, or compress a diskette. You enter your selection on this function menu, and the system either prompts you for specific information, or displays a panel of empty fields for you to complete with specific information. Based on your entries, the system performs the requested function.

Bypassing the Function Menus

The codes on any function menu are unique to that function menu. If you already know the codes on the function menus, you can bypass the function menu entirely by entering, on the Installation Menu, the code you would normally enter on the function menu. For example, to format a diskette (which would normally be code 10 on the Diskette Function menu), you can enter the code 10 directly on the 4700 Installation Menu.

Note: You cannot bypass the System Customizer menu. Rather, enter code 0A on the 4700 Installation Menu, and proceed to the System Customizer menu.

```
+-----------------------------------------+
|     ***  4700 INSTALLATION MENU  ***    |
|         01 - DISKETTE FUNCTIONS         |
|         02 - DISK FUNCTIONS             |
|         03 - DATA SET FUNCTIONS         |
|         04 - DIRECTORY FUNCTIONS        |
|         05 - PIN PAD KEY TEST           |
|         06 - CHANGE PASSWORD            |
|         07 - ENTER SYSTEM MONITOR       |
|         08 - MICROCODE PATCH            |
|         09 - TRANSFER AP                |
|         0A - SYSTEM CUSTOMIZER          |
|     ENTER 2 DIGIT SELECTION NUMBER 10_  |
+-----------------------------------------+
```

This invokes the format-diskette function (10 on the Diskette Function menu) in one request.

Entering Commands

Many of the installation-diskette panels display this line at the bottom of the screen:

CMD ==> __ (U=Update,P=Process,E=Exit)

Like this:

```
+-----------------------------------------+
|          SAMPLE DISKETTE MENU           |
|                                         |
|  MENU ENTRY 1 .    MENU ENTRY 2 .       |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> U_  (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

Enter one of the codes (U, P, or E) over the cursor, and press Enter to effect the command.

CMD ==> U__ (U=Update,P=Process,E=Exit)

When you enter U, the cursor moves to the first input field near the top of the panel. Type in the requested information, perhaps a data-set name, and press Enter to move the cursor to the next field. When you have entered data into all the fields, the system moves the cursor back to the command line. At any time during this process, you can press Reset twice in succession to move the cursor back to the command line without completing subsequent fields.

After you enter selections in the panel's fields, you can again enter the U command to review and change your selections. The system displays the panel with the selections that you have already entered. Again, press Enter to move the cursor from field to field without changing the selections in the fields. You can retype the data in any field, and press Enter to effect the change and move the cursor to the next field.

When you are ready to perform the function, enter the P command on the command line. The system performs the requested function, and displays the Function Completed Successfully message, or an appropriate error message. Press the Enter key to redisplay the prompt on the command line.

At any time you can enter the E command at the command line to cancel the process, and to display the previous function menu.

Note: The system highlights (intensifies) each field into which you enter data. Adjust the contrast and brightness for comfortable viewing.

System Customizer

The system customizer enables you to select those installation-diskette functions you want to load into your system. Use this when not all of the installation-diskette functions fit into your system's storage. After you use this procedure, the optional modules you select will be loaded automatically, at each subsequent IPL, until you use this procedure to change the list of modules.

To select the system customizer, enter 0A on the 4700 Installation Menu:

```
+-----------------------------------------+
|      ***  4700 INSTALLATION MENU  ***    |
|          01 - DISKETTE FUNCTIONS         |
|          02 - DISK FUNCTIONS             |
|          03 - DATA SET FUNCTIONS         |
|          04 - DIRECTORY FUNCTIONS        |
|          05 - PIN PAD KEY TEST           |
|          06 - CHANGE PASSWORD            |
|          07 - ENTER SYSTEM MONITOR       |
|          08 - MICROCODE PATCH            |
|          09 - TRANSFER AP                |
|          0A - SYSTEM CUSTOMIZER          |
|      ENTER 2 DIGIT SELECTION NUMBER 0A_  |
+-----------------------------------------+
```

The system asks you whether you want to select individual optional modules for your system, or whether you want to select all the modules that provide a function. The system displays this menu:

```
+-------------------------------------+
|       ***  SYSTEM CUSTOMIZER  ***    |
|                                      |
|         1 - FUNCTION MENU            |
|         2 - OPTIONAL MODULE MENU     |
|         3 - LOAD ALL OPT MODULES     |
|                                      |
|                                      |
|                                      |
|                                      |
|                                      |
|                                      |
|   ENTER SELECTION NUMBER _           |
+-------------------------------------+
```

Modules Always Loaded

The system always loads modules M1B, M1D, P5E, MB2, and MB4 automatically. If you customize the system using a DCA terminal, the system also loads modules M95, M98, MA8, and MAB automatically.

Note: During startup, you can use the 05 option to select optional modules for loading. If you respond by entering optional-module IDs, your response overrides

the list that you built with the system customizer. Thus, if you select optional modules during startup (responding to the 00005 message), be sure to include modules M1B, M1D, P5E, MB2, and MB4.

Select Modules by Function

Enter selection 1 on the System Customizer menu to load optional modules for each function.

```
+--------------------------------------+
|      ***  SYSTEM CUSTOMIZER  ***     |
|                                      |
|        1 - FUNCTION MENU             |
|        2 - OPTIONAL MODULE MENU      |
|        3 - LOAD ALL OPT MODULES      |
|                                      |
|                                      |
|                                      |
|                                      |
|                                      |
|                                      |
|   ENTER SELECTION NUMBER 1_          |
+--------------------------------------+
```

The system then displays this menu:

```
+--------------------------------------+
|     ***  FUNCTION CUSTOMIZER  ***    |
|                                      |
|       . FORMAT DISKETTE (P40)        |
|       . COMPRESS DISKETTE (P41)      |
|       . DCA DISPLAY (M95,M98,MA8,MAB)|
|       . B-LOOP PRINTER (M8A)         |
|       . DCA PRINTER (M93,M95,M99)    |
|       . PIN PAD (M0B,P57)            |
|       . DISK (M06,M2F,MB3,MB7)       |
|       . EXTENDED ISAM (MB5,MB6,MB8)  |
|  (PLACE AN X BY DESIRED FUNCTION)    |
| CMD ==> _(U=Update,P=Process,E=Exit) |
+--------------------------------------+
```

First, enter the U command so that you can type Xs onto the menu to select functions. Type U at the command line, and press Enter:

```
+--------------------------------------+
|     ***  FUNCTION CUSTOMIZER  ***    |
|                                      |
|       . FORMAT DISKETTE (P40)        |
|       . COMPRESS DISKETTE (P41)      |
|       . DCA DISPLAY (M95,M98,MA8,MAB)|
|       . B-LOOP PRINTER (M8A)         |
|       . DCA PRINTER (M93,M95,M99)    |
|       . PIN PAD (M0B,P57)            |
|       . DISK (M06,M2F,MB3,MB7)       |
|       . EXTENDED ISAM (MB5,MB6,MB8)  |
|  (PLACE AN X BY DESIRED FUNCTION)    |
| CMD ==>U_(U=Update,P=Process,E=Exit) |
+--------------------------------------+
```

Type an X over the period that precedes each function you want. Move the cursor to the command line and type a P. Now, when you have selected all the functions you need, press Enter to build the list of optional modules. For

example, if you select the modules for the DCA display and the DCA printer, your screen looks like this:

```
+--------------------------------------+
|     ***  FUNCTION CUSTOMIZER  ***    |
|                                      |
|         FORMAT DISKETTE (P40)        |
|         COMPRESS DISKETTE (P41)      |
|       X DCA DISPLAY (M95,M98,MA8,MAB)|
|         B-LOOP PRINTER (M8A)         |
|       X DCA PRINTER (M93,M95,M99)    |
|         PIN PAD (M0B,P57)            |
|         DISK (M06,M2F,MB3,MB7)       |
|         EXTENDED ISAM (MB5,MB6,MB8)  |
|  (PLACE AN X BY DESIRED FUNCTION)    |
| CMD ==>P_(U=Update,P=Process,E=Exit) |
+--------------------------------------+
```

The system builds a module load list from your selections.

To reset the list of optional modules to its original configuration, place the cursor to the left of each function, and press Enter (instead of X). This enters a null value for each optional function, and removes these modules from the list.

Select Individual Modules

Enter a 2 on the System Customizer menu to load individual modules:

```
+--------------------------------------+
|      ***  SYSTEM CUSTOMIZER  ***     |
|                                      |
|        1 - FUNCTION MENU             |
|        2 - OPTIONAL MODULE MENU      |
|        3 - LOAD ALL OPT MODULES      |
|                                      |
|                                      |
|                                      |
|                                      |
|                                      |
|                                      |
|   ENTER SELECTION NUMBER 2_          |
+--------------------------------------+
```

The system displays this menu of optional modules:

```
+--------------------------------------+
|  ***  OPTIONAL MODULE CUSTOMIZER  *** |
|   . M06     . M0B     . M1B    . M1D |
|   . M2F     . M93     . M95    . M98 |
|   . M99     . MA8     . MAB    . MB2 |
|   . MB3     . MB4     . MB5    . MB6 |
|   . MB7     . MB8     . M8A    . P28 |
|   . P40     . P41     . P57          |
|                                      |
|  (PLACE AN X BY DESIRED OP MOD NUM)  |
| CMD ==> _ (U=UPDATE,P=PROCESS,E=EXIT)|
+--------------------------------------+
```

First, enter a U at the command line so that you can type Xs on the menu. Type a U, and press Enter:

```
+--------------------------------------+
|  ***  OPTIONAL MODULE CUSTOMIZER  *** |
|    . M06      . M0B      . M1B     . M1D  |
|    . M2F      . M93      . M95     . M98  |
|    . M99      . MA8      . MAB     . MB2  |
|    . MB3      . MB4      . MB5     . MB6  |
|    . MB7      . MB8      . M8A     . P28  |
|    . P40      . P41      . P57            |
|                                           |
|  (PLACE AN X BY DESIRED OP MOD NUM)       |
| CMD ==>U_ (U=UPDATE,P=PROCESS,E=EXIT)     |
+--------------------------------------+
```

Now type an X to the left of each module that you want to load, type a P on the command line, and press Enter.

```
+--------------------------------------+
|  ***  OPTIONAL MODULE CUSTOMIZER  *** |
|      M06        M0B        M1B      M1D  |
|      M2F        M93      X M95    X M98  |
|      M99      X MA8      X MAB      MB2  |
|      MB3        MB4        MB5      MB6  |
|      MB7        MB8        M8A      P28  |
|      P40        P41        P57            |
|                                           |
|  (PLACE AN X BY DESIRED OP MOD NUM)       |
| CMD ==>P_ (U=UPDATE,P=PROCESS,E=EXIT)     |
+--------------------------------------+
```

To reset the list of optional modules to its original configuration, place the cursor to the left of each module ID, and press Enter (instead of X). This enters a null value for each optional module entry, and removes that module from the list.

Loading All Modules

Enter a 3 on the System Customizer menu to load all optional modules:

```
+--------------------------------------+
|       ***  SYSTEM CUSTOMIZER  ***    |
|                                       |
|         1 - FUNCTION MENU             |
|         2 - OPTIONAL MODULE MENU      |
|         3 - LOAD ALL OPT MODULES      |
|                                       |
|                                       |
|                                       |
|                                       |
|    ENTER SELECTION NUMBER 3_          |
+--------------------------------------+
```

The system loads all optional modules.

Do They Fit Your System ?

After you select the optional modules you need, the system determines whether they will all fit into your system's storage. If by chance you have selected more modules than your system can contain, the system displays an error message and discards that list of optional modules. If this happens, use the system customizer again. Select fewer optional modules this time.

A set of optional modules selected on one system might not fit another system. When you use one controller to customize (select optional modules for) another system, the system on which you will use the Installation Diskette should have at least as much storage as the system on which you run the System Customizer.

If, as so often happens, you want to run all of the available functions in a small system, you must load and run the modules for only one or two functions at a time.

1. Run the system customizer for functions A and B, for example.
2. Start your system (the startup or IPL procedure).
3. Run functions A and B.
4. Rerun the system customizer for functions C and D.
5. Start your system again.
6. Run functions C and D.

Now that you have built a list of modules that fit your system, that list is saved on the installation diskette for starting the system the next time.

Note: Installation-diskette functions that require optional modules will not run correctly unless you first load those optional modules.

Diskette Functions

When you enter 01 on the 4700 Installation Menu, the system displays a menu of diskette functions, like this:

```
+----------------------------------------+
|   ***  4700 DISKETTE FUNCTIONS  ***    |
|                                        |
|        10 - FORMAT DISKETTE            |
|        11 - COPY DISKETTE              |
|        12 - COMPRESS DISKETTE          |
|                                        |
|        00 - MAIN MENU                  |
|                                        |
|                                        |
|                                        |
|                                        |
|   ENTER 2 DIGIT SELECTION NUMBER _     |
+----------------------------------------+
```

Enter a code to select your function.

CODE	FUNCTION
00	The system again presents the 4700 Installation Menu.
10	The system prompts you for information to format a diskette.
11	The system prompts you for information to copy the contents of one diskette to another.
12	The system prompts you to compress the data on a diskette, collecting all free storage into one contiguous area.

Format Diskette

You can format Type 1 (single-sided, single density), Type 2 (dual-sided, single density), or Type 2D (dual-sided, double density) diskettes for use on 4700 controllers. The system prompts you to enter data such as the diskette type and data record length. You can also change the volume identifier (VOLID) with this option.

When you select 10 (the Format Diskette option), the system displays:

```
** FORMAT DISKETTE **
ENTER DRIVE NUMBER TO BE USED (1/2)?.
```

Enter 1 for the primary diskette drive: the drive from which you loaded the system (the IPL drive).

Enter 2 for the secondary, non-IPL drive. (If you enter an incorrect value, the system again displays the message until you enter the correct value.)

```
DEFAULT OR PROMPTING FORMAT (D/P)?.
```

You can request that the system use the data currently on the diskette, or that the system prompt you for each item of data. Enter D to use the values currently on the diskette. Enter P for prompting mode. You must use the prompting format for non-initialized diskettes.

Notes:

1. If you are prompted to enter data from any menu, and you press the Reset key twice, the Format Canceled message is displayed.

2. If you key in a value other than D or P and press the Enter key, the original message is displayed again until you enter a valid value.

When you enter P, the system displays:

```
MOUNT DISKETTE TO BE FORMATTED
IN DRIVE n
```

Insert the diskette to be formatted in the indicated drive. (If you have already inserted the diskette, in the secondary drive for example, just open and close the diskette drive door.) The system then displays:

```
SPECIFY DATA RECORD LENGTH:
  1 = 128 BYTE RECORDS
  2 = 256 BYTE RECORDS
  3 = USE DEFAULT VALUE
ENTER SELECTION NUMBER.
```

Enter the data record length for the diskette to be formatted. You can specify 128- or 256-byte records.

Enter a 1 for 128-byte records.

Enter a 2 for 256-byte records.

Enter a 3 to default to the format already on the diskette. If you select a 3 and the inserted diskette is blank (has not been initialized), the formatting fails. Retry the operation, but select 1 or 2 to establish a record length for the diskette.

(If you key in an incorrect value, the system repeats the prompt until you enter the correct value.)

The system now asks you what type of diskette you inserted:

```
SPECIFY DISKETTE TYPE:
  1 = DISKETTE TYPE 1
  2 = DISKETTE TYPE 2
  3 = DISKETTE TYPE 2D
ENTER SELECTION NUMBER.
```

Respond as follows:

Enter 1 to format a diskette 1.

Enter 2 to format a diskette 2.

Enter 3 to format a diskette 2D.

The system repeats this message until you enter a valid response.

After you specify the diskette type, the system asks you how you want the sectors initialized:

```
SPECIFY SECTOR INITIALIZATION VALUE:
  1 = DELETE CONTROL RECORDS
  2 = DATA RECORDS
ENTER SELECTION NUMBER__
```

Respond to this prompt.

Enter a 1 to initialize each unused sector on the diskette as a delete control record.

Enter a 2 to initialize each unused sector on the diskette as a null data record. (Option 2 is recommended for 4700 diskettes.)

If you enter an incorrect value, the system repeats this prompt. If you specify a diskette type 2D, the system asks you to specify a physical record sequencing number:

```
ENTER PHYSICAL RECORD
SEQUENCING CODE (1-13)
```

Enter a value in the range 1 through 13 if you are formatting a diskette type 2D. The system repeats this message until you enter a correct value.

Note: For information about diskette sequencing codes, see the FORMDKT instruction in the *4700 Controller Programming Library, Volume 2: Disk and Diskette Programming*.

The system next displays the volume ID currently on the diskette, and asks you whether you want to change the ID. If you enter an invalid volume ID, or if the system cannot read the volume ID from the diskette, the system prompts you to enter a new volume ID (but does not display the old ID).

```
CURRENT DISKETTE VOLUME ID: VOL1234
CHANGE VOLUME ID (Y/N)?
```

If you enter N, the system retains the current volume ID and begins to format the diskette. To change the volume ID, enter a Y. The system prompts you to:

```
ENTER NEW VOLUME ID .....
```

Enter the new volume ID. The system then begins to format the diskette, displaying these messages during the process.

```
FORMAT IN PROCESS
```

... indicates that the formatting of the diskette has begun.

```
FORMAT COMPLETE
```

... indicates that the diskette is formatted successfully.

FORMAT ERROR (err #)

... indicates that the formatting is unsuccessful. The *err #* is a status code, as explained in Appendix A.

FORMAT CANCELED

... indicates that you canceled the formatting procedure (you pressed the Reset key twice).

FORMAT ANOTHER DISKETTE (Y/N)?.

Enter Y to format another diskette. Enter N to return to the most-recent menu.

Copy Diskette

You can copy the entire content of one diskette to another diskette. Both diskettes must be of the same type, and must contain records of the same length (128- or 256-byte records). When you select code 11 on the Diskette Function menu, the system displays the Copy Diskette panel.

```
+----------------------------------------+
|          ***  COPY DISKETTE  ***       |
|                                        |
|  ENTER SOURCE DRIVE NUMBER (1/2)?_     |
|                                        |
|                                        |
|                                        |
|                                        |
|                                        |
|                                        |
|                                        |
|                                        |
+----------------------------------------+
```

Enter the drive number of the diskette drive that contains the diskette to be copied. If you have an auxiliary drive, the system then asks you to:

ENTER TARGET DRIVE NUMBER (1/2)?__

Enter the number of the diskette drive that you want to contain the copy. The system then prompts you to:

MOUNT SOURCE DISKETTE IN DRIVE n

Insert the diskette that contains the data you want to copy. (If you have only one drive, the message prompts you to insert the diskette into the primary drive -- drive 1.)

The system reads your data from this diskette, and prompts you to:

MOUNT TARGET DISKETTE IN DRIVE n

Insert the diskette that is to contain the copy. If the diskette is already inserted, open and close the diskette drive. The system informs you that:

COPY IN PROGRESS
READING BLOCK xxxx LAST BLOCK yyyy

or

COPY IN PROGRESS
WRITING BLOCK xxxx LAST BLOCK yyyy

In each case, the *xxxx* is the block number currently being processed. The *yyyy* is the number of the last block on the diskette.

When the copy is done, the system displays:

COPY COMPLETE

to tell you that the copy operation is complete. If the system displays:

COPY CANCELED

an operator canceled the operation. You can press the Reset key twice to stop the copy function. The system displays the COPY CANCELED message.

If the system displays:

SOURCE/TARGET DISKETTE INCOMPATIBLE

You inserted a diskette of the wrong type, or with the wrong record length. Retry the request using the correct diskettes.

The system now asks:

COPY ANOTHER DISKETTE (Y/N)?__

Type Y and press Enter to repeat the process for another copy, or type N and press Enter to return to the last active menu.

Note: For a faster diskette copy, format your diskettes with data records rather than with delete-control records.

Compress Diskette

Use the Compress Diskette function to collect all unused sectors on a 4700-formatted diskette into one contiguous space available for use. You can also change or delete data sets, add or delete sectors, and maintain data set alignment on track boundaries. Before you compress the data on a diskette, use the Copy Diskette procedure to make a copy of your diskette. Compress the copy, and save the original for backup.

Note: Any time the system prompts you for a reply, you can cancel the procedure by pressing the Reset key twice.

When you select option 12 on the Diskette Function menu, the system displays:

```
COMPRESS DISKETTE
ENTER DRIVE NUMBER TO BE USED (1/2)?.
```

Identify the drive to be used for compression. Enter a 1 for the primary (IPL) drive, or 2 for the secondary drive. (This message is not displayed if the controller does not have an auxiliary diskette drive.)

```
MOUNT DISKETTE TO BE COMPRESSED
IN DRIVE n
```

Insert the diskette to be compressed in the drive (1 is the primary drive; 2 is the secondary drive) specified in the previous step. If the diskette is already inserted, open and close the diskette drive door. The system next asks:

```
ALTER DATA SET(s) (Y/N)?.
```

If you want to change any data sets on this diskette, during the compression, enter a Y. If not, enter N. If you enter Y, the system prompts you to identify the data set and indicate the changes. Go to the section "Altering Data Sets" (later in this chapter) to learn how to alter the size of a data set during compression. If you enter N, compression begins immediately.

```
COMPRESS IN PROCESS
```

... indicates that the diskette compress operation has started.

```
COMPRESS COMPLETE
```

... indicates that the compress function completed normally.

```
COMPRESS ERROR (err #)
```

... indicates the compress function did not complete successfully. The *err #* is status information, as explained in Appendix A.

```
COMPRESS CANCELED
```

... is displayed when you cancel the compress function.

```
COMPRESS ANOTHER DISKETTE (Y/N)?.
```

To compress another diskette, enter Y. The process repeats. If you enter N, the last active menu is displayed.

Altering Data Sets

If you responded Y to the message:

```
ALTER DATA SET(s) (Y/N)?.
```

you can change as many as three data sets during each compress operation.

ENTER DATA SET NAME.....

Enter the name of the data set. This data-set name can be as many as 17 characters. The system displays:

```
+-----------------------------------------+
|                                         |
|     **   Alter Data Set Menu   **       |
|(1) INCREASE SIZE      (5) RETAIN EOD/EOE |
|(2) DECREASE SIZE      (6) SET EOD TO EOE |
|(3) DELETE DATA SET    (7) SET EOE TO EOD |
|(4) TRACK ALIGNMENT    (8) CANCEL COMPRESS|
|            ENTER SELECTION NUMBER _     |
|                                         |
|                                         |
+-----------------------------------------+
```

Choose a process, and enter its number over the cursor. The processes are:

1 Increase Size: increase the number of sectors allocated to the data set on the diskette.

2 Decrease Size: decrease the number of sectors allocated to a data set.

3 Delete Data Set: delete a specified data set, and release its storage. You can reuse the space assigned to the deleted data set.

4 Track Alignment: maintain data set alignment on track boundaries.

5 Retain EOD/EOE: do not change the current End-of-Data (EOD) and End-of-Extent (EOE) positions during compression.

6 Set EOD to EOE: move the End-of-Data indicator to the End-of-Extent indicator, plus one sector. This reserves space by making the data set appear to have more records than it actually has.

7 Set EOE to EOD: move the End-of-Extent indicator to the End-of-Data indicator, minus 1 sector. This compresses the data set by releasing any storage at the end of the data.

8 Cancel Compress: cancel the current operation, and display the Installation Menu.

After you select an option, the system alters the data set and asks you if you want to alter another data set. When you have altered three data sets, or when you indicate that you don't want to alter any more data sets, the system compresses the diskette as described previously.

Increase Data Set Size

When you select option 1 on the Alter Data Set Menu to increase the size of a data set, the system asks you to:

ENTER NUMBER SECTORS TO ADD __

Enter the number of sectors to add to the data set.

Decreasing the Data Set Size

When you select option 2 on the Alter Data Set Menu to decrease the data set size, the system asks you to:

ENTER NUMBER OF SECTORS TO DELETE....

Enter the number of sectors to be removed from the data set. If you enter a number equal to the extent size, the data set is deleted. The system then asks whether you want the data set aligned on a track boundary.

TRACK ALIGNMENT REQUIRED (Y/N)?.

If the data set begins and ends on track boundaries, and you want to maintain that alignment, enter Y.

Note: Track alignment cannot be guaranteed on compressed sequential data sets. Therefore, track alignment requests on data sets having sequential organization are ignored.

Enter N if you do not want to force the data set to track alignment.

Compression now begins.

Align Data Set on Tracks

When you select option 4 (Track Alignment) on the Alter Data Set Menu, or any of the following options:

- Increase size
- Decrease size
- Retain EOD/EOE
- Set EOD to EOE
- Set EOE to EOD

The system displays:

TRACK ALIGNMENT REQUIRED (Y/N)?.

If the data set begins and ends on track boundaries, and you want to maintain that alignment, enter Y.

Note: Track alignment cannot be guaranteed on compressed sequential data sets. Therefore, track alignment requests on data sets having sequential organization are ignored.

Enter N if you do not want to force the data set to track alignment.

Delete a Data Set

When you select option 3 on the Alter Data Set Menu to delete a data set, the system prompts:

DELETE DATA SET: data-set name (Y/N)?.

The *data-set name* is the name of the data set that you specified earlier. Enter Y to delete the data set, releasing the space it occupied. Enter N to save the data set.

Manipulating the End of Data and End of Extent

The End-of-Data indicator (EOD) shows the end of the actual data in the data set. Any data set space beyond EOD is empty. The End-of-Extent shows the end of the allocated space for the data set. If EOD = EOE, the data set is full, and each record is treated as if it contains data. If EOD falls short of EOE, there are empty records at the end of the data set.

On the Alter Data Set Menu, select options as follows:

5 Retain the current settings of EOD and EOE.

6 Move the EOD to the EOE+1, making the data set appear to be full of data records. This reserves space for future expansion, while ensuring that records cannot be added to the data set.

7 This option moves the EOE to the EOD+1, freeing any unused records at the end of the data set.

After you select option 5, 6, or 7, the system asks you:

TRACK ALIGNMENT REQUIRED (Y/N)?.

If the data set begins and ends on track boundaries, and you want to maintain that alignment, enter Y.

Note: Track alignment cannot be guaranteed on compressed sequential data sets. Therefore, track alignment requests on data sets having sequential organization are ignored.

Enter N if you do not want to force the data set to track alignment.

Alter As Many As Three Data Sets

You can now specify additional data sets to be altered. If you have already altered three data sets, the system begins to compress the diskette. Or, if you respond N to:

ALTER DATA SET(s) (Y/N)?.

Compression begins.

COMPRESS IN PROCESS

... indicates that the diskette compress operation has started.

COMPRESS COMPLETE

... indicates that the compress function completed normally.

COMPRESS ERROR (*err #*)

... indicates the compress function did not complete successfully. The *err #* is the error status information returned in the SMSDST field. Refer to Volume 1 of the *IBM 4700 Controller Programming Library* for a definition of SMSDST indicators for compression.

COMPRESS CANCELED

... is displayed when the compress function is canceled because of operator action. The operator pressed Reset twice, or selected option 8 from the Alter Data Set Menu.

COMPRESS ANOTHER DISKETTE (Y/N)?.

To compress another diskette during this sequence, type in Y and press the Enter key. Processing continues with the first compress message being displayed. If you enter N, the last active menu is displayed.

Notes:

1. When you are expanding or truncating the temporary file (data set SYSTF on an operating diskette), specify the sector count as a multiple of 16 .
2. Do not compress a 3600 operating diskette.
3. Diskette compress can require extensive diskette drive arm movement. This causes what can appear to be an unusual sound to anyone near the controller.

Disk Functions

Enter the code 02 on the 4700 Installation Menu to request disk-formatting functions. If your system has a disk, the system displays this Disk Functions menu:

```
+----------------------------------------+
|   ***  4700 DISK FUNCTIONS  ***        |
|                                        |
|       20 - DISK FORMAT                 |
|       21 - DISK EDAM INITIALIZATION    |
|       22 - DISK FORMAT OVERRIDE        |
|                                        |
|       00 - MAIN MENU                   |
|                                        |
|                                        |
|                                        |
|                                        |
|   ENTER 2 DIGIT SELECTION NUMBER _     |
+----------------------------------------+
```

Enter the 2-digit code over the cursor; the system performs the selected function. (There are no guidance panels for disk functions.)

Notes:

1. Functions 20, 21, and 22 destroy the data currently on the disk. Use these with care.

2. For new installations, or when you replace the disk enclosure, use function 20 followed by function 21.

3. If, after the system prompts you to enter data, you just press the Enter key, you cancel the request.

4. If you enter an invalid value, the system repeats the prompt until you enter a correct value or cancel the request.

Format a Disk

To format a disk, the system writes binary zeros in all data fields, and maintains alternate sector alignment for any previously reassigned sectors. Use this function during installation of your 4700 system, or any time you install a new disk enclosure. Enter code 20 on the Disk Functions menu to format the entire disk volume.

```
+--------------------------------------+
|   ***  4700 DISK FUNCTIONS  ***       |
|                                       |
|       20 - DISK FORMAT                |
|       21 - DISK EDAM INITIALIZATION   |
|       22 - DISK FORMAT OVERRIDE       |
|                                       |
|       00 - MAIN MENU                  |
|                                       |
|                                       |
|                                       |
|                                       |
|   ENTER 2 DIGIT SELECTION NUMBER 20_  |
+--------------------------------------+
```

The system displays:

```
+--------------------------------------+
|         ***  DISK FORMAT  ***        |
|                                       |
|    *** CAUTION CAUTION CAUTION ***    |
|    ***   DESTROYS  DISK DATA   ***    |
|                                       |
|                                       |
|                                       |
|                                       |
|                                       |
|                                       |
|ENTER DRIVE TO BE FORMATTED (A/B)==>   |
+--------------------------------------+
```

Enter the letter A to format the disk on disk drive A; enter B to format the disk on disk drive B. When processing begins, the system displays the message:

WRITING CYLINDER ==> xxxx

on the screen, showing you the current cylinder being processed.

Notes:

1. This function destroys the data on the disk.

2. Formatting a disk might consume from 5 to 10 minutes.

Initializing for EDAM

This function sets up the tables that control disk space for EDAM data sets. Use this function during installation of your 4700 system, or any time you install a new disk enclosure. Enter code 21 on the Disk Functions menu:

```
+---------------------------------------+
|   ***  4700 DISK FUNCTIONS  ***        |
|                                        |
|       20 - DISK FORMAT                 |
|       21 - DISK EDAM INITIALIZATION    |
|       22 - DISK FORMAT OVERRIDE        |
|                                        |
|       00 - MAIN MENU                   |
|                                        |
|                                        |
|                                        |
|                                        |
|   ENTER 2 DIGIT SELECTION NUMBER 21_   |
+---------------------------------------+
```

The system displays:

```
+---------------------------------------+
|   ***  DISK EDAM INITIALIZATION  **    |
|    *** CAUTION CAUTION CAUTION ***     |
|    ***   DESTROYS  DISK DATA   ***     |
|                                        |
|                                        |
|                                        |
|                                        |
|                                        |
|                                        |
|                                        |
|                                        |
|ENTER DRIVE TO BE FORMATTED (A/B)==>    |
+---------------------------------------+
```

Enter an A to initialize the disk on disk drive A; enter B to initialize the disk on disk drive B.

Note: This function destroys the data on the disk.

Override the Format of a Disk

This function writes binary zeros in all data fields, and assigns alternate sectors for any defective sectors found. Enter code 22 on the Disk Functions Menu.

```
+---------------------------------------+
|   ***  4700 DISK FUNCTIONS  ***        |
|                                        |
|       20 - DISK FORMAT                 |
|       21 - DISK EDAM INITIALIZATION    |
|       22 - DISK FORMAT OVERRIDE        |
|                                        |
|       00 - MAIN MENU                   |
|                                        |
|                                        |
|                                        |
|                                        |
|   ENTER 2 DIGIT SELECTION NUMBER 22_   |
+---------------------------------------+
```

The system displays:

```
+---------------------------------------+
|     ***  DISK FORMAT OVERRIDE  ***     |
|     *** CAUTION CAUTION CAUTION ***    |
|     ***   DESTROYS  DISK DATA   ***    |
|                                        |
|                                        |
|                                        |
|                                        |
|                                        |
|                                        |
|                                        |
|ENTER DRIVE TO BE FORMATTED (A/B)==>    |
+---------------------------------------+
```

Enter an A to process the disk on disk drive A; enter B to process the disk on disk drive B. When processing begins, the system displays the message:

WRITING CYLINDER ==> xxxx

on the screen, showing you the current cylinder being processed.

Notes:

1. This function destroys the data on the disk.

2. This function should be used only by an authorized service person.

Data Set Functions

You can use the installation diskette to perform a variety of maintenance functions on disk and diskette data sets. When you select item 03 on the 4700 Installation Menu, the system displays the Data Set Function menu.

```
+---------------------------------------+
|   ***  4700 DATA SET FUNCTIONS  ***    |
|                                        |
|                                        |
|   30 - DEFINE     31 - DELETE          |
|   32 - ALLOCATE   33 - DEALLOCATE      |
|   34 - RENAME     35 - COPY            |
|   36 - APPEND     37 - REORGANIZE      |
|   38 - DISPLAY    39 - PRINT           |
|                                        |
|          00 - MAIN MENU                |
|                                        |
|    ENTER 2 DIGIT SELECTION NUMBER _.   |
+---------------------------------------+
```

Enter the appropriate code over the cursor. The system displays the specific guidance panel for that function. When the system displays the guidance panel, enter a U on the command line. After the cursor moves, enter data in each field to describe the request. Move the cursor back to the command line and enter P to perform your request, and return to the Data Set Function menu.

Note: For more information on 4700 data sets, their creation and management, see Volume 2 of the *4700 Controller Programming Library: Disk and Diskette Programming*.

Define a Data Set

Before you can use a data set, you must define its characteristics, and allocate space for it. To define data set characteristics, enter code 30 on the Data Set Function menu.

```
+-----------------------------------------+
|   ***  4700 DATA SET FUNCTIONS  ***      |
|                                          |
|                                          |
|   30 - DEFINE      31 - DELETE           |
|   32 - ALLOCATE    33 - DEALLOCATE       |
|   34 - RENAME      35 - COPY             |
|   36 - APPEND      37 - REORGANIZE       |
|   38 - DISPLAY     39 - PRINT            |
|                                          |
|          00 - MAIN MENU                  |
|                                          |
|    ENTER 2 DIGIT SELECTION NUMBER 30_    |
+-----------------------------------------+
```

The system then asks you for the category of data set you want to define:

```
+-----------------------------------------+
|  ***  SELECT DATA SET CATEGORY   ***     |
|                                          |
|     1 - TEMPORARY FILE (TEMP)            |
|     2 - SEQUENTIAL (ESDS or ASDS)        |
|     3 - DIRECT (EDDS)                    |
|     4 - KEYED (RKAP or KSAP)             |
|                                          |
|                                          |
|                                          |
|                                          |
|                                          |
|  ENTER SELECTION NUMBER _                |
+-----------------------------------------+
```

Enter the number of the data set category that you want to define. The system displays the panel tailored to that data set category.

Note: Before you can define any data sets on a diskette, you must first define the system data set SYSDSLBL. Use the Define Direct Data Set function (code 3 on the Select Data Set Category menu) to define SYSDSLBL as a direct data set. (For the characteristics of SYSDSLBL, see Volume 2 of the *4700 Controller Programming Library: Disk and Diskette Programming*.) When you are defining a diskette data set, the system automatically allocates space for SYSDSLBL when you define SYSDSLBL. (When you define a disk data set, the system automatically defines and allocates space for SYSDSLBL.)

Define a Temporary File Data Set

When you enter code 1 on the Select Data Set Category menu, the system displays this panel to help you define the temporary file data set:

```
+-----------------------------------------+
|  **  DEFINE TEMPORARY FILE DATA SET  **  |
|                                         |
|  NAME ................. TYPE . DRIVE .   |
|  LRECL .... INITIAL SIZE .....          |
|  EXPIRATION DATE ...... USER FLAG .     |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> P_  (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

Complete the fields on the panel with the correct information. Enter the data-set name, and the cursor moves to the next field. Continue to type entries, and to press Enter after each field. Move the cursor back to the command line, and enter P to define the data set using the information you entered in this panel.

The fields in the guidance panel ask you to supply the new data set's characteristics. If you are unfamiliar with the 4700 data set concepts, see Volume 2 of the *4700 Controller Programming Library: Disk and Diskette Programming*.

Enter this data into the guidance panel:

NAME

Enter the name of the data set you want to define. You must enter a value in this field. The name must adhere to the standard 4700 data set naming conventions. These names are reserved for system use: ERMAP, ERRORSET, SYSAREA, SYSHASH, and SYSDSLBL.

TYPE

Enter T for the Temporary File data set. You must enter a value in this field.

DRIVE

Indicate the drive, where the data set resides. You must enter a value in this field.

1	Primary diskette drive
2	Secondary diskette drive
A	Disk drive A
B	Disk drive B

If you enter a 1 or a 2, the system prompts you to insert a diskette in that drive.

LRECL

Enter the logical record length for the data set. Although the physical record length for a diskette is either 128 or 256 bytes, and the physical record length for the disk is 256 bytes, you can define several logical records within each physical record, or you can collect several physical records into one logical record up to 1024 bytes long.

If you do not enter a value in this field, the system supplies a default value of 256 bytes.

INITIAL SIZE

Enter the initial size of the data set in K-bytes (1K bytes = 1024 bytes).

If you do not enter a value in this field, the system supplies a default value of 4K bytes.

EXPIRATION DATE

Enter the data set's expiration date. You can enter the date of expiration, in the format mmddyy (month day year), or you can enter the number of days until expiration, in the format +nnnn+ (nnnn is the number of days).

If you do not enter a value in this field, the system supplies a default value of all blanks, no expiration date.

USER FLAG

You can enter any EBCDIC value in the range 0-9, A-F. Your installation will determine the use of this flag.

If you do not enter a value in this field, the system supplies a default value of 0.

```
+-----------------------------------------+
|  **  DEFINE TEMPORARY FILE DATA SET  **  |
|                                         |
|  NAME DSNAME1.......... TYPE T DRIVE 1  |
|  LRECL 128. INITIAL SIZE 25...          |
|  EXPIRATION DATE 010185 USER FLAG B     |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> P_  (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

Define a Sequential Data Set

When you enter code 2 on the Select Data Set Category menu, the system displays this panel to help you define a sequential data set:

```
+-----------------------------------------+
|   ***  DEFINE SEQUENTIAL DATA SET  ***   |
|                                         |
|  NAME ................. TYPE . DRIVE .   |
|  LRECL .... INITIAL SIZE .....          |
|  EXPIRATION DATE ...... USER FLAG .     |
|  SEC EXTENT SIZE .... MAX NUM EXTS ..   |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> _   (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

Enter the data-set name, and the cursor moves to the next field. Continue to type entries, and to press Enter after each field. Move the cursor back to the command line, and enter P to define the data set using the information you entered in this panel.

The fields in the guidance panel ask you to supply the new data set's characteristics. If you are unfamiliar with the 4700 data set concepts, see volume 2 of the *4700 Controller Programming Library: Disk and Diskette Programming*. Enter this data into the guidance panel:

NAME

Enter the name of the data set you want to define. You must enter a value in this field. The name must adhere to the standard 4700 data set naming conventions. These names are reserved for system use: ERMAP, ERRORSET, SYSAREA, SYSHASH, and SYSDSLBL.

TYPE

Indicate the type of data set with these codes. You must enter a value in this field.

S	Sequential EDAM (ESDS) data set
A	ASDS data set

DRIVE

Indicate the drive, where the data set resides. You must enter a value in this field.

1	Primary diskette drive
2	Secondary diskette drive
A	Disk drive A
B	Disk drive B

If you enter a 1 or a 2, the system prompts you to insert a diskette in that drive.

LRECL

Enter the logical record length for the data set. Although the physical record length for a diskette is either 128 or 256 bytes, and the physical record length for the disk is 256 bytes, you can define several logical records within each physical record, or you can collect several physical records into one logical record up to 1024 bytes long. For variable-length records in an ASDS data set, enter 0.

If you omit this value, the system supplies a default value of 256 bytes.

INITIAL SIZE

Enter the initial size of the data set in K-bytes (1K bytes = 1024 bytes).

If you omit this value, the system supplies a default value of 4K bytes.

EXPIRATION DATE

Enter the data set's expiration date. You can enter the date of expiration, in the format mmddyy (month day year), or you can enter the number of days until expiration, in the format +nnnn+ (nnnn is the number of days).

If you omit this value, the system supplies a default value of all blanks, no expiration date.

USER FLAG

Enter any EBCDIC character in the range 0-9, and A-F. Your installation will determine the meaning of this field.

If you omit this value, the system supplies a default value of 0.

SEC EXTENT SIZE

Enter the size of the secondary extent, in K-bytes. (Enter 0 for diskette data sets.)

If you omit this value, the system supplies a default value of 0.

MAX NUM EXTS

Specify the number of secondary extents that may be allocated to a disk data set (the maximum is 15 for disk data sets). Enter 0 for a diskette data set.

If you omit this value, the system supplies a default value of 0.

```
+-----------------------------------------+
|   ***  DEFINE SEQUENTIAL DATA SET  ***   |
|                                         |
|  NAME DS1.............. TYPE S DRIVE 1   |
|  LRECL 128. INITIAL SIZE 25...          |
|  EXPIRATION DATE 010185 USER FLAG B     |
|  SEC EXTENT SIZE 0... MAX NUM EXTS 0.   |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> P_  (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

Define a Direct Data Set

When you enter code 3 on the Select Data Set Category menu, the system displays this panel to help you define a direct data set:

```
+-----------------------------------------+
|    ***  DEFINE DIRECT DATA SET  ***     |
|  NAME ................ TYPE . DRIVE .   |
|  LRECL .... INITIAL SIZE .....          |
|  EXPIRATION DATE ...... USER FLAG .     |
|  SEC EXTENT SIZE .... MAX NUM EXTS ..   |
|  ASSIGN RECDS . INITIALIZE RECDS .      |
|  DELETE RECD SIZE ... INIT/DEL CHAR ..  |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> _   (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

Enter the data-set name, and the cursor moves to the next field. Continue to type entries, and to press Enter after each field. Move the cursor back to the command line, and enter P to define the data set using the information you entered in this panel.

The fields in the guidance panel ask you to supply the new data set's characteristics. If you are unfamiliar with the 4700 data set concepts, see Volume 2 of the *4700 Controller Programming Library: Disk and Diskette Programming.* Enter this data into the guidance panel:

NAME

Enter the name of the data set you want to define. You must enter a value in this field. The name must adhere to the standard 4700 data set naming conventions. These names are reserved for system use: ERMAP, ERRORSET, SYSAREA, SYSHASH, and SYSDSLBL.

TYPE

Enter D to define a direct EDAM data set. You must enter a value in this field.

DRIVE

Indicate the drive, where the data set resides. You must enter a value in this field.

1	Primary diskette drive
2	Secondary diskette drive
A	Disk drive A
B	Disk drive B

If you enter a 1 or a 2, the system prompts you to insert a diskette in that drive.

LRECL

Enter the logical record length for the data set. Although the physical record length for a diskette is either 128 or 256 bytes, and the physical record length for the disk is 256 bytes, you can define several logical records within each physical record, or you can collect several physical records into one logical record up to 1024 bytes long.

If you omit this field, a default of 256 bytes is used.

INITIAL SIZE

Enter the initial size of the data set in K-bytes (1K bytes = 1024 bytes).

If you omit this field, a default of 4K bytes is used.

EXPIRATION DATE

Enter the data set's expiration date. You can enter the date of expiration, in the format mmddyy (month day year), or you can enter the number of days until expiration, in the format +nnnn+ (nnnn is the number of days).

If you omit this field, a default of all blanks is used.

USER FLAG

Enter any EBCDIC character in the range 0-9, and A-F. Your installation will determine the meaning of this field.

If you omit this field, a default of 0 is used.

SEC EXTENT SIZE

Enter the size of the secondary extent, in K-bytes. (Enter 0 for diskette data sets.)

If you omit this field, a default of 0 is used.

MAX NUM EXTS

Specify the number of secondary extents that may be allocated to a disk data set (the maximum is 15). Enter 0 for a diskette data set.

If you omit this field, a default of 0 is used.

ASSIGN RECDS

This field indicates whether the system will assign all data set records when the data set is allocated storage. Enter Y to have the system assign records at allocation. Enter N, and the system does not assign records at allocation.

If you omit this field, a default of N is used.

INITIALIZE RECDS

This field specifies whether the system initializes the data set records with the value from the INIT/DEL CHAR field. Enter Y to initialize the records; enter N to bypass initialization.

If you omit this field, a default of N is used.

DELETE RECD SIZE

In an EDAM data set with KSAP or RKAP attributes, use this field to specify how many initialization characters are to be written in each deleted record in the data set. The system writes initialization characters beginning with the first character of the data set. You use this field to specify how many bytes of the initialization character are to be written. (Specify the initialization character in the I/D CH field.)

Enter the number of bytes, beginning with the first byte of a deleted record, to be initialized; enter 255 to initialize the entire record.

If you omit this field, a default of 0 is used.

INIT/DEL CHAR

Enter a hexadecimal value that the system will use when initializing data set records, or when reinitializing deleted EDAM records.

If you omit this field, a default of 0 is used.

Define a Keyed Data Set

When you enter code 4 on the Select Data Set Category menu, the system displays this panel to help you define a keyed data set:

```
+-----------------------------------------+
|     ***  DEFINE KEYED DATA SET  ***     |
|  NAME ................. TYPE . DRIVE .   |
|  LRECL .... INIT SIZE .....             |
|  EXPIRATION DATE ...... USER FLAG .     |
|  SEC EXTENT SIZE .... MAX NUM EXTS ..   |
|  KEY OFFSET .... KEY LEN ... DUPL KEY . |
|  ASSOC DATA SETS:    1 .................|
|  2 ................. 3 .................|
|  4 ................. 5 .................|
|  6 ................. 7 .................|
|                                         |
| CMD ==> _   (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

Enter the data-set name, and the cursor moves to the next field. Continue to type entries, and to press Enter after each field. Move the cursor back to the command line, and enter P to define the data set using the information you entered in this panel.

The fields in the guidance panel ask you to supply the new data set's characteristics. If you are unfamiliar with the 4700 data set concepts, see Volume 2 of the *4700 Controller Programming Library: Disk and Diskette Programming*. Enter this data into the guidance panel:

NAME

Enter the name of the data set you want to define. You must enter a value in this field. The name must adhere to the standard 4700 data set naming conventions. These names are reserved for system use: ERMAP, ERRORSET, SYSAREA, SYSHASH, and SYSDSLBL.

TYPE

Enter R for an RKAP data set, or K for a KSAP data set. You must enter a value in this field.

DRIVE

Indicate the drive, where the data set resides. You must enter a value in this field.

1	Primary diskette drive
2	Secondary diskette drive
A	Disk drive A
B	Disk drive B

If you enter a 1 or a 2, the system prompts you to insert a diskette in that drive.

LRECL

Enter the logical record length for the data set. Although the physical record length for a diskette is either 128 or 256 bytes, and the physical record length for the disk is 256 bytes, you can define several logical records within each physical record, or you can collect several physical records into one logical record up to 1024 bytes long.

If you omit this field, a default value of 256 bytes is used.

INITIAL SIZE

Enter the initial size of the data set in K-bytes (1K bytes = 1024 bytes).

If you omit this field, a default value of 4K bytes is used.

EXPIRATION DATE

Enter the data set's expiration date. You can enter the date of expiration, in the format mmddyy (month day year), or you can enter the number of days until expiration, in the format +nnnn+ (nnnn is the number of days).

If you omit this field, a default value of all blanks is used.

USER FLAG

Enter any EBCDIC character in the range 0-9, and A-F. Your installation will determine the meaning of this field.

If you omit this field, a default value of 0 is used.

SEC EXTENT SIZE

Enter the size of the secondary extent, in K-bytes. (Enter 0 for diskette data sets.)

If you omit this field, a default value of 0 is used.

MAX NUM EXTS
Specify the number of secondary extents that may be allocated for a disk data set (the maximum is 15). Enter 0 for a diskette data set.

If you omit this field, a default value of 0 is used.

KEY OFFSET
Enter the offset, where the data set record key begins.

If you omit this field, a default value of 0 is used.

KEY LEN
Enter the length of keys to be used with RKAP or KSAP data sets. You must enter a value in this field.

DUPL KEY
Use this field to specify whether RKAP or KSAP data sets can have duplicate keys. Enter Y to use duplicate keys; enter N if duplicate keys will not be allowed.

If you omit this field, a default value of N is used.

ASSOC DATA SETS
You can use this field to name one or more EDDS or ASDS data sets, already defined on this volume, having records that can be retrieved through the RKAP or KSAP data set you are defining.

If you omit this field, no associated data sets are named.

Delete a Data Set

Enter code 31 on the Data Set Function menu to delete a data set definition from a disk or diskette volume. Before you try to delete a data set definition for an allocated data set, you must first deallocate that data set using code 33.

```
+-----------------------------------------+
|   ***  4700 DATA SET FUNCTIONS  ***      |
|                                         |
|                                         |
|   30 - DEFINE      31 - DELETE          |
|   32 - ALLOCATE    33 - DEALLOCATE      |
|   34 - RENAME      35 - COPY            |
|   36 - APPEND      37 - REORGANIZE      |
|   38 - DISPLAY     39 - PRINT           |
|                                         |
|          00 - MAIN MENU                 |
|                                         |
|    ENTER 2 DIGIT SELECTION NUMBER 31_   |
+-----------------------------------------+
```

The system displays the Delete Data Set menu:

```
+-----------------------------------------+
|        ***  DELETE DATA SET  ***        |
|                                         |
|   NAME     ..................  DRIVE     |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> _   (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

Enter U at the command line to move the cursor to the first field.

Enter the data-set name and a code to select the drive:

Code	Drive
1	Primary diskette drive
2	Secondary diskette drive
A	Disk drive A
B	Disk drive B

If you enter a 1 or a 2, the system prompts you to insert a diskette in that drive.

```
+-----------------------------------------+
|        ***  DELETE DATA SET  ***        |
|                                         |
|       NAME DATA1.............  DRIVE 1   |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> U_  (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

Now move the cursor to the command line and enter P to delete the data set.

```
+-----------------------------------------+
|        ***  DELETE DATA SET  ***        |
|                                         |
|       NAME DATA1.............  DRIVE 1   |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> P_  (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

The system deletes data set DATA1, and redisplays the latest active menu.

Allocate Storage for a Data Set

To allocate storage for a data set, first define that data set using code 30 on the Data Set Function menu. After you define the data set, use data set function 32 to allocate storage for that data set using the information entered when the data set was defined.

```
+----------------------------------------+
|   ***  4700 DATA SET FUNCTIONS  ***     |
|                                         |
|                                         |
|   30 - DEFINE     31 - DELETE           |
|   32 - ALLOCATE   33 - DEALLOCATE       |
|   34 - RENAME     35 - COPY             |
|   36 - APPEND     37 - REORGANIZE       |
|   38 - DISPLAY    39 - PRINT            |
|                                         |
|          00 - MAIN MENU                 |
|                                         |
|    ENTER 2 DIGIT SELECTION NUMBER 32_   |
+----------------------------------------+
```

The system displays the Allocate Data Set panel:

```
+----------------------------------------+
|      ***  ALLOCATE DATA SET  ***        |
|                                         |
|      NAME ..............  DRIVE .       |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> _   (U=Update,P=Process,E=Exit) |
+----------------------------------------+
```

Enter the U at the command line, and complete the data-set name and drive fields. Select the drive by entering one of these codes:

Code	Drive
1	Primary diskette drive
2	Secondary diskette drive
A	Disk drive A
B	Disk drive B

If you enter a 1 or a 2, the system prompts you to insert a diskette in that drive.

```
+----------------------------------------+
|      ***  ALLOCATE DATA SET  ***        |
|                                         |
|      NAME DATASET2.........  DRIVE 2    |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> U_  (U=Update,P=Process,E=Exit) |
+----------------------------------------+
```

Move the cursor to the command line, and enter P to allocate storage for the data set as previously specified during data-set definition.

```
+-----------------------------------------+
|      ***  ALLOCATE DATA SET  ***        |
|                                         |
|      NAME DATASET2.........  DRIVE 2    |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> P_  (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

The system allocates storage, and then returns you to the latest active menu.

Deallocate Data Set Space

Enter code 33 on the Data Set Function menu to deallocate the storage occupied by a disk or diskette data set. You cannot deallocate a data set that is open.

```
+-----------------------------------------+
|   ***  4700 DATA SET FUNCTIONS  ***     |
|                                         |
|                                         |
|   30 - DEFINE     31 - DELETE           |
|   32 - ALLOCATE   33 - DEALLOCATE       |
|   34 - RENAME     35 - COPY             |
|   36 - APPEND     37 - REORGANIZE       |
|   38 - DISPLAY    39 - PRINT            |
|                                         |
|          00 - MAIN MENU                 |
|                                         |
|    ENTER 2 DIGIT SELECTION NUMBER 33_   |
+-----------------------------------------+
```

The system displays the guidance panel, asking you to name the data set and its drive, and whether to override the data set's expiration date.

```
+-----------------------------------------+
|      ***  DEALLOCATE DATA SET  ***      |
|                                         |
|   NAME ...................  DRIVE .     |
|   OVERRIDE EXPIRATION DATE .            |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> _   (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

Enter U at the command line. When the cursor moves, enter the data set name and the drive number. Indicate whether you want to override the data set's expiration date. Enter Y to deallocate the data set even if the data set has not yet reached its expiration date. Enter N to deallocate the data set ONLY if the data set has reached its expiration date.

If you enter a 1 or a 2 in the DRIVE field, the system prompts you to insert a diskette in that drive.

```
+-----------------------------------------+
|      ***  DEALLOCATE DATA SET  ***      |
|                                         |
|   NAME DATASET3.............  DRIVE 1    |
|   OVERRIDE EXPIRATION DATE N            |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> P_  (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

In this example, the system deallocates data set DATASET3 on the primary diskette drive only if DATASET3 has expired. You then receive the latest active menu.

Rename a Data Set

Enter code 34 on the Data Set Function menu to rename an existing data set.

```
+-----------------------------------------+
|   ***  4700 DATA SET FUNCTIONS  ***     |
|                                         |
|                                         |
|   30 - DEFINE     31 - DELETE           |
|   32 - ALLOCATE   33 - DEALLOCATE       |
|   34 - RENAME     35 - COPY             |
|   36 - APPEND     37 - REORGANIZE       |
|   38 - DISPLAY    39 - PRINT            |
|                                         |
|          00 - MAIN MENU                 |
|                                         |
|    ENTER 2 DIGIT SELECTION NUMBER 34_   |
+-----------------------------------------+
```

The system displays the Rename Data Set panel.

```
+-----------------------------------------+
|       ***  RENAME DATA SET  ***         |
|                                         |
|    CUR  NAME ..............  DRIVE .    |
|    NEW  NAME ..............             |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> _   (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

Enter U to move the cursor, then enter the old data-set name, the number of the drive on which the data set resides, and the new data-set name.

```
+-----------------------------------------+
|        ***  RENAME DATA SET  ***        |
|                                         |
|     CUR  NAME OLDDS.............  DRIVE 1 |
|     NEW  NAME NEWDS.............        |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> U_  (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

Move the cursor to the command line, and enter the P command.

```
+-----------------------------------------+
|        ***  RENAME DATA SET  ***        |
|                                         |
|     CUR  NAME OLDDS.............  DRIVE 1 |
|     NEW  NAME NEWDS.............        |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> P_  (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

The system renames the data set, and displays the latest active menu.

Copy a Data Set

Enter code 35 on the Data Set Function menu to copy a data set from a volume on one drive, to a volume on another drive. You can copy a data set from diskette to diskette, from diskette to disk, and from disk to diskette. Of course, the target volume must have enough space.

Notes:

1. When you copy a multi-extent data set from a disk to a diskette, the system copies the data set into one extent on the diskette. There are no secondary extents on the diskette.

2. When you copy a data set from a diskette to a disk, the system rounds up the total data set allocation on the disk to the next 4K byte (16 sector) size.

3. When you copy a data set from one disk to another, the system retains the primary and secondary extent definitions and allocations.

4. When you copy a data set from one diskette to another, the system retains the primary extent allocation value.

5. The system retains the data-set characteristics on the copy.

6. The system retains the relative record sequencing value, regardless of the type of data set you are copying. (See the Append Data Set function for a contrasting situation.)

```
+-----------------------------------------+
|   ***  4700 DATA SET FUNCTIONS  ***      |
|                                         |
|                                         |
|   30 - DEFINE      31 - DELETE          |
|   32 - ALLOCATE    33 - DEALLOCATE      |
|   34 - RENAME      35 - COPY            |
|   36 - APPEND      37 - REORGANIZE      |
|   38 - DISPLAY     39 - PRINT           |
|                                         |
|          00 - MAIN MENU                 |
|                                         |
|    ENTER 2 DIGIT SELECTION NUMBER 35_   |
+-----------------------------------------+
```

The system displays the Copy Data Set panel.

```
+-----------------------------------------+
|          ***  COPY DATA SET  ***        |
|                                         |
| SOURCE: NAME ................ DRIVE .   |
| TARGET: NAME ................ DRIVE .   |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> _   (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

Enter U to move the cursor to the first input field.

Enter the name of the source data set. Enter the data-set name for the new copy.

Enter the drive code of the source volume (the number of the drive where data set resides). Enter the drive code of the target drive (the drive where you want the copy to reside).

If you copy a data set from one drive to another, you can use the same name for the copy. (To use the same name as the source data set, just enter an equal sign (=) in the TARGET: NAME field.)

You can copy a data set from one location to another on the same disk or diskette. To do this, you MUST assign a new data-set name to the copy.

```
+-----------------------------------------+
|          ***  COPY DATA SET  ***        |
|                                         |
| SOURCE: NAME ORIGINALDS....... DRIVE 1  |
| TARGET: NAME =.............. DRIVE 2    |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> _   (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

This copies the data set using the definition you provided for the original data set.

To copy a data set on the same drive, changing the name, use this example.

```
+-----------------------------------------+
|          ***  COPY DATA SET  ***        |
|                                         |
|                                         |
| SOURCE: NAME ORIGINALDS..... DRIVE 1    |
| TARGET: NAME COPYDS......... DRIVE 1    |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> U_  (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

Move the cursor to the command line, and enter P to copy the data set.

If you enter a 1 or a 2, the system prompts you to insert a diskette in that drive.

```
+-----------------------------------------+
|          ***  COPY DATA SET  ***        |
|                                         |
|                                         |
| SOURCE: NAME ORIGINALDS..... DRIVE 1    |
| TARGET: NAME COPYDS......... DRIVE 1    |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> P_  (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

The system copies the original data set on the specified drive, and displays the latest active menu.

Append a Data Set to Another Data Set

You can add all of one data set to the end of another data set. To append one data set to another, the system copies logical records from one data set (the source) to the end of the other data set (the target).

Note: Secondary extents are not allowed on a diskette. Before you append data to a diskette data set, be sure that the target data set (the data set to which you want to append records) is defined large enough to contain the additional logical records. You can append any type of data set to any other type of data set. However, the logical record lengths must be the same, or both must be specified as variable.

The system writes keyed data-set records in the order of the keys, not in the physical order in the data set. This provides a compress function for keyed data sets.

Enter 36 on the Data Set Function menu:

```
+-----------------------------------------+
|   ***  4700 DATA SET FUNCTIONS  ***      |
|                                          |
|                                          |
|   30 - DEFINE      31 - DELETE           |
|   32 - ALLOCATE    33 - DEALLOCATE       |
|   34 - RENAME      35 - COPY             |
|   36 - APPEND      37 - REORGANIZE       |
|   38 - DISPLAY     39 - PRINT            |
|                                          |
|          00 - MAIN MENU                  |
|                                          |
|    ENTER 2 DIGIT SELECTION NUMBER 36_    |
+-----------------------------------------+
```

The system presents the Append Data Set panel.

```
+-----------------------------------------+
|         ***  APPEND DATA SET  ***        |
|                                          |
|                                          |
| SOURCE: NAME ............... DRIVE .     |
| TARGET: NAME ............... DRIVE .     |
|                                          |
|                                          |
|                                          |
|                                          |
|                                          |
|                                          |
| CMD ==> P_  (U=Update,P=Process,E=Exit)  |
+-----------------------------------------+
```

Enter U to move the cursor to the first input field. Then, enter:

- The source data-set name. This is the name of the data set to be appended.
- The source drive code. This identifies the drive containing the data set to be appended to another data set.
- The target data-set name. This is the name of the data set to which the source data set is to be appended.
- The target drive code. This identifies the drive containing the data set to which the source data set is to be appended.

If you enter a 1 or a 2, the system prompts you to insert a diskette in that drive.

```
+-----------------------------------------+
|         ***  APPEND DATA SET  ***       |
|                                         |
|                                         |
| SOURCE: NAME APPENDAGE..... DRIVE 1     |
| TARGET: NAME BASEDS1........ DRIVE 2     |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> U_  (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

Move the cursor to the command line, and enter P to append one data set to another.

```
+-----------------------------------------+
|         ***  APPEND DATA SET  ***       |
|                                         |
|                                         |
| SOURCE: NAME APPENDAGE..... DRIVE 1     |
| TARGET: NAME BASEDS1........ DRIVE 2     |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> P_  (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

The system appends data set APPENDAGE to the end of data set BASEDS1, but does not alter APPENDAGE. Also, data set APPENDAGE remains on drive 1. The system appends a copy of APPENDAGE to BASEDS1, and displays the latest active menu.

Reorganize a Data Set

You can eliminate wasted space in an ASDS or KSAP data set; enter 37 on the Data Set Function menu.

```
+----------------------------------------+
|   ***  4700 DATA SET FUNCTIONS  ***     |
|                                        |
|                                        |
|   30 - DEFINE      31 - DELETE         |
|   32 - ALLOCATE    33 - DEALLOCATE     |
|   34 - RENAME      35 - COPY           |
|   36 - APPEND      37 - REORGANIZE     |
|   38 - DISPLAY     39 - PRINT          |
|                                        |
|          00 - MAIN MENU                |
|                                        |
|    ENTER 2 DIGIT SELECTION NUMBER 37_  |
+----------------------------------------+
```

The system displays the Reorganize Data Set panel.

```
+----------------------------------------+
|      ***  REORGANIZE DATA SET  ***     |
|                                        |
|      NAME .................  DRIVE .   |
|                                        |
|                                        |
|                                        |
|                                        |
|                                        |
|                                        |
| CMD ==> _   (U=Update,P=Process,E=Exit)|
+----------------------------------------+
```

Enter U to move the cursor to the first input field. Then, enter the name of the ASDS or KSAP data set you want to reorganize. Enter the drive code.

```
+----------------------------------------+
|      ***  REORGANIZE DATA SET  ***     |
|                                        |
|      NAME ASDSDATASET1.....  DRIVE A   |
|                                        |
|                                        |
|                                        |
|                                        |
|                                        |
|                                        |
| CMD ==> U_  (U=Update,P=Process,E=Exit)|
+----------------------------------------+
```

Move the cursor to the command line, and enter P.

```
+-----------------------------------------+
|      ***  REORGANIZE DATA SET  ***      |
|                                         |
|      NAME ASDSDATASET1.....  DRIVE A    |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> P_  (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

The system eliminates deleted records from an ASDS data set, or eliminates wasted space in a KSAP data set, and displays the latest active menu.

Display Attributes of a Data Set

You can display the attributes of a disk or diskette data set. Enter 38 on the Data Set Function menu:

```
+-----------------------------------------+
|   ***  4700 DATA SET FUNCTIONS  ***     |
|                                         |
|                                         |
|   30 - DEFINE     31 - DELETE           |
|   32 - ALLOCATE   33 - DEALLOCATE       |
|   34 - RENAME     35 - COPY             |
|   36 - APPEND     37 - REORGANIZE       |
|   38 - DISPLAY    39 - PRINT            |
|                                         |
|          00 - MAIN MENU                 |
|                                         |
|    ENTER 2 DIGIT SELECTION NUMBER 38_   |
+-----------------------------------------+
```

The system displays the Display Data Set Attributes panel:

```
+-----------------------------------------+
|   ***  DISPLAY DATA SET ATTRIBUTES ***   |
|                                         |
|      NAME .................  DRIVE .     |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> _   (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

Enter the U to move the cursor to the first input field. Enter the data-set name and the drive code.

If you enter a 1 or a 2, the system prompts you to insert a diskette in that drive.

```
+-----------------------------------------+
|   ***  DISPLAY DATA SET ATTRIBUTES ***   |
|                                         |
|      NAME MYSET.............  DRIVE 1    |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> U_  (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

Move the cursor back to the command line, and enter P.

```
+-----------------------------------------+
|   ***  DISPLAY DATA SET ATTRIBUTES ***   |
|                                         |
|      NAME MYSET.............  DRIVE 1    |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> P_  (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

The system displays the Data Set Attributes panel containing the attributes of the data set you specified. An incomplete panel looks like this:

```
+-----------------------------------------+
|      ***  DATA SET ATTRIBUTES  ***      |
| NAME ................. TYP . DR . W/P .  |
| LRL ....SIZE: INIT ..... S CUR ..... S  |
| EXP DATE ...... USER FLAG . ASGN RCDS .  |
| INIT RCDS . DEL RCD SIZE ... I/D CH ..   |
| SEC EXT: SIZE .... K  MAX # .. CUR # ..  |
| KEY OFFSET ...... KEY LEN ... DUPL KEY.  |
| ASSOC DATA SETS:    1 .................  |
| 2 ................. 3 .................  |
| 4 ................. 5 .................  |
| 6 ................. 7 .................  |
| Press ENTER key to CONTINUE_             |
+-----------------------------------------+
```

The fields displayed are:

NAME
The name of the data set.

TYP
The type of data set:

T	Temporary file diskette data set
S	Sequential EDAM (ESDS) data set
D	Direct EDAM diskette data set
A	ASDS disk data set
R	RKAP disk data set
K	KSAP disk data set

DR
The drive, where the data set resides:

1	Primary diskette drive
2	Secondary diskette drive
A	Disk drive A
B	Disk drive B

If you enter a 1 or a 2, the system prompts you to insert a diskette in that drive.

W/P
This field indicates whether the data set is read-only (write-protected). The character Y indicates that the data set is read-only; an N indicates that you can write data to this data set.

LRL
This is the logical record length for the data set. Although the physical record length for a diskette is either 128 or 256 bytes, you can define logical records within each physical record, and one logical record can contain several physical records. The value 0 indicates variable-length records in an ASDS data set.

SIZE: INIT
The initial size of the data set in sectors.

CUR
The current size of the data set in sectors.

EXP DATE
The data set's expiration date in the format mmddyy (month day year), or the number of days until expiration, in the format +nnnn+ (nnnn is the number of days).

USER FLAG
This is the value of the installation-defined user flag, which is in the range 0-9, and A-F.

ASGN RCDS
This field indicates whether the system will assign all data-set records when the data set is allocated storage.

Y The system assigns records when it allocates storage for the data set.

N The system does not assign records at allocation.

INIT RCDS
This field specifies whether the system initializes the data set records with the value from the I/D CH field.

Y The system initializes the records.

N The system does not initialize the records.

DEL RCD SIZE
In an EDAM data set with KSAP or RKAP attributes, this field specifies the number of bytes of the initialization character to be written.

I/D CH
The hexadecimal value that the system will use when initializing data set records, or reinitializing deleted EDAM records.

SEC EXT: SIZE
The size of any secondary extents that might be allocated for this data set, in K-bytes (1K byte = 1024 bytes). This field is valid only for ESDS, EDDS, ASDS, RKAP, and KSAP disk data sets.

MAX #
The number of secondary extents that can be allocated to this data set. This field is valid only for ESDS, EDDS, ASDS, RKAP, and KSAP disk data sets.

CUR #
The number of secondary extents currently allocated.

KEY OFFSET
The offset, in an ASDS or EDDS record, where the key begins.

KEY LEN
The length of keys to be used with RKAP or KSAP data sets.

DUPL KEY
Specifies whether RKAP or KSAP data sets can have duplicate keys. Y allows duplicate keys; N means duplicate keys are not allowed.

ASSOC DATA SETS
This field specifies the names of one or more EDDS or ASDS data sets, already defined on this volume, having records that can be retrieved through this data set.

Print Data Set Contents

Code 39 on the Data Set Functions menu prints the contents of a data set. You must have a 132-column printer with continuous forms mode, such as a 3615 printer on a loop, or a 3287, 3289, or 3262 printer on the DCA. The system prints a line of header information, and then prints each logical record of the data set in both hexadecimal and EBCDIC format. Enter code 39 on the Data Set Functions menu:

```
+-----------------------------------------+
|   ***  4700 DATA SET FUNCTIONS  ***      |
|                                         |
|                                         |
|   30 - DEFINE      31 - DELETE          |
|   32 - ALLOCATE    33 - DEALLOCATE      |
|   34 - RENAME      35 - COPY            |
|   36 - APPEND      37 - REORGANIZE      |
|   38 - DISPLAY     39 - PRINT           |
|                                         |
|          00 - MAIN MENU                 |
|                                         |
|    ENTER 2 DIGIT SELECTION NUMBER 39_   |
+-----------------------------------------+
```

The system displays the Print Data Set menu:

```
+-----------------------------------------+
|          ***  PRINT DATA SET  ***       |
|                                         |
|      NAME .................  DRIVE .     |
|      STARTING RECORD NUMBER ......      |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
| CMD ==> _   (U=Update,P=Process,E=Exit) |
+-----------------------------------------+
```

Enter the name of the data set you want to print, and the code for the drive where the data set resides.

Code	For Drive
1	Primary diskette drive
2	Secondary diskette drive
A	Disk drive A
B	Disk drive B

If you enter a 1 or a 2, the system prompts you to insert a diskette in that drive.

The system prints a line of header information, as shown in Figure 2-1.

```
                          ***IBM 4700 DATA SET DUMP***

DATA SET NAME:              DRIVE:      VOLUME ID:        CONTROLLER S/N:        DATE:        TIME:

RSN=                0000 - C1C2C3C4 C1C2C3C4 C1C2C3C4 C1C2C3C4   C1C2C3C4 C1C2C3C4 C1C2C3C4 C1C2C3C4  ABCDABCDABCDABCDABCDABCDABCDABCD
                    0020 -
                    0040 -
                    0060 -
                    0080 -
                    00A0 -
                    00C0 -
                    00E0 -
```

Figure 2-1. Header Line for Print Data Set Request

The fields in the header line are:

Data Set Name
The name of the data set you printed.

Drive
The drive, where the data set resides.

Volume ID
The volume ID of the disk or diskette volume.

Controller S/N
The serial number of this 4700 controller.

Date
The current date, in mm/dd/yy format.

Time
The current time, in hh:mm:ss format.

RSN
The logical record sequence number for the data set record.

After the RSN, the system prints the relative starting address (in hexadecimal) of the current record, and then prints each 32-byte segment of that record. Each print line contains up to 32 bytes of the record in hexadecimal, and then in EBCDIC. Any unprintable hexadecimal values print as periods.

Display 4700 Data Set Directory

From the 4700 Installation Menu, select code 04 to display the Directory Functions menu.

```
+-----------------------------------------+
|    ***  4700 DIRECTORY FUNCTIONS  ***    |
|                                         |
|      40 - DISPLAY DIRECTORY             |
|      41 - DISPLAY FREE SPACE            |
|      42 - PRINT DIRECTORY               |
|                                         |
|      00 - MAIN MENU                     |
|                                         |
|                                         |
|                                         |
|                                         |
|     ENTER 2 DIGIT SELECTION NUMBER _    |
+-----------------------------------------+
```

From this menu, you can:

Enter 40 to display the names and characteristics of all data sets on a specific drive.

Enter 41 to display the space utilization on a specific drive.

Enter 42 to print the names and characteristics of all data sets on a selected drive.

Enter 00 to return to the 4700 Installation Menu.

Display Data Sets on a Drive

You can request a display of all data sets residing on the volume at a specified drive. Enter 40 on the Directory Functions menu. The system displays:

```
+-----------------------------------------+
|       ***  DISPLAY DATA SETS  ***       |
|                                         |
|   ENTER DRIVE NUMBER _                  |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
+-----------------------------------------+
```

Enter the number of the specified drive. For example:

```
+-----------------------------------------+
|       ***  DISPLAY DATA SETS  ***       |
|                                         |
|   ENTER DRIVE NUMBER 1_                 |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
+-----------------------------------------+
```

The system displays a list of all data sets on that drive, along with selected data set attributes. The display looks like this:

```
+-----------------------------------------+
|  **  DATA SET DIRECTORY FOR DRIVE 1  ** |
|                                         |
| DATA SET NAME     TYP  SIZE  W/P EX DATE |
| ----------------  ---  ----  --- ------- |
| DATASET1           T     256  N  090583  |
| DATASET2           S    1024  Y  +0030+  |
|       .            .       .   .    .    |
|       .            .       .   .    .    |
|       .            .       .   .    .    |
|       .            .       .   .    .    |
| DATASETN           D      64  N  030484  |
| Press ENTER to continue _               |
+-----------------------------------------+
```

After the system displays the first group of data-set names, press Enter to see the next group of data set names. The top line displays the drive that you specified in your request.

The DATA SET NAME column lists the names of the data sets that are on the drive. If there are no data sets on that drive, the system displays the message NO DATA SETS under the Data Set Name heading.

The TYP column tells you the type of data set:

T	Temporary file diskette data set
S	Sequential EDAM (ESDS) data set
D	Direct EDAM data set
A	ASDS disk data set
R	RKAP disk data set
K	KSAP disk data set

The SIZE column tells you the size of the data set, expressed in the number of K-bytes.

The W/P column indicates:

Y	The data set is write-protected: you can read data from it but you cannot write data to it.
N	The data set is not write-protected; you can write data to the data set.

The DATE column tells you either:

- The expiration date of the data set, expressed in mmddyy (month day year) format, or
- The number of days since the data set was allocated, expressed in +nnnn+ format.

Press Enter after the latest Data Set Directory panel is displayed to return to the Directory Function menu.

Display Storage Use

You can display the storage use report for a volume on a disk or diskette drive. Enter 41 from the Directory Function menu. The system displays this panel:

```
+-----------------------------------------+
|    *** DISPLAY SPACE ALLOCATION ***     |
|                                         |
|   ENTER DRIVE NUMBER _                  |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
+-----------------------------------------+
```

Enter the number of the drive for which you want the space allocation.

If you enter a 1 or a 2, the system prompts you to insert a diskette in that drive. For example, to see the allocation for the primary diskette drive, enter 1:

```
+-----------------------------------------+
|    *** DISPLAY SPACE ALLOCATION ***     |
|                                         |
|   ENTER DRIVE NUMBER 1_                 |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
+-----------------------------------------+
```

And the system displays the space available, the used space, the free space, the number of data sets allocated on the drive, and the way the free space is distributed by extent.

```
+-----------------------------------------+
|  **  SPACE UTILIZATION FOR DRIVE .  **   |
|                                         |
| TOTAL SPACE AVAILABLE ..... K-BYTES (KB) |
| USED SPACE ..... KB FREE SPACE ..... KB  |
|                                         |
| TOTAL NUMBER OF DATA SETS .......       |
|                                         |
| FREE SPACE EXTENTS SUMMARY:             |
|    <0004 KB = .... 0004-0016 KB = ....  |
| 0016-0064 KB = .... 0064-0256 KB = .... |
| 0256-1024 KB = ....   GT 1024 KB = .... |
|   PRESS ENTER KEY TO CONTINUE           |
+-----------------------------------------+
```

Print Data Sets on a Drive

You can print a directory of all data sets on a drive. Enter code 42 on the Directory Functions menu. The system asks you to indicate the drive:

```
+-----------------------------------------+
|         ***  PRINT DIRECTORY  ***       |
|                                         |
|   ENTER DRIVE NUMBER 1_                 |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
|                                         |
+-----------------------------------------+
```

If you enter a 1 or a 2, the system prompts you to insert a diskette in that drive.

The system prints a line of identifying header information, followed by a line of information for each data set. When there are no data sets on the drive, the system prints the message NO DATA SETS in the Data Set Name field. Each printed form will contain up to 50 data set descriptions. When an additional page is required, the system repeats the header line on that new page.

Note: You must have an attached 132-column printer, such as a 3615, 3287, 3262, or 3289. Figure 2-2 shows the format of the printed directory.

*** IBM 4700 DATA SET DIRECTORY ***

DRIVE: 1 VOLUME ID: INSTGN CONTROLLER S/N: 0A0018 DATE: 06/01/1981 TIME: 00:46:11

DATA SET NAME	TYPE	RECD LENGTH	CRE DATE	EXP DATE	USER FLAG	I/D CHR	W/P	--DATA SET SIZE-- INITIAL	CURRENT	---PRIMARY EXTENT--- BOE	EOD	EOE	--SECONDARY EXTENTS-- SIZE	MAX #	CUR #
SYSCTL	D	00256		999999	00	00	N	000000S	000000S	02001	02002	02001	0000	00	00
SYSDSU	D	00256		999999	00	00	N	000000S	000022S	02002	05003	05002	0000	00	00
SYSST1	D	00256		999999	00	00	N	000000S	000010S	05003	06014	06013	0000	00	00
SYSBAS	D	00256		999999	00	00	N	000000S	000044S	06014	12010	12009	0000	00	00
SYSSM	D	00256		999999	00	00	N	000000S	000040S	12010	17105	17104	0000	00	00
SYSCPO	D	00256		999999	00	00	N	000000S	000034S	17105	22009	22008	0000	00	00
SYSOPT	D	00256		999999	00	00	N	000000S	000169S	22009	44112	44111	0000	00	00
SYSAP	D	00256		999999	00	00	N	000000S	000082S	44112	55112	55111	0000	00	00
SYSTF	D	00256		999999	00	00	N	000000S	000008S	55112	56114	56113	0000	00	00
ERRORSET	D	00256		999999	00	00	Y	000000S	000003S	74101	75001	74115	0000	00	00
SYSDSLBL	D	0256	810601	999999	00	00	N	000000S	000016S	56114	59003	59002	0000	00	00
TESTONE	D	0256			00	F0	N	000001K	000001K	01001	01001	01004	0000	00	00
COPYONE	D	0256													

Figure 2-2. Example of Printed Directory

The header fields are:

DRIVE

The drive, where the data set resides.

1	Primary diskette drive
2	Secondary diskette drive
A	Disk drive A
B	Disk drive B

VOLUME ID

The Volume ID of the volume containing the data set.

CONTROLLER S/N

The serial number of your 4700 controller.

DATE

The current date, in mm/dd/yy format.

TIME

The current time, in hh:mm:ss format.

The fields displayed for each data set are:

DATA SET NAME

The name of the data set.

TYPE

T	**Temporary file diskette data set**
S	**Sequential EDAM (ESDS) data set**
D	**Direct EDAM diskette data set**
A	**ASDS disk data set**
R	**RKAP disk data set**
K	**KSAP disk data set**

RECORD LENGTH

This is the logical record length for the data set. Although the physical record length for a diskette is either 128 or 256 bytes, and the physical record length for the disk is 256 bytes, you can define several logical records within each physical record, or you can collect several physical records into one logical record up to 1024 bytes long. The value 0 indicates variable-length records in an ASDS data set.

CRE DATE

The date the data set was created, in mmddyy format.

EXP DATE

The data set's expiration date, in the format mmddyy (month day year), or the number of days until expiration, in the format +nnnn+ (nnnn is the number of days).

USER FLAG

Any EBCDIC character in the range 0-9, and A-F. Your installation will determine the meaning of this field.

I/D CH

The hexadecimal value that the system uses to initialize a record in this data set.

W/P

Whether the data set is read-only. In this field, Y indicates read-only data; N indicates that the data set has read/write status.

INITIAL DATA SET SIZE

The initial size of the data set in K-bytes (1K bytes = 1024 bytes).

If you omit this field, a default value of 4K bytes is used. Following the size, the system displays a K, T, or S to indicate whether the size is in K-bytes, Tracks, or Sectors.

CURRENT DATA SET SIZE

The current size of the data set, in K-bytes.

BOE

The Starting location (beginning of extent) of the data set. For diskette data sets, this is in the format *ttsrr*, where:

tt	is the track number
s	is the side
rr	is the record number

For disk data sets, this is shown as the physical block number (PBN).

EOD

The end of data address identifies the next unused sector in the data set extent, shown in the same format as the BOE, above. If this address is the same as that shown for BOE, the data set contains no records.

EOE

The end of extent address identifies the location of the last sector allocated to this data set, and is shown in the same format as BOE, above.

SIZE OF SECONDARY EXTENTS

This is the size of any secondary extents, in K-bytes. This field contains zeros for diskette data sets and temporary file data sets.

MAXIMUM # SECONDARY EXTENTS

The maximum number of secondary extents that may be allocated for this data set.

CUR # SECONDARY EXTENTS

The current number of secondary extents allocated.

Verify The Input PIN Protection Key

The PIN (Personal Identification Number) is the code number that your customer enters to gain access to a personal account. Use this test to verify the input PIN protection key that was entered into the encrypting PIN pad. During this test, you enter the input PIN protection key, and a test PIN value, from your terminal. The system then asks you to enter the test PIN value from the PIN pad. The system decodes the encrypted results using the key to be verified. The test is successful if the resulting clear PIN is the same as the test PIN that you entered from the terminal.

Enter option 05 of the 4700 Installation Menu.

```
+-----------------------------------------+
|     ***  4700 INSTALLATION MENU  ***     |
|          01 - DISKETTE FUNCTIONS         |
|          02 - DISK FUNCTIONS             |
|          03 - DATA SET FUNCTIONS         |
|          04 - DIRECTORY FUNCTIONS        |
|          05 - PIN PAD KEY TEST           |
|          06 - CHANGE PASSWORD            |
|          07 - ENTER SYSTEM MONITOR       |
|          08 - MICROCODE PATCH            |
|          09 - TRANSFER AP                |
|          0A - SYSTEM CUSTOMIZER          |
|     ENTER 2 DIGIT SELECTION NUMBER 05_   |
+-----------------------------------------+
```

The system asks you to enter the input PIN protection key:

```
** PIN PAD KEY TEST **
ENTER 24 CHARACTER ENCRYPTION KEY VIA
THE KEYBOARD.....
```

Enter the input PIN protection key, from your terminal's keyboard, as it was entered into the encrypting PIN pad. (A valid key is 24 characters long.) If you enter an invalid key or a key of less than 24 characters, the system displays the following message:

```
INVALID ENCRYPTION KEY,
RE-ENTER.....
```

Enter the correct key from the keyboard. When you have entered the key, the system prompts:

```
ENTER 1 TO 13 CHARACTER PIN NUMBER
VIA KEYBOARD.....
```

Enter your PIN through the keyboard. This PIN must be 1 to 13 numeric characters. After you enter the PIN, the following message is displayed:

```
ENTER THE SAME PIN NUMBER VIA THE PIN PAD
AS PREVIOUSLY ENTERED VIA KEYBOARD.
```

Enter the same PIN from the PIN pad.

If you press the Reset key twice, you do not get the results of the test. Instead, the system displays:

```
VERIFY ANOTHER PIN PAD (Y/N)?.
```

If the PIN numbers are the same, the system displays:

```
PIN NUMBERS COMPARE
```

If the PIN numbers are not the same, the system displays:

```
PIN NUMBERS DO NOT COMPARE
RETRY (Y/N)?.
```

If you enter Y, the system prompts you to enter the PIN number again through the PIN pad. If you enter N, the system displays:

```
VERIFY ANOTHER PIN PAD (Y/N)?.
```

You can test other PIN pads using the same input PIN protection key and test PIN value. If you enter Y, the system tells you to:

```
ATTACH NEW PIN PAD,
PRESS ENTER WHEN READY.
```

Attach the new PIN pad and press the Enter key. When you press the Enter key, the system prompts:

```
ENTER THE SAME PIN NUMBER VIA THE PIN PAD
AS PREVIOUSLY ENTERED VIA KEYBOARD.
```

Continue as in the previous example. When the system prompts:

```
VERIFY ANOTHER PIN PAD (Y/N)?.
```

You can enter N to test a different input PIN protection key. The system displays:

```
SET UP FOR ANOTHER
TEST (Y/N)?.
```

Enter Y, to test the same PIN pad with a different key. The test procedure restarts with the first prompt message. If you enter N or a null, the 4700 Installation Menu is displayed.

Change Your Password

The 4700 installation diskette is protected by a password. When you receive the diskette, a password of 12345 is in effect. You can change this password to any string of 1 to 16 alphameric characters, with no embedded blanks, entered from the keyboard.

Enter option 06 of the 4700 Installation Menu.

```
+-----------------------------------------+
|     ***  4700 INSTALLATION MENU  ***     |
|         01 - DISKETTE FUNCTIONS          |
|         02 - DISK FUNCTIONS              |
|         03 - DATA SET FUNCTIONS          |
|         04 - DIRECTORY FUNCTIONS         |
|         05 - PIN PAD KEY TEST            |
|         06 - CHANGE PASSWORD             |
|         07 - ENTER SYSTEM MONITOR        |
|         08 - MICROCODE PATCH             |
|         09 - TRANSFER AP                 |
|         0A - SYSTEM CUSTOMIZER           |
|     ENTER 2 DIGIT SELECTION NUMBER 06_   |
+-----------------------------------------+
```

The system asks you to:

```
ENTER NEW PASSWORD
```

Enter 1 to 16 characters as the new password for the installation diskette. The system asks for the current (OLD) password to verify that you are authorized to change the password.

```
ENTER OLD PASSWORD
FOR VALIDATION
```

Enter the old (current) password. When you enter the current password correctly, the new password is in effect for all following logons to the installation diskette. The following message is displayed as an indication of the change.

```
NEW PASSWORD NOW IN EFFECT
PRESS ENTER TO CONTINUE
```

Press the Enter key to return to the 4700 Installation Menu.

If you did not enter the current password correctly, the system displays:

```
OLD PASSWORD INVALID
RE-ENTER
```

You can reenter the correct password or enter a null to return to the 4700 Installation Menu. After you enter the password incorrectly three times in succession, the system cancels the change-password option, and displays the 4700 Installation Menu. The old password is still in effect.

Use the System Monitor

Enter a 07 on the Installation Menu to log onto the system monitor.

```
+-----------------------------------------+
|     ***  4700 INSTALLATION MENU  ***     |
|          01 - DISKETTE FUNCTIONS         |
|          02 - DISK FUNCTIONS             |
|          03 - DATA SET FUNCTIONS         |
|          04 - DIRECTORY FUNCTIONS        |
|          05 - PIN PAD KEY TEST           |
|          06 - CHANGE PASSWORD            |
|          07 - ENTER SYSTEM MONITOR       |
|          08 - MICROCODE PATCH            |
|          09 - TRANSFER AP                |
|          0A - SYSTEM CUSTOMIZER          |
|     ENTER 2 DIGIT SELECTION NUMBER 07_   |
+-----------------------------------------+
```

The installation diskette gives control of your work station to the system monitor. (After you log off the system monitor, you return the control to the installation diskette by pressing the Enter key.)

When you select the system monitor, the system displays:

```
TO ENTER SYSTEM MONITOR
PRESS RESET KEY 3 TIMES
(PRESS ENTER KEY FOR 4700 INSTALLATION MENU)
```

You can now log on the system monitor. Refer to "Logging Onto the 4700 System Monitor" on page 3-1.

Patch Microcode on a Diskette

You can use this function to modify the microcode contained on the IBM diskette. This function is used for applying small patches to the microcode on type 1, type 2, or type 2D diskettes on the primary diskette drive only. It does not require support from the host system.

Note: Before you patch a diskette, make a copy of the diskette for backup.

After you enter option 08 (Microcode Patch) from the 4700 Installation Menu:

```
+----------------------------------------+
|     ***  4700 INSTALLATION MENU  ***   |
|          01 - DISKETTE FUNCTIONS       |
|          02 - DISK FUNCTIONS           |
|          03 - DATA SET FUNCTIONS       |
|          04 - DIRECTORY FUNCTIONS      |
|          05 - PIN PAD KEY TEST         |
|          06 - CHANGE PASSWORD          |
|          07 - ENTER SYSTEM MONITOR     |
|          08 - MICROCODE PATCH          |
|          09 - TRANSFER AP              |
|          0A - SYSTEM CUSTOMIZER        |
|     ENTER 2 DIGIT SELECTION NUMBER 08_ |
+----------------------------------------+
```

the patch diskette function displays the following message:

```
PATCH PROGRAM RUNNING, ENTER
 1 - IF PATCHES FROM DISKETTE
 2 - IF PATCHES FROM KEYBOARD
 3 - TO CANCEL PATCH PROGRAM
```

In response to this message, enter:

1 To supply patches from the patch history diskette.
2 To enter patches from the keyboard.
3 To cancel the patch program and return to the 4700 Installation Menu.

Patch from the Diskette

If you enter 1, the following message is displayed:

```
INSERT PATCH HISTORY DISKETTE
```

Before you insert the patch history diskette, check the release level number on the diskette label. The patch history diskette contains all the patches available. After you insert the patch history diskette, the system displays:

```
ENTER RELEASE LEVEL AS xx.x
```

Where *xx.x* is the microcode release level. After you enter the microcode release level, the system displays:

```
PATCH SELECTION, ENTER
  1 - TO APPLY ALL PATCHES OF A GIVEN RELEASE
  2 - TO APPLY OR REMOVE A SINGLE PATCH
```

If you enter a 1, the system applies all the patches pertaining to the release level you specified. If you enter 2, the system asks you to identify the patch to be applied or removed.

```
ENTER PATCH NUMBER AS xx
```

The *xx* is the patch number.

After you enter the patch number, the system displays:

```
ENTER 1 IF REMOVING THE PATCH
PRESS ENTER KEY ONLY IF APPLYING THE PATCH
```

Enter a 1 to remove the specified patch; just press the Enter key to apply the specified patch. The system displays:

```
NOW SEARCHING FOR THE PATCH
```

The system is now searching for the requested patches. After the patch search is complete, the following messages are displayed:

```
ALL REQUESTED PATCHES FOUND,
REMOVE PATCH DISKETTE AND INSERT DISKETTE TO BE PATCHED
```

Remove the patch diskette from the primary diskette drive. Insert the diskette to be patched in the same drive. When the patch completes successfully, the following message is displayed:

```
PATCH NUMBER xx
HAS FINISHED
```

The *xx* is the number of the patch that finished. When the latest patch finishes: the following message is displayed:

```
PATCH COMPLETE
PRESS ENTER TO RESTART PATCH PROGRAM
PRESS RESET KEY 2 TIMES TO ABORT
```

Patch from Keyboard

If you respond with a 2 to the Patch Program Running message, the system displays:

```
INSERT TEMPORARY PATCH DISKETTE
```

Insert the temporary patch diskette in the primary diskette drive. Patch statements that are entered through the keyboard are recorded on the temporary patch diskette. If a temporary patch diskette is not available, insert a blank diskette. The following message is displayed:

```
TEMPORARY PATCH DISKETTE NOT FOUND,
DO YOU WISH TO CREATE ONE?
Y OR N
```

If you enter *N*, the program restarts and displays the first message again:

```
PATCH PROGRAM RUNNING, ENTER
 1 IF PATCHES FROM DISKETTE
 2 IF PATCHES FROM KEYBOARD
 3 TO CANCEL PATCH PROGRAM
```

If you enter *Y*, the following message is displayed:

```
INSERT BLANK DISKETTE TO WRITE ON
```

If you want to write on the diskette already inserted in the diskette drive, open and close the diskette drive. If you want to write on a different diskette, insert it now.

After you have created a temporary patch diskette or inserted an existing one, the system displays:

```
ENTER PATCH STATEMENTS
```

Enter your patch statements. You must press the Enter key after each line of data that you key in. After all the patch statements are entered, the following message is displayed:

```
ENTER 1 IF MORE PATCHES TO ENTER
PRESS ENTER KEY ONLY IF NO MORE PATCHES
```

If you enter 1, the Enter Patch Statement is displayed again. If you only press the Enter key, the following message is displayed:

```
PATCHES SAVED SUCCESSFULLY
PRESS ENTER TO APPLY PATCHES
PRESS RESET KEY 2 TIMES TO ABORT
```

The patch information is recorded on the temporary patch diskette.

Press the Reset key twice to cancel the patch diskette function and return to the 4700 Installation Menu. If you want to apply the patches, press the Enter key.

Cancel Patch Program

If you enter 3 to the Patch Program Running menu, the patch diskette function stops and the 4700 Installation Menu is displayed.

Transferring Programs to Your Operating Diskette

You can transfer one or more programs from another diskette to your operating diskette. You can move selected functions from the installation diskette to your operating diskette for daily use, so that you need not load the installation diskette each time you need one of these functions.

Notes:

1. Certain functions require the dedicated use of your controller. If your controller is used 24 hours per day, or if it cannot be interrupted for short durations (10 minutes, for example), DO NOT move the diskette functions (format, compress, and patch) to your operating diskette.

2. You MUST NOT move these functions to your operating diskette:

   - System Customizer
   - Disk Functions: Format, EDAM Init, and Format Override

The file control programs on the installation diskette reside in a data set named SYSAP. This is a direct data set having a physical sector length of 256 bytes. The first records of this data set contain a directory of SYSAP. There is space for 15 descriptor records in the first directory record, and 16 additional descriptor

records on each subsequent directory record. The format for the directory follows.

The first 16 bytes of the first directory record are:

Byte	Content
0-1	Number of programs in SYSAP
2-3	Last relative record number of last program in SYSAP
4-5	Total directory slots (1 per program)
6-7	First relative record number of first program
8-15	Reserved

Each program is described by a 16-byte entry.

Byte	Content
0-7	Program name in EBCDIC, padded with X40
8	Program version
9	X80 if another entry follows; X00 for latest entry
10-11	First relative record number of program
12-13	Last relative record number of program
14-15	Reserved

Before you transfer any programs, define and allocate a SYSAP data set on your operating diskette. Create SYSAP large enough to contain all the programs you intend to transfer. Figure 2-3 shows you the sizes of the 4700 programs you might want to transfer.

Figure 2-3 lists each File Control program by name, and shows its corresponding size in sectors. After you determine those functions you want to transfer, total all the sectors for all the required programs. Then, convert this value to the number of tracks required, depending on the diskette type you are using. A diskette type 2D has twenty-six 256-byte sectors per track; a diskette 1 or 2 has fifteen 256-byte sectors per track. Divide the number of sectors you need by the number of sectors per track.

For example, if you need 400 sectors on a diskette type 2D, you will need 400/26=15.4, or 16 tracks.

You can transfer several file control functions to your operating diskette. But regardless of how many functions you move, you must include the complete set of required basic programs:

BUITLA00 11 sectors
BUITLA01 27 sectors
BUITLB50 10 sectors

When several functions use the same program, you need only transfer that common program once. And, when you calculate the number of sectors/tracks you need, include a common program only once (unless you move several copies).

To begin to transfer programs, enter code 09 on the 4700 Installation Menu:

```
+-----------------------------------------+
|     ***  4700 INSTALLATION MENU  ***     |
|         01 - DISKETTE FUNCTIONS          |
|         02 - DISK FUNCTIONS              |
|         03 - DATA SET FUNCTIONS          |
|         04 - DIRECTORY FUNCTIONS         |
|         05 - PIN PAD KEY TEST            |
|         06 - CHANGE PASSWORD             |
|         07 - ENTER SYSTEM MONITOR        |
|         08 - MICROCODE PATCH             |
|         09 - TRANSFER AP                 |
|         0A - SYSTEM CUSTOMIZER           |
|     ENTER 2 DIGIT SELECTION NUMBER 09_   |
+-----------------------------------------+
```

The system displays this AP Transfer menu:

```
+---------------------------------------+
|              AP TRANSFER              |
|                                       |
|  SELECT                               |
|                                       |
|       (1)  DEFINE AP SPACE            |
|       (2)  TRANSFER ALL APS           |
|       (3)  REPLACE SELECTED AP        |
|       (4)  ADD SELECTED AP            |
|       (5)  RETURN TO MAIN MENU        |
|                                       |
|  _                                    |
|                                       |
+---------------------------------------+
```

The options available are:

1 Allocate space on the operating diskette. This step is optional. If you have already transferred programs to this diskette, the SYSAP data set might already have enough space.

2 Transfer all application programs from the program or installation diskette to the operating diskette.

3 Replace a program, selected by the program name, on the operating diskette with a program of the same name from the program or installation diskette.

4 Add a program, by name, to those already on the operating diskette.

5 Leave this function; return to the Installation menu.

Whenever you select option 2, 3, or 4, the system first ensures that sufficient space exists on your operating diskette. If there is not enough space, use option 1 to allocate more space.

CAUTION
Option 1 erases any existing programs from the SYSAP data set. Use this option with CARE.

Allocating Space for Application Programs (Option 1)

Before you actually transfer programs to the operating diskette, you might need to allocate sufficient space in which to store those programs. Select option 1 from the AP TRANSFER panel:

```
+----------------------------------------+
|              AP TRANSFER               |
|                                        |
|  SELECT                                |
|                                        |
|       (1)  DEFINE AP SPACE             |
|       (2)  TRANSFER ALL APS            |
|       (3)  REPLACE SELECTED AP         |
|       (4)  ADD SELECTED AP             |
|       (5)  RETURN TO MAIN MENU         |
|                                        |
|  1_                                    |
|                                        |
+----------------------------------------+
```

The system now prompts you to:

ENTER NR. OF TRACKS

Enter the number of tracks required to contain the application programs that will eventually be transferred. To reserve space for programs coming later, you can enter a number larger than you now need.

The system then prompts you to enter the maximum number of application programs that will be transferred. If you do not indicate a number of programs, you will transfer only one program.

ENTER MAX NR. OF APS

Enter the maximum number of application programs that are to be transferred. Again, you can use this to reserve space for programs that will be transferred later.

Then, the system prompts you to insert the operating diskette:

MOUNT OP DSKT ON PRIMARY

Insert the correct diskette; the system allocates the space.

CAUTION
Option 1 erases any programs on the operating diskette before it allocates the space. Before you use option 1 to allocate space, ensure that space is needed. Perhaps you have already allocated sufficient space on the diskette.

Transferring all Application Programs (Option 2)

After you allocate space on the operating diskette, select option 2 to transfer all application programs from the AP or installation diskette to the operating diskette.

```
                AP TRANSFER

  SELECT

       (1)  DEFINE AP SPACE
       (2)  TRANSFER ALL APS
       (3)  REPLACE SELECTED AP
       (4)  ADD SELECTED AP
       (5)  RETURN TO MAIN MENU

  2_
```

If you have one diskette drive, the system first prompts you to insert the AP or installation diskette, then the operating diskette. If there are many programs to transfer, the system will again prompt you to insert the AP or installation diskette followed by the operating diskette. Each time, the system reads programs from the program or installation diskette and writes them on the operating diskette.

On completion, all programs will be transferred to your operating diskette.

Replacing Application Programs (Option 3)

You might need to replace existing programs on the operating diskette with programs from the AP or installation diskette.

```
                AP TRANSFER

  SELECT

       (1)  DEFINE AP SPACE
       (2)  TRANSFER ALL APS
       (3)  REPLACE SELECTED AP
       (4)  ADD SELECTED AP
       (5)  RETURN TO MAIN MENU

  3_
```

The system prompts you to enter the name of the AP (application program) to be transferred:

ENTER AP NAME

Enter the name of the application program to be transferred in one of these forms:

Enter	To Transfer
apname	The named program, only.
apname,{R | T}	The named program either as a resident program (R), or as a transient program (T).
ap*,{R | T}	All programs whose program names begin with the characters you specify.

For example, to transfer only program BQIAAA, enter just the name BQIAAA. To transfer BQIAAA as a resident module, enter:

```
BQIAAA,R
```

To transfer *all* programs whose names contain the first four characters APP4, enter:

```
APP4*
```

If the program already exists, the system gives you one more chance to change your mind about replacing the program:

```
AP EXISTS - ENTER R TO REPLACE
```

If you know that you want to replace this program, enter R. (Otherwise, press Enter to cancel the operation.)

Adding One Application Program (Option 4)

Use this option to add one or more programs, by name, from the program or installation diskette to the operating diskette.

```
+----------------------------------------+
|              AP TRANSFER               |
|                                        |
|  SELECT                                |
|                                        |
|      (1)  DEFINE AP SPACE              |
|      (2)  TRANSFER ALL APS             |
|      (3)  REPLACE SELECTED AP          |
|      (4)  ADD SELECTED AP              |
|      (5)  RETURN TO MAIN MENU          |
|                                        |
|  4_                                    |
|                                        |
+----------------------------------------+
```

The system first prompts you to insert the diskette that contains the programs or functions, and to enter the name of the program to be added. The system then displays:

MOUNT AP DSKT ON AUXILIARY

followed by

ENTER AP NAME

and

MOUNT OP DSKT ON PRIMARY

Enter the name of the application program to be transferred in one of these forms:

Enter	To Transfer
apname	The named program, only.
apname,{R | T}	The named program either as a resident program (R), or as a transient program (T).
ap*,{R | T}	All programs whose program names begin with the characters you specify.

For example, to transfer only program BQIAAA, enter just the name BQIAAA. To transfer BQIAAA as a resident module, enter:

BQIAAA,R

To transfer *all* programs whose names contain the first four characters APP4, enter:

APP4*

Be sure to insert the diskettes in the requested order, and to enter the program name correctly. If there is sufficient space in SYSAP, the system transfers the programs you select. Press the Enter key to return to the AP Transfer menu.

Sample Program Transfers

This sample sequence transfers all the File Control functions (except Patch Diskette and Transfer AP) to your operating diskette.

First, use Option 1 to allocate SYSAP on your operating diskette to contain the 59 modules, or 404 sectors. For a diskette type 1 or 2, you will need to allocate at least 27 tracks. For a diskette type 2D, you must allocate at least 16 tracks.

Now, use Option 4 to add the modules from the installation diskette to the operating diskette. You will respond to the ENTER AP NAME prompt six times:

```
ENTER AP NAME
BUITLA00,R      Move a resident basic module.

ENTER AP NAME
BUITLA01,R      Move a resident basic module.

ENTER AP NAME
BUITLB50,R      Move a resident basic module.

ENTER AP NAME
BUITLA*,T       Move all transient BUITLAxx modules.

ENTER AP NAME
BUITLB*,T       Move all transient BUITLBxx modules.

ENTER AP NAME
BUITLF*,T       Move all transient BUITLFxx modules.
```

This example moves the first three basic modules as resident modules, and the remaining modules as transient overlays.

Finally, load your operating diskette to verify that the transfer is successful. Be sure that the installation menu is displayed at the correct station, and that you can use the transferred functions.

Module	Sectors
Basic Modules	
BUITLA00	11
BUITLA01	27
BUITLB50	10
PIN Pad Test	
BUITLA05	7
BUITLB55	3
Microcode Patch	
BUIPD	48
Transfer AP	
BUIZQAPB	14
BUIZQAMW	6
BUIZQACM	9
Format Diskette	
BUITLA11	10
BUITLB51	12
Copy Diskette	
BUITLA11	10
BUITLB51	12
Compress Diskette	
BUITLA12	6
BUITLB51	12
Rename Data Set	
BUITLA34	4
BUITLB53	14
BUITLF77	1
Copy Data Set	
BUITLA35	8
BUITLB53	14
BUITLF78	1
Append Data Set	
BUITLA36	8
BUITLB53	14
BUITLF79	1
Display Data Set Attributes	
BUITLA38	7
BUITLB53	14
BUITLF81	1
BUITLF82	5
Print Data Set Contents	
BUITLA39	6
BUITLB53	14
BUITLF83	1

Module	Sectors
Display Free Space	
BUITLA41	6
BUITLB54	4
BUITLF86	3
Print Directory	
BUITLA42	6
BUITLB54	4
Define Data Set	
BUITLA30	11
BUITLB53	14
BUITLF70	2
BUITLF71	3
BUITLF72	2
BUITLF73	4
Delete Data Set	
BUITLA31	4
BUITLB53	14
BUITLF74	1
Allocate Data Set	
BUITLA32	4
BUITLB53	14
BUITLF75	1
Deallocate Data Set	
BUITLA33	5
BUITLB53	14
BUITLF76	1
Reorganize Data Set	
BUITLA37	4
BUITLB53	14
BUITLF80	1
Display Directory	
BUITLA40	5
BUITLB54	4
BUITLF84	7

Figure 2-3. Modules and Their Sector Counts

Note: If you need the same module for several functions, transfer the module only once, and include it only once in your SYSAP space calculations.

Patch Error Messages

REQUESTED PATCH NOT FOUND
ENTER RELEASE LEVEL AS xx.x

You entered a patch number that does not match any patch number on the patch history diskette. Check the patch source information again to be sure that it is correct.

RELEASE LEVEL xx.x NOT FOUND
RELEASE LEVEL ON DISKETTE IS yy.y

The diskette on which you want to put the patch is not at the release level that you selected, or you entered the wrong release level.

The *xx.x* is the release level you selected. The *yy.y* is the actual release level of the diskette to be patched. Check the patch source information again for the correct release level.

INVALID PATCH STATEMENT FOUND
PATCH STATEMENT IS xx...x
ENTER KEY ONLY TO ABORT PATCH
ENTER 1 TO RESTORE DISKETTE TO PRE-PATCH STATE

Patch commands from the patch history diskette are invalid. The *xx...x* is the patch statement in error.

Enter 1 to restore the patch diskette. If you get this message again, press the Enter key to get the 4700 Installation Menu. Record the *xx...x* statement, and notify your service representative.

INCORRECT DISKETTE MOUNTED
INSERT CORRECT DISKETTE

You inserted the wrong diskette. The diskette that you inserted in the drive was the wrong diskette or a damaged diskette. Replace the diskette with the correct diskette or a new diskette.

I/O ERROR xxxx

The diskette or the diskette drive has a problem.

The *xxxx* is the device status as explained in Appendix A.

These following messages describe errors:

PATCH STATEMENT MISSING, ENTER IT NOW

REC STATEMENT MISSING, ENTER IT NOW

DUPLICATE REC STATEMENTS, REENTER

RELEASE LEVEL NOT FOUND, REENTER REC STATEMENT NOW

TWO DIFFERENT RELEASE LEVELS FOR ONE PATCH,
REENTER REC STATEMENT NOW

NAME STATEMENT MISSING, REENTER

ORG FIELD MISSING OR INCORRECT, REENTER

LVL STATEMENT REQUIRED, ENTER IT NOW

PATCH LEVEL NOT FOUND, REENTER LVL STATEMENT NOW

SECOND PATCH STATEMENT WITH NO END PATCH
END PATCH STATEMENT NOT FOUND
ENTER IT NOW

INPUT LENGTH EXCEEDED, REENTER

MODULE TYPE MISSING OR INCORRECT, REENTER

An error occurred while you entered patch statements from the keyboard. When you receive one of the previous messages, enter the statement correctly.

DISKETTE DATA DOES NOT VERIFY
STATEMENT FLUSHED IS
xxx...x

Data verification failed. The *xxx...x* is the statement that did not match.

PATCH NUMBER xx IS REMOVED
PRESS ENTER TO RESTART PATCH PROGRAM
PRESS RESET KEY 2 TIMES TO ABORT

Patch *xx* is the patch you were running when the mismatch occurred.

The diskette is restored to the previous patch number. Check the patch statement source to determine if this patch should be installed.

If the patch is to be installed, press the Enter key. If not, press the Reset key two times to stop the patch.

DISPLACEMENT IN VERIFY STMT DOES NOT AGREE
WITH REPLACE STMT
STATEMENT FLUSHED WAS xxx...x
REMOVING PATCH...
PATCH NUMBER xx IS REMOVED

The VER (verify) location of data on the diskette does not agree with the data location specified on the related REP (replace) patch statement. The *xxx...x* is the patch number that you were running when the mismatch occurred. The diskette is restored to the previous patch number. Check the patch statement source to determine if this patch should be installed.

PATCH REQUEST MISMATCH, DISKETTE IS AT
RELEASE LEVEL xxx...x
PATCH NUMBER yy

or

PATCH REQUEST MISMATCH, DISKETTE IS AT
RELEASE LEVEL xxx...x
PATCH NUMBER IS NON-DISPLAYABLE

The *xxx...x* is the release level of the current diskette. The *yy* is the patch number of diskette to be patched, or data that cannot be displayed. The diskette that you are trying to patch is not at the correct level to accept the current patch. The diskette either lacks the previous patches or the current patch is already installed.

DISKETTE RESTORED TO STATE IT WAS
PRIOR TO PATCH REMOVAL REQUEST

You tried to remove a patch; the request failed. The patch remains on the diskette. Check the patch statement source to determine if the patch can be removed.

Installation Diskette Error Messages

When you are working with the installation diskette menus, the system informs you of errors by displaying a coded error message at the bottom of the display screen. Usually, this will occur as a two-line message. The first line describes the error, for example:

F001 DATA SET NAME REQUIRED DR 2

or

8010 END OF FORMS

The second line tells you how to recover:

PRESS ENTER TO RESTART OR CONTINUE

Press the Enter key. The system again displays your panel with the information that you entered. Correct the error, and enter P to reprocess the information. The installation diskette detects only the first error it encounters. If you make several errors on a panel, the system will display only one error message at a time. When you correct one error, the system might then detect another and start the error-correction procedure again.

When the process finally completes successfully, the system displays the Function Completed message. Press Enter to continue. The system now displays the most recent menu, *without* any data in the fields.

Error Codes

In the first line of the error message, the system precedes the message text with a 4-character number (F001, above). If the first character of this code is the character F (as in F001), the message is explained here, in this chapter. If the first character of this code is *not* an F, the code is a system status message. See Appendix A, "Status Messages" on page A-1 for explanations of status codes.

The Fxxx messages are:

F001 Data Set Name Required. You did not supply the required data-set name.

F002 Data Set Type Required. You did not supply the required data set category.

F003 Drive Number Required. You did not supply the required drive number.

F004 LRECL Required. You did not supply the required LRECL value.

F005 Initial Size Required. You did not supply the initial size of the data set.

F006 Invalid Data Set Name. The name you entered violates the rules for naming data sets.

F007 Invalid Data Set Type. You have entered an invalid data-set type code.

F008 Invalid Drive Number. You have entered an invalid drive number.

F009 LRECL Too Long. You have entered a logical record length that is too big.

F010 Invalid Initial Size. You have entered an invalid initial size for the data set.

F011 Invalid Expiration Date. You have entered an invalid expiration date.

F012 Invalid User Flag. You have entered an invalid user flag.

F013 Invalid Sec Extent Size. You have entered an invalid secondary-extent size.

F014 Invalid Max Num Exts. You have entered an invalid value for the maximum number of extents.

F015 Invalid Response: Assign Recds. You entered an invalid value in this field.

F016 Invalid Response: Initialize Records. You entered an invalid value in this field.

F017 Invalid Delete Recd Size. You have specified an invalid value in the Delete Recd Size field, which specifies the number of initialization characters to write in a deleted record.

F018 Invalid Init/Del Char. You have entered an invalid delete or initialization character.

F019 Invalid Key Offset. You have entered an invalid offset for a data-set key.

F020 Invalid Key Length. You entered a data set key that is too long.

F021 Invalid Response: Dupl Key. You entered an invalid value in this field.

F022 Invalid Assoc Data Set Name. You entered an invalid data-set name in the Associated Data Sets field.

F023 Invalid Response: Override Exp Date. You entered an invalid value in this field.

F024 Invalid New Data Set Name. During a request to copy or rename a data set, you have specified an invalid name for the new data-set name.

F025 Too Many Assoc DS Names. You have entered too many associated data-set names.

F026 Override Exp Date Required. You tried to deallocate a data set before it expired, but you did not enter Y for the Override Expiration Date field.

F027 The current System date and time are invalid. The installation diskette received an invalid value from the system.

F028 Key Length Required. You must enter the key length.

F029 Associated Data Set Required. You are defining a keyed data set; you must have an associated data set.

F02A You entered an invalid source data set name.

F02B You entered an invalid target data set name.

F02C The data set is not on the source drive.

F02D Enter a new data set name.

F02E Copy operation is canceled.

F02F The logical record lengths are not equal.

F030 You cannot perform this function with only one drive.

F031 There is not enough space in the target data set.

F032 There is an invalid record number.

F040 You did not load optional module M2F.

F041	The function is complete.
F097	There is not enough storage for the optional modules you selected. Try selecting fewer modules.
F098	FPT Access Failure. A programming error occurred on the installation diskette. Notify your service representative.
F099	Internal Program Error. A programming error occurred on the installation diskette. Notify your service representative.

Miscellaneous Installation Diskette Messages

The system might display the following messages while you are using the 4700 installation diskette.

PRESS ENTER FOR MAIN MENU

Press the Enter key to return to the 4700 Installation Menu.

READ ERROR, RE-ENTER INPUT

Your latest input was not read successfully. Enter the correct input again.

I/O ERROR xxxx
FUNCTION ABORTED, PRESS ENTER TO RESTART

xxxx is the device status defined in Volume 4 of the *IBM 4700 Controller Programming Library*. Rerun the function once, then save the information for your service representative.

PROGRAM CHECK ERROR xx yyyy zzzzz
FUNCTION ABORTED, PRESS ENTER TO RESTART

xx = the program check error.

yyyy = the address of the instruction that caused the program check.

zzzzz = the module name where the program check occurred.

Save this information for your service representative.

VERIFY PROGRAM DISKETTE MOUNTED
IN PRIMARY (IPL) DRIVE
PRESS ENTER WHEN READY

You have removed the diskette that contains the installation-diskette functions, but have requested another function. Be sure that the correct diskette is inserted, and press Enter when you are ready.

ISSUING START DISKETTE COMMAND

The system is restarting the program diskette. No action is required.

SYSTEM MONITOR BUSY - RETRY (Y/N) ?

The system monitor is in use by another station. You can log off the other station and reply Y to this message.

```
 * * * * * * * * * * * * * * * * * * * * * * * * * *
*   FUNCTION NOT AVAILABLE                          *
* PRESS ANOTHER KEY TO CONTINUE                     *
 * * * * * * * * * * * * * * * * * * * * * * * * * *
```

You selected a function that is not available on your program diskette. Perhaps you transferred functions to the operating diskette and then selected an option that you neglected to transfer. Or, perhaps you selected a disk function but have no disk on your system.

Configuration for Installation Diskette

The following is the configuration supported by the 4700 installation diskette.

Loop 1 (4800 bps) is configured for:

Address	Modulus	Device	Component
1	3	4704	Keyboard Display
2	3	3604-4	Keyboard Display
3	3	3615	Printer

You can also use DCA-attached devices.

Port	Device
0	4704-2/3 Display
1	DCA Printer

Configuration for Diagnostic Diskette

The following is the configuration supported by the 4700 diagnostic diskette.

Loops 1 through 4 are configured for:

Address	Modulus	Device	Component
1	0	3604	Keyboard Display
2	4	Test Address	Display for diagnostic system monitor routines
4	8	Test Address	Printer for diagnostic system monitor routines

You can also use DCA-attached devices.

Port	Device
0	4704-2/3 Display
1	DCA Printer

Chapter 3. System Monitor Procedures

Logging Onto the 4700 System Monitor

In order to use any of the commands described in this manual, you must first log onto the 4700 system monitor. There are several ways you can log onto the system monitor.

- You can log on locally, using a display station attached to the 4700 controller.
- You can select option 7 on the 4700 Installation Menu.
- You can log on from a host system, using a network control program such as the Network Problem Determination Analysis (NPDA) program.
- You can log on from a 4700 application program.

See Volume 1 of the *4700 Controller Programming Library* for details on logging on from an application program. See the appropriate host-program manual to log on from a host network control program. For NPDA, see the *IBM 3600 Threshold Analysis and Remote Access Feature: User's Guide*, SC34-2056.

Logging On from a Local Terminal

Find a terminal that is not currently using an application program; be sure that the power is switched on to the terminal.

Press the Reset key three times in succession.

The system monitor clears the screen and displays:

```
90000
```

The system waits for you to enter your assigned password. You have 1 minute in which to enter the password. (If you wait too long or enter the password incorrectly, begin the entire procedure over again by pressing the Reset key four times in succession.)

Note: Use the keyboard as it is defined by the universal translation table for your particular device. There is no application program in control of the terminal just yet, so you must use a basic keyboard layout understood by the 4700 system. If you do not have a picture of the keyboard as translated by the universal translation table, see Figure 1-2 .

Press the Enter key.

The system now either displays:

```
91005
```

indicating that you entered your password incorrectly. (Begin this procedure again.)

Or, the system displays:

```
91111 loop addr
```

indicating that the logon is successful. Note the lowercase words *loop* and *addr* above. These are variables. The system actually displays the loop number and component address of your terminal in place of these variables.

Note: Throughout the reference portion of the book, we use lowercase letters to stand for variable data that you replace with your own information. Enter uppercase letters exactly as shown.

The system might display:

```
91111 1 02
```

indicating that you are using the terminal at loop 1, address 2.

Forcing Logoff

The logon procedure does not work if someone else is already logged onto the system monitor. Only one user at a time can use the system monitor. You can force a remote operator or an application program to log off the system monitor. Press your Reset key 15 times in succession within 2 minutes. Then, follow the standard logon procedure.

After you log on as a local control operator, using a terminal attached to the 4700 controller, no other user can force you off the system.

Note: When you force another user to log off the system monitor, that user might lose important data. Be sure this is what you really want to do. Use care in forcing another user off the system.

Logging on the System Monitor From the Diagnostic Diskette

You use the diagnostic diskette primarily during installation and checkout of your 4700 subsystem. You can also use the system monitor on the diagnostic diskette to create and format an operating diskette, print statistical counters, display log information, test components, and manipulate device parameters.

Insert the diagnostic diskette in the controller diskette drive, and power off all devices except the 4704 or 3604 at loop 1, address 1. Power on the controller, and press Reset to IPL the system. The system displays a series of controller messages at the 4701 (E0nn through I699). The 4704 or 3604 display then presents message 00001. Let this default; do not respond. The system performs a cold start with no host communication. After the controller display shows I9nn, your display screen asks you to:

```
ENTER 0 FOR ADAPTER TEST
      1 FOR MANUAL INTERVENTION
```

Enter 1 (within 20 seconds). The controller display shows T988. You are now ready to log onto the system monitor.

To log onto the system monitor, use the following procedure:

1. After the controller displays T998, press the Reset key three times (as defined by the universal translation table).

   The system displays message 90000 at the terminal. When the system displays 90000, the layout of the keyboard keys are as assigned by the universal translation table.

   Note: If 90000 is not displayed and the SYSTEM CHECK indicator comes on, either you logged on at the wrong terminal, or the system found an error during the keying operation. Press the Reset key once and try to log on again.

   You can cause the 90000 message to be displayed again by pressing the Reset key three more times.

2. You have 1 minute to enter the diagnostic-diskette system monitor password (12345) at the keyboard display (use the universal translation table keyboard layout). The system does not display the password.

   Note: The system logs you off automatically if you do not enter your password within 1 minute.

3. The system displays message 91111 to indicate a successful logon. If the system displays 91005, you entered an invalid control operator ID. If the system displays 91005, repeat the logon procedure starting with step 1. If you want to get back to the T998 message after logging off the system monitor, enter one of the adapter tests (for example: 0002 or 0004). You will get the T998 message when the test is complete.

Creating an Operating Diskette

You can use the system monitor to create a new operating diskette on a formatted diskette, or replace a portion of an existing operating diskette. Before you can create an operating diskette:

- At the host, there must be a configuration image and application programs for your 4700 system.
- The communication link that joins your 4700 controller to the host system must be working. Be sure that the second character on your controller's message display is a +. This indicates that the link is working. If the second character is not a +, try the 041 command to start the host link. If the second character is still not a +, refer to the *Problem Determination Guide*.

You can create an operating diskette with the Host Diskette Image Create facility or with the Host Transmission Facility.

Creating an Operating Diskette in Unattended Mode

You can create an operating diskette without being present at the creation. The operator at the host system selects all options.

First, you must have an installation diskette, or an operating diskette with these options:

- Either the CNM/CS system monitor, or the expanded system monitor
- Optional module P41 (Compress Diskette)
- Optional module P5E (Set Diskette)
- The Extended Diskette Access Method (EDAM), with its allocation function and at least two buffers allocated.

You must have the Host Transmit Facility available at the host.

Note: In unattended mode no operator is present to remove the operating diskette and insert a new diskette. So, if you want to create the new operating diskette on the primary drive, you will create it over the operating or installation diskette that you used to load the system, destroying the data that was on that diskette.

Make the controller ready. Start the link using either response 1 or 2 to the 00001 message at startup, or issue the system monitor 041 command. To use the system monitor:

1. Log onto the system monitor.
2. Issue 041 with appropriate operands.
3. DO NOT issue a 999 command.
4. To create the operating diskette on the secondary drive, insert a diskette in the secondary drive. To create the diskette on the primary drive, leave the current diskette mounted.
5. You can either remain logged on, or enter 000 to log off the system monitor. If you remain logged on, when the host initiates the diskette-creating session, the system monitor displays:

```
90091
```

The system monitor continues to display any pertinent messages, but does not prompt for any information nor does it accept any data from your keyboard. When the diskette is created, the system monitor logs you off automatically. Press the Reset key four times to log on again.

Creating an Operating Diskette on a Blank Diskette

This procedure describes how you can use unattended mode to create an operating diskette on a blank, formatted diskette rather than over an existing operating diskette.

First, you must have an installation diskette, or an operating diskette with these options:

- Either the CNM/CS system monitor, or the expanded system monitor
- Optional module P41 (Compress Diskette)
- Optional module P5E (Set Diskette)
- The Extended Diskette Access Method (EDAM), with its allocation function and at least two buffers allocated

You must have the Host Transmit Facility available at the host.

Make the controller ready. Start the link using either response 1 or 2 to the 00001 message at startup, or issue the system monitor 041 command. The procedure is:

1. Log onto the system monitor.
2. Issue 041 with appropriate operands.
3. Issue the 998 command.
4. The system monitor displays:

   ```
   90090
   ```

5. Insert a blank diskette in the primary drive. The monitor clears your screen, and becomes ready to receive the image.

   The system monitor continues to display any pertinent messages, but does not prompt you to mount any diskettes. When the diskette is created, the system monitor logs you off automatically. Press the Reset key four times to log on again.

Using the Disk to Contain the System Monitor

You can also use this procedure to create an operating diskette on a blank diskette. First, you put the system monitor on a disk. Then, you remove the operating diskette and insert a formatted diskette in the primary drive. The system monitor, on the disk, creates an operating diskette on the blank, formatted diskette in the primary drive.

You must have an operating diskette with these options:

- Either the CNM/CS system monitor, or the expanded system monitor
- Optional module P41 (Compress Diskette)
- Optional module P5E (Set Diskette)
- The Extended Diskette Access Method (EDAM), with its allocation function and at least two buffers allocated
- The CPYAP option on the FILES macro, to copy the system monitor and your application programs from the operating diskette to a disk.

The procedure is:

1. Load the system as described in "Completing Startup" on page 1-8.

2. When loading is complete, remove the operating diskette and insert the blank diskette.

3. Ensure that the host-communication link is active.

4. The system creates the operating diskette.

Automatic Backup Capability

The host operator can use the Host Transmit Facility with its automatic backup capability. The system builds the operating diskette on the secondary drive, automatically overlaying the contents of the diskette on that drive. The system then copies the contents of the secondary drive to the primary drive. Therefore, be sure to have diskettes of the same type in both drives.

When the host initiates the process, the controller is ready to read the configuration data and create the diskette.

Note: You can change from unattended mode to attended mode by entering the 999 command before the host initiates the session. Now, the system monitor prompts you with messages such as 00032 and 00030.

Create an Operating Diskette with Host Diskette Image Create Facility

You can use the Host Diskette Image Creating program (HDIC) to create a controller load image on a sequential data set at the host computer. Your programming staff codes a program to transmit that image to the controller. Note that HDIC builds complete images only, and cannot be used to change an existing image.

Before you begin, you need:

- An installation or operating diskette with either the CNM/CS or expanded system monitor
- The HDIC-created image at the host
- The program for transmitting the image to the controller

You can use this procedure in two ways. You can let the system monitor prompt you for each element of data. Or, you can enter all the data as operands on the 999 command.

Using HDIC in Prompt Mode

1. Log onto the system monitor.
2. Start the host link. You can respond 1 or 2 to the 00001 startup message, or you can issue the 041 system monitor command with the appropriate operands.
3. Issue the 999 command with no operands.
4. Reply 0 to the 00010 command.
5. Wait for the host to initiate the session. No messages are issued until the process begins.
6. If you have two diskette drives, respond to the 00011 command. Enter a 0 to use the diskette on the primary drive. Enter a 1 to use the diskette on the secondary drive.
7. Respond to the 00012 message. The 00012 message tells you the type of diskette to insert on the selected drive.

Message	Diskette Type
00012 1	Type 1 diskette
00012 2	Type 2 diskette
00012 2D	Type 2D diskette

8. Respond to the 00013 message that displays the volume ID of the diskette just inserted. Enter 0 if the volume ID is acceptable; otherwise enter 1.
9. As the diskette creation begins, the system displays the track and record being written.

10. If for some reason you want to stop the process, press Reset twice in succession. The system displays 00020.

11. If the system displays 00020, you can respond:

    0 To continue creating the diskette.

    1 To end this session, but remain in diskette-creation mode.

    2 To end the session and stop creating the diskette.

12. The 00014 message indicates that the diskette is created. The system then displays 00010.

13. Respond to 00010. This message asks whether you want to create any more operating diskettes, or end the operation. Reply to 00010:

    0 or 1 Continue creating diskettes.
    2 End the process.

14. Respond to 00016. If you used the primary drive to create the diskette, reinsert the operating or installation diskette and wait for the system to make the drive ready. You can now issue further system monitor commands.

Using HDIC Without Prompts

You can use the 999 command with operands to avoid the slower prompting mode.

1. First, log onto the monitor and activate the host link as shown previously.

2. Now issue the 999 command with its first two operands.

   999 0 m

   In place of the *m*, enter a code that indicates the diskette to be used. You can enter:

Code	Diskette to Use
999 0 0	Use the diskette already mounted on the primary drive.
999 0 1	Have the system display a message requesting you to insert a diskette.
999 0 2	Use the diskette already on the secondary drive.

3. Wait for the host to initiate the session. No messages are issued until the process begins.

4. If you entered *m* as a 1 (999 0 1), the system prompts you to indicate which drive to use. The system displays 00011. To respond, enter a 0 to use the diskette on the primary drive. Enter a 1 to use the diskette on the secondary drive.

A 00012 message tells you the type of diskette to insert on the selected drive.

Message	Diskette
00012 1	Type 1 diskette
00012 2	Type 2 diskette
00012 2D	Type 2D diskette

5. As the diskette creation begins, the system displays the numbers of the track and record that are being written.

6. If for some reason you want to stop the process, press Reset twice in succession. The system displays 00020.

7. If the system displays 00020, you can respond:

0	To continue creating the diskette.
1	End this session, but remain in diskette-creation mode.
2	End the session and end diskette-creation mode.

8. The 00014 message indicates that the diskette is created.

9. Respond to 00016. If you used the primary drive to create the diskette, reinsert the operating or installation diskette and wait for the system to make the drive ready. You can now issue further system monitor commands.

Creating an Operating Diskette with the Host Transmit Facility

You can create an operating diskette using the Host Transmit Facility. The Host Transmit Facility sends the data to the controller, where the Extended Diskette Access Method (EDAM) places the data on the diskette.

Before you use this method, obtain an installation or operating diskette with:

- The CNM/CS or expanded system monitor
- Optional module P41 (Compress Diskette)
- Optional module P5E (Set Diskette)
- EDAM with the allocation function, and two buffers allocated

You also need the Host Transmit Facility installed at the host system.

The system monitor lets you create the diskette in two ways. You can enter the 999 command with no operands; the system prompts you for needed data. Or, you can enter the 999 command with operands.

Using the Host Transmit Facility in Prompt Mode Without Backup

1. Log onto the system monitor.

2. Start the host link. You can respond 1 or 2 to the 00001 startup message, or you can issue the 041 system monitor command with the appropriate operands.

3. Issue the 999 command with no operands.

4. Reply to the 00010 command. If you reply 0, the Host Transmit Facility initiates the session. If you reply 1, the controller initiates the session.

5. Wait for the host system. When the controller initiates the session, the system displays the 00011 message. When the host initiates the session, the system monitor waits for the host to start operations. No messages are issued until the process begins.

6. If you have two diskette drives, the system displays 00011. Respond to the 00011 message. Enter a 0 to use the diskette on the primary drive. Enter a 1 to use the diskette on the secondary drive.

7. Respond to the 00012 or 00015 message. The system displays 00012 to create a new diskette or 00015 to change a diskette.

```
        00012 volid
or
        00015 volid
```

   Both messages tell you to mount the diskette with the specified volume ID. However, you can insert any diskette of any type you want. You need not insert the requested diskette. If you do insert another diskette, the system displays the 00013 message.

8. Reply to message 00013. You respond:

   0 To proceed with this other diskette.
   1 To prompt again for the diskette to be inserted.

9. After adding or modifying each data set, the system displays the 00017 message followed by the name of the data set that was just added or modified. If the data set name is followed by two asterisks (**), that data set was not successfully added or modified. Check the Host Transmit Facility log for reasons for the failure.

10. If for some reason you want to stop the process, press Reset twice in succession. The system displays 00020.

11. If the system displays 00020, you can respond:

    0 To continue creating the diskette.
    1 End this session, but remain in diskette-creation mode.
    2 End the session and end diskette-creation mode.

12. Respond to the 00030 message. If you are creating a new diskette, you can now change the volume ID of that diskette. Reply to 00030:

    Enter 0 to leave the volume ID as written.
    Enter 1 followed by a new volume ID to change the volid.

13. Respond to the 00032 message. You can change the control unit address (CUA) of the diskette. (This message does not appear when you change an existing diskette.) Reply to 00032:

    Enter 0 to leave the control unit address as written.
    Enter 1 followed by new control unit address (1 cua).

14. Respond to the 00034 message. You can change the control operator ID (the system monitor password) on the diskette. This message does not appear when you change an existing diskette.

    Enter 0 to leave the password as written.
    Enter 1 followed by the new password (1 password) to change the password.

    If you change the password, the system now displays the 90000 message to prompt you for the old password.

    Enter the old password.

    If you enter the wrong data here, the system displays 00034 again.

15. Respond to the 00038 message. You can change the node ID (XID) for the diskette. This message is not displayed when you modify a diskette. Enter:

    0 to leave the XID as written.
    1 followed by a new XID (1 xid)

16. The 00014 message indicates that the diskette is created. The system then displays 00010.

17. Respond to 00010. This message asks whether you want to create any more operating diskettes, or end the operation. Reply to 00010:

    0 or 1 Continue creating diskettes.
    2 End the process.

18. Respond to 00016. If you used the primary drive to create the diskette, reinsert the operating or installation diskette and wait for the system to make the drive ready. You can now issue further system monitor commands.

Using the Host Transmit Facility in Prompt Mode With Backup

1. Log onto the system monitor.

2. Start the host link. You can respond 1 or 2 to the 00001 startup message, or you can issue the 041 system monitor command with the appropriate operands.

3. Issue the 999 command, with no operands.

4. Reply to the 00010 command.

5. Respond to the 00112 message. Insert the diskette in the *secondary* diskette drive. You need not insert the requested diskette. You can insert any diskette of any type you want. If you do insert another diskette, the system displays the 00013 message.

6. Reply to 00013. You respond:

   0 To proceed with this other diskette.
   1 To prompt again for the diskette to be inserted.

7. After adding or modifying each data set, the system displays the 00017 message followed by the name of the data set that was just added or modified. If the data set name is followed by two asterisks (**), that data set was not successfully added or modified. Check the Host Transmit Facility log for reasons for the failure.

8. If for some reason you want to stop the process, press Reset twice in succession. The system displays 00020.

9. If the system displays 00020, you can respond:

   0 To continue creating the diskette.
   1 End this session, but remain in diskette-creation mode.
   2 End the session and end diskette-creation mode.

10. Respond to the 00030 message. If you are creating a new diskette, you can now change the volume ID of that diskette. Reply to 00030:

    Enter 0 to leave the volume ID as written.
    Enter 1 followed by a new volume ID to change the volid.

11. Respond to the 00032 message. You can change the control unit address (CUA) of the diskette. This message does not appear when you change an existing diskette. Reply to 00032:

    Enter 0 to leave the control unit address as written.
    Enter 1 followed by a new control unit address (1 cua).

12. Respond to the 00034 message. You can change the control operator ID (the system monitor password) on the diskette. This message does not appear when you change an existing diskette.

    Enter 0 to leave the password as written.

Enter 1 followed by the new password (1 password) to change the password.

If you change the password, the system now displays the 90000 message to prompt you for the old password.

Enter the old password.

If you enter the wrong data here, the system displays 00034 again.

13. Respond to the 00038 message. You can change the node ID (XID) for the diskette. This message is not displayed when you modify a diskette. Enter:

    0 to leave the XID as written.
    1 followed by a new XID (1 xid)

14. The 00014 message indicates that the diskette is created.

15. Respond to the 00153 message; insert a backup diskette in the primary diskette drive. The backup diskette must be the same type (1, 2, 2D) diskette as the diskette in the auxiliary drive. Press Enter when you have inserted the diskette, and the diskette becomes ready.

16. Message 00059 indicates that the copy is complete.

17. Respond to the 00016 message. Insert the IPL diskette in the primary drive, and wait for the system to make the drive ready. You can now issue further system monitor commands.

Using the Host Transmit Facility without Prompts

1. Log onto the system monitor.

2. Start the host link. You can respond 1 or 2 to the 00001 startup message, or you can issue the 041 system monitor command with the appropriate operands.

3. Issue the 999 command in this format:

```
999  init drv volidcuapwordxid
```

   Where:

   init
   Session initiated by:

   0 Host Transmit Facility
   1 Controller (invalid when changing existing diskette).

   drv
   Type of diskette request:

   0 Use the diskette in the primary drive.
   1 Issue a request to insert a new diskette.
   2 Use the diskette in the secondary drive.

   Notes:

   a. If you enter the *init* operand, the system does not prompt for operand values *unless* you enter this *drv* operand as a 1. In this case, the system prompts you to insert a new diskette.

   b. If you omit this operand, the system uses the diskette currently in the primary drive. BE CAREFUL. You might accidentally destroy the contents of your operating diskette.

   volid
   Enter the volume ID, for new diskettes only.

   pword
   Enter the password, for new diskettes only.

   xid
   Enter the node ID, for new diskettes only.

4. If you entered the *m* operand as a 1 (999 0 1 or 999 1 1), the system prompts you for the drive (00011 message) and the volume ID (00012 or 00015 message). If you really want to run this procedure without prompts, enter the 999 command with *drv* as a 0 or a 2.

5. After adding or modifying each data set, the system displays the 00017 message followed by the name of the data set that was just added or modified. If the data set name is followed by two asterisks (**), that data set was not successfully added or modified. Check the Host Transmit Facility log for reasons for the failure.

6. If for some reason you want to stop the process, press Reset twice in succession. The system displays 00020.

7. If the system displays 00020, you can respond:

   0 To continue creating the diskette.
   1 End this session, but remain in diskette-creation mode.
   2 End the session and end diskette-creation mode.

8. The 00014 message indicates that the diskette is created. The system then displays 00010.

9. Respond to 00016. If you used the primary drive to create the diskette, reinsert the operating or installation diskette and wait for the system to make the drive ready. You can now issue further system monitor commands.

Using the Host Transmit Facility Without Prompts With Backup

1. Log onto the system monitor.

2. Start the host link. You can respond 1 or 2 to the 00001 startup message, or you can issue the 041 system monitor command with the appropriate operands.

3. Issue the 999 command in this format:

```
999  init drv volidcuapwordxid
```

init

Session initiated by: Enter:

0 Host Transmit Facility
1 Controller (invalid when changing existing diskette).

drv

Type of diskette request:

0 Use the diskette in the primary drive.
1 Issue a request to insert a new diskette.
2 Use the diskette in the secondary drive.

Notes:

a. If you enter the *init* operand, the system does not prompt for operand values *unless* you enter this *drv* operand as a 1. In this case, the system prompts you to insert a new diskette.

b. If you omit this operand, the system uses the diskette currently in the primary drive. BE CAREFUL. You might accidentally destroy the contents of your operating diskette.

volid

Enter the volume ID, for new diskettes only.

pword
Enter the password, for new diskettes only.

xid
Enter the node ID, for new diskettes only.

4. Respond to the 00112 message. Insert the diskette in the *secondary* diskette drive. You need not insert the requested diskette. You can insert any diskette of any type you want. If you do insert another diskette, the system displays the 00013 message.

5. After adding or modifying each data set, the system displays the 00017 message followed by the name of the data set just added or modified. If the data set name is followed by two asterisks (**), that data set was not successfully added or modified. Check the Host Transmit Facility log for reasons for the failure.

6. If for some reason you want to stop the process, press Reset twice in succession. The system displays 00020.

7. If the system displays 00020, you can respond:

   0 To continue creating the diskette.
   1 End this session, but remain in diskette-creation mode.
   2 End the session and end diskette-creation mode.

8. The 00014 message indicates that the diskette is created.

9. Respond to the 00153 message; insert a backup diskette in the primary diskette drive. The backup diskette must be the same type (1, 2, 2D) diskette as the diskette in the auxiliary drive. Press Enter when you have inserted the diskette.

10. Message 00059 indicates that the copy is complete.

11. Respond to the 00016 message. Insert the IPL diskette in the primary drive, and wait for the system to make the drive ready. You can now issue further system monitor commands.

Controller-Initiated Creation

If you want the controller to initiate the creation process, you must:

- Perform a BLDCIT for a controller image table (CIT) using the host processor.
- Activate the Host Transmit Facility before you reply 1 to the 00010 message.
- Perform a CILOAD with the Host Transmit Facility.

Then, you can have the controller initiate the process.

Copying a Data Set to Another Diskette

You can use the 955 command to copy an IBM standard-format data set from one diskette to another. (Use the 188 command to copy an entire diskette.) To use this function, you need:

Two diskette drives: a primary drive and a secondary drive.

The installation diskette, or an operating diskette with:

- The CNM/CS or expanded system monitor.
- EDAM support (with allocation) on both drives.

You also need a user-defined, alphameric keyboard translation table if you want to copy a user-defined data set or specify a system data set by name rather than by number.

Log onto the system monitor, and follow this procedure:

1. If you want to know what data sets are on the diskette, issue the 990 command to identify all data sets on the diskette. Issue the 990 command with the 0 operand to specify the primary drive.

   ```
   990 0
   ```

   Or, issue the 990 command with the 1 operand to see which data sets are on the secondary diskette:

   ```
   990 1
   ```

2. If you are going to copy one of your own user-defined data sets, you must first use the 045 command to assign a user-defined, alphameric translation table.

   ```
   045 1
   ```

   However, if you are going to copy one of these system data sets, you need not issue 045.

ID	Data Set
SYSBAS	Base microcode
SYSAP	Application programs
SYSPF	Permanent files
SYSCTL	4700 control data set
SYSDSU	Diagnostic and Startup routines
SYSST1	Stage 1 overlays
SYSSM	System monitor
SYSOPT	Optional modules
SYSTF	Temporary files
SYSCPG	CPGEN file
DUMPAP	Application dump data set
SYSDLBL	Data set label

3. Issue 955 1 to copy a data set from the primary diskette to the secondary diskette. Or issue 955 2 to copy a data set from the secondary diskette to the primary diskette.

4. Respond to the 00053 message; the system is asking you to mount the correct diskettes. Insert the "from" diskette in the primary drive, and the "to" diskette in the secondary drive. When you have both drives ready, press Enter.

5. Reply to the 00060 message, which is asking you to identify the data sets to be copied. To copy only one data set, enter the name or number of that data set. To copy several data sets, enter the name or number of each data set, and separate the names or numbers with spaces.

   For system data sets, you can enter the name, or you can enter a number from the following table.

Number	Name	Data Set
1	SYSBAS	Base microcode
2	SYSAP	Application programs
6	SYSPF	Permanent files
8	SYSCTL	4700 control data set
9	SYSDSU	Diagnostic and Startup routines
10	SYSST1	Stage 1 overlays
11	SYSSM	System monitor
12	SYSOPT	Optional modules
13	SYSTF	Temporary files
15	SYSCPG	CPGEN files
16	DUMPAP	Application dump data set
FF		All system data sets

6. Receive 00018 messages. The system displays 00018 after copying each data set.

7. Receive message 00059. This message indicates that the process is complete; your data set is copied onto the secondary diskette. If you want to copy another diskette, enter 995 again, and repeat the procedure.

Note: Insert the operating or installation diskette, wait for the drive to become ready, and enter 042 0 to start the diskette.

Copy An Entire Diskette

Use the 188 command to copy an entire diskette, or only a part of a diskette, to another diskette. Both diskettes must be of the same type (1, 2, 2D), and must have the same size records.

To use this function, you need:

- Two diskette drives: a primary drive and a secondary drive. (If you have only one drive, use the copy-diskette procedure on the installation diskette.)
- An installation diskette, or an operating diskette with either the CNM/CS or expanded system monitor.

Follow this procedure:

1. Log onto the system monitor.
2. Enter 188.
3. Reply to the 00053 message, which asks you to insert the diskettes. Insert the "from" diskette in the primary drive; insert the "to" diskette in the secondary drive. Press Enter when you have made both diskettes ready.
4. Reply to the 00054 message, which asks you to indicate the data to be copied. Enter the starting and ending addresses (tracks and records) in either hexadecimal or decimal. To copy the entire diskette, just enter a 0.

   For example, to copy from track 13, record 13 up to track 16, record 9, you can enter:

   ```
   X0D0D X1009
   ```

   or you can enter:

   ```
   1313 1609
   ```

   To start copying from side 1 of a type 2 or 2D diskette, enter the addresses in hexadecimal and specify side 1 by setting on the high-order bit of the record number:

   ```
   X018F
   ```

5. If you are copying only a part of the diskette, the system displays the 00055 message, which asks for the addresses on the secondary diskette where you want the copied data written. You can just press Enter; the system copies the data to the location on the secondary diskette equivalent to the location on the primary diskette from which the data was copied. Or, you can enter new addresses in either hexadecimal or decimal. For example, to copy the data to the area beginning at track 13, record 13, and extending to track 16, record 9, you can enter:

   ```
   X0D0D X1009
   ```

   or

   ```
   1313 1609
   ```

6. When the process is complete, the system displays 00059. To copy more data, issue 188 again and repeat the process. Or, insert the operating or installation diskette, wait for the drive to become ready, and issue 042 0 to start the diskette.

Compress a Diskette

Use the 037 or 137 command to rearrange the data sets on a diskette to collect all free space into one continuous area. Use 037 on the primary diskette; use 137 on the secondary diskette. You need:

- Either an installation diskette, or an operating diskette with the CNM/CS or expanded system monitor.
- Optional module P41 (compression).

Notes:

1. Before you attempt to compress a diskette, use the copy-diskette function to save the contents. Sometimes a hardware error can render your diskette unusable.

2. The process of compression might take 20 minutes or more.

3. During compression, the extensive arm movement is noisy. This noise is not cause for alarm.

4. DO NOT compress a 3600 Operating Diskette.

Compress on the Primary Drive

1. Log onto the system monitor.

2. Enter 037.

3. Reply to the 00012 message, which asks you to insert the diskette to be compressed. (If the diskette is already in the primary drive, open and close the door of the primary drive.) When the drive is ready, the system begins to compress the data on the diskette.

4. The 00073 message indicates that the process is complete.

5. If you have more diskettes to compress, enter 037 again, and repeat the procedure.

6. Insert the installation or operating diskette, wait for the drive to become ready, and enter 042 0 to start the diskette.

   If you compressed the diskette from which the system was loaded, reload the system from that diskette.

Compressing on the Secondary Drive

1. Log onto the system monitor.

2. Insert the diskette to be compressed.

3. Enter the 137 command.

4. When the system displays 00073, the process is complete. You can repeat the procedure to compress other diskettes on the secondary drive.

Change Data Set Size on Diskette

You can use the 037 and 137 commands to change the size of a data set. This is an extension of the compression procedure. Thus, you ought to make a copy of your diskette before you change it.

To use this procedure, you need:

- Either an installation diskette, or an operating diskette with the CNM/CS or expanded system monitor
- Optional module P41 (compression)

The 037 command changes a data set on the primary drive; 137 works on the secondary drive.

Change a Data Set on the Primary Drive

1. Log onto the system monitor, and issue the 045 command to assign the alphameric, user-defined translation table to your keyboard.

   ```
   045 1
   ```

2. Issue the 037 command with its operands:

   ```
   037 dsid type alin size
   ```

   which might look like this:

   ```
   037 DATA1 1 0 64
   ```

   This sample command adds 64 sectors to data set DATA1, but does not align the changed data set on track boundaries.

   Enter the operands as:

   dsid Enter the data set identification (up to 17 alphameric characters) of the data set you want to change.

   type Enter a numeric code that tells the system how you want to change the size of the data set.

   1 Add sectors to the data set.

   2 Remove sectors from the data set.

   3 Delete (erase) the entire data set.

   4 Extend the end-of-data indicator to the end of the data set extent, plus 1 sector (1 sector beyond the end of the current data set extent).

   Now for an explanation.

   The diskette data set has three important indicators. The *beginning of data* shows where both the data, and the storage assigned to that data, begin. The data set and its data both begin at the same location.

   The data ends at a point called the *end of data*, which may or may not be at the end of the data set. In other words, the data set might not be full of data, but may have storage sectors assigned for future use.

   The data set itself, initially defined with a specified size, ends at a location in storage called the *end of extent*. The data set definition ends here, although the data might end considerably earlier. Thus ends the explanation.

   You can enter a 4 here to move the end-of-data indicator one sector beyond the end-of-extent indicator. This tells the system that, even though no records exist there, the data set is full; new records

cannot be added. Use this function to prevent the system from adding records to this data set.

5 Move the end-of-extent indicator forward, 1 sector *before* the end-of-data indicator.

First, read the explanation above. Now that you know what these terms mean, you can realize that this function removes unused sectors from the end of the data set, sectors that exist past the location where data ends.

alin Tell the system how you want the changed data set aligned. A data set is aligned if it begins and ends on track boundaries; it begins at the first location on a track, and ends at the last location on a track.

If the data set is already aligned on a track, and you want to preserve this alignment after changing the data set, enter a 1 to maintain track alignment.

If you don't care about alignment, enter a 0.

Note that aligning a data set on a track boundary might make access more convenient, but it might waste space. If the preceding data set does not end on a track boundary, you waste the space from the end of the previous data set to the beginning of this data set.

The system cannot guarantee to maintain track alignment for a sequential data set. Therefore, the system ignores your request to maintain track alignment for a sequential data set.

size This operand applies only if you use the 1 or 2 values for the *type* operand. Enter the number of sectors you want to add to, or remove from, the data set.

3. Now that you have entered the 037 command, the system prompts with:

```
00012
```

This message asks you to insert the diskette to be changed in the primary drive. (If the diskette is already inserted, open and close the diskette door.) The change begins when the diskette is readied.

4. The 00073 message indicates that the operation is complete. You can repeat this procedure for other diskettes, or you can replace the installation or operating diskette and enter 042 2 to start the diskette and continue with your work.

Change a Data Set on the Secondary Drive

The procedure for the secondary drive is similar to that for the primary drive.

1. Log onto the system monitor and issue the 045 command to assign the alphameric, user-defined translation table to your keyboard.

   ```
   045 1
   ```

2. Insert the diskette to be changed in the secondary drive. Proceed when the diskette becomes ready.

3. Issue the 137 command with its operands:

   ```
   137 dsid type alin size
   ```

   which might look like this:

   ```
   137 DATA1 1 0 64
   ```

   This sample command adds 64 sectors to data set DATA1, but does not align the changed data set on track boundaries.

   Enter the operands as:

   dsid Enter the data set identification (up to 17 alphameric characters) of the data set you want to change.

   type Enter a numeric code that tells the system how you want to change the size of the data set.

Code	Function
1	Add sectors to the data set.
2	Remove sectors from the data set.
3	Delete (erase) the entire data set.
4	Move the end-of-data indicator 1 sector beyond the end of the data set extent. The diskette data set has three important indicators. The *beginning of data* shows where both the data, and the storage assigned to that data, begin. The data set and its data both begin at the same location. The data ends at a point called the *end of data*, which may or may not be at the end of the data set. In other words, the data set might not be full of data, but may have storage sectors assigned for future use. The data set itself, initially defined with a specified size, ends at a location in storage called the *end of extent*. The data set definition ends here, although the data might end considerably earlier.

You can enter a 4 here to move the end-of-data indicator 1 sector beyond the end-of-extent indicator. This tells the system that, even though no records exist there, the data set is full; new records cannot be added. Use this function to prevent the system from adding records to this data set.

5 Move the end-of-extent indicator forward, 1 sector before the end-of-data indicator.

This function removes unused sectors from the end of the data set, sectors that exist past the location where data ends.

alin Tell the system how you want the changed data set aligned. A data set is aligned if it begins and ends on track boundaries; it begins at the first location on a track, and ends at the last location on a track.

If the data set is already aligned on a track, and you want to preserve this alignment after changing the data set, enter a 1 to maintain track alignment.

If you don't care about alignment, enter a 0.

Note that aligning a data set on a track boundary might make access more convenient, but it might waste space. If the preceding data set does not end on a track boundary, you waste the space from the end of the previous data set

The system cannot guarantee to maintain track alignment for a sequential data set. Therefore, the system ignores your request to maintain track alignment for a sequential data set. to the beginning of this data set.

size This operand applies only if you use the 1 or 2 values for the *type* operand. Enter the number of sectors you want to add to, or remove from, the data set.

4. Now that you have entered the 137 command, the system changes the diskette in the secondary drive.

5. The 00073 message indicates that the operation is complete. You can repeat this procedure for other diskettes.

Sample Commands

Here are some samples of 037 and 137 commands.

Enter this command to remove the data set named DATA1 from the primary diskette:

```
037 DATA1 3
```

This command adds 10 sectors (2560 bytes) to data set DATA2 on the secondary diskette drive:

```
137 DATA2 1 0 10
```

The system does not align DATA2 on a track boundary, and does not set the end-of-data indicator to the end of the extent. You can now move the end-of-data indicator by entering:

```
137 DATA2 4
```

This command removes 2 sectors (512 bytes) from data set DATA3 on the primary diskette drive, maintains track alignment, and moves the end-of-data indicator 1 sector beyond the end-of-extent indicator (if the end-of-data indicator is greater than the adjusted end-of-extent, plus 1 sector):

```
037 DATA3 2 1 2
```

This command removes unused sectors from the end of data set DATA4 by setting the end-of-extent indicator forward, 1 sector before the end-of-data indicator:

```
137 DATA4 5
```

Format a Diskette

Use the 039 or 139 command to prepare a diskette so that it will have 128-byte or 256-byte records and a standard 4700 format.

You need:

- Either an installation diskette, or an operating diskette with the CNM/CS or expanded system monitor
- Optional module P40 (Format Diskette)

Use the 039 command on the primary drive, and the 139 command on the secondary drive.

CAUTION
When you request the system to format a diskette, you lose any data that is currently on that diskette. BE SURE that you can afford to lose the data on the diskette BEFORE you request formatting.

Format a Diskette on the Primary Drive

Follow this procedure:

1. Log onto the system monitor.
2. Ensure that the host link is inactive, or issue the 041 1 command to stop the host link.
3. Issue the 039 command with its operands:

```
039 lgth typ volid crc seq
```

which might look like this:

```
039 0 1 VOL1
```

Enter the operands as:

lgth This is the record length, or number of bytes per record to be established for this diskette. Enter a 0 to format 128-byte records; enter a 1 for 256-byte records; or, enter an F to use the record length specified on the diskette's label.

typ Tell the system the kind of diskette you have. Enter a 1 for a diskette 1; enter a 2 for a diskette 2; enter a 3 for a diskette 2D; enter an F to use whatever type is already specified on the diskette's label.

volid Enter the volume identification (1 to 6 bytes) to be associated with this diskette volume. You can omit this operand; the system uses the volume ID already on the diskette's label.

crc This is the type of record to be written to the diskette. Enter 0 for a delete control record, or 1 for a data record. For multi-block diskette I/O, enter 1.

seq This value modifies the physical sequence numbering of records on a type 2D diskette. You can modify the sequence numbering to get more diskette accesses per revolution of the diskette. Replace *seq* with a number in the range 0 to 13. For example, diskette records are normally numbered:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

If you specify the *seq* operand as a 2, the system then numbers the records in this order:

1 3 5 7 9 11 13 15 2 4 6 8 10 12 14

This enables the system to read records 1 and 2 in one revolution of the diskette.

Notes:

a. You can omit the *lgth* and *typ* operands if you also omit the volume ID, or if you enter a volume ID longer than one character. This enables the system to recognize the various operands. If you enter a volume ID of only one character (1 byte), be sure to enter the first two operands.

b. If you enter the *crc* and *seq* operands, you must first enter the volume ID.

4. The system now prompts with message 00012. Insert the diskette in the primary drive. If the diskette is already inserted, open and close the drive door. When the diskette becomes ready, the system formats the diskette.

5. If the diskette contains data sets in the standard IBM or 4700 format, as defined for the Extended Diskette Access Method (EDAM), message 00070 gives you one last chance to save those data sets. If you press Enter, the system formats the diskette, rendering useless any data that might have been on the diskette. You can enter any other valid key to stop the format request before that data is lost.

6. Message 00071 indicates that the operation is complete. You can repeat this procedure for other diskettes, or insert the installation or operating diskette and enter the 042 2 command to start the diskette.

Format a Diskette on the Secondary Drive

Follow this procedure:

1. Log onto the system monitor.
2. Ensure that the host link is inactive, or issue the 041 1 command to stop the host link.
3. Insert the diskette to be formatted in the secondary drive.
4. Issue the 139 command with its operands:

```
139 lgth typ volid
```

which might look like this:

```
139 0 1 VOL1
```

Enter the operands as:

lgth This is the record length, or number of bytes per record to be established for this diskette. Enter a 0 to format 128-byte records; enter a 1 for 256-byte records; or, enter an F to use the record length specified on the diskette's label.

typ Tell the system the kind of diskette you have. Enter a 1 for a diskette 1; enter a 2 for a diskette 2; enter a 3 for a diskette 2D; enter an F to use whatever type is already specified on the diskette's label.

volid Enter the volume identification (1 to 6 bytes) to be associated with this diskette volume. You can omit this operand; the system uses the volume ID already on the diskette's label.

Note: You can omit the *lgth* and *typ* operands IF you also omit the volume ID, or IF you enter a volume ID greater than one character. This enables the system to recognize the various operands. If you enter a volume ID of only one character (1 byte), be sure to enter the first two operands.

5. If the diskette contains data sets in the standard IBM or 4700 format, as defined for the Extended Diskette Access Method (EDAM), message 00070 gives you one last chance to save those data sets. If you press Enter, the system formats the diskette, rendering useless any data that might have been on the diskette. You can enter any other valid key to stop the format request before that data is lost.
6. Message 00071 indicates that the operation is complete. You can repeat this procedure for other diskettes.

Sample Commands

Enter this command to format a diskette on the secondary drive as a type 1 diskette, with 128-byte records, and a volume ID of ABCDEF:

```
139 0 1 ABCDEF
```

Assume you have a type 2 diskette, already formatted with 256 bytes per record, and a volume ID of 123456. You want to format the diskette on the secondary drive, changing the volume ID to GEN011. You can enter:

```
139 GEN011
```

Transmitting Data to the Host System

Use the 888 command to transmit application programs, controller dumps, and diskette data sets to a program in the host system.

You need either an installation diskette, or an operating diskette with the CNM/CS or expanded system monitor. The transmission is sent on a data link either to the Host Transmission Facility or to a host application program provided by your installation.

1. Log onto the system monitor.

2. If you did not start the host link at startup, issue the 041 command with the appropriate operands to start the host link now.

3. Issue the 888 command as:

```
     888
or
     888 1
```

   to transmit from the primary drive, or:

```
     888 2
```

   to transmit from the secondary drive.

4. The system displays 00091, prompting you to insert the diskette containing the data to be transmitted. Be sure to insert the diskette in the drive you indicated on the 888 command.

5. The system now displays 00092. Enter one of the following to indicate the type of data you want to send to the host.

   - Press Enter to transmit a controller dump. (You have mounted a dump diskette.)
   - Enter 0 to transmit the entire diskette.
   - Enter the characters CF followed by a data set name to transmit a data set from the Local Configuration Facility library. Be sure to insert the LCF library diskette.
   - Enter AD to transmit an application program dump. (In a previous step you mounted an operating diskette containing the application dump.)
   - Enter the track and record addresses that begin and end the part of the diskette you want to transmit. For example, to transmit data that begins on track 2 record 15, and ends on track 16 record 1, you could enter:

```
     X020F X1001
or
     0215 1601
```

6. The message 00093 asks you whether the controller or the host will initiate the session. Enter a 1; the controller initiates a session with the Host Transmission Facility. Enter a 0; any host program can initiate a session with the controller.

Note: The Host Transmit Facility will NOT initiate a session. Either enter a 1, or be sure a user-provided program at the host will initiate the session.

7. The transmission begins. As data is transmitted, the system displays the track and record address of the data being sent.

   If you want to halt the transmission, press the Reset key twice in succession. The system displays the 00090 message. You can enter 1 to end the session, or 0 to continue the session.

8. When transmission is complete, the system displays 00099. You can repeat this procedure to transmit more data, or you can replace the operating diskette and enter 042 0 to start the diskette.

Executable Files

An EXEC, or an executable file, is a 4700 file that contains a sequence of system monitor commands to be executed as a unit. The system saves your EXEC in the log message data set, and assigns it a 4-digit number that you can later use to invoke the EXEC.

CAUTION
Whenever the system log file is reset (you load the system with a cold start, enter the 063 command, or use the Set Diskette function), all EXECs are lost.

Creating an EXEC

To create an EXEC, you need an installation diskette, or an operating diskette with the CNM/CS or expanded system monitor.

The procedure for creating an EXEC is:

1. Log on to the system monitor.
2. Issue the 980 command.
3. Type in each system monitor command. Press Enter after you key each command, just as if you were entering the commands for execution.
4. When you have entered all your commands, press Enter one more time to end the procedure. The system files your EXEC in the log message data set, and displays a 4-digit number. This number is the ID of the EXEC.

Executing an EXEC

To execute one of your EXECs, just issue the 982 command along with the 4-digit EXEC ID that the system displayed when you created the EXEC. For example, to execute EXEC 0011, enter:

```
982 0011
```

The system executes each command in the file.

You can cancel an EXEC any time during its execution. Press Reset twice in succession. You can now enter system monitor commands.

Using the 981 Command

When you create an EXEC, you can include a 981 command to repeat execution of all preceding commands in the EXEC. For example, if you enter these commands into the EXEC file:

```
001
075
981 4.
```

When you invoke this EXEC, the system executes the 001 and 075 commands. Then, encountering the 981 4, the system repeats the sequence of 001 and 075 commands four more times.

Sample EXEC Procedure

This procedure shows how to create an EXEC that executes the 001, 075, and 076 commands.

1. First, enter:

   ```
   980
   ```

   The system now enables you to enter commands for inclusion in the EXEC. Remember, the system does not execute these commands until you invoke the EXEC.

2. Now enter the first command:

   ```
   001  (press Enter)
   ```

3. And the second command:

   ```
   075  (press Enter)
   ```

4. And the last command:

   ```
   076  (press Enter)
   ```

5. Press Enter to tell the system monitor that the EXEC is complete. The system monitor displays:

   ```
   0006
   ```

6. To invoke this EXEC, you can enter:

   ```
   982 0006
   ```
   or
   ```
   982 6
   ```

Modifying Application Programs

This procedure shows you how to convert hexadecimal addresses to track and record format, how to size an overlay, and how to modify an application program. The procedure we will use is:

1. Use the 991 command to obtain the starting address of the application program.
2. Calculate the address within the application program of the data you want to modify.
3. Use the 032 or 232 command to modify the program.

Step 1: Obtain the Program's Address

Use the 991 command to display the starting addresses of application programs.

```
991
```

The system displays the names and addresses of programs on the diskette. If the program you want is not displayed, press the Enter key; the system presents another group of program names and addresses.

```
PGM1234    001    2B07
PGM2345    001    2B0B
YRPGM12    001    2C0B
```

Step 2: Calculate Instruction Addresses

Use a program listing to calculate the addresses of areas you want to change. Obtain the segment 14 displacement of the area, and convert that displacement into a track and record address. In a program assembled *without* the relocation option, the address on the listing is the actual displacement within segment 14. In a program assembled *with* the relocation option, the listing address does not correspond to the segment 14 displacement. To convert a relocatable address to a segment 14 displacement, see the *Controller Programming Library*.

Nonsplit application programs (root and overlay sections) are placed on the diskette as shown in Figure 3-1.

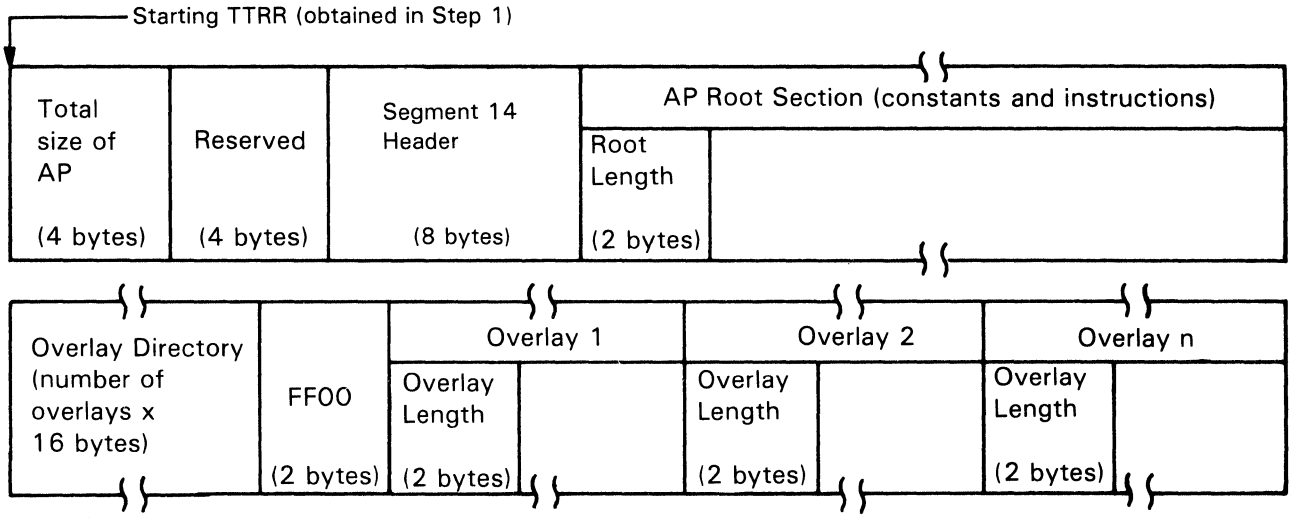


Figure 3-1. Application Programs on the Diskette

The format of the data written on the diskette depends on whether you use a one- or two-sided diskette. The number of diskette sides also affects how the addresses are calculated.

The procedure for modifying data in the root and overlay sections is discussed next under "Calculating Root Displacements" and "Calculating Overlay Displacements".

Calculating Root Displacements: To find the diskette location of the data you want to modify:

1. Find the starting track and record numbers (*ttrr*) for the application program (step 1 above). If your installation uses two-sided diskettes, double the *tt* portion of the starting *ttrr*.. If the *rr* portion is greater or equal to 80, add 1 to the *tt* portion before continuing.

2. Using your listing, find the segment 14 displacement of the data you want to modify; add 16 (X'10') to that displacement. (If the program is relocatable, first convert the listing address to a displacement as discussed earlier.)

3. A diskette record has 256 bytes. Divide the displacement that was just obtained by 256 (X'100'). The quotient is the number of diskette records, and the remainder is the displacement.

4. Add the calculated number of records to the starting *ttrr* to obtain the *ttrr* of the diskette record that contains the area you want to modify. (Remember, there are 15 records per track on a type 1 or 2 diskette, and 26 per track on a type 2D.)

5. Use the 031 command to display the data at the *ttrr* you have calculated to verify that you have found the right record.

Calculating Overlay Displacements:: The overlay directory follows the root section on the diskette. The overlays follow the directory in the order they were specified. The root section is that part of the program from the start of the program to the FINISH statement.

There are two methods to locate overlays on the diskette. Use the first method if the programs are not in storage (they are still on the diskette). Use the second method if the programs and overlays are loaded in the controller.

Overlays on the Diskette:

1. Find the root length, which is stored in hexadecimal at displacement 16 (bytes) into the application program on the diskette (at location 0 when the program is in storage).

2. Immediately following the root section is the overlay directory, which consists of one 16-byte entry for each overlay. Multiply the number of entries by 16, add 2, and then add the root length to get the displacement to the first or only overlay. (See "Sizing Overlay Directories" at the end of this chapter.) Convert this displacement to *ttrr* format.

3. Immediately following the directory is the start of the first overlay. The first two bytes of each overlay contain the length of the overlay. All the length of

the overlay, converted to *ttrr* format, to the displacement of the overlay calculated in step 2, above. Continue this process until you find the overlay you want.

4. Find the address in the overlay section of the data you want to modify, and subtract the overlay starting address from it. The result is the displacement into the overlay of the area that contains your data. Convert that address to *ttrr* format.

5. Add the *ttrr* location of the start of the overlay to the results from *D* above. For one-sided diskettes, the result is the location of the data you want. For two-sided diskettes, divide the *tt* portion of the result by 2, and combine the quotient with the *rr* portion of the result to find the data location. A remainder of 1 indicates the data is on side 1 of the diskette.

6. Display the data at that *ttrr* to verify that you have found the data you want to change.

Diskettes that Have Been Loaded:

1. The overlay directory is at the end of segment 14. The displacement to the first overlay entry is at location X'16' (decimal 22) of the header. There is one directory entry for each overlay; X'FF00' follows the last entry. Each entry contains the following:

```
Overlay name (8 bytes)
Starting address of the overlay (2 bytes)
Reserved (2 bytes)
Starting PBN (Physical Block Number) for that overlay
(2 bytes)
Displacement into record of the start of overlay (1 byte)
Flag byte (1 byte)

  Flag byte settings:

   X'80' = constant section present (always set with
           nonsplit AP)
   X'01' = overlay loaded
```

2. To display the overlay directory,issue 123 to enter debugging mode, and use the 01 debugging command to display segment 14.

   For example:

```
Enter:  123 X          X is the station ID.
        01 14 22       22 is the displacement of the field
                       containing the displacement of the overlay
                       directory.
        01 14 Xyyyy    yyyy is the displacement of
                       the overlay directory obtained in the
                       above step.
```

   The system displays the first 8 bytes of the directory. Press the Enter key to display the next 8 bytes. You can do this until you find the appropriate overlay entry.

3. From your listing, get the address in the overlay of the data you want to change, and convert this displacement to track and record (*ttrr*) format.

4. Enter 00 to leave debugging mode. Convert the physical block number (PBN) found in the overlay directory to the starting *ttrr* using the following procedure. Add the *ttrr*, derived in step 3 to the starting *ttrr*. The result, adjusted for two-sided diskettes (see step *5* in the previous procedure), if applicable, and in *ttrr* format, is the location on the diskette of the data you want to modify.

Converting a Physical Block Number (PBN) to a ttrr

You derive Physical Block Numbers (PBN) by numbering sequentially all sectors on a diskette starting with 0001 (meaning track 1 record 1, and continuing through the last sector on the diskette. To convert the PBN to a *ttrr* address, use the following algorithms:

For diskette type 1 (1-sided)

$$t = \frac{pbn}{mr} + 1$$

z = pbn modulo mr

r = z modulo mr

Where:

t = The track number (tt)

z = Is a temporary work variable used to calculate r

r = The record number (rr)

pbn = The physical block number (1 to n)

mr = The maximum number of records on a track (15 on type 1 or 2; 26 on type 2D)

modulo = The remainder resulting from the division of the first integer by the second integer.

In the above algorithm, the value of *t* is the *tt* of the *ttrr*. And the value of *r* is the *rr* value of *ttrr*. To combine the *h* value and the *r* value: If *h* =0, take *r* as the *rr* value; if *h* = 1, add (80 base 16) to the *r* value, and use the result as the *rr* value for *ttrr*.

Example: If the PBN=348 for a diskette 1:

$$t = \frac{348}{15} \pm = 24_{10} = 18_{16}$$

z = 348 modulo 15 =3

r = 3 modulo 15 = 3_{10} =3_1

ttrr = 2403_{10} = 1803_{16}

For diskette type 2 (2-sided)

$$t = \frac{pbn}{mr \times 2} + 1$$

$$z = pbn \text{ modulo } (mr \times 2)$$

$$h = \frac{z}{mr}$$

$$r = z \text{ modulo } mr$$

Where:

```
t      = The track number (tt)

z      = The temporary work variable used in the calculation
         of h and b

h      = The head number (0 or 1)

r      = The record number (when combined with
         h is the rr value)

pbn    = The physical block number (1 to n)

mr     = Maximum number of records on a track (15)

modulo = The remainder resulting from the division
         of the first integer by the second integer.
```

In the above algorithm, the value of *t* is the *tt* value of *ttrr*. The value of *r*, when combined with the value of *h*, is the *rr* value of *ttrr*. To combine the *h* value and the *r* value: If *h* =0, take *r* as the *rr* value; if *h* = 1, add (80 base 16) to the *r* value, and use the result as the *rr* value for *ttrr*.

Example: Diskette type 2 with PBN = 348:

$$t = \frac{348}{15 \times 2} + 1 = 12_{10} = 0C_{14}$$

$$z = 348 \text{ modulo } (15 \times 2) = 18$$

$$h = \frac{18}{15} = 1$$

$$r = 18 \text{ modulo } 15 = 3_{10} = 3_{16}$$

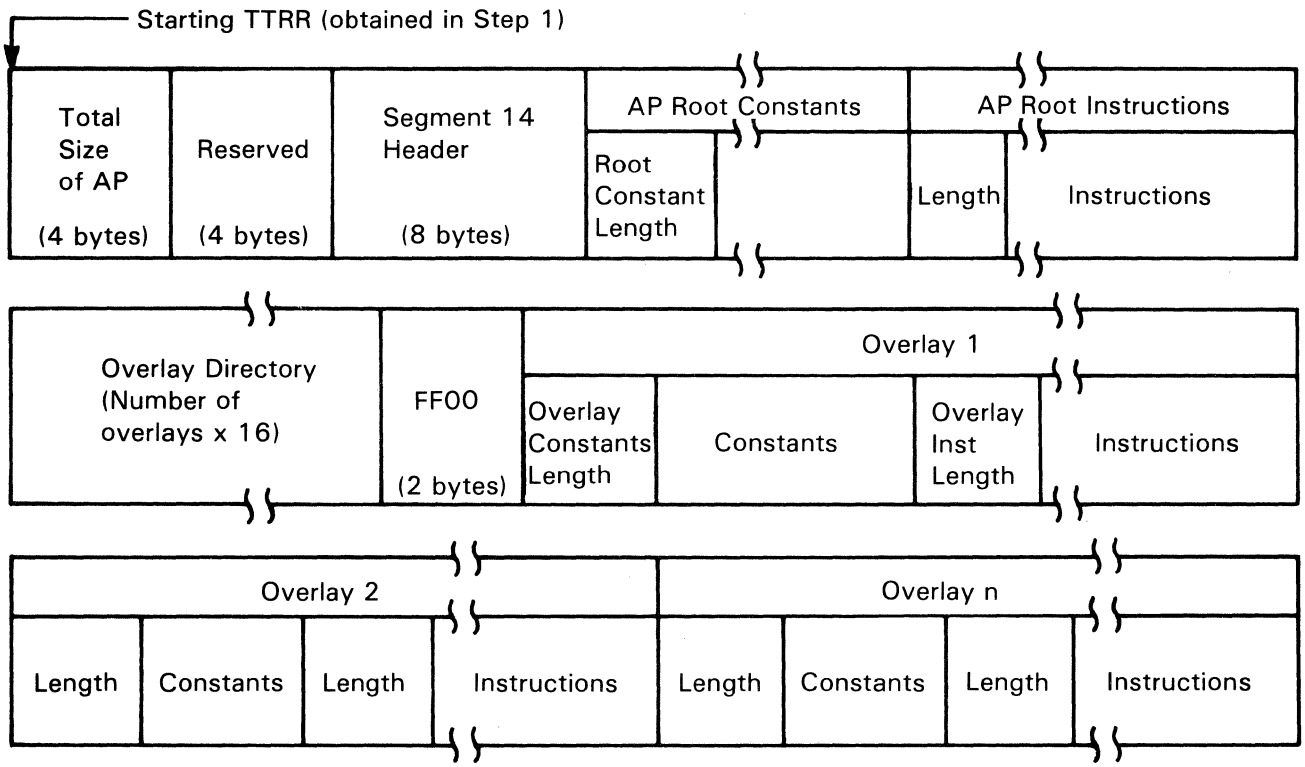
$$ttrr = 1283_{10} = 0C83_{16}$$

Calculating Displacements for Split Programs

To modify data within a split application program, follow the same process as for nonsplit programs. Get the starting *ttrr* for the AP area on the diskette, modifying the *tt* portion for two-sided diskettes, if applicable (as described under "Calculating Root Displacements," step 1). Get the segment 14 displacement from the program listing (converting relocatable addresses, if necessary) and

calculate the *ttrr* address of the data you want to modify. Because of the way a split program is placed on the diskette, calculating the *ttrrs* is more complex. The diskette layout of a split program is shown below, followed by the formulas for calculating displacements into root constant, instruction areas, overlay constant, and instruction areas.

Split AP Layout on the Diskette:



Split AP Formulas:: To address data in the root constant area:

1. Get the segment 14 address from the listing and add 16 (X'10') to it.
2. Convert the displacement to *ttrr* format (see Note a.), and add to the starting *ttrr* obtained in Step 1. The result is the *ttrr* of the data you want to modify.

To address data in the root instruction area:

1. Get the segment 14 address from the listing and add to it:

   ```
   16 (X'10') + root constant length   (see Note b.)
   ```

   The root constant length is contained in a 2-byte field at a displacement of X'10' into the record identified by the starting *ttrr*.

Notes:

a. See "Converting Hexadecimal Addresses or Displacements to *ttrr* Format" later in this chapter.

b. See "Sizing Overlay Directories" at the end of this chapter. Root constant length is not added when using OS/VS assemblies.

2. Convert the displacement to *ttrr* format and add to the starting *ttrr* obtained in Step 1. On one-sided diskettes, the result is the *ttrr* of the data you want to modify in the root instruction area. On two-sided diskettes, divide the *tt* portion of the result by two. The quotient combined with the *rr* of the result is the address of the data you want. A remainder of 1 indicates that your data is located on side 1.

To address data in an overlay on the diskette:

1. Compute the starting *ttrr* of the first or only overlay by adding together:

```
16 (X'10') + root constant length + root instruction
length-overlay directory length + 2
```

   This displacement, converted to *ttrr* format and added to the AP area starting *ttrr* for the overlays on the diskette, gives the *ttrr* of the first or only overlay. By adding the lengths of the overlay constant and instruction pieces to the overlay starting *ttrr*, the *ttrr*s for succeeding overlay sections can be computed.

2. To address data within a particular overlay section, follow *4* and *5* in the "Calculating Overlay Displacements" section that deals with overlays on the diskette (earlier in this chapter). Use the starting *ttrr* for the overlay section in question.

To address data in an overlay on a diskette that has been loaded:

1. Follow *2 3* and *4* in the "Calculating Overlay Displacements" section that deals with overlays on diskettes that have been loaded.

2. The resident overlay directory entry for an overlay of a split application program is structured as follows:

```
Overlay name (8 bytes)
Starting address of constants for overlay (2 bytes)
Starting address for overlay (2 bytes)
Displacement into record of the start of overlay (1 byte)
Flag byte (1 byte)

   Flag byte settings are:

       hex 80 = constant piece present
       hex 40 = instruction piece present
       hex 01 = overlay loaded
```

Step 3. Entering Modifications

Use system monitor command 032 to modify your program. (Use the 031 command to define the diskette side to use.) Example:

```
Enter

   032 2312 200 1 A 24

   This command changes the two bytes of data on diskette
   side 0 at ttrr address 2312 (X'170C'), at
   a displacement of 200 (X'C8'), to X'1A24'.
   You could use hexadecimal instead of decimal
   for the ttrr and ddd numbers.
   If you issue this command using an operating diskette, a
   90001 error message is displayed.
```

These changes are stored on the diskette only and do not become effective until the next system load or, for an overlay change, until the overlay is next read from the diskette. If the application programs are stored on the disk file, these changes do not become effective until the next system load.

Converting Hexadecimal Addresses or Displacements to TTRR Format

Each location on the diskette is addressed by its track number, record number, and, for some commands (the 032 command for example), the displacement into the record from its beginning. (Each track on a diskette 1 or 2 has 15 records; each track on a diskette 2D has 26 records; each record has 256 (X'100') bytes.) Segment 14 addresses from the application program listing represent the number of bytes from the beginning of the segment. The process for converting hexadecimal addresses or displacements to *ttrr* format and adding *ttrr*s follows:

1. Split the address from the displacement. The low-order byte is used as a displacement value; the high-order byte represents the number of records *(rr)*. For example:

   2134_{16} =21_{16} records, 34_{16} displacement

2. To convert records to track and record format, convert the record number to decimal, and, if greater than the number of records per track on the type of diskette being used, divide by the number of records per track. The quotient represents tracks, and the remainder represents the record number. For example, if you are using a diskette 1:

$21_{16} = 33_{10}$

$$\frac{33_{10}}{15} = 02 \text{ and a remainder of } 03$$

Thus, tt=02 and rr=03; ttrr = 0203

The result of converting 2134 (base 16) to *ttrr* format is *tt*=02, *rr*=-03, with a displacement of 34.

3. To add this *ttrr* to a starting *ttrr*:

	tt = 34	rr = 0C	disp = EA
add	02	03	34
	36_{16}	$0F_{16}$	$11E_{16}$

Because the displacement value now exceeds record length, you must convert the displacement value into records and displacement. Divide by X'100':

$$\frac{11E_{16}}{100_{16}} = 01_{16} \text{ (rr) and } 1E_{16} \text{ (disp)}$$

4. Add the *rr* value (01) to the *rr* value. The displacement is 1E.

	tt = 36	rr = 0F	disp = converted
add		01	1E
	36_{16}	10_{16}	$1E_{16}$

5. Convert the *rr* value to decimal; divide by 15, (or the number of records per track for the diskette being used) quotient = 1, remainder = 1, or *tt*=01, *rr*=01.

6. Add the quotient from step 3 to the *tt* value from step 2. The remainder, 1, from step 3 is the *rr* value.

	tt=36	rr=conv	disp=1E
add	tt 01	01	
	37_{16}	01_{16}	$1E_{16}$

The segment 14 address/displacement of 2314 hexadecimal is equivalent to the diskette location (*ttrr*) of track 37, record 01, with a displacement of 1E into the record.

Sizing Overlay Directories

When you know the number of overlays in an application program, the size, in hexadecimal, of the resident overlay directory may be obtained by converting the number of overlays (decimal) to a hexadecimal number and appending a 0 to the low-order position. The resulting hexadecimal number represents the number of bytes occupied by the directory. For example:

You have 21 overlays, therefore:

$21_{10} = 15_{16}$, append 0 = 150_{16}

$21_{10} \times 16_{16} = 336_{10} = 150_{16}$

Testing 4700 Components

After you log onto either the operating or diagnostic diskette, you can test the various components of your 4700 subsystem. Use these tests to determine whether a particular component's malfunction is due to an error at the component, or in the program that communicates with that component.

First, issue the 007 system monitor command to assign the device as a test component. (Chapter 4 describes the 007 command.) To assign a 4704 keyboard, attached at loop 1, address 1, you would issue:

```
007  10101
```

To assign the 3262 printer on port 2, enter:

```
007 A024
```

Then, you might use the 062 command to request notification of any error during communication with the test device. (Normally, the system does not report intervention required or unit exception.)

```
062 0
```

Now, the system stops the test on any error, or on receipt of exception status, and reports the error to you.

You might now want to determine whether the DEVPARM settings for the test device are correct. Issue 043 with no operands, the system displays the DEVPARM settings. Now you can issue 043 with new DEVPARM values. Finally, issue the testing commands to send test output to printers and displays, and to read test input from keyboards.

On the Operating Diskette: You issue the 007 command to assign a component as the test component. This assignment continues until you issue another 007 command to reassign the test component, or to assign another test component, or until you log off.

Note: Be careful when assigning test components. After you assign a component as a test component, that component is no longer available to its previous work station.

On the Diagnostic Diskette: The test devices are kept in a free pool. Use the 973 command to activate a test device. Then issue 007 to assign the device for testing. When you are finished with a device, issue another 007 command to release the test device, and issue 973 with no operands to deactivate the device.

When you test a device on a loop, switch off the other terminals that are not actually being tested.

Only one component of any type can be active. If you try to activate another component of a type that is already active, the system deactivates the current terminal and reactivates it on the newly-specified address. If you try to activate a component at an address that already contains an active component, the system deactivates the current device, and activates the new device at that address.

Testing a Loop Device: Use the 973 command to activate the device from the device free pool. Then, use 007 to assign the device as the test component. You can activate a test device at any of these addresses:

Loop	Address
1	2 or 4
2	2 or 4
3	2 or 4
4	2 or 4

The diagnostic diskette is configured for a 3604 or 4704 keyboard display at address 1 of each loop. Use the 048 command to specify the correct model number of the display.

Testing a DCA Device: Use the 074 command to activate a test device on any DCA port. Then, use 007 to assign the device as the test component. Enter the DCA device's address as follows:

Device	007 lssdd	Optional Modules	Device Parameter
3278/79 Keyboard	App1	13, 95, 98	Model 8
3278/79 Display	App2	13, 95, 98, A8	Model 8
4704 Keyboard	App1	13, 95, 98, AB	Model 21,22
4704 Display	App2	13, 95, 98, AB, A8	Model 21,22
3262/3287/5210	App4	13, 93, 95, 99	

Replace *pp* with the port to which the component is assigned.

Chapter 4. Command Reference

This chapter contains all 4700 system monitor commands in numeric order (for debugging commands, see Chapter 5, "Debugging Commands"), and describes the purpose of each command, the format of each command (what you enter and how), and the meaning of each operand. This chapter also contains samples of command entry, the output that the command produces, and random notes about how to use the command. Here are the conventions that we have tried to follow in this chapter.

An operand that we show in uppercase is not a variable symbol, but an actual operand value. Enter an operand shown in uppercase just as we show it in this chapter.

An operand that we show in lowercase is a variable; replace this symbol with your own command input. For example, the operand might show *dsid*, but you enter the data set identification. Each operand description tells you what data to enter in place of the symbol.

An operand enclosed in brackets ([]) is optional; you need not enter this operand. Generally, if you omit an operand the system provides a default value.

When several operand values are enclosed in braces ({}), select one of the values for the operand. If the braces are in turn enclosed in brackets (as above), you can either select one of the operand values, or omit the operand altogether and use the supplied default value.

000 – Log Off the System Monitor

The 000 command logs you off the system monitor, and clears the display screen.

```
Command        Operands
  000
```

Operand Descriptions

There are no operands.

Sample Command

If you enter:

```
000
```

the 4700 logs you off the system monitor. Press Reset 3 times in succession to log on again.

001 – Display Current Log Messages

The 001 command displays the 4-digit message number and the text of a specified message, and then displays preceding messages.

Command	Operands
001	[X] [msno]

Operand Descriptions

X

This optional operand indicates that you want messages displayed in hexadecimal. If you omit the X, the system displays the messages in EBCDIC.

msno

Replace *msno* with the 4-digit message number of the most recent message you want to see. (You need not enter leading zeros.) The system displays the first line of that message, and the first lines of each of a group of preceding messages.

If you omit this operand, the system displays the most recent messages.

Special Considerations

- After the system displays the first group of messages, you can press Enter to see the next previous group of messages. Continue pressing Enter to page backward through the log. (Remote operators, use the system ATTN command to display groups of previous messages.)
- You can use the 049 command to change the number of messages displayed at one time. The system default is to fill the screen with messages, so the number displayed depends on your screen size.
- Use the 002 command to display the full text of the messages, or the 046 command to print the messages on the output printer.

Sample Command

If you enter:

```
001 8
```

the system monitor displays the text of messages 8, 7, 6, 5, and 4 in EBCDIC.

```
0008 10 0731 030 THIS IS A TEST
0007 10 0730 018 0 1982/09/27 07;30;00
0006 11 0000 010 4
0005 11 0000 004 DSI2 4040 4040 4040 40
0004 11 0000 004 DSI1 4040 4040 4040 40

Then press Enter
to see the next group of messages:

0003 11 0000 017 1224 TYPE=82 01 02 01
0002 11 0000 017 2124 TYPE=82 01 02 01
0001 10 0000 002 00 CNMGEN 09/28/82 0000
```

If you enter:

```
001 X 45
```

the system displays messages 45 and 44 in hexadecimal.

002 – Display Complete Log Message

The 002 command displays the complete text (up to 252 characters) of a specified log message, or displays the current status of the diskette drive.

Command	Operands
002	{ [X] [X]msno } { 0[000] }

Operand Descriptions

X

This operand displays up to 504 bytes of message text in hexadecimal. If you do not enter X, the system displays up to 252 characters in EBCDIC.

msno

Replace *msno* with the decimal message ID of the message to be displayed, or enter X followed by the message ID in hexadecimal. Enter 9999 to display the most recent message.

0000

Enter the 0000 (or only 0) to display the two diskette status bytes.

Special Considerations

- If the message text is greater than the screen size, the system wraps characters from the end of the message to overlay the message number and the characters from the beginning of the message.

Sample Command

If you enter:

```
002 45
```

the system monitor displays message 0045 in EBCDIC.

```
0045 11 0000 010 4
```

If you enter:

```
002 X 45
```

the system displays message 0045 in hexadecimal.

```
F0F0F4F540F1F140F0F0F0F040F0F1F040F4
```

If you enter:

```
002 0
```

the system displays the status bytes for the diskette:

```
8000
```

003 – Display One Entry from the Trace Area

The 003 command displays one entry from the terminal or loop trace area. After you display an entry, you can enter an F to display the next entry, or a B to display the previous entry. In this way, you can page forward and backward through the trace area.

Command	Operands
003	x y

Operand Descriptions

x

Replace *x* with a 0 to display a terminal entry, or a 1 to display a loop entry.

y

Replace *y* with a 0 to display the first entry in the area, or a 1 to display the most recent entry.

Command Output

For a loop trace entry, the output format is:

```
t aaaa aaaa l ss cc xxxxxxxx dddddd
```

Where:

t Is the entry type:

S = Start of table

F = Next entry in table

B = Previous entry in table

C = Current entry

aaaa aaaa Is the log entry.

l Is the loop number.

ss Is the slot number, 1 less than the device address.

cc Is the component number.

xxxxxxxx Is the loop trace type.

dddddd Is the data or command type: (RESET, LPM, REJ IN, SETIND, SETMOD, READ, WR RED, WR ECH, SENSE, ATTN, REJOUT, or END OP)

For a terminal trace entry, the command displays:

```
t xxxx xxxx xxxx xxxx xxxxxxxx xxxx
```

Where:

t Is the type of entry:

S = Start of table

F = Next entry

B = Previous entry

C = Current entry

xx...xx Is the trace data.

Special Considerations

- After you display an entry, enter either F (forward) or B (backward) to establish a direction for scrolling (paging) through the file. Then, when you press just the Enter key, the system displays more trace information in that direction. If you do not establish a direction first, the system displays the same entry again when you press Enter.
- You can skip over entries when you scroll through the file. Follow the B or the F with a space and the number of entries to skip (up to 999). For example, if you enter F 60, the system skips the next 60 entries before it displays a trace entry.

Sample Command

If you enter:

```
003 0 0
```

the system monitor displays the first terminal trace entry.

```
S 8036 200D 0800 0208 000 200D81F1 0218
```

The S preceding the entry indicates that this is the start of the trace. If you now enter the character F:

```
F
```

the system displays the next entry:

```
F 8036 200D ...
```

The F that precedes the data indicates that you are moving forward in the trace area. To continue moving forward, merely press Enter; the system displays the next entry:

```
F 8036 200D ...
```

005 – Assign a Device as the Output Printer or Display

The 005 command assigns a specified device as the output printer or display for subsequent operations, and begins output by invoking the 061 command automatically. When you issue another 005 command, the system returns this device to its previous assignment, and assigns the new device as the output device.

If you enter the 005 command with no operand, the system reassigns the current output device to its previous work station or to the free pool, but does not assign a new output device.

```
Command     Operands
  005       [lssdd x]
```

Operand Descriptions

lssdd

Replace *lssdd* with the device address, consisting of the loop number (l), the terminal or port address (ss), and the component address (dd). For a DCA device, enter the character A as the *l* operand. Always enter the leading 0 for the *ss* part of the operand. The values for *dd* are:

```
Fixed Addresses:

     1       4704/3604/3278/3279 keyboard
     2*      4704/3604/3278/3279 display
     3       Magnetic stripe encoder
     4*      3610/3612 document printer;3262/3287/5210 printer
     5       3611/3612 passbook printer
     6       3606/3608 keyboard, display, magnetic
             stripe reader
     7       3608 printer
     8       3614/3624 terminal

Variable Addresses:

     1-15*   4710/3615 printer (must be same value as the
             subaddress switch settings on the printer).
     2-14*   Even numbers only, 4720 and 3616 journal printer
             station (must be set same as subaddress switch
             settings).

          * You can assign only these components as output
            printers and they must be in continuous-forms
            mode.  Note that you cannot use odd numbers 3-15
            for the 005 or 006 commands. The 3616 document
            printer is not a continuous-forms printer;
            you cannot use it for an output printer.
```

x

Replace the *x* with a 0 for the Operator A part of the device, or a 1 for the Operator B part of the device. If you omit this operand, or enter a value other than 0 or 1, the system uses the Operator A part of the device.

Special Considerations

- The 005 command restarts the printing that was stopped by a write error on the 061 command.

- You cannot assign an output printer as a test device until you first issue 005 or 006 to release it as the output device.
- This command is available only with the CNM/CS or expanded system monitor.
- Use this command with no operands to release the current output device to its original assignment.
- The 4710/4720, 3610, 3612, 3615, and 3616 printers must be in continuous mode, with paper wide enough for an 80-character line. Although the 3616 in continuous mode is restricted to a 56-character line, and the 4710 is restricted to 48 characters, an 80-character line is continued to the next print line.

  Use the 043 command to assign continuous mode in this manner:
  1. Enter the 007 command to assign the device as a test component.
  2. Use 043 to set the parameters.
  3. Issue 007 again, this time to release the device from test mode.
  4. Issue 005 or 006 to assign the device as the output device.
- If you use 005 to start the hard-copy trace (printing), the command precedes each keyboard entry with two asterisks (**).
- The hard-copy-trace option does not end when you log off. It can span several sessions. You must turn it off explicitly by entering the 005 command with no operands.

Sample Command

If you enter:

```
005 1125 1
```

the system monitor assigns as an output device the device on loop 1, with terminal address 12, and component number 5 (for example, a 3611 or 3612 printer). The system begins printing on the output printer.

Output from the hard-copy trace option looks like this:

```
**075
0100 --++
**002 45
0045 11 0000 010 4
```

The asterisks indicate your entries.

006 – Assign Device as Output Printer or Display

The 006 command assigns a specified device as the output printer or display for subsequent operations, but does not begin printing on the output printer. When you issue another 006 command, the system returns this device to its previous assignment, and assigns the new device as the output device.

Command	Operands
006	[lssdd x]

Operand Descriptions

lssdd

Replace *lssdd* with the device address, consisting of the loop number (l), the terminal or port address (ss), and the component address (dd). For a DCA device, enter the character A as the *l* operand. Always enter the leading 0 for the *ss* part of the operand. The values for *dd* are:

Fixed Addresses:

1	4704/3604/3278/3279 keyboard
2*	4704/3604/3278/3279 display
3	Magnetic stripe encoder
4*	3610/3612 document printer;3262/3287/5210 printer
5	3611/3612 passbook printer
6	3606/3608 keyboard, display, magnetic stripe reader
7	3608 printer
8	3614/3624 terminal

Variable Addresses:

1-15*	4710/3615 printer (must be same value as the subaddress switch settings on the printer).
2-14*	Even number only, 4720, 3616 journal printer station (must be set same as subaddress switch settings).

* You can assign only these components as output printers and they must be in continuous-forms mode. Note that you cannot use odd numbers 3-15 for the 005 or 006 commands. The 3616 document printer is not a continuous-forms printer; you cannot use it for an output printer.

x

Replace the *x* with a 0 for the Operator A part of the device, or a 1 for the Operator B part of the device. If you omit this operand, or enter a value other than 0 or 1, the system uses the Operator A part of the device.

Special Considerations

- You cannot assign an output printer as a test component until you first release it with an 005 or 006 command.
- The 4710/4720, 3610, 3612, 3615, and 3616 printers must be in continuous mode, with paper wide enough for an 80-character line. Although the 3616 in continuous mode is restricted to a 56-character line, and the 4710 is restricted to 48 characters, an 80-character line is continued to the next print line.

Use the 043 command to assign continuous mode in this manner:

1. Enter the 007 command to assign the device as a test component.
2. Use 043 to set the parameters.
3. Issue 007 without operands, this time to release the device from test mode.
4. Issue 005 or 006 to assign the device as the output device.

Sample Command

If you enter:

```
006 1125 1
```

the system monitor assigns as an output device the device on loop 1, with terminal address 12, and component address 5 (for example, a 3611 or 3612 printer).

007 – Assign a Test Component

The 007 command assigns a device component as a test component to be the subject of such testing commands as 043, 020, and 021. You can subsequently use a 007 command with no operand to reassign the test component to its previous assignment.

On the diagnostic diskette, issue the 973 command before you issue the 007 command.

Command	Operands
007	[lssdd x]

Operand Descriptions

lssdd

Replace *lssdd* with the device address, consisting of the loop number (l), the terminal or port address (ss), and the component address (dd). For a DCA device, enter the character A as the *l* operand. Always enter the leading 0 for the *ss* part of the operand. The values for *dd* are:

Fixed Addresses:

1	4704/3604/3278/3279 keyboard
2	4704/3604/3278/3279 display
3	Magnetic stripe encoder
4	3610/3612 document printer; 3262/3287/5210 printer
5	3611/3612 passbook printer
6	3606/3608 keyboard, display, magnetic stripe reader
7	3608 printer
8	3614/3624 terminal

Variable Addresses:

1-15	4710/3615 printer (must be same value as the subaddress switch settings on the printer).
2-14	Even numbers only, 4720, 3616 journal printer station (must be set same as subaddress switch settings).
3-15	Odd numbers only, 3616 document print station.

x

Replace the *x* with a 0 for the Operator A part of the device, or a 1 for the Operator B part of the device. If you omit this operand, or enter a value other than 0 or 1, the system uses the Operator A part of the device.

Command Output

When the assignment is successful, this command displays the assignment parameter list in hexadecimal:

```
lsd0 xx yy zz
```

where:

l	Loop number, or A for DCA
s	Terminal or port address
d	Component address
xx	C1 for A side; C2 for B side
yy	Work station ID of previous owner
zz	Logical device address of previous owner

Special Considerations

- After the 007 command is complete, use a 009 command to assign a subaddress to a 3606 or 3608.
- A printer cannot be both an output printer and a test component. Before assigning a test printer as an output printer, use the 007 command with no operand to release the test printer.
- To retrieve the device status, use the 062 command.

Sample Command

If you enter:

```
007 1028
```

the system monitor assigns as a test component the 3614 on loop 1 at address 2.

008 – Assign Device Component

The 008 command assigns a device to the free pool or to a specified work station, or changes the SNA logical unit address.

Command	Operands
008	lssdd x yy zz

Operand Descriptions

lssdd

Replace *lssdd* with the device address, consisting of the loop number (l), the terminal or port address (ss), and the component address (dd). For a DCA device, enter the character A as the *l* operand. Always enter the leading 0 for the *ss* part of the operand. The values for *dd* are:

Fixed Addresses:

1	4704/3604/3278/3279 keyboard
2	4704/3604/3278/3279 display
3	Magnetic stripe encoder
4	3610/3612 document printer;3262/3287/5210 printer
5	3611/3612 passbook printer
6	3606/3608 keyboard, display, magnetic stripe reader
7	3608 printer
8	3614/3624 terminal

Variable Addresses:

1-15	4710/3615 printer (must be same value as the subaddress switch settings on the printer).
2-14	Even number only, 4720, 3616 journal printer station (must be set same as subaddress switch settings).
3-15	Odd numbers only; 3616 document print station ONLY FOR THE 007 AND 008 COMMAND. Do not use the document print station for the 005 or 006 command.

To change the logical unit address, enter this first operand as 9001.

x

Replace the *x* with a 0 for the Operator A part of the device, or a 1 for the Operator B part of the device. If you omit this operand, or enter a value other than 0 or 1, the system uses the Operator A part of the device.

To change the logical unit address, omit this operand.

yy

Replace *yy* with the hexadecimal work station ID of the work station to which the device is to be assigned, or replace *yy* with a 0 to assign the device component to the free pool.

zz

Replace *zz* with the hexadecimal logical device address of the device.

To change the logical unit address, enter the SNA LU address.

Command Output

When the assignment is successful, this command displays the assignment parameter list in hexadecimal.

```
lsd0 xx yy zz
```

where:

l	Loop number, or A for DCA
s	Terminal or port address
d	Component address
xx	C1 for A side; C2 for B side
yy	Work station ID of previous owner (0 if free pool)
zz	Logical device address of previous owner

Special Considerations for Device Assignment

- To reassign a device to its previous owner, issue 008 with the assignment parameter list that was returned after you issued the previous 008 command.
- Device components currently assigned as test components cannot be reassigned by the 008 command.
- If you specify *yy* as X'FF', this command returns the ID of the work station to which logical device *zz* is assigned. If the device is in the free pool, the command returns a 0.
- If you specify *zz* as X'FF', this command returns the logical device address currently assigned to the work station specified in the *yy* operand. If the station is not assigned, the command returns a logical device address of X'FF'.

Special Considerations for LU Assignment

- If you specify *yy* as 0, the system reassigns the LU address in *zz* to the free pool. The *yy* field of the output contains the node ID to which the LU address was assigned previously.
- If you specify *yy* as X'FF', the system returns the node ID of the node to which the logical unit is currently assigned.
- If you specify *zz* as X'FF', the system the LU address currently assigned to the node ID.

Sample Command

If you enter:

```
008 1028 1 42 6
```

the system monitor assigns the device at lssdd 1028 to work station 42.

009 – Assign a Subaddress to a 3606/3608

The 009 command assigns a subaddress to a 3606 or 3608 used as a test component in a terminal group specified by a 007 command. The subaddress you assign should be the same value as the subaddress switch setting on the device.

```
Command     Operands
  009         id
```

Operand Descriptions

id

Replace *id* with the subaddress of the device, in the range 0 to 15.

Command Output

This command displays:

```
lsd0
```

where:

```
l     Is the loop number of the device.
s     Is the terminal address of the device.
d     Is the component address of the device.
```

If the command displays 000, a subaddress was not assigned.

Special Considerations

- A 007 command sets the subaddress to 0, overriding any previous 009 command setting.
- If you assign a subaddress of 0, and begin a read operation, the system reads from the first component in the terminal group that has data to read. The system then uses that terminal's subaddress, as set in the device switches, as the current subaddress.
- A subaddress of 0 is not valid for a write operation.

Sample Command

If you enter:

```
009 2
```

the system monitor assigns subaddress 2 to the 3606 that is currently assigned as the test component.

010 – Display Statistical Counters

The 010 command displays the statistical counters for devices, the host link, a loop or loop adapter, and the diskette.

Command	Operands
010	lssdd

Operand Descriptions

lssdd

For loop or DCA devices, replace *lssdd* with the device address, consisting of the loop number (l), the terminal or port address (ss), and the component address (dd). Always enter the leading 0 for the *ss* part of the operand. The values for *dd* are:

Fixed Addresses:

1	4704/3604/3278/3279 keyboard
2	4704/3604/3278/3279 display
3	Magnetic stripe encoder
4	3610/3612 document printer;3262/3287/5210 printer
5	3611/3612 passbook printer
6	3606/3608 keyboard, display, magnetic stripe reader
7	3608 printer
8	3614/3624 terminal

Variable Addresses:

1-15	4710/3615 printer (must be same value as the subaddress switch settings on the printer).
2-14	Even number only, 4720, 3616 journal printer station (must be set same as subaddress switch settings).
3-15	Odd numbers only, 3616 document print station.

For other devices, code *lssdd* as follows:

9001	Host link
9002	Primary diskette
9003	Secondary diskette
9006	Encryption facility
9007	Disk drive 1
9008	Disk drive 2
x000	Loop control; x = loop number
9100	DCA adapter
A0p0	DCA port; p = port number

Command Output

This command displays:

```
lsdm tt ss xxx xxx xxx ... xxx
```

where:

```
l       Loop number (1-4, A for DCA)
s       Terminal or port, in hexadecimal
d       Component address, in hexadecimal
m       Modulus value of terminal, speed of loop,
        link type, or 0
```

For other devices, lsdm is displayed as:

```
 901x  host link (x = link module loaded)

      0   No link module loaded
      2   SDLC-SNA link loaded
      5   BSC
      7   X.21
      8   Multi-Use loop

  9020   Primary diskette drive
  9030   Secondary diskette drive
  9060   Encryption facility
  9070   Disk drive 1
  9080   Disk drive 2
  9A00   DCA adapter counters
  Ap00   DCA port counters (p=port number)
  x00z   Loop control

         x = loop number
         z = loop speed:
                1 = 4800 bps
                2 = 2400 bps
                4 = 1200 bps

tt = Component types
    01  = Host link
    02  = Diskette
    03  = ALA line
    04  = Disk
    06  = Encryption facility
    80  = Loop control
    81  = 4704/3604/3278/3279 keyboard
    82  = 4704/3604/3278/3279 display
    83  = 3610, 3611, or 3612 printer
    84  = 3262/3287/5210 printer
    86  = Magnetic stripe encoder (3604 and 4704-1)
    87  = 3614/3624 terminal
    88  = 3606 or 3608 keyboard, display, and magnetic
          stripe reader
    89  = 3608 printer
    8A  = 3615 printer
    92  = 3616 printer
    95  = DCA adapter
    9A  = 4710 printer
    AB  = Magnetic stripe encoder (4704-2/3)
    B0  = 4720 printer

ss      Work station ID (does not apply
        to host, diskette, or loop)
xxx     Counter value, in decimal
```

Sample Command

If you enter:

```
010 1051
```

the system monitor displays the counters for the 4704 keyboard at loop 1, address 5.

```
1514 81 03     000 000 000 000 000
```

011 – Change X.21 Network Selection Sequence

The 011 command changes the set selection sequence for the controller in an X.21 network.

```
Command     Operands
  011       [X]selseq
```

Operand Descriptions

selseq

Replace *selseq* with up to 24 EBCDIC characters or up to 48 hexadecimal character (24 pairs, each pair representing a character). You can use all decimal digits, the comma (,), the minus sign (-), the slash (/), the period (.), and the ending delimiter -- a plus sign (+).

Special Considerations

This command works on X.21 networks. For any other network type, the system ignores 011.

Sample Command

If you enter:

```
011 704/305/6678
```

the system monitor changes the selection sequence.

012 – Print Statistical Counters

The 012 command prints all statistical counters on the assigned output printer.

Command	Operands
012	loops

Operand Descriptions

loops

Replace *loops* with the number of loops attached to the controller.

Command Output

This command displays:

```
lsdm tt ss xxx xxx xxx ... xxx
```

where:

```
l       Loop number (1-4, A for DCA)
s       Terminal or port, in hexadecimal
d       Component address, in hexadecimal
m       Modulus value of terminal, speed of loop,
        link type, or 0
```

For other devices, lsdm is displayed as:

```
901x  host link (x = link module loaded)

     0   No link module loaded
     2   SDLC-SNA link loaded
     5   BSC
     7   X.21
     8   Multi-use loop

 9020   Primary diskette drive
 9030   Secondary diskette drive
 9070   Disk drive 1
 9080   Disk drive 2
 9A00   DCA adapter counters
 Ap00   DCA port counters (p=port number)
 x00z   Loop control

        x = loop number
        z = loop speed:
              1 = 4800 bps
              2 = 2400 bps
              4 = 1200 bps
```

```
tt = Component types
     01  = Host link
     02  = Diskette
     03  = ALA line
     04  = Disk
     06  = Encryption facility
     80  = Loop control
     81  = 4704/3604/3278/3279 keyboard
     82  = 4704/3604/3278/3279 display
     83  = 3610, 3611, or 3612 printer
     84  = 3262/3287/5210 printer
     86  = Magnetic stripe encoder (3604 and 4704-1)
     87  = 3614/3624 terminal
     88  = 3606 or 3608 keyboard, display, and magnetic stripe reader
     89  = 3608 printer
     8A  = 3615 printer
     92  = 3616 printer
     95  = DCA adapter
     9A  = 4710 printer
     AB  = Magnetic stripe encoder (4704-2/3)
     B0  = 4720 printer

ss       Work station ID (does not apply
         to host, diskette, or loop)
xxx      Counter value, in decimal
```

Special Considerations

Use the 005 or 006 command to assign an output printer.

Sample Command

If you enter:

```
012 2
```

the system monitor prints the statistical counters for the first two loops.

```
2124 82 03 - 000 002
2114 81 03 - 000 000 000 000 000
.
.
.
9012 01 00 - 000 000 ...
```

013 – Display Machine Feature Switches

The 013 command displays the settings of the machine feature switches.

```
Command     Operands

  013
```

Operand Descriptions

There are no operands.

Command Output

The 013 command displays the switch settings as:

```
            xxxx xxxx xxxx xxxx xxxx

            |                      |
            |                      |
      Bit   0                     19
```

Each x represents a bit in the machine switch setting.

```
 0     Reserved
 1     Reserved
 2     (On) 2 diskette adapters
 3     (On) DCA adapter
 4     Reserved
 5-7   Number of loops
       001 - 1
       010 - 2
       011 - 3
       100 - 4
 8     Reserved
 9-11  Host link type
       000  No host link
       001  X.21
       010  SDLC-SNA
       011  Multi-use loop
       101  Binary synchronous
12-13  Number of disk drives
       00   No disk drives
       10   1 disk drive
       11   2 disk drives
14-19  Reserved
```

Sample Command

If you enter:

```
013
```

the system monitor displays the machine switch settings.

```
0011 0100 0010 0000 0000
```

This response indicates a system with:

- Two diskette adapters
- A DCA adapter
- Four loops
- An SDLC-SNA link

014 – CNM -- Control Work Station Timers

The 014 command, used by Communication Network Management (CNM) users, activates, reads, and resets work station timers.

```
Command     Operands

  014       func [wkst] [tmr]
```

Operand Descriptions

func

Replace *func* with one of these values indicating the function you want to perform.

Value	Function
2	Read
3	Read and reset
4	Activate
5	Deactivate

wkst

Replace *wkst* with the ID of the work station associated with the timers. If you omit this operand, or specify 00, all work stations are included.

tmr

Replace *tmr* with a value representing the timers you want included. If you enter 0, all timers for the work station are included. If you omitted the work station ID, DO NOT enter this operand.

Command Output

This command displays data in this format:

```
f ss tt eeeeeee iii mmmmm xxxxxx vvvvv
```

where:

f	Status of timer 0 = Active, but not running 4 = Active and running 8 = Not running; deactivated C = Deactivated while running
ss	Work station ID
tt	Timer number
eeeeeee	Total time of all intervals since last reset
iii	Intervals timed since last reset
mmmmm	Shortest interval since last reset
xxxxxx	Longest interval since last reset
vvvvv	Average interval since last reset

The system displays the time values with the rightmost 2 digits indicating hundredths of a second. For example, if mmmmm = 07323, the value is 1 minute, 13.23 seconds.

Special Considerations

If the system displays only part of your data, press Enter to display the rest. (Host operators, issue the system ATTN command.)

Sample Command

If you enter:

```
014 2 00
```

the system monitor displays all timers for all work stations.

015 – Display and Set Time-Of-Day Clock

The 015 command sets, adjusts, and displays the time-of-day clock.

```
Command     Operands
  015       func { yyyy/mm/dd hh:mm:ss }
                 { yy                  }
```

Operand Descriptions

func

Replace *func* with a value indicating the function you want performed.

Value	Function
0	Set clock value.
1	Display time-of-day.
2	Stop clock for from 1 to 99 seconds; use yy to indicate 1 to 99.
3	Advance time of day from 1 to 99 seconds; use yy to indicate 1 to 99.
4	Display high-resolution timer; the rightmost 2 digits are a decimal fraction.

yyyy/mm/dd hh:mm:ss

Enter a string to set the clock to a new value. In the string, use these values:

yyyy	Year (for example, 1982)
mm	Month
dd	Day of the month
hh	Hour of the day
mm	Minutes
ss	Seconds
/ or :	You can enter any delimiters; they are retained by the system for subsequent time and date displays. Each occurrence can be a different value. (See the sample command at the end of this section.)

yy

Replace *yy* with a number in the range 1 to 99 indicating the number of seconds to advance (func=3) or delay (func=2) the clock.

Special Considerations

You can issue the 045 command to request your own user translation table for the complete alphameric character set.

Sample Command

If you enter:

```
015 0 1982/10/09 01:15:05
```

the system monitor sets the clock to the specified value.

016 – Measure System Use

The 016 command starts and stops measuring the portion of the controller's processing capability being used.

```
Command     Operands
  016       func
```

Operand Descriptions

func

Replace *func* with a 0 to start measuring usage, or a 1 to stop measuring and display the measurement. You can log off the system monitor after you start the measurement; the measurement continues until you stop it by entering 016 1.

Error Conditions

This command displays the 90095 message if you enter 016 1 without entering 016 0 to start measurement, or if the measurement timer exceeds its maximum and wraps around to start again.

Command Output

The command displays that percent of total controller processing capability being used during the measurement period. For example, if the 016 1 command displays 11.98, you know that during the measurement period 11.98 % of controller processing capability was being used.

Special Considerations

Because any system monitor commands issued during the measurement period are included in the measurement, you might want to log off the system monitor as soon as you begin the measurement.

Sample Command

If you enter:

```
016 1
```

the system monitor stops measuring system use, and displays the percent of controller processing in use.

```
005.5
```

020 – Ripple Test

The 020 command does a ripple test on the output device (either a display or a printer).

```
Command     Operands
  020       rpt lin aaa bbb
```

Operand Descriptions

rpt

Replace *rpt* with the decimal number of times to print or display the test line. If you enter 000, the test continues until you press Reset twice. If a remote operator enters 000, the test runs 20 times.

lin

Replace *lin* with the decimal number of characters to present on each line. You can specify up to 255 characters per line.

aaa

Replace *aaa* with the output position of the first of a sequence of characters to be used in the test. This operand is either the physical position on the print wheel or print belt, or the logical position in the display output translation table. See the OUTRTBL macro in the *4700 Controller Programming Library* for information describing output positions.

bbb

Replace *bbb* with the output position of the last character in the sequence to be used in the test.

Command Output

This command prints or displays a ripple test pattern on the assigned test component. The pattern consists of the number of lines specified in the command. The first line begins with the first character in the specified sequence, and repeats the sequence to the length of the line. The next line begins with the second character in the sequence, and repeats the sequence until the end of the line. Each subsequent line begins with a different character. For example, if the character set is:

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ123456
         |        |
         10       19
```

and you enter the command:

```
020 5 20 10 19
```

the ripple pattern displayed is:

```
J K L M N O P Q R S J K L M N O P Q R S
K L M N O P Q R S J K L M N O P Q R S J
L M N O P Q R S J K L M N O P Q R S J K
M N O P Q R S J K L M N O P Q R S J K L
N O P Q R S J K L M N O P Q R S J K L M
```

If you specify more characters in your sequence than you specify in the output line, the command only displays characters up to the line length. Now, if you enter:

```
020 3 6 3 10
```

the system presents:

```
C D E F G H
D E F G H C
E F G H C D
```

Special Considerations

- Use the 025 command for DCA printers.
- Use the 025 command for the 3616, 4710, and 4720 printers.
- If you enter the 060 1 command first, this 020 command can present identical test lines.

021 – Print or Display Character Group on Test Component

The 021 command presents a group of characters on the assigned test component.

Command	Operands
021	rpt aaa bbb

Operand Descriptions

rpt

Replace *rpt* with the decimal number of times to print or display the test line. If you enter 000, the test continues until you press Reset twice. If a remote operator enters 000, the test runs 20 times.

aaa

Replace *aaa* with the output position of the first of a group of consecutive characters to be used in the test. This operand is either the physical position on the print wheel or print belt, or the logical position in the display output translation table. See the OUTRTBL macro in the *4700 Controller Programming Library* for information describing output positions.

bbb

Replace *bbb* with the output position of the last character in the group to be used in the test.

Command Output

This command repeats the group of characters from *aaa* to the *bbb* character the number times specified by *rpt*.

Special Considerations

Use the 025 command for DCA printers and for the 3616, 4710, and 4720 printers.

Sample Command

If you enter:

```
021 33 10 19
```

the system monitor presents 33 repetitions of the characters from position 10 to position 19.

023 – Present Test Pattern

The 023 command presents a test pattern on the assigned test component (display or printer). The command prints a pair of characters (in an ABABAB format) to the specified line length for the specified number of lines.

```
Command     Operands
  023       rpt lin aaa bbb
```

Operand Descriptions

rpt

Replace *rpt* with the decimal number of times to print or display the test line. If you enter 000, the test continues until you press Reset twice. If a remote operator enters 000, the test runs 20 times.

lin

Replace *lin* with the decimal number of characters to present on each line. You can specify a line length up to 255 characters.

aaa

Replace *aaa* with the output position of the first of two characters to be used in the test. This operand is either the physical position on the print wheel or print belt, or the logical position in the display output translation table. See the OUTRTBL macro in the *4700 Controller Programming Library* for information describing output positions.

bbb

Replace *bbb* with the output position of the second character to be used in the test. This character can be the same as the first character.

Command Output

The command prints a test pattern consisting of the two selected characters repeated again and again. For example, if you choose to print A and B, the command prints lines consisting of the pattern ABABABAB.

Special Considerations

- Do not use this command with DCA printers or with the 3616, 4710, or 4720 printers; use 025 instead.
- Character position 168 is a null character for the 3610, 3611, and 3612 printers. If you enter 168 for either character position, double the line length for the *lin* operand.

Sample Command

If you enter:

```
023 5 26 10 19
```

the system monitor prints a test pattern consisting of 5 lines of 13 pairs of the characters from positions 10 and 19 of the output translation table.

024 – Read from Test Component

The 024 command reads up to 128 characters from the test component, and displays the data in either decimal or hexadecimal.

```
Command     Operands
  024       rpt x
```

Operand Descriptions

rpt

Replace *rpt* with the number of times to run the test. To run the test continuously, enter 000 (or 0); the test stops when you press Reset twice. For remote operators, the test runs 20 times.

x

Replace *x* with the type of output you want.

```
0    Decimal output; asynchronous device
1    Hexadecimal output; asynchronous device.
2    Decimal output; synchronous device
3    Hexadecimal output; synchronous device
```

Command Output

When you press the Enter key or Send key on the test component, the command displays the input test data in decimal or hexadecimal.

Special Considerations

- Do not use this command with the installation diskette.
- Use the 045 command to change the keyboard translation table for the display station at which the command is issued; use the 062 command to specify exception conditions to be displayed or ignored.
- If you use the diagnostic diskette, and read input from a keyboard, specify only hexadecimal display. If you specify the *x* operand as 0, no data is displayed.
- When no keyboard translation table is assigned to the test device, the Send key is the 01 scan code. This occurs when you assign a 3604 or 4704 keyboard to test address 2 or 4 using the diagnostic diskette. On the 4704, this is usually the key marked with the letter I. On the 3604, it is usually the key marked with a 2, on the top left of the keyboard. When you use the 4704 keyboard as an input device, press the I key after you enter the data.

Sample Command

If you enter:

```
024 0 2
```

the system monitor reads up to 128 characters from the input test component, and displays them in decimal. The command continues until you press Reset twice.

025 – Print or Display Text on Test Component

The 025 command presents immediate text on the test component.

```
Command     Operands
  025       rpt text
```

Operand Descriptions

rpt

Replace *rpt* with the decimal number of times to print or display the line of text. If you enter 000, the test continues until you press Reset twice. If a remote operator enters 000, the test runs 20 times.

text

Replace *text* with a string of decimal or hexadecimal characters to be presented at the test component.

Use the character X to precede and follow an even number of hexadecimal characters; use two Xs (XX) to present the character X. For example, if you enter X1234X, the command presents hexadecimal 1234. To display an X, enter two as in FIXX.

You can intermix decimal and hexadecimal data in the same text, but be sure to enclose any hexadecimal data in Xs.

Special Considerations

- See the *Controller Programming Library* for terminal control characters you can imbed in the data string.
- With terminal control characters, you can use 025 to set on and off the terminal indicators.

Sample Command

If you enter:

```
025 5 FIXXX0123XDATA
```

the system monitor presents the characters FIX X'0123' DATA five times.

If you enter:

```
025 20 DATAX17C101XDATA
```

the command turns on indicator 1 on a 3615.

028 – Track Text on Display Component

The 028 command displays the test message on the display component, then discards the message.

Command	Operands
028	text

Operand Descriptions

text
Replace *text* with the message to be displayed.

Special Considerations

Use 028 to test the magnetic device attached to the control operator's display station.

Sample Command

If you enter:

```
028 TEXT
```

the system monitor displays, then discards, the message TEXT.

029 – Send a Message to a Station

Use the 029 command to send a message to a work station that accepts messages.

```
Command     Operands
  029       sid  text
```

Operand Descriptions

sid

Replace *sid* with the work station ID, in decimal, of the receiving work station.

text

Replace *text* with the message text you want to send.

Special Considerations

Before you use 029, issue an 045 command to request your user translation table for the complete alphameric character set.

Sample Command

If you enter:

```
029 10 MESSAGE1
```

the system monitor sends the text MESSAGE1 to the work station with id 10.

030 – Write a Controller Log Message to Diskette

The 030 command writes a message to the controller log on the operating diskette. Your message is written in the log with the prefix 10 hhmm 030.

Command	Operands
030	text

Operand Descriptions

text
Replace *text* with the message that you want written to the log.

Special Considerations

Before you issue this command, issue the 045 command to request your user-assigned translation table for the translation of the complete alphameric character set.

Command Output

The 030 command writes your message to the log in the form:

```
10 hhmm 030 text
```

Sample Command

If you enter:

```
030 SAMPLE LOG MESSAGE
```

the system monitor stores the sample message in the log in the form:

```
10 0522 030 SAMPLE LOG MESSAGE
```

031 – Read and Display Primary Diskette Record

The 031 command reads a record from the diskette on the primary drive, and displays the first 64 bytes. To display the remainder of the record, press the Enter key (remote operators, enter system ATTN command).

Command	Operands
031	[X]ttrr [s]

Operand Descriptions

X

Enter X to specify the diskette address in hexadecimal; omit the X to enter the address in decimal.

ttrr

Replace *ttrr* with the track (tt) and record (rr) numbers in either decimal or hexadecimal.

s

Replace *s* with a 0 to read from side 0, or a 1 to read from side 1. If you omit this operand, the system uses side 0.

Sometimes you need not specify this operand. If you omit this operand, but enter the track and record in decimal, the system uses the side-0 default. When you specify the track and record numbers in hexadecimal, the system ignores your side specification if you specified side 1 in the *rr* field.

Command Output

This command displays the first 64 bytes of the record in hexadecimal. The top line of this display contains indications of the diskette drive number, the track and record number in decimal and hexadecimal, the side number, and the displacement of the first byte of data displayed.

Press the Enter key to display the rest of the record, or the rest of the records on this track. (Host operator, use the system ATTN command.) Or, enter a decimal number in the range 1-9 to skip 1 to 9 records.

Special Considerations

- You cannot use this command to read from the installation diskette or from an operating diskette with DSKOP=Y coded.
- You can use the 047 command, when the diskette is on the primary drive, to display the diskette count field.

Sample Command

If you enter:

```
031 0201 1
```

the system monitor displays the first 64 bytes from track 2, record 1, on side 1.

```
1 X0201 0201 0 - 0000
0002 C180 C3D5 D4C7 C5D5 F0F9 61F2 F861
.
.
.
0001 2345 0000 4010 0000 0000 0000 0000
```

If you then enter a 4, the system displays the first 64 bytes of track 2, record 5, on side 1. If you just press the Enter key now, the system displays the next 64 bytes of the record.

032 -- Change a Diskette Record on Primary Drive

The 032 command changes the program data set on a diskette on the primary drive.

```
Command     Operands
  032       [X]ttrr [X]dsp data
```

Operand Descriptions

X

Code X to specify the operand in hexadecimal; omit the X to enter the operand in decimal.

ttrr

Replace *ttrr* with the track (tt) and record (rr) numbers in either decimal or hexadecimal.

dsp

Replace *dsp* with the displacement into the record. You can begin the change up to 255 bytes into the record.

To enter the displacement in hexadecimal, enter Xdd; the character X followed by the hexadecimal displacement, up to XFF.

data

Replace *data* with up to 8 hexadecimal bytes (16 input characters) of data to replace the data in the record. If you enter an odd number of characters, the system sets the leftmost 4 bits to 0000.

Error Conditions

- If you try to enter an *s* operand (side), an error results; there is no side operand.
- Do not use this command to read from an installation diskette or from an operating diskette with the DSKOP=Y CPGEN option on the STARTGEN macro. If you try this, the system displays a 90001 message.

Special Considerations

Changes are reflected in the diskette's count field. Use the 047 command to display the count.

Sample Command

If you enter:

```
032 2503 XA0 123
```

the system monitor replaces the 2 bytes of data on track 25, record 3, starting at displacement X'A0' with the value X'0123'.

033 – Print Dump or Storage Map from Primary Diskette Drive

This command prints the stand-alone dump or storage map on the output printer.

Command	Operands
033	[X] [address]

Operand Descriptions

X

Enter X to enter the address in hexadecimal; omit the X to enter the address in decimal.

address

Replace *address* with the starting address in decimal or hexadecimal. The command prints the stand-alone dump, beginning at the address you specify.

If you omit this address, the command prints the storage map.

Command Output

The command prints the dump or storage map on the assigned output printer.

Special Considerations

- Assign an output printer using the 005 or 006 command.
- A dump is the result of a controller error. You cannot load the diskette that contains the dump.
  1. Insert an installation diskette, or another operating diskette.
  2. Load the system from this diskette.
  3. Use the 005 or 006 command to assign an output printer.
  4. Issue 033.
  5. Press the Reset key twice (ignore the 90002 command).
  6. Remove the operating or installation diskette.
  7. Insert the diskette that contains the dump.
  8. Issue 033 to print the dump.
- A remote operator cannot issue this command.

Sample Command

If you enter:

```
033 X01E0
```

the system monitor prints the dump beginning at address X'01E0'.

034 – Perform Seek Test on Primary Diskette Drive

This command reads from two diskette addresses; first from one, then from the other, alternating until you press Reset twice.

Command	Operands
034	[X]ttrr [X]ttrr [s]

Operand Descriptions

X

Enter X to enter the address in hexadecimal; omit the X to enter the address in decimal.

ttrr

Replace *ttrr* with the track (tt) and record (rr) numbers in either decimal or hexadecimal.

s

Replace *s* with a 0 to read from side 0, or a 1 to read from side 1. If you omit this operand, the system uses side 0.

Sometimes you need not specify this operand. If you omit this operand, but enter the track and record in decimal, the system uses the side-0 default. When you specify the track and record numbers in hexadecimal, the system ignores your side specification if you specified side 1 in the *rr* field.

The system reads first from the first address, then from the second address, alternating until you press Reset twice (host operators: the test is performed 20 times).

Sample Command

If you enter:

```
034 X0101 X4F0F
```

the system monitor first reads the data from address X'0101', then reads the data from address X'4F0F', and continues to read alternatively from each address.

035 – Display Dump or Storage Map from Primary Diskette

This command displays 32-byte portions of the stand-alone dump or the storage map from the diskette.

Command	Operands
035	[X]address

Operand Descriptions

X

Enter X to enter the address in hexadecimal; omit the X to enter the address in decimal.

address

Replace *address* with the starting address in decimal or hexadecimal. The command displays the stand-alone dump, beginning at the address you specify.

If you omit this address, the command displays the storage map.

Command Output

This command displays 32 bytes at a time. Press Enter to display the next 32 bytes.

The data actually displayed always begins on a 32-byte boundary. If you specify an address that is not on a 32-byte boundary, the system begins displaying data from the *previous* 32-byte boundary. For example, if you enter 035 X1f0, the system displays 32 bytes beginning at address X'01E0', a 32-byte boundary.

Special Considerations

- A remote operator cannot issue this command.
- A dump is the result of a controller error. You cannot load the diskette that contains the dump.
  1. Remove the diskette with the dump.
  2. Insert another operating or installation diskette.
  3. Load the system from this diskette.
  4. Enter the 035 command.
  5. Remove the operating or installation diskette.
  6. Insert the diskette that contains the dump.
  7. Issue 035 again to display the dump.

Sample Command

If you enter:

```
035 X01E0
```

the system monitor displays the 32 bytes starting at X'01E0'.

036 – Identify Dump

This command associates up to 32 bytes of identifying text with a dump, and stores that text in segment 7 of the system monitor. You can find the text in segment 7 when a machine-check dump occurs. This dump information is for use by service personnel.

Command	Operands
036	[text]

Operand Descriptions

text

Replace *text* with up to 32 characters you want to associate with a dump. If you omit this operand, the ID area for the dump is set to zeros.

Special Considerations

Use the 045 command to request your own user translation table for the complete alphameric character set.

Sample Command

If you enter:

```
036 DUMP1
```

the system monitor identifies the dump as DUMP1.

037 – Compress Diskette on Primary Diskette

This command rearranges data sets on the diskette to provide a continuous free space for use. You can also use this command to alter the size or alignment of one data set on the diskette.

To prevent loss of data, copy the data to another diskette, compress the copy, and keep the original diskette for a backup.

Be sure to read the Compress Diskette procedure in the first part of this book.

```
Command     Operands
  037       [dsname func alin size]
```

Operand Descriptions

dsname

Replace *dsname* with the name of a data set to be altered. Omit this operand, and all other operands, to compress the entire diskette.

func

Replace *func* with a value that indicates what you want done to the data set named in the first operand. Do not specify this operand without naming a specific data set. The allowable function codes are:

Code	Function
0	No change.
1	Add to the data set.
2	Subtract from the data set.
3	Delete the entire data set.
4	Extend the end of the data set to the end of the extent + 1.
5	Reduce the data set by moving the end of extent to end of data + 1.

alin

Replace *alin* with a 0 if you do not want to specify alignment, or a 1 if you want the data set aligned on a track boundary. If you specify a 1, the data set must already begin and end on track boundaries before you issue the command.

The system ignores requests to compress sequential data sets. Track alignment cannot be guaranteed for compressed sequential data sets.

size

Replace *size* with the number of sectors to be added or subtracted when using function codes 1 and 2. You can add or subtract from 0 to 65535 sectors.

Special Considerations

- If you change the length of the temporary file, add or subtract sectors in multiples of 16.
- DO NOT compress a 3600 operating diskette.
- During compression, extensive diskette arm movement creates an unusual sound to anyone near the controller.
- You can use the installation diskette procedures to compress a diskette.
- This command is available only on the CNM/CS or expanded system monitor, and requires optional module P41.
- The remote operator cannot issue this command.

Sample Command

After you read the procedure in the first part of this book, you might enter:

```
037
```

The system monitor compresses the entire diskette.

To process a single data set, enter operands as follows:

037 DSNAME1 5 0	Truncates the data set to the actual extent of the data.
037 DSNAME1 2 0 400	Truncates the data set by subtracting 400 sectors.
037 DSNAME1 4 0	Extends data set to the end of the extent.
037 DSNAME1 1 0 400	Adds 400 sectors to the end of the data set.
037 DSNAME1 3 0	Deletes data set DSNAME1.
037 DSNAME1 0 1	Maintains data set track alignment.

038 – Print Operating Information from Primary Drive

This command prints the controller operating information from a dump diskette inserted in the primary diskette drive.

```
Command     Operands
  038
```

Operand Descriptions

There are no operands.

Command Output

The command prints the operating information on the output printer.

Special Considerations

- Assign an output printer using the 005 or 006 command.
- A dump is the result of a controller error. You cannot load the diskette that contains the dump.
  1. Remove the diskette with the dump.
  2. Insert another operating or installation diskette.
  3. Load the system from this diskette.
  4. Enter the 038 command.
  5. Remove the operating or installation diskette.
  6. Insert the diskette that contains the dump.
  7. Issue 038 again to display the dump.
- The remote operator cannot issue this command.

Sample Command

If you enter:

```
038
```

the system monitor prints the controller operating information.

039 – Format a Diskette on Primary Drive

This command formats a diskette on the primary drive. DO NOT insert the diskette until you receive the 00012 message.

```
Command     Operands
  039       [lgth type volid crc seq]
```

Operand Descriptions

lgth

Replace *lgth* with a code that indicates the record length:

Code	Record Length
0	128 bytes per record
1	256 bytes per record
F	Use existing diskette record length

type

Replace *type* with code that indicates the diskette type.

Code	Diskette Type
1	Diskette 1
2	Diskette 2
3	Diskette 2D
F	Assume the type already inserted in the drive (default value)

volid

Replace *volid* with a one- to six-character volume identification ONLY if you want to change the existing volume ID. If you omit this operand, the system retains the existing volume ID.

Notes:

1. You can change only the volume ID by omitting the preceding operands. However, you can do this *ONLY* if the volume ID is longer than one character. If the volume ID is only one character, enter all preceding operands.

2. The following two operands, *crc* and *seq*, are optional operands. If you enter them, you must first enter a volume ID.

crc

Replace *crc* with a code that indicates the type of record to be written to the diskette.

0	Format with delete control records. This is the default.
1	Format with data records.

Specify 1 (data records) for multi-block I/O on the diskette.

seq

Use this operand to modify the physical sequence numbering of records on a type 2D diskette. You can modify the sequence numbering to get more diskette accesses per revolution of the diskette Replace *seq* with a number in the range 0 to 13. For example diskette records are normally numbered:

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
```

If you specify the *seq* operand as a 2, the system then numbers the records in this order:

```
1 3 5 7 9 11 13 15 2 4 6 8 10 12 14
```

This enables the system to read records 1 and 2 in one revolution of the diskette.

If you omit this operand, the system uses the value 0, which does not modify the standard order.

Special Considerations

- If the diskette contains data sets, the system stops to display message 00070. If you still want to format the diskette, regardless of the data sets, merely press the Enter key. However, if you decide that you do not want to format the diskette (probably because of the data sets), press any character key, and then press Enter. If you press Enter alone, the system formats the diskette regardless of the data sets.
- When the formatting is complete, you receive message 00071. Insert an operating diskette. If you formatted the operating diskette, you must insert another operating diskette to load the system (IPL).
- Before you format a diskette, deactivate the host link. When formatting is complete, you can reactivate the host link.
- This command is available only with the expanded system monitor, using optional module P40.
- The remote operator cannot issue this command.
- Do not use the *seq* operand with a type 1 or type 2 diskette.

Sample Command

If you enter:

```
039 0 0
```

the system monitor formats the primary diskette at 128 bytes per record, as a type 1 diskette.

040 – Start and Stop Loops

This command starts a stopped loop, or stops a loop during error recovery.

Command	Operands
040	func [08 00 loop]

Operand Descriptions

func
Replace *func* with a 0 to start loops, or a 1 to stop loops during error recovery.

08 00
Enter these operands as shown.

loop
Replace *loop* with the number of the loop.

Special Considerations

When using the diagnostic diskette, use 040 to stop the current test loop and assign a new test loop. Then enter 040 0 to start the new test loop.

Sample Command

If you enter:

```
040 0 08 00 01
```

the system monitor starts loop 1.

041 -- Start or Stop Host Link

This command starts or stops the link to the host computer.

```
Command     Operands
  041       x [yy zz cc Xff aaaa]
```

Operand Descriptions

x

Enter 0 to start the host link if it is stopped, or to perform a wrap test; enter 1 to stop the link. (If you enter 041 0, but the link is already running, the system ignores the entire request.)

yy

Enter a combination of these codes to describe the host link. Specify NRZI encoding, except for X.21 switched links or with Western Electric 201B or 201C modems. Also ensure that the primary station port (an IBM 3704 or 3705), and the controllers connected to that port, specify the same NRZI parameters that govern transmission encoding.

Code	Link Characteristic
01	NRZI encoding
02	Not NRZI encoding
04	Nonwrappable modem
08	Wrappable modem
10	High-speed line
20	Low-speed line
40	Wrap-test the adapter or modem once (ignoring other parameters)

Note: The remaining operands are link parameters. If you omit them, the system uses the existing link parameters. If you enter them, they replace the current link parameters until you change them using another 041 command, or until you reload the controller.

zz

Enter a combination of these codes to characterize the link.

Code	Link Characteristic
01	Control request to send
02	Permanent request to send
04	Data set ready
08	Connect data set to line
10	Nonswitched line
20	Switched line (02 is ignored)
40	Extended command indicator
80	An entry for the control unit address follows

cc

Enter the control unit address (only used if the CUA switches are all off).

Xff

Enter the X, followed by two hexadecimal characters describing the link:

Code	Link Characteristic
01	BSC3 single message mode (used during diskette creation).
02	BSC3 batch message mode
04	X.21 direct call
08	X.21 auto-call
10	X.21 auto-answer

If you do not select any X.21 function above, the system uses the functions specified in a previous COMLINK or STRLINK.

40	Perform an X.21 wrap test. Set all other bits in this operand to 0s.
80	The *aaaaa* operand contains a node ID.

aaaaa

Replace *aaaaa* with the five-character, hexadecimal transmission ID (XID) assigned to this controller.

Special Considerations

The remote operator cannot issue this command.

042 – Start or Stop Primary Diskette

This command logically starts or stops the primary diskette drive. This command does not physically start or stop the diskette drive, but causes the diskette drive to appear to the program to be stopped or started.

Note that the diskette drive logically stops each time you open the drive handle. You then issue the 042 0 command to restart the drive logically. The system rejects the 042 0 command if you change operating diskettes while the drive is logically stopped.

```
Command     Operands
  042       func
```

Operand Descriptions

func

Replace *func* with a 0 to start the diskette drive, or a 1 to stop the diskette drive.

Sample Command

If you enter:

```
042 1
```

the system monitor logically stops the primary diskette drive.

043 – Change Test Component Operating Parameters

This command changes the operating parameters associated with the assigned test component (see 007 command). Enter the 043 command, a parameter list flag byte, and up to nine parameter data bytes. Or, just enter 043; the system displays the currently assigned operating parameters. (You cannot display parameters for a 3616.)

```
Command     Operands

  043       ff xx xx xx ... xx
```

Operand Descriptions

The parameters you specify on the 043 command remain in effect until you change them with another 043 command or a 048 command, or until you restart the system.

ff

Replace *ff* with one or two hexadecimal characters to be used as the flag byte. See the flag byte information, listed for each device, later in the description of this command.

xx

Replace each occurrence of *xx* with one or two hexadecimal characters representing up to nine parameter bytes. See the parameter byte information, listed for each device, later in the description of this command.

Enter either data or zeros for each data byte that applies to a given device. If the device requires six data bytes, you must enter data (or zeros) for six bytes.

Special Considerations

Before you change operating parameters, enter 043 with no operands to display the current parameters so that you will remember them.

Device Operating Parameters

Following, listed by device, are the flag byte and data byte settings allowable for each device.

4710 Journal Printer

```
Flag byte:          X'02'=continuous-forms mode (restricts concurrent
                    sharing)
                    X'82'=continuous-forms mode (specifies concurrent
                    sharing)
Data byte 1:        Page size in lines
Data byte 2:        Warning line number
Data byte 3:        Line length
Data byte 4:        Device characteristics,
                       bits 0-6   unused
                       bit  7     0 = 10 CPI
                                  1 = 12 CPI
```

4710 Document Printer

```
Flag byte              X'01' Cut-forms mode
Data byte 1:           Page size in lines
Data byte 2:           Warning line number
Data byte 3:           Reserved
Data byte 4:           Line offset in number of lines
Data byte 5:           Line length
Data byte 6:           Device characteristics:
                         bit 0  unused
                         bit 1  unused
                         bit 2  0 = nonshared
                                1 = shared
                         bit 3  0 = start key required
                                1 = autostart
                         bit 4  unused
                         bit 5  0 = no auto-new line
                                1 = auto-new line
                         bit 6  unused
                         bit 7  0 = 10 CPI
                                1 = 12 CPI
                         *Both bits 2 and 3 must not be 1
```

4720 Printer -- Passbook Mode

```
Flag byte              X'00' Passbook mode
Data byte 1:           Page size in lines
Data byte 2:           Centerfold begin
Data byte 3:           Centerfold Skip
Data byte 4:           Vertical increment offset
Data byte 5:           Vertical line offset
Data byte 6:           Horizontal character offset
Data byte 7:           Line length
Data byte 8:           Device characteristics:
                         bit 0  0 = horizontal fold passbook
                                1 = vertical fold passbook
                         bit 1  unused
                         bit 2  0 = nonshared
                                1 = shared
                         bit 3  0 = start key required
                                1 = autostart
                         bit 4  unused
                         bit 5  0 = auto-new line
                                1 = line length exceeded check
                         bit 6  0 = 5 LPI
                                1 = 6 LPI
                         bit 7  0 = 10 CPI
                                1 = 12 CPI

Data byte 9:           Extended device characteristics:
                         bit 0-5 reserved
                         bit 6-7 allowable skew:
                               00 = 1.37 mm per 100 mm line
                               01 = 0.68 mm per 100 mm line
                               10 = 1.37 mm per 100 mm line
                               11 = 1.37 mm per 100 mm line
```

4720 Printer -- Cut-forms Mode

```
Flag byte              X'01' Cut-forms mode
Data byte 1:           Page size in lines
Data byte 2:           Warning line number
Data byte 3:           Vertical increment offset
Data byte 4:           Vertical line offset
Data byte 5:           Line length
```

```
Data byte 6:        Device characteristics:
                      bit 0  unused
                      bit 1  unused
                      bit 2  0 = nonshared
                             1 = shared
                      bit 3  0 = start key required
                             1 = autostart
                      bit 4  0 = no extended characteristics
                             1 = extended characteristics (byte 7)
                      bit 5  0 = line length exceeded check
                             1 = auto-new line
                      bit 6  0 = 5 LPI
                             1 = 6 LPI
                      bit 7  0 = 10 CPI
                             1 = 12 CPI
Data byte 7:        Extended device characteristics:
                      bit 0  0 = regular font
                             1 = quality font
                      bit 1  0 = no advance
                             1 = advance journal
                      bit 2-5  unused
                      bit 6-7 allowable skew:
                            00 = 1.37 mm per 100 mm line
                            01 = 2.05 mm per 100 mm line
                            10 = 2.74 mm per 100 mm line
                            11 = 3.42 mm per 100 mm line
```

4720 Printer -- Journal Mode

```
Flag byte           X'02' Journal mode
Data byte 1:        Page size in lines
Data byte 2:        Warning line number
Data byte 3:        Line length
Data byte 4:        Device characteristics:
                      bits 0-5 unused
                      bit 6  0 = 5 LPI
                             1 = 6 LPI
                      bit 7  0 = 10 CPI
                             1 = 12 CPI
```

4704/3604/3278/3279 Keyboard

```
Flag byte:      The bits of this byte set the end-of-message (EOM)
                selection mask.
Data bytes:     Not used
```

The bits of the flag byte specify which EOM characters defined in the translation table are to be active. If this byte is X'00', the current EOM selection mask is not changed.

4704/3604/3278/3279 Display

```
Flag byte:          X'00'
Data byte 1:        model number, or: X'08' for 3278-2, 3279-2;
                    X'11' or X'12' for 4704-1; X'21' or X'22'
                    for 4704-2 and 4704-3
Data byte 2:        number of characters per lines
Data byte 3:        number of lines on screen
Data byte 4:        line number of cursor
Data byte 5:        column number of cursor
```

Note: Data bytes 2-5 are for information return only; you cannot change them.

3608 Printer

```
Flag byte:          X'00'=no changes
                    X'80'=first line is 10-pitch
                    X'C0'=first line is 7-pitch
Data byte 1:        Maximum form width (in tenths of an inch)
Data byte 2:        First offset (in tenths of an inch)
Data byte 3:        Page spacing (in tenths of an inch)
```

3610 and 3612 Document Printer

```
Flag byte:          X'01'=cut-form mode
                    X'02'=continuous form, no concurrent sharing
                    X'41'=cut-form mode automatic start
                    X'82'=continuous form, concurrent sharing
Data byte 1:        Page size (number of lines)
Data byte 2:        Warning line (line number)
Data bytes 3 to 5:  Not used
```

3611 and 3612 Passbook Printer

The page size plus center-fold skip plus line offset cannot exceed 42. The number of steps and the number of lines offset are for passbook registration.

```
Flag byte:          X'00'
Data byte 1:        Page size (number of lines)
Data byte 2:        Center-fold start (line number)
Data byte 3:        Center-fold skip (number of lines)
Data byte 4:        Step offset (number of stepper motor steps)
Data byte 5:        Line offset (number of lines)
```

3615 Printer:

Setting the Parameters:

```
Flag byte:          X'01'=cut-forms feed option
                    X'02'=continuous-forms mode
                    X'41'=cut-form mode, automatic start
                    X'82'=continuous form, concurrent sharing
Data byte 1:        Page size (number of lines)
Data byte 2:        Warning line (line number)
```

Retrieving the Parameters:

```
Flag byte:          X'16'=continuous form, no concurrent sharinc
                    X'17'=cut-form mode, no automatic start
                    X'57'=cut-form mode, automatic start
                    X'96'=continuous form, concurrent sharing
Data byte 1:        Page size (number of lines)
Data byte 2:        Warning line (line number)
Data byte 3:        Reserved
Data byte 4:        Reserved
Data byte 5:        Reserved
Data byte 6:        '02'=unidirectional
                    '03'=bidirectional
Data byte 7:        '02'=10 CPI
                    '03'=12 CPI
```

3616 Journal Printer

```
Flag byte:          X'02'=continuous-forms mode (restricts concurrent
                    sharing)
                    X'82'=continuous-forms mode (specifies concurrent
                    sharing)
Data byte 1:        Page size in lines
Data byte 2:        Warning line number
Data byte 3:        Line length
Data byte 4:        Device characteristics,
                       bits 0-1 unused
                       bit  2*  0=nonshared
                                1=shared
                       bit  3*  0=start key required
                                1=autostart
                       bits 4-6 unused
                       bit  7   0=10 CPI
                                1=12 CPI
                       *bits 2 and 3 should not both be 1.
Data byte 5:        Reserved
Data byte 6:        Reserved
Data byte 7:        Reserved
Data byte 8:        Reserved
```

3616 Document Printer (Passbook Mode)

```
Flag byte:          X'00'=Passbook mode
Data byte 1:        Page size lines
Data byte 2:        Center-fold starting line number
Data byte 3:        Center-fold skip in number of lines
Data byte 4:        Step offset in number steps
Data byte 5:        Line offset in number of lines (see note)
Data byte 6:        Left margin column number
Data byte 7:        Line length
```

Note: Line offsets are required to space from the clamped position of a passbook to the first line.

```
Data byte 8:          Device characteristics:
                      bit 0 0 = horizontal-fold passbook
                            1 = vertical-fold passbook
                      bit 1 unused
                      bit 2* 0 = nonshared
                             1 = shared
                      bit 3* 0 = start key required
                             1 = autostart
                      bit 4 unused
                      bit 5 0 = no automatic new line
                            1 = automatic new line
                      bit 6 0 = 5 LPI
                            1 = 6 LPI
                      bit 7 0 = 10 CPI
                            1 = 12 CPI
                      *bits 2 and 3 should not both be 1.
```

3616 Document Printer (Cut-form mode)

```
Flag byte              X'01' Cut-form mode
Data byte 1:           Page size in lines
Data byte 2:           Warning line number
Data byte 3:           Step offset in number of steps
Data byte 4:           Line offset in number of lines
Data byte 5:           Line length

Data byte 6:           Device characteristics:
                         bit 0  unused
                         bit 1  0 = no data chaining
                                1 = data chaining
                         bit 2* 0 = nonshared
                                1 = shared
                         bit 3* 0 = start key required
                                1 = autostart
                         bit 4  unused
                         bit 5  0 = no automatic new line
                                1 = automatic new line
                         bit 6  0 = 5 LPI
                                1 = 6 LPI
                         bit 7  0 = 10 CPI
                                1 = 12 CPI
                         *bits 2 and 3 should not both be 1.
Data byte 7:           Reserved
Data byte 8:           Reserved
```

3262/3287/5210 Printer

```
Flag byte              X'02' Continuous-form mode
Data byte 1:           Device Characteristics

                       X'0x' Only segment (no chaining)
                       X'2x' Last segment of chain
                       X'4x' First segment of chain
                       X'6x' Middle segment of chain
                       X'x1' FM Header data stream for structured
                             fields follows
```

044 – Write to Magnetic Stripe Encoder

This command writes up to 36 characters to the magnetic stripe encoder assigned as the test component (007 command).

Command	Operands
044	text

Operand Descriptions

text

Replace *text* with up to 36 characters consisting of the numbers 0-9 and the letters C, D, and E. The characters C and D have special meaning to the system: C indicates the end of an inquiry; D is the field separator. E is unassigned; you can use it for your needs.

Command Output

This command switches on the encode light on the magnetic stripe encoder and, when the stripe is passed through the encoder, writes the data.

Special Considerations

- To stop encoding after you enter 044, but before the encoding actually takes place, enter 025 1 X0C.
- This command requires optional module M86 for the 3604 and 4704-1, and optional module MAB for the 4704-2.
- The remote operator cannot issue this command.

Sample Command

If you enter:

```
044 00000D45D5D66D617275C
```

the system monitor writes the data to the encoder.

045 – Change Keyboard Translation Table

This command changes the translation table used for your keyboard. You can alternate between the IBM-supplied universal translation table and your own application-program defined translation table. A keyboard translation table assigns meanings to the keys you press, and conveys those meanings to the program you are using.

Command	Operands
045	table

Operand Descriptions

table
Enter a 0 to use the IBM-supplied universal translation table; enter a 1 to use the application-program translation table.

Special Considerations

- You can use your own keyboard translation table while you use the system monitor. However, the translation table must define all of the characters you need to enter your commands.
- The universal translation table defines a restricted subset of input characters usable by all keyboards. The variety of keyboards available might not permit the universal translation table character definitions to match the keytop engravings or user-defined values.

Sample Command

If you enter:

```
045 1
```

the system monitor uses the application-program translation table to translate data received from your keyboard.

046 – Print Controller Log Messages

This command prints messages from the controller log on the assigned output printer.

```
Command      Operands
  046        [first last]
```

Operand Descriptions

first

Replace *first* with the message number of the first log message you want printed. (Message 1 is the first message.) If you omit the operands, the system prints all messages.

last

Replace *last* with the message number of the last message you want printed. If you omit the operands, the system prints all messages.

To print all messages in the log, enter 046 with no operands.

Command Output

This command prints the contents of messages in the log. If a log message contains invalid or unprintable characters, the command prints only that part of the message up to the invalid or unprintable character in EBCDIC. The command then prints the complete message in hexadecimal, with blanks in place of the message number.

Special Considerations

- Use the 005 or 006 command to assign an output printer.

Sample Command

If you enter:

```
046 100 150
```

the system monitor prints messages 100 through 150.

047 – Display Storage and Diskette Change Counters

This command displays the change counters for storage and for the diskette.

The storage counter is reset to 0 each time you reload the system, and is increased by 1 each time a change is made to a diskette (other than to the operating diskette). The diskette counter records the same changes, but is not reset; it accumulates from one startup to the next.

```
Command      Operands
  047
```

Operand Descriptions

There are no operands.

Command Output

This command displays the counters in this format:

```
stor  dskt
```

where *stor* is the value of the storage counter, and *dskt* is the value of the diskette counter.

Special Considerations

- See the 032 command, and the 02, 10, and 12 debugging commands for more information on counters.
- These counters should be 0 when you are using the operating diskette.

Sample Command

If you enter:

```
047
```

the system monitor displays the storage and diskette counters.

048 – Change Control Operator Display Screen Attribute

This command changes the number and sizes of characters displayed on the screen of your display monitor. For example, if you are using the large-screen 4704, you can have the system monitor display fewer, but larger, characters by changing the screen-size attribute to indicate a 480-character screen.

Command	Operands
048	mod

Operand Descriptions

mod

Replace *mod* with one of these screen attribute codes:

Code	Screen Size
01-07	3604-1 thru 3604-7
08	3278-2 or 3279-2
11	480-character 4704-1
12	1920-character 4704-1
21	480-character 4704-2
22	1920-character 4704-2

For example, you can enter 048 11 to instruct the system to communicate with your terminal as if it were a small-screen 4704.

Special Considerations

The change remains in effect until you enter either a 043 command or another 048 command.

Sample Command

If you enter:

```
048 12
```

the system monitor communicates with your terminal as if it were a large-screen 4704.

049 – Change Number of Lines Displayed

This command changes the number of lines displayed at your terminal.

Command	Operands
049	lines

Operand Descriptions

lines

Replace *lines* with the new number of lines to be displayed at your terminal. The valid range is 1 to 24. For example, on a 4704 with a large (24 lines) screen, enter 049 23 (leaving one line for command input).

Special Considerations

- The system monitor uses one line for command input. You should define one line *less* than the number of lines actually on your display screen.
- This change remains in effect until you issue another 049, or until you restart the system.
- Sometimes displayed data requires more lines than are available on the screen. In this case, to view the next group of lines (to scroll forward), press the Enter key *once*. (If you press the Enter key repeatedly, the system displays the 90001 error message.)
- A remote operator sees no more than 5 lines at a time, regardless of screen size or 049 setting.

Sample Command

If you enter:

```
049 23
```

the system monitor displays the maximum lines on a 4704-12.

051 – Wrap Test 3614/3624 with Prepared Text

This command tests the 3614 or 3624 consumer transaction facility assigned as a test component. The 3614 or 3624 must be closed, unable to accept customer input. This wrap test uses this line of prepared text:

```
X'FFEEDDCCBBAA99887766554433221100'
```

When the test is complete, the command displays a count of the good wrap tests performed: the number of tests that ran successfully and did not produce errors.

Command	Operands
051	rpt x

Operand Descriptions

rpt

Replace *rpt* with the number of times to perform the test; the number of times to transmit and receive the line of prepared text. If you enter 000, the test continues until you press the Reset key twice (remote operators: the test runs 20 times).

x

Enter a 0 to stop on comparison errors; enter a 1 to continue the test when comparison errors occur.

The command displays a 90022 message when a comparison error occurs and you enter a 0 for this operand.

Command Output

The command displays a count of successful wrap tests.

Special Considerations

- This command requires optional module M87.
- The 3614 or 3624 must be closed to customer input.
- This command alternately writes, then reads, the line of prepared text. If the line read does not match the line previously written, a comparison error occurs. If you requested the command to stop on errors, the command displays the 90022 message.

Sample Command

If you enter:

```
051 20 1
```

the system monitor writes and reads the prepared text line twenty times, continuing even when a comparison error occurs.

052 – Wrap Test 3614/3624 with User Text

This command tests the 3614 or 3624 consumer transaction facility assigned as a test component. The 3614 or 3624 must be closed, unable to accept customer input. This wrap test uses a line of text you provide.

When the test is complete, the command displays a count of the good wrap tests performed: the number of tests that ran successfully and did not produce errors.

```
Command     Operands
  052       rpt x text
```

Operand Descriptions

rpt

Replace *rpt* with the number of times to perform the test; the number of times to transmit and receive the text. If you enter 000, the test continues until you press the Reset key twice (remote operators: the test runs 20 times).

x

Enter a 0 to stop on comparison errors; enter a 1 to continue the test when comparison errors occur.

The command displays a 90022 message when a comparison error occurs, and you enter a 0 for this operand.

text

Enter up to 50 hexadecimal characters (50 pairs) to be used in the test. If you enter an odd number of characters, the command sets the end of the output to X'00'.

Command Output

The command displays a count of successful wrap tests.

Special Considerations

- This command requires optional module M87.
- This command alternately writes, then reads, the line of text. If the line read does not match the line previously written, a comparison error occurs. If you requested the command to stop on errors, the command displays the 90022 message.

Sample Command

If you enter:

```
052 25 0 C1C2C3C4C5C6C7
```

the system monitor writes and reads the text 25 times, stopping on comparison errors.

053 – Display 3614 or 3624 Error Log

This command displays the most recent error-log records in hexadecimal for the 3614 or 3624 assigned as the test component.

```
Command     Operands
  053
```

Operand Descriptions

There are no operands.

Command Output

See the programmer's guide for the IBM 3614 or 3624 Consumer Transaction Facility for descriptions of the log messages.

Special Considerations

- This command requires optional module M87.

Sample Command

If you enter:

```
053
```

the system monitor displays the error log entries.

055 – Display Test

This command runs the display test on the assigned test display component, or on your control-operator terminal.

Command	Operands
055	mod code

Operand Descriptions

mod

Enter the model number of the display to be tested (1-6).

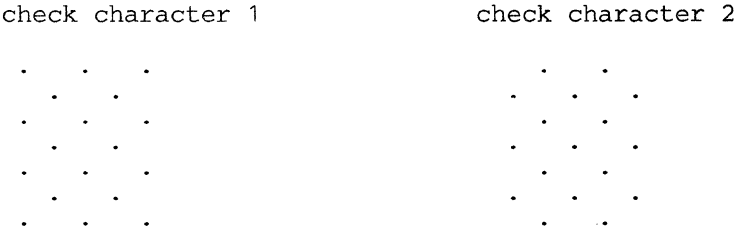
code

Enter a 0 to run the test on the assigned test device, or a 1 to run the test on your control-operator terminal. (Be sure that the command works on your device.) If you omit this operand, the test is run at the test device.

Command Output

This test fills the screen with check character 1, waits approximately 3 seconds, erases the display, and fills the screen with check character 2. The command then repeats the display until you press Reset twice to stop the test. You can then press Enter to resume the test. Any other response is executed as a command.

Check characters 1 and 2 are dot matrixes that resemble this on the screen of a 3604:



The command displays a check character in every character position on the screen.

Special Considerations

- The remote operator cannot issue this command.
- This command does not work on these terminals: 3604-7, 4704, 3278, and 3279. It works ONLY on the 3604 Models 1-6.

Sample Command

If you enter:

```
055 3 1
```

the system monitor runs the test on the 3604-3 control-operator terminal.

060 – Bypass Checking on Write to Test Component

This command controls the checking performed after each write to the test component. Normally, the system performs a check after each line is written to the test component. You can bypass that check to operate faster.

Command	Operands
060	func

Operand Descriptions

func

Enter 0 to check all writes to the test component; enter a 1 to bypass the checking.

Sample Command

If you enter:

```
060 1
```

the system monitor bypasses the checking on writes to the test component.

061 -- Print Keyboard and Display Messages

This command controls the printing of keyboard and display data on the output printer.

```
Command      Operands
  061        func
```

Operand Descriptions

func
Enter a 0 to stop printing, or a 1 to print all display and keyboard messages on the output printer.

Command Output

Input (keyboard) data is preceded by two asterisks (**) on the printer. If only the ** is printed, only the Enter key was pressed, with no translatable data.

```
**075
0100 --++
**002 45
0045 11 0000 010 4
```

Special Considerations

If the system detects an output error, printing stops and the system displays the 90007 message. Re-enter 061 to resume printing.

Sample Command

If you enter:

```
061 1
```

the system monitor begins printing keyboard and display messages.

062 -- Ignore Error Conditions at Test Component

This command controls testing based on selected errors. You can request that the test stop on selected errors, or that the test continues under selected conditions.

During testing, conditions like intervention-required, unit exception, and prior operation, are not displayed. If you suspect a problem with the test component, use the 062 command to specify which conditions are to be ignored, and which conditions will cause a halt and an error message during testing.

```
Command     Operands
  062       func error
```

Operand Descriptions

func

Enter a 0 to stop on the condition noted in operand 2, or a 1 to continue in spite of the error.

error

Replace *error* with a combination of the following codes. The first operand specifies whether the system will stop for, or ignore, the conditions specified here.

Code	Condition
80	Intervention required
40	Unit exception
10	Prior operation
02	Unit check
FF	All of the above

Special Considerations

- Until you enter a 062, the following are always ignored:
  Intervention required
  Unit exception
  Prior operation
- When you run a test with unit exceptions ignored, the number of lines printed might not equal the number of lines requested, depending on when a unit exception is encountered.

Sample Command

If you enter:

```
062 0 80
```

the system monitor stops tests when intervention is required.

063 – Set Diskette Parameters

This command establishes parameters for subsequent commands that operate on a diskette.

Command	Operands
063	func val

Operand Descriptions

func

Enter one, or a combination, of the following function codes.

Code	Function
01	Reset the temporary file and change the session ID number.
02	Enter a start-mode value on the next automatic startup only. The second operand contains a start-mode value.
04	Enter new start-mode value on all automatic startups. The second operand contains a start-mode value.
08	Dump on system failure.
10	Reload the system after a system failure; do not dump.
20	Set primary diskette ready.
40	Set primary diskette not ready; later diskette requests get 8001 status.
80	Load the system, as if you pressed controller's Reset switch.

val

Enter the start-mode values only if you enter 02 or 04 on the first operand.

Code	Function
0	Delete current start-mode values; assume default start-mode value of 2 (warm start).
1	Cold start.
2	Use warm start, the default when no other value specified.
4	Prompt for system variables. The system prompts you for startup values: control unit address, dump option, control operator ID, switched-network identifier (XID).
5	System prompts for optional modules. Specify the optional module IDs you will need to execute your commands and application programs.
8	Perform cold start; do not activate host link.
9	Perform warm start; do not activate host link.

Special Considerations

This command requires optional module P5E.

Sample Command

If you enter:

```
063 04 4
```

the system monitor will prompt for system variables on each subsequent automatic startup.

065 – Display Stations That Have Opened a Data Set

The 065 command indicates which work stations have a specified data set open on either a disk or a diskette.

```
Command     Operands
  065       d did
```

Operand Descriptions

d

Replace *d* with a 1 for the primary diskette drive, or a 2 for the secondary diskette drive. For a disk data set, enter a A for disk drive 1, and an B for disk drive 2.

did

Replace *did* with the data set identification (in decimal) of the data set in question. If you do not know the data set ID, ask your programming personnel.

Command Output

The command displays the format:

```
did xx xx xx xx xx xx xx xx
```

The *did* is the data set ID you specified; each *xx* is the station ID of a station that has the data set open.

Sample Command

If you enter:

```
065 1 007
```

the system monitor indicates which stations have data set 007 open.

```
007 2 3 4 7 16
```

Stations 2, 3, 4, 7, and 16 have data set 007 open.

066 – Clean Printer Print Wheels

Use the 066 command when you want to clean the print wheels on the output printer. This command prints 128 characters per line for 20 lines, or until the printer reaches the end of the form or passbook.

```
Command     Operands
  066
```

Operand Descriptions

There are none

Sample Command

If you enter:

```
066
```

the system monitor starts the printer so that you can clean the print wheels.

067 – Reset Extended Statistical Counters

The 067 command resets extended statistical counters to 0.

```
Command     Operands
  067       ctid
```

Operand Descriptions

ctid

Replace *ctid* with the ID of the extended statistical counter to be reset, or enter the value FFFF to reset all extended statistical counters. (Your programming personnel assign IDs to counters during configuration.)

Special Considerations

- If you assign an ID of FFFF to an extended statistical counter, you cannot use the 067 command to reset all counters.
- See the 072 command for more information on counters.
- You need optional module P25 for this command.

Sample Command

If you enter:

```
067 3000
```

the system monitor resets the counter associated with ID 3000.

068 – Reset Standard Statistical Counters

This command resets the standard statistical counters to 0.

Command	Operands
068	lssdd

Operand Descriptions

lssdd

Replace *lssdd* with the address of the component associated with the counter that you want to reset, or with FFFF to reset all counters.

For loop or DCA devices, replace *lssdd* with the device address, consisting of the loop number (l), the terminal or port address (ss), and the component address (dd). Always enter the leading 0 for the *ss* part of the operand. The values for *dd* are:

Fixed Addresses:

1	4704/3604/3278/3279 keyboard
2	4704/3604/3278/3279 display
3	Magnetic stripe encoder
4	3610/3612 document printer;3262/3287/5210 printer
5	3611/3612 passbook printer
6	3606/3608 keyboard, display, magnetic stripe reader
7	3608 printer
8	3614 or 3624/3624 terminal

Variable Addresses:

1-15	4710/3615 printer (must be same value as the subaddress switch settings on the printer).
2-14	Even number only, 4720, 3616 journal printer station (must be set same as subaddress switch settings).
3-15	Odd numbers only, for 3616 document print station.

For other devices, code *lssdd* as follows:

9001	Host link
9002	Diskette
9003	Diskette
9006	Encryption facility
9007	Disk drive 1
9008	Disk drive 2
x000	Loop control; x = loop number
9100	DCA adapter
A0p0	DCA port; p = port number

Command Output

This command displays:

```
lsdm tt ss xxx xxx xxx ... xxx
```

where:

l	Loop number (1-4, A for DCA)
s	Terminal or port, in hexadecimal
d	Component address, in hexadecimal
m	Modulus value of terminal, speed of loop, link type, or 0

For other devices, lsdm is displayed as:

901x host link (x = link module loaded)

0	no link module loaded
2	SDLC SDLC-SNA link loaded
5	BSC
7	X.21 version A (feature 5656)
8	X.21 version B (feature 5656)

9020	Primary diskette drive
9030	Secondary diskette drive
9060	Encryption facility
9A00	DCA adapter counters
Ap00	DCA port counters (p=port number)
x00z	Loop control

x = loop number
z = loop speed:
1 = 4800 bps
2 = 2400 bps
4 = 1200 bps

tt = Component types

01	= Host link
02	= Diskette
03	= ALA line
04	= Disk
06	= Encryption
80	= Loop control
81	= 4704/3604/3278/3279 keyboard
82	= 4704/3604/3278/3279 display
83	= 3610, 3611, or 3612 printer
84	= 3262/3287/5210 printer
86	= Magnetic stripe encoder (3604 and 4704-1)
87	= 3614 or 3624/3624 terminal
88	= 3606 or 3608 keyboard, display, and magnetic stripe reader
89	= 3608 printer
8A	= 3615 printer
92	= 3616 printer
95	= DCA adapter
9A	= 4710 printer
AB	= Magnetic stripe encoder (4704-2/3)
B0	= 4720 printer

ss	Work station ID (does not apply to host, diskette, or loop)
xxx	Counter value, in decimal; counters are numbered from left to right, beginning with counter 1.

When a counter reaches 256, it begins again at 128 (if STATS=WRAP is specified on the STARTGEN macro). Thus, values over 128 might not be definitive.

The counts represent the number of events, not the number of retries. One event can increase more than one counter.

Special Considerations

This command requires optional module P25.

Sample Command

If you enter:

```
068 FFFF
```

the system monitor resets all counters.

069 – Control Terminal Indicator Lights

This command switches on or off the keyboard system indicator light or the indicator lights on the test component.

```
Command     Operands
  069         xx
```

Operand Descriptions

xx

Replace *xx* with a hexadecimal value indicating the lights to switch on or off. Enter 069 FF to switch on the keyboard system indicator light; then, press Reset to extinguish that light. Or, enter the hexadecimal value of the following bit settings:

Bit	Explanation
0	Action: 1 = switch on; 0 = switch off
1	Reserved all devices
2	Reserved all devices
3	3616 journal forms insert; ignored for other devices.
4	3616/4710/4720 document insert; other devices, check indicator
5	Indicator light 3 (ignored 4710/4720)
6	Indicator light 2
7	Indicator light 1

For example, to switch on indicator light 2, you would set bits 0 and 6 on, the others off:

```
1000 0010
```

So you would code the hexadecimal equivalent, X'82'. The command would then be 069 82.

Indicator Lights

Indicator lights 1, 2, and 3 are used for the 4704, 3604, 3278, and 3279 displays, and the 3604 encoder. Indicator lights 1 and 2 are also used for the 3610, 3611, and 3612. For the 4704, 3604, 3278, and 3279 keyboard, the operand bits are ignored; the check indicator (bit 4) is switched on and the keyboard is placed in purge mode.

Special Considerations

An indicator is ignored when you do not set the bit on, or when the corresponding light does not exist on the test device.

Sample Command

If you enter:

```
069 92
```

the system monitor sets on the journal forms insert light and indicator light 2 for a 3616.

070 – Diagnostic Event Recording (Trace)

This command records (traces) diagnostic events occurring throughout the subsystem. See the 071 command to stop tracing diagnostic events.

```
Command     Operands
  070       xx xx 7yslot xx
```

Operand Descriptions

xx

Enter codes to indicate which types of events you want to record in the trace area. Each code you enter starts a trace on a subsystem component. The system components and their codes are:

Code	Event
0	Host link function request and post
1	Terminal component
2	Host link input and output
3	Diskette input and output
4	Reserved
5	Diskette incidents
6	Reserved
7	Loops (see 7yslot operand, below)
8-9	Reserved
10	Disk incidents
11	DCA function request and post
12	DCA interruption processing
13-23	Reserved

7yslot

You can enter only the 7 to trace all loops. Or, you can replace the *y* with the number of a specific loop you want to trace. To trace specific slots on a loop, replace *y* with the loop number, and replace *slot* with a mask indicating the slots to trace (to trace slot 0 on loop 2, enter 7yslot as 728000).

Command Output

This command places trace entries in the trace area. Use the 003 command to display entries from the trace area.

Special Considerations

The system retains trace settings from one IPL to another.

Sample Command

If you enter:

```
070 2 5 72
```

the system monitor begins tracing for host link input/output, diskette incidents, and all slots of loop 2.

071 -- Stop Recording (Tracing) Diagnostic Events

This command stops traces that you started with the 070 command.

```
Command     Operands
  071       xx xx xx
```

Operand Descriptions

xx

Enter codes to indicate which traces you want to stop. Each code you enter stops a trace on a subsystem component. The system components and their codes are:

Code	Event
0	Host link function request and post
1	Terminal component
2	Host link input and output
3	Diskette input and output
4	Reserved
5	Diskette incidents
6	Reserved
7	All loops.
8-10	Reserved
11	DCA function request and post
12	DCA interruption processing
13-20	Reserved
21	DATSM input/output errors
22-23	Reserved

Sample Command

If you enter:

```
071 2 5 7
```

the system monitor stops tracing on the host link input/output, diskette incidents, and all loops.

072 -- Display or Print Extended Statistical Counters

This command displays or prints the contents of the extended statistical counters.

Command	Operands
072	code ctrid

Operand Descriptions

code

Enter one of these function codes:

Code	Function
1	Displays the counter identified by *ctrid* or, if the second operand is omitted, displays data from the first extended statistical counter. You can then press the Enter key to display the next counter (host operator, use the ATTN command). The 90036 message indicates the end of the data.
2	Prints all extended counters at the output printer assigned by the 005 or 006 command. (The *ctrid* operand is not used.)
3	Displays all device IDs assigned to the extended counter identified in the *ctrid* operand.
4	Displays the extended counter ID associated with the device ID contained in the *ctrid* operand. The device ID is entered in the form *lsdx,* where: *l* = loop number; *s* = terminal address; *d* = component ID; and *x* = subaddress if present, or 0.

ctrid

Enter the ID of the counters you want:

Code	Counters
1	Enter ID of an extended statistical counter
3	Enter ID of an extended statistical counter
4	Enter a device address in the form *lsdx*, where: **l** Loop number **s** Terminal address **d** Component ID **x** Subaddress, or 0

Command Output

The output format for codes 1 and 2 follows:

```
xxxx-nnnnnnnnnnnn eeeeee ddd pp...p

where:

xxxx    = Extended statistical counter.
n...nn  = Number of input bytes received
          (in decimal).
ee...ee = Number of input bytes received in error
          (in decimal).
ddd     = Number of devices assigned to this counter
          (in decimal).
pp...p  = Percentage of error bytes received
          (bytes in error per bytes received).
```

The output format for codes 3 and 4 follows:

```
eeee-lsdx lsdx....

where:

eeee = Extended statistical counter ID (in hexadecimal).

lsdx = Device ID (in hexadecimal) as previously described.
       For code 3, all device IDs associated with counter ID
       eeee are displayed.

xxxx = Extended statistical counter ID in hexadecimal
       (counter IDs are specified at system configuration)
       or device ID in hexadecimal.
```

Special Considerations

This command requires optional module P25.

074 – Start or Stop DCA

This command starts or stops the Device Cluster Adapter (DCA), enables or disables a DCA port, or changes the port for a device.

```
Command     Operands
  074       code port dtype
```

Operand Descriptions

code

Enter one of these function codes:

Code	Function
0	Start the adapter.
1	Stop the adapter.
2	Enable port.
3	Disable port.
FF	Change port for specified device. (This is available only on the diagnostic diskette.)

port

Enter the port number (0-7) for codes 2, 3, and FF.

dtype

Enter the DCA device type for code FF only. Enter 0 for a keyboard display; enter 1 for a printer.

Special Considerations

- Before you enable a port, you must activate the port.
- Function code FF is available only on the diagnostic diskette.

Sample Command

If you enter:

```
074 0
```

the system monitor starts the Device Cluster Adapter.

075 – Display the Status of the System

This command displays the status of the four operator panel lights, and the contents of the message indicators.

```
Command      Operands
  075
```

Operand Descriptions

There are no operands.

Command Output

This command displays the format:

```
            lite msgs
which might look like this:
            0100 --++
```

The *lite* field displays the four operator panel lights. Starting on the left, the lights are:

l	The Alert light
i	The Ready light
t	The Check light
e	The Test/IPL light

A 1 indicates that the light is on; a 0 indicates that it is off.

The *msgs* shows the LED message indicators that display the system's operational status or an error message. See Chapter 6, "Controller Messages"for descriptions of these messages.

076 – Display System Variables

This command displays the release level, EC level, Patch level, required level of host support, CPGEN name, and CPU identifier current for the system.

```
Command      Operands
  076
```

Operand Descriptions

There are no operands.

Command Output

The command displays:

```
IR=yyy       EC=eeeeee     PAT=pp CPG=ver
GENID=name      SERIAL NO=serno  CUA=cu
```

Field	Meaning
yyy	Release level of your Controller Data
eeeeee	EC level
pp	Patch level
ver	Required level of 4700 Host Support
name	CPGEN name (from ID operand of STARTGEN)
serno	Controller serial number
cu	Control unit address of controller

Sample Command

If you enter:

```
076
```

the system displays:

```
IR=02.0      EC=000000     PAT=00 CPG=02.0
GENID=TEST001   SERIAL NO=0A0018 CUA=C1
```

123 – Enter Debugging Mode

This command starts debugging mode for a specified work station. After you enter this command, you then enter a series of special, 2-digit debugging commands to find and correct problems in application programs associated with logical work stations. To leave debugging mode, enter 00.

See Chapter 5, "Debugging Commands" for information on the 2-digit debugging commands.

Command	Operands
123	id

Operand Descriptions

id

Enter the work station ID of the work station to be debugged. The logical work station consists of the application program, the terminal components with which it is associated, and the controller storage to which it has access.

133 – Print Application Program Dump

This command prints an application program dump from the primary diskette. An application program issues the APDUMP instruction to request a dump; the dump is stored in the dump data set with other application program dumps. When you enter 133, you tell the system monitor how many dumps to skip before printing the dump you want.

```
Command      Operands

  133        [skip]
```

Operand Descriptions

skip

Enter the number of application program dumps to skip before printing the dump you want. If your dump is the third dump in the dump data set, enter 133 2, skipping two dumps.

You can enter the value D to print a list of all dump IDs with their associated station IDs.

Command Output

This command presents the dump data in this format:

```
dumpid   dtatyp  st  apname

disp     pfp     spf fli

data data data data data data data data
data data data data data data data data
data data data data data data data data
```

```
Where:

dumpid    = Specified dump ID
dtatyp    = Type of data (T1, T2, T3, T4, L
            PERM, or SEG xx)
st        = Station
apname    = APNAME
disp      = Displacement into the data
pfp       = Primary field pointer
spf       = Secondary field pointer
fli       = Field-length indicator
data      = Data
```

For example, the output might look like this:

```
TEST      SEG00       04          TEST2001
0000      008         000         000
0000 0000 0000 0000 0000 0000 0000 0000
0000 0000 0000 0000 0000 0000 0000 0000
                    .
                    .
                    .
TEST      SEG01       04          TEST2001
0000      008         000         000
0404 02FA 0000 0000 0016 2000 0005 C350
0000 0000 0000 0000 0000 0000 0000 0000
```

If you enter the command as:

```
133 D
```

the command prints:

```
TEST  -04 TEST  - 04 TESTA - 04 TESTB - 04 1   - 04  TEST02  - 04
TEST1 -04 TEST2 - 04 TEST3 - 04  TEST - 04 1   - 04  TEST02  - 04
```

Special Considerations

This command is available on the installation diskette, or with the CNM/CS or expanded system monitor and EDAM coded on the FILES CPGEN macro.

135 – Display Application Program Dump

This command displays 32-byte portions of an application program dump. Press the Enter key to display the next 32 bytes of the dump.

```
Command      Operands
  135        [skip]
```

Operand Descriptions

skip

Enter the number of application program dumps to skip before displaying the dump you want. For example, if you want to see the third dump, enter 135 2.

You can enter the value D to display a list of the dump IDs and their associated station IDs.

Command Output

This command presents the dump data in this format:

```
dumpidid dtatyp  st  apname

disp     pfp     spf fli

data data data data data data data data
data data data data data data data data
data data data data data data data data
```

```
Where:

dumpidid  = Specified dump ID
dtatyp    = Type of data (T1, T2, T3, T4, L
            PERM, or SEG xx)
st        = Station
apname    = APNAME
disp      = Displacement into the data
pfp       = Primary field pointer
spf       = Secondary field pointer
fli       = Field-length indicator
data      = Data
```

For example, if you enter the command as:

```
135
```

the output might look like this:

```
TEST     SEG00       04          TEST2001
0000     008         000         000
0000 0000 0000 0000 0000 0000 0000 0000
0000 0000 0000 0000 0000 0000 0000 0000
                     .
                     .
                     .
TEST     SEG01       04          TEST2001
0000     008         000         000
0404 02FA 0000 0000 0016 2000 0005 C350
0000 0000 0000 0000 0000 0000 0000 0000
```

If you enter the command as:

```
135 D
```

the command presents:

```
TEST     - 04  TEST     - 04  TEST     - 04
TEST     - 04  1        - 04  TEST02   - 04
```

Special Considerations

This command is available on the installation diskette or with the CNM/CS or expanded system monitor. Code EDAM on the FILES CPGEN macro.

137 – Compress Diskette on Secondary Drive

This command rearranges data sets on the diskette to provide a continuous free space for use. You can also use this command to alter the size or alignment of one data set on the diskette.

To prevent loss of data, copy the data to another diskette, compress the copy, and keep the original diskette for a backup.

```
Command     Operands
  137       [dsname func alin sects]
```

Operand Descriptions

dsname

Replace *dsname* with the name of a data set to be altered. Omit this operand, and all other operands, to compress the entire diskette.

func

Replace *func* with a value that indicates what you want to do to the data set named in the first operand. Do not specify this operand without naming a specific data set. The allowable function codes are:

Code	Function
0	No change.
1	Add to the data set.
2	Subtract from the data set.
3	Delete the entire data set.
4	Extend the end of the data set to the end of the extent + 1.
5	Reduce the data set by moving the end of extent to end of data + 1.

alin

Replace *alin* with a 0 if you do not want to specify alignment, or a 1 if you want the data set aligned on a track boundary. If you specify a 1, the data set must already begin and end on track boundaries before you issue the command.

The system ignores requests to compress sequential data sets. Track alignment cannot be guaranteed for compressed sequential data sets.

sects

Replace *sects* with the number of sectors to be added or subtracted when using function codes 1 and 2. You can add or subtract from 0 to 65535 sectors.

Special Considerations

- This command requires the installation diskette, or the expanded system monitor with optional module P41.
- If you change the size of the temporary file, add or subtract sectors in multiples of 16.
- DO NOT compress a 3600 operating diskette.

- During compression, extensive diskette arm movement creates an unusual sound to anyone near the controller.
- You can use the installation diskette to compress a diskette.
- Message 00073 means the command has completed.
- See the procedures in Chapter 3 for more information.

Sample Command

If you enter:

```
137
```

the system monitor compresses the entire diskette.

To process a single data set, enter operands as follows:

137 DSNAME1 5 0	Truncates the data set to the actual extent of the data.
137 DSNAME1 2 0 400	Truncates the data set by subtracting 400 sectors.
137 DSNAME1 4 0	Extends data set to the end of the extent.
137 DSNAME1 1 0 400	Adds 400 sectors to the end of the data set.
137 DSNAME1 3 0	Deletes data set DSNAME1.
137 DSNAME1 0 1	Maintain data set track alignment.

138 – Compress Application Program Data Set

The 138 command rearranges the application programs on an operating diskette to collect unused space into one usable area. You should not use this command to compress the application program data set on an operating diskette currently in use on your controller; use this command on an operating diskette *not* currently loaded.

```
Command        Operands
  138
```

Operand Descriptions

There are no operands.

Error Conditions

If you use the 138 command to compress the loaded operating diskette, the diskette currently controlling your system, you must reload your controller.

Special Considerations

- The system prompts you to mount the diskette on which application programs are to be compressed.
- The system modifies the data set directory, and leaves empty entries at the end for future expansion.
- The system resets the End-of-Extent value for the data set.
- This command is available with the CNM/CS or expanded system monitor.

Sample Command

If you enter:

```
138
```

the system monitor prompts you to insert the operating diskette, and compresses the application program data set on that diskette.

139 – Format a Diskette on Secondary Drive

This command formats a diskette on the secondary drive. Insert the diskette in the secondary drive before you issue this command.

```
Command     Operands
  139       [lgth type volid crc seq]
```

Operand Descriptions

lgth

Replace *lgth* with a code, from the following table, indicating the record length:

Code	Length
0	128 bytes per record
1	256 bytes per record
F	Use existing diskette record length

type

Replace *type* with code from the following table indicating the diskette type.

Code	Diskette Type
1	Diskette 1
2	Diskette 2
3	Diskette 2D
F	Assume the type already inserted in the drive (default value)

volid

Replace *volid* with a one- to six-character volume identification ONLY if you want to change the existing volume ID. If you omit this operand, the system retains the existing volume ID.

Notes:

1. You can change only the volume ID by omitting the preceding operands. However, you can do this *ONLY* if the volume ID is longer than one character. If the volume ID is only one character, enter all preceding operands.

2. The following two operands, *crc* and *seq*, are optional operands. If you enter them, you must first enter a volume ID.

crc

Replace *crc* with a code that indicates the type of record to be written to the diskette.

0	Format with delete control records. This is the default.
1	Format with data records.

Specify 1 (data records) for multi-block I/O on the diskette.

seq

Use this operand to modify the physical sequence numbering of records on a type 2D diskette. You can modify the sequence numbering to get more diskette accesses per revolution of the diskette. Replace *seq* with a number in the range 0 to 13. For example, diskette records are normally numbered:

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
```

If you specify the *seq* operand as a 2, the system then numbers the records in this order:

```
1 3 5 7 9 11 13 15 2 4 6 8 10 12 14
```

This enables the system to read records 1 and 2 in one revolution of the diskette.

If you omit this operand, the system uses the value 0, which does not modify the standard order.

Special Considerations

- This command is available on the installation diskette, or with the expanded system monitor and optional module P40.
- If the diskette contains data sets, the system stops to display message 00070. If you still want to format the diskette, regardless of the data sets, merely press the Enter key. However, if you decide that you do not want to format the diskette (probably because of the data sets), press any character key, and then press Enter. If you press Enter alone, the system formats the diskette.
- When the formatting is complete, you receive message 00071. Insert an operating diskette. If you formatted the operating diskette, you must insert another operating diskette to load the system (IPL).
- Before you format a diskette, deactivate the host link. When formatting is complete, you can reactivate the host link.
- Do not use the *seq* operand on a type 1 or 2 diskette.

Sample Command

If you enter:

```
139 0 0
```

the system monitor formats the secondary diskette at 128 bytes per record, as a type-1 diskette.

166 – Change Volume ID on Diskette

This command changes the volume ID (VOLID) on the specified diskette drive.

```
Command     Operands
  166       d [X]volid
```

Operand Descriptions

d

Enter 1 to use the primary drive, or 2 to use the secondary drive.

volid

Either enter X followed by the volume ID in hexadecimal, or just enter the volume ID in alphameric characters. The volume ID is a 1- to 6-character alphameric value, or 2 to 12 hexadecimal characters entered in pairs.

If you enter fewer than 6 alphameric characters, or fewer than 12 hexadecimal characters, the system pads the VOLID to the right with blanks.

Command Output

After you insert the diskette, the system displays the old volume ID from the label (******, if the label is invalid) and the new volume label you just entered (IBMIRD, if you omitted the *volid* operand). Then the system displays messages 00050, 00056, and 00059. If the volume IDs are correct, enter a 0. If the volume IDs are incorrect, enter a 1 to the message, and reenter the 166 command.

If the first volume ID that is displayed is blank or incomplete, the volume ID on the diskette is blank or invalid.

Special Considerations

- This command is available on the installation diskette and with the extended system monitor, but cannot be used by the remote system operator.
- You must enter hexadecimal data in pairs of characters. Each character pair becomes a single EBCDIC character.

Sample Command

If you enter:

```
166 1 CUST01
```

the system monitor changes the volume ID on the diskette on the primary drive.

188 – Copy Diskette

This command copies the contents of the primary diskette to the secondary diskette.

Both diskettes must be the same type (1, 2, or 2D), and in the same format (128 or 256 bytes per record).

```
Command     Operands
  188
```

Operand Descriptions

There are no operands.

Special Considerations

- This command is available on the installation diskette and with the expanded system monitor.
- The remote operator cannot issue this command.

Sample Command

See Chapter 3, "System Monitor Procedures" for the 188 procedure.

202 – Display Secondary Drive Status

This command displays the two status bytes (SMSDST) for the secondary diskette drive.

```
Command      Operands
  202
```

Operand Descriptions

There are no operands.

Command Output

The command displays the two status bytes.

Sample Command

If you enter:

```
202
```

the system monitor displays the status of the secondary diskette.

```
0000
```

231 – Read and Display Secondary Diskette Record

The 231 command reads a record from the diskette on the secondary drive, and displays the first 64 bytes. To display the remainder of the record, press the Enter key (remote operators, enter system ATTN command).

Command	Operands
231	[X]ttrr [s]

Operand Descriptions

X

Code X to specify the diskette address in hexadecimal; omit the X to enter the address in decimal.

ttrr

Replace *ttrr* with the track (tt) and record (rr) numbers in either decimal or hexadecimal.

s

Replace *s* with a 0 to read from side 0, or a 1 to read from side 1. If you omit this operand, the system uses side 0.

Sometimes you need not specify this operand. If you omit this operand, but enter the track and record in decimal, the system uses the side-0 default. When you specify the track and record numbers in hexadecimal, the system ignores your side specification if you specified side 1 in the *rr* field.

Command Output

This command displays the first 64 bytes of the record in hexadecimal. The top line of this display contains indications of the diskette drive, track and record number in decimal and hexadecimal, the side number, and the displacement of the first byte of data displayed.

Press the Enter key to display the rest of the record, or the rest of the records on this track. (Host operator, use the system ATTN command.) Or, enter a decimal number in the range 1-9 to skip 1 to 9 records.

Error Conditions

Do not use this command to read from an installation diskette, or from an operating diskette with the DSKOP=Y option coded on the STARTGEN macro. If you try this, the system displays a 90001 message.

Special Considerations

You can use the 047 command, when the diskette is on the secondary drive, to display the diskette count field.

Sample Command

If you enter:

```
231 0201 1
```

the system monitor displays the first 64 bytes from track 2, record 1, on side 1. If you then enter a 4, the system displays the first 64 bytes of track 2, record 5, on side 1. If you just press the Enter key now, the system displays the next 64 bytes of the record.

232 -- Change a Diskette Record on Secondary Drive

The 232 command changes the program data set on the secondary diskette drive.

```
Command     Operands
  232       [X]ttrr [X]dsp data
```

Operand Descriptions

X

Code X to specify the operand in hexadecimal; omit the X to enter the operand in decimal.

ttrr

Replace *ttrr* with the track (tt) and record (rr) numbers in either decimal or hexadecimal.

dsp

Replace *dsp* with the displacement into the record. You can begin the change up to 255 bytes into the record.

To enter the displacement in hexadecimal, enter the character X followed by the hexadecimal displacement, up to XFF.

data

Replace *data* with up to 8 hexadecimal bytes (16 input characters) of data to replace the data in the record. If you enter an odd number of characters, the system sets the leftmost 4 bits to 0000.

Error Conditions

- If you try to enter an *s* operand (side), an error results; there is no side operand.
- Do not use this command to read from an installation diskette, or from an operating diskette with the DSKOP=Y option coded on the STARTGEN macro. If you try this, the system displays a 90001 message.

Special Considerations

Changes are reflected in the diskette's count field. Use the 047 command to display the count.

Sample Command

If you enter:

```
232 2503 XA0 123
```

the system monitor replaces the 2 bytes of data on track 25, record 3, starting at displacement X'A0' with the value X'0123'.

233 – Print Dump/Storage Map from Secondary Drive

This command prints the stand-alone dump or storage map on the output printer.

Command	Operands
233	[X] [address]

Operand Descriptions

X

Enter X to enter the address in hexadecimal; omit the X to enter the address in decimal.

address

Replace *address* with the starting address in decimal or hexadecimal. The command prints the stand-alone dump, beginning at the address you specify.

If you omit this address, the command prints the MEF storage map.

Command Output

The command prints the dump or storage map on the assigned output printer.

Error Conditions

- Message 90006 indicates that you entered an address outside the range of the diskette.

Special Considerations

- Assign an output printer using the 005 or 006 command.
- A dump is the result of a controller error. You cannot load the diskette that contains the dump.
  1. Insert another operating or installation diskette.
  2. Load the system from this diskette.
  3. Use the 005 or 006 command to assign an output printer.
  4. Insert the diskette that contains the dump in the secondary drive.
  5. Issue 233 to print the dump.

Sample Command

If you enter:

```
233 X01E0
```

the system monitor prints the dump beginning at address X'01E0'.

234 – Perform Seek Test on Secondary Diskette Drive

This command reads from two diskette addresses, first from one then from the other, alternating until you press Reset twice.

Command	Operands
234	[X]ttrr [X]ttrr [s]

Operand Descriptions

X

Enter X to enter the address in hexadecimal; omit the X to enter the address in decimal.

ttrr

Replace *ttrr* with the track (tt) and record (rr) numbers in either decimal or hexadecimal.

s

Replace *s* with a 0 to read from side 0, or a 1 to read from side 1. If you omit this operand, the system uses side 0.

Sometimes you need not specify this operand. If you omit this operand, but enter the track and record in decimal, the system uses the side-0 default. When you specify the track and record numbers in hexadecimal, the system ignores your side specification if you specified side 1 in the *rr* field.

The system reads from the first address, then from the second address, alternating until you press Reset twice (host operators: the test is performed 20 times).

Sample Command

If you enter:

```
234 X0101 X4F0F
```

the system monitor first reads the data from address X'0101', then reads the data from address X'4F0F', and continues to read alternatively from each address.

235 – Display Dump or Storage Map from Secondary Diskette

This command displays 32-byte portions of the stand-alone dump or the MEF storage map from the diskette.

Command	Operands
235	[X]address

Operand Descriptions

X

Enter X to enter the address in hexadecimal; omit the X to enter the address in decimal.

address

Replace *address* with the starting address in decimal or hexadecimal. The command displays the stand-alone dump, beginning at the address you specify.

If you omit this address, the command displays the MEF storage map.

Command Output

This command displays 32 bytes at a time. Press Enter to display the next 32 bytes.

The data actually displayed always begins on a 32-byte boundary. If you specify an address that is not on a 32-byte boundary, the system begins displaying data from the *previous* 32-byte boundary. For example, if you enter 235 X1F0, the system displays 32 bytes beginning at address X'01E0', the previous 32-byte boundary.

Special Considerations

A dump is the result of a controller error. You cannot load the diskette that contains the dump.

1. Remove the diskette with the dump.
2. Insert another operating or installation diskette.
3. Load the system from this diskette.
4. Insert the diskette containing the dump in the secondary drive.
5. Issue 235 again to display the dump.

Sample Command

If you enter:

```
235 X01F0
```

the system monitor displays the 32 bytes starting at X'01E0'.

236 – Write Record to Secondary Diskette

This command writes a 256-byte record to the diskette on the secondary drive. The record consists of one or two specified characters. After you write the data to the diskette, you can no longer load the diskette.

```
Command     Operands
  236       [X]ttrr xx [s]
```

Operand Descriptions

X

Enter X to specify the diskette address in hexadecimal; omit the X to enter the address in decimal.

ttrr

Replace *ttrr* with the track (tt) and record (rr) numbers in either decimal or hexadecimal.

xx

Replace *xx* with one or two hexadecimal characters to be written as data in the record. If you omit this operand, 0s are written.

If you enter the *s* operand, you must also enter the *xx* operand.

s

Replace *s* with a 0 to read from side 0, or a 1 to read from side 1.

If you enter the *s* operand, you must also enter the *xx* operand. If you omit this operand, the system uses side 0.

Sometimes you need not specify this operand. If you omit this operand, but enter the track and record in decimal, the system uses the side-0 default. When you specify the track and record numbers in hexadecimal, the system ignores your side specification if you specified side 1 in the *rr* field.

Command Output

This command writes a 256-byte record, consisting of the hexadecimal values specified, to the diskette.

Special Considerations

This command is available only on the installation diskette.

Sample Command

If you enter:

```
236 1301 A5
```

the system monitor writes 256 bytes of X'A5' to the diskette beginning at track 13, record 01.

237 – Reconstruct Temporary File or Index Record on Secondary Drive

This command reconstructs an index record for a temporary file using the records associated with the index, or builds a null record to replace a record in the temporary file.

Command	Operands
237	[X]ttrr [s]

Operand Descriptions

X

Enter X to specify the diskette address in hexadecimal; omit the X to enter the address in decimal.

ttrr

Replace *ttrr* with the track (tt) and record (rr) numbers in either decimal or hexadecimal.

s

Replace *s* with a 0 to read from side 0, or a 1 to read from side 1. If you omit this operand, the system uses side 0.

Sometimes you need not specify this operand. If you omit this operand, but enter the track and record in decimal, the system uses the side-0 default. When you specify the track and record numbers in hexadecimal, the system ignores your side specification if you specified side 1 in the *rr* field.

Command Output

The address you enter is either the address of an index block or of a data block in the temporary file. The output depends on the address you enter.

To reconstruct an index block, the system reads the other records associated with the index, and from them builds a new index.

To reconstruct a temporary data record, the command writes a null record to the temporary file at the address you specify.

Special Considerations

This command is available only on the installation diskette. Use it under the direction of your service person.

238 – Print Operating Information from Secondary Drive

This command prints the controller operating information from a dump diskette inserted in the secondary diskette drive.

Command	Operands
238	

Operand Descriptions

There are no operands.

Command Output

The command prints the operating information on the output printer.

Special Considerations

- Assign an output printer using the 005 or 006 command.
- A dump is the result of a controller error. You cannot load the diskette that contains the dump.
  1. Insert another operating or installation diskette.
  2. Load the system from this diskette.
  3. Use the 005 or 006 command to assign an output printer.
  4. Insert the diskette that contains the dump in the secondary drive.
  5. Issue 238 command.

Sample Command

If you enter:

```
238
```

the system monitor prints the controller operating information.

243 – Change Test Component Characteristics

Use this command to display and change characteristics associated with the assigned test component (see the 007 command). Enter the 243 command with no parameters to display the information. Enter the 243 command along with 8 bytes of information to change the information.

Command	Operands
243	[ddddmmmmmmccuuoo]

Operand Descriptions

The parameters you specify on the 243 command remain in effect until you change them with another 243 command or until you restart the system.

dddd
Enter the 4-digit device type.

mmmmmm
Enter the model number of the device, in character format, right adjusted and padded with blanks. For example, enter model B02 as C2F0F2, and model 12 as 40F1F2.

cc
Enter an ID that indicates the general type of component. The component IDs are defined as follows:

01	Keyboard
02	Display
03	Magnetic Stripe encoder
04	Printer (first or only print component)
05	Printer (second print components)
06	Financial Services Terminal
07	Document Processor
08	Consumer Transaction Facility

uu
Enter 1 byte of user data, as defined during CPGEN. This can be any value from hex 00 to hex FF.

oo
Indicate how the device is owned:

80	In the device pool associated with this station.
40	Shared with another station (non-concurrent).
20	Shared with another station (concurrent).

Command Output

This command displays the line:

```
ddddmmmmmmccuuoo
```

where:

dddd Is the 4-digit device type.

mmmmmm Is the model number of the device, in character format, right adjusted and padded with blanks. For example, model B02 is C2F0F2, and model 12 is 40F1F2.

cc Is an ID that indicates the general type of component. The component IDs are defined as follows:

01	Keyboard
02	Display
03	Magnetic Stripe
04	Printer (first or only print component)
05	Printer (second print component)
06	Financial Services Terminal
07	Document Processor
08	Consumer Transaction Facility

uu Is 1 byte of user data, as defined during CPGEN. This can be any value from hex 00 to hex FF.

oo Indicates how the device is owned:

80	In the device pool associated with this station.
40	Shared with another station (non-concurrent).
20	Shared with another statement (concurrent).

Device Codes

The following, listed by device, are the possible combinations of devices, models, and components.

Loop Attached Devices

Device	Model	Component	Description
3604	1	01	Keyboard (optional MSR and PIN)
		02	Display
		03	Magnetic Stripe (MSE)
	2	01	Keyboard (optional MSR and PIN)
		02	Display
		03	Magnetic Stripe (MSE)
	3	01	Keyboard (optional MSR and PIN)
		02	Display
		03	Magnetic Stripe (MSE)
	4	01	Keyboard (optional MSR and PIN)
		02	Display
		03	Magnetic Stripe (MSE)
	5	01	Keyboard (optional MSR and PIN)
		02	Display
	6	01	Keyboard (optional MSR and PIN)
		02	Display
	7	01	Keyboard (optional MSR and PIN)
		02	Display
3606		06	Financial Services Terminal (Keyboard, Display, MSR)
3608		04	Printer
		06	Financial Services Terminal (Keyboard, Display, MSR)
3609	1	01	Keyboard (optional MSR and PIN)
		02	Display
		03	Magnetic Stripe (MSE)
	2	01	Keyboard (optional MSR and PIN)
		02	Display
		03	Magnetic Stripe (MSE)
	3	01	Keyboard (optional MSR and PIN)
		02	Display
		03	Magnetic Stripe (MSE)
3610	1	04	Document Printer
	2	04	Document Printer
	3	04	Document Printer
	4	04	Document Printer
	5	04	Document Printer
	12	04	Document Printer
	13	04	Document Printer

3611	1	04	Passbook Printer
	2	04	Passbook Printer
3612	1	04	Document Printer
		05	Passbook Printer
	2	04	Document Printer
		05	Passbook Printer
	3	04	Document Printer
		05	Passbook Printer
	12	04	Document Printer
		05	Passbook Printer (CPGEN MODEL=12P)
	13	04	Document Printer
		05	Passbook Printer (CPGEN MODEL=13P)
3613		04	Journal Printer
		05	Passbook Printer w/MSR (optional MSE and OLF)
3614		08	Consumer Transaction Facility
3615	1	04	Administrative Printer
	2	04	Administrative Printer
3616		04	Journal Print Station
		05	Document Print Station
3619	A01	04	Administrative Printer
	B01	04	Administrative Printer
	B02	04	Administrative Printer
	B03	04	Administrative Printer
3620		03	Magnetic Stripe (MSRE)
		04	Journal Print Station
		05	Document Print Station
3621	B01	04	Statement Printer
	B02	03	Magnetic Stripe (optional Keyboard and PIN)
		04	Statement Printer
	B03	03	Magnetic Stripe (optional Keyboard and PIN)
		04	Statement Printer
3624		08	Consumer Transaction Facility
4704	1	01	Keyboard (optional MSR and PIN; CPGEN MODEL=11 or 12)
		02	Display (CPGEN MODEL=11 or 12)
		03	Magnetic Stripe (MSE CPGEN MODEL=11 or 12)
4710		04	Receipt/Validation Printer
4713		04	Verification Printer
		05	See DCA-Attached Devices for this Component
4720	1	04	Cutform Printer
	2	04	Cutform Printer with Journal
	3	04	Cutform/Passbook Printer
	4	04	Cutform/Passbook Printer with Journal
4723		07	Document Processor
5906		06	Financial Services Terminal (Keyboard, Display, MSR)
5922		07	Document Processor

DCA Attached Devices

Device	Model	Component	Description
3262		04	Line Printer
3268		04	Line Printer
3278	2	01	Keyboard (optional MSR; CPGEN MODEL=8)
		02	Display (CPGEN MODEL=8)
	52	01	Keyboard (optional MSR; CPGEN MODEL=E)
		02	Display (CPGEN MODEL=E)
3279	2A	01	Keyboard (optional MSR; CPGEN MODEL=8A)
		02	Display (CPGEN MODEL=8A)
	2B	01	Keyboard (optional MSR; CPGEN MODEL=8B)
		02	Display (CPGEN MODEL=8B)
3283		04	Printer
3287		04	Printer
4704	2/3	01	Keyboard (optional MSR and PIN) (CPGEN MODEL=21 or 22)
		02	Display (CPGEN MODEL=21 or 22)
		03	Magnetic Stripe (MSE; CPGEN MODEL=21 or or 22)
4713		04	See Loop Attached Devices for this Component
		05	Passbook Printer w/MSR (optional MSE and OLF)
5210		04	Printer
7436		04	Printer
7486	2	01	Keyboard (CPGEN MODEL=8)
		02	Display (CPGEN MODEL=8)

301 – Display Message Type

This command displays the most recent messages of a specified type.

```
Command     Operands
  301       type
```

Operand Descriptions

type
Replace *type* with the 3-digit message-type code.

Command Output

This command displays the message number and the first line of text for the most current log message of the specified type. Then, the system displays the message numbers and text for the preceding messages of the same type.

Sample Command

If you enter:

```
301 030
```

the system monitor displays the most recent log messages of type 030.

```
0010 10 0747 030 THIS IS SECOND TEST
0008 10 0731 030 THIS IS FIRST TEST
0001 10 0000 002 CNMGEN 09/28/82 0000
```

302 – Display Message Types in the System Log

This command displays the various types of system messages entered in the log since the last IPL.

```
Command      Operands
  302
```

Operand Descriptions

There are no operands.

Command Output

The command displays a list of message types entered in the log since the last IPL.

Sample Command

If you enter:

```
302
```

the system monitor displays the message types encountered.

```
030 018 010 004 017
```

310 – Retrieve Work Station Status

This command displays data you might need to debug an application program in an operating environment. You can either specify the ID of the work station, or the address of a terminal associated with the work station.

```
Command      Operands
  310      { id     }
            { lssdd  }
```

Operand Descriptions

id

Replace *id* with the work station ID associated with the program to be debugged.

lssdd

Replace *lssdd* with the address of the terminal using the program, consisting of the loop number (l) or A for a DCA device, the terminal or port address (ss), and the component address (dd). Always enter the leading 0 for the *ss* part of the operand. Enter component addresses as:

```
dd      Component

Fixed Addresses:

1       4704/3604/3278/3279 keyboard
2       4704/3604/3278/3279 display
3       Magnetic stripe encoder
4       3610/3612 document printer;3262/3287/5210 printer
5       3611/3612 passbook printer
6       3606/3608 keyboard, display, magnetic
        stripe reader
7       3608 printer
8       3614/3624 terminal

Variable Addresses:

 1-15   4710/3615 printer (must be same value as the
        subaddress switch settings on the printer).
 2-14   Even number only, 4720, 3616 journal printer
        station (must be set same as subaddress
        switch settings).
 3-15   Odd numbers only; 3616 document print station.
```

Command Output

The format of the displayed data is:

```
F01=___      F02=____  F03=___  F04=________
F05=_____      F06=_______________
F07=_______  F08=_________  F09=_______
F10=(__________ _____) (___________ ______)
```

Where:

```
  F01 = Work station ID.
  F02 = Application program instruction counter.
  F03 = Pause Counter (increased by 1 each time
        LPAUSE is executed; reset to 0 by
        LEXIT).
  F04 = Combined status flag:
        1 = Program check has occurred.
        2 = Station is in session with host.
        3 = Station is at LPAUSE instruction.
        4 = Station is at LEXIT, awaiting dispatching.
        5 = Host protocol is SNA.
        6 = Timer is set.
  F05 = Status flag 1:
        1 = Idle.
        2 = Terminal wait (cannot cancel).
        3 = Terminal wait (can cancel).
        4 = Host wait (cannot cancel).
        5 = Host wait (can cancel).
        8 = Executing WAIT instruction.
  F06 = Format of last instruction executed.
  F07 = Application program name.
  F08 = Station indicators:
        1 = Attention (2 Cancels) for Wait.
        2 = Timer has interrupted.
        3 = Interrupt from Post instruction.
        5 = Host input message pending.
        6 = Terminal input message pending.
        7 = Station message pending.
  F09 = Terminal address if station is in a wait state.
  F10 = Application program names (maximum of 2) with calling
        application programs (if any) and the APCALL stack. If
        the current application program (F02) was called, the
        name of the caller is displayed on the left. If the caller
        was called, that caller's name is displayed on the right.
```

Sample Command

If you enter:

```
310 02
```

the system monitor displays application data for the program associated with work station ID 02.

```
F01=02  F02=023E  F03=0000 F04=1.....
F05=.2..... F06=2702
F07=PROGNAME F08=........ F09=10101
F10=( )   ( )
```

320 – Test Cryptographic Facilities

This command tests the 4700 cryptographic facilities, the P57 (encode/decode) and P28 (encipher/decipher) modules.

```
Command     Operands
  320
```

Operand Descriptions

There are no operands.

Command Output

The 320 command displays one or both of these messages:

10073 The encipher/decipher facilities are working properly.
10074 The encode/decode facilities are working properly.

Special Considerations

This command requires the optional module for the cryptographic facility you want to test. This command attempts to test both facilities, but if only one facility is present, this command tests that facility.

Sample Command

If you enter:

```
320
```

the system monitor tests the cryptographic facilities.

330 – Load, Verify, Erase Cryptographic Keys

This command loads, verifies, or erases the cryptographic keys used in your subsystem. before you use this command, read the *IBM 4700 Controller Programming Library, Volume 5: Cryptographic Programming*. Read the *IBM 4701 Controller Operating Instructions* to find out how to activate the controller's encryption keylock. You must turn the key *counterclockwise* before using the 330 command, and return the key to the vertical position and remove the key when you have completed the operation.

CAUTION
Work carefully. If you turn the key clockwise from its initial, vertical position, you might erase all of the keys.

```
Command     Operands
  330       func key
```

Operand Descriptions

func

Enter one of these codes to indicate what you want to do.

Code	Function
1	Load encrypted keys. You cannot use this option with a master key.
2	Load keys in two parts from two operators. A send cross-domain key must be encrypted under the first variant of the master key. A receive cross-domain key must be encrypted under the second variant of the master key.
3	Verify keys
4	Erase keys.

key

Replace *key* with one of these codes to indicate which key you want to load, verify, or erase.

Code	Key
1	Master key (KM) You cannot use this value with a *func* value of 1.
3	Send cross-domain key (KCD1)
4	Receive cross-domain key (KCD2)

Special Considerations

This command requires optional module P28.

Procedure

Loading Encrypted Keys: Enter 330 1 3 or 330 1 4 to load the send or receive cross-domain key. The command displays message 91077 if there is a problem; otherwise the command displays 10075 prompting you to enter the encrypted key as a single string of 16 hexadecimal characters. The command finally displays message 10077 and a 2-byte verification code.

Loading Plaintext Keys in Two Parts: Enter 330 2 1, 330 2 3, or 330 2 4 to load the master key or the send or receive cross-domain keys. The command prompts 10075; the first operator enters the first part of the key as a string of 16 hexadecimal characters. The command next prompts 10076; the second operator enters the second part of the key as a string of 16 hexadecimal characters. The command finally displays message 10077 and a 2-byte verification code.

Verifying Keys: Enter 330 3 1, 330 3 3, or 330 3 4 to verify the master key, or the send or receive cross-domain keys. The command displays 10077 and the 2-byte verification code.

Erasing Keys: Enter 330 4 1, 330 4 3, or 330 4 4 to erase the master key, or the send or receive cross-domain keys.

To erase all keys at once, turn the controller's encryption key clockwise from its initial, vertical position, and switch off the controller's power.

711 – Send Message to Remote Operator

This command sends a message to the remote operator who uses NCCF at the host system.

Note: You can issue this 711 command ONLY from the CNM/CS work station.

Command	Operands
711	opid text

Operand Descriptions

opid
Replace *opid* with the NCCF network identifier of the remote operator.

text
Enter the message text to send to the remote operator.

Sample Command

If you enter:

```
711 NET5TA HI KID
```

the system monitor sends the message to the host.

712 – Control Access by CNM/CS

This command determines whether a remote operator, using CNM/CS, can access data at the controller.

Note: You can issue this command only from the CNM/CS work station.

```
Command     Operands
  712       [func secs]
```

Operand Descriptions

func

Enter one of these control codes:

Code	Function
0	Disable CNM/CS processing; prevent access from host.
1	Enable CNM/CS access; DO NOT allow access to alert processing.
2	Enable CNM/CS access to alert processing only.
3	Enable all CNM/CS access.

secs

Replace *secs* with a value in the range 10 to 65535 indicating the maximum time (in seconds) between host queries for loop or alert status.

Enter the 712 command with no operands to see the values already assigned to these codes. The system displays the values as:

```
func   secs
```

just as they were entered previously.

Sample Command

If you enter:

```
712 3 60
```

the system monitor allows complete CNM/CS access, and sets the time of 60 seconds between requests for alerts and loop status.

777 – Immediate Controller Dump

This command causes an immediate controller dump, and can cause a machine check. Use this command only under the direction of qualified support personnel.

Command	Operands
777	password

Operand Descriptions

password
Enter the system monitor password.

Command Output

The controller performs a dump.

Special Considerations

You cannot use this command after you change the system monitor password to all nulls. To correct this, change the system monitor password to a string of characters other than nulls.

778 – Add Trap-After-Store Table Entry

This command adds a trap in the system trap-after-store table.

This command can cause a machine check (C13B). Use this command only under the direction of qualified support personnel.

```
Command     Operands
  778       password eq sp [X]address mask value
```

Operand Descriptions

password
Enter the system monitor password.

eq
Enter 1 to trap on an equal comparison, or a 0 to trap on an unequal comparison.

sp
Enter 1 to check for register space, or a 0 to check storage space.

address
Enter an even (real or mapped) address in either decimal or hexadecimal. This is the address at which the trap takes place.

mask
Replace *mask* with 4 hexadecimal digits to be ANDed with the halfword at the location specified by the *address* operand.

value
Replace *value* with 4 hexadecimal digits to be compared with the result of the AND operation.

Special Considerations

- An invalid mapped address can cause a C137 trap when the trap-after-store is activated.
- Use this command only under the direction of qualified support personnel.
- Up to four entries may reside in the table at any time.

Sample Commands

1. To add a table entry for trapping when bits 0 and 1 at X'23333' equal b'10', enter:

   778 password 1 0 X23332 00C0 0080

2. To add a table entry for trapping when bits 0 and 1 at X'23333' do not equal b'10', enter:

   778 password 0 0 X23332 00C0 0080

3. To add a table entry for trapping when cycle-steal register C2 equals X'42D8', enter:

   778 password 1 1 XC2 FFFF 42D8

4. To add a table entry for trapping when slot 1 of TTA 0 equals X'24', enter:

   778 password 1 1 XFD02 00FF 0024

779 – Activate or Deactivate Trap-After-Store

This command activates or deactivates the traps in the trap-after-store table.

This command can cause a machine check (C13B). Use this command only under the direction of qualified support personnel.

```
Command     Operands
  779       password xx
```

Operand Descriptions

password
Enter the system monitor password.

xx
Replace *xx* with 2 hexadecimal characters representing bits (binary indicators) set in the following pattern.

Bit	Meaning
bit 0	Set to 1 to activate, 0 to deactivate the trap function when each executor returns to the function interpreter.
Bits 1-7	Set to 1 to activate, 0 to deactivate, the trap before and after each routine gets control by the CLIH for levels 1 to 7, respectively.

Set *xx* = 00 to deactivate the function and clear the trap-after-store table.

Sample Command

If you enter:

```
779 password BF
```

the system tests each entry in the trap-after-store table after each execution, and before and after the CLIH gives control to each processor at interrupt levels 2 through 7.

888 – Transmit Diskette

This command transmits the data from a diskette to the host system. See the first part of this book for a procedure describing how to use the 888 command.

Command	Operands
888	[drive]

Operand Descriptions

drive
Enter a 1 for the primary drive, or a 2 for the secondary drive. If you omit this operand, 1 is used.

Error Conditions

Any transmission error ends the session.

Special Considerations

- The remote user cannot issue this command.
- This command is available on the installation diskette and with the expanded system monitor.

Sample Command

If you enter:

```
888 1
```

the system monitor begins to send data from the primary diskette.

929 – Test Host Link

This command executes a wrap test for the host link.

Command	Operands
929	rpt stop test address

Operand Descriptions

rpt
Enter the number of times to repeat the test.

stop
Enter a 0 to stop the test when an error occurs, or a 1 to continue the test when status 0203 (wrap failed) is received.

test
Enter 01 to perform the adapter wrap test, or 02 to test the modem.

address
Enter the adapter address, 15 for the host link.

Special Considerations

- If you code address 15, and have a Multi-Use Loop adapter installed, the *test* operand is ignored; the system performs these tests:
  Communication adapter test
  Loop station adapter test
  Loop station connection test
- This command is available on the installation diskette or diagnostic diskette.
- This command will not work on an operating diskette. If you issue this command from the operating diskette with the expanded system monitor, the system displays message 90030; if you issue this command from the operating diskette with the standard system monitor, the system displays message 90001.
- The system reads the machine-feature switches to determine the adapter type. If an error occurs while reading the switches, the system presents status 0200.
- Status 0401 is presented if you try to test address 15 (the host link), but the host communication adapter is not installed on your controller.

Sample Command

If you enter:

```
929 025 0 01 15
```

the system monitor tests the host link.

936 – Write Record to Primary Diskette

This command writes a 256-byte record to the diskette on the primary drive. The record consists of one or two specified characters. After you write the data to the diskette, the condition of the diskette is unpredictable. You might not then be able to load the diskette.

Command	Operands
936	[X]ttrr xx [s]

Operand Descriptions

X

Enter X to specify the diskette address in hexadecimal; omit the X to enter the address in decimal.

ttrr

Replace *ttrr* with the track (tt) and record (rr) numbers in either decimal or hexadecimal.

xx

Replace *xx* with one or two hexadecimal characters to be written as data in the record. If you omit this operand, 0s are written.

If you enter the *s* operand, you must also enter the *xx* operand.

s

Replace *s* with a 0 to read from side 0, or a 1 to read from side 1.

If you enter the *s* operand, you must also enter the *xx* operand. If you omit this operand, the system uses side 0.

Sometimes you need not specify this operand. If you omit this operand, but enter the track and record in decimal, the system uses the side-0 default. When you specify the track and record numbers in hexadecimal, the system ignores your side specification if you specified side 1 in the *rr* field.

Command Output

This command writes a 256-byte record, consisting of the hexadecimal values specified, to the diskette.

Special Considerations

This command is available only on the installation diskette.

Sample Command

If you enter:

```
936 1301 A5
```

the system monitor writes 256 bytes of X'A5' to the diskette, beginning at track 13, record 01.

937 – Rebuild Temporary File/Index Record on Primary Drive

This command reconstructs an index record for a temporary file using the records associated with the index, or builds a null record to replace a record in the temporary file.

Command	Operands
937	[X]ttrr [s]

Operand Descriptions

X

Enter X to specify the diskette address in hexadecimal; omit the X to enter the address in decimal.

ttrr

Replace *ttrr* with the track (tt) and record (rr) numbers in either decimal or hexadecimal.

s

Replace *s* with a 0 to read from side 0, or a 1 to read from side 1. If you omit this operand, the system uses side 0.

Sometimes you need not specify this operand. If you omit this operand, but enter the track and record in decimal, the system uses the side-0 default. When you specify the track and record numbers in hexadecimal, the system ignores your side specification if you specified side 1 in the *rr* field.

Command Output

The address you enter is either the address of an index block or of a data block in the temporary file. (The file has an index record as the first record, and as every sixteenth record after that.) The output depends on the address you enter.

To reconstruct an index block, the system reads the temporary-file data records associated with the index, and from them builds a new index.

To reconstruct a temporary data record, the command writes a null record to the temporary file at the address you specify.

Special Considerations

- This command is only on the installation diskette. Use it under the direction of your service person.
- If you mistakenly address a valid data record, this command will replace that valid record with a null record. BE CAREFUL.

955 – Copy Data Set

This command copies a data set from one diskette drive to the other diskette drive.

Command	Operands
955	[x]

Operand Descriptions

x

Enter 1 to copy from the primary to the secondary diskette; enter 2 to copy from the secondary to the primary diskette. If you do not enter this operand, the system uses 1.

Command Output

When the system displays 00060, enter one or more data set names, or system data set numbers, to be copied. If you enter several names or numbers, separate them with spaces. The system data set numbers are:

Number	System Data Set	Data Set Content
1	SYSBAS	Base microcode
2	SYSAP	Applications
6	SYSPF	Permanent files
8	SYSCTL	4700 control data set
9	SYSDSU	Diagnostics and startup
10	SYSST1	Stage 1 overlays
11	SYSSM	System monitor
12	SYSOPT	Optional modules
13	SYSTF	Temporary files
15	SYSCPG	CPGEN
16	DUMPAP	APDUMP data set
FF		All data sets

Special Considerations

- This command requires the Extended Diskette Access Method (EDAM) for both diskette drives, along with the EDAM Allocate option for the "to" drive.
- This command is available on the CNM/CS or expanded system monitor.
- You can copy ONLY direct and sequential 256-byte records. To copy other record types, use the installation diskette.

973 – Activate or Deactivate Loop Device for Testing

This command activates or deactivates a specified loop device for use in testing with the diagnostic diskette. Use this command before you issue 007 to assign a loop device as a test device. (See the 074 command to activate a DCA device.)

You can enter 973 with no operand to deactivate any active test devices. If you enter an operand, enter the address of the terminal that is to be activated. The system deactivates the currently-active terminal, and activates this new terminal.

```
Command     Operands
  973       [lssdd]
```

Operand Descriptions

lssdd

Replace *lssdd* with the device address, consisting of the loop number (l), the terminal address (ss can be 02 for modulus 4, or 04 for modulus 8). Always enter the leading 0 for the *ss* part of the operand. The device type can be:

Code	Device Type
91	3604
92	3610, 3611, 3612
93	3614, 3624
94	4720
95	3608, 3606
96	3615
97	3616
98	4704
99	4710

Omit the operand to deactivate all active devices. Enter a terminal address to activate the new terminal and deactivate the previous test terminal.

Error Conditions

Message 90035 is displayed if you try to activate an invalid device type or address.

Special Considerations

- This command is intended ONLY for the diagnostic diskette.
- Only one terminal can be active at a time.
- Use 007 to release any previously-assigned test devices before you activate a new test device.
- This command is available on the CNM/CS or expanded system monitor.

Sample Command

If you enter:

```
973 20299
```

the system monitor activates the 4710 test device. You can now use 007 to assign it as a test device.

980 – Create an EXEC File

This command creates a file of executable system monitor commands (an EXEC). After you enter 980, enter a series of system monitor commands. Instead of executing these commands as you enter them, the system monitor places them in a file called an EXEC. Then, press Enter to tell the system monitor to stop building the EXEC. The system monitor displays a 4-digit EXEC number. Use this number with the 982 command to execute the EXEC.

```
Command      Operands
  980
```

Operand Descriptions

There are no operands.

Special Considerations

- The maximum size of an EXEC file is 247 bytes; that includes a 9-byte header and a 3-byte counter for each command in the file.
- The system keeps the EXECs in the log message data set; you must insert the operating diskette before you invoke an EXEC. The 4-digit EXEC number is actually a message number; you can use the 001 or 002 command to display an EXEC file.
- The system monitor does NOT check the validity of commands as you enter them into an EXEC file.
- While you are entering commands into an EXEC file, you can enter an X to cancel the operation and stop creating the EXEC. Any further system monitor commands you enter are executed.
- This command is available on the installation and diagnostic diskettes or with the expanded system monitor.

Sample Command

If you enter:

```
980
```

the system monitor accepts subsequent commands for an EXEC file.

981 – Repeat Previous Commands

This command, placed in an EXEC file, causes the system monitor to repeat the execution of the previous commands in the EXEC file.

```
Command     Operands
  981       rpt
```

Operand Descriptions

rpt

Enter a number, from 1 to 3 digits, indicating the number of times the system monitor is to repeat the previous commands in this EXEC file, when the EXEC file is invoked.

Special Considerations

- You can enter only one 981 command in an EXEC file; if you try to enter more, they are ignored.
- This command is available on the installation and diagnostic diskettes or with the expanded system monitor.

Sample Command

If you enter:

```
981 10
```

when the EXEC is invoked, and the system monitor finds this command, the system monitor will execute 10 iterations of the commands prior to this in the EXEC file. In all, that series of commands will be executed 11 times.

982 – Invoke an EXEC File

This command invokes an EXEC file stored in the system log.

```
Command     Operands
  982       execid
```

Operand Descriptions

execid
Enter the 4-digit EXEC message ID that was displayed when you created the EXEC with the 980 command.

Special Considerations

- The remote operator cannot issue this command.
- If you include a logoff (000) command in an EXEC file, the logoff takes place when the 000 command is encountered. The next time you log onto the system monitor, the EXEC runs to completion, beginning after the 000 command.
- This command is available on the installation diskette, and with the expanded system monitor.

Sample Command

If you enter:

```
982 011
```

the system monitor invokes EXEC 011.

990 – Display Diskette Data Set Names

This command displays the names and locations of data sets on the specified diskette. Press Enter to see the next group of messages.

```
Command     Operands
  990       [drive]
```

Operand Descriptions

drive

Enter 0 for the primary drive, 1 for the secondary drive. If you omit this operand, the system uses 0.

Command Output

This command displays the names and starting and ending hexadecimal locations in this format:

```
dsname    ttrr  ttrr
```

For example, if data set ABC starts on track 1, record 5, side 0, and ends on track 15, record 10, side 1, the command displays:

```
ABC   0105  0F8A
```

Sample Command

If you enter:

```
990 0
```

the system monitor displays data set names from the primary drive diskette, and their beginning and ending track and record addresses in hexadecimal:

```
SYSCTL     0201 0201
SYSDSU     0202 0702
SYSST1     0703 090D
.
.
.
ERRORSET   4A01 4A0F
```

991 – Display Application Program Names and Addresses

This command displays the names and addresses of the application programs on the primary diskette. This diskette can be any 4700-formatted diskette. When you want to see the next group, press Enter (host operator: issue system ATTN command).

```
Command     Operands
  991
```

Operand Descriptions

There are no operands.

Command Output

The command displays the names of application programs, and follows each name with the version number and the address. Each address is a hexadecimal track and record combination, and represents the address on which the program begins.

Press Enter to see the next group.

Sample Command

If you enter:

```
991
```

the system monitor displays the first group of names.

```
TIMER001  001 2B07
APDATA01  001 2B0B
APDATA02  001 2C0B
APPTELLR  001 2C0E
APINQUIR  001 2D01
```

998 – Prepare for Unattended Creation

This command prepares the 4700 controller to receive an operating diskette image from the host for recording on a blank diskette. You must first ensure that the host link is active.

```
Command     Operands
  998
```

Operand Descriptions

There are no operands.

Special Considerations

This command requires optional modules P41 (compression) and P5E (set diskette), the extended diskette access method (EDAM), the EDAM allocation option, and two buffers. Specify all this at CPGEN.

999 – Create Operating Diskette

This command creates a 4700 operating diskette from data that is read from the host computer. You must first issue the 041 command to activate the host link. Then, enter 999 to request diskette creation. You can enter the operands with the 999 command, or you can omit them and let the system monitor prompt you for each value. (If you include any operand, the system does not prompt for the rest.)

```
Command     Operands
  999       [init drv volidcuacopidtransid]
```

Operand Descriptions

init

Enter a 0 to have the host initiate the session, or a 1 to have the controller initiate the session. If you enter 1, the Host Transmit Facility, at the host computer, must be active.

drv

Enter 0 to use the diskette on the primary drive; enter a 1 if you want to insert a new diskette on the primary drive; enter 2 to use the secondary drive. If you omit this operand, the system uses the diskette on the primary drive (0).

Notes:

1. If you omit this operand, the system uses the diskette currently on the primary drive. BE CAREFUL that you do not destroy your operating diskette.

2. If you enter the *init* operand, the system does not prompt for any subsequent operands *unless* you enter this *drv* operand as a 1. In this case the system does prompt you to insert a new diskette.

volidcuacopidtransid

This compound operand consists of the:

volid	Volume ID to be written on the diskette. If you omit this, 6 blanks are written.
cua	Control unit address to be written on diskette. If you omit this, X'40' is written.
copid	Control operator ID, consisting of 1 to 16 characters, which can be 0-9, A-F, X, and blank. If you omit this, 16 blanks are written. If you enter the *transid* operand, you must enter this *copid* operand as a 16-character ID.
transid	Transmission ID (XID) for the switched network. If you omit this, X'00000' is written. If you enter this operand, you must enter the previous *copid* operand as a 16-character ID.

Special Considerations

- This command is available only on the installation diskette, or on the operating diskette with the expanded system monitor.

- The remote operator cannot issue this command.

- This command requires:

  Optional modules P41 (Compression) and P5E (Set Diskette) for use with the Host Transmit Facility.

  The Extended Diskette Access Method (EDAM), the EDAM Allocate option, and 2 buffers (all specified on the FILES macro at CPGEN).

Chapter 5. Debugging Commands

This chapter describes the 2-digit debugging commands that you can use after you enter the 123 system monitor command to begin debugging a logical work station. These commands are presented in numeric order, and are shown along with their operands and operand descriptions.

Before you read this chapter, here are some general rules you should know.

- Operand fields are variable in length; the command descriptions show the maximum length. You need not enter leading zeros.
- Enter spaces between operands.
- Enter data operands as hexadecimal strings with no spaces between fields.
- When you see the operand *data* you can enter either EBCDIC or hexadecimal data. If you enter hexadecimal data, DO NOT precede hexadecimal data with an X. This is unlike operands that are addresses or displacements.
- Operands, other than data operands and operands preceded by an X, require you to enter decimal data.
- If an operand is preceded by an X, you can enter the operand in decimal, or enter an X followed by the operand in hexadecimal. For example, you could enter the same operand as X01FB, X1FB, 00507, or 507.
- The 02, 10, and 12 commands change data only in storage. The changes remain until you enter another command to change the same location, until the system is reloaded, or until another application program overlay segment is loaded over this location. If you log off, the original data is NOT returned to storage.
- After you enter run mode by entering the 05 command, you can pass control to the control operator's terminal so that the control operator can enter the debugging commands. Press the Reset key twice in succession, or press any valid data or function key to pass control to control operator.
- When you use an operating diskette, changes to programs and CPGEN data made with the 02, 10, and 12 commands are not accepted. The system displays the 90086 message.

  With a diskette other than an operating diskette, these changes are made and counted in the storage counters. You can use the 047 system monitor command to display storage counters.

00 DEBUGGING COMMAND: Leave Debugging Mode

This command returns you to the system monitor. Debugging commands are no longer valid, but you can enter 3-digit system monitor commands.

The system removes all stops from the program you were debugging, and switches off single-cycle mode and hard-copy mode.

```
Command     Operands
   00
```

Operand Descriptions

There are no operands.

01 DEBUGGING COMMAND: Display 8 Bytes of Data

This command displays 8 bytes of data from a specified location. Press Enter to display subsequent 8-byte portions of data.

Command	Operands
01	seg [X]disp [id]

Operand Descriptions

seg

Enter the number of the segment (0-15) that contains the data to be displayed. Enter 14 to display the constants section of a split application program. Enter 140 to display the instruction section. If you enter 140, the command displays data only up to the resident overlay directory.

disp

Enter the displacement in decimal, or an X followed by the displacement in hexadecimal. This is the displacement into the specified segment where you want the display to begin.

id

Enter 1 or 2 digits that represent the segment space ID used during the processing of an APCALL instruction in the application program. If you omit this operand, the system uses the current segment space ID.

Procedure

After the system displays the first portion of data from the segment, you can press Enter, or enter an F to display the next portion. Or you can enter a B to display the previous portion (to move backward in the segment). Then you can just press Enter to continue moving in the established direction.

02 DEBUGGING COMMAND: Write 8 Bytes of Data

This command writes up to 8 bytes of data to the specified location, replacing the data at that location.

Command	Operands
02	seg [X]disp data [id]

Operand Descriptions

seg

Enter the number of the segment (0-15) to which data is to be written. Enter 14 to write in the constants section of a split application program. Enter 140 to write in the instruction section.

disp

Enter the displacement in decimal, or an X followed by the displacement in hexadecimal. This is the displacement into the specified segment where you want to begin writing.

data

Enter up to 8 bytes of data. If you enter an odd number of bytes, the system adds 4 bits of zeros to the left.

id

Enter 1 or 2 digits that represent the segment space ID used during the processing of an APCALL instruction in the application program.

Special Considerations

- Before writing to segment 0, see the 09 command.
- Use only diskettes that are not operating diskettes.

03 DEBUGGING COMMAND: Place Stop in Application Program

This command places a stop in an application program running on the work station you are debugging. When the program reaches the stop, the program stops and the system displays 8 bytes of data from the stop location.

```
Command     Operands
   03       [X]disp [progname]
```

Operand Descriptions

disp

Enter the decimal address, or an X followed by the hexadecimal address where you want to place a stop. When the program reaches this address, execution stops.

progname

Enter the application program name as coded on the BEGIN instruction. If you omit this name, the system puts the stop in the application program currently associated with the work station.

You can enter this name in either EBCDIC or hexadecimal. If the name is 8 characters or less, the system assumes EBCDIC. If the name is 16 characters, the system assumes hexadecimal, and converts it to EBCDIC. For example, if you enter:

```
03 X100 C1C1C1C1C1C1C1C1
```

The system places a stop at location 256 (X'100') in program AAAAAAAA.

Procedure

You can place up to five stops in a program. When the program reaches a stop, execution stops before the addressed instruction. The command then displays:

- The instruction
- The application program name
- Up to eight bytes of data beginning at the stop address

The system displays these in the format:

```
AT  addr IN  progname  data
```

You can now enter any other debugging command, and then enter the 05 command to resume program execution after the stop.

Special Considerations

- The 00 command removes all stops.
- Unless you issue the 19 command, a stop in one program does not affect another program or work station.
- To place stops in all work stations, see the 19 command

04 DEBUGGING COMMAND: Remove Stop

This command removes a stop placed by an 03 command.

Command	Operands
04	[X]disp [progname]

Operand Descriptions

disp

Enter the decimal address, or an X followed by the hexadecimal address where you want to remove a stop.

If you enter 0, the system removes all stops.

progname

Enter the application program name as coded on the BEGIN instruction. If you omit this name, the system removes the stop in the application program currently associated with the work station.

You can enter this name in either EBCDIC or hexadecimal. If the name is 8 characters or less, the system assumes EBCDIC. If the name is 16 characters, the system assumes hexadecimal, and converts it to EBCDIC. For example, if you enter:

```
04 X100 C1C1C1C1C1C1C1C1
```

the system removes a stop at location 256 (X'100') in program AAAAAAAA.

05 DEBUGGING COMMAND: Start a Stopped Work Station

This command restarts a work station that encountered a stop. A restarted work station continues to run until its program encounters a stop, you press a valid data or function key, or you press Reset twice in succession.

Command	Operands
05	[[X]disp]

Operand Descriptions

disp

This operand indicates the instruction address in the stopped application program where you want operation to continue. Enter the displacement in decimal, or enter an X followed by the displacement in hexadecimal.

If you omit this operand, the program resumes with the stopped instruction.

Command Output

Usually the 05 command produces no output. However, if you are using single-cycle execution (the 13 debugging command), the system displays application-program information each time you enter the 05 command. See the 13 debugging command for details.

Special Considerations

The remote operator using CNM/CS has no Reset key. In debugging mode, the system monitor stops a remotely-operated work station after a number of dispatching cycles, unless the program encounters another stop.

06 DEBUGGING COMMAND: Identify Attached Terminal Components

This command displays information identifying the terminal components attached to any work station.

Command	Operands
06	id

Operand Descriptions

id

Enter the work station ID. You can inquire about any work station, not just the station you are debugging.

Command Output

This command displays eight entries, corresponding to logical device addresses 0 to 7. (If this command displays FFFF, no components are attached to the work station.) Each entry is in the form *lsdm*, where:

l Loop number 1-4, or A for DCA
s Terminal address 0-F, or port number 0-7
d Component address, expressed as:

1	4704/3604/3278/3279 keyboard
2	4704/3604/3278/3279 display
3	Magnetic stripe encoder
4	3610/3612 document printer;3262/3287/5210 printer
5	3611/3612 passbook printer
6	3606/3608 keyboard, display, magnetic stripe reader
7	3608 printer
8	3614/3624 terminal
1-15	4710/3615 printer
2-14	Even number only, 4720, 3616 journal print station

m Modulus value assigned at configuration

07 DEBUGGING COMMAND: Display Header Segment

This command displays the header of a specified segment, as well as the segments length, primary field pointer, field length, and secondary field pointer.

```
Command     Operands
   07       seg [id]
```

Operand Descriptions

seg

Enter the segment number (00-15).

id

Enter 1 or 2 digits representing the segment space ID used during the processing of an APCALL instruction in the application program. If you omit this operand, the system uses the current segment space ID.

Special Considerations

For segment 0, the system displays the header for operator A or B, depending on the previous use of the 09 command. (If you did not use 09, the system displays the operator A header.)

08 DEBUGGING COMMAND: Stop Work Station

This command immediately stops the work station being debugged. Issue 05 to restart the work station.

Command	Operands
08	

Operand Descriptions

There are no operands.

09 DEBUGGING COMMAND: Specify Operator A or B

This command specifies that subsequent commands apply to operator A or operator B. Commands such as the 07 command assume you want to see data for operator A, unless you first use the 09 command to specify operator B.

Command	Operands
09	op

Operand Descriptions

op

Enter 0 for operator A, or 1 for operator B.

10 DEBUGGING COMMAND: Change Segment Header Data

This command changes the primary field pointer, field length, or secondary field pointer in the specified segment header.

```
Command     Operands
   10       seg [id] code [X]data
```

Operand Descriptions

seg

Enter the 2-digit segment number (00-15). For segment 00, the system assumes that you want operator A data unless you use the 09 command to request operator B data.

id

Enter the 2-digit segment space ID used in APCALL processing.

code

Enter a code to indicate:

1 Change primary field pointer.
2 Change field length.
3 Change secondary field pointer.

data

Enter the value in decimal, or an X followed by the value in hexadecimal, that is to replace the current setting.

Command Output

The system displays the complete header.

Special Considerations

- Use this command only on nonoperational (DSKOP=N) diskettes.
- This command increases the storage counter.
- For the global segments 13, 14, and 15, data is changed only for this work station.

11 DEBUGGING COMMAND: Display Data at Byte Address

This command displays 8 bytes of data beginning at a specified byte address. This command is similar to the 01 command, except that the 11 command allows you to specify an actual byte address rather than the segment and displacement address.

Command	Operands
11	[X]address

Operand Descriptions

address
Enter the byte address in decimal, or enter an X followed by the address in hexadecimal.

Procedure

After the command displays the first 8 bytes, press Enter or enter an F to see the next 8 bytes. Enter a B to see the previous 8 bytes. After you establish this direction, just press Enter to continue in that direction. (Host operator, use the system ATTN command to display the next message group.)

12 DEBUGGING COMMAND: Change Data at Byte Address

This command changes data at a specified byte address rather than at a segment and displacement address.

You can change your configuration data too. Get the byte address from the configuration data listing.

Command	Operands
12	[X]address data

Operand Descriptions

address
Enter the byte address in decimal, or enter an X followed by the byte address in hexadecimal.

data
Enter the 8 bytes of data that you want written at the specified byte address.

Special Considerations

- You cannot change control storage or system-monitor storage.
- Use care when changing configuration data. An incorrect address or wrong data could cause you to reload the system due to an error.
- You cannot use this command with an operating diskette that has DSKOP=Y coded on STARTGEN.
- This command increases the storage counter.

13 DEBUGGING COMMAND: Begin Single-Cycle/Hard-Copy Trace

This command begins single-cycle (one instruction at a time) execution, and the hard-copy trace, a listing of each application-program instruction executed.

```
Command     Operands
   13       [x]
```

Operand Descriptions

x
Enter any character to begin the hard-copy trace.

Procedures

Single Cycle Mode: To begin single-cycle operation, enter the 13 command without an operand, followed by the 05 command. The application program performs its first instruction. The system stops the application program and displays:

```
AT addr IN progname data
```

addr Is the address of the instruction to be performed next.
progname Is the name of the application program operating.
data Is the 8 bytes starting at the displayed location.

Each time the program stops, and the message is displayed, you can either press Enter to perform the next instruction, or you can enter any other debugging commands followed by the 05 command to resume single-cycle operation.

Hard-Copy Trace Mode: Enter the 13 command with any character as an operand. The system begins to run the application program, one instruction at a time as in single-cycle mode, but prints the message (AT addr IN progname data) on the output printer rather than displaying it. (Use the 005 or 006 command to assign an output printer BEFORE you enter 123 to start debugging mode.) The operation is continuous; you do not press Enter to continue operation. If you want to stop operation temporarily, press Reset twice in succession. Resume operation by entering 05 to restart the trace.

If a printer error (message 90007) occurs, issue the 13 command with an operand again, followed by 05.

Special Considerations

The system ignores any stops you placed in the application program.

14 DEBUGGING COMMAND: Stop Single-Cycle/Hard-Copy Trace

This command ends the single-cycle or hard-copy trace mode you started with a 13 command. The system returns the work station to standard debugging mode.

Command	Operands
14	

Operand Descriptions

There are no operands.

Special Considerations

You must issue 05 to restart the station.

15 DEBUGGING COMMAND: Test Indexing Status

This command tests the indexing status of the work station or of a specified segment.

This command requires optional module P67.

Command	Operands
15	[seg]

Operand Descriptions

seg
Enter the number of the segment (0-15) you want to test. If you omit this operand, only the station itself is tested.

Command Output

The output format is:

```
ff aabb ccdd
```

ff Flag byte:

X'80' = Segment level request (that is, that *ss* was specified.)
X'02' = Station is active for indexing.
X'01' = Segment is active for indexing.

aa Number of work station being tested for indexing.

bb Depends on level request:

For a station level request, *bb* contains FF if the station is not active for indexing, or contains the number of the segment that contains the station's Index Register Number Table (if the station is active for indexing).

For a segment level request, *bb* contains the number of the segment being tested (the *ss* operand of the command).

ccdd Depends on level request:

For a station level request, *ccdd* contains FFFF if the station is not active for indexing, or contains the displacement to the start of the Index Register Number Table from the start of segment BB, if the station is active for indexing.

For segment level request, *ccdd* contains FFFF if the station is not active for indexing; otherwise, *cc* is the index-register number of operand-1, fixed-field operands that refer to segment *bb*, and *dd* is the index register number for operand 2.

16 DEBUGGING COMMAND: Find and Display Data Pattern

This command scans for a specified data pattern, and displays the address where the pattern is found. Each time you press the Enter key, the command repeats the scan looking for the next occurrence.

Command	Operands
16	data [[X]address1 [X]address2]

Operand Descriptions

data
Enter up 16 characters. The system searches the work station for this pattern.

address1
Enter the address in decimal or hexadecimal where you want the scan to begin. If you omit this operand entirely, the scan begins at 0.

address2
Enter the address in decimal or hexadecimal where you want the scan to stop. If you omit the operand, the scan stops at the end of storage.

Special Considerations

The scan might find an extraneous data pattern in the system monitor segment. Not to worry.

17 DEBUGGING COMMAND: Display Log Message Text

This command displays the first line of the specified log message, and of several preceding messages. Press the Enter key to display groups of previous messages.

This command works like the 001 system monitor command.

Command	Operands
17	[X] [msid]

Operand Descriptions

X

Enter X to display the message text in hexadecimal; omit the X to see the text in EBCDIC.

msid

Enter the ID of the message you want displayed. The command displays that message, and several preceding messages.

If you omit this operand, the system begins with the current message.

18 DEBUGGING COMMAND: Display Log Message

This command displays the text of a specified log message, and is similar to the 002 system monitor command.

Command	Operands
18	[X] msid

Operand Descriptions

X

Enter X to display up to 504 bytes of the message text in hexadecimal. Omit this operand to display up to 252 characters in EBCDIC. If the message is larger than the screen size, the system overlays the message number and beginning of the text with the end of the text.

msid

Enter the 4-digit message ID of the log message to be displayed.

19 DEBUGGING COMMAND: Activate Stops in Program

This command activates the stops in an application program regardless of the work station running the program.

Command	Operands
19	code

Operand Descriptions

code

Enter a 1 to activate all stops for all stations; enter 0 to deactivate all stops for all stations.

Procedure

Use this procedure:

1. Enter 123 *id* to enter debugging mode for a specified work station.
2. Use the 03 command to place stops in the program. The work station will not run the program until you issue one of these commands to begin operation: 05, 04 0, 00.
3. Enter 19 1 to activate all stops for all stations.
4. Issue 05 to start operation of the work station and the program.
5. When any station (not necessarily the station in debugging mode) encounters a stop, the system monitor deactivates this stop-any-station process, and displays:

   ```
   AT addr IN progname data
   ```

   If the stop is for a station OTHER than the station being debugged, this message is preceded by 00100 x (the x is replaced by the station ID of the stopped station). The system monitor then switches debugging mode to the station that encountered the stop.
6. To deactivate, enter 19 0.

20 DEBUGGING COMMAND: Display Stops in Application Program

This command displays the stops (set by an 03 command) in an application program regardless of the work station running the program.

```
Command     Operands
   20
```

Operand Descriptions

There are no operands.

Command Output

This command displays one entry for each stop. The format of each entry is:

```
no addr apbname
```

no
Is the number of the stop.

addr
Is the address within the program; the location of the stop.

progname
Is the program name.

21 DEBUGGING COMMAND: Display Application Program Stack

This command displays a specified entry from the application program stack.

```
Command      Operands
   21        [level]
```

Operand Descriptions

level

Enter the level number of the entry you want to see. If you omit this operand, the system displays the current entry.

Then, you can press the Enter key to see the stack entry for the application program that called the current program. (Remote operator, use the system ATTN command.)

Command Output

This command displays this information for the specified stack entry.

```
id apnamexx ictr dd  ee ff  gg hhhh ii
```

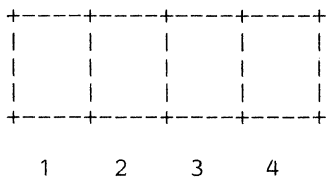
id	The specified stack ID.
apnamexx	The application program name (APNAME).
ictr	Application program instruction counter.
dd	Identification of the parent segment stack.
ee	The top of the SMS link stack.
ff	The bottom of the SMS link stack.
gg	The 2-character flag byte as set by the VIEW instruction.
hhhh	The SMSDEL delimiter table field.
ii	The resident/transient flag.

Chapter 6. Controller Messages

System Operational State Display Messages

When only the green light is on, each character in the message display is set to a minus sign (−). These are the initial values for the display in the operational state. When the controller updates the 1-second GMS timer, it also updates the message display.

The lighted message display appears like this:



Where:

1 - Reserved

2 - Host communication link indicator

3 - Loop indicator

4 - DCA indicator

Character position 2: indicates the state of the host link, including binary synchronous (BSC) and SDLC links. The following symbols can be displayed in this position:

−	The host communication link is not started.
%	The link failed during normal operations. The 4700 tries to reestablish the link. The communication link status counters indicate the status of the link error.
*	An error occurred during a test of the adapter or modem. Status regarding the failure can be found in the system log.
"	You used the stop-link command. The link stopped.
<	The link is started, but the host is not available.
>	Frame and synchronization characters are being received on the communication line (not applicable for the BSC link).
+	The controller is in session with the host.
=	The host-communication optional module was not loaded. There is a mismatch between the host-link machine-configuration switches and the host link selected in the CPGEN.

/ Eight seconds have elapsed without activity on the Multi-Use communications loop (World Trade only).

Character position 3: indicates loop status. The following symbols are displayed in this position:

– All loops are not started.

\+ All loops attached to the controller and started are operational.

1-4 A displayed number identifies the failing loop with the lowest loop number. Other loops might also be failing. You can issue an 040 1 command to reset the indicator and stop the loop for error recovery.

Character position 4: indicates the state of the DCA and its attached terminals.

– The DCA was not started.

* The DCA was stopped due to an error.

X The DCA was stopped due to an operator request.

\+ The DCA was started; all defined ports with attached, powered-on devices are active.

0-F Indicates the number of the last port that became inactive. If several ports become inactive, the number of the last port to become inactive is indicated. When the inactive port becomes active, the next lowest active port number to be inactive is indicated. If all remaining ports are active, the indicator returns to the plus (+) indicating all defined ports are active.

Controller Error Messages (Message Display)

These messages are displayed on the controller.

Messages E000 through E00A are displayed during the initial testing sequence, and show errors resulting from controller tests. Messages E020 through E961 refer to adapter tests during intial testing. During the testing sequence, you can bypass an adapter test by opening and closing the handle on the controller's diskette drive. The sequence continues with the next test. Or, you can rerun an adapter test by pressing Reset.

A-OK

Meaning: If you are using the diagnostic diskette, the controller adapter test completed without error. This indicates the error-free completion of the diagnostic testing.

ACTION: Open and close the primary diskette drive handle. The controller display changes to the operational state when the drive becomes ready.

C00x

MEANING: You pressed the Interrupt key; the *x* indicates the interrupt level.

ACTION: If a dump is not required, press the Reset switch on the controller to reload the system.

If a dump is required, remove the diskette from the primary diskette drive. Press and release the Interrupt key to display the D1xx message. Insert a 256-byte formatted diskette into the primary diskette drive. The dump begins when the diskette becomes ready.

When the dump is complete, the system displays the D2xx message.

Note: Write the D1xx message number on the diskette label; you can no longer load the system from this diskette.

C1xx

MEANING: A controller error occurred; the *xx* is the trap code.

ACTION: Request a dump. If there is a diskette in the primary drive, remove it. Press and release the Interrupt key to display the D1xx message. Insert a 256-byte formatted diskette into the primary diskette drive. The dump begins when the diskette becomes ready.

Notify your service personnel.

Note: Write the D1xx message number on the diskette label because this diskette can no longer be used to load the system.

C2xx

MEANING: Storage parity failed; the *xx* indicates the 64K sections of storage that have bad parity.

ACTION: Record the message and press Reset to restart; no dump is required. Notify your service personnel.

C4xx

MEANING: An invalid sequence was detected between the processor and an adapter. The *xx* is the adapter address. If *xx* = 60, an interrupt occurred from an adapter that was not configured.

ACTION: Request a dump. Notify your service personnel.

C8xx

MEANING: An input parity error occurred; the *xx* is the adapter address.

ACTION: A dump is not required.

D001

MEANING: The controller diskette drive is not ready, has the wrong type of diskette (2-sided diskette on a 1-sided drive), or no diskette.

ACTION: If you want to IPL from the primary diskette drive, insert the diskette into the primary diskette drive. If you want to IPL from the secondary diskette drive, press the Interrupt key.

D002

MEANING: The auxiliary diskette drive is not ready, does not exist, has the wrong type of diskette, or no diskette.

ACTION: Place the appropriate diskette in the auxiliary drive. If you want to IPL from the primary diskette drive, insert the diskette into the primary diskette drive and press the Reset button.

D003

MEANING: Adapter detected diskette error.

ACTION: Try another diskette. If the message continues to appear, the controller requires service.

D004

MEANING: The diskette is not an operating diskette. The SYSDSU data set containing the diagnostic and startup microcode cannot be found.

ACTION: Verify that the diskette you are using is the correct diskette. If it is the correct diskette, create a new operating diskette. If you get this message again, notify your service personnel.

D005

MEANING: A diskette hash checksum error occurred, indicating a bad diskette or the wrong diskette.

ACTION: Verify that the diskette you are using is the correct diskette. If it is the correct diskette, create a new operating diskette. If you receive this message again, consult your service personnel.

D006

MEANING: Diagnostic and startup microcode is being checked. This message is displayed for several seconds. If the D006 message is blinking, the test failed. The diskette might be at fault.

ACTION: Verify that the diskette you are using is the correct diskette. If it is the correct diskette, create a new operating diskette. If you receive this message again, consult your service personnel.

D1xx

MEANING: The controller is ready to dump; *xx* is the next segment to be dumped.

ACTION: If a dump is not required, press the Reset switch on the controller.

If a dump is required, use a 256-byte formatted diskette for the dump. Insert the diskette into the primary drive. Do not press the Interrupt key. The dump begins when the diskette becomes ready.

When the dump is complete, another message is displayed.

If you press the Interrupt key, a sequential display of the design support information begins in the controller message display. If you press the Interrupt key again, the 01xx is restored and controller is ready to dump.

Note: Write the D1xx message number on the diskette label because this diskette can no longer be used to load the system.

D200

MEANING: Controller dump is complete.

ACTION: Remove and save the diskette. Inform your service representative.

D201

MEANING: The controller dump is not complete, but dumping to the current diskette is complete.

ACTION: Remove and save the diskette. The D1xx message is displayed. Continue the dump process as described by the D1xx message.

D202

MEANING: An output error occurred when dumping to the diskette.

ACTION: Remove the diskette, and continue the dump process as described by the message displayed when the diskette is removed. Use a different diskette or retry the operation with the same diskette.

D203

MEANING: The loaded diskette is not a 256-byte formatted diskette.

ACTION: Remove the diskette, and continue the dump process as described by the message displayed when the diskette is removed.

D600

MEANING: The diskette adapter test is ready to test the secondary diskette drive. If you used the secondary drive to load the system, the D600 indicates the primary diskette drive.

ACTION: Move the diagnostic diskette from the primary drive to the secondary drive. The E624 error occurs if you do not do this within 1 minute.

D601

MEANING: Testing of the secondary diskette adapter is complete.

ACTION: Move the diagnostic diskette from the secondary diskette drive to the primary diskette drive.

E000

MEANING: The system is testing the processor and the first 64K bytes of storage.

PROBABLE CAUSE: The controller malfunctioned.

ACTION: Record the message and press the Reset switch. If the message continues to occur, refer to the *IBM 4700 System Problem Determination Guide.*

E001

MEANING: The system is testing the second 64K bytes of storage.

PROBABLE CAUSE: The controller malfunctioned.

ACTION: Record the message and press the Reset switch. If the message continues to occur, refer to the *IBM 4700 System Problem Determination Guide.*

E002

MEANING: The system is testing the third 64K bytes of storage.

PROBABLE CAUSE: The controller malfunctioned.

ACTION: Record the message and press the Reset switch. If the message continues to occur, refer to the *IBM 4700 System Problem Determination Guide.*

E003

MEANING: The system is testing the fourth 64K bytes of storage.

PROBABLE CAUSE: The controller malfunctioned.

ACTION: Record the message and press the Reset switch. If the message continues to occur, refer to the *IBM 4700 System Problem Determination Guide.*

E004

MEANING: The system is testing the fifth 64K byte of storage.

PROBABLE CAUSE: The controller malfunctioned.

ACTION: Record the message and press the Reset switch. If the message continues to occur, refer to the *IBM 4700 System Problem Determination Guide .*

E005

MEANING: The system is testing the sixth 64K bytes of storage.

PROBABLE CAUSE: The controller malfunctioned.

ACTION: Record the message and press the Reset switch. If the message continues to occur, refer to the *IBM 4700 System Problem Determination Guide .*

E006

MEANING: The system is testing the seventh 64K bytes of storage.

PROBABLE CAUSE: The controller malfunctioned.

ACTION: Record the message and press the Reset switch. If the message continues to occur, refer to the *IBM 4700 System Problem Determination Guide .*

E007

MEANING: The system is testing the eighth 64K bytes of storage.

PROBABLE CAUSE: The controller malfunctioned.

ACTION: Record the message and press the Reset switch. If the message continues to occur, refer to the *IBM 4700 System Problem Determination Guide* .

E008

MEANING: The system is testing the ROS (Read Only Storage) checksum and parity.

PROBABLE CAUSE: The controller malfunctioned.

ACTION: Record the message and press the Reset switch. If the message continues to occur, refer to the *IBM 4700 System Problem Determination Guide* .

E009

MEANING: Many adapter failures occurred.

PROBABLE CAUSE: The controller malfunctioned.

ACTION: Record the message and press the Reset switch. If the message continues to occur, refer to the *IBM 4700 System Problem Determination Guide* .

E00A

MEANING: The system is testing the cryptographic storage.

PROBABLE CAUSE: The controller malfunctioned.

ACTION: Make sure the key is not in the encryption key lock. If it is not in the encryption key lock, record the message and press the Reset switch. If the message continues to occur, refer to the *IBM 4700 System Problem Determination Guide* .

E020

MEANING: The system is testing system control card -- operator panel.

PROBABLE CAUSE: The controller malfunctioned.

ACTION: Record the message and press the Reset switch. If the message continues to occur, refer to the *IBM 4700 System Problem Determination Guide* .

E021-E0B4

MEANING: The system is testing the controller configuration. Failure to proceed past these messages indicates a conflict between the configuration description and the installed adapters.

ACTION: Report problem to your service representative.

E101

MEANING: When testing the DCA feature with the diagnostic diskette, the DCA adapter test detected a controller problem.

PROBABLE CAUSE: Controller hardware problem.

ACTION: Press the Reset switch to retry the test. If the message continues to appear, the controller requires service.

E155

MEANING: One or more of the diagnostic test switches (located behind the cover on the operator panel) appear to be set incorrectly.

PROBABLE CAUSE: The diagnostic test switches are not set to the off position, or there is a controller hardware problem.

ACTION: Set all switches off and press Reset. If the message continues to appear, the controller requires service.

E201

MEANING: The host-adapter test detected a controller problem during testing with the diagnostic diskette.

PROBABLE CAUSE: Controller hardware problem.

ACTION: Press reset to retry the test. If the message continues to appear, the controller requires service.

E202

MEANING: The host-adapter wrap test detected a controller problem during testing with the diagnostic diskette.

PROBABLE CAUSE: Controller hardware problem.

ACTION: Press Reset to retry the test. If the message continues to appear, the controller requires service.

E203

MEANING: The host-adapter cable wrap test detected a controller problem during testing with the diagnostic diskette.

PROBABLE CAUSE:

- The wrap switch is not in test position (EIA).
- The wrap plug is not in place (X.21 switched or Multi-Use loop).
- A powered-on wrappable modem is not properly connected (X.21 non-switched).
- There is a controller cable connector failure.

ACTION:

1. You can retry the test by opening and closing the primary diskette drive handle.
2. Ensure that the required wrap-test plug is in place.
3. Press Reset to retry.

If the message continues to appear, the controller requires service.

E204

MEANING: A host link adapter setup error occurred while you were using the diagnostic diskette to test the host link.

PROBABLE CAUSE: Controller hardware problem.

ACTION: The controller requires service.

E209

MEANING: A parameter error occurred while you were using the diagnostic diskette to test the host link.

PROBABLE CAUSE: The diagnostic diskette is damaged or a diskette read error occurred, or the required link module was not loaded.

ACTION: Press Reset to retry the test. If the message continues to appear, try another diskette.

E411

MEANING: The loop-1 adapter test detected a problem while you were testing the adapter with the diagnostic diskette.

PROBABLE CAUSE: Controller hardware failure.

ACTION: The controller requires service.

E412

MEANING: The loop-1 adapter test detected a problem while you were using the diagnostic diskette to test the adapter.

PROBABLE CAUSE: There is a problem with loop 1, with the terminal attached to loop 1, or with the controller.

ACTION: Unplug the loop-1 connectors at the rear of the controller. Press Reset to rerun the test. If the message continues to appear, the controller requires service. Refer to the *IBM 4700 System Problem Determination Guide* for loop and terminal problems.

E413

MEANING: The loop-1 signal propagation delay is too long.

PROBABLE CAUSE: Too many devices are attached to the loop.

ACTION: Switch off the devices one at a time to determine the maximum number of devices that you can have on a loop. If the error continues, the controller needs service.

E421

MEANING: The loop-2 adapter test detected a problem while you were using the diagnostic diskette to test the adapter.

PROBABLE CAUSE: Controller hardware failure.

ACTION: The controller requires service.

E422

MEANING: The loop-2 adapter test detected a problem while you were using the diagnostic diskette to test the adapter.

PROBABLE CAUSE: There is a problem with loop 2, with a terminal attached to loop 2, or with the controller.

ACTION: Unplug the loop-2 connectors at the rear of the controller. Press Reset to rerun the test. If the message continues to appear, the controller requires service. Refer to the *IBM 4700 System Problem Determination Guide* for loop and terminal problems.

E423

MEANING: The loop-2 signal propagation delay is too long.

PROBABLE CAUSE: Too many devices are attached to the loop.

ACTION: Switch off the devices one at a time to determine the maximum number of devices that you can have on a loop. If the error continues, the controller needs service.

E431

MEANING: The loop-3 adapter test detected a problem while you were using the diagnostic diskette to test the adapter.

PROBABLE CAUSE: Controller hardware failure.

ACTION: The controller requires service.

E432

MEANING: The loop-3 adapter test detected a problem while you were using the diagnostic diskette to test the adapter.

PROBABLE CAUSE: There is a problem with loop 3, with a terminal attached to loop 3, or with the controller.

ACTION: Unplug the loop-3 connectors at the rear of the controller. Press Reset to rerun the test. If the message continues to appear, the controller requires service. Refer to the *IBM 4700 System Problem Determination Guide* for loop and terminal problems.

E433

MEANING: The loop-3 signal propagation delay is too long.

PROBABLE CAUSE: Too many devices are attached to the loop.

ACTION: Switch off the devices one at a time to determine the maximum number of devices that you can have on a loop. If the error continues, the controller needs service.

E441

MEANING: The loop-4 adapter test detected a problem while you were using the diagnostic diskette to test the adapter.

PROBABLE CAUSE: Controller hardware failure.

ACTION: The controller requires service.

E442

MEANING: The loop-4 adapter test detected a problem while you were using the diagnostic diskette to test the adapter.

PROBABLE CAUSE: There is a problem with loop 4, with a terminal attached to loop 4, or with the controller.

ACTION: Unplug the loop-4 connectors at the rear of the controller. Press Reset to rerun the test. If the message continues to appear, the controller requires service. Refer to the *IBM 4700 System Problem Determination Guide* for loop and terminal problems.

E443

MEANING: Loop-4 signal propagation delay is too long.

PROBABLE CAUSE: Too many devices are attached to the loop.

ACTION: Switch off the devices one at a time to determine the maximum number of devices that you can have on a loop. If the error continues, the controller needs service.

E500 through E5A8

MEANING: An error occurred on the disk.

ACTION: Press Reset to retry the test. If this message continues, refer to the *IBM 4700 System Problem Determination Guide*, and notify your service personnel. To bypass the test, open and close the primary diskette drive handle; the test sequence continues with the next test.

E601

MEANING: A write error occurred on the primary diskette side 0, track 73.

PROBABLE CAUSE: The primary diskette is damaged or there is a controller hardware problem.

ACTION: Press Reset to retry the test. If the message continues to occur, try another diskette. Refer to the *IBM 4700 System Problem Determination Guide* for additional information.

E602

MEANING: A read error occurred on the primary diskette, side 0, track 73.

PROBABLE CAUSE: The primary diskette is damaged or there is a controller hardware problem.

ACTION: Press Reset to retry. If the message continues to occur, try another diskette. Refer to the *IBM 4700 System Problem Determination Guide* for additional information.

E603

MEANING: The read/write data on side 0, track 73 did not compare.

PROBABLE CAUSE: The diskette is damaged, or there is a controller hardware problem.

ACTION: Press Reset to retry the test. If the message continues to occur, try another diskette. Refer to the *IBM 4700 System Problem Determination Guide* for additional information.

E604

MEANING: A read error occurred after the D601 message.

PROBABLE CAUSE: The diskette is damaged or there is a controller hardware problem.

ACTION: Press Reset to retry the test. If the message continues to occur, try another diskette. Refer to the *IBM 4700 System Problem Determination Guide* for additional information.

E611

MEANING: A write error occurred on the primary diskette side 1, track 73.

PROBABLE CAUSE: The primary diskette is damaged or there is a controller hardware problem.

ACTION: Press Reset to retry the test. If the message continues to occur, try another diskette. Refer to the *IBM 4700 System Problem Determination Guide* for additional information.

E612

MEANING: A read error occurred on the primary diskette, side 1, track 73.

PROBABLE CAUSE: The primary diskette is damaged or there is a controller hardware problem.

ACTION: Press Reset to retry. If the message continues to occur, try another diskette. Refer to the *IBM 4700 System Problem Determination Guide* for additional information.

E613

MEANING: The read/write data on side 1, track 73 did not compare.

PROBABLE CAUSE: The diskette is damaged, or there is a controller hardware problem.

ACTION: Press Reset to retry the test. If the message continues to occur, try another diskette. Refer to the *IBM 4700 System Problem Determination Guide* for additional information.

E620

MEANING: The auxiliary diskette drive was not ready within 1 minute after the D600 message signaled the request to transfer the diagnostic diskette to the auxiliary drive.

PROBABLE CAUSE:

1. The diskette was not transferred in time.
2. The diskette in the auxiliary drive is not a diagnostic diskette.
3. The diskette is damaged.
4. The auxiliary drive malfunctioned.

ACTION: Insert the diagnostic diskette in the primary drive; close the handle. The T999 message (rather than A-OK) is displayed at the completion of test.

Press Reset and follow the correct procedure to test the auxiliary diskette drive. If the E620 message continues to appear, the auxiliary diskette unit or the controller requires service.

E621

MEANING: A write error occurred on the auxiliary diskette side 0, track 73.

PROBABLE CAUSE: There is a controller or auxiliary diskette drive hardware problem.

ACTION: Press Reset to retry the test. If the message continues to occur, the controller or auxiliary diskette drive requires service.

E622

MEANING: A read error occurred on the auxiliary diskette side 0, track 73.

PROBABLE CAUSE: Controller or auxiliary diskette drive hardware problem.

ACTION: Press Reset to retry the test. If the message continues to occur, the controller or auxiliary diskette drive requires service.

E623

MEANING: The read/write data on side 0, track 73, did not compare.

PROBABLE CAUSE: A controller or auxiliary diskette hardware problem.

ACTION: Press Reset to retry the test. If the message continues to occur, the controller or auxiliary diskette drive requires service.

E624

MEANING: A read error occurred while you were using the diagnostic diskette.

PROBABLE CAUSE:

1. The diskette is damaged.
2. There is a controller or auxiliary diskette drive hardware problem.
3. The diskette was not moved from the primary diskette drive to the auxiliary diskette drive within the time-out.

ACTION: Press Reset to retry the test. If the message continues to occur, try another diskette. If this does not correct the problem, the controller or auxiliary diskette drive requires service. You can bypass the test by opening and closing the primary diskette drive handle.

E631

MEANING: A write error occurred on the auxiliary diskette side 1, track 73.

PROBABLE CAUSE: There is a controller or auxiliary diskette drive hardware problem.

ACTION: Press Reset to retry the test. If the message continues to occur, the controller or auxiliary diskette drive requires service.

E632

MEANING: A read error occurred on the auxiliary diskette side 1, track 73.

PROBABLE CAUSE: Controller or auxiliary diskette drive hardware problem.

ACTION: Press Reset to retry the test. If the message continues to occur, the controller or auxiliary diskette drive require service.

E633

MEANING: The read/write data on side 1, track 73, did not compare.

PROBABLE CAUSE: A controller or auxiliary diskette hardware problem.

ACTION: Press Reset to retry the test. If the message continues to occur, the controller or auxiliary diskette drive requires service.

E901

MEANING: You made an invalid request to the diagnostic control console (address 1, loop 1).

PROBABLE CAUSE: The correct key sequence was not used.

ACTION: Reenter using the correct input. The keyboard is programmed to use the universal translation table.

E902

MEANING: A read error occurred on the diagnostic diskette while an overlay was being loaded.

PROBABLE CAUSE: Controller of auxiliary diskette drive hardware problem.

ACTION: Enter the command again. If you get the message again, the controller or auxiliary diskette drive requires service.

E903

MEANING: An incorrect read from the diagnostic control console (address 1, loop 1) occurred.

PROBABLE CAUSE: Possible loop or terminal failure.

ACTION: Reenter command, If the error continues to occur, refer to the *IBM 4700 System Problem Determination Guide* for correction of loop or terminal problems.

E905

MEANING: An error occurred while you were writing to the diagnostic control console.

PROBABLE CAUSE: Hardware failure on loop 1 or one of the terminals on loop 1.

ACTION: Check that the display at loop 1, address 1 is ready. Refer to the *IBM 4700 System Problem Determination Guide* for correction of loop and terminal problems.

E909

MEANING: An invalid address was entered from the control console.

PROBABLE CAUSE: Incorrect input.

ACTION: Reenter the command using the correct input.

E916

MEANING: You requested the wrong test routine from the diagnostic diskette.

PROBABLE CAUSE: Invalid input.

ACTION: Enter the correctly formatted input request.

E932

MEANING: Station read or write error occurred during system monitor programmable input mode while you were using the diagnostic diskette.

PROBABLE CAUSE: System hardware failure.

ACTION: Retry. If the error continues, request a dump. Refer to the *IBM 4700 System Problem Determination Guide* for corrections of the loop or terminal problems.

E933

MEANING: System monitor already used at another terminal.

PROBABLE CAUSE: Conflicting operator input.

ACTION: Log off the other terminal and retry the logon.

E960

MEANING: A timer interrupt occurred while you were using the diagnostic diskette.

PROBABLE CAUSE: System hardware failure.

ACTION: Retry. If the error continues to occur, request a dump. Refer to the *IBM 4700 System Problem Determination Guide* for the correct actions.

E961

MEANING: A program check occurred while you were using the diagnostic diskette.

PROBABLE CAUSE: Optional module 6A required for host link test (T200).

ACTION: Load optional module 6A or suppress the host-link test.

I00v

MEANING: The system is going through startup, *v* is the controller storage size in 64k-byte units. This is an informational message.

ACTION: No action required.

I100

MEANING: Loading base microcode.

ACTION: This is an informational message.

I200

MEANING: The system is loading CPGEN. This is an informational message.

ACTION: No action is required.

I3nn

MEANING: The system is processing or modifying CPGEN data; *nn* is the module identifier. This is an informational message.

ACTION: No action is required.

I4nn

MEANING: The system is loading system application programs; *nn* is the sequence number of the system application program being loaded. This is an informational message.

ACTION: No action is required.

I5nn

MEANING: The system is loading application programs; *nn* is the sequence number of the application program being loaded. This is an informational message.

ACTION: No action is required.

I601

MEANING: The system is allocating the initialized segment headers requested by the application program. This is an informational message.

ACTION: No action required.

I602

MEANING: This system is allocating MAXSTOR and segment space to the stations, and connecting the segment space to the segment headers. This is an informational message.

ACTION: No action required.

I603

MEANING: The system is initializing the segment as specified by the CPGEN or the application program. This is an informational message.

ACTION: No action required.

I698

MEANING: The system is getting ready to run the system monitor. This is an informational message.

ACTION: No action is required.

I699

MEANING: The system is prompting for startup information at a terminal. This is an informational message.

ACTION: You might be required to respond to the 00001 message. Or, you can either press Enter or wait 2 minutes for the system to run the standard startup procedure.

I7nn

MEANING: The system is loading optional module *nn*. This is an informational message.

ACTION: No action is required.

I8nn

MEANING: The system is loading and running startup overlay module *nn*. This is an informational message.

ACTION: No action is required.

I9nn

MEANING: The system is loading communications module *nn*. This is an informational message.

ACTION: No action is required.

T000

MEANING: This is the first message displayed by the system monitor on the diagnostic diskette.

ACTION: No action is required.

T100

MEANING: This is the first message from the DCA adapter test when you IPL using the diagnostic diskette.

ACTION: No action is required.

T199

MEANING: The DCA adapter test is complete.

ACTION: No action is required.

T200

MEANING: This is the first message from the host adapter test when you IPL using the diagnostic diskette.

PROBABLE CAUSE: This is an informational message.

T299

MEANING: The host adapter test is complete.

PROBABLE CAUSE: This is an informational message.

T400

MEANING: This is the first message from the loop adapter test when you IPL using the diagnostic diskette.

PROBABLE CAUSE: This is an informational message.

T410

MEANING: The system is testing loop 1.

PROBABLE CAUSE: This is an informational message.

T420

MEANING: The system is testing loop 2.

PROBABLE CAUSE: This is an informational message.

T430

MEANING: The system is testing loop 3.

PROBABLE CAUSE: This is an informational message.

T440

MEANING: The system is testing loop 4.

PROBABLE CAUSE: This is an informational message.

T499

MEANING: The loop adapter test is complete.

PROBABLE CAUSE: This is an informational message.

T500

MEANING: The disk test is beginning.

PROBABLE CAUSE: This is an informational message.

T599

MEANING: The disk test is complete.

PROBABLE CAUSE: This is an informational message.

T600

MEANING: The diskette adapter test started.

PROBABLE CAUSE: This is an informational message.

T699

MEANING: Diskette adapter testing is complete.

PROBABLE CAUSE: This is an informational message.

T998

MEANING: Diagnostic testing is complete. When this appears on the control console (display on loop 1, address 1), you can log onto the system monitor or invoke another test.

PROBABLE CAUSE: This is the normal end of testing. This message is displayed when you open and close the primary diskette drive handle. The system changes to operational state.

ACTION: Press the Reset three times to log on the system monitor, or enter a manual test request.

T999

MEANING: Adapter testing has completed with retry or error bypass.

PROBABLE CAUSE: The primary diskette drive handle has been opened and closed to bypass some type of stop while testing controller adapters with the diagnostic diskette.

ACTION: Open and close the primary diskette drive handle to change the controller display to the operational state.

XCxx

MEANING: A machine check or microcode check occurred during early phase of startup. The *xx* identifies the specific cause of the malfunction. The malfunction cannot be logged by the controller.

PROBABLE CAUSE: The controller malfunctioned.

ACTION: Record the message and press the Reset switch. If you get the message again, load the diagnostics diskette and press the Reset switch.

X011

MEANING: The SYSBAS diskette data set cannot be found. This data set contains essential control program data. The startup process cannot proceed.

PROBABLE CAUSE: If this diskette has never been successfully loaded, probably the diskette create process had abnormally ended and the diskette being loaded is only partially written. If the diskette had been operating, it was changed by some program or procedure during the previous operation.

ACTION: Verify that the diskette you are using is the correct diskette. If it is the correct diskette, create a new operating diskette. If you get this message again, inform your service personnel.

X012

MEANING: The SYSOPT diskette data set cannot be found. This data set contains the optional load modules, startup overlays, and communications link modules. The startup process cannot proceed.

PROBABLE CAUSE: If this diskette has never been successfully loaded, probably the diskette create process had abnormally ended and the diskette being loaded is only partially written. If the diskette had been operating, it was changed by some program or procedure during the previous operation.

ACTION: Verify that the diskette you are using is the correct diskette. If it is the correct diskette, create a new operating diskette. If you get this message again, inform your service personnel.

X013

MEANING: The CPGEN data is not compatible with the microcode on the diskette. The startup ends.

PROBABLE CAUSE: Either the microcode or the CPGEN macros were modified at the host, they no longer agree.

ACTION: Correct the host libraries, and re-create the operating diskette.

X014

MEANING: The SYSCPG diskette data set cannot be found. This data set contains the CPGEN data. The startup process cannot proceed.

PROBABLE CAUSE: If this diskette has never been successfully loaded, probably the diskette create process had abnormally ended and the diskette being loaded is only partially written. If the diskette had been operating, it was changed by some program or procedure during the previous operation.

ACTION: Verify that the diskette you are using is the correct diskette. If it is the correct diskette, create a new operating diskette. If you get this message again, inform your service personnel.

X015

MEANING: The SYSST1 diskette data set cannot be found. This data set contains the control program overlays that process CPGEN data. The startup process cannot proceed.

PROBABLE CAUSE: If this diskette has never been successfully loaded, probably the diskette create process had abnormally ended and the diskette being loaded is only partially written. If the diskette had been operating, it was changed by some program or procedure during the previous operation.

ACTION: Verify that the diskette you are using is the correct diskette. If it is the correct diskette, create a new operating diskette. If you get this message again, inform your service personnel.

X017

MEANING: The SYSSM diskette data set cannot be found. This data set contains the system monitor. The startup process requires the system monitor and cannot proceed.

PROBABLE CAUSE: If this diskette has never been successfully loaded, probably the diskette create process had abnormally ended and the diskette being loaded is only partially written. If the diskette had been operating, it was changed by some program or procedure during the previous operation.

ACTION: Verify that the diskette you are using is the correct diskette. If it is the correct diskette, create a new operating diskette. If you get this message again, inform your service personnel.

X018

MEANING: The temporary or permanent diskette data set cannot be found or has an invalid data set label. The startup process cannot proceed.

PROBABLE CAUSE: If the diskette has never been successfully loaded, probably the diskette create process has abnormally stopped and the diskette being loaded is only partially written. If the diskette had been operating, the

diskette has been changed by some program or procedure during the previous operation.

ACTION: Re-create the operating diskette with VTAM traces active. If you cannot re-create the diskette, refer to the *IBM 4700 Host Support Problem Diagnosis and Logic* .

X01B

MEANING: The microcode level and controller EC level are not compatible.

PROBABLE CAUSE: The diskette being loaded is a back-level diskette. If the diskette has been created recently, the appropriate level of microcode must be installed at the host.

ACTION: Try another operating diskette. If this fails, report the problem to your service personnel.

X01D

MEANING: The diskette adapter control code is missing.

PROBABLE CAUSE: There is a failure in the release of the controller code.

ACTION: Report the problem to your service personnel.

X020

MEANING: The control operator failed to respond to message 00001 within the predefined time-out, and the system attempted an automatic startup. Sixteen automatic startups, without an intervening control operator response, are attempted before this message appears. (It cannot occur if the dump option has been requested.)

ACTION: If you do not want a dump, press the Reset switch on the controller.

If you want a dump, open the cover and press the Interrupt key. Insert a 256-byte formatted diskette into the controller. Do not press the Interrupt key again. The dump begins when the diskette becomes ready.

When the dump is complete, the D1xx message is replaced with the D200 message.

Note: Write the D1xx message number on the diskette label because this diskette can no longer be used to load the system.

X021

MEANING: A diskette read error occurred while you were accessing the SYSCTL data set. Because this data set contains data essential to the control programs, startup cannot continue. The diskette is physically or magnetically damaged.

ACTION: Try another operating diskette.

X022

MEANING: The system is unable, or for security reasons not permitted, to write to the SYSCTL data set. Startup cannot continue. The diskette was unloaded or the diskette was physically or magnetically damaged.

ACTION: If the diskette was not ready, make it ready and press Reset. If the diskette was ready, retry using another operating diskette.

X030

MEANING: There is not enough controller storage to execute startup process.

PROBABLE CAUSE: There is a failure in the release of the controller microcode.

ACTION: Insert the installation diskette. If you still get an error, there is a control storage problem. If the installation diskette loads without error, create a new operating diskette.

X031

MEANING: There is not enough storage to load control program.

PROBABLE CAUSE: There is a failure in the controller microcode.

ACTION: Insert the installation diskette. If you still get an error, there is a control storage problem. If the installation diskette loads without error, create a new operating diskette.

X032

MEANING: There is insufficient storage to build an application program table. The startup process cannot proceed.

PROBABLE CAUSE: Controller storage cannot contain the system configured on the diskette. Note that the system and your application programs are not loaded yet.

ACTION: Decrease the size of CPGEN or add storage to the controller.

X033

MEANING: There is not enough storage to load optional or link microcode modules. The startup process cannot proceed.

PROBABLE CAUSE: Controller storage cannot contain the system configured on the diskette.

ACTION: Decrease the size of CPGEN or the application program, selectively load optional modules, or add storage to the controller.

X034

MEANING: There is not enough storage to load CPGEN. The startup process cannot proceed.

PROBABLE CAUSE: Controller storage cannot contain the system configured on the diskette. Note that the system and your application programs requiring storage are not loaded yet.

ACTION: Decrease CPGEN size or add storage to the controller.

X035

MEANING: There is not enough storage to load the application program constant section. The startup process cannot proceed.

PROBABLE CAUSE: Controller storage cannot contain the system configured on the diskette. Note that any optional modules requiring storage are not loaded yet.

ACTION: Decrease CPGEN size or add storage to the controller.

X036

MEANING: There is not enough storage to load the application program instruction section. The startup process cannot proceed.

PROBABLE CAUSE: Controller storage cannot contain the system configured on the diskette. Note that any optional modules requiring storage are not loaded yet.

ACTION: Decrease CPGEN size or add storage to the controller.

X037

MEANING: There is not enough storage to load the dummy application program. The startup process cannot proceed.

PROBABLE CAUSE: Controller storage cannot contain the system configured on the diskette. Note that any optional modules requiring storage are not loaded yet.

ACTION: In the CPGEN, some stations are not assigned to any of the application programs contained on the operating diskette. Modify the CPGEN to assign stations to the available application programs. Otherwise, decrease the size of the CPGEN or the application programs, or add storage to the controller.

X038

MEANING: There is not enough storage to define the diskette index counters. The startup process cannot proceed.

PROBABLE CAUSE: Controller storage cannot contain the system configured on the diskette. Note that the system monitor, your application programs, and any optional modules requiring storage are not loaded yet.

ACTION: Decrease the size of CPGEN or add storage to the controller.

X03A

MEANING: There is not enough storage to load data stream mapping (DATSM) image buffers.

PROBABLE CAUSE: Controller storage cannot contain the system configured on the diskette. Note that the system and your application programs requiring storage are not loaded yet.

ACTION: Decrease CPGEN size or add storage to the controller.

X03B

MEANING: There is not enough storage to load scratch pad area (SPA) buffers.

PROBABLE CAUSE: Controller storage cannot contain the system configured on the diskette. Note that the system and your application programs requiring storage are not loaded yet.

ACTION: Decrease CPGEN size or add storage to the controller.

X03C

MEANING: There is not enough storage for interval-timer buffers.

PROBABLE CAUSE: Controller storage cannot contain the system configured on the diskette. Note that the system and your application programs that require storage are not loaded yet.

ACTION: Decrease CPGEN size or add storage to the controller.

X041

MEANING: A checksum error was detected while you were loading the controller microcode.

PROBABLE CAUSE: If this diskette has never been successfully loaded, probably the diskette create process abnormally ended and the diskette being loaded is only partially written. If the diskette was operating, the diskette has been changed by some program or procedure during the previous operation.

ACTION: Try another operating diskette.

X042

MEANING: A checksum error was detected while loading the optional module, startup overlay, or communication link module. The startup process cannot proceed. The previous I*nnn* message identifies the failing microcode module.

PROBABLE CAUSE: If this diskette has never been successfully loaded, probably the diskette create process abnormally ended and the diskette being loaded is only partially written. If the diskette was operating, the diskette has been changed by some program or procedure during the previous operation.

ACTION: Try another operating diskette.

X046

MEANING: A checksum error was detected while loading the system application programs.

PROBABLE CAUSE: If this diskette has never been successfully loaded, probably the diskette create process abnormally ended and the diskette

being loaded is only partially written. If the diskette was operating, the diskette has been changed by some program or procedure during the previous operation.

ACTION: Try another operating diskette.

X050

MEANING: The system is unable to initialize the diskette drive with the current diskette (if there is one in the diskette drive) or unable to read either the data set label or the control data set. Startup cannot continue.

PROBABLE CAUSE: The diskette was unloaded or the diskette is physically or magnetically damaged.

ACTION: If the diskette was not ready, make it ready and press Reset. If the diskette was ready, retry with another operating diskette.

X051

MEANING: A control program diskette read error occurred. The startup process cannot proceed.

PROBABLE CAUSE: The diskette was unloaded or the diskette is physically or magnetically damaged.

ACTION: If the diskette was not ready, make it ready and press Reset. If the diskette was ready, retry with another operating diskette.

X053

MEANING: A diskette error occurred while the system was loading an optional module, startup overlay, or communication link module.

PROBABLE CAUSE: The diskette was unloaded or the diskette is physically or magnetically damaged.

ACTION: If the diskette was not ready, make it ready and press Reset. If the diskette was ready, retry with another operating diskette.

X054

MEANING: A CPGEN diskette read error occurred. The startup process cannot proceed.

PROBABLE CAUSE: The diskette was unloaded or the diskette is physically or magnetically damaged.

ACTION: If the diskette was not ready, make it ready and press Reset. If the diskette was ready, retry with another operating diskette.

X056

MEANING: An application program diskette read error occurred. The startup process cannot proceed.

PROBABLE CAUSE: The diskette was unloaded or the diskette is physically or magnetically damaged.

ACTION: If the diskette was not ready, make it ready and press Reset. If the diskette was ready, retry with another operating diskette.

X057

MEANING: A diskette read error occurred in the error map phase of startup. The startup process cannot proceed.

PROBABLE CAUSE: The diskette was unloaded or the diskette is physically or magnetically damaged.

ACTION: If the diskette was not ready, make it ready and press Reset. If the diskette was ready, retry with another operating diskette.

X058

MEANING: A diskette read error occurred in the advanced phase of startup. The startup process cannot proceed.

PROBABLE CAUSE: The diskette was unloaded or the diskette is physically or magnetically damaged.

ACTION: If the diskette was not ready, make it ready and press Reset. If the diskette was ready, retry with another operating diskette.

X059

MEANING: A diskette read error occurred while the system was loading a startup overlay used in modifying CPGEN data.

PROBABLE CAUSE: The diskette was unloaded or the diskette is physically or magnetically damaged.

ACTION: If the diskette was not ready, make it ready and press Reset. If the diskette was ready, retry with another operating diskette.

X060

MEANING: The SYSLCF diskette data set cannot be found. This data set contains essential system configuration data. The startup process cannot proceed.

PROBABLE CAUSE: If this LCF diskette has never been successfully loaded, probably the diskette create process abnormally ended and the diskette being loaded is only partially initialized. If the diskette had been operational, the diskette has been changed by some program or procedure during a previous operation.

ACTION: Reinitialize the operating diskette with the installation diskette using the LCF create diskette option. Load the system from the diskette.

X061

MEANING: There is not enough storage for LCF startup to construct the defined configuration. The startup process cannot proceed.

PROBABLE CAUSE: Controller storage cannot contain the system configured on the diskette.

Note: The system monitor, your application program, or the optional modules (which require storage) have not been loaded.

ACTION: Decrease size of configuration, or add storage to the controller.

X062

MEANING: A checksum error was detected while loading the SYSLCF data set. The startup process cannot proceed.

PROBABLE CAUSE: If this diskette was never successfully loaded, it is probable that the LCF create process abnormally ended and the diskette being loaded is only partially initialized. If the diskette had been operational, the diskette has been changed by some program or procedure during a previous operation.

ACTION: Try with another LCF pre-operating diskette.

X063

MEANING: A diskette read error occurred while the system was loading startup control data used by LCF in building CPGEN data. The startup process cannot proceed.

PROBABLE CAUSE: The operator unloaded the diskette or the diskette is physically or magnetically damaged.

ACTION: If the diskette was not ready, make it ready and press Reset to retry the procedure. If you want to use another diskette, retry with another pre-operating diskette.

X064

MEANING: The LCF data required for the LCF startup process does not agree with the data that was expected. The startup process cannot proceed.

PROBABLE CAUSE: The diskette has been altered by some prior procedure.

ACTION: Re-create the diskette using another pre-operating diskette.

X065

MEANING: The data contained in SYSLCF is inconsistent and cannot be processed. The startup process cannot proceed.

PROBABLE CAUSE: An error has occurred in the CPGEN definition that was entered through the installation diskette.

ACTION: Re-create the configuration using the LCF option on the installation diskette.

X066

MEANING: LCF startup processing has detected a procedure being performed out of sequence. The startup process cannot proceed.

PROBABLE CAUSE: An error has occurred processing the CPGEN definition that was entered through the installation diskette.

ACTION: Re-create the diskette using the installation diskette LCF procedure. If the error still occurs, open the cover and press the Interrupt key. Follow D1xx procedure.

X070

MEANING: Application program section length is odd or zero. Startup process cannot proceed.

PROBABLE CAUSE: The image created at the host contains an invalid application program.

ACTION: Reassemble the application program, and create a new diskette. If the error occurs with the new diskette, refer to the *IBM 4700 Host Support Problem Diagnosis and Logic* for further action.

X071

MEANING: The application-program length is less than the sum of its parts.

PROBABLE CAUSE: The image created at the host contains an invalid application program.

ACTION: Reassemble the application program, and re-create the diskette. If the error occurs with the new diskette, refer to the *IBM 4700 Host Support Problem Diagnosis and Logic* for further action.

X072

MEANING: Total application program length is greater than the sum of its parts.

PROBABLE CAUSE: The image created at the host contains an invalid application program.

ACTION: Reassemble the application program, and re-create the diskette. If the error occurs with the new diskette, refer to the *IBM 4700 Host Support Problem Diagnosis and Logic* for further action.

X073

MEANING: End of the extent, but not the application program.

PROBABLE CAUSE: The image created at the host contains an invalid application program.

ACTION: Reassemble the application program, and re-create the diskette. If the error occurs with the new diskette, refer to the *IBM 4700 Host Support Problem Diagnosis and Logic* for further action.

X074

MEANING: The application program data set is invalid.

PROBABLE CAUSE: The diskette data set is invalid.

ACTION: Verify that the diskette you are using is the correct diskette. If it is the correct diskette, create a new operating diskette. If you get this message again, inform your service personnel.

X075

MEANING: There is an overlay directory length error.

PROBABLE CAUSE: The image created at the host contains an invalid application program.

ACTION: Reassemble the application program, and re-create the diskette. If the error occurs with the new diskette, refer to the *IBM 4700 Host Support Problem Diagnosis and Logic* for further action.

X076

MEANING: There is an overlay directory format error.

PROBABLE CAUSE: The image created at the host contains an invalid application program.

ACTION: Reassemble the application program, and re-create the diskette. If the error occurs with the new diskette, refer to the *IBM 4700 Host Support Problem Diagnosis and Logic* for further action.

X077

MEANING: Application program name in the index does not match the name in the data set.

PROBABLE CAUSE: Error in diskette create process.

ACTION: Verify that the diskette you are using is the correct diskette. If it is the correct diskette, create a new operating diskette. If you get this message again, inform your service personnel.

X078

MEANING: An optional module contains invalid information.

PROBABLE CAUSE: The diskette is modified by a program or procedure during the previous operation.

ACTION: Verify that the correct operating diskette has been inserted. If you are using the correct diskette, create a new operating diskette. If the error still occurs, open the cover and press the Interrupt key to cause a dump. Follow the action in the D1xx message.

X07A

MEANING: The application-program level is below the current release of the controller microcode. The sequence number of the failing application program in your application program data set is identified by the I5nn message.

PROBABLE CAUSE: The application program was not reassembled to match the current release level of microcode. If the application programs have been reassembled, the 4700 instructions used to update the macros have not been updated.

ACTION: Reassemble the application program at the correct level and create a new diskette. If the problem still occurs, refer to the *IBM 4700 Host Support Problem Diagnosis and logic* .

X07B

MEANING: The AP header specified that this AP is written with the SPLIT=Y option set and the CPGEN designates it as transient. This combination is invalid. The sequence number of failing AP in user AP data set is identified by the I5nn message displayed just before this message.

PROBABLE CAUSE: Unsupported combination of options between the AP and the CPGEN.

ACTION: Reassemble the AP with SPLIT=N, or change the CPGEN to designate the AP as resident.

X081

MEANING: The CPGEN storage definition is invalid. The startup process cannot proceed.

PROBABLE CAUSE: If this diskette has never been successfully loaded, probably the diskette create process abnormally ended and the diskette being loaded is only partially written. If the diskette was operating, the diskette has been changed by some program or procedure during the previous operation.

ACTION: Re-create the operating diskette with VTAM traces active. Load the diskette. If it fails to load, refer to the *IBM 4700 Host Support Problem Diagnosis and Logic* for further action.

X082

MEANING: The diskette might not be loaded or it has been modified.

PROBABLE CAUSE: The diskette has been changed by some program or procedure during a previous operation.

ACTION: Verify that the correct operating diskette was inserted. If it is the correct diskette, re-create the operating diskette. If the error occurs again, open the cover and press the Interrupt key to cause a dump. Follow the D1xx procedure.

X083 to X087

MEANING: Errors occurred in the configuration or in the microcode.

PROBABLE CAUSE: Microcode error.

ACTION: Inform your service representative.

X089

MEANING: There is insufficient controller storage for the minimum logging area.

PROBABLE CAUSE: Controller storage cannot contain the system configured on the diskette.

ACTION: Decrease the size of CPGEN or the application programs, selectively load optional modules, or add storage to the controller.

X08A

MEANING: The configuration being loaded has requirements that exceed maximum controller resources.

PROBABLE CAUSE: The requested optional modules, either explicitly or implicitly, require more controller storage than is available.

ACTION: Use prompt mode for optional modules (reply 5 to message 00001) to reduce the set of optional modules. If this is not possible, rerun the CPGEN to request fewer optional modules; re-create the diskette.

X093

MEANING: The system cannot allocate an application program table. This is not necessarily due to a shortage of storage.

PROBABLE CAUSE: The CPGEN requires more station-related control storage than can be accommodated.

ACTION: Decrease some combination of the following: number of stations, number of segment headers for a station, size of SMS extensions, or size of APCALL stack areas.

X0A0

MEANING: There is not enough storage for the allocation of the segments.

PROBABLE CAUSE: The CPGEN or application program has requested more storage than is available. The CPGEN requests storage through the SEGSTOR macro and MAXSTOR keyword on the STATION macro. The application program requests storage through the DEFSTOR instruction.

ACTION: Change the CPGEN or the application program, and re-create the diskette or add more storage to the controller.

X0A1

MEANING: A work station has been allocated too few segment headers.

PROBABLE CAUSE: The CPGEN or the application program requested more segments than were specified at CPGEN. The CPGEN requests segments through the SEGSTOR macro; the application program requests them through the DEFSTOR instruction. The total number of headers required for the station can be specified through the MAXSEG keyword on the STATION CPGEN macro.

ACTION: Re-specify the number of segments or the number of segment headers required and re-create the diskette.

X0A2

MEANING: The segment 13 definitions specified by the application and CPGEN do not agree.

PROBABLE CAUSE: The application program defined a shared segment 13 for one station, but CPGEN has defined a shared segment 13 for another station.

ACTION: Re-specify the shared segment 13 with the CPGEN or the application program, and re-create the diskette.

X0A3

MEANING: The stations specified by SEGINIT/INITSEG cannot be found.

PROBABLE CAUSE: SEGINIT/INITSEG specified a station that has not been declared in the CPGEN.

ACTION: Re-specify the SEGINIT CPGEN macro or the INITSEG instruction with the proper station ID, or specify a station for the segment. Reassemble the CPGEN and the application program, then re-create the operating diskette.

X0A4

MEANING: The station specified by INITSEG does not have the specified segment.

PROBABLE CAUSE: The application program has an INITSEG for an undeclared segment.

ACTION: Re-specify the SEGINIT CPGEN macro or the INITSEG instruction with the proper segment number, or specify a segment for the station. Reassemble the CPGEN and the application program, then re-create the operating diskette.

X0A5

MEANING: SEGINIT/INITSEG segment offset plus the data length exceeds the size of the segment.

PROBABLE CAUSE: Incorrect segment initialization specified.

ACTION: Re-specify the SEGINIT CPGEN macro or the INITSEG instruction with the proper offset into the segment, or decrease the data length. Reassemble the CPGEN and the application program, then re-create the operating diskette.

X0A6

MEANING: A diskette read error occurred on SEGINIT.

PROBABLE CAUSE: An unrecoverable read error occurred while you were reading the SEGINIT data from the diskette.

ACTION: Re-create the diskette and retry the operation.

X0A7

MEANING: The CPGEN extent ended prematurely. The SEGINIT or INITSEG data indicates there are more initialization entries, but the CPGEN extent has ended.

PROBABLE CAUSE: The data set containing the segment initialization data was modified.

ACTION: Re-create the diskette and retry the operation. If this fails to correct the problem, refer to the *IBM 4700 Host Support Diagnosis and Logic* for further action.

X0A8

MEANING: A diskette read error occurred on INITSEG.

PROBABLE CAUSE: An unrecoverable read error occurred while reading the INITSEG data from the diskette.

ACTION: Re-create the diskette and retry the operation.

System Monitor Messages Displayed at your Terminal

This section contains the messages that the system monitor displays at your terminal.

Status Bytes

Most of the 900xx messages are accompanied by two status bytes that are displayed as 4 hexadecimal characters. These status bytes contain the status of the terminal component associated with the error. Byte 1 (the first 2 characters) contains general status that might apply to any component. Byte 2 contains the specific information.

Character	Bit	Meaning
First		
	8	Intervention required
	4	Unit exception
	2	Data check
	1	Status if for a previous write combined with any residual status stored before the current write. Status of current write is lost. (This is not used for the host link.)
Second		
	8	The operator pressed Reset twice on a 3604/3278, or asynchronous status was stored before the current write.
	4	Command reject
	2	Unit check; loss of contact on host link
	1	Wrong length record

The system can activate several status bits at one time. The displayed characters is the sum of the bits.

00001

MEANING: The system expects you to indicate the type of startup you want.

ACTION: Enter one of these codes to specify the type of startup. If you do not respond in the time-out period, the controller performs an automatic startup.

1

Cold start (system log and temporary files discarded) with host-communication link activated.

2

Warm start (system log and temporary files retained) with host-communication link activated. If you do not specify a startup type, this is the automatic startup type.

4

Prompt mode for system variables. The controller prompts you to enter the CUA, a dump option, a control operator ID, or a switched network identifier (XID) for this diskette.

5

Prompt mode for optional modules. The controller prompts you to identify the optional modules you want loaded.

6 xx

Change the model number associated with the control operator display station. For example, if you enter the response as 6 4, the system treats your display as if it were a 3604-4. If you respond 6 11, the system treats your 4704 as if it had a 480-character display screen.

8

Cold start with no host link (no start link command). This is the default on the Diagnostic diskette.

9

Warm start with no host link (no start link command).

B yyyy mm dd hh mn ss

Set date and time-of-day clock. Standard default separators are provided.

C x ttttt

Type of CNM/CS processing; available only on the expanded and CNM/CS system monitor.

Note: If you do not press a key within the 2-minute time-out (20 seconds on the diagnostic diskette) the system performs an automatic startup. When entering your response, use the universal translation table keyboard locations.

00002

MEANING: The system expects you to enter a control unit address.

ACTION: Enter a 1- or 2-character control unit address (CUA) in hexadecimal. This CUA writes this CUA on the diskette.

Note: If the CUA switches are all off, the diskette address is used. Otherwise, the CUA switches override the diskette address.

Press the Reset key twice to leave prompt mode and to return to the 00001 message. Press the Enter key to continue without changing the CUA.

00003

MEANING: This message asks whether the dump option is to be in effect.

ACTION: Enter a 1 to request dump option; enter 0 to refuse the dump option.

Note: The dump (a printed copy of information in storage) is made only when there is a system failure. If the dump option is in effect, you must reload the system after an error. If unattended operation is planned, select 0 (no dump), so that the system will be loaded automatically after an error.

Press the Reset key twice to leave prompt mode and to return to the 00001 message. Press the Enter key to continue without changing this value in the system.

00004

MEANING: This message asks for a new control-operator identification.

ACTION: Enter a 1- to 16-character control-operator identification. Construct your ID from the characters: 0-9, A-F, X, and blank. After you enter the new control-operator ID, the system displays the 90000 message. Enter the current control-operator ID. If you don't enter the current ID correctly, the system refuses your request and displays the 00004 message again. You can retry the change.

The control-operator ID is changed only if you complete IPL by entering a 1, 2, 8, or 9 in response to the previous 00001 message.

Press the Reset key twice to leave prompt mode and to return to the 00001 message. Press the Enter key if you don't have an entry for the item requested.

00005

MEANING: This message asks you to load optional modules. (This is not required with the installation and diagnostic diskettes, where all optional modules on the diskette are loaded.)

ACTION: Enter up to 50 module identification codes (IDs); press the Enter key after each ID. (Each ID is 1 or 2 hexadecimal characters.) The system loads only the optional modules that you specify here. The system then displays all the module IDs you have entered. After you enter the last module ID, press the Enter key again to complete the sequence.

Enter 00 to load *no* optional modules.

Enter FF to load all optional modules that were included in the configuration.

The optional module IDs are:

01	Change loops.
04	3279 color convergence, enter 95, 98, A8. (See Note 1.)
06	Multiblock diskette I/O. (See Note 2.)
0B	PIN pad.
0C	3278/3279 MSR, enter 98, 95, A8. (See Notes 1 and 2.)
11	HPCA link diagnostics, enter 67 too. (See Notes 1 and 2.)

13	Change DCA port, enter 95 also -- only on diagnostic diskette. (See Note 1.)
15	UDP TGU address processor. (See Note 1.)
18	LUASSIGN optional function. (See Notes 1 and 2.)
1B	EDAM (Extended Diskette Access Method).
1D	EDAM Allocate/Deallocate, enter 1B also.
1E	EDAM Temporary File Processor, enter 1B too. (See Note 1.)
21	Translate instruction, LTRT. (See Notes 1 and 2.)
24	Binary table lookup instruction, LSEEKP. (See Notes 1 and 2.)
25	Extended statistical counter instruction, STATS. (See Note 1.)
26	Decompress/Decompact instructions, DECOMP and DECOMPTB. (See Notes 1 and 2.)
27	Compress/Compact instructions, COMP and COMPTB. (See Notes 1 and 2.)
28	Security instructions, ENCIPHER, DECIPHER, and KEYGEN. (See Note 1.)
2A	Scratch pad instruction (SCRPAD). (See Notes 1 and 2.)
2C	Interval timer instruction, INTMR. (See Notes 1 and 2.)
30	LDIAG. (See Note 1.)
31	Zoned decimal instructions. (See Notes 1 and 2.)
32	Read data and time of day in variable format, LTIMEV. (See Note 2.)
34	Binary character conversion instruction, LCONVERT. (See notes 1 and 2.)
40	Format diskette instruction, FORMDKT. (See Note 2.)
41	Compress diskette instruction, COMPDKT. (See Note 2.)
57	DES data encryption instructions, ENCODE/DECODE.
5C	Data sequencing instructions, LSORT/LMERGE. (See notes 1 and 2.)
5E	SETDSKT instruction.
68	Enhanced instruction set, SCALE, SETX, SETXREC, TESTX. (See Note 2.)
6A	Diagnostic diskette link wrap tests. (See Note 1.)
70	DATSM instructions, PUTFLD, GETFLD, PUTDMS, GETDMS. (See Note 1.)
83	3610, 3611, or 3612 printer. (See Note 1.)
86	4704-1, 3604 magnetic stripe encoder. (See Note 1.)
87	3614/3624 terminal. (See Note 1.)
88	3606 or 3608 keyboard, display, and magnetic stripe reader. (See Note 1.)
89	3608 printer. (See Note 1.)
8A	3615 Printer. (See Note 1.)
93	4710/4720/3616/3262/3287 printer. (See Note 1.)
95	DCA device. (See Note 1.)
98	3278/3279 terminal, enter 95 and A8 also. (See Note 1.)
99	3262/3287/5210 printer, enter 93 and 95 also. (See Note 1.)
A7	3279 (7 color), 3278/3279 terminal, enter 95, 98, and A8.
A8	3278/3279 display translation, enter 95 and 98 also. (See Note 1.)
AB	4704-2 local key tracking, PIN, MSR, MSRE; enter 95, 98, and A8 also. (See Note 1.)

Notes:

1. These optional modules are not available on the installation diskette.

2. These optional modules are not available on the diagnostic diskette.

Press the Reset key twice to leave prompt mode and return to the 00001 message. Press the Enter key if you don't have an entry for the item requested.

00006

MEANING: This message requests you to enter a new node ID.

ACTION: Enter a 5-character node ID (in hexadecimal) or press the Enter key to accept the currently assigned XID. This XID replaces the XID on the diskette. This message appears only if you enter a 4 in response to the 00001 message.

Press the Reset key twice to leave prompt mode and to return to the 00001 message. Press the Enter key if you don't have an entry for the item requested.

00010

MEANING: This message appears after you enter the 999 command or if the system requires a restart.

You must respond with a one-digit code indicating whether the host or controller begins a session to create a diskette, or if the current diskette creation should be stopped and normal operation resumed.

If the controller initiates the session, you can create a complete diskette only. The host program must initiate partial replacements.

ACTION: Key and enter:

0	Host initiates session.
1	Controller initiates session (with the Host Transmit Facility only).
2	Cancel diskette creation; return to normal monitor mode.

If you enter 1, Host Transmission Facility (HTF) must be active in the host.

00011

MEANING: This message asks which diskette drive to use for creating a diskette, and appears only if there is an auxiliary diskette drive on the system.

ACTION: Enter 0 for the primary drive, or 1 for the secondary drive.

00012 xxxxxx s

MEANING: This message asks you to remove the current diskette and insert a formatted diskette; it appears when a complete diskette is to be created. The *xxxxxx* is displayed only when the Host Transmit Facility creates the diskette (for example, you receive 00012 TESTGEN). It means that the system wants you to load a specific diskette.

The *s* is displayed when the diskette is created by the Host Diskette Image Create program (for example, you receive 00012 2D).

ACTION: Remove the diskette from the drive that you specified on the previous 011 command. Insert the requested diskette. If *xxxxxx* is displayed, insert the diskette with VOLID = *xxxxxx*. If *s* is 1, insert a one-sided diskette. If *s* is 2, insert a two-sided diskette. No operator keyboard response is required. About 10 seconds after you insert the diskette, the diskette drive should move to track 0 to read the volume ID. If there is no diskette drive activity after 15 seconds, open and close the diskette drive door.

00013 xxxxxx

MEANING: This message means either:

- The diskette inserted in the diskette drive is not appropriate for the request in message 00012, or
- The diskette satisfies the request to load ANY formatted diskette. The VOLID of the inserted diskette is *xxxxxx*.

ACTION: Do one of the following:

- Enter 0 to indicate that the create diskette function should continue, whether or not the VOLID is appropriate for message 00012.
- Enter 1 to tell the system to read the diskette VOLID again. Then load a diskette that is appropriate for message 00012 or load any diskette you want to use.

00014

MEANING: The create-diskette operation is complete. This message might be followed by message 00010, 00012, 00015, or an error message, depending on the next message received from the host.

ACTION: No operator response is required.

00015

MEANING: Insert a diskette for a partial replacement on a diskette. The rest of the diskette does not change. A previous 00011 message indicates the drive.

ACTION: Remove the diskette and insert the requested diskette in the drive that you selected.

Because only portions of the diskette are replaced, it is important that you insert the diskette with the VOLID requested.

00016

MEANING: Insert the diskette from which you loaded the system.

ACTION: Insert the diskette from which you loaded the system in the primary drive. If you have already mounted the diskette, open and then close the diskette drive door.

00018 data set name

MEANING: The named data set was copied successfully by the 955 command.

00017 data set name (**)

MEANING: The named data set has been added or replaced on the diskette. If ** follows the data set name, the data add or replace was not successful.

00019 data set name

MEANING: The named data set was successfully copied from a diskette to a disk during the loading of the system.

00020

MEANING: The control operator pressed the Reset key twice.

ACTION: Key and enter one of the following:

0	To continue at the point interrupted.
1	To tell the host to end the session. When the host ends the session, the 00010 message is displayed.
2	To end the current session, leave diskette create mode and return to normal monitor mode.

00024

MEANING: Diskette creation completed with no data from the host.

ACTION: Check the host console logs. The controller load image to be transmitted was not on the VSAM data base, or the data base was not available.

00030 xxxxxx

MEANING: The *xxxxxx* is the volume ID currently on the diskette. If there is no *xxxxxx*, the VOLID is blank. This message does not appear if only portions of the diskette were replaced.

ACTION: Do either of the following:

- Enter a 0 to retain the *xxxxxx* as the VOLID to be rewritten on the diskette.
- Enter 1, followed by a space and a 1- to 6-character volume ID to be written on the diskette.

00032 xx

MEANING: The *xx* is the control unit address (CUA) currently on the diskette. This message does not appear if only portions of the diskette are replaced. If the load request from the host did not contain a CUA, then the CUA used at startup appears in this message.

ACTION: Do either of the following:

- Enter 0 to retain the control unit address, *xx*, currently on the diskette.
- Enter 1 followed by a space and one or two hexadecimal characters to change the CUA on the diskette.

00034

MEANING: You can retain the current operator ID, or change the operator ID on this diskette. This message does not appear if only portions of the diskette were replaced.

ACTION: Do either of the following:

- Enter 0 to retain the current operator ID.
- Enter 1 followed by a space and a new control operator ID to be written on the diskette. The ID consists of 1 to 16 characters. Valid characters are 0-9, A-F, X, and blank. After you enter the new ID, the 90000 message is displayed. Enter the ID just transmitted from the host. If you enter the wrong ID, the new code does not take effect; the system displays the 00034 message again. If an ID code was not transmitted from the host, use blanks, and press the Enter key in response to the 90000 message.

00038 xxxxxx

MEANING: Verify the XID associated with this diskette; *xxxxxx* is the current XID.

ACTION:

- To accept the currently assigned XID, enter 0.
- To change the XID, enter 1 followed by a space and the new XID.

00050

MEANING: This message is a response to an attention from the keyboard, or to a reply other than the Enter key after an 00053 message. It also acts as a prompt after the volume IDs (VOLIDs) are displayed by a 166 command or after a diskette read error during a 188 command.

ACTION: Reply with either 0 to continue, or a 1 to cancel the request.

00053

MEANING: This is a request for you to insert the diskette during a copy operation.

ACTION: Insert the diskette being copied in the primary drive, and insert the diskette being written in the secondary drive. Press the Enter key after inserting both diskettes. Any other reply causes a 00050 message.

00054

MEANING: This message requests you to specify the data to be copied during a diskette-copy function (188 command).

ACTION: To copy the entire diskette from track 0 to track 74, enter 0 or just press the Enter key.

To copy a selected portion of the diskette, enter the beginning address (*ttrr*) and the ending address (*ttrr*) in this format:

```
(X)ttrr          (X)ttrr
```

Use the hexadecimal form (precede the *ttrr* with the character X) to select side 1.

00055

MEANING: This message requests you to enter the starting track and record on receiving diskette during a copy (188 command) operation. This message appears only if the (X)*ttrr* (X)*ttrr* parameters were entered previously in response to a 00054 message.

ACTION: To start the copy on the same track and record as the start of the source information on the original diskette, press the Enter key. To start the copy at a specific track (*tt*) and record (*rr*), specify them in the following format:

```
(X)ttrr
```

Use the hexadecimal form (X) if side 1 is required.

00056

MEANING: This message requests you to insert a diskette in the drive specified in the 166 command.

ACTION: Insert the requested diskette. If the diskette is already inserted, open and close the secondary diskette door.

00059

MEANING: This message indicates that the diskette copy function completed successfully (188 command), or that you ended the command request with a 1 response to an 00050 message. Note that this message can appear when you change the volume ID (166 command) or when you copy the data set (955 command).

00060

MEANING: Issued during the 955 command, this message requests the names or numbers of the data sets to be copied.

ACTION: Enter either the name or number of the data set that you want copied. To copy several data sets, enter the names or numbers separated by blanks.

00064

MEANING: Requests you to insert a diskette in the diskette drive.

ACTION: Insert the diskette with the temporary file block to be reconstructed according to the command used:

- On the primary drive for a 937 command.
- On the secondary drive for a 237 command.

00070

MEANING: The diskette to be formatted has data on it.

ACTION: If you want the formatting to continue, press the Enter key. If you do not want to format this diskette, press any data key and the Enter key.

00071

MEANING: Formatting is complete.

ACTION: Replace the operating diskette if it was removed. If the operating diskette was formatted, re-IPL with the correct operating diskette.

00073

MEANING: Compression is complete.

ACTION: Replace the operating diskette if it was removed. If the operating diskette was compressed, re-IPL with the correct operating diskette.

00090

MEANING: You pressed Reset twice during an 888 command request.

ACTION: Enter:

0 to continue transmission.
1 to end transmission.

00091

MEANING: This message requests you to insert the diskette to be transmitted.

ACTION: Remove the diskette that is in the controller diskette drive and insert the diskette to be transmitted.

00092

MEANING: This message requests you to enter the identifiers for the data to be transmitted.

ACTION:

- Press Enter to transmit a controller dump. (You mounted a dump diskette in the previous step.)
- Enter 0 to transmit the entire diskette.
- Enter the characters CF followed by a data set name to transmit a data set from the Local Configuration Facility library.
- Enter AD to transmit an application program dump.
- Enter the track and record addresses that begin and end the part of the diskette you want to transmit.

00093

MEANING: This message requests you to indicate whether the host or the controller will start the transit session.

ACTION:

- Enter 1 for the controller to initiate the session.
- Enter 0 for the host user program to initiate the session.

00099

MEANING: Transmission is complete. This is an informational message. All other system commands are now valid.

00100 x

MEANING: Debugging mode has transferred to work station *x*. You placed a stop for any work station, and work station *x* encountered the stop.

00112 xxxxxx

MEANING: This message is used only during automatic backup, and asks you to remove the current diskette and insert a formatted diskette in the secondary drive. If *xxxxxx* is displayed, insert the diskette with VOLID = *xxxxxx*.

ACTION: Remove any diskette from the secondary drive, and insert the requested diskette in the secondary drive. No operator keyboard response is required. About 10 seconds after you insert the diskette, the diskette drive should move to track 0 to read the volume ID. If there is no diskette drive activity after 15 seconds, open and close the diskette drive door.

00153

MEANING: This is a request for you to insert the diskette during a copy operation while automatic backup is in effect.

ACTION: Insert the diskette being written in the primary drive. This diskette must be the same type (1, 2, 2D) as the diskette in the secondary drive.

10075

MEANING: This message requests you to enter a key for encryption.

ACTION: Enter either an encrypted key, or the first part of a two-part key. Enter the key as a single string of 16 hexadecimal alphameric characters.

10076

MEANING: You are being prompted to enter the second part of a two-part key.

ACTION: Enter the key as a single string of 16 hexadecimal alphameric characters.

10077 xxxx

MEANING: The *xxxx* is the verification code that is returned by the 330 command with the 1, 2, or 3 operand.

The verification operation is complete. Compare the verification code with the expected verification code.

3262C

MEANING: 3262 DCA printer test complete.

ACTION: Enter another test request.

3262S

MEANING: You started the 3262 DCA printer test.

3278C

MEANING: 3278 DCA display test complete.

ACTION: Enter another test request.

3278S

MEANING: You started the 3278 DCA display test.

3287C

MEANING: 3287 DCA printer test complete.

ACTION: Enter another test request.

3287S

MEANING: You started the 3287 DCA printer test.

3604C

MEANING: 3604 display test is complete.

ACTION: Enter another test request.

3604S

MEANING: You started the 3604 display test.

4704C

MEANING: 4704 display test is complete.

ACTION: Enter another test request.

4704S

MEANING: You started the 4704 display test.

4710C

MEANING: 4710 printer test is complete.

ACTION: Enter another test request.

4710S

MEANING: You started the 4710 printer test.

4720C

MEANING: 4720 printer test is complete.

ACTION: Enter another test request.

4720S

MEANING: You started the 4720 printer test.

90000

MEANING: This message requests you to enter the identification code during the logon procedure. It also appears during startup or create-diskette prompting if you attempt to change the identification code.

ACTION: Enter the control operator ID code. If you enter the ID correctly, the system displays the 91111 message. If you make a keying error, the system displays the 91005 message.

When the system accepts the new ID, that becomes the control operator ID for subsequent use. If the system does not accept the ID, the system displays the 00004 or 00034 message.

90001

MEANING: You entered an invalid command (not numeric, more or less than three characters, or not in the command code table), or you entered the 032 command to write to the operating diskette.

ACTION: Enter the command correctly.

90002 xxxx

MEANING: An error occurred while the system was reading from the diskette. The status code appears immediately after the error message. The *xxxx* is the status. The status codes are in Appendix A. For some read operations, the system also displays *ttrr* address and diskette drive in error following the status; 1 indicates the error was on the primary drive, 2 indicates the error was on the secondary drive.

ACTION:

1. If the diskette stopped, start the diskette (042 0).
2. Insert the correct diskette, and close the diskette drive door.
3. If an invalid record was requested (status 0480), enter the command again with the correct track and record number.
4. If the read operation was for a control record (status 0204), the requested record is not there.

5. If the temporary file was reset with the set diskette option, no action is required.

90003

MEANING: An error was detected while the system was reading from the keyboard. If the error continues for two more keyboard entries, the control operator is automatically logged off. Also, this message appears when you press the Reset key twice; status is 0800.

ACTION: Reenter the command.

90005

MEANING: The system detected an error while the system was writing to the display.

ACTION: If this is a recurring error, log off the display station via the 000 command. If this does not work, press the Reset key six times. When the logoff is complete, log on using another display station, and test the display causing the error.

90006

MEANING: You entered invalid data when keying the log message number in a 002 or 046 command, or when keying the track and record number of a read diskette command.

ACTION: Enter the command correctly.

90007

MEANING: A command has been given to print on the output printer and one of the following conditions was detected: (1) no output printer has been assigned, (2) an error occurred while printing, or (3) the optional module was not loaded for the assigned terminal.

ACTION:

1. Assign an output printer with the 005 or 006 command if none was assigned.
2. Determine the meaning of the status bytes.
3. Try the operation again; if the error still occurs, reassign the printer with the 005 or 006 command and then assign it as the test component with the 007 command. Test the printer; if errors still occur, inform your service representative.
4. The wrong diskette was inserted for this controller, or the optional module for this terminal was not included at startup. Insert the correct diskette for this controller or request that the proper optional modules be loaded at startup.

90008

MEANING: You issued a command to a test component, and one of the following conditions was detected: (1) No test component has been assigned, (2) an error was detected while using the test component, or (3) the optional module was not loaded for this component.

ACTION:

1. Assign a test component if none was assigned with the 007 command.

2. Determine the meaning of the status bytes connected with the test component. If the errors continue, inform your service representative.

3. The wrong diskette was inserted for this controller, or the optional module for this terminal was not included at startup. Insert the correct diskette for this controller or request that the proper optional module be loaded at startup.

90009

MEANING: An operator keyboard error occurred; an invalid component address, station ID, or logical device or LU address was keyed in, or the component is not included in the configuration.

ACTION: Enter the command correctly or verify that the component is defined in the configuration.

90010

MEANING: You entered an invalid field for test repetition.

ACTION: Enter the command correctly. The valid repeated values range from 0 to 999.

90011

MEANING: Either you entered the 069 command incorrectly, or did not assign a test component.

ACTION:

1. Enter the 069 command correctly.

2. Assign the test component using the 007 command, then try the 069 command again.

90012 xxxx

MEANING: An error occurred while the system was writing to the diskette. For some write operations the address and diskette drive are also displayed following the status. The *xxxx* is the status; 1 indicates the error was on the primary drive, 2 indicates the error was on the secondary drive.

ACTION: Inform your system programmer.

90013

MEANING: You have entered an invalid work-station identification (ID) with a 123 command, or the work station was not included in the configuration procedure.

ACTION:

1. Enter the correct ID (1-60).

2. Check the configuration list to determine if the work station was defined.

90014

MEANING: An error was detected while the system was attempting to load overlays within the system monitor.

Note: Opening the diskette drive handle causes the diskette to lose its ready condition. When the diskette drive handle is closed, the diskette goes from the not-ready condition to a logically-stopped condition.

ACTION:

1. Ensure that the diskette drive door is closed.

2. If the diskette is logically stopped (see Note above), ensure that the correct diskette is inserted, and then enter the start diskette command (042 0).

3. Again enter the command that caused the error.

4. If the error occurs again, try a new operating diskette or try an installation diskette.

90015

MEANING: The component requested as the output printer or test component (command 005, 006, 007, or 008) is busy and cannot be assigned, or the device cluster adapter (DCA) port should execute an 074 request first before using one of the commands, or the LUASSIGN function is invalid.

ACTION: Verify that the component or port is not busy, and enter the command again; or try another component or port.

90016

MEANING: You entered an invalid command field.

ACTION: Enter the command correctly.

90017

MEANING: You entered an invalid line length or a line length greater than that permitted for the test.

ACTION: Enter the command correctly.

90018

MEANING: No component has been assigned for the requested function.

ACTION: Assign a terminal component capable of performing the function requested.

90019

MEANING:

- You attempted to assign the presently assigned test component as the output printer, or
- You attempted to assign the presently assigned output printer as the test component, or
- You attempted to assign an LU address to, or components to or from, your control-operator terminal with the 008 command, or
- You attempted to assign your terminal as test component.

ACTION: Use another component for the function. If the component is correct, reassign it first with the 005 or 006 and 007 commands, and then assign it again with the 007 and 005 or 006 commands or the 008 command.

90020

MEANING: You entered 051 or 052, but did not assign a 3624 as the test component.

ACTION: Assign the appropriate component and reenter the command.

90021

MEANING: An error was detected when reading from the test component.

ACTION: Refer to the status bytes to identify the problem.

90022

MEANING: The echo message from the automated teller machine did not match the output test message.

The format of the 90022 error message is:

```
90022 xxx s....se...e
xxx = counter
s....s = data sent
e....e = echo data
```

ACTION: Compare the displayed data sent with the displayed echo data. Try the test again. If the error persists, call the service representative.

90023

MEANING: You changed the diskette and entered 042 0 to start the diskette; or, if the diskette was inserted in response to the 00016 message, the diskette was not the diskette used to load the system.

ACTION: Either reload the original diskette and retry the operation, leave the second diskette inserted and startup again (reset), or insert the IPL diskette.

90024

MEANING: Unexpected data was received from the 3624.

The format of the 90024 message is:

```
90024 - d....d
d....d = unexpected data received from the 3624
```

ACTION: Refer to the *IBM 3624 Operator's Guide* for the meaning of the data received.

90025

MEANING: Unable to reassign test component or output printer to the original owner.

ACTION: Start up again (reset). If the error recurs, notify the service representative.

90026

MEANING: Unable to assign an LU address or a component because the logical device address (LDA) requested already has a component or LU address assigned.

ACTION: If you have issued 005, or 006 and 007, start the system again. If the error recurs, notify the service representative. If the error resulted from a 008 command, remove the component or LU address that is assigned to the LDA before assigning the new component or or LU address. Issue 008 to remove the old component; then issue 008 for the new component. To correct an LU address assignment, first assign the currently-assigned LU address to the free pool, then reissue the 008 command.

90030

MEANING: Either:

- A command was issued that required an optional module that was not loaded or was not available on the loaded diskette
- The command requires disk drive 2 or the auxiliary diskette drive, which is not present.

ACTION: Insert the correct disk or diskette or start up the system again (press the Reset switch on the controller) and enter a 5 in response to the 00001 message to specify the required optional module ID.

90032

MEANING: A read or write error occurred during programmable input mode, or during operation of a 029 command.

ACTION: Inform your programming personnel.

90033

MEANING: Another work station is logged on in programmable input mode.

ACTION: Use your installation's procedures.

90034

MEANING: Link adapter wrap test failed or the host link adapter was not stopped (status = 8000).

ACTION: Ensure that the host link adapter is stopped and try the command again. If the error still occurs, inform the service representative.

90035

MEANING: One of the following occurred:

- You entered an invalid 040 command.
- A 973 command failed because of invalid loop number or device type.
- An 074 device cluster adapter (DCA) or port control command failed.

ACTION: Take action according to the status returned. If no status was returned, enter the command correctly.

90036

MEANING: Invalid extended statistical counter or device ID entered with the 067, 068, or 072 command; or end of list reached when displaying counters with the 072 command (code 1).

ACTION: Enter the correct ID.

90047

MEANING: The diskettes used during a copy operation are not the same type or format, or an invalid diskette was inserted for a copy operation.

ACTION: Reenter the command and insert the correct diskette.

90048

MEANING: The HEADER01 record could not be found, the record after HEADER01 is not a Host Diskette Image Create (HDIC) header.

ACTION: Notify your host programming personnel.

90050

MEANING: The response or data entered from the keyboard during startup is not valid.

ACTION: Enter the correct response to the 00001 message that appears on the next line.

90051

Either you did not load the correct diskette, or requested the wrong link module.

ACTION:

1. Load the correct diskette.

2. Request the correct link module.

90052

MEANING: If the status bytes are zero, an invalid data set ID was entered in a 065 command; a nonzero status indicates the LDKT instruction failed.

ACTION: Verify the data set ID and reissue the 065 command.

90053

MEANING: A valid diskette was not inserted in the auxiliary drive, one or both diskettes were not 256-byte format, or the starting or ending track on the primary drive diskette was zero.

ACTION: Correct the diskette problem, and retry the operation.

90061 aaaa bbbb cc ddddzzz...z

MEANING: Invalid or unexpected response or input was received from the host. Transmission ends.

aaaa = Device status bytes

bbbb = Host read control field

cc = Communication link status byte

dddd = Host write control field

zzz = First 20 bytes of data in input/output segment

All characters are hexadecimal. Refer to Appendix A for status byte information.

90062 aaaa bbbb cc dddd zzz...z

MEANING: An error was detected during a read operation to the host. Transmission ends.

aaaa = Device status bytes

bbbb = Host read control field

cc = Communication link status byte

dddd = Host write control field

zzz = First 20 bytes of data in input/output segment

All characters are hexadecimal. Refer to Appendix A for status byte information.

90063 aaaa bbbb cc dddd zzz...z

MEANING: Contact with the host was lost during a read or write operation. Transmission ends.

aaaa = Device status bytes

bbbb = Host read control field

cc = Communication link status byte

dddd = Host write control field

zzz = First 20 bytes of data in input/output segment

All characters are hexadecimal. Refer to Appendix A for status byte information.

90064 aaaa bbbb cc dddd zzz...z

MEANING: An error was detected during a write operation to the host. Transmission ends.

aaaa = Device status bytes

bbbb = Host read control field

cc = Communication link status byte

dddd = Host write control field

zzz = First 20 bytes of data in input/output segment

All characters are hexadecimal. Refer to Appendix A for status byte information.

90066 aaaa bbbb cc dddd zzz...z

MEANING: The controller could not establish a session with the host. Transmission ends.

aaaa = Device status bytes

bbbb = Host read control field

cc = Communication link status byte

dddd = Host write control field

zzz = First 20 bytes of data in input/output segment

All characters are hexadecimal. Refer to Appendix A for status byte information.

90070 aaaa bbbb cc dddd zzz...z

MEANING: This message appears only when the host is transmitting a diskette image processed by the Host Diskette Image Create (HDIC) service program. The message indicates one of the following:

1. The header record (produced by HDIC) preceding the diskette image is less than 7 bytes long.
2. All other records (except 0588) are not 256 bytes long.
3. The starting *ttrr,* specified in the header record, is invalid.

aaaa = Device status bytes

bbbb = Host read control field

cc = Communication link status byte

dddd = Host write control field

zzz = First 20 bytes of data in input/output segment

All characters are in hexadecimal. Refer to Appendix A for status byte information.

Diskette creation ends.

90071 aaaa bbbb ccc dddd zzz...z

MEANING: Invalid or unexpected response or input received from the host. Diskette creation ends.

aaaa = Device status bytes

bbbb = Host read control field

cc = Communication link status byte

dddd = Host write control field

zzz = First 20 bytes of data in input/output segment

All characters are in hexadecimal. Refer to Appendix A for status byte information.

90072 aaaa bbbb cc dddd zzz...z

MEANING: An error was detected during a read operation to the host. Diskette creation ends.

aaaa = Device status bytes

bbbb = Host read control field

cc = Communication link status byte

dddd = Host write control field

zzz = First 20 bytes of data in input/output segment

All characters are in hexadecimal. Refer to Appendix A for status byte information.

90073 aaaa bbbb cc dddd zzz...z

MEANING: Contact with the host was lost during a read or write operation. Diskette creation ends.

aaaa = Device status bytes

bbbb = Host read control field

cc = Communication link status byte

dddd = Host write control field

zzz = First 20 bytes of data in input/output segment

All characters are in hexadecimal. Refer to Appendix A for status byte information.

90074 aaaa bbbb cc dddd zzz...z

MEANING: An error was detected during a write operation to the host. Diskette creation ends.

aaaa = Device status bytes

bbbb = Host read control field

cc = Communication link status byte

dddd = Host write control field

zzz = First 20 bytes of data in input/output segment

All characters are in hexadecimal. Refer to Appendix A for status byte information.

90076 aaaa bbbb cc dddd zzz...z

MEANING: The controller was unable to establish a session with the host. Diskette creation ends.

aaaa = Device status bytes

bbbb = Host read control field

cc = Communication link status byte

dddd = Host write control field

zzz = First 20 bytes of data in input/output segment

All characters are in hexadecimal. Refer to Appendix A for status byte information.

90077 aaaa bbbb cc dddd zzz...z

MEANING: This message means either:

1. The diskette you inserted in the diskette drive is not formatted correctly, or
2. The diskette is an invalid operating diskette on which you are attempting to add or replace an application program.

This message is followed by a 00012 or 00015 message.

Note: The VOLID of an existing diskette is displayed each time the diskette is loaded. The top line of the startup message contains seven groups of characters. The VOLID is the second group of characters. If you cannot load a diskette, you can get the VOLID by displaying track 0, record 7, of the diskette in question. To do so, log on as the control operator and issue the 031 command for that track and record (see the 031 command for the required format). Remove the current diskette and insert the diskette in question in the diskette drive. After 15 seconds, key and enter 031 7. The first 64 bytes of the record (0 to 3F), in hexadecimal characters, are displayed. If this is a valid IBM diskette, the first 10 characters contain E5D6D3F1 (VOL1) *xxxxxx*, where *xxxxxx* is the VOLID in hexadecimal.

To display the next 64 bytes (40 to 7F), press the Enter key. Location 75 (4B) should contain an F1 which indicates this is a properly formatted diskette. Anything other than an F1 causes a 90077 error message, and the diskette cannot be used for the create diskette function. The diskette format service program can be used to reinitialize a diskette so that it can again be used for the create-diskette function.

aaaa = Device status bytes
bbbb = Host read control field
cc = Communication link status byte
dddd = Host write control field
zzz...z = First 20 bytes of data in input/output segment

All characters are in hexadecimal. Refer to Appendix A for status byte information.

90078 aaaa bbbb cc dddd zzz...z

MEANING: The controller could not load a required portion of the create diskette function. Diskette creation ends.

aaaa = Device status bytes
bbbb = Host read control field
cc = Communication link status byte
dddd = Host write control field
zzz...z = First 20 bytes of data in input/output segment

All characters are in hexadecimal. Refer to Appendix A for status byte information.

90079 aaaa bbbb cc dddd zzz...z

MEANING: You inserted the wrong type diskette in response to a 00012 message.

aaaa = Device status bytes
bbbb = Host read control field
cc = Communication link status byte
dddd = Host write control field
zzz...z = First 20 bytes of data in input/output segment

All characters are in hexadecimal. Refer to Appendix A for status byte information.

90080

MEANING: An invalid debugging command was entered or one of the input fields was not valid.

ACTION: Enter the command again with the correct information.

90081

MEANING: An error was detected while the system was writing to the display during debugging mode.

ACTION: Enter the command again. If the error persists, log off and try another display station.

90082

MEANING: One of the following:

- The operator keyed an invalid segment number or an invalid address of the first byte to be displayed or changed.
- The end of the segment was reached during a segment display.

ACTION: Enter the command again with the correct information.

90084

MEANING: One of the following:

- The stop table is full when you issue the 03 command.
- You entered an invalid address on an 04 command.
- You entered an invalid direct address on an 11 or 12 command

ACTION: Enter the command again with the correct information. If there is no error on the 03 command, the stop table is full. You must remove a stop with a 04 command before entering a new stop with the 03 command.

90086

MEANING: You tried to change the area of storage containing application programs and the configuration data on an operating diskette.

ACTION: Make these changes at the host, and create a new operating diskette; or use a non-operating diskette.

90088

MEANING: One of the following:

- You entered an invalid work station identification on an 06 command.
- There is no A/B operator on the work station being debugged.

ACTION: Enter the command again with the correct information. If there is no B operator, issue a 09 command for an A operator, then try the previous command again.

90089

MEANING: Scan pattern on debug request not found.

90090

ACTION: Mount a formatted diskette for the unattended creation of an operating diskette.

90091

MEANING: The unattended creation of an operating diskette is in progress. DO NOT enter any system monitor commands.

90092

MEANING: You issued the 320 command and the controller found a problem with the 3600-level of encryption (ENCODE/DECODE).

ACTION: Follow the problem reporting procedures described in *4701 Controller Operating Instructions*.

90093

MEANING: You issued the 320 command and the controller found a problem with the 4700-level of encryption (ENCIPHER/DECIPHER).

ACTION: First ensure that a master key has been loaded into the controller. To determine if the master key is loaded, issue the 330 3 1 command and compare the resulting verification code with the verification code maintained by your security personnel. If the codes do not match, a new master key (Km) must be loaded; see the 330 2 1 command.

If the encryption keylock is activated and the controller contains a master key, the 90093 message means that the controller is malfunctioning. Follow the problem reporting procedures described in *4701 Controller Operating Instructions*.

90094

MEANING: The controller's cryptographic facilities are not working properly because of an internal machine failure.

ACTION: Follow the problem reporting procedures described in *4701 Controller Operating Instructions*.

90095

MEANING: You requested a utilization report but the timer was not started or has wrapped.

90096

MEANING: The address you requested when printing or displaying the dump diskette is not available on the diskette you are using.

90097

MEANING: The next screen of data was requested, but there is no data to display.

90098

MEANING: No available space on the diskette to perform the copy.

90099 xx yyyy nnnnnnnn

MEANING: An error was detected in the system monitor or the CNM/CS function of the controller. When this message appears you might be logged off the system monitor.

The *xx*, *yyyy*, and *nnnnnnnn* are diagnostic data for service personnel. (The *nnnnnnnn* value is displayed only when the error occurs in CNM/CS.)

ACTION: If you are logged off the system monitor, log on again. Continue with what you were doing. If the error occurs again, inform your service representative.

91001

MEANING: A 711 command was issued, but CNM/CS processing is disabled.

ACTION: Enter a 712 command from the CNM/CS workstation.

91002

MEANING: No operator is logged on at the remote controller. (This appears only at the remote operator's display.)

91003

MEANING: The remote host operator is attempting to log on the system monitor through CNM/CS.

ACTION: Notify the remote operator of system monitor availability with a 711 command, or follow your local procedure.

91004

MEANING: The remote controller has an operator logged on the system monitor.

ACTION: The controller operator receives a message of your logon attempt, and should follow the procedure established at the controller site.

91005

MEANING: The operator attempted to log on the system monitor with an invalid control operator ID.

91006

MEANING: The controller accepted the logon from the remote operator.

91007

MEANING: This message acknowledges a command from the remote operator to the system monitor. (This appears only on the remote operator's display.)

91010

MEANING: The accompanying message is from the remote operator.

91013

MEANING: You entered an interval timer (014) command containing an invalid function code.

ACTION: Reenter the 014 command with the correct function code.

91014

MEANING: You requested interval timer data for an invalid work station or timer.

ACTION: Reenter the 014 command with the correct work station and timer number.

91077

MEANING: A problem occurred that prevents the controller from loading, verifying, or erasing the cryptographic key.

SYSTEM ACTION: The 330 command is rejected. The system monitor is waiting for you to enter a system monitor command.

PROBABLE CAUSE: If this message appeared after you received a 10075 or 10076 prompting message, you may have entered a key in the wrong format. Reissue the 330 command, and when prompted, be sure to enter the key or key part as a single string of sixteen hexadecimal characters.

If this message appeared after you issued the 330 command (that is, you never received a 10075 or 10076 prompting message), the problem could be one of the following:

- You forgot to activate the encryption keylock. Insert the encryption key in its keylock, turn the key *counterclockwise,* and reissue the 330 command.
- Your institution did not include the necessary module of controller data in the operating diskette. The P28 module is required to support the cryptographic facilities, and must be included during the configuration procedure (OPTMOD configuration instruction), or during the startup procedure (enter P28 in response to the 00005 startup message).
- The controller is malfunctioning. Follow the problem reporting procedures described in *4701 Controller Operating Instructions.*

91111 x yy

MEANING: The control operator identification is correct. Logon is complete. The control operator can now enter system monitor commands.

x = the loop number or 0 for DCA devices.
yy = the address or port number for DCA devices.

Note: The loop number and address are not displayed when you log on at the host or from another work station.

92010

MEANING: A diskette read error occurred during startup; the system is unable to continue processing.

ACTION:

1. Try startup again (press Reset).
2. Try another operating diskette.
3. Try an installation diskette.

If the error still occurs, inform the service representative.

92076 xxyy xxyy...

MEANING: The Module IDs displayed are:

- IDs that are invalid.
- IDs of modules not available on the loaded diskette.
- IDs that were entered more than once in response to prompt message 00005.

```
xx = The invalid, not available, or duplicate ID.
yy = 00 Module not found on diskette.
         01 Module xx requires an optional module that was not
            loaded.
         03 Controller data error.
         04 Insufficient base control storage space.
         05 System capacity for optional modules exceeded.
         07 Configuration assembly error.
         08 Configuration assembly error.
         09 Configuration assembly error.
         0A Configuration assembly error.
```

ACTION: Press the Enter key to continue the startup sequence if these modules are not required, or insert the correct diskette, press the Reset switch on the controller, and enter prompt mode during the startup to specify the correct optional module IDs.

Chapter 7. Controller Log Messages

The controller log is a temporary file on the operating diskette. The controller places messages in this log that relate to maintenance and engineering data. Your institution's programs can also place messages in this log. The maximum message length is 252 bytes without a time stamp, and 247 bytes with a time stamp.

The controller log is destroyed by a cold start, a program's request to reset a temporary file, or an 063 command to reset the temporary file. It is not lost by a warm start.

The log messages written by the controller are stacked in a queue (a waiting line) from which they are written to the diskette when the diskette is not busy. The system can retain up to four log messages in the queue. When the queue is full, any further log messages are lost.

Note: All messages not described here are written by your institution's application programs with a Write-to-Log command. Follow your institution's procedures.

General Log Message Format

The format of the controller-generated messages (except EXEC file log messages), when displayed by the system monitor, is:

```
msid xy hhmm typ data ... data
```

msid The four-digit message sequence number, assigned in the numeric sequence. (The message sequence number is not part of the message; the system monitor assigns it when displaying or printing the message.)

x Originator of the message: 1 means the controller wrote the message. Any other value means the message was written by an application program.

y Urgency: 1 means the message requires immediate attention (the controller also turns on the Alert light); any value other than 1 means the message does not require immediate attention.

hhmm Is a four-digit time stamp, where *hh* represents hours; *mm* represents minutes.

A blank character separates the time stamp from the rest of the message. Time stamps are included on all controller log messages. However time stamps on user generated log messages are optional and are determined by configuration options.

Note: The date is placed in the controller log when it is set by the operator or when the date changes (for example, at midnight). Refer to the 018 type controller log message.

typ Message type.

data The message information.

EXEC Log Message Format

The monitor, when it creates an EXEC file, writes this log message after you issue the 980 command:

```
BXccccdddd...dccccdddd...
```

where:

BX Is the identifier.
ccc Is the number of characters in the following command.
dddd...d Is the command.

When this message is displayed by the system monitor, *mmmm,* precedes BX and is the number you use in the EXEC file command (982) when invoking this EXEC command file.

Your institution's log messages (with one exception) can have any format. (The exception: log record type 01 101 is used by the application program to communicate alerts to the host.) However, the first two bytes of any message are treated as *xy* above.

To examine a display or a listing of the controller log, log on at any operating keyboard display, and enter a 001, 002, 046, or 301 system monitor command, or a 17 or 18 debug command.

Analyzing Log Messages at the Host

A remote operator at the host, using the alert message processing facility of the Network Problem Determination Application (NPDA), can review the contents of the log. The log messages are reported as NPDA messages, each with a unique user action code but without the significance code and message type shown in this chapter.

Log Messages

The controller places the following types of messages in the log:

1y hhmm 002 aa bbbbbb cccccccc dddddd ee ff gggg.

y
0 for no alert light; 1 lights the alert light.

hhmm
Time stamp (when the message is placed in the log).

a
The control code supplemental version ID.

b
Diskette volume identification (VOLID).

c
Configuration generation identification (GENID).

d

The EC level of the controller data.

e

Control unit address (CUA).

f

Relocation count, a count of the number of the diskette records moved to the error track because of diskette surface defects.

g

Session identification (ID), the number of cold starts since the diskette was created.

On a cold start, the controller places message 10 002 in the log and increases the session identification. On a warm start, the controller writes message 10 002 in the log but does not increase the session identification.

11 hhmm 003 nnnnnnnn ss pp aaaa cccc iiii

nnnnnnnn
Application program name.

ss

Work-station identification in hexadecimal.

pp

Program check code in hexadecimal.

aaaa

Program check address in hexadecimal.

cccc

Loop threshold count in hexadecimal (number of application program instructions executed since last exit).

iiii

First 2 bytes of the instruction. If *pp* = 0B (user's instruction counter invalid), *iiii* is not valid data.

The above information is related to your institution's application program.

11 hhmm 004 DSIx dddd dddd ... dddd

DSI is design support information. This message appears only once when the diskette is used to start the system after the system stops on a Cxxx error or Xxxx error. Two physical records contain the data. The service representative might request this information when correcting a problem.

x

Record containing data bytes.

1 First 64 bytes of data.
2 Last 64 bytes of data.

dddd dddd . . . dddd

64 bytes of data.

11 hhmm 005 LOOP x ERROR, CODE - y - z

x

Loop number.

y

Loop status:

0	The controller loop adapter card and the modem (if a remote loop) passed the wrap test.
1	Modem failed wrap test.
2	Controller loop adapter card failed wrap test.
4	Adapter check.
6	Combination of 2 and 4.
8	User requested stop loop.
9	A loop defined in the CPGEN is not started because it is not present, not included in the controller.

z

Modem status (always equal to 3):

10 hhmm 006 axxdd

This log message describes the status of the X.21 switched host link. The value *a* indicates the reason for the log message. The values *xx* and *dd* define retry or completion status and signal status.

a = 4

The X.21 retry function exceeds the retry value specified during CPGEN on the COMLINK macro. Byte *xx* defines the reason for the retry (see Figure 7-2). Byte *dd* defines the last X.21 call progress signal received (see Figure 7-1).

Bit	Meaning
1	Read control block overflow.
2	First call progress character was a 2 or a 6 (recall required), and is stored in the user buffer.
3	Unexpected or undefinable condition occurred.
4	Overrun.
5	Underrun.
6	Abnormal condition during wait for "proceed to select" or incoming call (more characters than expected or character other than BEL or + was received).

Figure 7-1. X.21 Host Link Open Retry Status

a = 5

Call progress signal 45 or 46 (controlled or uncontrolled not ready) was received from the network. Byte *xx* defines the OPEN intermediate completion status (see Figure 7-3). Bit 00 of *xx* is on, and bits 03 and 06 may also be on. Byte *dd* defines the call progress signal received. Refer to Figure 7-2 for a definition of each call progress signal.

Call Progress (CP) Group and Signal	CP Signal Meaning	Action
Group 0 (positive):		60-second time-out set.
01	Terminal called.	
02	Redirected call.	
03	Connect when free.	
Group 2 (negative-- retry permitted):		Cleared and retried, except for procedure error (22), which is not retried.
20	No connection.	
21	Busy.	
22	Procedure error.	
23	Transmission error.	
Group 4 & 5 (negative -- retry not permitted:		Log message sent and indicated. 45 and 46 retried after delay.
41	Access barred.	
42	Changed number.	
43	Not available.	
44	Out of order.	
45	Controlled; not ready.	
46	Uncontrolled; not ready.	
47	DC power off.	
48	Invalid facility request.	
49	Network fault, local loop.	
51	Assistance needed (call information service).	
52	Incompatible user.	
Group 6 (negative -- retry permitted):		Cleared and retried.
61	Network congestion.	
Group 7 (negative -- retry not permitted):		Log message issued & indicated.
71	LT network congestion.	
72	RPOA out of order.	
Group 8 (confirmation):		Log message issued & indicated. Halt request issued.
81	Registration or cancelation confirmed.	

Figure 7-2. X.21 Call Progress (CP) Signals

Bit	Meaning
0	Call progress message in user buffer.
1	Format error; network protocol not followed.
2	Line ID or DPI in user buffer.
3	Retry time-out during OPEN preparation or auto-answer OPEN. Three seconds elapsed without receiving incoming call. The time-out is restarted.
4	+, /, and BEL received. Incoming state entered during auto-answer OPEN, or "proceed to select" signalled.
5	Data was lost. Call progress signals or line ID did not fit into user buffer.
6	Comparator error. Possible hardware malfunction. If generated, this status bit occurs with another status bit.
7	One or more retry conditions occurred.

Figure 7-3. X.21 Host Link Intermediate Completion Status

11 hhmm 006

The host link error message has five formats:

11 hhmm 006 a

a = 0

An error condition caused the controller to run wrap tests, and they were successful. The controller automatically tests the modem if it is wrappable, and was defined as such in the configuration. Whether the controller automatically tests an external modem depends on your institution's configuration image and the external modem capability.

a = 2

A stop link command was issued by the system monitor or your institution's application program.

11 hhmm 006 a xxbbxxxxxxxxxxxx

a = 1

The controller ran wrap tests, but they were not run successfully. Inform the appropriate service representative.

xx

This is the adapter address, 15.

bb

Identifies the test that failed:

```
09   Adapter wrap test
0D   Modem wrap test, X.21 switched network DCE,
     or cable wrap switch test
11   Interface select test
21   Adapter reset test
27   X.21 translator card test
```

xxx...x
This is diagnostic information for the service representative.

11 hhmm 006 a sssssssstttxxttttttrrrrrrcc

The 28 hexadecimal characters that follow the *a* are programming information. If *a* = 3, a message was received in error. If *assss* = 38004, the LU address *(xx)* does not exist. All other occurrences of this message suggest a network error.

ssssssss
Sense returned to the host, if possible, on a bad message.

ttttxxt...t
Transmission header of the failing message. The *xx* is the LU address.

rrrrrr
Request header of the failing message.

cc
First byte of the request unit.

See "Communication Sense Codes," in the *IBM 4700 Controller Programming Library.*

11 hhmm 006 a xxyy

The X.21 host link requires immediate attention. The type of status depends on the settings of the message information as shown in Figure 7-4.

a:	xx:	xx:	yy:
4	OPEN error completion status.	n/a	Extension or time-out status.
5	OPEN intermediate	bit 0=1 bit 5=1	Call progress signal. Length of message received.
6	CLOSE error completion status.	n/a	00

Figure 7-4. 11 006 Log Message Analysis

11 hhmm 006 a xx ss...ss

This message for X.21 switched links defines intermediate or error completion status, depending on the value of *a* as follows:

a = 4
OPEN error completion status, selection sequence error. Status byte *xx*, the 8-bit completion status, is defined in Figure 7-5. Bit 1 is always on; bits 4 and 7 are always off. If present, *sssssss* are the first eleven EBCDIC characters of the X.21 selection sequence that failed. The X.21 selection sequence is described under the 011 command description.

a = 5

OPEN intermediate completion status, line identification error. Status byte *xx* contains the status as defined in Figure 7-3. Status bits 0 and 5 are both off, and bit 2 is on. Bit 3 or 6 may also be on. If present, *sssssss* is the line identification received from the network. If *sssssss* is not present, a line ID was expected but not received.

Error Completion Status Bit	Operation	Meaning
1	OPEN	Format error. Invalid selection sequence or other user error.
4*	OPEN	An X.21 time-out occurred. T1 (yy bit 2 = 1) T2 (yy bit 3 = 1) T3A (yy bit 5 = 1) T3B (yy bit 5 = 1; manual DTE) T4 (yy bit 6 = 1) T5/T6 (yy bit 4 = 1)
	CLOSE	Clear time-out occurred. Clearing sequence not ended properly.
6	OPEN/CLOSE	Comparator error. Possible hardware malfunction. If generated during OPEN, occurs with another status bit.
7*	OPEN	Extension status indicating at least 1 error in yy.

* If both xx bits 4 and 7 are on, yy contains extension status rather than time-out status.

Figure 7-5. X.21 Host Link Error Completion Status (xx)

xx Status Bit 4 = 1:	XX Status Bits 4 & 7, or Bit 7 only = 1:
yy bit 2 =1: "Proceed to select" response to "call request" not set.	yy bit 2 = 1: Network not ready.
yy bit 3 = 1: Neither "ready for data" nor a call progress signal was sent after the selection sequence.	
yy bit 4 = 1: "DCE ready" response to DCE clear request for confirmation not received.	
yy bit 5 = 1: (Manual DTE) Call progress signal requested the calling DTE to wait 20 seconds for "ready for data". (Other DTEs) DTE was not set to wait 60 seconds, so "ready for data" was not detected after call progress signals were received.	
yy bit 6 = 1: "ready for data" not detected after "Call accepted" was sent.	yy bit 6 = 1: DCE cleared by network request.
	yy bit 7 = 1: Last retry. Retry count exceeded.

Figure 7-6. X.21 Time-Out and Extension Status (yy)

11 hhmm 010 x

The *x* is the error return code:

X'1'	Link adapter type unknown.
X'2'	Link module requested cannot be found.
X'3'	Default taken, but no link module matches adapter.

1y hhmm 014 t dp ccc....ccc

y

0 for no check light or 1 for check light.

t

Reason code:

1 = DCA shutdown
2 = Port shutdown
3 = Machine check

4 = Adapter timeout
5 = Invalid port ID
6 = No extended status
7 = Stray Op complete
8 = Feature error
9 = Device check
10 = Device/CPGEN mismatch

dp

For port errors, *d* = A, and *p* = port number.

dp

For adapter errors, *d* = 9, and *p* = A.

ccc....ccc

Port statistical error counter for port errors, adapter statistical error counters for adapter errors.

11 hhmm 017 lsdm TYPE=tt fc s1 s2

l

Loop number or A if DCA.

s

Terminal address in hexadecimal, or port number if DCA.

d

Component address in hexadecimal.

m

Modulus value for the terminal.

tt

component type:

01	host link
02	diskette
80	loop control
81	4704/3604/3278/3279 keyboard
82	4704/3604/3278/3279 display
83	3610, 3611, or 3612 printer
84	3262/3287/5210 printer
86	magnetic stripe encoder
87	3614/3624 terminal
88	3606 or 3608 keyboard, display, and magnetic stripe reader
89	3608 printer
8A	3615 printer
92	3616 printer
9A	4710 printer
AB	4704-2/3 magnetic stripe encoder
B0	4720 printer

fc

Failure code:

01	communication failure, S1S2 = I/O status code
02	operational failure, S1S2 = I/O status code
03	propagation delay, S1S2 = I/O status code
08	power-on failure, S1 for 4704 = device code (see Figure 7-7 and Figure 7-8)

For FC=01, 02, or 03, the s1 and s2 fields contain one of the status codes shown in Appendix A, "Status Messages."

s1

When FC=08: for the 4710 and 4720, the terminal's failing subcomponent; for the 4704, the power-on device code.

s2

For FC=08: the ROS/EC number.

Terminal Status 4704-1 Power-On Device Codes

	Keyboard Test Error
11	Invalid keyboard on primary or secondary port.
12	Keyboard internal test of primary port.
13	Keyboard internal test of secondary port.
14	No keyboard attached to port.
15	No response from keyboard adapter.
16	PIN pad offline test error.
17	Keyboard adapter port check.
18	Keyboard adapter microprocessor check.
	Keyboard Echo Test Error.
25	Transmit check.
27	No response from magnetics device.
38	Magnetics adapter self test.
	CRT Adapter Test Error.
47	CRT controller check.
48	Refresh RAM check.
	IPL Check Error.
81	Sense response time-out.
82	Microcode patch load error.
86	UDC font load or microcode patch failure.
87	Typematic load failure.
88	Sense failure.

Figure 7-7. 4704-1 Device Codes for Message Type 017.

Terminal Status 4704-2 Power-on Device Codes	
80	Keyboard test error
40	Magnetic device error
20	Patch load check

Figure 7-8. 4704-2 Device Codes for Message Type 017.

10 hhmm 018 a yyyyrmmrddrhhrmmrss

a
Timer set by:

0 Date and time of day set by operator.
1 Date increased by system.
2 Time of day adjusted by operator.

r
Separator

yyyy
Year

mm
Month

dd
Day

hh
Hour

mm
Minute

ss
Second

10 hhmm 020 xxx ... xxx

This log message records a command entered from the control operator's terminal. The *xxx ... xxx* is the command.

11 hhmm 021 NVM ERROR ENCIPHER STATUS xxxx

The *xxxx* is the status returned from an encipher instruction, as contained in SMSDST. (See Encryption Status in Appendix A.)

During IPL, the system monitor attempts to encrypt data (if the encipher instruction is available). If the encryption fails, the 021 message is placed in the controller log.

1y hhmm 022 dllccffrraaaaiiiisseeppppppppp

y

0 for no check light; 1 lights the check light.

d

Drive number

0	Disk drive.
1	Disk drive.

ll

Error record flags

Bit	**Meaning**
0	Partial log; no address or data CPR
1	Partial log; no adapter internal address
2,3	Partial log; device sense validity flags: 00 All sense bytes read with no errors 10 Current sense mode read with no errors 01 All sense bytes read; errors occurred 11 No sense information
4	Partial log; no SCA director
5	Reserved
6	Partial log; adapter status
7	Partial log; no operational statistics

cc

Retry count

ff

First status flags

Bit	**Meaning**
0-4	Reserved
5	First ARC is an error ARC
6	First ARC is an exception ARC
7	Reserved

rr

First return code (ARC)

aaaa

Adapter status bytes

iiii

Adapter internal status byte

ss
SCA director

ee
Error syndrome

pppppppp
Failing physical block number (PBN)

10 hhmm 023 dhhhhhhhhddd...ddd

d
Drive

0	Disk drive 1
1	Disk drive 2

hhhhhhhh
Failing cylinder head and sector

ddd...ddd
Device sense bytes

10 hhmm 024 dccc...ccc

d
Drive

0	Disk drive 1
1	Disk drive 2

ccc...ccc
Device commands and parameters

10 hhmm 025 dsssssssswwwwzzzznnnnmmmmaaaa

d
Drive

1	First disk drive
2	Second disk drive

ssssssss
Number of sectors read or verified

wwww
Number of sectors written or erased

zzzz
Number of zero-length seek operations

nnnn
Number of non-zero-length seek operations

mmmm
Number of missed revolutions

aaaa
Number of off-track alternates accessed

10 hhmm 030 data

This message is written when you issue the 030 system monitor command to place a message in the log.

data
The text you wrote with the 030 command.

01 hhmm 01 101 token data

This is a user-written log message for communicating error information to the host-resident NPDA program. Your application program writes this message into the log using an LWRITE instruction. The system passes this message for Alert processing by the host program.

token
A 1- to 8-character error identification (an NPDA token).

data
Up to 240 bytes of user-written error data.

mmmm
Number of missed revolutions

aaaa
Number of off-track alternates accessed

10 hhmm 030 data

This message is written when you issue the 030 system monitor command to place a message in the log.

data
The text you wrote with the 030 command.

01 hhmm 101 token data

This is a user-written log message for communicating error information to the host-resident NPDA program. Your application program writes this message into the log using an LWRITE instruction. The system passes this message for Alert processing by the host program.

token
A 1- to 8-character error identification (an NPDA token).

data
Up to 240 bytes of user-written error data.

Appendix A. Status Messages

Some of the 9xxxx messages are accompanied by two status bytes, displayed as four hexadecimal characters. This status information describes the status of a previous data transfer or data processing request involving a specific subsystem component. When a problem occurs with your subsystem, you will want to obtain the status information for your service personnel.

In the status information listed here, we show only 1 bit on at a time, indicating a single item of status information. In practice, these status bits are set on in combination, indicating a combination of status events. To indicate several conditions, the system adds the several status indicators to present one pair of status bytes.

Status messages noted with a "P" are possible programming errors; these are explained in the *Controller Programming Library*. Status messages noted with an "H" are possible hardware errors. Status messages noted with a "O" report operational conditions that the application program might need to resolve. Status messages with a "W" are warning messages.

Status Applies to:	Status	Action	Meaning
Work Station	8000	P	Message pending.
	4000	P	Record not found.
	0800	O	Check ended by attention.
	0402	P	Invalid target station
	0401	P	Missing entry point (EP) in current application program.
	0101	P	Record too long.
Indicator Lights	0480	P	Invalid request.
Signal *	0440	O	A test component has not been assigned.
	0200	H	Common loop error.
	0201	P,H	Terminal address error.

* Status related to operation of indicator lights always contain an active bit 1 in first character of byte 1. Thus, the status is the previous write operation plus any residual status.

Diskette	8200	O	Intervention required, unit check.
	8101	O	Intervention required, wrong length sectors.
	8002	O	Intervention required, diskette not stopped.
	8000	O,P,H	Diskette not ready.
	4095	O,P	Unit exception, invalid record length.
	4094	O,P	Unit exception, invalid sector count.
	4093	O,P	Unit exception, wrong diskette type.
	4092	O,P	Unit exception, invalid diskette type.
	4090	O,P	Unit exception, too many defaults.
	4080	O,P	Unit exception, space unavailable.
	4008	O,P	Unit exception, incompatible diskette.
	4004	O,P	Unit exception, data set name unknown.
	4002	O,P	Unit exception, exclusive use conflict.
	4000	P	Transient area fill on write, or no record found on read.
	3000	P,H	Unable to read or write a record, AND previous read or was in error (3000 + 1000).
	2000	P,H	Unable to read/write a record (block).
	1000	P,H	Previous read or write in error.
	0A80	P	Attention, unit check, space unavailable.
	0A20	H,P	Attention, unit check, invalid volume label.
	0A08	H,P	Attention, unit check, invalid extent.
	0A00	H	Attention, bad diskette.
	0480	P	Invalid request.
	0440	O,P	Diskette is logically stopped.
	0404	P	Command reject, drive not supported.
	0403	P	Command reject, volume access inhibited.
	0402	O,H	Unable to operate second side of diskette, wrong diskette, or hardware error.
	0210	H	Unit check, read error count exceeded.
	0208	H	Unit check, unreadable sectors were logged.
	0204	P	Unit check, wrong length, temporary file record.
	0203	H	Unit check, bad diskette.
	0201	P	Unit check, wrong length, temporary file record.
	0200	H	Hardware error.
	0101	P	Record too long.
	0100	P	Record too short.

Disk	0020	P	Duplicate keys follow.
	0100	P	Record too short.
	0101	P	Record too long; user data truncated.
	0142	P	Secondary index exception.
	0200	H	Hardware error.
	0202	P	Unit check; session ID error.
	0204	P	Unit check; control record read.
	0403	P	Access inhibited on drive.
	0404	P	Drive not supported.
	0408	P	Invalid extent parameter.
	0410	P	Dataset not open.
	0420	P	Dataset write protected or unexpired.
	0441	P	Keyed record too short to contain record key.
	0442	P	Duplicate keys not allowed in primary index.
	0444	P	Insufficient buffer space for keyed record I/O.
	0480	P	Command reject; invalid request.
	0481	P	Command reject; optional module missing.
	0482	P	Command reject; data set size conflict.
	0481	P	Command reject; optional module missing.
	0484	P	Command reject; open conflict.
	0485	P	Command reject; invalid temporary file request.
	0488	P	Invalid dataset spec; invalid dataset type; invalid user request flag.
	0489	P	Invalid keyed access specification.
	04C2	P	Command reject; record not found.
	0887	P	Attention; data set allocation not complete.
	0888	P	Attention; retain data set definition when a definition does not exist.
	0889	P	Attention; invalid associated data set specification.

0A00	H	Attention; unit check, bad disk.
0A08	P,H	Attention; unit check, invalid extent.
0A20	P,H	Attention; unit check, invalid volume label.
0A40	P	Attention. Unit check; unrecoverable disk error.
0A80	P	Attention; unit check; space unavailable.
0A86	P	Attention; unit check; data set defined, not allocated.
0A88	P	Attention; invalid dataset specification (bad label).
1000	P,H	Prior operation; insufficient buffers.
1800	P	Prior operation; attention.
2000	P,H	Data check; unable to read/write a record block.
2001	P	Data exception; incorrect record type.
4000	P	Unit exception; end-of-file, invalid RSN request, data set full, no unkeyed data set to contain record for keyed LWRITE.
4002	P,O	Unit exception; exclusive use conflict.
4004	P,O	Unit exception; data set name unknown.
4008	P,O	Unit exception; incompatible disk or diskette.
4010	P	Unit exception; too many open requests.
4011	P	Unit exception; multiple temporary file opens.
4020	P	Unit exception; data set name not unique.
4040	P	Unit exception; no unused header label positions.
4080	P,O	Unit exception; space unavailable.
4100	P/O	Unit exception; invalid record length.

3262/3287/5210	8000	O,P	Intervention required.
	4040	O	Line-spacing switch changed from single to double.
	4002	O	Case switch changed from mono to dual case.
	4020	O	Case switch changed from dual to mono case.
	4010	O	Line-spacing switch changed from double to single.
	4008	O	The LPI switch changed from 6 to 8 LPI.
	4004	O	The LPI switch changed from 8 to 6 LPI.
	4001	O	Operator intervention, cover or platen open, end of forms, paper jam. Hold print left on for 10 minutes during printing.
	2008	H	Parity error in print buffer.
	2002	P	Invalid SCS control parame-
	2001	P	ter. Invalid SCS control code.
	1000	O	Prior operation or asynch- ronous status.
	0880	O	Cancel switch pressed while printing.
	0840	O	Printer became ready.
	0808	O	Printer completed power-on sequence.
	0804	O	Power off.
	0802	O	PA2 switch activated.
	0801	O	PA1 switch activated.
	0800	O	Wait stopped by attention.
	0480	O,P	Command reject (optional module not loaded or invalid operation).
	0440	O	Printer not assigned as test component.
	0210	H	Equipment check, thermal check, hammer-fire check, belt-synchronous check, or repeatable parity error.
	0208	H	Repeated attempts to write to printer have failed.
	0201	O,H	3262/3287 power off, port does not have 3262/3287 attached, port stopped, or hardware error.
	0200	O,H	DCA stopped or DCA adapter error.
DCA Adapter	0485	O,P,H	Command reject, no DCA devices on any port.
	0484	O,P	Device assigned to another station.
	0483	O	Device type not 00-01.
	0482	O	Port number not 00-07.
	0481	O	Port not 00-07 on enable/disable port.
	0480	O,P	Command reject (optional module not loaded, or invalid operation).
	0201	H	Unit check DCA port error.
	0200	H	DCA adapter error.

4704/3604/3278/3279 Keyboard/Display	4000	H	Tracking error.
	2000	P,H	Translate check.
	0800	O	Read ended by attention (pressing 4704/3604/3278/327[illegible] Reset key twice).
	0480	P	Invalid request.
	0440	O,P	4704/3604/3278 has not been assigned.
	0202	P	Unit check.
	0201	P,H	Terminal address error in 4704-1 or 3604; port error in 3278, 3279, or 4704-2.
	0200	H	Common loop or DCA adapter error.
	0101	P	Segment overrun.
4704/3604 Magnetic Stripe Encoder	2000	P,H	Translate error.
	0800	O	Wait ended by attention.
	0480	P	Invalid request.
	0440	O,P	Magnetic stripe encoder has not been assigned.
	0202	H	A failure in readying or writing to the encoder.
	0201	P,H	Terminal address error in 4704/3604.
	0200	H	Common loop error.
	0101	P	Record too long.
3606 Keyboard/ Display and 3608 Keyboard/ Display	0101	P	Incorrect length.
	0200	H	Common loop error.
	0201	P,H	Terminal address error.
	0202	P,H	Time-out.
	0404	P	Invalid request.
	0440	P	Invalid request.
	0480	P	Invalid request.
	1000	O	Prior operation.
	2000	P	Data check.
	4001	P	Read issued with no message pending.
3608 Printer	0101	P	Incorrect length.
	0200	H	Common loop error.
	0201	P,H	Terminal address error.
	0202	H	Printer error.
	0404	P	Invalid request.
	0440	P	Invalid request.
	0480	P	Invalid request.
	1000	O	Prior operation.
	2000	P	Data check.
	8000	O	Intervention required.

4710, 3610, 3611, 3612, 3615, 3616, 4720	8202	O,P	Stop switch pressed or tried to print off right edge of passbook (3611-2).
	8010	O,P	End of forms.
	8000	O,P	Printer not ready; intervention required.
	4080	O,P	Warning line.
	4020	O,P	End of page.
	4001	O	Printer deactivated.
	2000	P	Translation error; invalid character in data stream.
	1000	O	Prior operation.
	0808	O	Power on(4710/3616/4720).
	0800	O	Wait ended by attention (pressing 4704/3604/ 3278/3279 Reset key twice).
	0480	O,P	Optional module not loaded or invalid request.
	0440	O,P	No component assigned at logical address.
	0208	P	Incorrect message length (4720, 4710, 3616)
	0204	H	Protocol error(4710/3616/ 4720)
	0202	H	Printer error.
	0201	P,H	Terminal address error in printer.
	0200	H	Common loop error.
	0101	P	Incorrect length(4710/ 3616/4720).
3614/3624	0801	P	Write ended, data pending.
	0800	O,P	Read ended by attention (pressing 4704/3604 Reset key twice).
	0480	P	Invalid request.
	0440	O	3624 not assigned as test component.
	0201	P,H	Terminal address error in 3614.
	0200	H	Common loop error.
	0101	P	Record too long.

SDLC Host Link Status	0104	P	Incorrect length.
	0108	P	Incorrect length.
	0200	P	Unit check.
	0404	P	Command reject.
	0408	P	Command reject.
	0410	P	Command reject.
	0420	P	Command reject.
	0440	P	Command reject.
	0480	P	Command reject.
	0800	O,P	The operator signaled ATTN by pressing Reset twice in succession.
	2000	P	Data check.
	4010	P	Unit exception: end-bracket read; data transferred.
	4020	P	Unit exception: start-bracket read; data transferred.
	4040	P	Unit exception: last-of-chain read; data transferred.
	4080	P	Unit exception: first-of-chain read; data transferred. place.
	4820	P	Unit exception, attention.
	4840	P	Unit exception, attention.
	4880	P	Unit exception, attention.
	8020	O,P	Intervention required.
	8040	O,P	Intervention required.
	8080	O,P	Intervention required.
BSC Host Link Status	0104	P	Incorrect length.
	0108	P	Incorrect length.
	0200	P	Loss of contact.
	0401	P,H	Command reject.
	0408	P	The command was rejected.
	0420	P	The command was rejected.
	0800	O	Operator signaled ATTN by pressing Reset twice.
	8040	P	Intervention required.
	0201	P,P	Bad data.
	4001	P	The link is up.
	8080	O,P	Contact not established with the host.
	4080	P	Unit exception: there is data pending for this logical work station.
Encryption Status	0200	H	Controller error.
	2001	W	Warning: key does not have add parity.
	2002	O,P,H	Key checksum error.
	2004	H	Readback check failed.
	2008	O,P	Invalid pad length for decipher.
	2080	O,P,H	Invalid PIN data.
	2040	O,P,H	Invalid PIN length.
	2020	O,P,H	PIN check length error.
	2010	O	PIN verification failure.

Appendix B. Statistical Counters

The controller records errors in statistical counters and extended statistical counters. The statistical counters record errors for each device and each component of the system, including all attached devices, as well as the:

- Host communication link
- Diskette drives
- Loop control
- DCA control
- DCA ports

Notes:

1. Statistical counters count the events of components at terminal addresses. Terminal groups are collectively counted by counters associated with the common terminal addresses. For example, five 3606s in a terminal group at terminal address 7 are counted as if they were one 3606 at terminal address 7. Thus, the counters do not distinguish between subaddresses within the terminal group.

2. The events counted include hardware errors (for example, machine failures) and improper operations (for example, incorrectly passing a magnetic stripe card through the magnetic stripe reader), or provide information (for example, indicating an out-of-forms condition or that the STOP PRINT key was pressed).

3. The statistical counters are lost at each startup (reset). In contrast, the controller log is on the diskette. Thus, this log is lost only on a cold start or a reset of the temporary file.

Extended Statistical Counters

The controller also maintains extended statistical counters, if you define them in the configuration process. The extended counters record total bytes received and bytes in error for input devices. The extended counters, if assigned to a loop, record the total slots received (both data and null) as well as the total error slots detected. The counts can be maintained for devices as well as for loops. You can assign many devices to one extended counter, and individual terminals to the same or different counters.

Note: To display, print, or reset the extended counters, you must load the optional module for the STATS instruction (ID = 25).

Extended statistical counters are loaded in functional storage and are lost (reset) at each startup.

Statistical Counters

Each statistical counter is discussed separately in the following form:

1. General Description

2. Counter Increases

3. Probable Cause

4. Action

Throughout this discussion, events causing the error counters to increase are in four categories:

1. Information

2. Soft Error

3. Hard Error

4. Protocol Error

It is important for you to understand what is implied by each category.

Information counters have no effect on the operation of the controller. Information counters are for diagnostic or system tuning purposes only.

Soft Errors can be recovered by the controller without affecting the application program. Normally, a soft error is caused by a transient disturbance on the host link. If the soft error persists, a hard error can result.

Hard Errors cause those stations in contact with the host at the time of failure to be posted with loss-of-contact status, and cause the controller to perform wrap tests on the communication adapter and optionally (under CPGEN control) the modem.

The result of a failing wrap test is written to the system log on the diskette. If the wrap test fails, inform the service representative for the failing component. The controller automatically resumes monitoring the line to reestablish contact with the host.

Long-term failures also cause hard errors, and may require the network or the control operator to take some action to restore operations. Application programs at both the host and controller should be designed for recovery from hard errors.

Protocol Errors are reported to the host at the next response opportunity. When the host acknowledges the error, all controller sessions are broken and loss-of-contact posted to all controller stations with outstanding I/O. Session can be reestablished with proper protocol. However, if it is a link level protocol error as opposed to a multi-bit transient disturbance, the problem will recur. In that event, inform the service representative.

The communication link is *initially started* as the result of the following:

- An appropriate response is entered after the startup message is displayed.
- A start link is requested by the control operator via the system monitor.
- A start link instruction is executed by the user application program.

The communication link is *stopped* as a result of the following:

- A stop link request is entered into the system monitor by the control operator.
- A stop link request is executed by the user application program.

Host Communication Link Statistical Counters

These counters report the status of the host communication link.

Counter 1: First and Ending Sequence Counter (Information)

General Description: A Set Normal Response Mode (SNRM) or a Set Disconnect Response Mode (SDRM) SDLC command has been received. The SNRM is used for the first contact sequence and SDRM is used for the final transmission sequence. When an SNRM is received, GMSILDM is set to 0. When SDRM is received GMSILDM is set to 1. GMSILRM must be equal to 1 (adapter enabled) for data to be received on the link. (Refer to the *4700 Principles of Operation* for descriptions of data area fields such as GMSILDM.)

Counter Increases: This counter increases every time an SNRM or SDRM is received. After the controller makes contact with the host, this counter increases by 1. If the cluster is subsequently deactivated, the count increases by 1. The counter is not increased by a loss-of-contact condition.

Probable Cause: The counter should increase under normal operation. If this counter never increases, the host has not polled this controller, the controller does not recognize the first contact sequence, or the line has been interrupted.

Action: If the counter does not increase:

1. Ensure that the controller has been brought online at the host.
2. Ensure that the communication adapter has been enabled by the appropriate start link command. If the adapter is enabled, GMSILRM is 1. The link can be started at IPL time by the system monitor or by the application program.
3. Check for a host control unit address and a controller address mismatch. This check is most important if this is a new or changed controller installation.
4. If a counter indicating a hard error has increased, inspect the log messages to see if an adapter or modem failure has been logged. If an adapter or modem failure has been logged, inform the appropriate service representative.
5. If the above checks do not show a correctable problem, inform service personnel.

Counter 2: Test Message Received Counter (Information)

General Description: An SDLC test message has been received without error and a response has been generated. This counter cannot increase unless the SDLC Link Level test has been initiated at the host site. It can be a useful installation verification test if the necessary configuration assemblies have not been completed or are suspect. If a test message was sent but was received in error, the message cannot be identified as a test message; hence, error counters are updated as for any message received in error. The response to a test message contains the

data received if the buffers are large enough to hold the message. If the message is too large for a read buffer, a response without data is generated.

Counter Increases: This counter increases each time a test message is received without error.

Probable Cause: This counter increases each time a test message is received. If the counter does not increase, either the host has not sent the message, the controller does not recognize its address, or there may be a link or modem problem. If this counter increases and no response is received, the problem is in the transmission path to the host site (either the modem or link is suspect).

Action: If the counter does not increase, use action steps 2 through 5 under Counter 1. If the counter increases but no response was received at the host, the transmit path from the controller to the host is suspect. Check, or have checked, the host and controller modems. If no problem is found, and a wrap test was successful at the controller and host, report the suspected link problem to the service representative responsible for the interconnecting link.

Counter 3: Write Retry Error Counter (Soft Error)

General Description: The controller was required to retry a previous write of a message because it was not acknowledged by the receiving unit. In SDLC, acknowledgment occurs on the next transmission from the receiver as a receive count. If the send count of the last message that was sent by the controller does not match the receive count returned, an error is detected. The amount of time before a message is acknowledged depends on the poll/select algorithm of the receiving unit.

Counter Increases: The counter increases for each occurrence of a message being retransmitted because the receiving unit did not acknowledge.

Probable Cause: The message was either not recognized as such or a Frame Check Sequence (FCS) error was detected by the host. If the leading SDLC flag byte is damaged, the message is not recognized by the host. If the trailing SDLC flag byte is damaged, it appears as an FCS error or a wrong-length message to the host. If any other message bits are in error, an FCS error occurs. Normally, the message damage is caused by a transient disturbance in the transmission path from the controller to the host.

There are many possible causes of transient disturbances on a telecommunication channel. It is important to understand that telecommunication channels are generally not completely error-free. Just some of the possible causes of transient disturbances are: cross talk between channels, atmospheric conditions, power surges and dropouts, electrostatic or electromagnetic interference from other exchange hardware, and other branch hardware. Other factors affecting the error rate are modem adjustments and quality of the telecommunication channel relative to phase jitter, frequency shift, and bandwidth parameters.

If the bit error rate of a channel is normal, the long-term average (30 minutes or more, sample period) bit error rate probably will not exceed 1 per 100,000 bits.

Note: The common carrier may not support this (or any) bit error rate criteria if its modems are not being used. However, many modem vendors, given that the common carrier channel is within specification, support similar criteria.

Action: As the bit error rate of a communication channel increases, the efficiency of the channel decreases because more time is spent in error recovery with less time available for data. The effect of this is generally a response time increase. If the disturbance is extended, counter 7 may increase(a hard error).

If counter 7 increases and/or counter 3 increases at a "high rate," inform the common carrier service representative. A high rate is a function of the transmitted block lengths and number during a counter monitor period. If this data is available or can be reasonably estimated, an accurate bit error rate can be calculated.

Counter 4: Time-out Error Counter (Hard Error)

General Description: A time-out error is recognized whenever the controller detects one of the following for the time specified in the configuration COMLINK macro:

- The line has been inactive (no SDLC flag bytes detected) or nonproductive (no valid SDLC frames received).
- The controller or modem clock has failed.

Counter Increases: The first time-out encountered after the initial start of the communication link but before establishing contact will be processed as a hard error and the counter increased.

Any time-out encountered after first contact (SNRM) and before disconnect (SDRM) is treated as a hard error and the counter increases. If a hard time-out error does not cause the communication adapter to be disabled, or if a disconnect is received, following time-outs are ignored until contact is established.

Probable Cause: If the system log message indicates the wrap tests were successful, there are many possible external failures or conditions that can cause the time-out. The most probable cause and recommended action are based on the operational conditions at the time of the error.

Action: First Installation:

1. May be a mismatch between the host CPGEN and the controller; check for a conformity of:
   - Control unit address.
   - NRZI/Non-NRZI encoding.
   - High-speed/low-speed selection.
   - Leased line/select standby link attachment.
   - Control request to send (on for a 2-wire or multidrop) or permanent request to send (on for 4-wire point-to-point only).
   - Data terminal ready (normally on).

   You can set the above parameters at controller configuration time and change them with the system monitor command 041. Determine the

installation's requirements and ensure conformity at the host and controller.

2. Use the first four action steps described for Counter 1.

3. If the above steps do not uncover the problem, inform the common carrier and/or modem service representative (if modem is not wrap testable).

Operational Installation--Failure at IPL (Counter 1 = 0)

Do steps 2 and 3.

Operational Installation--Failure after Contact (Counter 1 ≠ 0)

Check with the host network supervisor or await call. If the problem is external to the host complex, the loss of contact alert should automatically be presented to the network supervisor. The network supervisor should then inform the controller location to display the host link error message in the controller log. If the problem was in a critical path element at the host complex, the network supervisor knows the affected controllers and may place calls notifying them of the status and expected restoration time.

Counter 5: Overrun Error Counter (Soft Error)

General Description: A byte of data entering the controller was lost because the controller could not receive the data from the communication line during the allotted time.

Counter Increases: The counter increases each time an overrun is detected.

Probable Cause: The controller has malfunctioned.

Action: Consult the *IBM 4701 Operating Instructions*.

Counter 6: Underrun Error Counter (Soft Error).

General Description: A byte of data leaving the controller was lost because the controller could not place the data on the communication line in the al time interval.

Counter Increases: The counter increases each time an underrun is detected.

Probable Cause: The controller has malfunctioned.

Action: Consult the *IBM 4701 Operating Instructions*.

Counter 7: Connection Problem Error Counter (Hard Error)

General Description: The controller has made 20 successive unsuccessful attempts to transmit a message. Counter 3 reflects all retries.

Counter Increases: The counter increases each time 20 successive retries fail without an intervening successful transmission.

Probable Cause: The message was either not recognized as such or a Frame Check Sequence (FCS) error was detected by the host. If the leading SDLC flag byte is damaged, the message is not recognized by the host. If the trailing SDLC flag

byte is damaged, it appears as an FCS error or a wrong-length message to the host. If any other message bits are in error, an FCS error occurs. Normally, the message damage is caused by a transient disturbance in the transmission path from the controller to the host.

There are many possible causes of transient disturbances on a telecommunication channel. It is important to understand that telecommunication channels are generally not completely error-free. Just some of the possible causes of transient disturbances are: cross talk between channels, atmospheric conditions, power surges and dropouts, electrostatic or electromagnetic interference from other exchange hardware, and other branch hardware. Other factors affecting the error rate are modem adjustments and quality of the telecommunication channel relative to phase jitter, frequency shift, and bandwidth parameters.

If the bit error rate of a channel is normal, the long-term average (30 minutes or more, sample period) bit error rate probably will not exceed 1 per 100,000 bits.

Note: The common carrier may not support this (or any) bit error rate criteria if its modems are not being used. However, many modem vendors, given that the common carrier channel is within specification, support similar criteria.

Action: As the bit error rate of a communication channel increases, the efficiency of the channel decreases because more time is spent in error recovery with less time available for data. The effect of this is generally a response time increase. If the disturbance is extended, counter 7 may increase(a hard error).

If counter 7 increases and/or counter 3 increases at a "high rate," inform the common carrier service representative. A high rate is a function of the transmitted block lengths and number during a counter monitor period. If this data is available or can be reasonably estimated, an accurate bit error rate can be calculated.

Counter 8: Invalid Adapter Status Error Counter (Hard Error)

General Description: A communication adapter problem has been encountered.

Counter Increases: The counter increases when the controller encounters a communication adapter malfunction.

Probable Cause: A controller malfunction has occurred.

Action: Consult the *IBM 4701 Operating Instructions*.

Counter 9: Frame Check Sequence Error Counter (Soft Error)

General Description: A Frame Check Sequence (FCS) error was detected by the controller during the cyclic redundancy checking (CRC) of a message being received by the controller. This indicates that the message was received incorrectly and the controller did not acknowledge receiving it. The message is retransmitted until either it is successful or the sender declares a permanent error. If the sender declares a permanent error, a time-out is detected and counter 4 increases.

Counter Increases: The counter increases whenever an FCS error is detected by the controller.

Probable Cause: Refer to the Probable Cause for counter 3. The same comments apply, except here the transient disturbance is being introduced into the transmission path from the host to the controller.

Action: This counter increases by intermittent line errors; therefore, no action is required unless the counter is increasing on a regular basis (see discussion for counter 3).

Counter 10: Abnormal End Error Counter (Soft Error)

General Description: An invalid bit pattern (seven consecutive 1 bits) has been detected on the line by the controller. This can result because of a line error (similar to the FCS error) or because of a primary abort sequence. An example for using a primary abort sequence is the sender transmitting this sequence on an underrun condition.

Counter Increases: The counter increases when the invalid bit sequence is detected while receiving an SDLC frame addressed to this controller. The invalid (all 1 bits) bit stream may continue for some time but the counter increases once.

Probable Cause: A transient communication error has occurred or the sender has encountered an error condition during transmission.

Action: If this counter increases infrequently relative to the stepping rate of counter 9, it is probably due to transient communication channel errors; follow the counter-9 recommended action. It could be caused by high I/O rate demands on the host.

Counter 11: Data Communication Equipment Error Counter (Hard Error)

General Description: A line between the controller communications adapter and the data communication equipment (DCE) or modem has dropped, indicating that the modem is no longer available. This line is called the Data Set Ready (DSR) line. For an X.21 switched link, the controller adds one to this counter each time a "DCE Clear" occurs. DCE Clear is a soft error and requires no action.

Counter Increases: The counter increases if DSR drops during normal operation.

Probable Cause: A modem error has been detected. Usually this indicates that either the modem was powered off or unplugged.

Action: Ensure all cables are connected and that the modem is switched on. If the failure continues, inform modem service personnel.

Counter 12: Busy Counter (Information)

General Description: A message has been received and no receive buffers (number specified at CPGEN) are available. The message is retransmitted.

Counter Increases: This counter increases whenever a message is received and no buffer is available.

Probable Cause: The number of buffers specified in the COMLINK macro (configuration process input) is not enough for this application or the application programming is not reading the buffers fast enough.

Action: Modify the configuration process input to increase the number of read buffers or restructure the application program to clear the receive buffer sooner.

Counter 13: Command Reject Error Counter (Protocol Error)

General Description: The receiver of *n* messages transmitted from the controller acknowledged more than *n* messages received. For example, four messages were transmitted but five messages are acknowledged; this is an obvious error.

Counter Increases: The counter increases each time the error is encountered.

Probable Cause: Either a hardware or software malfunction, resulting in a protocol error, has occurred at the receiving site.

Action: If a value is ever found in this counter, inform your service representative.

Counter 14: Machine Check Error Counter (Hard Error)

General Description: The controller encountered a communications adapter failure while attempting to enable the adapter during a start link operation.

Counter Increases: The counter increases when the controller encounters an adapter malfunction.

Probable Cause: The controller has malfunctioned.

Action: Inform the service representative or take the controller to the service center.

Counter 15: Invalid Data Field (Protocol Error)

General Description: An SDLC command was received by the controller without error; however, the SDLC data field was not valid for this command. An SDLC command reject has been generated by the controller.

Counter Increases: The counter increases each time the error is encountered.

Probable Cause: Either a hardware or software malfunction, resulting in a protocol error, has occurred at the sender's location.

Action: The sending equipment (software or hardware) should be repaired.

Counter 16: Nonsupported Command Received (Soft Error)

General Description: An SDLC command was received by the controller without error, but the controller does not support the command. An SDLC command reject has been generated.

Counter Increases: The counter increases each time the error is encountered.

Probable Cause: Either a hardware or software malfunction, resulting in a protocol error, has occurred at the sender's location, or the SDLC protocol selected is not supported by the controller.

Action: The sending equipment (software or hardware) should be repaired or the correct SDLC protocol should be selected.

Counter 17: Receive line Dropped (Multiuse Loop and World Trade Only)

General Description: The line indicating the presence of a host on the IBM multi-use loop (World Trade only) has been down.

Counter Increases: This counter increases 4 seconds after a time-out (counter 4) if the RLSD line is not active for that period.

Probable Cause: The problem is external to the 4700 controller and is probably caused by:

- Bad or improperly installed cables
- A problem at the host

Action: Ensure that all cables between the host and the controller are operational. If they are, inform the host operator.

Counter 18: CTS Transition During Write (Multi-Use Loop and

World Trade Only)

General Description: Clear-to-Send line signal dropped while a write was in progress indicating a hardware error.

Counter Increases: This counter increases whenever an internal count of CTS (Clear-to-Send) transition is reached and performance is severely impacted. Normally, you can recover from CTS transition problems.

Probable Cause: Controller communications adapter failure.

Action: Inform your service representative.

Counters 19-24: Reserved

BSC Host Communication Link Statistical Counters

Counter 1: Poll Counter (Information)

General Description: A valid poll sequence for this controller has been received. GMSILDM is set to zero when a poll is received.

The counter continually increases during normal operation. If the counter is not increasing, the host is not polling this controller, the controller does not recognize the poll sequence, or the line has been interrupted.

Counter Increases: This counter increases every time a valid poll sequence is received by the controller.

Probable Cause: If the counter does not increase, the host computer is not polling this controller or the controller does not recognize the poll sequence. Reasons include:

1. Wrong address in polling sequence.

2. The line has been interrupted.

3. The link has not been started.

Action: If the counter is not increasing:

1. Ensure that BSC has been loaded and a start-link command issued. BSC is loaded if the first 4 characters (displayed/printed) of this statistical counter group are 9015. If there is any doubt that the link has been started, issue the control operator command 041. Another check is to display GMSIND. If the link is started (communication adapter enabled), GMSIND = x1xx xxxx, and if also in contact with the host, GMSIND = 01xx xxxx.

2. Check that the host-defined control unit and device addresses match the actual controller addresses.

3. If a counter indicating a hard error increases, inspect the log message to see if the adapter or modem wrap test failed, and contact the appropriate service representative.

4. Ensure that a proper communication line connection has been made.

5. If the link has been started but the counter is not increasing, check whether any other counters are increasing, and if so, refer to the discussion of each.

Counter 2: Test Request Counter (Information)

General Description: A test request was received without error by the controller and a response has been sent. This counter cannot increase unless the BSC link-level test has been initiated at the host site. If a test message is received in error, the normal error recovery action is taken.

Counter Increases: The counter increases every time a test request has been received without error. The test request sequence consists of an SOH followed by the percent (%) sign.

Probable Cause: If this counter does not increase when a test request has been sent by the host, a proper connection has not been established or the test request sequence is incorrect.

Action

1. Ensure that the test request sequence is correct.

2. Check whether counter 15 has increased. If not, take the action specified for counter 1.

3. If the counter has increased but no response was received at the host, the transmit path from the controller to the host is suspected. Check the host and controller modems. If no problem is found and the wrap tests are successful at the controller and host, report suspected link problems to the service representative responsible for the inter-connecting link.

Counter 3: Write Retry Counter (Soft Error)

General Description: A controller write retry has occurred because a negative response (NAK) was received to data sent to the host. (The previous transmission has been sent again.)

Counter Increases: This counter increases whenever the controller receives a NAK response to a message it transmitted to the host.

Probable Cause: A BSC error occurred at the host, and the host requested a re-transmission of the message (might be an intermittent line error).

There are many possible causes of transient disturbance on a telecommunication channel. Also, it is important to remember that telecommunication channels are generally not completely error-free because of the channel environment and state-of-the-art technology. Some of the possible causes of transient disturbance are: cross talk between channels, atmospheric conditions, power surges/dropouts, electrostatic or electromagnetic interference from other exchange equipment or other branch equipment. Other factors affecting the error rate are modem adjustments and quality of the telecommunication channel relative to phase jitter, frequency shift, and bandwidth parameters.

If the bit error rate of a channel is "normal", the long term (30 minutes or more) average bit error rate can be expected to not exceed 1 per 100,000 bits.

Note: The common carrier may not support this (or any) bit error rate criteria if their modems are not being used. However, many modem vendors do support similar criteria, if the common carrier channel is within specification.

Action: As the bit error rate of a communication channel increases, the efficiency of the channel decreases, because more time is spent in error recovery with less time available for data. The effect of this is generally a response time increase. If the disturbance is for an extended duration, counter 7 may increase (a hard error).

If counter 7 is increasing and/or counter 3 is increasing at a high rate, contact the common carrier service representative. A high rate of stepping is a function of the transmitted block lengths and number during a counter monitor period. If this data is available or can be reasonably estimated, an accurate bit error rate can be calculated.

Counter 4: Time-out Error Counter (Hard Error)

General Description: A time-out error is recognized whenever the controller detects one of the following for the period specified in the COMLINK macro:

1. The line has been inactive (no POLL/SELECT sequence detected) or a nonproductive time-out has occurred (that is, no end character received on a controller read).

2. The controller or modem clock has failed.

Counter Increases: The counter increases each time a time-out is detected.

Probable Cause: Many possible external failures or conditions can cause the time-out. The most probable cause and recommended action are based on the operational conditions at the time of the error.

Action First installation:

1. May be a mismatch between the system generation and the controller configuration; check for conformity of:

   - Control unit addresses
   - Internal or modem clocking
   - High-speed/low-speed selection
   - Leased-line link attachment
   - Control request to send (on for a 2-wire or multi-drop) or permanent request to send (on for 4-wire point-to-point only)
   - Data terminal ready (normally on).

   The above parameters can be set at configuration time and changed via the control operator command 041 when the link is in a stopped state. Determine the installation's requirements and ensure conformity at the host and controller.

2. Use action steps 1 through 5 under "Counter 1-Poll Counter (Information)".

3. If the above actions do not uncover the problem, inform the common carrier and/or modem service representative (if the modem cannot be wrap tested).

   Operational Installation - Failure at IPL (counter 1=0): Do steps 2 and 3 above.

   Operational Installation - failure after contact (counter 1≠0): Do steps 2 and 3 above. Check with the host network supervisor or wait for a call. If the problem is external to the host, the loss-of-contact alert should be presented automatically to the network supervisor. The network supervisor should then inform the controller location to display the host link error message in the system log. If the problem was in a critical path element at the host complex, the network supervisor will know the affected controllers and may place calls notifying them of the status and expected restoration time.

Counter 5: Overrun Error Counter (Soft Error)

General Description: A byte of data entering the controller was lost because the controller was did not receive the data from the communication line during the allowed time interval.

Counter Increases: The counter increases each time an overrun is detected. If the problem still exists after seven successive retries, it is considered a hard error.

Probable Cause: The controller has malfunctioned.

Action: Inform your service representative.

Counter 7: Connection Problem Error Counter (Hard Error)

General Description: The controller has made seven successive unsuccessful attempts to transmit a message. Counter 3 reflects all retries.

Counter Increases: The counter increases each time seven successive retries fail without an intervening successful transmission.

Probable Cause: See Counter 3 for probable cause description.

Action: See Counter 3 description for required action.

Counter 8: Invalid Adapter Status Counter (Hard Error)

General Description: A communication adapter problem has occurred.

Counter Increases: The counter increases when the controller encounters a communication adapter malfunction.

Probable Cause: The communication adapter malfunctioned.

Action: Inform your service representative.

Note: Increasing counter 8 and counter 14 are both caused by a communication adapter malfunction. The malfunction is recorded in separate counters for diagnostic purposes.

Counter 9: Block Check Error Counter (Soft Error)

General Description: An input message was received from the host, and the block check test failed, These two events occurring together indicate that the message was received incorrectly. The 4700 responded with a NAK requesting the host to retransmit the message.

Counter Increasing.: The counter increases whenever the controller encounters a Block Check error.

Probable Cause: See the Probable Cause discussion for counter 3. The same comments apply, except that here the transient disturbance is being introduced into the transmission path from the host to the controller.

Action: This counter is stepped by intermittent line errors; therefore, no action is required unless the counter is increasing on a regular basis (see discussion for counter 3).

Counter 10: Primary Abort Counter (Information)

General Description: The host requests the controller to stop transmitting data, to ignore the incoming message, or to retain the line, but the host is not ready to transmit immediately.

Counter Increases: The counter increases whenever the controller receives a forward abort sequence, temporary text delay sequence, or an EOT response to data.

Probable Cause

1. The host encountered a control character in its data stream (non-transparent mode).

2. The host cannot continue to receive data and send an EOT response to a message.

3. The host wants to retain the line but is not ready to transmit to the 4700.

Action

1. Check whether there are any control characters in the host data stream (non-transparent mode).

2. Check whether the host has enough buffers.

3. Depending on the application, no action may be required. The TTD sequence is valid BSC protocol sequence and will be honored by the 4700 system. Also, if the 4700 receives an EOT response to a message, the message will be retransmitted the next time the controller is polled.

Counter 11: Data Communication Equipment Error Counter (Hard Error)

General Description: A modem error was detected by the controller.

Counter Increases: The counter increases whenever the controller detects a modem malfunction.

Probable Cause

1. The modem is not connected to the controller.

2. The modem is not powered on.

3. The modem failed.

Action

1. Ensure that the modem is powered on and connected to the controller.

2. Inspect the 4700 log messages to determine whether the adapter wrap tests failed. If so, inform your service representative. Otherwise inform the modem personnel.

Counter 12: Secondary Busy Counter (Information)

General Description: The host sent a selection sequence to the controller requesting it to receive a message, and the controller has no available buffers. A negative response (NAK) was set by the controller.

Counter Increases: The counter increases whenever a NAK to selection is sent, because no read buffers are available.

Probable Cause: The number of buffers specified by the COMLINK macro is not enough for this user's application program, or the the user application program is not reading the buffers fast enough.

Action: Modify COMLINK macro to increase the number of read buffers or restructure the application program to clear the communication read buffers sooner.

Counter 13: Sequence Error (Soft Error)

General Description: The 4700 encountered an incorrect line protocol sequence.

Counter Increases: An ENQ, incorrect ACK, or a 3-second time-out occurred while awaiting a host response.

Probable Cause: The host and controller are out of sequence, the communication line was temporarily disturbed, the host application program is delaying the response (because of structure) or it is being delayed because of a system resource overload.

Action: If counter 13 is increasing infrequently relative to counters 3 and 9, it is probably caused by communication line disturbance and can be ignored.

Counter 14: Adapter Check Counter (Hard Error)

General Description: The controller encountered a communication adapter failure while attempting to address the communication adapter.

Counter Increases: The counter increases whenever the 4700 encounters an adapter malfunction.

Probable Cause: An adapter hardware failure occurred, or the adapter is missing.

Action: Inform your service representative.

Counter 15: Select Counter (Information)

General Description: A valid selection sequence for this controller has been received. GMSILDM is set to zero when a select is received, The counter should be continually stepped under normal operation. If the counter is not increasing, the host is not selecting this controller, the controller does not recognize the selection sequence, or the line has been interrupted.

Counter Increases: This counter increases every time a valid selection sequence is received by the controller.

Probable Cause: If the counter is not increasing, the host is not selecting this controller, or the controller does not recognize the selection sequence. Reasons include:

1. Wrong address in select sequence.
2. The line has been interrupted.
3. The link has not been started.

Action: If the counter is not stepping, see action specified for counter 1.

Device Cluster Adapter (DCA) Statistical Counters

The DCA statistical counters record the status of the DCA adapter and each port on the adapter. Device statistics are also recorded for each device assigned to a DCA port.

DCA Adapter Counter Descriptions

Counter 1: Over-63 Error

General Description: This counter increases to indicate that 63 keystrokes, status, and/or errors were transferred to storage before the controller could service them. The DCA stopped all data transfer until the controller could service this condition.

Probable Cause: A device malfunction or control program problem.

Action: The second counter associated with each port ('Terminal Shutdown' counter), if stepped, should identify the port associated with this error.

Counter 2: Read Time-out

General Description: No response was received to a read command.

Probable Cause: A failure in the device, the coaxial connection, or the controller.

Action: To determine the port or ports associated with this failure, check the device counters for each DCA device to determine whether I/O failures have been recorded for that device.

Counter 3: Transmission Turnaround Error or Read Line Parity Error

General Description: This counter increases when data is received from the device as the result of a read command and the data contains bad parity or, as the result of a write command, a bad response is detected.

Probable Cause: A device malfunction, bad coaxial connection from the device to the controller, or a malfunctioning controller.

Action: To determine the port or ports associated with this failure, check the device counters for each DCA device to determine whether I/O failures have been recorded for that device.

Counter 4: Read Data Parity Error

General Description: A read data parity error occurs when the response to a read command contains a data parity error.

Probable Cause: A device malfunction, bad coaxial connection from the device to the controller, or a malfunctioning adapter.

Action: To determine the port or ports associated with this failure, check the device counters for each DCA device to determine whether I/O failures have been recorded for that device.

Counter 5: Stop Poll Set in Status

General Description: Stop poll indicates that the DCA stopped polling because of an invalid command sequence ending.

Probable Cause: A command sequence was started when data was scheduled to be cycle-stolen into storage. This is probably not an error.

Action: No action is required unless you are experiencing I/O failures that cannot be explained by any other error.

Counter 6: Reserved

Counter 7: Entry in Error Queue

General Description: This counter increases each time an error queue entry is brought into storage.

Action: To determine the port or ports associated with this failure, check the port counters associated with each port and follow the action specified for these counters.

Counter 8-11: Reserved

Counter 12: Invalid Port ID in Queue Entry

General Description: This counter increases each time a data byte consisting of either keystroke, status, or error information is transferred into the controller and port identification associated with the data byte was invalid.

Probable Cause: The controller malfunctioned.

Action: Refer to the *IBM 4700 Subsystem Problem Determination Guide.*

Counter 13: No Extended Status Bits

General Description: DCA status was received by the controller that indicated that one or more of those conditions that are recorded in adapter counters 1-5 (over-63 error, read time-out transmission-turnaround error or read line- parity error, read-data parity error, and stop-poll set in status) occurred, but the status received by the controller did not show any of these conditions to be present.

Probable Cause: The controller malfunctioned.

Action: Refer to the *IBM 4700 Subsystem Problem Determination Guide.*

Counter 14: DCA Machine Check Status

General Description: Machine check status indicates that a hardware malfunction or an illegal command was detected.

Probable Cause: There may be a malfunctioning controller or a problem with the control program.

Action: Refer to the *IBM 4700 Subsystem Problem Determination Guide.*

DCA Port Counter Descriptions

Counter 1: 32nd Poll Retry Occurred

General Description: This counter increases each time a polling error occurs and the next 32 retries also fail. Only the original error was recorded in the appropriate counter (poll time-out or poll error). Following retries were not recorded.

Probable Cause: The device has been powered off or disconnected, a device malfunction, or a bad coaxial connection from the device to the controller.

Action: Ensure that a device is connected to the port in question and that the device is powered on. Refer to the *IBM 4700 Subsystem Problem Determination Guide.*

Counter 2: Terminal Shutdown

General Description: Terminal shutdown by the system occurs when a device has been determined to be responsible for a DCA 63-counter error.

Probable Cause: There may be a device malfunction that caused continual input of data to the controller, or a problem with the control program.

Action: Refer to the *IBM 4700 Subsystem Problem Determination Guide.*

Counter 3: Poll Time-out

General Description: Poll time-out indicates that the device has not responded to a poll command in the allowable time and the adapter timed out. The adapter retries the poll for a maximum of 32 times. The following time-outs during retry are not recorded in this counter. If the problem persists for the maximum number of retries (32), Port Counter 1 ('32nd Poll Re-try occurred') increases.

Probable Cause: The device has been powered off, disconnected, or malfunctioned, a bad coaxial connection from the device to the controller, or a malfunctioning controller.

Note: If Port Counter 1 ('32nd Poll Re-try occurred') has not increased with this counter, the problem is intermittent.

Action: Ensure that the coaxial cable is connected to the device and to the controller. If this not the cause of the problem, refer to the *IBM 4700 Subsystem Problem Determination Guide.*

Counter 4: Poll Error

General Description: A poll error indicates that a poll response contained a line parity error or an invalid ending sequence. The controller retries the poll for a maximum of 32 times. The following problems during retry are not recorded in this counter. If the problem persists for the maximum number of retries (32), port counter 1 ('32nd poll retry occurred') increases.

Probable Cause: The device has been powered off or disconnected, a device malfunction, or a bad coaxial connection from the device to the controller.

Note: If Port Counter 1 ('32nd poll retry occurred') has not increased with this counter, the problem is intermittent.

Action: Ensure that the coaxial cable is securely connected to the device and the controller. If this is not the cause of the problem, refer to the *IBM 4700 Subsystem Problem Determination Guide.*

Counter 5: Stray Operation Complete Interrupt

General Description: The system received an unexpected operation complete interrupt.

Probable Cause: The device malfunctioned, or there is a problem with the control program.

Action: Refer to the *IBM 4700 Subsystem Problem Determination Guide.*

Counter 6: Feature Error

General Description: The device reported an error associated with a feature on the device or the CPGEN indicated the device has a feature that was not present on the attached device.

Probable Cause: There may be a device malfunction.

Action: Refer to the *IBM 4700 Subsystem Problem Determination Guide.*

Counter 7: Device Check

General Description: The device reported an error associated with the device.

Probable Cause: There may be a device malfunction.

Action: Refer to the *IBM 4700 Subsystem Problem Determination Guide.*

Counter 8: Device/CPGEN Mismatch

General Description: This condition reflects a mismatch between the type of device specified in the CPGEN for connection to this port and the actual device that was connected to this port.

Probable Cause: A display is connected to a port that has been defined for a printer, or vice versa.

Action: Correct the CPGEN or connect the correct terminal to this port.

Diskette Statistical Counters

Counter 1: Intervention required counter.

General Description: This counter indicates the number of times the diskette drive handle was opened. The count can also indicate the diskette is not rotating or the rotation speed is not within limits.

Probable Cause

1. The operator has removed or replaced the diskette in the drive.

2. If the drive handle has not been opened, the cause is a hardware failure.

Action

1. If the cause is removal of diskettes, no action is needed. This counter is for your information only.

2. If this counter is stepped and the cause is not from opening the drive handle, hardware malfunction is the problem. For intermittent errors, automatic retry has correctly taken care of each incident. However if this problem persists, inform your service representative.

Counter 2: Command reject.

General Description: The controller diskette logic encountered an incompatible condition in its internal checking.

Probable Cause: The controller diskette logic encountered an incompatible condition in its internal checking.

Action: For intermittent errors, automatic retry has correctly taken care of each incident. However if this problem persists, inform your service representative.

Counter 3: No record found.

General Description: The diskette processing hardware and logic was unable to find the sector (cylinder, head, and sector number) when an I/O operation was requested.

Probable Cause.

1. An invalid (nonexistent) absolute diskette address was requested by an application program.

2. An invalid (nonexistent) absolute diskette address was computed by the controller when processing an I/O request for a data record in a temporary file, permanent file or data set. This is a controller error.

3. The diskette is faulty. It is because of physical damage or wear or it was not formatted with correct diskette IDs on the diskette.

Action

1. Correct the program to request a valid absolute address.

2. Call your service representative.

3. Replace the faulty diskette.

Counter 4: CRC - Cyclic Redundancy Check

General Description: The computed CRC and the CRC read from the diskette do not match.

Probable Cause

1. The diskette was physically damaged or has encountered wear since the sector was last written.

2. A hardware malfunction has occurred.

Action

1. Replace the faulty diskette.

2. For intermittent errors, automatic retry has correctly taken care of each incident. However if this problem persists, inform your service representative.

Counter 5: Bad diskette format.

General Description: The diskette does not meet standards.

Probable Cause

1. The diskette was physically damaged or has encountered wear. This could be a hard or soft error. The diskette was not formatted or written according to standards. This is a hard error and automatic retry will not succeed.

2. Hardware error.

Action

1. Replace the faulty diskette with a good one.

2. For intermittent errors, automatic retry has correctly taken care of each incident. However if this problem persists, inform your service representative.

Counter 6: Diskette hardware malfunction.

General Description: An asynchronous interruption from the diskette was lost.

Probable Cause Hardware or controller failure.

Action: For intermittent errors, automatic retry has correctly taken care of each incident. However if this problem persists, inform your service representative.

Counter 7: Seek failure.

General Description: The diskette processing hardware was unable to find the cylinder given for the I/O operation.

Probable Cause

1. An absolute diskette address was requested by an application program, but the cylinder number was invalid.

2. The diskette is faulty. It is because of physical damage or wear.

3. An absolute diskette address was requested by the controller access method, but the cylinder number was invalid.

4. A hardware malfunction occurred.

Action

1. Correct the program to request valid absolute addresses.
2. Replace the faulty diskette.
3. For intermittent errors, automatic retry has correctly taken care of each incident. However if this problem persists, inform your service representative.

Counter 8: Overrun

General Description: One or more data bytes were lost entering the controller.

Probable Cause: The total cycles needed to process all concurrent I/O from all I/O sources exceeded the available supply.

Action: No action if this counter is only stepped occasionally. Automatic retry has correctly taken care of each incident. However if this counter is stepped often and excessively, examine your overall application-I/O loading of the system, or call your service representative if I/O loading is normal.

Loop Control Counters

When any of the loop-control counters, except Counter 2, shows a count, check the controller log for an 11 005 message (see Chapter 3).

Counter 1: Syncronization (Loop Outage)

General Description: A loop outage is suspected when invalid bit combinations are received from the loop. This condition is indicated when synchronization cannot be reestablished by recovery procedures; that is, the controller cannot locate or stay in synchronization with the loop framing character.

Counter Increases: When all recovery actions fail, the counter increases to note a loop circuit failure. In addition to increasing the counter, the failure sets a bit in the GMSLOP byte of GMS to indicate the failing loop. The GMS field may be interrogated by the application program.

A wrap test is also done to the loop adapter and modem (if present). A message is then written to the controller log which identifies the failing loop (adapter or modem if the wrap test failed).

Probable Cause: There may be a loop circuit failure. This may be caused by an unplugged or broken loop cable, common carrier circuit outage, 3603 with power off or defective.

Action: Refer to the *IBM 4700 Subsystem Problem Determination Guide.*

Counter 2: Noise (Slot Damage)

General Description: Slot damage is suspected when data or commands are not received correctly from a slot on the loop. This condition is indicated when the data received on any given slot violates the loop protocol.

Counter Increases: This counter increases once each time sixteen or more errors are detected in a measured interval of 16 x 85000 bits. (The counter increases only once per 16 x 85000 bits). No message is written to the controller log.

Probable Cause: There may be faulty or loose loop cables, loop connectors, and/or bypass relays, or terminals being powered off and on. For remote loops you may also have lines that are performing in a degraded mode.

Action: If this counter is greater than 127 and you suspect your performance has been degraded, inform your service representative. The counter is of particular significance if it is changing at a relatively high rate over a short period of time (10 minutes, for example). If the counter has a high value, but it is no longer changing, the problem may have been intermittent and no longer exists.

Counter 3: Loop Adapter Check

General Description: This indicates a loop adapter check has occurred.

Counter Increases: For every occurrence of a loop adapter check, a message is written to the controller log and the counter increases.

Probable Cause: The loop adapter is missing but was defined for the configuration, or the loop adapter is failing.

Action: Have the missing loop adapter installed, replace failing loop adapter, or modify the configuration to match current hardware configuration. When there is a count in this counter, check the controller log for an 11 005 message.

Counter 4: Adapter Wrap Failure

General Description: This indicates that the loop adapter failed to correctly wrap test data from the output circuitry to the input circuitry on the loop adapter. A wrap is attempted whenever loop outage occurs.

Counter Increases: The counter increases whenever the wrap test fails. A message is also written to the controller log.

Probable Cause: The loop adapter failed.

Action: Call your service representative.

Counter 5: Reserved

Counter 6: Propagation Delay

General Description: The loop has too many devices configured.

Counter Increases: The counter increases every time a write completes that has a propagation delay. The counter increases for good or bad status I/O.

Probable Cause: The loop has too many devices configured.

Action: Remove some of the devices.

Terminal Component Counters

4704-1 Keyboard

Counter 1: Loop Error (Status 0200)

Counter Increases

- The loop fails during input or output.
- An operation is requested, but the loop has not been started.

Counter 2: Terminal Loop Adapter Error (Status = 0201)

General Information: If a terminal is powered off and an input/output operation (LREAD, LWRITE, or LCHECK) is attempted by the application program, a status of 0201 is returned and this counter increases for each attempt. Therefore, this count can get quite high if I/O operations are continued after the error is reported.

Counter Increases

1. An I/O command is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or a wrong address is set).
2. Output data is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or the terminal address is changed during operation).
3. An attention is received from a component other than those indicated in the configuration generation process (for example, a 3604 on a 3612 address).
4. An ambiguous situation arises during an I/O operation. This occurs when the state of the terminal loop adapter is unpredictable and a reset must be sent. (For example, turning power on or off on another component while operating causes a bit-shift and the data may be interpreted by the terminal loop adapter as a command.)
5. An I/O request is made to a component whose terminal loop adapter has been previously determined to be not operational.

Counter 3: Device Errors

General Description: There is keyboard overrun, or a magnetic stripe reader error.

Probable Cause: The operator keyed more than 62 characters while a write was in progress to the display, or someone passed a magnetic stripe through the reader too quickly or with an uneven motion.

Counter 4: Translation Error

General Description: The input could not be processed due to a translation error.

Probable Cause: An input scan code was not found in the translation table.

Action: Re-define the translation table; use the SCRANGE option to define scan codes not in the basic table.

Counter 5: Segment Overflow

General Description: Input cannot be processed; the input would cause the segment to overflow.

Probable Cause: The application program segment specified by LREAD is smaller that the amount of data entered.

Action: Change the CPGEN to specify a larger segment, or change the application program to specify a larger input buffer. Note that a translation table can translate one character into several characters.

4704-1 Display

Counter 1: Loop Error (Status 0200)

Counter Increases

- The loop fails during input or output.
- An operation is requested, but the loop has not been started.

Counter 2: Terminal Loop Adapter Error (Status = 0201)

General Information: If a terminal is powered off and an input/output operation (LREAD, LWRITE, or LCHECK) is attempted by the application program, a status of 0201 is returned and this counter increases for each attempt. Therefore, this count can get quite high if I/O operations are continued after the error is reported.

Counter Increases

1. An I/O command is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or a wrong address is set).
2. Output data is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or the terminal address is changed during operation).
3. An attention is received from a component other than those indicated in the configuration generation process (for example, a 3604 on a 3612 address).
4. An ambiguous situation arises during an I/O operation. This occurs when the state of the terminal loop adapter is unpredictable and a reset must be sent. (For example, turning power on or off on another component while operating causes a bit-shift and the data may be interpreted by the terminal loop adapter as a command.)
5. An I/O request is made to a component whose terminal loop adapter has been previously determined to be not operational.

4704-1 Magnetic Stripe Encoder

Counter 1: Loop Error (Status 0200)

Counter Increases

- The loop fails during input or output.
- An operation is requested, but the loop has not been started.

Counter 2: Terminal Loop Adapter Error (Status = 0201)

General Information: If a terminal is powered off and an input/output operation (LREAD, LWRITE, or LCHECK) is attempted by the application program, a status of 0201 is returned and this counter increases for each attempt. Therefore, this count can get quite high if I/O operations are continued after the error is reported.

Counter Increases

1. An I/O command is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or a wrong address is set).
2. Output data is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or the terminal address is changed during operation).
3. An attention is received from a component other than those indicated in the configuration generation process (for example, a 3604 on a 3612 address).
4. An ambiguous situation arises during an I/O operation. This occurs when the state of the terminal loop adapter is unpredictable and a reset must be sent. (For example, turning power on or off on another component while operating causes a bit-shift and the data may be interpreted by the terminal loop adapter as a command.)
5. An I/O request is made to a component whose terminal loop adapter has been previously determined to be not operational.

Counter 3: Device Error

General Description: There is a format or encoding error.

Probable Cause: The system cannot make the encoder ready or cannot encode. The encoder might have rejected the message. The user might have moved the stripe improperly. The encoder might have malfunctioned.

Action: If the problem persists, inform the service representative.

4704-2/3 Keyboard

Counter 1: DCA Error (Status 0200)

General Description: The DCA stopped, or experienced an error while the program attempted I/O.

Counter Increases: The counter increases for each occurrence.

Probable Cause: There is a hardware error.

Action: Try to start the DCA. See the *4700 Problem Determination Guide.*

Counter 2: Port/Cable/Terminal Error (Status 0201)

General Description: The program attempted to read from a keyboard that is disconnected, powered off, or connected to a deactivated port.

Counter Increases: The counter increases for each occurrence.

Probable Cause The device has not been connected or powered on, the operator deactivated the port, or there is a hardware error.

Action: Check that the terminal and port are active and powered on. See the *4700 Problem Determination Guide.*

Counter 3: Reserved

Counter 4: Translation Check (Status 2000)

General Description: A character is not in the input translation table.

Counter Increases: The counter increases for each occurrence.

Probable Cause: The translation table or application program is in error.

Action: Check the translation table and application program to be sure that all needed characters are in the translation table.

Counter 5: Segment Overrun (Status 0101)

General Description: The input message is longer than the application program input area.

Counter Increases: The counter increases for each occurrence.

Probable Cause: The message length exceeded the space:

- between the PFP and the end of the segment
- Provided in the FLI, when the FLI is not 0, but is less than or equal to the length between the PFP and the end of the segment.

Action: Provide enough segment space for the message or, if the end of the message is unexpected, change the FLI.

Counters 6-15: Reserved

4704-2/3 Display

Counter 1: DCA Error (Status 0200)

General Description: The DCA stopped, or experienced an error while the program attempted I/O.

Counter Increases: The counter increases for each occurrence.

Probable Cause: There is a hardware error.

Action: Try to start the DCA. See the *4700 Problem Determination Guide*.

Counter 2: Port/Cable/Terminal Error (Status 0201)

General Description: The program attempted to write to a display that is disconnected, powered off, or connected to a deactivated port.

Counter Increases: The counter increases for each occurrence.

Probable Cause The device has not been connected or powered on, the operator deactivated the port, or there is a hardware error.

Action: Check that the terminal and port are active and powered on. See the *4700 Problem Determination Guide*.

Counter 3-4: Reserved

Counter 5: Keyboard POR test failure

General Description: A hardware error occurred.

Action: See the *4700 Problem Determination Guide*.

Counter 6: Magnetic device POR failure

General Description: A hardware error occurred.

Action: See the *4700 Problem Determination Guide*.

Counter 7: Device patch error

General Description: A hardware error occurred.

Action: See the *4700 Problem Determination Guide*.

Counter 8-12: Reserved

4704-2/3 Magnetic Stripe Encoder

Counter 1: DCA Error (Status 0200)

General Description: The DCA stopped, or experienced an error while the program attempted I/O.

Counter Increases: The counter increases for each occurrence.

Probable Cause: There is a hardware error.

Action: Try to start the DCA. See the *4700 Problem Determination Guide.*

Counter 2: Port/Cable/Terminal Error (Status 0201)

General Description: The program attempted to write to a display that is disconnected, powered off, or connected to a deactivated port.

Counter Increases: The counter increases for each occurrence.

Probable Cause The device has not been connected or powered on, the operator deactivated the port, or there is a hardware error.

Action: Check that the terminal and port are active and powered on. See the *4700 Problem Determination Guide.*

Counter 3: Device Error

General Description: There is a format or encoding error.

Probable Cause: The system cannot make the encoder ready or cannot encode. The encoder might have rejected the message. The user might have moved the stripe improperly. The encoder might have malfunctioned.

Action: If the problem persists, inform the service representative.

3604 Keyboard

Counter 1: Loop Error (Status 0200)

Counter Increases

- The loop fails during input or output.
- An operation is requested, but the loop has not been started.

Counter 2: Terminal Loop Adapter Error (Status = 0201)

General Information: If a terminal is powered off and an input/output operation (LREAD, LWRITE, or LCHECK) is attempted by the application program, a status of 0201 is returned and this counter increases for each attempt. Therefore, this count can get quite high if I/O operations are continued after the error is reported.

Counter Increases

1. An I/O command is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or a wrong address is set).
2. Output data is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or the terminal address is changed during operation).

3. An attention is received from a component other than those indicated in the configuration generation process (for example, a 3604 on a 3612 address.

4. An ambiguous situation arises during an I/O operation. This occurs when the state of the terminal loop adapter is unpredictable and a reset must be sent. (For example, turning power on or off on another component while operating causes a bit-shift and the data may be interpreted by the terminal loop adapter as a command.)

5. An I/O request is made to a component whose terminal loop adapter has been previously determined to be not operational.

Counter 3: Device Errors

General Description: There is keyboard overrun, or a magnetic stripe reader error.

Probable Cause: The operator keyed more than 62 characters while a write was in progress to the display, or someone passed a magnetic stripe through the reader too quickly or with an uneven motion.

Counter 4: Translation Error

General Description: The input could not be processed due to a translation error.

Probable Cause: An input scan code was not found in the translation table.

Action: Re-define the translation table; use the SCRANGE option to define scan codes not in the basic table.

Counter 5: Segment Overflow

General Description: Input cannot be processed; the input would cause the segment to overflow.

Probable Cause: The application program segment specified by LREAD is smaller that the amount of data entered.

Action: Change the CPGEN to specify a larger segment, or change the application program to specify a larger input buffer. Note that a translation table can translate one character into several characters.

3604 Display

Counter 1: Loop Error (Status 0200)

Counter Increases

- The loop fails during input or output.
- An operation is requested, but the loop has not been started.

Counter 2: Terminal Loop Adapter Error (Status = 0201)

General Information: If a terminal is powered off and an input/output operation (LREAD, LWRITE, or LCHECK) is attempted by the application program, a status of 0201 is returned and this counter increases for each attempt. Therefore,

this count can get quite high if I/O operations are continued after the error is reported.

Counter Increases

1. An I/O command is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or a wrong address is set).

2. Output data is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or the terminal address is changed during operation).

3. An attention is received from a component other than those indicated in the configuration generation process (for example, a 3604 on a 3612 address).

4. An ambiguous situation arises during an I/O operation. This occurs when the state of the terminal loop adapter is unpredictable and a reset must be sent. (For example, turning power on or off on another component while operating causes a bit-shift and the data may be interpreted by the terminal loop adapter as a command.)

5. An I/O request is made to a component whose terminal loop adapter has been previously determined to be not operational.

3604 Magnetic Stripe Encoder

Counter 1: Loop Error (Status 0200)

Counter Increases

- The loop fails during input or output.

- An operation is requested, but the loop has not been started.

Counter 2: Terminal Loop Adapter Error (Status = 0201)

General Information: If a terminal is powered off and an input/output operation (LREAD, LWRITE, or LCHECK) is attempted by the application program, a status of 0201 is returned and this counter increases for each attempt. Therefore, this count can get quite high if I/O operations are continued after the error is reported.

Counter Increases

1. An I/O command is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or a wrong address is set).

2. Output data is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or the terminal address is changed during operation).

3. An attention is received from a component other than those indicated in the configuration generation process (for example, a 3604 on a 3612 address).

4. An ambiguous situation arises during an I/O operation. This occurs when the

state of the terminal loop adapter is unpredictable and a reset must be sent. (For example, turning power on or off on another component while operating causes a bit-shift and the data may be interpreted by the terminal loop adapter as a command.)

5. An I/O request is made to a component whose terminal loop adapter has been previously determined to be not operational.

Counter 3: Device Error

General Description: There is a format or encoding error.

Probable Cause: The system cannot make the encoder ready or cannot encode. The encoder might have rejected the message. The user might have moved the stripe improperly. The encoder might have malfunctioned.

Action: If the problem persists, inform the service representative.

3614/3624 Consumer Transaction Facility

Counter 1: Loop Error (Status 0200)

Counter Increases

- The loop fails during input or output.
- An operation is requested, but the loop has not been started.

Counter 2: Terminal Loop Adapter Error (Status = 0201)

General Information: If a terminal is powered off and an input/output operation (LREAD, LWRITE, or LCHECK) is attempted by the application program, a status of 0201 is returned and this counter increases for each attempt. Therefore, this count can get quite high if I/O operations are continued after the error is reported.

Counter Increases

1. An I/O command is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or a wrong address is set).
2. Output data is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or the terminal address is changed during operation).
3. An attention is received from a component other than those indicated in the configuration generation process (for example, a 3604 on a 3612 address).
4. An ambiguous situation arises during an I/O operation. This occurs when the state of the terminal loop adapter is unpredictable and a reset must be sent. (For example, turning power on or off on another component while operating causes a bit-shift and the data may be interpreted by the terminal loop adapter as a command.)
5. An I/O request is made to a component whose terminal loop adapter has been previously determined to be not operational.

Counter 3: Time Out

General Description: A time out occurred during data transfer.

Probable Cause: The data transfer did not complete within 1 minute.

Action: Ensure that the loop speed matches that specified by the BPS operand of the LOOPS macro.

Counters 4-16: Not Used

4710/4720 Printer

Counter 1: Loop Error (Status 0200)

Counter Increases

- The loop fails during input or output.
- An operation is requested, but the loop has not been started.

Counter 2: Terminal Loop Adapter Error (Status = 0201)

General Information: If a terminal is powered off and an input/output operation (LREAD, LWRITE, or LCHECK) is attempted by the application program, a status of 0201 is returned and this counter increases for each attempt. Therefore, this count can get quite high if I/O operations are continued after the error is reported.

Counter Increases

1. An I/O command is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or a wrong address is set).
2. Output data is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or the terminal address is changed during operation).
3. An attention is received from a component other than those indicated in the configuration generation process (for example, a 3604 on a 4710/4720 address).
4. An ambiguous situation arises during an I/O operation. This occurs when the state of the terminal loop adapter is unpredictable and a reset must be sent. (For example, turning power on or off on another component while operating causes a bit-shift and the data may be interpreted by the terminal loop adapter as a command.)
5. An I/O request is made to a component whose terminal loop adapter has been previously determined to be not operational.

Counter 3: Timeout (Status 0202)

General Description: A timeout occurs if the printer does not respond to output data within 10 seconds for a 4710 or 20 seconds for a 4720.

Counter Increases: The counter increases each time a timeout occurs.

Probable Cause: A hardware malfunction occurred.

Action: Do NOT retry the operation. See the *4700 Problem Determination Guide*.

Counter 4: Terminal Protocol Violation (Status 0204)

General Description: The controller detected a violation of the communications protocol.

Counter Increases: The counter increases for each protocol violation.

Probable Cause: A hardware malfunction or loop error occurred.

Action: See the *4700 Problem Determination Guide*. DO NOT retry the operation.

Counters 5-8: Unused

Counter 9: Power On (Status 0808)

General Description: The 4710/4720 completed its power-on sequence, is on line and initialized with CPGEN defaults.

Counter Increases: The counter increases each time the 4710/4720 is powered on.

Action: If the CPGEN values are acceptable, reissue the command. Otherwise change the device parameters using DEVPARM.

Counter 10: Unused

Counter 11: A Operator Active

General Description: The START A key started the operator A portion of the printer, or an automatic start occurred.

Counter Increases: The counter increases each time the interface is activated.

Counter 12: B Operator Active

General Description: The START B key started the operator B portion of the printer, or an automatic start occurred.

Counter Increases: The counter increases each time the interface is activated.

Counter 13: Controller Protocol Violation (Status 0204)

General Description: The 4710/4720 detected a protocol violation by the controller.

Counter Increases: The counter increases for each protocol violation detected.

Probable Cause: A controller malfunction or loop error occurred.

Action: See the *4700 Problem Determination Guide*.

Counter 14: DEVPARM Request Rejected (Status 0480)

General Description: The 4710/4720 detected an invalid device parameter supplied by DEVPARM.

Counter Increases: The counter increases each time the 4710/4720 rejects a DEVPARM.

Probable Cause: The DEVPARM parameter list is incorrect.

Action: Correct the application program.

Counter 15: Incorrect Message Length (Status 0208)

General Description: There controller-provided data length does not match the actual data length.

Counter Increases: The counter increases on each mismatch.

Probable Cause: There is a controller malfunction or loop error.

Action: Do not retry the operation. See the *4700 Problem Determination Guide.*

Counter 16: Inhibit Print Key (Status 4001)

General Description: The operator pressed the Inhibit Print key while an operation was in progress at the 4710/4720.

Counter Increases: The counter increases each time this occurs.

Counter 17: Line Length Exceeded (Status 0101)

General Description: The program tried to print beyond the logical or physical form characteristics.

Counter Increases: The counter increases each time this occurs.

Probable Cause: The application program tries to print beyond the line length or past the end of the form

Action: Either change the form or the program.

Counter 18: Warning Line (Status 4080)

General Description: The program caused the 4710/4720 to index past the warning line.

Action: The action depends on the needs of the application program.

Counter 19: End of Form (Status 8010)

General Description: The end-of-forms switch on the 4710/4720 detected the end of the form.

Probable Cause: The 4710/4720 is out of continuous-forms paper.

Counter 20: Print Emitter Check (Status 0202)

General Description: The 4710/4720 detected an emitter problem.

Probable Cause: The hardware malfunctioned.

Action: Do not retry the operation. See the *4700 Problem Determination Guide*.

Counter 21: Unused

Counter 22: Translation Check (Status 2000)

General Description: The data stream contains an invalid control or data character.

Counter Increases: The counter increases for each invalid character.

Probable Cause: There is an invalid character in the data stream.

Action: Check the application program.

Counter 23: End of Page (Status 4020)

General Description: The program caused the 4710/4720 to index beyond the end of the page.

Action: Check the application program.

Counter 24: Unused

3606 and 3608 Terminals

Counter 1: Loop Error (Status 0200)

Counter Increases

- The loop fails during input or output.
- An operation is requested, but the loop has not been started.

Counter 2: Terminal Loop Adapter Error (Status = 0201)

General Information: If a terminal is powered off and an input/output operation (LREAD, LWRITE, or LCHECK) is attempted by the application program, a status of 0201 is returned and this counter increases for each attempt. Therefore, this count can get quite high if I/O operations are continued after the error is reported.

Counter Increases

1. An I/O command is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or a wrong address is set).

2. Output data is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or the terminal address is changed during operation).

3. An attention is received from a component other than those indicated in the configuration generation process (for example, a 3604 on a 3616 address).

4. An ambiguous situation arises during an I/O operation. This occurs when the state of the terminal loop adapter is unpredictable and a reset must be sent. (For example, turning power on or off on another component while operating causes a bit-shift and the data may be interpreted by the terminal loop adapter as a command.)

5. An I/O request is made to a component whose terminal loop adapter has been previously determined to be not operational.

Counter 3: Read Time Out (Status 0202)

General Description: A read operation from the keyboard did not complete within 1 minute.

Probable Cause: The operator powered the device off and on after keying a message and pressing the send key.

Action: If reading from a specific device, retry until you receive input or until different status is returned. If servicing an attention, exit and wait for input.

Counters 4-9: Unused

Counters 10,11: Total Transactions

General Description: These counters reflect the total number of transactions received from a terminal group.

Counter Increases: The counter increases each time a transaction occurs at this terminal group.

Action: See Counter 14,15

Counter 12,13: Transaction Queued

General Description: These counters contain a count of the transactions queued but not serviced when another transaction is received. If three transactions are queued and another is received, the counter contains 3.

Action: See Counters 14,15.

Counter 14,15: Total Transactions received When Not Idle

General Description: These counters contains the total number of transactions received from a terminal group while the work station is not idle.

Action: You can use counters 11-16 to determine the activity on a terminal group. Compare these counters to those for other terminal groups to optimize the configuration and to spread the load across several groups. The higher the counter value, the heavier the load.

Counter 16: Transactions Queued

General Description: This counter contains the largest number of transactions queued at one time.

Action: See Counters 14,15.

3608 Printer

Counter 1: Loop Error (Status 0200)

Counter Increases

- The loop fails during input or output.
- An operation is requested, but the loop has not been started.

Counter 2: Terminal Loop Adapter Error (Status = 0201)

General Information: If a terminal is powered off and an input/output operation (LREAD, LWRITE, or LCHECK) is attempted by the application program, a status of 0201 is returned and this counter increases for each attempt. Therefore, this count can get quite high if I/O operations are continued after the error is reported.

Counter Increases

1. An I/O command is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or a wrong address is set).
2. Output data is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or the terminal address is changed during operation).
3. An attention is received from a component other than those indicated in the configuration generation process (for example, a 3604 on a 3612 address).
4. An ambiguous situation arises during an I/O operation. This occurs when the state of the terminal loop adapter is unpredictable and a reset must be sent. (For example, turning power on or off on another component while operating causes a bit-shift and the data may be interpreted by the terminal loop adapter as a command.)
5. An I/O request is made to a component whose terminal loop adapter has been previously determined to be not operational.

Counter 3: Print Emitter Check (Status 0202)

General Description: The device detected an emitter check.

Probable Cause: A hardware malfunction occurred.

Action: Do not retry the operation. See the *4700 Problem Determination Guide*.

Counter 4: Incorrect Message Length (Status 0101)

General Description: The program used an incorrect length in an operation.

Counter Increases: The counter increases each time the program issues LWRITE or DEVPARM with a data length of 0, or attempts to print a line longer than the width specified.

Probable Cause: The application program.

Action: Change the data or the specified width. See the DEVPARM instruction.

Counter 5: Intervention Required (Status 8000)

General Description: The printer needs operator intervention to complete the current print operation.

Probable Cause: The printer might be out of paper, might have a jam, or the cover might be open.

Action: Check the printer.

Counter 6: Timeout (Status 0202)

General Description: The printer failed to respond within 2 minutes of the previous print request.

Probable Cause: Perhaps the printer was powered off and on, or there is a hardware problem.

Action: See the *4700 Problem Determination Guide*.

3610/3611/3612 Printers

Counter 1: Loop Error (Status 0200)

Counter Increases

- The loop fails during input or output.
- An operation is requested, but the loop has not been started.

Counter 2: Terminal Loop Adapter Error (Status = 0201)

General Information: If a terminal is powered off and an input/output operation (LREAD, LWRITE, or LCHECK) is attempted by the application program, a status of 0201 is returned and this counter increases for each attempt. Therefore, this count can get quite high if I/O operations are continued after the error is reported.

Counter Increases

1. An I/O command is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or a wrong address is set).
2. Output data is not acknowledged by the terminal loop adapter (for example,

the terminal is powered off or the terminal address is changed during operation).

3. An attention is received from a component other than those indicated in the configuration generation process (for example, a 3604 on a 3612 address).

4. An ambiguous situation arises during an I/O operation. This occurs when the state of the terminal loop adapter is unpredictable and a reset must be sent. (For example, turning power on or off on another component while operating causes a bit-shift and the data may be interpreted by the terminal loop adapter as a command.)

5. An I/O request is made to a component whose terminal loop adapter has been previously determined to be not operational.

Counter 3: Intervention Required (Status 8000)

General Description: Operator intervention is required to complete the current print operation.

Counter Increases: The counter increases each time the cover is opened or the Stop Print button is pressed. (Counter 6 is also increased when Stop Print is pressed.)

Action: Close the cover, press Start Print, insert a new document, and retry the operation.

Counter 4: Print Emitter Check (Status 0202)

General Description: The device detected a print emitter check.

Probable Cause: There is a hardware malfunction.

Action: Do not retry the operation. See the *4700 Problem Determination Guide*.

Counter 5: End of Forms (Status 8010)

General Description: The printer detected the end of the print form (for 3610/3612 Models 3 and 13).

Probable Cause: The printer is out of paper.

Action: Reload the printer paper, and retry the operation.

Counter 6: Platen Open (Status 0202/8202)

General Description: The printer platen is open.

Probable Cause: Either the Stop Print button was pressed, there is a hardware error (status 0202), or the cover was opened (status 8202). If this counter value is less than or equal to the value in counter 3, this counter (6) contains the number of times the Stop Print button was pressed.

Action: If status is 8202, press Start Print, close the cover, and retry the operation. If status is 0202, see the *4700 Problem Determination Guide*.

Counter 7: Timeout (Status 0202)

General Description: After the previous print request, no response was received from the printer for at least 40 seconds.

Probable Cause: There is a hardware error.

Action: See the *4700 Problem Determination Guide*.

Counter 8: Missing Left Margin

General Description: The device receives a carriage return order, but does not report a left margin indication.

Probable Cause: There is a hardware error.

Action: The left margin switch might need adjustment.

3615 Printer

Counter 1: Loop Error (Status 0200)

Counter Increases

- The loop fails during input or output.
- An operation is requested, but the loop has not been started.

Counter 2: Terminal Loop Adapter Error (Status = 0201)

General Information: If a terminal is powered off and an input/output operation (LREAD, LWRITE, or LCHECK) is attempted by the application program, a status of 0201 is returned and this counter increases for each attempt. Therefore, this count can get quite high if I/O operations are continued after the error is reported.

Counter Increases

1. An I/O command is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or a wrong address is set).
2. Output data is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or the terminal address is changed during operation).
3. An attention is received from a component other than those indicated in the configuration generation process (for example, a 3604 on a 3612 address).
4. An ambiguous situation arises during an I/O operation. This occurs when the state of the terminal loop adapter is unpredictable and a reset must be sent. (For example, turning power on or off on another component while operating causes a bit-shift and the data may be interpreted by the terminal loop adapter as a command.)
5. An I/O request is made to a component whose terminal loop adapter has been previously determined to be not operational.

Counter 3: Print Check (Status 0202)

General Description: An emitter check or a print-wire check occurred.

Probable Cause: A hardware error occurred.

Action: Do not retry the operation. See the *4700 Problem Determination Guide*.

Counter 4: End of Forms (Status 8010)

General Description: End of forms occurred; the device is out of paper.

Action: Reload the printer and retry the operation.

Counter 5: Printer not Ready (Status 0202)

General Description: The printer detects power-on reset, TLA reset, or the print head is no longer ready.

Probable Cause: There is a hardware malfunction, or someone powered the printer on after printing was requested.

Action: Retry the operation if the device had just been powered on. Otherwise, see the *4700 Problem Determination Guide*.

Counter 6: Timeout (Status 0202)

General Description: A timeout occurs if the printer does not respond to output data within 40 seconds.

Counter Increases: The counter increases each time a timeout occurs.

Probable Cause: A hardware malfunction occurred.

Action: Do NOT retry the operation. See the *4700 Problem Determination Guide*.

Counter 7: Halt on Check (Status 0202)

General Description: The print operation ended prematurely.

Probable Cause: One of the following:

- The hardware malfunctioned.
- The print head was moved manually.
- You used a one-direction printer, but a bi-directional printer was configured.

Action: Be sure that the printer in use is the correct printer. See the *4700 Problem Determination Guide*.

Counter 8: Forms Emitter Check (Status 0202)

General Description: A forms emitter check occurred.

Probable Cause: The forms feeding system failed.

Action See the *4700 Problem Determination Guide*.

Counter 1: Loop Error (Status 0200)

Counter Increases

- The loop fails during input or output.
- An operation is requested, but the loop has not been started.

Counter 2: Terminal Loop Adapter Error (Status = 0201)

General Information: If a terminal is powered off and an input/output operation (LREAD, LWRITE, or LCHECK) is attempted by the application program, a status of 0201 is returned and this counter increases for each attempt. Therefore, this count can get quite high if I/O operations are continued after the error is reported.

Counter Increases

1. An I/O command is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or a wrong address is set).
2. Output data is not acknowledged by the terminal loop adapter (for example, the terminal is powered off or the terminal address is changed during operation).
3. An attention is received from a component other than those indicated in the configuration generation process (for example, a 3604 on a 3612 address).
4. An ambiguous situation arises during an I/O operation. This occurs when the state of the terminal loop adapter is unpredictable and a reset must be sent. (For example, turning power on or off on another component while operating causes a bit-shift and the data may be interpreted by the terminal loop adapter as a command.)
5. An I/O request is made to a component whose terminal loop adapter has been previously determined to be not operational.

Counter 3: Timeout (Status 0202)

General Description: A timeout occurs if the printer does not respond to output data within 40 seconds.

Counter Increases: The counter increases each time a timeout occurs.

Probable Cause: A hardware malfunction occurred.

Action: Do NOT retry the operation. See the *4700 Problem Determination Guide*.

Counter 4: Terminal Protocol Violation (Status 0204)

General Description: The controller detected a violation of the communications protocol.

Counter Increases: The counter increases for each protocol violation.

Probable Cause: A hardware malfunction or loop error occurred.

Action: DO NOT retry the operation. See the *4700 Problem Determination Guide.*

Counters 5-8: Unused

Counter 9: Power On (Status 0808)

General Description: The 3616 completed its power-on sequence, is on line and initialized with CPGEN defaults.

Counter Increases: The counter increases each time the 3616 is powered on.

Action: If the CPGEN values are acceptable, reissue the command. Otherwise change the device parameters using DEVPARM.

Counter 10: Unused

Counter 11: A Operator Active

General Description: The START A key started the operator A portion of the printer, or an automatic start occurred.

Counter Increases: The counter increases each time the interface is activated.

Counter 12: B Operator Active

General Description: The START B key started the operator B portion of the printer, or an automatic start occurred.

Counter Increases: The counter increases each time the interface is activated.

Counter 13: Controller Protocol Violation (Status 0204)

General Description: The 3616 detected a protocol violation by the controller.

Counter Increases: The counter increases for each protocol violation detected.

Probable Cause: A controller malfunction or loop error occurred.

Action: See the *4700 Problem Determination Guide.*

Counter 14: DEVPARM Request Rejected (Status 0480)

General Description: The 3616 detected an invalid device parameter supplied by DEVPARM.

Counter Increases: The counter increases each time the 3616 rejects a DEVPARM.

Probable Cause: The DEVPARM parameter list is incorrect.

Action: Correct the application program.

Counter 15: Incorrect Message Length (Status 0208)

General Description: The controller-provided data length does not match the actual data length.

Counter Increases: The counter increases on each mismatch.

Probable Cause: There is a controller malfunction or loop error.

Action: Do not retry the operation. See the *4700 Problem Determination Guide*.

Counter 16: Inhibit Print Key (Status 4001)

General Description: The operator pressed the Inhibit Print key while an operation was in progress at the 3616.

Counter Increases: The counter increases each time this occurs.

Counter 17: Line Length Exceeded (Status 0101)

General Description: The program tried to print beyond the logical or physical form characteristics.

Counter Increases: The counter increases each time this occurs.

Probable Cause: The application program tries to print beyond the line length or past the end of the form

Action: Either change the form or the program.

Counter 18: Warning Line (Status 4080)

General Description: The program caused the 3616 to index past the warning line.

Action: The action depends on the needs of the application program.

Counter 19: End of Form (Status 8010)

General Description: The end-of-forms switch on the 3616 detected the end of the form.

Probable Cause: The 3616 is out of continuous-forms paper.

Counter 20: Print Emitter Check (Status 0202)

General Description: The 3616 detected an emitter problem.

Probable Cause: The hardware malfunctioned.

Action: Do not retry the operation. See the *4700 Problem Determination Guide*.

Counter 21: Print Wire Check (Status 0202)

General Description: The 3616 detected a problem with the print wires.

Probable Cause: There is a hardware error.

Action: Do not retry the operation. See the *4700 Problem Determination Guide*.

Counter 22: Translation Check (Status 2000)

General Description: The data stream contains an invalid control or data character.

Counter Increases: The counter increases for each invalid character.

Probable Cause: There is an invalid character in the data stream.

Action: Check the application program.

Counter 23: End of Page (Status 4020)

General Description: The program caused the 3616 to index beyond the end of the page.

Action: Check the application program.

Counter 24: Unused

3278/3279 Keyboard

Counter 1: DCA Error (Status 0200)

General Description: The DCA stopped, or experienced an error while the program attempted I/O.

Counter Increases: The counter increases for each occurrence.

Probable Cause: There is a hardware error.

Action: Try to start the DCA. See the *4700 Problem Determination Guide*.

Counter 2: Port/Cable/Terminal Error (Status 0201)

General Description: The program attempted to read from a keyboard that is disconnected, powered off, or connected to a deactivated port.

Counter Increases: The counter increases for each occurrence.

Probable Cause The device has not been connected or powered on, the operator deactivated the port, or there is a hardware error.

Action: Check that the terminal and port are active and powered on. See the *4700 Problem Determination Guide*.

Counter 3: Keyboard Overrun (Status 0204)

General Description: The buffer overflowed; the keyboard is purged to synchronize the input data stream with the operator.

Counter Increases: The counter increases for each occurrence.

Probable Cause: The application program delayed its read request.

Action: Discard a partial message; reissue the read request. The operator must press Reset, and enter the message again.

Counter 4: Translation Check (Status 2000)

General Description: A character is not in the input translation table.

Counter Increases: The counter increases for each occurrence.

Probable Cause: The translation table or application program is in error.

Action: Check the translation table and application program to be sure that all needed characters are in the translation table.

Counter 5: Segment Overrun (Status 0101)

General Description: The input message is longer than the application program input area.

Counter Increases: The counter increases for each occurrence.

Probable Cause: The message length exceeded the space:

- between the PFP and the end of the segment
- Provided in the FLI, when the FLI is not 0, but is less than or equal to the length between the PFP and the end of the segment.

Action: Provide enough segment space for the message or, if the end of the message is unexpected, change the FLI.

Counters 6-15: Reserved

3278/3279 Display

Counter 1: DCA Error (Status 0200)

General Description: The DCA stopped, or experienced an error while the program attempted I/O.

Counter Increases: The counter increases for each occurrence.

Probable Cause: There is a hardware error.

Action: Try to start the DCA. See the *4700 Problem Determination Guide*.

Counter 2: Port/Cable/Terminal Error (Status 0201)

General Description: The program attempted to write to a display that is disconnected, powered off, or connected to a deactivated port.

Counter Increases: The counter increases for each occurrence.

Probable Cause The device has not been connected or powered on, the operator deactivated the port, or there is a hardware error.

Action: Check that the terminal and port are active and powered on. See the *4700 Problem Determination Guide*.

Counters 3-12: Reserved

3262/3287/5210 Printers

Counters 1,2: Reserved

Counter 3: Timeout (Status 0202)

General Description: At lease 12 minutes passed with no response to the previous request.

Counter Increases: The counter increases for each occurrence.

Probable Cause: There is a hardware error.

Action: Do not retry the operation. See the *4700 Problem Determination Guide*.

Counters 4-8: Reserved

Counter 9: Power On (Status 0808)

General Description: The printer completed its power-on sequence and is on line. The printer is initialized with CPGEN-supplied values.

Counter Increases: The counter increases for each occurrence.

Action: If the CPGEN-supplied default values are acceptable, retry the operation. Otherwise, use an SVF command in the data stream to set acceptable page size and margins.

Counter 10: Printer Ready (Status 0840)

General Description: A previously-reported operator-intervention status is cleared, the printer is ready for printing, but no request is queued.

Counter Increases: The counter increases for each occurrence.

Probable Cause: The operator cleared an intervention-required condition.

Counter 11: Operator Active (Status 0000)

General Description: Due to operator activity, the operator interface is now active.

Counter Increases: The counter increases for each occurrence.

Probable Cause: An operator intervened.

Counters 12,13: Unused

Counter 14: DEVPARM Request Rejected (Status 0480)

General Description: The application program provided an invalid DEVPARM parameter.

Counter Increases: The counter increases for each occurrence.

Probable Cause: There is an invalid parameter in the DEVPARM list.

Action: Check the application program.

Counter 15: DCA Not Active (Status 0200)

General Description: The program attempted to print data, but the DCA was stopped or had an error.

Counter Increases: The counter increases for each occurrence.

Probable Cause: There is a hardware error, or the operator stopped DCA.

Action: Attempt to restart the DCA, or see the *4700 Problem Determination Guide*.

Counter 16: Operator Intervention Required (Status 4001)

General Description: The printer requires operator attention.

Counter Increases: The counter increases for each occurrence.

Probable Cause: One of the following:

- Hold Print left on for 10 minutes
- Cover or platen open
- End of forms
- Paper jam

Action: Correct the problem, and reissue the LWRITE.

Counter 17: Power Off (Status 0804)

General Description: The printer was powered off or disconnected from the controller.

Counter Increases: The counter increases for each occurrence.

Action: Be sure that the printer is powered on and connected to the controller.

Counter 18: Data Check -- Parity (Status 2008)

General Description: A parity error occurred during printing.

Counter Increases: The counter increases for each occurrence.

Probable Cause: There is a hardware error.

Action: Reissue the LWRITE. If the problem persists, see the *Component Description*

Counter 19: No Device on Port (Status 0201)

General Description: The application program tried to print at a printer that is not connected, powered off, or connected to an inactive port.

Counter Increases: The counter increases for each occurrence.

Action: Ensure that the printer and port are active, connected, and powered on.

Counter 20: Equipment Check (Status 0210)

General Description: There is a printer problem.

Counter Increases: The counter increases for each occurrence.

Probable Cause: There is a hardware error.

Action: Do not retry the operation. See the *4700 Problem Determination Guide.*

Counter 21: Device I/O Error (Status 0208)

General Description: Repeated attempts to print have failed.

Counter Increases: The counter increases for each occurrence.

Probable Cause: There is a hardware error.

Action: Do not retry the operation. See the *4700 Problem Determination Guide.*

Counter 22: Invalid SCS Control Parameter (Status 2002)

General Description: The data stream contains an invalid SCS control parameter.

Counter Increases: The counter increases for each occurrence.

Probable Cause: There is an application program error.

Action: Check the application program.

Counter 23: Invalid SCS Control Code (Status 2001)

General Description: The data stream contains an invalid SCS control code.

Counter Increases: The counter increases for each occurrence.

Probable Cause: There is an application program error.

Action: Correct the application program.

Counter 24: Cancel Key (Status 0880)

General Description: The operator pressed the Cancel key on the printer while data was printing. Data is lost.

Counter Increases: The counter increases for each occurrence.

Probable Cause: This is an operator action.

Counter 25: PA1 Key (Status 0801)

General Description: The operator pressed PA1.

Counter 26: PA2 Key (Status 0802)

General Description: The operator pressed PA2.

Counter 27: 8 LPI Key (Status 4008)

General Description: The operator changed the printer from 6 to 8 lines per inch.

Counter 28: 6 LPI Key (Status 4004)

General Description: The operator changed the printer from 8 to 6 lines per inch.

Counter 29: Single Space Key (Status 4010)

General Description: The operator selected single-space printing.

Counter 30: Double Space Key (Status 4040)

General Description: The operator selected double-space printing.

Counter 31: Mono Case Key (Status 4020)

General Description: The operator selected mono-case printing.

Counter 32: Dual Case Key (Status 4002)

General Description: The operator selected dual case printing.

Statistical Counters for Encryption

The 4700 controller maintains a set of statistical counters for its cryptographic facilities. An operator can see the contents of the statistical counters by logging on to the system monitor and issuing a 010 command that specifies an LSSDD value of 9006. A program can obtain the contents of the statistical counters by issuing an ERRLOG or STATS instructions that specifies a physical device address of X'9060'. The controller displays (or returns) a device type of X'06'.

The controller displays the entire set of statistical counters together. In the following description, the name of the counter is the displacement of the counter value within the displayed string. For example, Counter 3 occupies the third byte of the string, and Counter 9-11 is a three-byte binary value occupying the 9th, 10th, and 11th bytes of the string.

Counter 1: Machine Check

General Description: Counter 1 increases each time the controller encounters a machine check.

Probable Cause: A hardware malfunction.

Action: See *IBM 4700 Subsystem Problem Determination Guide.*

Counter 2: Intervention Required

General Description: Counter 2 increases each time the controller attempts to load or clear a cryptographic key but finds that the encryption keylock has not been activated.

Probable Cause: The operator did not activate the encryption keylock, or the controller malfunctioned.

Action: Activate the encryption keylock in accordance with your institution's procedures; if this problem recurs, see the *IBM 4700 Subsystem Problem Determination Guide.*

Counter 3: Invalid Key Checksum

General Description: Each time the controller places a key in cryptographic storage, it calculates a checksum value and stores it with the key. Each time the controller reads a key from cryptographic storage, it recalculates the value and compares it with the stored value. Counter 3 increases each time the controller reads a key and finds that the two values do not match.

Probable Cause: This problem can be caused by:

- Not loading a key
- Erasing a key and not loading a new one
- A controller malfunction (dead cryptographic storage battery, for example).

Action: Ensure that the controller contains a key (330 command); if it does, see *IBM 4700 Subsystem Problem Determination Guide.*

Counter 4: Unsuccessful Write

General Description: Counter 4 increases each time the controller attempts to write into cryptographic storage and cannot do so.

Probable Cause: Controller malfunction.

Action: Refer to the *IBM 4700 Subsystem Problem Determination Guide.*

Counter 5-8: Reserved

Counter 9-11: Attempted PIN Validation

General Description: Counters 9-11 increase each time a PINVERIF instruction completes successfully, up to the point where the PIN is actually validated (SMSCCD = X'01', or SMSCCD = X'02' and SMSDST = X'2010'). This is the total number of PIN validations attempted. The controller provides this counter so that an operator or user-written program can audit the number of PIN validation attempts.

Counter 12-14: Unsuccessful PIN Validation

General Description: Counters 12-14 increase each time a PINVERIF instruction completes successfully, but results in a "PIN not valid" status (SMSCCD = X'02' and SMSDST = X'2010'). The controller provides this counter so that an operator or user-written program can audit the number of unsuccessful PIN validations.

Counter 15-17: Successful PIN Translation

General Description: Counter 15-17 increase each time a PINTRANS instruction completes successfully; that is, completes with a condition code of 1 (SMSCCD = X'01'). The controller provides this counter so that an operator or user-written program can audit the number of PIN translations.

Counter 18-32: Reserved

Disk Statistical Counters

Counter 1: CRC - Cyclic Redundancy Check

General Description: The computed CRC does not match the CRC read from the disk.

Probable Cause

1. The disk has a defective sector.
2. The disk drive malfunctioned.

Action: For intermittent errors, automatic retry has solved the problem. If this problem persists, inform your service representative.

Counter 2: Not Ready

General Description: The disk drive became not ready during an operation.

Probable Cause: A hardware failure has occurred.

Action: Inform your service representative.

Counter 3: No Alternate Sectors Available

General Description: During an I/O operation the controller attempted to assign an alternate sector for one that was defective and found that no alternate sectors were available for use.

Probable Cause: A hardware error has caused the controller to assign all available alternate sectors.

Action: Inform your service representative to repair the disk file. After repair, reformat the disk to reclaim the alternate sectors that were assigned erroneously.

Counter 4: Disk Hardware Malfunction

General Description: A disk adapter malfunction was detected by either the disk adapter or the controller hardware.

Probable Cause: Hardware or controller failure.

Action: For intermittent errors, automatic retry has correctly taken care of each incident. If this problem persists, inform your service representative.

Counter 5: Data Unsafe

General Description: An error condition within the disk hardware might destroy data if operations continue.

Probable Cause: Hardware malfunction has occurred.

Action: For intermittent errors, automatic retry has correctly taken care of each incident. If this problem persists, inform your service representative.

Counter 6: Alternate Sector Assignment Failed

General Description: The controller was unsuccessful in its attempts to assign an alternate sector for a sector that is defective.

Probable Cause: A disk hardware malfunction has occurred.

Action: Inform your service representative.

Counter 7: Seek Failure

General Description: The disk drive's movable read/write arm could not be positioned correctly for the I/O operation.

Probable Cause: A hardware malfunction has occurred.

Action: Inform your service representative.

Counter 8: Equipment Check

General Description: An unexpected condition was detected by the disk hardware or the controller.

Probable Cause: A hardware or controller failure occurred.

Action: For intermittent errors, automatic retry has correctly taken care of each incident. However if this problem persists, inform your service representative.

Counter 9: No Record Found

General Description: The disk processing hardware and logic was unable to find the correct sector when an I/O operation was requested.

Probable Cause

1. An invalid (nonexistent) physical block number was requested by an APB.
2. An invalid (nonexistent) physical block number was computed by the controller when processing an I/O request for a data record. This is a controller error.
3. The disk is faulty. This can be caused by a defective sector or an invalid format on the disk.

Action

1. Correct the program to request a valid physical block number.

2. Inform your service representative.

3. For intermittent errors, automatic retry has correctly taken care of each incident. However if this problem persists, inform your service representative.

Counter 10: Successful Engineering Change Correction

General Description: A data CRC check occurred during an I/O operation that could not be recovered by re-reading the data but was such that an Engineering Change correction could be successfully applied. The corrected data was then passed to the application program

Probable Cause: A defective sector was encountered during a read operation.

Action: For intermittent errors, automatic retry and EC correction has correctly taken care of each incident. When this condition occurred an error log message was written to the system log that indicates the defective sector. If this problem occurs frequently on a particular sector, inform your service representative.

Counter 11: Alternate Sector Assigned

General Description: An alternate sector was assigned for a sector that the controller determined to be defective.

Probable Cause: A sector has become defective during normal use of the disk.

Action: For intermittent errors, automatic alternate sector assignment has correctly taken care of each incident. However if this error occurs frequently, inform your service representative.

Appendix C. Loop Terminal Addressing

A 4700/3600 terminal can contain one or more addressable components. For example, IBM 4710 Receipt/Validation Printer is a single-component terminal, but an IBM 4704 Display has a keyboard and a display, and can also include a magnetic stripe encoder. Each terminal component attached to a controller has a unique physical address composed of a loop number, a terminal address, and a component address. The physical address is used by the controller to refer to a component.

4700 terminals are attached to one of the controller loops. The loops are numbered 1 through 4. All terminals have a set of terminal address switches to identify the terminal's base loop address. The terminals also have a component address that is either fixed or can be set with an additional set of switches. Each of the following terminals has a fixed component address:

Component Address	Component
1	4704 model 1 keyboard
2	4704 model 1 display monitor
3	4704 model 1 magnetic stripe encoder
1	3604 Keyboard
2	3604 Display
3	3604 Magnetic Stripe Encoder
4	3610/3612 Document Printer
5	3611/3612 Passbook Printer
8	3614/3624 Consumer Transaction Facility

The component address for one of the following devices can be any value from 1 to 15, as defined by the sub-address switches in the device and specified in the DEFADDR macro in the CPGEN.

Default Component Address	Component
4	4710/4720 Printer
6	3606/3608 Keyboard/Display/Magnetic Stripe Reader
7	3608 Printer
4	3615 Administrative Terminal Printer
4	3616 Journal Printer
5	3616 Passbook/Document Printer

Other terminals are attached directly by coaxial cables, and have component addresses similar to those for devices attached to the the loops. The following directly-attached terminals have fixed component addresses (binary numbers):

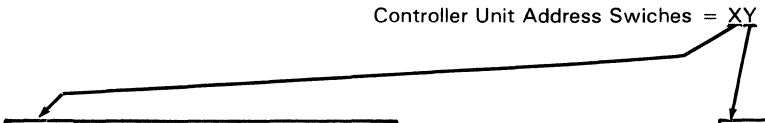
Component Address	Component
1	4704 model 2/3 keyboard
2	4704 model 2/3 display monitor
3	4704 model 2/3 magnetic stripe encoder
1	3278/3279 keyboard
2	3278/3279 display
4	3262/3287/5210 printer

Loop-Speed and Address Switches

Each loop terminal has two groups of switches. Group 1 sets the terminal address, and group 2 sets the terminal to the loop speed. Some terminals can have a third set of switches for setting the subaddress. All the terminals on a loop must be set to the same speed (and must match the speed of the loop to which they are attached); however, each terminal on a loop must have a different terminal address.

Each group has four switches. The speed and address switches are labeled 1 to 4 and the subaddress switches are labeled 5 to 8. Figure C-1 shows the settings of the address switches, loop-speed switches, and subaddress switches.

The switches are located in different places on the various terminals. See the appropriate device operating guide to interpret the symbols and to find the switches.



X =	Switch On	Switch Off
0	-	1,2,3,4
1	4	1,2,3
2	3	1,2,4
3	3,4	1,2
4	2	1,3,4
5	2,4	1,3
6	2,3	1,4
7	2,3,4	1
8	1	2,3,4
9	1,4	2,3
A	1,3	2,4
B	1,3,4	2
C	1,2	3,4
D	1,2,4	3
E	1,2,3	4
F	1,2,3,4	

Y =	Switch On	Switch Off
0	-	5,6,7,8
1	8	5,6,7
2	7	5,6,8
3	7,8	5,6
4	6	5,7,8
5	6,8	5,7
6	6,7	5,8
7	6,7,8	5
8	5	6,7,8
9	5,8	6,7
A	5,7	6,8
B	5,7,8	6
C	5,6	7,8
D	5,6,8	7
E	5,6,7	8
F	5,6,7,8	-

Figure C-1 (Part 1 of 2). Terminal, Loop Speed, and Subaddress Switch Settings

Terminal Address (Group 1) Switch Settings

Terminal Address	*Switch*	
	ON	*OFF*
0	NOT VALID	
1	1	2,3,4
2	2	1,3,4
3	1,2	3,4
4	3	1,2,4
5	1,3	2,4
6	2,3	1,4
7	1,2,3	4
8	4	1,2,3
9	1,4	2,3
10	2,4	1,3
11	1,2,4	3
12	3,4	1,2
13	1,3,4	2
14	2,3,4	1
15	1,2,3,4	

Loop Speed (Group 2) Switch Settings

*Loop Speed**	*Switch*	
	ON	*OFF*
1200	2	1,3,4
2400	3	1,2,4
4800	4	1,2,3

*Speed in bits-per second.

Subaddress (Group 3) Switch Settings

Sub-Address	*Switch**	
	ON	*OFF*
0	NOT VALID	
1	5	6,7,8
2	6	5,7,8
3	5,6	7,8
4	7	5,6,8
5	5,7	6,8
6	6,7	5,8
7	5,6,7	8
8	8	5,6,7
9	5,8	6,7
10	6,8	5,7
11	5,6,8	7
12	7,8	5,6
13	5,7,8	6
14	6,7,8	5
15	5,6,7,8	-

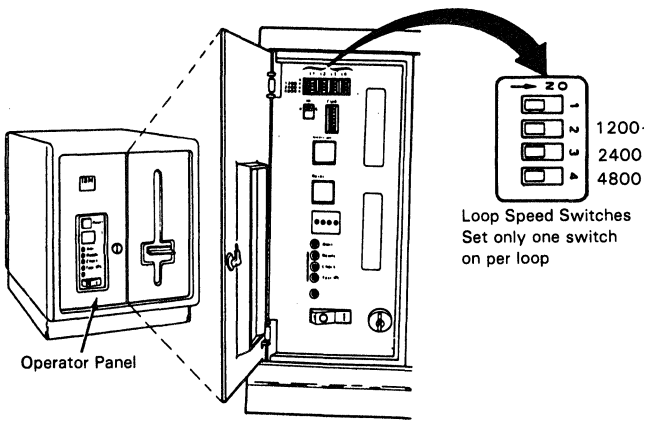
*The 3608/3616 does not use switch 5; therefore, only even number subaddress switch settings are valid.

Control Module
Loop Speed (Group 2) Switch Settings

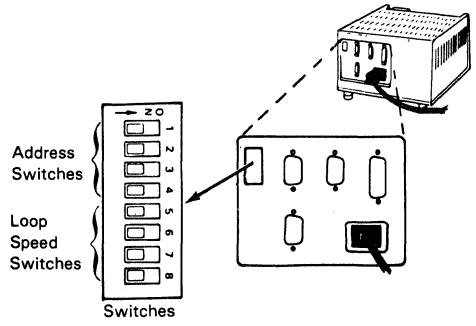
*Loop Speed**	*Switch*	
	ON	*OFF*
1200	6	5,7,8
2400	7	5,6,8
4800	8	5,6,7

*Speed in bits-per second.

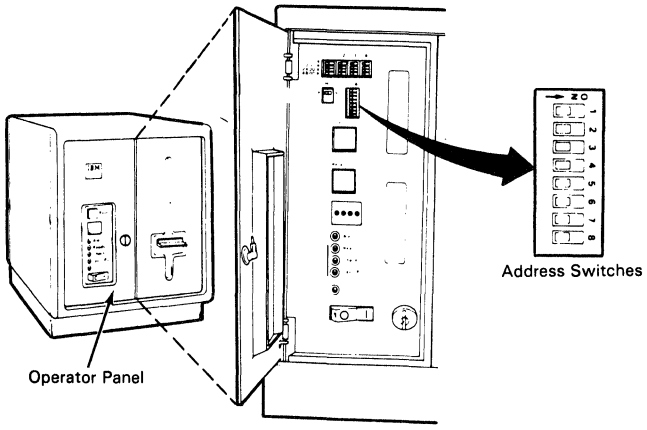
Figure C-1 (Part 2 of 2). Terminal, Loop Speed, and Subaddress Switch Settings



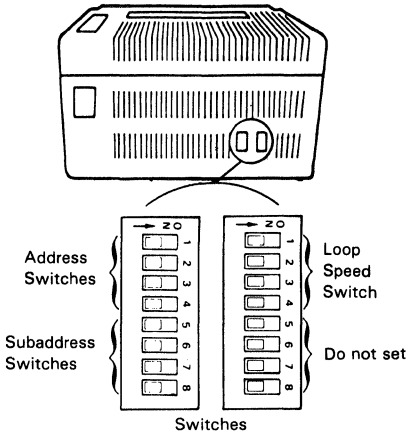
4701 Controller (Inside Operator Panel)



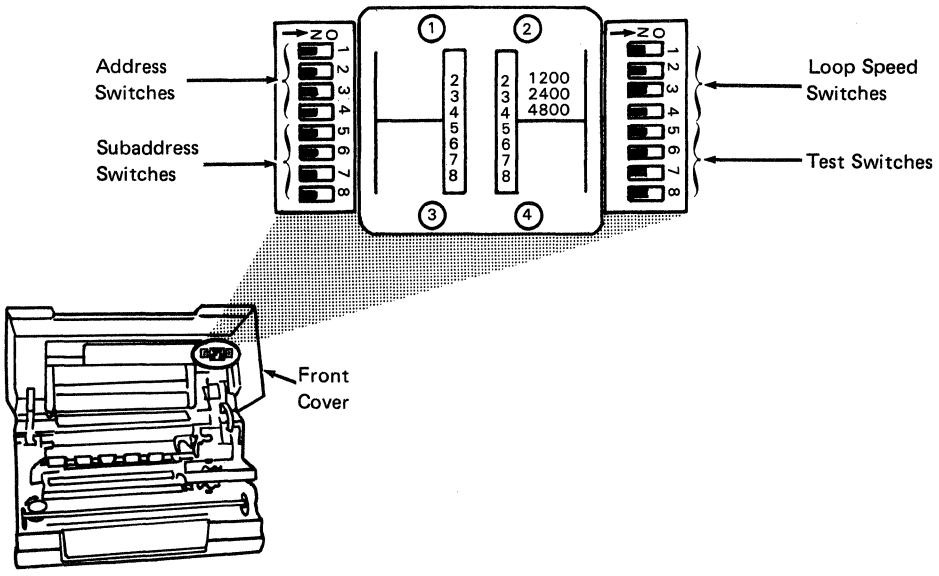
4704 Control Module (Back Panel).



4701 Controller (Inside Operator Panel)

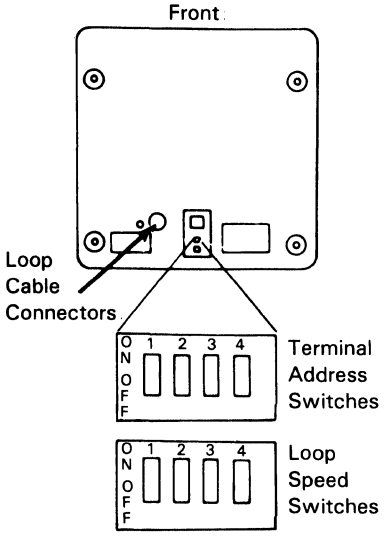


4710 Printer (Back Panel)

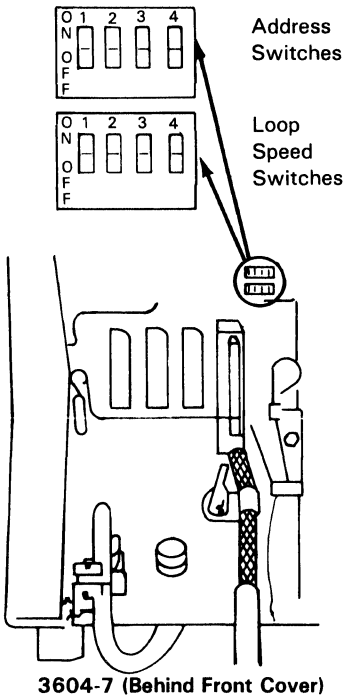


4720 Printer

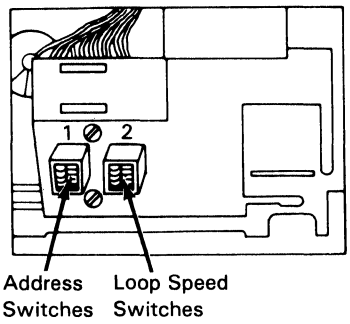
Figure C-2 (Part 1 of 3). Loop Speed and Address Switch Locations



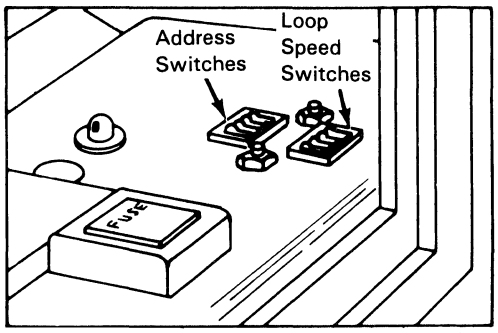
3604-1,-2,-3,-4 (Bottom View)



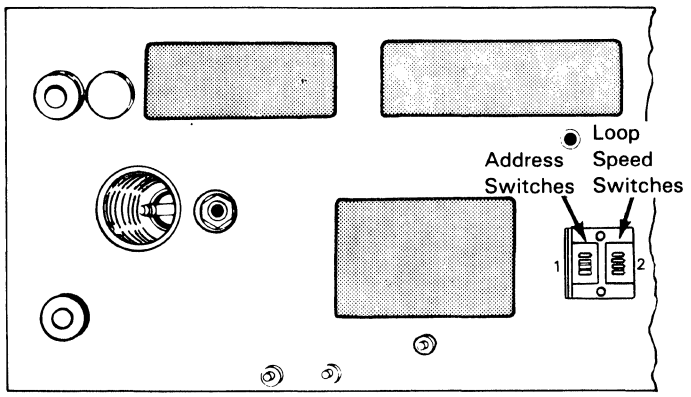
3604-7 (Behind Front Cover)



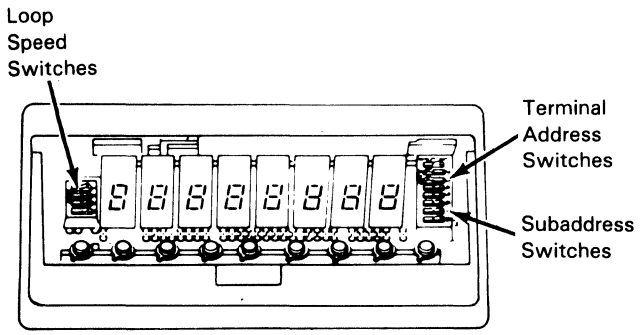
3610-1,-2,-3 (Inside Printer; Lift Top Cover)



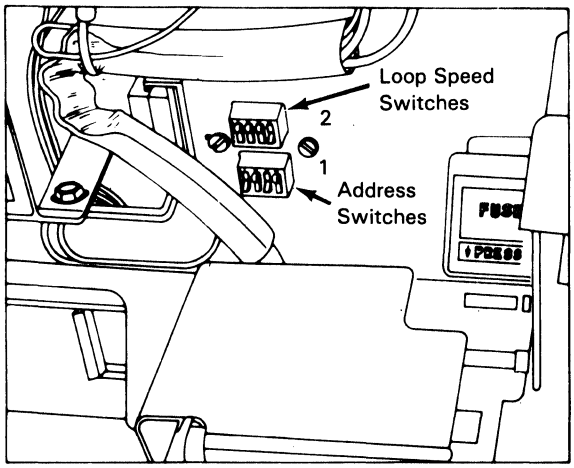
C. 3610-4,-5 (Inside Printer; Open Front Cover)



A. 3604-5,-6 (Bottom View)

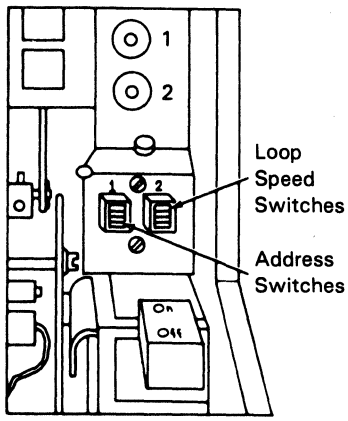


B. 3606 and 3608 (Under Display Filter)

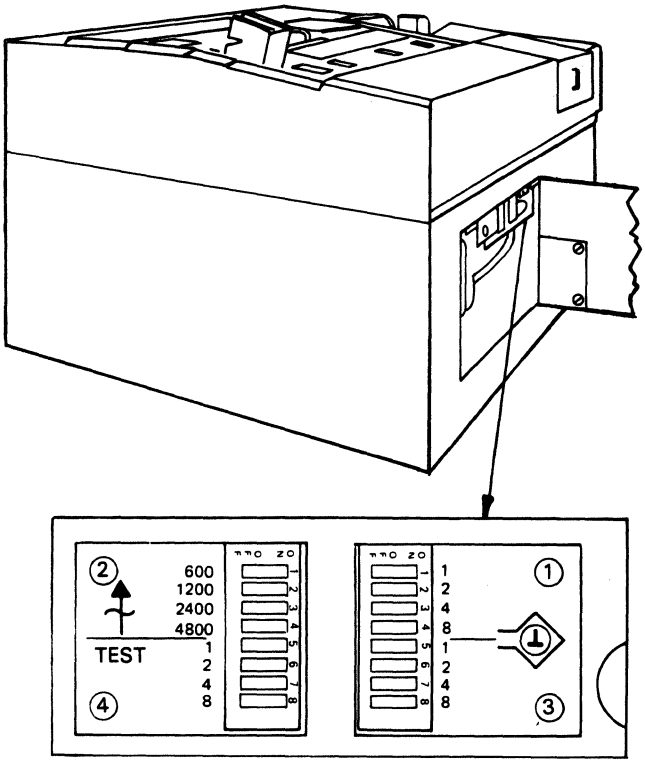


D. 3611 (Inside Printer; Lift Top Cover)

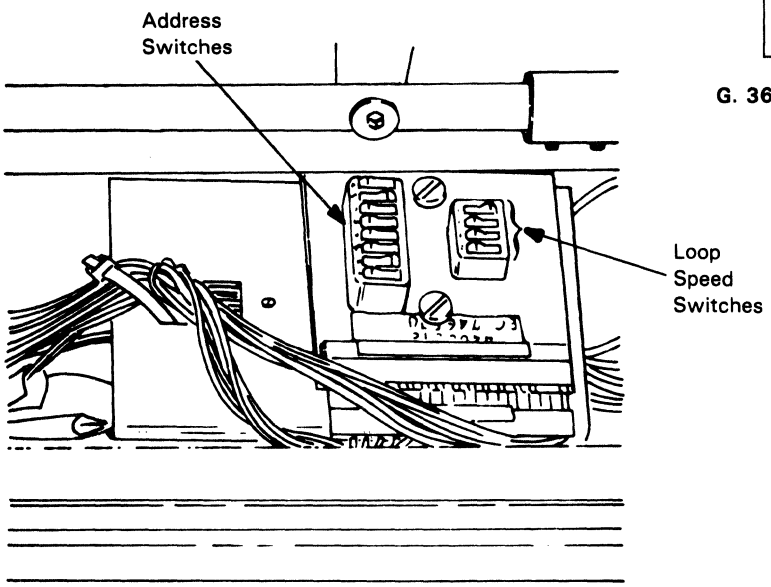
Figure C-2 (Part 2 of 3). Loop Speed and Address Switch Locations



E. 3612 (Inside Printer; Lift Top Cover)



G. 3616 (Inside Front Access Cover)



F. 3615 (Inside Printer; Open Customer Access Cover). Switches Located Inside Front Panel

Figure C-2 (Part 3 of 3). Loop Speed and Address Switch Locations

Appendix D. Communications Network Management (CNM/CS)

The Communications Network Management facility (CNM/CS) is provided with all controllers. To obtain it, specify either the expanded or CNM/CS monitor, and the CNM operand on the STARTGEN CPGEN macro. The CNM/CS functions execute under the control of the system monitor, but they occupy a separate work station.

CNM/CS does not need a terminal to process requests from the host. However, to issue the 711 or 712 command, you need a terminal.

If the CNM/CS work station has an associated terminal, the message ENTER CNM COMMAND is displayed at the terminal. The only commands that you can issue from this terminal are the 711 and 712 commands.

All error messages that can occur are described with the rest of the error messages in this manual. The CNM/CS facility enables the communication of error and statistical data between a controller and a host system. CNM/CS is controlled by the host system. The controller operator can choose the type of processing, and send messages to the CNM/CS host operator.

Several IBM host products support CNM/CS:

- The Network Problem Determination and Analysis (NPDA).
- The 8100 Information System (DPPX/PDA).

Two types of data are communicated between the host and the controller: solicited and unsolicited.

SOLICITED DATA: The host operator can request different types of error and statistical data using Request Maintenance Statistics (RECMS). The controller responds to these requests using Record Maintenance Statistics (RECFMS).

Full support of CNM/CS enables the host to request:

- Link-test statistics, the base statistical counters for the host link.
- Summary error data, the machine check counters and the communication check counters.
- The EC level data, the engineering-change level of the controller.
- Resource statistics, the loop and controller status.
- Resource status, response time statistics.

- Host batch processing, the statistical data and log records of the controller.
- Set Parameters, modify the controlling parameters, or report the timer data.
- System Services. The System Services enable a remote user to log onto the system monitor and issue a subset of the system monitor commands. A local operator can press the RESET key 15 times to force a host user off the system monitor.

UNSOLICITED DATA: The controller sends unsolicited data (an alert) to notify a host of an error condition. The controller checks the system log at predetermined intervals, and notifies the host of any condition that can cause an alert. This interval is preset to 2 minutes, but can be changed from the host using the Set Parameters function of the 712 command.

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IBM / Technical Newsletter

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Date 22 Oct 1983

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File No. S370/4300/8100/S34-40

Prerequisite Newsletters None

IBM 4700 Finance Communication System
Subsystem Operating Procedures

This Technical Newsletter, a part of Release 2 of the IBM 4700 Finance Communication System, provides replacement pages for the subject publication. These pages remain in effect for subsequent releases unless specifically altered. Pages to be removed and inserted are:

vii-xiv
1-3, 1-4
2-1 through 2-76
3-3 through 3-6
4-39, 4-40
4-71, 4-72
4-81 through 4-84
4-103, 4-104
6-3, 6-4
7-17, 7-18
B-23, B-24
X-1 through X-6

A change to the text or to an illustration is indicated by a vertical line to the left of the change.

Summary of Amendments

This Technical Newsletter includes changes to the Installation Diskette menus and procedures, as well as changes for the 061 and 999 commands, the 101 log message, and the loop status counters.

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IBM 4700 Finance Communication System
Subsystem Operating Procedures
Release 2

Order No. GC31-2032-2

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