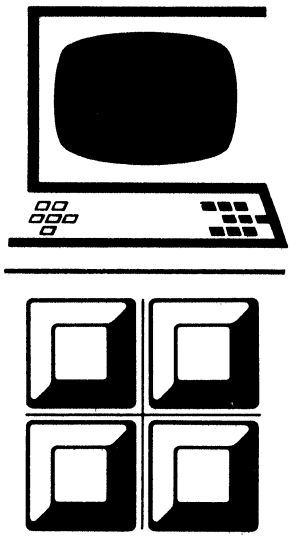
ForeWord System Reference Manual



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Preface

This manual provides information on the standard operation and maintenance procedures for the ForeWord word processing system. It contains information for the ForeWord supervisor on supervisory functions, the statistical package, keystroke memory, startup, and backup operations. Additionally, the organization of the ForeWord master disc pack, as well as backup and recovery procedures for ForeWord files are discussed.

Also explained are techniques in how to compute the amount of disc space required to store ForeWord files, how to call up a screen display of ForeWord functions, how to print an IDOS directory, and how to copy non-ForeWord files to a text area.

It is assumed that the reader is familiar with the principles of ForeWord operation as detailed in the following publications:

- ForeWord Operator's Manual (SIV/70-12-13)
- ForeWord Communication Manual (SIV/70-55-30)

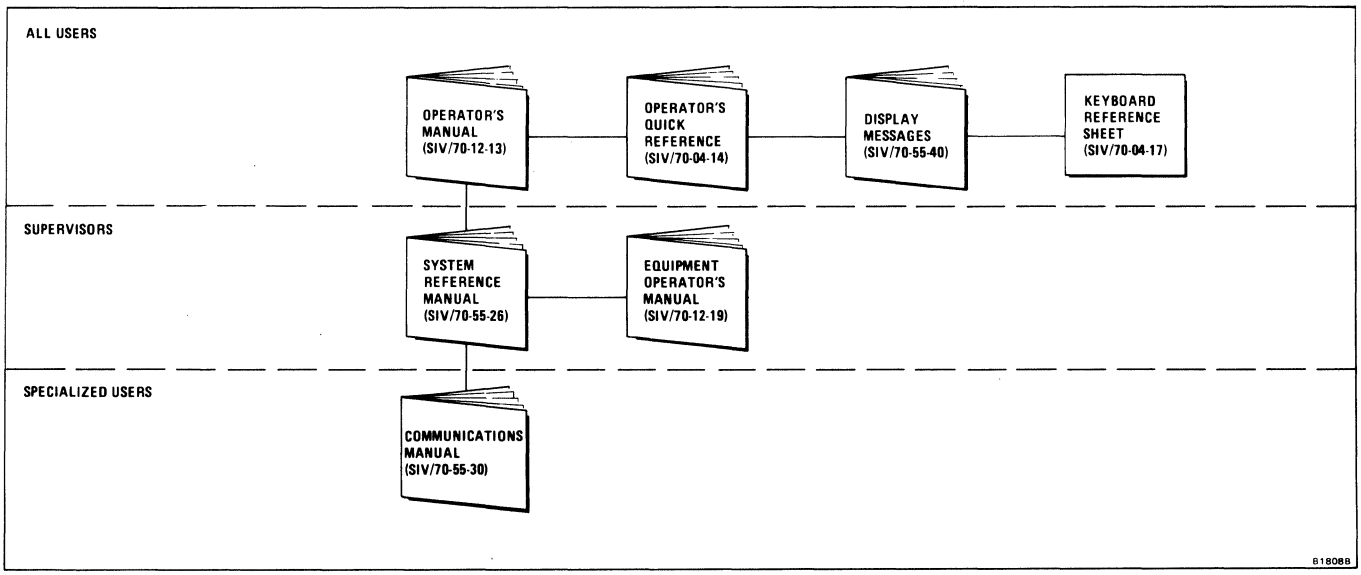
This issue combines information from previous issues of this manual with information formerly contained in the ForeWord Supervisor's Handbook (SIV/70-12-15), and replaces that publication.

This issue reflects ForeWord release AY06. As of this release, ForeWord operates under the Multifunction Executive (MFE/IV) operating system. New information concerning MFE/IV, as well as the Interrupt Disc Operating System (IDOS), which forms the base for MVE/IV, has been included in this issue. Additional details on procedures for handling wide and extra-wide documents have also been included.

ForeWord Publications

The figure below shows the various publications that are available to ForeWord users. The manuals are as follows:

- ***ForeWord Operator's Manual*** — contains lessons and exercises that form a self-teaching course for learning how to use ForeWord; contains operating instructions; describes the ForeWord keyboard, key functions, and text editing commands; explains how to open and close documents and how to enter, edit, store, and print text.
- ***ForeWord Operator's Quick Reference*** — summarizes the procedures that are detailed in the ForeWord Operator's Manual.
- ***ForeWord Keyboard Reference Sheet*** — illustrates the ForeWord keyboard and key functions.
- ***Equipment Operator's Manual*** — provides operating instructions for peripheral devices, such as printers and disc devices.
- ***ForeWord System Reference Manual*** — gives advanced technical procedures for backing up and maintaining a ForeWord System; also covers basic system architecture, and explains how to recover from a system failure.
- ***ForeWord Communications Manual*** — describes the ForeWord commands and procedures used to send and receive documents in a telecommunications environment.
- ***ForeWord Display Messages*** — lists all display messages generated by ForeWord, providing an explanation and a corrective procedure for each.



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Section 1
Introduction

ForeWord is a flexible, shared-logic, text-editing system that allows text to be entered, stored, edited, and printed.

GENERAL

ForeWord operates under control of the Multifunction Executive (MFE/IV) operating system, which in turn has as its foundation the Interrupt Disc Operating System (IDOS). In addition to text-editing with ForeWord, MFE/IV is capable of handling data entry and data inquiry, as well as COBOL applications. The flexibility of the Series IV processors allows the hardware to be used for multiple applications concurrently.

The MFE/IV system is initialized by the MFE/IV Preprocessor under IDOS control. The Preprocessor extracts the operating parameters from a configuration file and prepares the MFE/IV system for execution of individual jobs in separate partitions. Each partition is like an independent processor that is dedicated to a particular job when that job is started. Partitioning of the MFE/IV processor is explained in detail in the *MFE/IV Programmer's Guide.*

The Interrupt Disc Operating System (IDOS) is a disc-resident collection of utility programs and routines designed to aid the user in producing software for Series IV processing system applications. IDOS contains, among other routines, the system monitor program, the system libraries, and library routines. Software that is IDOS-based resides on IDOS discs and is invoked under IDOS control. For example, the code assembler, the RPG compiler, and the software that they produce are all IDOS-based.

LEVELS OF OPERATION

It is important to be aware of what state the processor is in, since only certain functions can be attempted while the processor is in each of its various states.

Keep in mind that ForeWord operates on a base of MFE/IV, and that MFE/IV operates on a foundation of IDOS, as shown in Figure 1-1, below.

The processor can be at one of two levels at any time: either the MFE/IV levelor the IDOS level.

When the processor is in the IDOS level of operation, no other job or application can be running. While in the MFE/IV level, however, it is possible to have other applications such as VISION running while text-editing is being done in ForeWord. IDOS communicates only with MFE/IV. MFE/IV communicates with the applications, as well as with IDOS. Once MFE/IV has been started,no further interaction with IDOS is necessary.

SYSTEM DESCRIPTION

Using a System IV/40, IV/50, IV/60, IV/65, IV/70, or IV/90 processor, ForeWord can accommodate up to 24 video terminals. This multi-terminal system supports up to a total of 8 disc drives (8231, 8241, 8261, or 8271), with removable

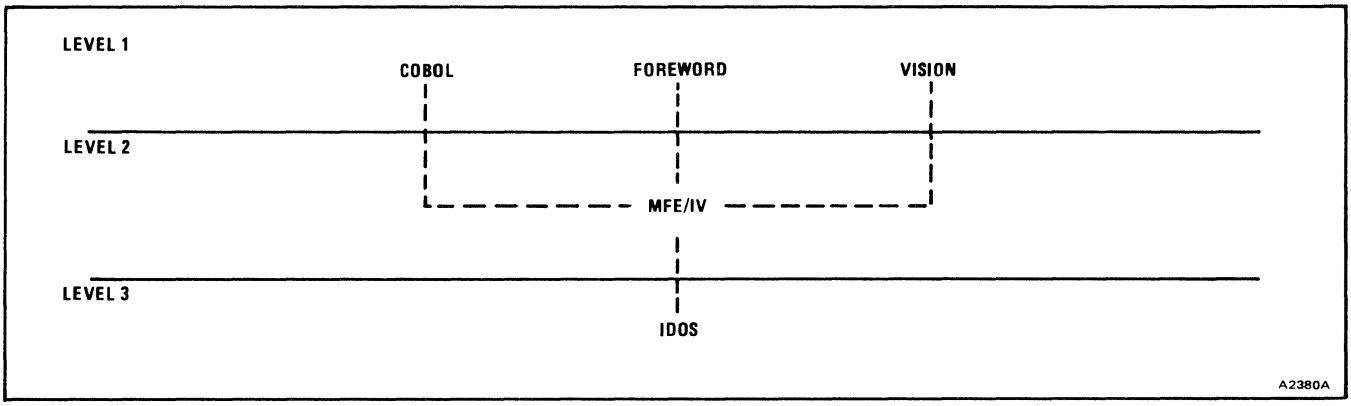


Figure 1-1. Levels of Operation

disc cartidges or disc packs providing an online storage capacity ranging from 400 to 100,000 pages of text. Removable discs also provide unlimited archival storage.

TERMINOLOGY AND CONVENTIONS

Throughout this manual the 8235 Disc Cartridge is referred to as the 8231 Disc and the 8265 Disc Pack is referred to as the 8261 Disc. Also note that octal numbers are indicated by a leading zero: for example, 0277. Hexadecimal numbers are represented by a percent sign: for example, %22F.

As used in this manual, the term *online* refers to the use of a peripheral device under continual control of a processor, while the term *offline* describes a peripheral device that is not under such continual control.

Section 2
System Operating Procedures

ForeWord is an application program that runs under the Multifunction Executive (MFE/IV) operating system. Since several application programs besides ForeWord can be running on the same operating system, the following procedures assume that the MFE/IV operating system is in operation. For information about the operation of the MFE/IV operating system, see the *MFE/IV Multifunction Executive Operator's Manual* (SIV/70-12-16).

OPERATING PROCEDURES FOR MFE/IV

IDOS is used to load MFE/IV into the Series IV/60, IV/65, IV/80, IV/90 Model 2, or IV/95 Extended Memory Processors. MFE/IV is initialized automatically by the MFE/IV Pre-processor using the Configuration File, under IDOS control.

ENTERING TIME AND DATE

After system initialization is complete, the System Terminal Control Program is called automatically and all terminals on the system are placed in System Terminal Mode. You must put one terminal (normally terminal zero) into System Console Mode and then enter the system time and date. Because entering the system time and date is a System Console function, a password is required.

STARTING FOREWORD

After the system time and date have been entered, MFE/IV is ready to start execution of application programs. You must enter a separate START command from the System Console Terminal for each job to be started. To start ForeWord key in the six-character name for the ForeWord program, as follows:

```
// IVWORD  (or START,IVWORD)
```

After the START command has been issued, the System Console Terminal remains in System Console Mode; all other terminals on the system are in System Terminal Mode. All System Terminals display a prompt line similar to the following:.

```
TYPE,S,or?
MFE IS READY
```

The letter I does not automatically appear when the prompt line first appears. The I is displayed only after ForeWord has completed initialization, and only when a terminal returns to the MFE/IV IDLE mode screen.

STOPPING FOREWORD

ForeWord can be stopped by keying in the MFE/IV command STOP IVWORD while in the System Console Mode. To terminate ForeWord for one terminal only, press CTRL CURSOR RETURN.

Section 3
Statistics Programs

Statistical information can be obtained through a series of statistical programs that operate at the IDOS level. The STATISTICS command is used to access the Statistics Display that can be printed immediately, if desired. No MFE/IV applications can be executing while the statistics programs are in use.

The statistical programs are optional and are configured during installation. These programs are run when the system is operating under IDOS control, that is, before MFE/IV is initialized. No other application jobs can be running while the system is under IDOS control. These optional programs print information from the Document Descriptions in text areas and ARCHIV storage, statistics on terminal and printer usage, listings from the ASSEMBLE log, or summary reports from ASSEMBLE commands. One program deletes documents as specified by the user, and prints a list of the documents deleted. Each statistical program is described under "Statistical Reports" below.

STATISTICS DISPLAY

Position the cursor over STATISTICS in the Command Menu, and press COMMAND.

The screen displays the number of terminals and printers configured for the installation. Figure 3-1 shows a sample statistics display for configuration of 24 terminals and printers.

ForeWord fills in the fields for those foreground and background terminals and printers activated by the system. Each column lists eight foreground or background terminals and printers; zeros appear where no activity has taken place or where there is neither terminal nor printer connected to the system.

The terminal/printer number is listed, followed by the total number of documents that have been opened at that terminal/printer, the total time in hours and minutes that the documents were open, and the total number of lines printed from that terminal or printer.

When an asterisk appears next to the terminal number, it indicates that the terminal is currently in use. For example, in the display shown in Figure 3-2, terminals 1, 5, 8, 11, 14, and 15 were in use at the time STATISTICS was displayed on the screen.

Cumulative statistics can be cleared by executing the program STATS2 and specifying that the statistics are to be reset to zero at the completion of the program.

STATISTICS REPORTS

The statistics programs are STATS1, STATS2, STATS3, STATS5, STATS7, and STATS8. If STATS5 and STATS8 are to be a part of the STATS program (a control file that runs the statistical programs) at an installation, the IDOS file PASTAT must be made available by the Four-Phase Systems Engineer at the time of installation. Check with the Four-Phase Systems Engineer to determine whether or not ForeWord has been configured for the STATS programs discussed in this section. To execute the STATS program, use the following procedure:

a. Check that no terminals are in use. Key in the command STOP ALL. This will stop all applications under MFE/IV, so that the statistics programs can be run under IDOS.

b. At terminal 0, type:

```
// STATS
```

A space must be entered between the second slash and the word STATS.

Each of the STATS programs produces a printed report. Some of the programs require keyboard input in response to questions. Each of these STATS programs and the accompanying statistical reports is fully described on the following pages.

c. Return to MFE/IV (from System Console Mode.)

d. Restart ForeWord with the command: // IVWORD (or START IVWORD.)

STATS1 (Text Area Document Description Report)

Statistical Report 1 prints the document name, originator, date created, date to be deleted, document width (narrow = T, wide = W, or extra-wide = X) and description from each Document Description in the text area. Figure 3-3 illustrates the printed information in this report.

STATS2 (Terminal and Printer Report)

Statistical Report 2 contains information about terminals and printers, as shown in the sample report in Figure 3-4. The average lines per document is calculated by dividing the total number of documents accessed into the total number of lines printed.

```
                        TERMINAL STATISTICS 10/15/80

#  DOC  TIME  LINES     #  DOC  TIME  LINES     #  DOC  TIMES  LINES
0 9570 99:32 989003     8 2334 46:03     3    16 1209  27:23   1290
1 7584 73:34 948500     9 7399 60:28     1    17    0  00:00      0
2 4547 17:41 612337    10 4695 27:21    17    18    0  00:00      0
3 3290 12:54      7    11 1553 58:24 87610    19    0  00:00      0
4 4808 30:59      8    12 2475 02:18    19    20    0  00:00      0
5 5929 47:11     44    13 1617 32:27     3    21    0  00:00      0
6 4933 20:08     16    14 2864 76:30 852156    22    0  00:00      0
7 4721 65:52     10    15   58 01:36     2    23    0  00:00      0

                          PRINTER STATISTICS

#  DOC  TIME  LINES     #  DOC  TIME  LINES     #  DOC  TIMES  LINES
0 9570 99:32 989003     8 2334 46:03     3    16 1209  27:23   1290
1 7584 73:34 948500     9 7399 60:28     1    17    0  00:00      0
2 4435 16:43 612337    10    0 00:00     0    18    0  00:00      0
3    0 00:00      0    11 1653 73:28 142526    19    0  00:00      0
4    0 00:00      0    12    0 00:00     0    20    0  00:00      0
5    0 00:00      0    13    0 00:00     0    21    0  00:00      0
6    0 00:00      0    14 2647 60:41 797240    22    0  00:00      0
7    0 00:00      0    15    0 00:00     0    23    0  00:00      0
```

Figure 3-1. Sample Statistics Display

```
                        TERMINAL STATISTICS 02/15/81

#  DOC  TIME  LINES     #  DOC  TIME  LINES     #  DOC  TIMES  LINES
0 9570 99:32 989003     8*2334 46:03     3    16 1209  27:23   1290
1*7584 73:34 948500     9 7399 60:28     1    17    0  00:00      0
2 4547 17:41 612337    10 4695 27:21    17    18    0  00:00      0
3 3290 12:54      7    11*1553 58:24 87610    19    0  00:00      0
4 4808 30:59      8    12 2475 02:18    19    20    0  00:00      0
5*5929 47:11     44    13 1617 32:27     3    21    0  00:00      0
6 4933 20:08     16    14*2864 76:30 852156    22    0  00:00      0
7 4721 65:52     10    15*  58 01:36     2    23    0  00:00      0
```

Figure 3-2. Statistics Display Showing Terminals in Use

```
NAME ORIGINATOR CREATED   DELETE  DOC.WIDTH DESCRIPTION TEXT AREA:TXAREA PAGE 1

B123 BROWN      11/07/80  04/11/81      W    OUTLINE PROP
CMAN CONWAY     03/05/80  04/10/81      T    HOUSE MANUAL
```

Figure 3-3. Sample STATS1 Report

TERMINAL STATISTICS mm/dd/yy

TERMINAL #	# LINES PRINTED	# DOCUMENTS ACCESSED	TOTAL TIME	AVG LINES/DOC	AVG TIME/DOC
0	8679	303	11:31	28.6	:02.28
1	479	340	16:28	1.4	:02.90
2					
3					
4					
.					
.					
24					

PRINTER STATISTICS

PRINTER #	# LINES PRINTED	# DOCUMENTS ACCESSED	TOTAL TIME	AVG LINES/DOC	AVG TIME/DOC
0	25818	206	18:34	173.8	:05.40
1	4212	37	16:53	113.8	:27.37
2			:00	0.0	:00:00
3					
4					
.					
.					
16					

Figure 3-4. Sample STATS2 Report

The STATS2 program asks the user two questions. First, the screen displays the following request.

```
PLEASE ENTER TODAY'S DATE
```

Type in the month, day, year in the form mm/dd/yy. The entered date appears on the first line of the report.

The program then asks the following question about STATS2.

```
SHOULD STATISTICS BE RESET TO ZERO AT THE END OF THE RUN?
REPLY Y OR N
```

Respond N (no) for a listing of the data without disturbing the retained information.

Respond Y (yes) if all the printer and terminal statistics are to be reset to zero after the listing is printed.

STATS3 (Archive Document Description Report)

Statistical Report 3 lists the document name, originator, date created, date to be deleted, document width (narrow, wide or extra-wide) and description from each Document Description in the ARCHIV area. The printed information is like that outlined above for Statistical Report 1.

For Statistical Report 3 the display reads:

```
FILES ACCESSED AFTER mm/dd/yy
WILL NOT BE PRINTED
```

The date entered determines which files are to be accessed. Any file accessed on or after the date entered does not become a part of Report 3. This method enables the tracking of documents that have been idle for some time. If blanks are entered, all file Descriptions will be printed.

STATS5 (Assembled Documents Report)

Statistical program 5 prints the log that is generated by the ASSEMBLE command. Each time the ASSEMBLE command is successfully completed, ForeWord logs the data from that command.

The STATS5 program displays the request:

PLEASE ENTER REPORT DATE

Enter the current date in the form mm/dd/yy (for example, 02/15/79).

Figure 3-5 shows an example of the information printed by STATS5.

STATS5 (Log)

STATS5 also prints a listing of the log generated by the system when the ASSEMBLE command is used. The log can be viewed in the form in which it originated.

To view the log exactly as it was generated by ForeWord, use the following procedure after all STATS programs have completed.

a. Return to ForeWord (see Section 2).

b. Type IDOS.

c. Press INDEX.

d. Position the cursor over the document named PASTAT.

e. Press XFER.

This procedure causes the information in the PASTAT file to be transferred to a document by the same name located in the ForeWord text area.

To view or print the document named PASTAT located in the ForeWord text area, follow the procedures for opening and/or printing a document.

STATS7 (Documents Used for Assembly Report)

Statistical program 7 lists all the documents used in the ASSEMBLE command. These documents are sorted and summarized by document name and STATS7 also indicates the total number of times each document was accessed.

The STATS7 program requests the data to be printed on the report:

PLEASE ENTER REPORT DATE

COMPANY NAME

02/15/79 DOCUMENT USAGE STATISTICS PAGE 1

DOCUMENT NAME	TEXT AREA	ACCESSED BY TERMINAL #	DATE	TIME
p1	Txarea@1	2	12/15/78	09:07
p2	Txarea@1	2	12/15/78	09:07
p4	Txarea@1	2	12/15/78	09:07
para6A	Txarea@1	2	12/15/78	09:07
para10	Txarea@1	2	12/15/78	09:07
p3	Txarea@1	2	12/15/78	09:07
p5	Txarea@1	2	12/15/78	09:07
p22	Txarea@1	2	12/15/78	09:07
p13	Txarea@1	2	12/15/78	09:07
para6a	Txarea@1	2	12/15/78	09:07
para6B	Txarea@1	2	12/15/78	09:07
para5C	Txarea@1	2	12/15/78	09:07
p789	Txarea@1	2	12/15/78	09:07
p1	Txarea@1	2	12/15/78	09:07

Figure 3-5. Sample STATS5 Report

Enter the date, which may be the current date, the weekend date for a report at the end of the week, or a month end date. The date is entered in the form mm/dd/yy. Figure 3-6 shows an example of the summary printed from STATS7.

STATS8 (Document Deletion Function and Report)

Statistical Program 8 accesses the text areas which are specified at installation time, and deletes documents from those text areas. The deletion of the document is based on the criteria entered from the keyboard in response to the requests made by the STATS8 program.

The program first requests the date:

```
PLEASE ENTER REPORT DATE
```

Enter the current date. After the date is entered STATS8 asks a series of questions to determine the basis for deletion of documents. Respond to each question asked.

```
DO YOU WANT TO DELETE ALL DOCUMENTS WITH TEMP IN THE FIRST
FOUR CHARACTERS?
                REPLY Y OR N.

DO YOU WANT TO DELETE DOCUMENTS BASED ON DELETE DATE?
                REPLY Y OR N.
```

The delete date that STATS8 refers to is the date the operator enters in the Description of the document. If no deletion date has been entered in the Description of the document, the document is ignored and bypassed.

If the answer to this question is Y for yes, STATS8 displays the following statement:

```
DELETE ALL DOCUMENTS WITH A DELETION DATE OF mm/dd/yy AND
PRIOR.
```

Enter the appropriate date, indicating the month, day, and year; for example, 02/15/81.

STATS8 then displays the following question:

```
DO YOU WANT TO DELETE DOCUMENTS BASED ON CREATE DATE?
                REPLY Y OR N.
```

If the response is Y for yes, STATS8 displays the following statement:

```
DELETE DOCUMENTS WITH A CREATION DATE OF mm/dd/yy AND
PRIOR.
```

Fill in the appropriate date. The STATS8 program will then delete all documents created on or before the date entered.

If no deletion criteria has been entered (all questions asked by STATS8 have been answered with N for no), the STATS8 program displays the following:

```
NO DELETE CRITERIA SELECTED.
DO YOU WANT TO RE-ENTER PARAMETERS?
REPLY Y TO RE-ENTER JOB OR ANY KEY TO ABORT.
```

Respond Y for yes to reenter deletion criteria. Respond by pressing any other key if no deletion criteria is to be entered.

The final question asked by STATS8 is:

```
DO YOU WANT TO DELETE PROTECTED DOCUMENTS?
                REPLY Y -OR- N.
```

A yes response indicates that all password-protected documents meeting deletion criteria will be deleted. A no response means that no password protected documents will be deleted.

The STATS8 program prints a list of all documents deleted.

After the STATS8 program has been run, use the IDOS utility CHKTXT to return unused sectors to the list of available sectors.

```
                        SUMMARY OF DOCUMENT USAGE
02/15/81
        DOCUMENT          TXAREA          DATE        # ACCESSES
          NAME             NAME

          p1              Txarea          12/15/80         2
          p2              Txarea          12/15/80         1
          p3              Txarea          12/15/80         1
          p4              Txarea          12/15/80         1
          p5              Txarea          12/15/80         1
          p5              Memos1          12/15/80         7
          p5C             Txarea          12/15/80         1
          p5C             LETTER          12/15/80         8
```

Figure 3-6. Sample STATS7 Report

Section 4
Keystroke Memory

ForeWord is able to store any specified combination of characters and function keys (up to 700 keystrokes) in a glossary for later recall by the operator. ForeWord's capability for remembering and producing these keystrokes is called keystroke memory. Keystroke memory enables a user to invoke a sequence of keystrokes, previously stored in memory, as though they had been entered directly from the keyboard.

INTRODUCTION

Applications that would require operators to enter repetitive sequences of keystrokes can be done easily by invoking the keystroke memory feature. The sequence of keystrokes can contain both text, such as a document name or portion of a form letter, as well as functions specified by the function keys found on the keyboard. The function keys are those which surround the standard keyboard.

Keystroke memory can be used to duplicate almost any sequence of keystrokes that can be entered from the operator's keyboard. Any sequence of keystrokes that must be repeated often can be coded into a keystroke memory sequence, for an effective saving of operator effort.

Other uses of keystroke memory sequences are to open old documents and make changes to the document description, or leave one text area and move to another. Copying files, setting margins, and archiving documents can all be quickly accomplished by the operator using keystroke memory.

Since keystroke memory simulates keystrokes entered from the keyboard, the keystroke memory sequence must duplicate *exactly* the series of keystrokes the operator would use to perform the same functions. Therefore, it can be understood that the position of text, symbols, and functions within a keystroke memory sequence is very important.

CREATING A KEYSTROKE MEMORY SEQUENCE

A keystroke memory sequence is entered into a glossary. A glossary can contain both glossary entries such as portions of form letters, as well as keystroke memory sequences. Each keystroke memory sequence must have a single-character unique identifier. This unique identifier can be any character that will display on the screen. This identifier must appear on a line with a chapter mark. The chapter mark denotes the beginning of a new keystroke memory sequence, and the single-character identifier denotes the specific keystroke memory sequence.

The single-character unique identifier must be on a line by itself, denoted by a chapter mark.

The single-character unique identifier is pressed in conjunction with the CODE key to indicate to ForeWord exactly which keystroke memory sequence is desired.

Function keys such as RETURN, MOVE, OPEN, GLSRY, INDEX, COMMAND, or PAGE DOWN can be entered into the keystroke memory sequence by use of the appropriate special symbol. All special function keys except the SHIFT, SHIFT LOCK, and REPEAT keys have symbolic representations. Some symbols do not have corresponding keys on the keyboard. These are PRINTC, PAUSE, RESUME, SAVCUR, SETCUR, SAVPTR, SETPTR, and BEEP. The special function and symbol keys are described in Table 4-1 below.

Table 4-1. Keystroke Memory Symbols and Function Keys

FUNCTION KEY	SYMBOL
BEEP	beep
CENTR	centr
CHAPT	chapt
CLEAR MAR	clear
CODE	code
COMMAND	command
CTRL DEL	c/del
CTRL ↑	c/up
CTRL ↓	c/down
CTRL ←	c/left
CTRL →	c/right

Table 4-1. Keystroke Memory Symbols and Function Keys (Continued)

FUNCTION KEY	SYMBOL	FUNCTION KEY	SYMBOL
CTRL HOME	c/home	OPEN	open
CTRL CURSOR RETURN	c/return	PAGE DOWN	page
CTRL INS	c/ins	PARA	para
CTRL O	c/o	PASSW	passw
CTRL P	c/p	PAUSE	pause
CTRL R	c/r	PRINT (one page only)	print
CTRL TAB	c/tab	PRINT (continuous)	printc
CTRL V	c/v	REL	rel
CURSOR RETURN	return	RESET	reset
↑	up	RESUME	resume
↓	down	SHIFT CURSOR RETURN	s/return
←	left	SHIFT DEL	s/del
→	right	SHIFT HOME	s/home
DEC TAB	dectab	SHIFT INS	s/ins
DEL	del	SHIFT TAB	s/tab
GLSRY	glsry	SHIFT ↓	s/down
HOME	home	SHIFT ←	s/left
HYPHN	hyphn	SHIFT →	s/right
INDEX	index	SHIFT ↑	s/up
INS	ins	TAB	tab
LINE EDIT	line	UPPER CASE	upper
MARGN SET	margn	XFER	xfer
MOVE	move	|←	begin
NEW PAGE	new	→|	end

HOW KEYSTROKE MEMORY WORKS

When the CODE key is pressed, ForeWord waits for the next character to be entered. The next character entered after the CODE key signals ForeWord to "look through" the assigned glossary until it finds this single-character unique identifier. ForeWord looks for a line with a chapter mark. When a chapter mark is found, the character on that line is compared with the character just entered. If there is a match found, ForeWord builds a sequence of keystrokes from the text and symbols found in the entry labeled by the single-character unique identifier. At this point ForeWord begins responding to the sequence it has built as though the keystrokes were actually being entered by the operator from the keyboard. If there is no match, the sequential search is continued until the match is made.

ENTERING A KEYSTROKE MEMORY SEQUENCE INTO A GLOSSARY

To place a keystroke memory entry in the glossary:

a. Open the document used as the glossary or open a new glossary document.

b. Type the single-character unique identifier. This character can be any upper- or lowercase letter of the alphabet, any number between 0 and 9, or any puncuation mark.

c. Press CHAPT to place a chapter mark on the line that contains the unique identifier.

d. Press CURSOR RETURN.

e. Type the comments that explain the operation of the function to follow. Comments must be enclosed within brackets, e.g. [and]. Entry of such descriptive comments is highly recommended but not required. Figure 4-1 shows an example of keystroke memory entries in a glossary. Comments can be inserted anywhere within the glossary entry.

f. Press CURSOR RETURN.

g. Each keystroke memory entry can be up to 700 keystrokes long. All symbols and text (but not comments enclosed in brackets) are included in the 700 keystrokes. Each character and each function key translates as one keystroke.

h. Type the symbol or symbols for the functions to be performed. Symbols can be typed in either upper- or lowercase letters. Each symbol must be separated from another symbol or text by one or more spaces or commas. Remember that ForeWord performs the keystroke sequence *exactly* as it is entered in memory. Therefore, the *positions* of the functions with relation to the text and other functions is *very important.*

i. Type any text that ForeWord should insert. The text must be enclosed within either double or single quotes. Text can be separated from symbols by either spaces or commas. Text containing one type of quote marks must be enclosed in the other type of quote marks to avoid confusion. Keystroke memory sequences can be added to glossaries as needed.

j. Press CURSOR RETURN.

k. Repeat steps *b* through *j* for each keystroke memory entry.

ENTERING COMMANDS INTO A KEYSTROKE MEMORY SEQUENCE

ForeWord commands can be entered into a keystroke memory sequence as easily as keying them in at the keyboard. When you use COMMAND to indicate a command statement that is to be processed, you identify the particular command and place a response for each fill-in area in the keystroke memory entry. To specify a command in keystroke memory, use the following procedure.

a. Type the word COMMAND and enter a space.

b. Type the first four letters of the COMMAND name. Enclose these letters in either single or double quote marks. Enter a space.

c. Type the word COMMAND, enter a space.

d. Type the information that you would normally enter in the command itself. Each command has a specific number of positions allocated for each field. If the information you enter does not fill the allocated number of positions, type the word TAB, that is the symbol for the TAB key. The cursor is moved to the next field for text entry. It is important to account for each position of a fill-in field. If the information you enter fills the field, the cursor automatically positions itself at the next fill-in field, and you need not enter the TAB function. The text in the fill-in field must be enclosed in either single or double quote marks.

e. Type the word COMMAND.

KEYSTROKE MEMORY EXAMPLE

An example of a keystroke memory function would be the assigning of a queue to a background terminal. If the operator were doing this by individual keystrokes, it would be necessary to go to the IDLE MODE screen, type the

word "ASSIGN" on the screen and then press the COMMAND key. ForeWord displays the ASSIGN menu.

The operator would then have to press CURSOR RETURN twice to position the cursor on the field requiring the queue number. The operator would then type the desired queue number. It would then be necessary to TAB once in order to position the cursor over the background terminal field of the ASSIGN menu. Then the operator enters the desired background terminal number. Then the operators would press the COMMAND key again. ForeWord would begin to process the request by determining if the background terminal was busy. If the background terminal were busy, an error message would display on the screen. If the background terminal were available, the assignment would be completed, and ForeWord would return to the IDLE MODE display.

The sequence described above could take as many as 16 keystrokes. With keystroke memory the operator would only need to enter two keystrokes, the CODE key and the single-character unique identifier. This has the dual effect of speeding operations while minimizing operator error. Keystroke memory can be used by the ForeWord site supervisor to reduce necessary operator training time. The supervisor can develop keystroke memory sequences (KMS) that duplicate complex or long series of keystrokes and thereby eliminate the need for the individual operators to know exactly how to perform an ASSIGN command. For the operator, queuing a printer is as easy as entering two keystrokes.

The example in Figure 4-1 shows how the ASSIGN command might be entered in the keystroke memory glossary.

Consider the keystroke memory sequence in Figure 4-1. It simulates keystokes entered from the keyboard to assign a printer and queue number to a background terminal. When the COMMAND key is pressed, ForeWord displays the command menu. At the cursor position the characters 'ASSI' are then entered on the screen. When the COMMAND key is pressed again, ForeWord will go to the ASSIGN command. Numbers are entered in the appropriate fields with the TAB key used to move between fields as necessary.

You must account for each space in a fill-in area. In Figure 4-2, the ASSIGN command is used to assign a printer to a background terminal and a queue to a background terminal. Each fill-in area is marked with a number. The areas numbered 1 and 2 are not used for this assignment. When ForeWord goes to the ASSIGN command, the cursor is positioned in fill-in area 1. Because this is true, the directions in keystroke memory tell ForeWord to tab to area 2 and then to area 3, which is the first fill-in area for this assignment. Fill-in areas 3, 4, 5, and 6 are used to assign a printer and a queue to the same background terminal.

Each of these fill-in areas has two positions available. Because only one position is used for each number, directions to tab to the next fill-in area must be a part of the directions in keystroke memory. If a double-digit number were used in any fill-in field, the direction to tab would not be necessary. When both positions have information entered

```
A
[Glossary entry A is an assignment of printer #2 to background terminal #8, and
queue #3 to background terminal #8]
COMMAND 'ASSI' COMMAND TAB TAB '2' TAB '8' TAB '3' TAB '8' COMMAND
```

Figure 4-1. ASSIGN Command in Keystroke Memory Glossary

```
Foreground printing:      ASSIGN printer # 1  to terminal # 2
Background printing:      ASSIGN printer # 3  to background terminal # 4
Queue assignment:         ASSIGN queue   # 5  to background terminal # 6
Sheet feeder:             ASSIGN sheet feeder to printer    #
                          RELEASE sheet feeder from printer #


      (you have # background terminals and # queues available)

    Queue # and Printer #       assigned to background terminal #

       For foreground printing, leave terminal number blank.
```

Figure 4-2. Example of ASSIGN Command

in a two-position fill-in field, the cursor is automatically repositioned to the next fill-in area.

ASSIGNING THE KEYSTROKE MEMORY

To assign the keystroke memory document as a glossary:

a. Position the cursor over the name of the document in the index that contains the keystroke memory glossary.

b. Press GLSRY.

USING THE KEYSTROKE MEMORY

To use keystroke memory in a document:

a. Press the CODE key.

b. The type the single-character unique identifier associated with the desired keystroke memory sequence.

ForeWord automatically performs the keystrokes associated with that identifier and inserts any associated text. Repeat steps *a* and *b* each time a keystroke memory entry is recalled. Press RESET to stop a keystroke memory sequence after it has been invoked. ForeWord will not perform any more of the sequence after you press RESET.

NESTING

Nesting means that one function is invoked by another function. During development of a long and complicated sequence of keystrokes it is often advisable to break up one long involved sequence into two or more smaller sequences, both for testing and managability. Once a smaller sequence has been tested successfully it can be brought into the larger sequence by nesting.

Another advantage in nesting keystroke memory sequences is that two different sequences might assign the same queue to the same background task. The assignment could be written as a separate KMS and nested within two other sequences.

Also, since a single keystroke memory sequence is limited to 700 text characters and/or symbols, it is often necessary to break up extremely large keystroke memory sequences.

In keystroke memory, nesting is accomplished by placing the word CODE and the single-character unique identifier in the sequence of functions listed under another function. For example, if function z opens a previously created document and changes the tabs, function y enters tabulated text in the document, and function x again returns the standard tabs and closes the document. The glossary entries might look like the examples in Figure 4-3.

Nesting entries x, y and z in entry B would produce the following glossary entry:

```
B
CODE 'z' CODE 'y' CODE 'x'
```

```
x
margn c/tab c/tab margn rel rel
y
'date' tab 'city' tab 'state' tab 'country' tab 'percentage' return return
z
open s/home return margn c/right s/tab c/right c/right s/tab c/right s/tab
c/right s/tab c/right c/right s/tab c/right s/tab c/right s/tab c/right s/tab
c/right c/right s/tab c/right s/tab c/right margn return return
```

Figure 4-3. Examples of the Nesting Function

```
C
[This keystroke memory entry causes two adjacent tabbed columns to exchange
positions.  Position the cursor on the tab stop of the left most column of the
two columns to be swapped.  Press CODE C.  The function will then swap the
columns until the end of the document is reached, or until you press RESET.]
SAVCUR TAB BEGIN TAB LEFT END SETCUR MOVE DOWN CODE 'C'
```

Figure 4-4. A Sample Keystroke Memory Entry

Any keystroke memory sequence, whether nested or not, can be stopped by pressing RESET.

SAVCUR AND SETCUR

The symbols SAVCUR and SETCUR appear in the sample entry. SAVCUR (save the cursor column position) tells ForeWord to remember the position where the cursor is located, as shown in Figure 4-4. In the example, the operator set the cursor on the first 2 in the second column. It is this cursor position that ForeWord will remember when it sees SAVCUR in the keystroke memory sequence. When ForeWord sees SETCUR, the function that follows the END function in the sample entry, it positions the cursor on the first 2 in the second column. ForeWord remembered this position (SAVCUR.) SAVCUR saves only the column number, not the line the cursor was on.

In the sample entry above, the word TAB is the symbol for the TAB key; BEGIN is the symbol for a beginning pointer; END is the symbol for an ending pointer; MOVE tells ForeWord to place the text in the new location and delete it from its original location. When ForeWord does this, the column to the right is moved to the left. Thus the MOVE function repositions column three and makes it the second column in the document. Because the text has been removed from column three, what was previously in column two shifts over to the right one column. The DOWN direction tells the cursor to move down one line and CODE C tells it to repeat the sequence of keystrokes on that line.

To reposition columns two and three, position the cursor on the first 2 in the second column, shown in Figure 4-5; then press CODE C. ForeWord automatically repositions columns two and three. To stop the keystroke function at any point, press RESET.

The first line of each keystroke memory function entry must contain the single-character unique identifier. Any single character that can be displayed and printed is a legal unique identifer for an entry in keystroke memory. In keystroke memory, the identifier can be only one character. That character can be any upper- or lowercase letter, any number between 0 and 9, or any punctuation mark. The single-character unique identifier is used to identify the beginning of each keystroke memory sequence. In the sample entry shown in Figure 4-4, the unique identifier is C.

Table 4-2. Special Symbols in Keystroke Memory

Special Symbols	Meaning
savcur	This tells ForeWord to save the cursor column number on at the point where it was.
savptr	After the beginning and ending pointers have been set, this tells ForeWord to remember the columns where those pointers are located.
setcur	This tells ForeWord to move the cursor to the column where it was located when ForeWord was directed to "savcur". The cursor remains on the same line.
setptr	This tells ForeWord to use the line in which the cursor is positioned and set the pointers to the positions that were saved when ForeWord was given the direction "savptr."

PAUSE and RESUME

The keywords PAUSE and RESUME allow a keystroke memory sequence (KMS) to be interrupted in order to accept keyboard input.

```
11111   22222   33333
11111   22222   33333
11111   22222   33333
11111   22222   33333
11111   22222   33333
11111   22222   33333
11111   22222   33333
11111   22222   33333
11111   22222   33333
11111   22222   33333
```

Figure 4-5. Screen Display Examples

The keyword PAUSE can be typed in any keystroke memory sequence. PAUSE causes a keystroke memory function to be suspended at the point where the PAUSE keyword is encountered. The cursor reappears on the screen and the operator may perform any normal function (even perform another KMS) just as if the end of the keystroke memory sequence had been encountered.

Pressing the RESUME key (CTRL 7) causes the KMS (which was suspended by the PAUSE) to continue execution at a point immediately following the PAUSE keyword. A RESUME keyword is also provided to correspond to the RESUME key.

If the RESUME keyword is used in a KMS that is invoked while another KMS sequence has paused, the RESUME keyword terminates the KMS in which it appears, discards all following keystrokes, and resumes processing for the KMS that was paused.

The PAUSE/RESUME feature is useful in creating form letters with fill-in fields. The letter can be entered as a KMS with a PAUSE keyword located each place a fill-in field must be entered.

The operator opens a new document for each letter, and invokes the KMS which contains the letter. Each time a PAUSE is encountered, the system waits for the operator to type in the required field. After the field is entered, the operator presses the RESUME key to continue the generation of the boiler-plate portion of the letter.

A BEEP keyword is provided to cause the terminal alarm to sound once. When executed as part of a KMS, it causes the terminal alarm to sound once each time the BEEP keyword is encountered. When entered before the PAUSE directive, the operator is alerted that a fill-in field is approaching.

Note that the RESET key cannot be used to cancel a KMS that has paused. Use CODE RESUME (CODE CTRL 7) to cancel a paused KMS.

When a PAUSE keyword is encountered by the system, the KMS containing it is actually terminated at that point. The distinction between a PAUSE termination and a KMS termination is that the system remembers the KMS which was terminated by the PAUSE directive and the point in the KMS where the PAUSE was encountered. When the RESUME key is pressed, the KMS is restarted following the PAUSE without taking any checks to determine if the state of the system is the same as it was when the PAUSE was encountered. This could present a problem; for example, if a KMS expects a document to be open when the KMS is RESUMED, but the document has been inadvertently closed while the KMS was paused, the results would be incorrect.

A PAUSE cannot be nested (see Nesting above.) Any attempt to do so will terminate the KMS function and the following error message displays.

```
NESTED PAUSE IN KEYSTROKE MEMORY IS NOT ALLOWED
PRESS RESET TO CONTINUE
```

REPEATING A KEYSTROKE MEMORY SEQUENCE

To cause the keystroke memory sequence to repeat itself:

a. After the entire sequence has been entered, type the word CODE in lowercase or capital letters.

b. Space once and, within quote marks, type the single character unique identifier for the sequence.

c. CODE and the unique identifier tell ForeWord to go back to the beginning of the sequence and repeat it.

If you wish to stop processing of the sequence, press RESET. Because CODE and the unique identifier cause ForeWord to return and repeat the sequence each time, it can only be stopped by pressing RESET. RESET ends the insertion of any sequence in the document.

Following is an example of the entry of a series of keystrokes that are repeated until RESET is pressed:

```
R
tab 'AAAA' tab 'BBBB' tab 'CCCC' return code 'R'
```

The sequence can be stopped at any time by pressing RESET.

ADDITIONAL NOTES ON KEYSTROKE MEMORY

There are some cautions which should be observed when nesting keystroke memory sequences.

When editing a glossary containing keystroke memory sequences, it is best to reassign the glossary. It is possible to edit the glossary without reassigning it, as long as the first eight lines of the glossary are not changed. This makes it possible for a keystroke memory sequence to edit itself in the assigned glossary.

Caution should be used when creating a keystroke memory sequence that calls (or repeats) itself. A thorough understanding of keystroke memory is essential before attempting repetitive keystroke memory sequences.

ForeWord searches through a glossary sequentially for the single-character identifiers and the keystroke memory

sequences they flag. Frequently used sequences should be placed near the top of the glossary in order to save search time.

Two error messages can appear when keystroke memory is invoked.

The first message is:

```
ERROR IN GLOSSARY ENTRY FOR FUNCTION a AT SYMBOL tat
```

This error message means that a symbol for function a (the unique identifier) was incorrectly typed in the glossary document. The incorrect symbol "tat" is displayed. ForeWord could not recognize the symbol. In most cases this represents a misspelled word, as illustrated above when tat was used instead of tab.

The second message is:

```
GLOSSARY ENTRY FOR FUNCTION M IS TOO LONG
```

This error message means that the entry in the glossary was greater than the permitted number of 700 keystrokes.

When this occurs, break the entry into two separate entries and place CODE and the single-character unique identifier for the second entry at the end of the first entry. Thus, after all text and keyboard function sequences have been inserted from entry one, ForeWord moves to entry two and inserts the sequences and text from there.

SAMPLE KEYSTROKE MEMORY ENTRIES

Figure 4-6 illustrates keystroke memory entries in a glossary. Each entry is prefaced with a descriptive comment that explains the functions performed.

```
C                                                                    □
[This keystroke memory entry causes two adjacent columns to exchange
positions.  Position the cursor on the tab stop of the left-most column of the
two columns to be swapped.  Press CODE C.  The function will then swap the
columns until the end of the document is reached, or until you press RESET.]
SAVCUR TAB BEGIN TAB LEFT END SETCUR MOVE DOWN CODE 'C'
S                                                                    □
[This keystroke memory function swaps two tabular data columns that are
separated by a third column.  The data must be entered correctly and the cursor
must be at the tab stop for the left-most column of the two columns to be
swapped.  Position the cursor at the tab-stop of the left-most column to be
swapped, and press CODE S]
SAVCUR TAB TAB BEGIN TAB LEFT END SETCUR MOVE SETCUR TAB TAB BEGIN TAB LEFT END
SETCUR TAB MOVE SETCUR DOWN CODE 'S'
d                                                                    □
[This function deletes a column of tabbed material and shifts the remaining
columns to the left.  Position the cursor on the first character of the column
to be deleted and press CODE d.]
BEGIN TAB LEFT DEL DOWN CODE 'd'
c                                                                    □
[Use this function to delete a column of tabbed material that is up to 15
characters wide.  The column space will remain but will be blank.  Position the
cursor on the first character of the column to be cleared and press CODE c]
DEL DEL DEL DEL DEL DEL DEL DEL DEL DEL DEL DEL DEL DEL DEL DOWN CODE 'c'
O                                                                    □
[Use this function to fill in the first line of text in the Description of a
newly created document.  Type the document name and press CODE and O.  After
entering the first line of text, the cursor will be positioned next to
"description" in the header.]
OPEN 'c.c.connell' TAB 'WPC' TAB
A                                                                    □
[Use this function to display the ARCHIV index for the current drive.  Must be
in IDLE mode.]
'ARCHIV' INDEX
```

Figure 4-6. Sample Keystroke Memory Entries (Page 1 of 2)

I ☐
[Use this function to display text area TXAREA on drive number 2. Must be in IDLE mode.]
'TXAREA@2' INDEX

a ☐
[Use this function to assign printer number 1 to background terminal number 1 and queue number 3 to background terminal number 1. Must be in IDLE mode.]
COMMAND 'assi' COMMAND TAB TAB '1' TAB '1' TAB '3' TAB '1' COMMAND

N ☐
[If your installation is configured for the temporary document option, use this function when you want to copy a document into a temporary document created by keystroke memory. First position the cursor over the to-be-copied document name in the index, or type the document name; then press CODE N.]
OPEN BEGIN S/HOME END REL OPEN C/INS

T ☐
[Use this function to open an existing document and change the margins and tab settings and enter text. The tab changes are entered on the assumption that that a tab stop in every five positions currently exists in the document. Position the cursor on the document name, or type the document name on the screen, and press CODE T.]
OPEN S/HOME RETURN MARGN C/RIGHT S/TAB C/RIGHT S/TAB C/RIGHT S/TAB C/RIGHT C/RIGHT S/TAB C/RIGHT S/TAB C/RIGHT S/TAB C/RIGHT S/TAB C/RIGHT C/RIGHT S/TAB C/RIGHT S/TAB MARGN RETURN RETURN 'Salesperson' TAB 'State' TAB 'Date' TAB 'Percentage'

K ☐
[Entry K will copy the line above the cursor, insert that line before the line containing the cursor, and move the cursor down to the next line]
HOME UP BEGIN END DOWN C/INS DOWN C/DEL DOWN

r ☐
[This keystroke memory entry releases a document, enters the general text area named, and returns the screen to the ForeWord display.]
REL REL 'TXAREA' INDEX RESET

h ☐
[This keystroke memory sequence changes some of the fill-in areas under PRINTER CONTROLS in the document header. Lines in top margin changes to 00, pitch changes to pica, the right justify response becomes yes, the left margin offset changes to 10, and the prepaginated response changes to yes. Press CODE h when the document is open.]
COMMAND 'head' COMMAND TAB 'oo' TAB 'py10' TAB 'y' COMMAND

Figure 4-6. Sample Keystroke Memory Entries (Page 2 of 2)

MATHEMATICAL OPERATIONS IN KEYSTROKE MEMORY

Keystroke memory sequences can be used to perform repetitive mathematical operations on rows or columns of numbers. The MATH function key, which activates the ForeWord Math Package, is represented in keystroke memory by the symbol *math.* Most mathematical operations require nested keystroke memory sequences: a non-repeating sequence to clear the accumulator and set an initial value, and a repeating sequence to perform the desired operation vertically or horizontally as required. Mathematical keystroke memory sequences must take into account whether the numbers in the target document were entered with regular or decimal tabulation. Decimal tabulation is recommended; it provides the most convenient method of numerical entry and allows the most efficient use of keystroke memory.

Figure 4-7 gives examples of mathematical keystroke memory sequences.

To stop a keystroke memory sequence and display a total, enter CTRL J t (\ t) using decimal tab where the decimal point of the total is to appear. Any attempt to invoke a MATH operation while the cursor is positioned over \t forces keystroke memory to halt and displays the accumulator total. CTRL J s (\ s) halts keystroke memory, but does not automatically display a total. Either \t or \s provides a convenient mechanism for specifying an end point to a repeating sequence. Note that the keystroke memory sequence must position the cursor directly on the \control character in the target document. Figure 4-8 shows how, to display a total at the end of a row of numbers, position the \t as illustrated below:

To display a total at the end of a column of numbers, position the \t as illustrated below:

```
1111.1
2222.2
3333.3
    \t (Position on tab stop with TAB key)
```

You can also halt a mathematical keystroke memory sequence manually by pressing RESET when the sequence is complete.

```
1[This nested sequence adds one column of numbers.  Position the cursor on the
decimal point of the first number in the column.]
math 'p' down code '2'
2
math 'a' down code '2'

3[This nested sequence adds one dec-tabbed row of numbers.  Position the cursor
on the decimal point of the first number in the row.]
math 'p' dectab code '4'
4
math 'a' dectab code '4'

5
[This repeating sequence multiplies dec-tabbed numbers in each line of two
columns and displays the total in a third column.  Position the cursor on the
decimal point of the first number in the first line.]
math 'p' dectab math 'm' dectab math 't' return code '5'
```

Figure 4-7. Mathematical Keystroke Memory Sequences

```
FOOD            LODGING       TRANSPORTATION     TOTAL
   1111.1         2222.2           3333.3           \t (Position on tab
                                                        stop with TAB key)
```

Figure 4-8. Math Package Keystroke Memory Display

Section 5
Supervisory Functions

This section describes those ForeWord facilities which are of particular interest to a Supervisor.

CREATING NEW TEXT AREAS

Initially each ForeWord disc has a single text area named TXAREA. Multiple text areas can be created on a disc by using the program PRETXT. Text area names can be up to six characters long. Both letters and numbers can be used, but the first character must be non-numeric. The use of special characters in the text area name is recommended, since it helps eleminate the danger of having a text area and a document of the same name. This could be a danger when archiving documents; the text area of the same name could be inadvertently written over. Documents on the other hand, should not begin with a special character for the same reason.

PRETXT creates the new text area only if there is enough contigious space remaining on the disc to do so. To create a new text area using PRETXT, proceed as follows:

a. Ensure that the appropriate disc (the one that is to receive the new text area) is loaded and ready.

b. Be sure no other users are on the system. Then exit from ForeWord and MFE/IV by keying in STOP ALL.

c. Key in // PRETXT and press CURSOR RETURN. This statement can be followed by one or more of the statements below as needed. Press CURSOR RETURN after each statement.

`/TEXT AREA=xxxxxx@n`	Optional name for the text area. If not specified, TXAREA is used; *n* indicates disc drive number. Default is 0.
`/SECTORS=xxxxxx@n`	Optional number of sectors to be assigned to the text area. If not specified, 1536 (03000 octal) isused; *n* indicates disc drive number. The maximum size of a text area is 3072 sectors on an 8231 disc and 6000 sectors on an 8241 or 8261 disc.
`/PASSWORD=xxxxxx`	Optional password for the text area. (Text areas can be password protected, but it is not necessary.)
`/CREATE` or `/NEW`	Required when creating a new text area. Required when changing the password. When changing the password, both the old as well as the new password are required.

d. Key in // and press CURSOR RETURN.

e. When the block cursor appears in the upper left corner of the screen, you can restart MFE/IV and ForeWord if desired.

SORTING THE ARCHIV INDEX

Use the IDOS program DIRSRT to sort the entire ARCHIV and IDOS index so that the documents appear in sequence.

a. Be sure no other users are using the system. Stop ForeWord and exit MFE/IV by keying in STOP ALL.

b. Key in // DIRSRT and press CURSOR RETURN.

c. If only the ARCHIV and IDOS index on disc 0 are to be sorted, press CURSOR RETURN again, then proceed to step *f* below.

d. If the ARCHIV and IDOS indexes on a loaded disc are to be sorted, key in /D = drive, where *drive* is the logical unit number of the disc drive on which the index resides. Press CURSOR RETURN.

e. Repeat step *d* for each disc to be sorted, then key in // and press CURSOR RETURN.

f. When the block cursor reappears in the upper left corner of the screen, MFE/IV and ForeWord can be restarted.

TEMPORARY DOCUMENTS

The creation of temporary documents is described in the *ForeWord Operator's Manual.* At the time ForeWord is installed, temporary documents and the program for deletion of temporary documents can be made a part of ForeWord. To automatically delete TEMPxx documents, use STATS8, the automatic deletion program described in Section 2 of this manual.

SUPERVISORY PASSWORD

The supervisory password allows access to all text areas and documents that have been password protected. It overrides any operator-entered password. At the time of installation, the Four-Phase Systems Engineer enters the password the supervisor provides.

READ-ONLY DOCUMENTS

The *ForeWord Operator's Manual,* describes read-only documents: creating, deleting, and copying. Refer to that publication for complete details.

READ-ONLY TERMINALS

ForeWord can be configured for terminals which are used only for reading. Documents cannot be entered, changed, or copied from a read-only terminal.They can only be displayed. An installation option allows a read-only terminal access to only the text area preset for that terminal.

Advise your Four-Phase Systems Engineer if a read-only terminal is desired at the time the system is initially configured.

DOCUMENT DESCRIPTION OR FIRST PAGE DISPLAY

ForeWord provides the option to display either the Document DESCRIPTION or the first page of the document each time a document is opened. A newly created document always displays the Document Description when OPEN is pressed if a document name was specified. Pressing the OPEN key when the cursor is not over a document name opens a TEMPxx document. In this case ForeWord immediately displays the first 12 blank lines of the document. Advise your Four-Phase Systems Engineer, at the time the system is installed, which display is preferred.

COMMAND MENU

ForeWord allows the user to choose the position of the cursor in the Command Menu display when the menu is first entered. Select the command most often used at the operator's workstations, or some command in the menu from which the cursor can be quickly moved to the commands used more frequently. Advise your Four-Phase Systems Engineer of the name of the command.

Section 6
Maintenance and Recovery Procedures

INTRODUCTION

This chapter describes the procedures necessary to maintain ForeWord files on a day to day basis. This section also gives explicit instruction on how to use MFE/IV to help diagnose a failure should ForeWord operation terminate abnormally. If these procedures are observed, the task of the System Engineer in recovering from system problems is greatly simplified, and the time that your system is not operational is greatly reduced.

DAILY FILE MAINTENANCE

The MFE/IV utility MJOB should be run daily. MJOB deletes all IDOS files that start with the letters TEMP, and reclaims disc sectors that were deallocated due to archive storage deletions. MJOB also rebuilds and compresses the disc directory.

USING MJOB

MJOB can be run by entering the MFE/IV System Console Mode and keying in the following JCL:

`// MJOB`	
`/A`	Optional; causes TEMP files to be deleted and deallocated in addition to blank file names.
`/D=logical drive number.`	Optional; defaults to all logical drives assigned.
`(blank record)`	
`/D=logical drive number.`	
`/`	
`.`	
`.`	
`.`	
`//`	

MJOB references the disc directory and replaces all file names beginning with TEMP with spaces, thereby deleting those files. It then deallocates sectors held by any files that have blank directory names. MJOB also rebuilds the directory and compresses it by moving entries into the space where the entries were deleted. If some error occurs during MJOB, an appropriate message is printed describing the error. These errors are detailed in the *MFE/IV Utilities Reference Manual*. While MJOB is executing, the entire disc is inaccessible to other users.

RECOVERY FROM SYSTEM FAILURE

There are two basic types of system failure that can occur:

- Hardware Failure. The equipment on which the ForeWord program runs has failed.
- Software Failure. The ForeWord program (or other application running under MFE/IV) has failed.

The procedures outlined below should be helpful in recovering from these failures.

System Checks

When ForeWord operation is not normal or ForeWord has stopped operating altogether for at least 3 minutes, the following procedure can be used to determine the type of problem that has occurred.

If MFE/IV is still operating, the problem is most likely in the ForeWord software. If this is the case, proceed as follows:

- Abort ForeWord by keying in the MFE/IV command ABORT IVWORD at the MFE/IV System Console screen.
- Run the control file that executes the IDOS program CHKTXT on all text areas.
- After CHKTXT completes successfully, restart ForeWord by keying in the command // IVWORD (or START, IVWORD.)

If MFE/IV is not operating, and there is no blinking cursor, the problem is probably a hard halt. If this is the case, a manual dump will have to be taken. Proceed as follows:

- Place the AUTO/MANUAL switch on the front panel of the processor in the AUTO position.
- Set the three Display Select switches to display RP.
- Check to see if the STOP bit is on. If it is, a hard halt has occured. Check to see if the MM light is on. If it is, call your Four-Phase Systems Engineer.
- If the MM light is not on, place the AUTO/MANUAL switch in the MANUAL position. Check to see if the console lights are still flickering.

- Place NORMAL/REPEAT switch in the REPEAT position.
- Record the contents of MPR, MAP PR, and MAP ADR. (To record the contents of a register, set the Select Display switches to the register setting as shown on the console panel. The indicators above the console keys show the contents of the selected register.)
- Place the NORMAL/REPEAT key in the NORMAL position.
- Record the contents of MEM, TIR, RP, RA, RB, X1, X2, and X3.
- If all the registers read the same, the processor is in an I/O hang. If this happens, call your Four-Phase Systems Engineer.
- Press RESET, then press STEP.
- Place the AUTO/MANUAL switch in the MANUAL position.
- Set the three Select Display switches down to display TIR.
- Set the console keys to 71100001.
- Press the RESET key, then the STEP key, and then the LOAD key in exactly that order.
- Place the AUTO/MANUAL switch in the AUTO position.
- The console lights will flash for a few seconds and then go out again. Flip the AUTO/MANUAL switch to MANUAL and then back to AUTO. When the console lights finish flashing, then the dump has completed successfully.

These procedures should clear the halt and produce a memory dump. If the procedure is unsuccessful, or the dump is incomplete, call your Four-Phase Systems Engineer.

NOTE

Be sure to run the control file that runs CHKTXT on all text areas that had documents open when the problem occurred *before* restarting ForeWord. If the system does not restart normally, call your Four-Phase Systems Engineer.

Restarting the Software

If your ForeWord software has failed as determined by the above procedure,a copy of the contents of the processor's memory at the time of the problem must be made if the Systems Engineer is to solve the problem. In some cases, the MFE/IV operating system may detect the problem and make the copy automatically. If this happens, the following message is displayed:

```
TIME LIMIT EXCEPTION-WINDOW=aaa
JOB:=bbbbbbbbb STEP cccccc
RP=ddddddddd RB=ddddddddd RA=ddddddddd
X1=ddddddddd X2=ddddddddd X3=ddddddddd
```

where:

aaa is the window number
bbbbbbbbb is the job name
cccccc is the program name
ddddddddd is register contents

If the copy was not created automatically, the copy can be made manually from a terminal in the System Console Mode by executing the ABORT IVWORD command.

ForeWord can be restarted immediately after a software problem or after a copy of the memory is made, as described above. ForeWord is restarted by keying in // IVWORD. When ForeWord is running, operators who had documents open when the problem occurred must run the check program CHKTXT on their text area to be sure that their text files have not been damaged by the problem. CHKTXT must be run from a control file. In most cases, your Systems Engineer will have set up these control files for you, and will have given them whatever name you have chosen. If this has been done, simply execute these control files before working in the text area or areas. If no control file has been set up, CHKTXT can be run by keying the following (with appropriate substitutions) into a control file and running the file:

```
// CHKTXT
/T=text area name@drive number
//
```

When CHKTXT is running, document sectors will flash rapidly on the center of the screen. A summary of the number of sectors in each document are displayed at the top of the screen.

When an error is detected by CHKTXT, the contents of the screen will be the sectors in question, and one of the messages described in Table 6-1 is displayed. When the message is displayed, examine the text on the bottom two-thirds of the screen. If the text displayed on the bottom eight lines of the screen is a continuation of the text displayed in the center eight lines of the screen, press Y. If the center eight lines or the bottom eight lines of the screen are blank, or if the text in the bottom eight lines of the screen is not a continuation of the text displayed in the center eight lines of the screen, press N. CHKTXT will continue to scan other documents and may display the question several more times before it has completed a check of the entire text area. CHKTXT should be run again on the text area when any error was found. If no error messages

are displayed when CHKTXT is run the second time, the text area can be used. If the errors still exist, call your Four-Phase Systems Engineer. In addition to the message above, additional messages can be displayed by CHKTXT. These messages and possible actions required are described in Table 6-1. When CHKTXT has completely checked a text area, a summary of the usage of that text area is printed out. The summary messages and possible actions required are described in Table 6-2.

CHKTXT can correct the following two types of chain-linkage errors when the L option is specified:

- A nonzero back pointer in the first text sector or DESCRIPTION sector of a document.
- Zero values in the first-sector and last-sector pointers in the directory entry for a document.

Table 6-1. Runtime Messages for CHKTXT

Message	Comments
nnnnnn NOT FOUND	Text area *nnnnnn* is not on the disc specified. Reenter the name and drive of the text area.
zzzzz SECTORS IN DOCUMENT nnnnnn,	Information only—no response required. *zzzzz* is decimal, *yyyyy* is octal, and *nnnnnn* is alphanumeric.
COULD SECTOR nnnnn LINK TO SECTOR yyyyy ?	Key in Y or N as described above.
SECTOR xxxxxx OVERLAP IN DOCUMENT	Doubly-allocated sector. See *zzzzz* SECTORS ABOVE ARE COUNTED TWICE in Table 6-2.
DISC REJECT STATUS = xxxxxx	Hardware error. Call Four-Phase Field Engineer.

Table 6-2. Summary Messages for CHKTXT

Message	Comments
zzzzz SECTORS ARE IN USE	Information only. *zzzzz* is decimal.
zzzzz SECTORS ARE AVAILABLE	Information only.
zzzzz SECTORS WERE RECLAIMED	Number of sectors allocated but not used.
zzzzz SECTORS WERE IN USE BUT NOT ALLOCATED	Information only. CHKTXT corrected this problem and updated its record of which sectors are in use.
zzzzz SECTORS ABOVE ARE COUNTED TWICE	Sector overlaps have been found. If this message is dispayed, rerun CHKTXT and watch the screen for the message SECTOR OVERLAP. Record the document name and restart ForeWord. Copy the document or documents (it will be necessary to change the name if the same text area is used) and delete the original version that had the sector overlap problem. Rerun CHKTXT.
CHAIN LINK ERRORS PREVENT ALLOCATOR RE-WRITE	Chain linkage errors have not been corrected and CHKTXT's record of which sectors are in use has not been updated. HKTXT must be rerun. If all errors cannot be corrected, this message will continue to be printed when CHKTXT is run. If this happens, call your Four-Phase Systems Engineer.

The MFE/IV control file required to correct these types of errors is:

```
// CHKTXT
/T=name,L.
//
```

CHKTXT uses the first-sector pointer from the directory entry for each document to begin validating the links in all text sectors. If the pointer is nonzero, the specified sector is read into memory, and the forward and bacck pointers within the sector are validated.

If the back pointer in the first sector is nonzero, the screen is cleared, the text is displayed in the bottom third of the screen, and the inquiry:

```
IS TEXT SHOWN AT BOTTOM IN FIRST PARAGRAPH OF DOC?
REPLY Y, N, OR C.
```

is displayed on line 7.

If the operator types 'C' in response, CHKTXT ignores the broken document and scans the remaining documents in the text area. When the scan is complete, the message:

```
''CHAIN-LINKAGE ERROS STILL EXIST.
DO YOU WISH TO RERUN CHKTXT''
```

is displayed. The document remains broken until CHKTXT or CRTDMP is used to repair the bad back pointer.

If the operator types "Y" in reply, the back pointer is cleared to zero and the sector is rewritten to disc. The remaining sectors in the text area are processed normally.

If the operator replies "N", then the first-sector pointer in the directory is assumed to be wrong, and CHKTXT processes the broken document as if the first-sector pointer had a value of 0.

If the first-sector pointer in the directory is 0, CHKTXT outputs the following message to the printer and the screen:

```
DIRECTORY ERROR IN DOCUMENT XXXXXX
```

The last-sector pointer is examined. If it is also 0, CHKTXT reclaims all the sectors allocated to the document, and lists the addresses of the reclaimed sectors to the printer. CRTDMP must be used to locate the first sector from among these on the printed listing.

As an alternative, the ForeWord DELETE command can be used to delete the entry from the text area directory. The sectors are reclaimed when CHKTXT is run again.

If the last-sector address is nonzero, the last sector of the document is read to the bottom of the screen. The prompt:

```
IS TEXT SHOWN AT BOTTOM IN 1ST PARAGRAPH OF DOC?
RELPY Y, N, OR C.
```

is displayed on line 7. If the operator types "C" in response, processing continues as described above.

If the operator types "N" in reply, the back pointer from the sector currently displayed at the bottom of the screen is used to locate the previous sector of text. The previous sector is read to the screen and the prompt is redisplayed on line 7.

The operator can reply "N" repeatedly, until CHKTXT threads through all the back pointers, and displays the first sector of the document at the bottom of the screen.

When the operator types "Y" in reply, the present pointer from the displayed sector is stored in the first-sector pointer of the directory entry, and CHKTXT resumes normal execution.

If the operator replies "N", but the current back pointer is 0, then the first part of the document cannot be recovered by CHKTXT. The present pointer from the displayed sector is stored in the first-sector pointer of the directory entry, and the message:

```
PARTIAL DOCUMENT RECOVERED
```

is displayed and printed. CHKTXT reclaims the delinked sectors, and lists their addresses on the printer. CRTDMP can be used to locate the first sector from among those in the printed listing.

Section 7
Backup Procedures

Backup procedures are an important part of a word processing operation. If a document is accidentally damaged, destroyed, or deleted by mistake it is much easier to recover the document from backup storage than it is to retype it.

There are several options available for backup procedures. Whole disc packs, single text areas, or documents can be copied to either tapes or other disc packs. Table 7-1 shows the recommended backup procedures for different combinations of discs and tapes. Your Four-Phase Systems Engineer can help you set up a backup procedure that will fit your particular needs.

STORAGE MAINTENANCE

The programs JOB and BOJ are used to reclaim deallocated sectors resulting from archive storage deletions. The IDOS utility JOB deallocates sectors allocated to any deleted file. JOB also refers to the IDOS directory and replaces with blanks all file names beginning with TEMP, thereby deleting those files. It then deallocates sectors held by any files that have blank directory names. JOB rebuilds the directory and compresses it by moving entries into the space where entries have been deleted. If an error should occur during JOB, an appropriate message is printed describing the error and giving the file number of the file in error.

Using JOB

If the documents have been deleted from archive storage on a disc, use the following procedure to process that disc at the end of the workday. In addition, this procedure should be used immediately following any system failure to process any discs that were in use at the time of the failure.

a. Exit from ForeWord to IDOS by keying in:

```
STOP ALL
```

This has the effect of stopping all MFE/IV applications in an orderly fashion. No other applications can be executing while JOB and BOJ are being executed. The disc with archive deletions should be loaded in drive 0. All drives on multiple drive systems can be loaded with discs.

b. Key in // JOB and then press CURSOR RETURN.

c. The following message is displayed for each disc as it is processed:

```
xxxxxxx SECTORS WERE RETURNED ON DRIVE  n ,
MAKING THE TOTAL NUMBER OF SECTORS IN THE DISC POOL
nnnnnnn
```

If any error message occurs, call your Four-Phase Systems Engineer.

d. When all discs have been processed by JOB, the blinking cursor reappears in the upper left corner of the screen.

Using BOJ

The IDOS utility BOJ frees sectors that have been recorded as being allocated but are not part of any file or document. BOJ also checks chain linkages for archived documents and other chained files. JOB, in contrast, merely checks for deleted (blank name) and temporary file (files with names that begin with TEMP) and frees their sectors for use.

Table 7-1. Recommended Backup Procedures

ALL OF A DISC TO:				TEXT AREA TO:			DOCUMENT TO:
SOURCE DISC TYPE	same type disc	diff. type disc	tape	disc	tape	ARCHIV	ARCHIV
8231	COPY01	BACKUP	DTUX	offline COPY	WRTAPE	XTXFIL	XFER key
8261	COPY60	BACKUP	NPDTUX	or	or		or
8271	—	BACKUP	DTUX	MFE/IV MCOPY	MWTAPE		COPY command
8281	BACK80	BACKUP	—	or			
6280	BACK80	BACKUP	—	COPY command	—		
6281	BACK80	BACKUP	—		—		

To use BOJ, proceed as follows:

a. Exit from ForeWord to IDOS by keying in the command:

```
STOP ALL
```

This has the effect of stopping all MFE/IV applications in an orderly fashion. No other applications can be executing while BOJ is running. The disc to be processed should be loaded in drive 0. All drives on multiple drive systems can be loaded with discs.

b. Key in // BOJ and then press CURSOR RETURN.

c. If BOJ is to be run on all drives, key in // and then press CURSOR RETURN. If BOJ is to be run on only one drive, key in /DRIVE = n, where *n* is the number of the drive that contains the disc on which BOJ is to be run, then press CURSOR RETURN. Then key in //, and press CURSOR RETURN again.

d. The following messages are printed for each disc as it is processed:

```
xxxxxxx SECTORS ARE IN USE
xxxxxxx SECTORS ARE AVAILABLE
xxxxxxx SECTORS ALLOCATED BUT NOT IN USE
```

If an error occurs while BOJ is executing, call your Four-Phase Systems Engineer.

e. When the dics have been processed by BOJ, the blinking cursor reappears in the upper left corner of the screen.

Some backup procedures can be performed while MFE/IV is running (MJOB and MBOJ), and some procedures must be performed at the IDOS level (JOB and BOJ).

BACKING UP ALL OF A DISC

Discs are usually backed up to the same type of disc. An exception is the 8271 disc which is usually backed up to an 8231 disc. It is possible to back up any type of disc to any other type of disc. In some instances, this may be desirable.

All backup procedures to copy whole discs use offline utilities.

Copying to the Same Type of Disc

If your MFE/IV system has two or more disc drives of the same type, backup discs can be created by using the offline utility COPY01 or COPY60, depending on which model disc drives your system has.

8231 DISCS (COPY01)

The offline utility COPY01 copies everything on one disc cartridge onto a second disc cartridge. Since the utility does not save the old contents of the second disc cartridge, the disc cartridge that is used for the backup copy should be a spare or scratch disc cartridge. To copy an 8231 disc cartridge, proceed as follows:

a. Exit from ForeWord to IDOS by keying in:

```
STOP ALL
```

This has the effect of shutting down the MFE/IV applications in an orderly fashion. No MFE/IV applications can be running while the COPY01 utility is executing.

b. Insert the disc cartridge that you want to copy into drive 0. Insert the spare disc pack (your backup copy) into drive 1.

c. When both drives are ready, enter the following commands (press CURSOR RETURN after each line):

```
// COPY01   (COPY zero one)
//
```

The following message is displayed:

```
*** HIT ''CTRL-C'' TO COPY FROM DRIVE 0 TO DRIVE 1 ***
```

d. Press CTRL-C. The contents of the disc cartridge on drive 0 are copied to the disc cartridge on drive 1. The constantly changing numbers on the screen identify the number of the disc sector being copied. Wait for the *COMPLETE* message.

e. Remove the disc cartridge from drive 1 and label it with the date, the drive number, and the names of the text areas copied. Also write "Made with COPY01" on the label.

For more information about the offline utility COPY01, see the *Series IV Interrupt Disc Operating System (IDOS) Utilities Reference Manual* (SIV/70-50-7).

8261 DISCS (COPY60)

COPY60 is an offline utility for systems with an NP/80 processor and at least two 8260 disc drives. The utility copies everything on one disc pack to a second disc pack. Since the original contents of the second disc pack are not saved, the second disc pack should be a spare or scratch disc pack. To create a backup disc pack using COPY60, proceed as follows:

a. Exit from ForeWord to IDOS by keying in:

```
STOP ALL
```

This has the effect of shutting down all MFE/IV applications in an orderly fashion. No MFE/IV applications can be running while the COPY60 utility is executing.

b. Insert the disc pack that you want to copy into drive 0. Insert the spare disc pack into drive 1. Ready the disc drives.

c. When both drives are ready, enter // COPY60 and then press CURSOR RETURN.

d. In response to the following prompts at the top of screen 0:

```
PUT ALL NP/80 KEYS DOWN THEN PUSH NP/80 RESET
HIT CTRL-C TO COPY FROM 0 TO 1
```

(1) Set all of the console keys down on the NP/80 control panel.

(2) Press the RESET button on the NP/80 processor.

(3) Press CTRL-C.

e. The following message displays briefly on screen 0:

```
WAITING FOR NP/80 TO START COPY
```

If the message remains on the screen longer than a few seconds, stop the utility, as described in step *i*, and either start over at step *b* or call your Four-Phase Systems Engineer.

e. One of the following messages is displayed:

```
STAGGERS ARE EQUAL
or
STAGGERS ARE NOT EQUAL
```

If the staggers are not equal, stop the utility, as described in step *i*, and call your Four-Phase Systems Engineer.

f. The following message remains on the screen while the disc pack is being copied:

```
NOW COPYING CYLINDER #xxx. MAX=330
```

The cylinder number changes continually until it reaches 330. If an error message is displayed on the screen, stop the utility, as described in step *i* , and call your Four-Phase Systems Engineer.

g. If the copy is successful, the following message is displayed:

```
COPY60 HAS COMPLETED SUCCESSFULLY
HIT CTRL-C TO COPY FROM 0 TO 1
```

If the copy is unsuccessful, the following message is displayed:

```
UNSUCCESSFUL COMPLETION, UNRECOVERABLE ERRORS
```

If the copy is not successful, stop the utility, as described in step *i* and call your Four-Phase Systems Engineer.

h. If you need to copy another disc pack, insert the new disc packs as described in step *a* , and repeat the procedure.

i. To stop COPY60, proceed as follows:

(1) Set the AUTO/MANUAL switch on the Series IV console to MANUAL.

(2) Press the RESET button on the NP/80.

(3) Press the BOOT switch on the Series IV console.

(4) Set the AUTO/MANUAL switch on the Series IV console to AUTO.

j. After COPY60 has completed, remove the disc packs, label each backup copy with the date, the drive number, and the names of the text areas copied. Label the backup copy "Made with COPY60."

k. Restart ForeWord by keying in:

```
START IVWORD
```

For more information about the offline utility COPY60, see the *Series IV Interrupt Disc Operating System (IDOS) Utilities Reference Manual.*

Backing Up 6280, 6281, and 8280 Discs (BACK80)

BACK80 is an offline utility that is used to back up both the fixed and removable portions of a Cartridge Module Drive (6280/6281/8280). The utility is described in *The NP/80 Operating System (NPOS) Utilities Reference Manual* (NP/80-50-2).

Copying to a Different Type of Disc (BACKUP)

The offline utility BACKUP copies the contents of one type of disc to a different type of disc. This utility is used mainly to backup 8271 discs onto 8235 disc packs. The utility can be used with other combinations of disc drives, as shown in Table 7-2, and the sequence of operations is the same for all of the combinations shown in the table.

Table 7-2. Discs Required for BACKUP

Source Disc	Output Disc		
	8235	8265	8271
8235	—	1	1
8265	28	—	—
8271	5	1	2

To backup an 8271 disc pack, proceed as follows:

a. Insure that the 8271 and 8231 disc drives are loaded and ready. The 8231 should contain a scratch disc that becomes a backup disc.

b. Enter // BACKUP and then press CURSOR RETURN. The following message displays:

```
BACKUP PARAMETERS:
/MODE=BACKUP OR RESTORE.
/INPUT<FILENAME>@<DRIVE>.
/OUTPUT=<FILENAME>@<DRIVE>.
/CLEAR.
/DUPLICATE-ONLY.
/HIGHEST ALLOCATED.
```

c. Key in the following statements, pressing CURSOR RETURN after each:

```
/MODE=BACKUP
/INPUT=@i                (where i is the number of the
                          8271 disc drive)
/OUTPUT=BACPAC@o         (where o is the number of
                          the 8231 disc drive)
/CLEAR
/H
(enter a 1- to 80-character message to identify the
disc being copied)
//
```

d. When the following message displays, press CTRL C:

```
MOUNT PACK NUMBER 1 IN BACKUP SEQUENCE.
     HIT ''CTRL C'' TO CONTINUE.
```

e. In response to the following message, press CTRL C:

```
CAUTION: ABOUT TO CLEAR PACK ON LOGICAL DRIVE nn.
 HIT ''CTRL A'' TO ABORT.
 HIT ''CTRL B'' TO BYPASS PACK.
 HIT ''CTRL C'' TO CONTINUE.
```

f. When the backup disc is completely filled, the following message displays:

```
MOUNT PACK NUMBER nn IN BACKUP SEQUENCE.
     HIT ''CTRL C'' TO CONTINUE.
```

g. Remove the backup disc and label it with the date, the drive number, and the names of the text areas copied. Also write "Made with BACKUP, number xx of yy" on the label, where xx is the number of the disc in the backup sequence and yy is the total number of backup discs that will be used.

h. Load the next backup disc. When the disc is ready, press CTRL C to resume the backup.

i. Repeat steps *g* and *h* each time a backup disc is filled. As many as five 8235 backup disc packs may be required to copy an 8271 disc. When the backup operation is complete, the following message displays:

```
BACKUP COMPLETE
```

j. Remove and label the last backup disc.

k. Press BOOT on the Series IV console.

Copying to Tape

If the MFE/IV system has a tape drive, backup tapes of discs can be created by using the offline utilities DTUX and NPDTUX, as described below.

DTUX is for 8231 and 8271 disc drives. NPDTUX is for 8261 and 8281 disc drives. Usually more than one tape is needed to copy a whole disc pack.

DTUX and NPDTUX allow a one-line message to be placed on the tape. This message helps to identify the tape at a later date.

8231 AND 8271 DISCS (DTUX)

The following procedure copies a disc to tape:

a. Mount the tape on which the copy is to be written on tape drive 0 and press LOAD on the tape drive front panel. For more information about tape deck operation, see the *Equipment Operators Manual* (SIV/70-12-9).

b. Enter each of the following statements, pressing CURSOR RETURN after each statement:

```
// DTUX
/I=D@numberi             (where numberi is the number of the
                          disc drive containing the disc to be
                          copied)
     TAPE7@0             (for 7-track tape)
/O=  TAPE8@0             (for 9-track, 800 bpi tape)
     TAPE16@0            (for 9-track, 1600 bpi tape)
/HIGH=high               (where high is the highest sector
                          address on the disc to be copied. To
                          copy the entire disc, enter 06177 for
                          an 8231 or 030777 for an 8271.)
//
```

c. When DTUX displays the prompt to enter a message, type the one-line message and press CURSOR RETURN to start the tape copy.

d. When a tape is full, it automatically rewinds and the following message is displayed:

```
IS DECK 1 READIED WITH THE NEXT TAPE?
```

Enter N and press CURSOR RETURN. The following message is displayed:

```
IS DECK 0 READIED WITH THE NEXT TAPE?
```

e. Mount a new tape, ready it, then type Y and press CURSOR RETURN. Copy of the disc to tape continues.

f. Label the tapes as they are created to note the correct sequence in which they were generated. Write "Made with DTUX" on each label. When the final tape is written, it automatically rewinds. To remove the tape, press RESET and REWIND on the tape drive.

g. Insure that the console keys are correctly set and press BOOT on the Series IV console.

For more information about the offline utility DTUX, see the *Series IV Interrupt Disc Operating System (IDOS) Utilities Reference Manual.*

8261 AND 8281 DISCS (NPDTUX)

To backup an 8265 disc pack or either the fixed or removable part of an 8281 Cartridge Module Drive onto tape, use the offline utility NPDTUX as follows:

a. Mount the tape on which the copy is to be written on tape deck 0 and press LOAD on the tape deck front panel. For more information about tape deck operation see the *Equipment Operators Manual.*

b. Enter each of the following statements when the cursor appears. Press CURSOR RETURN after each statement:

```
// NPDTUX
/I=D@number          (where number is the number of the
                      disc drive containing the disc to be
                      copied. The drive number for the
                      fixed part of an 8281 is the number
                      shown on the front of the drive plus
                      eight.)
/O=TAPE16@deck       (where deck is the tape drive
                      number)
//
```

c. When NPDTUX displays the prompt to enter a message, type the one-line message and press CURSOR RETURN to start copying the tape.

d. When a tape is full, it automatically rewinds and the following message is displayed:

```
IS DECK 1 READIED WITH THE NEXT TAPE?
```

Type N and press CURSOR RETURN. The following message is displayed:

```
IS DECK 0 READIED WITH THE NEXT TAPE?
```

e. Mount a new tape, ready it, then type Y and press CURSOR RETURN. Copying from disc to tape continues. Label the tapes as they are created to note the correct sequence in which they were generated. Write "Made with NPDTUX" on each label. When the final tape is written, it rewinds automatically. To remove the tape, press RESET and REWIND on the tape drive.

f. Reboot the system using the following steps:

(1) Set the AUTO/MANUAL switch on the Series IV console to MANUAL.

(2) Insure that the NP/80 console keys are correctly set and then press the RESET button on the NP/80 processor.

(3) Insure that the console keys are correctly set and then press the BOOT switch on the Series IV console.

(4) Set the AUTO/MANUAL switch on the Series IV console to AUTO.

BACKING UP INDIVIDUAL TEXT AREAS

Text areas can be either copied intact, or each document can be placed in archive storage.

Copying to Disc

Text areas can be copied from one disc to another using the offline utility COPY, the MFE/IV utility MCOPY, or the ForeWord COPY command.

OFFLINE COPY UTILITY

The offline utility COPY can be used to transfer a text area or archive documents from one disc to another. For example, a text area on an 8235 disc can be copied onto an 8265 disc pack.

To copy text areas or archive documents with the offline utility COPY, proceed as follows:

a. Make sure that the input and output discs are loaded and ready, and that the printer is enabled.

b. Enter the following statements, pressing CURSOR RETURN after each statement:

```
// COPY
/INPUT=namei@numberi      (where namei is the name of the archive document or text area to be copied, and numberi is the number of the drive that contains the disc on which the text area or archive document resides.)
/OUTPUT=nameo@numbero     (where nameo is the name to be given to the archive document or text area when it is copied, and numbero is the number of the disc drive on which the copy is to be made.)
//
```

The input file is copied to the output file provided there are sufficient sectors available on the output disc. The blinking cursor reappears when the copy is complete. If there is not enough space on the output disc, an error message is printed.

NOTE

If an unprotected archive document or text area has the same name as an input name, this unprotected file is written over by the copy. If a protected archive document or text area on the output disc has the same name as an input name, the input file is copied and assigned the name TEMP.x (where *x* is A through Z). Normally the name will be TEMP.A, or TEMP.B if TEMP.A is already used. If all letters (A-Z) have been used, the input file is not copied.

This example copies the text area named TXTAR1 on disc 0 to disc 1 and names it TEXTAR:

```
// COPY
/INPUT=TXTAR1@0
/OUTPUT=TEXTAR@1
//
```

For more information about the offline utility COPY, see the *Series IV Interrupt Disc Operating System (IDOS) Utilities Reference Manual.*

MFE/IV MCOPY UTILITY

The MFE/IV utility MCOPY does the same thing as the offline utility COPY, except that MCOPY is used while MFE/IV is running. To copy a text area or archive document from one disc to another, use the same sequence of operations from the MFE/IV System Console that are used for the offline utility COPY with one exception: type // MCOPY instead of // COPY.

For more information about the MFE/IV utility MCOPY, see the *MFE/IV Utilities Reference Manual* (SIV/70-42-4).

ForeWord COPY COMMAND

Entire text areas can be copied while ForeWord is running using the COPY command from the ForeWord menu. Select the COPY command and proceed as follows:

a. Type the name of the text area to be copied in the space marked "COPY the document named."

b. Type ARCHIV for the text area name. (ARCHIV is used to indicate to the system that it is not a standard copy.)

c. Type the disc number on which this text area resides.

d. Type the name for the stored backup copy in the space marked "to the document named."

e. Type ARCHIV for the text area name.

f. Type the disc number where the copy is to reside.

g. Fill in the background task information and press COMMAND.

Figure 7-1 is an example of the COPY command used to copy text area TEXT01 on disc 0 to disc 1 under the name BACK01.

Copying to Tape

Text areas and archive documents can be copied from disc to tape with the offline utility WRTAPE or the MFE/IV utility MWTAPE.

OFFLINE WRTAPE UTILITY

The offline utility WRTAPE can be used to copy archive documents or text areas from disc to tape. The tape files can then be read to disc using RDTAPE, as described in Section 8, "Restoration from Backup."

To copy one or several archive documents or text areas to tape with the offline utility WRTAPE, proceed as follows:

a. Mount the tape on which the copy is to be written on the tape deck and press LOAD on the tape deck front panel. For details about tape deck operation, see the *Equipment Operators Manual.*

b. Enter // WRTAPE and press CURSOR RETURN.

```
COPY the document named, TEXT01, in text area, ARCHIV, on drive # 0
  to the document named, BACK01, in text area, ARCHIV, on drive # 1
                  using queue 2  with a priority of 9.

                If the text area is ARCHIV, the document
          is be copied into/from the archival area of the disc.
```

Figure 7-1. Copying a Text Area with the COPY Command

c. When the "ENTER OPTIONS" prompt appears, enter one or more of the statements listed below, pressing CURSOR RETURN after each statement:

/TAPE= TAPE16	Required. TAPE16 refers to 1600 bpi (standard).
/DISC=@n	(where *n* is the number of the disc drive containing the text areas or archive documents to be written to tape.)
/MESSAGE	(optional statement indicates that a message follows.)
message record	(up to 80 characters entered only if the /MESSAGE statement is used; when CURSOR RETURN is pressed after entering this message, WRTAPE writes the message in the beginning-of-volume tape header for display when the tape is bootstrapped. After the message is written to the header, you can continue to enter other statements.)
/FILE=name	(where *name* is the name of the text area or archive document to be copied to tape. Press CURSOR RETURN twice to initiate the copy. Other statements can be entered when the block cursor reappears. If this is the only text area or archive document to be copied, press CURSOR RETURN once, type // and press CURSOR RETURN again.)
/FILE=name	(enter the name of the next text area or archive document to be copied, then press CURSOR RETURN twice. Other statements can be entered when the block cursor reappears. If this is the last text area or archive document to be copied, press CURSOR RETURN once, type // and press CURSOR RETURN again.)
/REMAINDER	(optional statement; indicates all remaining text areas, archive documents, and IDOS files on the disc are to be copied to tape.)
//	(indicates end of statements.)

WRTAPE executes each /FILE statement before allowing any further entries. Files are written on the tape in the order that the /FILE statements are entered. If no /FILE statements precede a /REMAINDER statement, all files on the disc are written to the tape.

d. When the files have been copied, rewind and remove the tape. Label each tape with the date, the drive numbers of both the disc and the tape, and the names of the files copied. Also write "Made with WRTAPE" on each label.

WRTAPE always expects to write a complete tape and it assumes that the tape is empty. If a tape is used that already has information written on it, the information on the tape is destroyed and new information is written over it.

The first example writes two text areas, TXTAR1 and TXTAR2, and an archive document, INTRO, on disc 1 to an 800 bpi tape.

```
// WRTAPE
/TAPE=TAPE8
/DISC=@1
/FILE=TXTAR1
blank record
/FILE=TXTAR2
blank record
/FILE=INTRO
//
```

This second example writes all text areas, archive documents, and IDOS files from disc 0 to a 1600 bpi tape. A message is included to identify the tape.

```
// WRTAPE
/TAPE=TAPE16
/DISC=@0
/MESSAGE
BACKUP OF FOREWORD DISC 0 7/22/78
/REMAINDER
//
```

For more information about the offline utility WRTAPE, see the *Series IV Interrupt Disc Operating System (IDOS) Utilities Reference Manual.*

MFE/IV MWTAPE UTILITY

Text areas and archive documents can be copied to tape while MFE/IV is running by using the MFE/IV utility MWTAPE.

To copy an archive document or text area to tape while MFE/IV is running, proceed as follows:

a. Mount a tape on the tape drive.

b. Enter the following statements from the MFE/IV System Console (press CURSOR RETURN after each statement):

```
// MWTAPE
/TAPE=drivex      (where drivex is the tape drive number)
/DISC=discx       (where discx is the disc drive number)
/FILE=name        (where name is the name of the text area or archive document)
/MESSAGE
(one-line message to identify the file on the tape)
```

c. Enter the following statements for each additional text area or archive document to be copied (press CURSOR RETURN after each statement):

```
/FILE=name        (where name is the name of the text area or archive document)
/MESSAGE
(one-line message to identify the file on the tape)
```

d. Type // and press CURSOR RETURN.

e. When the copying is completed, rewind and remove the tape.

f. Label the tape with the date and the names of the text areas or archive documents. Also write "Made with MWTAPE" on the label.

For more information about the MFE/IV utility MWTAPE, see the *MFE/IV Utilities Reference Manual,* SIV/70-50-10.

Copying to ARCHIV Storage

Whole text areas can be copied to archive storage while MFE/IV is offline, and individual documents can be copied to archive storage while ForeWord is running.

OFFLINE XTXFIL UTILITY

All documents within a text area can be copied to archive storage on the same disc or another disc using the offline utility XTXFIL.

To transfer all documents within a text area to archive storage while the system is in offline mode, proceed as follows:

a. Enter the following statements and press CURSOR RETURN after each statement:

```
// XTXFIL
/OUTPUT=@numbero      (where numbero is the number of the disc drive to which the text area is to be transferred.)
/NAME=textarea@numberi (where textarea is the name of the text area that is to be transferred to archive storage; numberi is the number of the disc drive on which the text area resides.)
//
```

b. When the transfer is complete, the blinking cursor reappears on the screen and MFE/IV can be reloaded or another offline utility can be run.

This example copies all of the documents in the text area named TEXTX on disc 0 to archive storage on disc 1:

```
// XTXFIL
/OUTPUT=@1
/NAME=TEXTX@0
//
```

ForeWord XFER KEY

To copy documents in a text area on one disc to archive storage on the same disc while ForeWord is running, proceed as follows for each document:

a. Position the cursor over the document name in the Index.

b. Press XFER.

ForeWord COPY COMMAND

To copy a document in any text area on any disc to archive storage on a different disc while ForeWord is running, use the COPY command as follows:

a. Select the COPY command from the ForeWord command menu.

b. On the first line enter the document name, the text area, and the number of the disc drive containing the text area.

c. On the second line enter the name that the document will have in archive storage.

d. Enter ARCHIV as the text area on the second line.

e. Enter the number of the disc drive that the archive area is on.

f. Press COMMAND.

Section 8
Restoration from Backup

If ForeWord documents are accidentally damaged or lost, it may be necessary to restore the document from a backup copy. Text documents, archive documents, text areas, and whole discs can be restored from backup discs or tape.

Some of the restoration procedures require that MFE/IV is offline. For information about stopping MFE/IV, see the *Multifunction Executive (MFE/IV) Operator's Manual* (SIV/70-12-16).

RESTORING DOCUMENTS FROM DISC BACKUP

The following procedures describe how to recover individual documents or entire discs from disc backup.

CAUTION

If a hardware problem is suspected in one of the disc drives on the system, *do not load the backup disc into that drive*, or the documents on the backup disc could be destroyed. Call your Four-Phase Field Engineer to check the disc drive.

Recovering A Single Document (COPY Command)

To recover a single document from disc backup while ForeWord is running, proceed as follows:

a. Delete the faulty document, if it still exists.

b. At the next available drive, insert the backup disc containing the required document, and ready the disc drive.

c. When the disc drive is ready, press COMMAND to display the command directory, then move the cursor to the COPY command and press COMMAND again.

d. On the first line of the COPY command display, fill in the name of the document to be transferred, the name of the text area in which it is currently located (ARCHIV if archive storage), and enter the disc drive number.

e. On the second line of the COPY command display, fill in the name to be assigned to the document when it is copied, the name of the text area where the new copy is to be stored (ARCHIV if archive storage), and the disc drive where the new copy of the document is to reside.

f. Press COMMAND to execute the COPY command.

Recovering an Entire Disc

If an entire disc needs to be recovered, a copy can be made from a backup disc or discs using the offline utility COPY01, COPY60, BACKUP, or BACK80, depending on the backup procedure that was used to make the backup disc or discs.

RECOVERING AN 8231 OR 8261 DISC (COPY01 AND COPY60)

To recover an entire disc from a backup disc that was made with COPY01 or COPY60, proceed as follows with MFE/IV offline:

a. Insert the backup disc in drive 0 and ready the drive.

b. Insert the disc that contains the damaged documents in drive 1 and ready the drive.

c. When drives 0 and 1 are ready, enter // COPY01 (for 8231 discs) or // COPY60 (for 8261 discs), and press CURSOR RETURN (twice for COPY01). (For details on COPY01 and COPY60 see "Copying to the Same Type of Disc" in Section 8.)

d. When the disc has been copied, remove both discs and insert the disc that was in drive 1 into drive 0. MFE/IV can then be restarted.

RECOVERING AN 8271 DISC (BACKUP)

An 8271 disc can be restored from multiple 8231 backup discs, using the offline utility BACKUP. To restore an 8271, proceed as follows (for other types of discs, follow the same sequence):

NOTE

The 8231 backup discs created by BACKUP are not in bootstrap format. Therefore, if a problem has occurred so that the 8271 cannot be bootstrapped, an 8231 IDOS master must be used to regenerate the 8271.

a. Type // BACKUP then press CURSOR RETURN. The following message displays:

```
BACKUP PARAMETERS:
/MODE=BACKUP OR RESTORE.
/INPUT=FILENMAME@DRIVE.
/OUTPUT=FILENAME@DRIVE.
/CLEAR.
/DUPLICATE-ONLY.
/HIGHEST ALLOCATED.
```

b. Type the following statements, pressing CURSOR RETURN after each:

```
/MODE=RESTORE
```

`/I=name1@numberi` (where *namei* is the name of the input file on the 8231 to be used to restore the 8271; this name is the same as the output name used in creating the backup disc. *numberi* is the number of the disc drive that contains the 8231 disc)

`/O=@driveo` (where *driveo* is the number of the disc drive that contains the 8271 disc to be restored)

```
//
```

c. If disc 0 is being restored, press CTRL C in response to the following message:

```
CAUTION: RESTORE OF LOGICAL DRIVE ZERO.
 HIT ''CTRL A'' TO ABORT.
 HIT ''CTRL B'' TO BYPASS PACK.
 HIT ''CTRL C'' TO CONTINUE.
```

d. When the following message displays, insure that the first backup disc is loaded and ready, then press CTRL C:

```
MOUNT NEXT PACK IN RESTORE SEQUENCE.
    HIT ''CTRL C'' TO CONTINUE.
```

e. The following message identifying the disc is displayed if such a message was entered during the backup procedure:

```
IDENTIFICATION MESSAGE FOR THIS BACKUP FILE IS:
message text
```

```
VERIFY BACKUP FILE IDENTIFICATION MESSAGE.
 HIT ''CTRL A'' TO ABORT.
 HIT ''CTRL B'' TO BYPASS PACK.
 HIT ''CTRL C'' TO CONTINUE.
```

Press CTRL C to continue. (If the wrong disc has been loaded, press CTRL B to suspend processing, then load the correct backup disc and press CTRL C.)

f. When the backup disc has been completely copied to the 8271 disc, the following message displays:

```
MOUNT NEXT PACK IN RESTORE SEQUENCE.
    HIT ''CTRL C'' TO CONTINUE.
```

Load the next backup disc. When the disc is ready, press CTRL C to continue the restore operation.

g. Repeat steps *e* and *f* until the following messages display:

```
RESTORE COMPLETE.
BOOT TO CONTINUE.
```

h. Press the BOOT switch, then restart MFE/IV or restore another 8271 disc starting with step *a*.

RECOVERING 6280, 6281, AND 8281 DISCS (BACK80)

To recover a 6280, 6281, and 8281 discs from backup discs, use the offline utility BACK80 as described in *The NP/80 Operating System (NPOS) Utilities Reference Manual.*

RESTORING DISCS FROM TAPE

If the offline utility DTUX or NPDTUX was used to make a backup tape, use the same offline utility to copy from the tape back to the disc. If the offline utility WRTAPE or the MFE/IV utility MWTAPE was used to make the backup tape, use the MFE/IV utility MRTAPE to copy from the tape to the disc.

Restoring Discs from Tapes Created by DTUX or NPDTUX

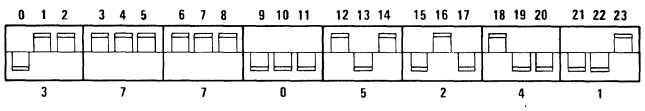
To restore an entire disc from a backup tape created by the offline utilities DTUX or NPDTUX, proceed as follows:

a. Mount the backup tape on the tape deck.

b. Insert a scratch disc in drive 0 and enable the drive.

c. Press LOAD on the tape deck console. When the tape stops moving, it is loaded.

d. Set the console keys on the processor front panel to 37705241, as shown below:



e. Press BOOT on the processor front panel.

f. When the message HIT "CTRL-C" TO CONTINUE is displayed, press CTRL-C on the keyboard.

g. When the message COMPLETE, HIT "CTRL-C" TO RETURN TO MONITOR is displayed, the tape rewinds automatically. The disc is now restored from the tape and can be used as required.

To restore a disc from a tape containing copies of several discs, it is necessary to restore all discs written before the desired copy. If the desired copy is the first copy on the tape, the above procedure can be used, but the tape will not automatically rewind as described in step f. To rewind the tape, press RESET and REWIND on the tape deck console. When the tape stops, press RESET and REWIND a second time to unload the tape.

If any copy past the first copy on the tape is required, restore the first and subsequent copies to the scratch disc by repeating the above procedure except step *g*. Instead, after each restoration, press CTRL-C at the end of each copy, note which drive is then required for the next copy, load the drive with the scratch disc, press CTRL-C, and continue until the desired copy is obtained.

Restoring Discs from Tapes Created by WRTAPE or MWTAPE

A backup tape made with either the offline utility WRTAPE or the MFE/IV utility MWTAPE can be copied to disc with the MFE/IV utility MRTAPE.

RECOVERING A TEXT DOCUMENT FROM TAPE (MRTAPE)

To recover an individual text document from a tape written by the offline utility WRTAPE or the MFE/IV utility MWTAPE, the entire text area containing the document must be read. If there is sufficient space on the ForeWord disc, the text area can be copied directly to that disc from the tape. However, the following procedure assumes that two disc drives are being used, and there is not enough contiguous space on the ForeWord working discs to read the entire text area from tape. Therefore, the text area is read to a scratch disc, and the document is copied from the scratch to the ForeWord disc using the ForeWord COPY command.

To recover a single document in a text area on tape written by WRTAPE or MWTAPE, proceed as follows:

a. Insert a scratch disc in disc drive 1.

b. Load and ready tape deck 0 as described in the *Equipment Operator's Manual.*

c. When the disc drive and tape deck are ready, enter the following statements from the MFE/IV System Console (press CURSOR RETURN after each statement):

```
// MRTAPE
/DISC=@1
/INCLUSIVE MODE
/ALL
/FILE=textarea      (where textarea is the name of the
                     text area that is to be copied from
                     the tape to the disc.)
//
```

d. When the file has been copied, log on to ForeWord.

e. If the faulty document still exists on disc 0, delete it.

f. Press COMMAND to display the command directory, move the cursor to the COPY command, and then press COMMAND again.

g. When the COPY command display appears, fill in the name of the document to be transferred, the name of the text area in which it is currently located (ARCHIV if archive storage), and the number of the disc on which it resides. Then, if the name is to be changed, fill in the name to be assigned to the document when it is transferred, the name of the text area into which the transfer is to be made (ARCHIV if archive storage), and the drive on which the transferred document is to reside.

h. Press COMMAND to execute the COPY command.

RECOVERING ARCHIVE DOCUMENTS FROM TAPE (MRTAPE)

The following procedure requires enough space on the ForeWord disc to read archive documents directly from a backup tape written by WRTAPE. If there is not enough space, first read the documents to a scratch disc, and then use the ForeWord COPY command to copy from the scratch disc to the ForeWord disc (as previously described for text documents).

To recover archive documents from a tape written by the offline utility WRTAPE or the MFE/IV utility MWTAPE, proceed as follows:

a. Load and ready tape deck 0 as described in the *Equipment Operator's Manual.*

b. When the tape deck is ready, enter the following statements from the MFE/IV System Console (press CURSOR RETURN after each statement):

```
// MRTAPE
/DISC=@n            (where n is the number of the disc
                     drive to which the archive docu-
                     ments are to be copied.)
```

```
/INCLUSIVE MODE
/ALL
/FILE=name
```

(where *name* is the name of the archive document to be read from the tape. Press CURSOR RETURN twice to start reading the tape. Other archive documents can be copied by repeating this statement, once for each document, with blank lines between each statement. See MRTAPE EXAMPLE 2 below.)

```
//
```

c. When the documents have been copied, log on to ForeWord. The archive documents are located in archive storage on the disc.

The following example recovers a text area named TXTAR1 from a backup tape on a system with two disc drives and one tape drive. The tape was written with WRTAPE. The text area is restored to a scratch disc on disc drive 1.

```
// RDTAPE
/TAPE=TAPE16
/DISC=@1
/INCLUSIVE MODE
/ALL
/FILE=TXTAR1
//
```

This example recovers three archive documents, SEC1, SEC2, and SEC3, from a backup tape created by MWTAPE. The archive documents are read directly to the ForeWord disc in drive 0.

```
// MRTAPE
/DISC=@0
/INCLUSIVE MODE
/ALL
/FILE=SEC1
blank line
/FILE=SEC2
blank line
/FILE=SEC3
//
```

Appendix A
Screen Display (CTRL V)

You may sometimes want to determine what functions (for example, chapter, paragraph, tab settings) have been used in a section of ForeWord text. You may also want to determine which blank spaces on the screen are blank characters (the result of pressing the spacebar) and which are null characters (the result of using cursor control and certain function keys). ForeWord provides a special screen display that shows settings within the text not ordinarily visible. To view the display, proceed as follows:

a. Display the portion of the ForeWord document that is to be checked.

b. Press CTRL V. (Each null position is displayed as ///, each tab stop location that has been tabbed over is displayed as \ , and each auto tab position is displayed as ¤ . Text characters are displayed normally.)

c. Press CTRL V again to return to normal ForeWord operations.

Table A-1 shows the special symbols that may appear in the rightmost column of a line of text, and explains their meanings.

Table A-1. Control V System

DISPLAY CHARACTER	MEANING							DISPLAY CHARACTER	MEANING							DISPLAY CHARACTER	MEANING							DISPLAY CHARACTER	MEANING						
	LINE IN USE	PARAGRAPH	TAB	NEW PAGE	AUTO TAB	CENTERING	CHANGE		LINE IN USE	PARAGRAPH	TAB	NEW PAGE	AUTO TAB	CENTERING	CHANGE		LINE IN USE	PARAGRAPH	TAB	NEW PAGE	AUTO TAB	CENTERING	CHANGE		LINE IN USE	PARAGRAPH	TAB	NEW PAGE	AUTO TAB	CENTERING	CHANGE
●										●						@	●							'	●	●					
△							●	!		●					●	A	●						●	a	●	●					●
♁						●		"		●				●		B	●					●		b	●	●				●	
¢						●	●	#		●				●	●	C	●					●	●	c	●	●				●	●
◢					●			$		●			●			D	●				●			d	●	●			●		
㊋					●		●	%		●			●		●	E	●				●		●	e	●	●			●		●
¤					●	●		&		●			●	●		F	●				●	●		f	●	●			●	●	
¤					●	●	●	'		●			●	●	●	G	●				●	●	●	g	●	●			●	●	●
㊋				●				(		●		●				H	●			●				h	●	●		●			
←				●			●	)		●		●			●	I	●			●			●	i	●	●		●			●
\				●		●		*		●		●		●		J	●			●		●		j	●	●		●		●	
/				●		●	●	+		●		●		●	●	K	●			●		●	●	k	●	●		●		●	●
£				●	●			,		●		●	●			L	●			●	●			l	●	●		●	●		
■				●	●		●	—		●		●	●		●	M	●			●	●		●	m	●	●		●	●		●
⌟				●	●	●		.		●		●	●	●		N	●			●	●	●		n	●	●		●	●	●	
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NOTE: CIRCLED SYMBOLS DO NOT DISPLAY

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Appendix B
Printing the IDOS Directory

Occasionally, it may be convenient to print the offline (IDOS) directory. The utility DIRDMP can be used to print an annotated listing of all files in thedirectory.

To print the directory, proceed as follows:

a. Be sure no other users are using the system. Stop ForeWord by entering the MFE/IV console mode and keying in STOP IVWORD. Exit MFE/IV by pressing CTRL CURSOR RETURN.

b. Key in // DIRDMP and press CURSOR RETURN. // DIRDMP can be followed by the parameter statement listed below. If this statement is entered, press CURSOR RETURN.

`/DRIVE=n.` (optional disc drive number if directories for all drives are not to be printed)

c. Key in // and press CURSOR RETURN.

d. The directory for drive *n* is printed. If no drive is specified, the directories for all drives on the system are printed.

A line is printed for each file listed in the directory. The information included on each line is shown in Table B-1.

The following conventions can be used for the flag character (F):

C = Control File

R = Relocatable File

: = Created by COBOL or RPG

T = Archive Format Document

t = ForeWord Text Area

W = Wide document

X = Extra-wide document

NOTE

A file that is password-protected in ForeWord is not listed as protected in the offline IDOS directory.

Table B-1. Information on Files in the Directory

Heading	Meaning of Field
NAME	Name of File
F	Flag Character
P	Protected (P for protected, otherwise blank)
L	Locked
C	Chained = 1, Data File = 0
A	Load File = 1, Contiguous = 0
R	Relocatable (R for relocatable, otherwise blank)
I (first)	ISAM
I (second)	Reserved for future expansion
LOAD	Load Location
FIRST	Starting Sector
COUNT	Number of Sectors
LAST	Last Sector
USER PARAMETER	(currently used for ISAM, DISAM, DC, RF, and RBS files, and text area passwords)

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