

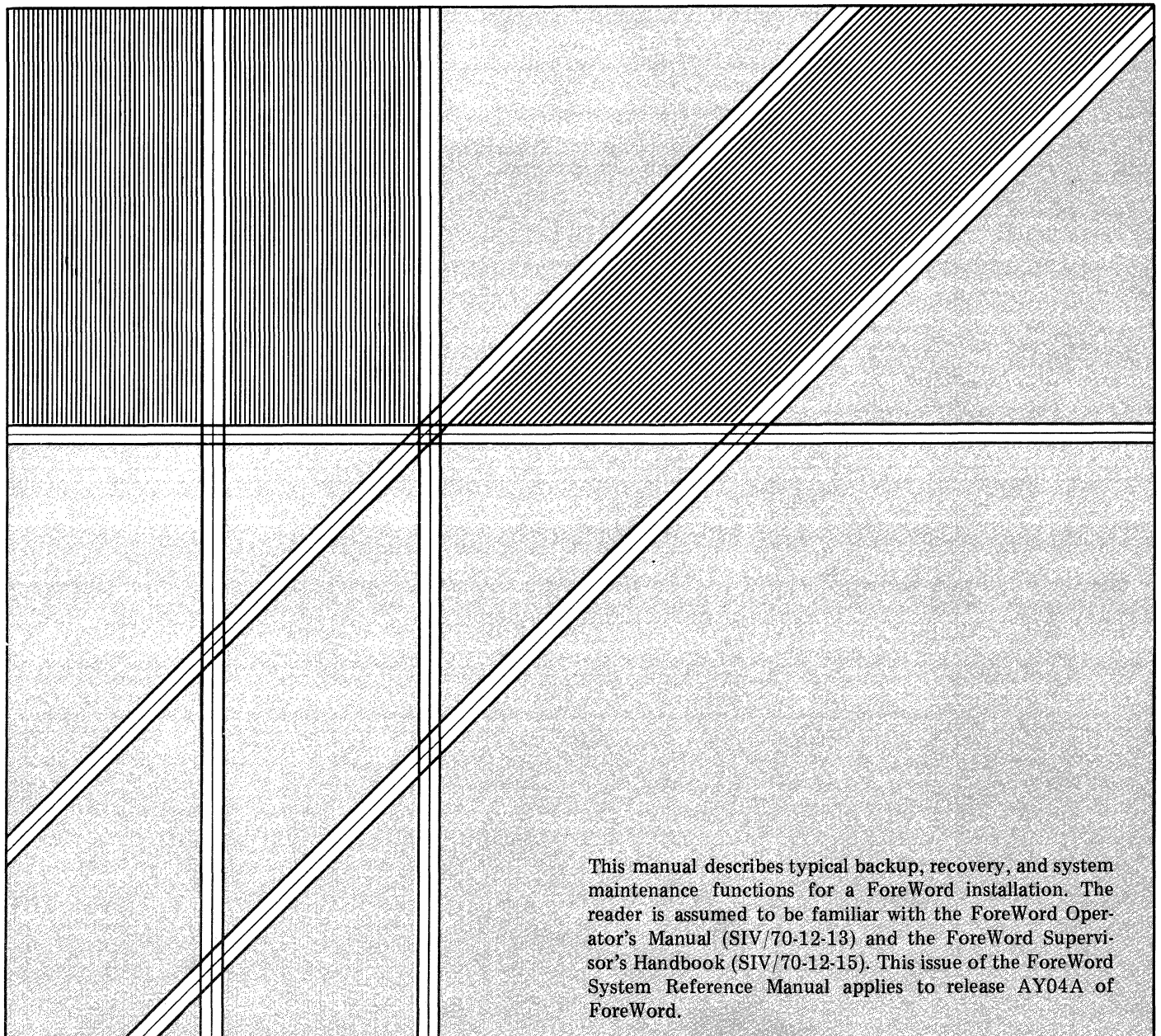
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ForeWord™ System Reference Manual

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This manual describes typical backup, recovery, and system maintenance functions for a ForeWord installation. The reader is assumed to be familiar with the ForeWord Operator's Manual (SIV/70-12-13) and the ForeWord Supervisor's Handbook (SIV/70-12-15). This issue of the ForeWord System Reference Manual applies to release AY04A of ForeWord.

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Section 1

Introduction

SYSTEM DESCRIPTION

ForeWord is a flexible, shared-logic text-editing system that allows text to be entered, stored, edited, and printed. Using a System IV/40, IV/50, 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, 8271, 8241, or 8261), with removable disc cartridges or disc packs providing an online storage capacity ranging from 400 to 100,000 pages of text. Removable discs also provide unlimited archival storage.

The flexibility of System IV processors allows the hardware to be used for other functions during second shift operations. For example, the user may remove the ForeWord disc cartridge and replace it with a DATA IV cartridge, thereby changing the system from text-editing to data entry.

SCOPE OF MANUAL

This manual describes the organization of a ForeWord master disc (Section 2), procedures for backing up discs (Section 3), and procedures for recovering ForeWord files (Section 4). The manual also explains how to compute the amount of disc space required to store ForeWord files (Appendix A), how to call up a screen display of ForeWord functions (Appendix B), how to print an IDOS directory (Appendix C), and how to copy a non-ForeWord file to a text area (Appendix D).

Information about ForeWord operating procedures may be found in the ForeWord Operator's Manual (SIV/70-12-13) and in the ForeWord Supervisor's Handbook (SIV/70-12-15). For details regarding utilities used with the IV/40, IV/50, IV/70, and IV/90 processors, refer to the IDOS Reference Manual SIV/70-50-2D. Operation of peripheral equipment is described in the Equipment Operator's Manual (SIV/70-12-9).

Section 2

Disc Organization

Every ForeWord master disc contains three general areas: Interrupt Disc Operating System (IDOS), archive storage, and ForeWord text areas (see Figure 2-1). Each of these areas is discussed in this section.

INTERRUPT DISC OPERATING SYSTEM (IDOS)

The Interrupt Disc Operating System (IDOS) is a disc-resident collection of utility programs and routines. Note that ForeWord cannot be used when IDOS is in use.

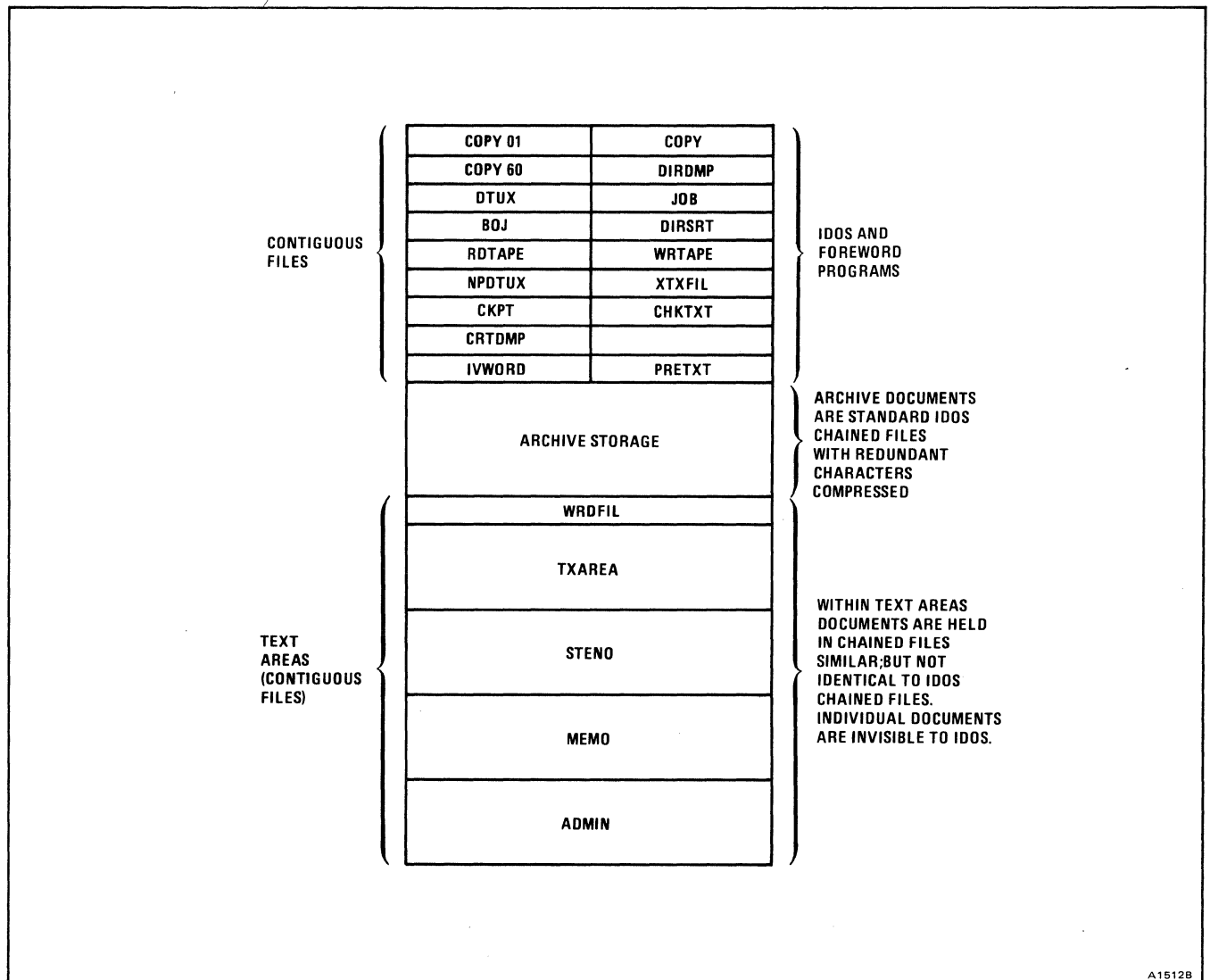


Figure 2-1. Simplified Version of ForeWord Disc Format

IDOS requires a minimum of 48K bytes (16K words) of main memory space and one or more 8231, 8271, 8241 or 8261 disc drives. It accepts input from cards, disc or from video display unit 0. Since IDOS utilities transfer information from tape to disc and from disc to tape, certain utility programs can be loaded and executed from tape. For further details on IDOS, refer to the Interrupt Disc Operating System (IDOS) Reference Manual (SIV/70-50-2).

Operating Procedures for IDOS Utilities

The procedures given in the remainder of this manual assume that IDOS is running the system. To exit from ForeWord to IDOS when ForeWord is running, type CTRL E from terminal 0. (All terminals must release documents before this keystroke operates.) All IDOS procedures must be executed from terminal 0.

When IDOS is running, two frequently used characters are produced by keys different from those marked on the ForeWord keyboard. To type an at sign (@), use the shifted bracket (]) key; to type an equal sign (=), use the unshifted bracket key ([) key.

All IDOS utilities are executed by entering two slashes (//) followed by a space and the name of the utility. For example, the utility program COPY is executed by entering:

```
// COPY
```

After entering the name of the utility, press CURSOR RETURN. The utility will begin executing. Most utilities also require other information to perform the desired function. The COPY program, for example, requires the name of the file to copy from, and the name of the file to copy it to. This information is given by entering additional control statements. Control statements always start with a slash (/). A control statement for the program COPY might be:

```
/INPUT=FILE1@0
```

The keyword in the control statement (INPUT in the above example) may be abbreviated to its first character. Thus an equivalent statement to the above would be:

```
/I=FILE1@0
```

After typing in all desired control statements for the utility, key in two slashes (//). The following shows a complete example of executing the utility COPY with both the short and long forms of the control statements.

```
// COPY // COPY
/INPUT=FILE1@0 /I=FILE1@0
/OUTPUT=FILE2@0 /O=FILE2@0
// //
```

The two examples above perform exactly the same function. All utilities explained in this manual include an explanation of all the control statements needed to execute them.

If you make an error in entering an IDOS statement, you can backspace and correct the error before pressing CURSOR RETURN. If you discover an error in a statement after pressing CURSOR RETURN but before executing the IDOS processor, press the BOOT switch to clear the entered statements and re-enter all statements.

It is advisable to always have the printer enabled when you are in IDOS status, since some messages are printed but not displayed. If you enable the printer before executing other IDOS procedures, all input statements and messages will be printed. The command to enable the printer depends on the type of printer on the system. The commands for each printer type are as follows:

<u>COMMAND</u>	<u>EFFECT</u>
// P8121	Enables 8121 printer
// P8146	Enables 8145, 8146, 8148, or 8149 printer
// NOPRNT	Disables printer

To enable or disable the printer, key in the appropriate command and press CURSOR RETURN.

IDOS Files

An IDOS disc is organized into files of two general types: contiguous and chained. An allocation table on the disc distinguishes between sectors that are in use and those that are available. In addition, an IDOS disc directory is maintained to identify the types and locations of files on the disc. The IDOS directory contains the names of ForeWord text areas and archive documents since they are IDOS files.

CONTIGUOUS FILE STRUCTURE

Executable programs, like IVWORD, and the text areas in ForeWord are examples of contiguous IDOS files.

A contiguous file is composed of physically adjacent sectors and is defined by a file name, a starting sector address, and a sector count. A contiguous file must be pre-allocated in its entirety before information can be stored in it.

CHAINED FILE STRUCTURE

Archived documents, source files, and control files are examples of IDOS chained files.

A chained file is composed of sectors that are not necessarily adjacent to each other, or physically sequential, but are dispersed throughout the disc and "linked" together by their disc addresses (sector numbers). The linkage information is contained in the file itself--each sector contains a forward pointer (address of the next sector in the chain) and a backward pointer (address of the previous sector). The first sector has a backward pointer of zero and the last sector has a forward pointer of zero. (See Figure 2-2.)

To Display the IDOS Directory

To display the IDOS Directory, proceed as follows:

- a. With the system in ForeWord status, type IDOS@n and press INDEX. (Since the default disc drive number is 0, the drive number n is required only if another drive is being specified.)
- b. Press INDEX to display subsequent pages of the directory. In the directory, each IDOS file is listed by name, followed by its size in disc sectors. ForeWord text areas and archive documents are among the files shown in the directory display. In this display, each archive document is designated by a T after its sector count.

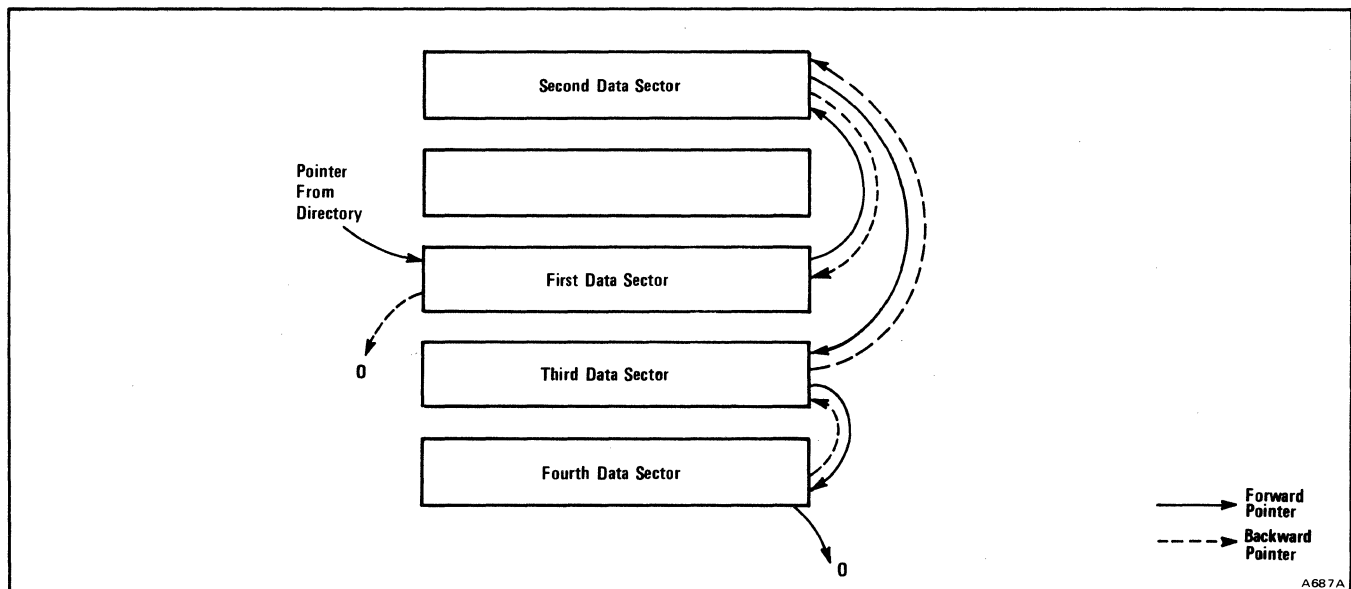


Figure 2-2. Chained File Linkage

ARCHIVE STORAGE

Archive storage is provided for documents that need to be retained but are not needed for immediate use. Documents may be transferred from the text areas to archive storage where they are stored as standard IDOS chained files with redundant characters compressed. When text files are transferred to archive storage, the header sections are written in the file first. Text files are stored with tabs, margins and flags. Records are 96 characters (97 including line feed terminator).

To display the directory of archive documents, proceed as for the IDOS directory, but substitute the special name ARCHIV for IDOS. Only those IDOS files that are designated as archived text documents will be displayed.

ForeWord TEXT AREAS

Referring to Figure 2-1, the ForeWord text areas are the portion of the ForeWord disc where text documents are stored in working format. The disc may contain one or many text areas, with each text area completely contained on one disc. These text areas are contiguous files, within which documents are allocated as chained files. (Within a text area, IDOS utility programs are not able to identify individual documents.)

CREATING NEW TEXT AREAS (PRETXT)

The ForeWord text areas will vary in size, according to the type of disc pack and the use to be made of the text area. See Appendix A for a detailed discussion of the amount of text that may be stored on a particular disc pack.

If sufficient space exists, the program PRETXT may be used to create or modify text areas on a disc. The name of a text area may be up to six alphanumeric characters long and must begin with a alphabetic character (upper case only).

To create a new text area or modify an existing one 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. Exit from ForeWord to IDOS (press CTRL E).
- c. The disc in drive 0 must contain the program PRETXT. If it does not, insert a disc containing this utility in drive 0.
- d. Type // PRETXT and press CURSOR RETURN. // PRETXT may be followed by one or more of the statements listed below. Press CURSOR RETURN after each statement.

/TEXT AREA=xxxxxxx@n Optional name for the text area. If not specified, TXAREA is used; n indicates disc drive number.

/SECTORS=xxxxxxx For create mode, you may assign up to 07640 (4000 decimal) sectors. If you do not specify a number, 03000 (1536 decimal) will be used.

For modify mode, this is the size to which the text area will be changed.

/PASSWORD=xxxxxxx Optional password for the text area (required for modify mode if existing text area is password protected).

/CREATE Selects create mode. Use only when you are creating new text area.

/NEW PASSWORD=xxxxxxx Use only in modify mode if you are changing the password.

//

e. When the blinking cursor appears in the upper left corner of the screen, ForeWord may be reloaded.

The password will be modified if you entered the new and the old passwords. PRETXT checks the old password with the one stored in the IDOS directory. If they match, the password in the directory will be replaced. Otherwise, an error message displays and the program aborts.

PRETXT enters the create mode when you enter the /CREATE parameter. The program will allocate a contiguous file with the length specified by the /SECTOR parameter. It uses the first sector of the file as the allocation table for the file. The following six sectors are cleared and used for the directory of the text area.

The IDOS directory is then updated with the name of the file as specified by the /TEXT-AREA parameter. If the given text area name already exists in the IDOS directory, an error message displays and the request terminates.

If you omit the /CREATE parameter, PRETXT enters the modify mode. Then you have the option to modify the text area, the password, or both.

You can expand or reduce the text area as specified by the /SECTOR parameter. To expand the text area, the program searches the IDOS allocator for contiguous free sectors starting from the ending sector address. It stops searching if one of the following conditions is met:

1. It finds the requested number of sectors.
2. It encounters a used sector.
3. It reaches the end of the IDOS allocator.

PRETXT will expand the text area by the amount of free space it finds. If the number of sectors allocated differs from the number you requested, PRETXT will display the allocated size in Informative Message #10. To increase the size of a text area, there must be free contiguous sectors immediately following the existing text area.

To reduce the text area, PRETXT searches backward from the end of the text area allocator until one of the following conditions is met and displays Informative Message #5:

1. It finds the amount of space to reduce.
2. It encounters a used sector.
3. It reaches the upper limit of the text area allocator.

PRETXT error messages are

1. NOT ENOUGH ROOM ON DISC

2. FILE PROTECTED OR FILE LOCKED OUT
3. DIRECTORY FULL OR FILE NOT FOUND
4. EXCEEDED IDOS ALLOCATOR LIMIT
5. MIN SIZE OF TEXT-AREA IS 20 SECTORS
6. TEXT-AREA PASSWORD PROTECTED
7. INCORRECT PASSWORD
8. JOB ABORTED, HIT CURSOR RETURN TO EXIT
9. TXAREA xxxxxx ALREADY EXISTS ON DRIVE nn
10. MAX SIZE OF TEXT AREA IS xxxxxx
11. TEXT-AREA xxxxxx EXPANDED TO MAX AVAILABLE SIZE OF nnnn SECTORS. HIT CURSOR RETURN TO EXIT.
12. TEXT-AREA xxxxxx REDUCED TO MIN REDUCIBLE SIZE OF nnnn SECTORS. HIT CURSOR RETURN TO EXIT.

Section 3

Backup and Maintenance Procedures

This section discusses methods of backing up the ForeWord system, depending on whether the system uses discs of the same type, discs of different types, or a combination of disc and tape drives.

Backup procedures should be performed daily after the utility programs CHKTXT, JOB, and BOJ have been run, so that if errors are found, they will be corrected before the disc is backed up. Backup discs or tapes allow the recovery of documents, should the information contained on the disc be inadvertently destroyed.

Table 3-1 summarizes backup options available to ForeWord users. Specific information about using the recommended IDOS processor may be found later in this section.

Table 3-1. ForeWord Backup Options

<u>Type of Backup</u>	<u>Recommended IDOS Processor</u>	<u>Comments</u>
Disc to Disc (Discs of Same Type)	COPY01	COPY01 copies the contents of an entire 8231, or 8241 disc to an identical disc.
	COPY60	COPY60 copies the contents of an entire 8261 disc to another 8261 disc.
Disc to Tape	DTUX	DTUX copies an entire 8231, 8271, or 8241 disc to tape.
	NPDTUX	NPDTUX copies an entire 8261 disc to tape or tapes.
	WRTAPE	WRTAPE copies specified text areas or archive documents to tape.
Disc to Disc (Discs of Same or Different Type)	COPY	COPY copies specified text areas or archive documents to another disc or the same disc.
8271 Disc to Multiple 8231's	BACKUP	BACKUP copies the entire contents of an 8271 disc to multiple 8231 cartridges.
Disc to Disc or Intradisc	XTXFIL	XTXFIL copies an entire text area to archive storage. Also copies non-ForeWord files to a text area.

ARCHIVE STORAGE MAINTENANCE

The programs JOB and BOJ should be used to reclaim deallocated disc 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 all file names that begin with TEMP with blanks, 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 will be printed describing the error and giving the file number of the file in error. This is the same number that is printed in the left-most column of a directory dump (DIRDMP). See appendix C for the procedure for using DIRDMP.

Using JOB

If 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 after any system failure to process any discs in use at the time of the failure.

- a. Exit from ForeWord to IDOS (press CTRL E). The disc with archive deletions should be loaded in drive 0. All drives may be loaded with such discs on multiple drive systems.
- b. Type // JOB and then press CURSOR RETURN.
- c. The following message is printed 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 will reappear 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. This condition could be created, for example, by pressing RESET when transferring a file to ARCHIV. BOJ also checks chain linkages for archived documents and other chained files. JOB, in contrast, merely checks for deleted (blank name) and temporary files (files with names that begin with TEMP) and frees their sectors for use.

BOJ should be run daily as part of the normal startup or shutdown procedure, and any every system failure to insure IDOS file and directory integrity.

To use BOJ, proceed as follows:

- a. Exit from ForeWord to IDOS (press CTRL E). The disc to be processed should be loaded in drive 0. All drives may be loaded with discs on multiple-drive systems.

- b. Type // BOJ and press CURSOR RETURN.
- c. If BOJ is to be run on all drives, type // and press CURSOR RETURN. If BOJ is to be run on only one drive, type /DRIVE=n, where n is the number of the disc drive that contains the disc on which BOJ is to be run, press CURSOR RETURN, then key in // and press CURSOR RETURN again.
- d. The following messages may be printed for each disc as it is processed:

```

xxxxxx SECTORS ARE IN USE
xxxxxx SECTORS ARE AVAILABLE
xxxxxx SECTORS ALLOCATED BUT NOT IN USE

```

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

- e. When the discs have been processed by BOJ, the blinking cursor will reappear on the screen.

COPYING AN ENTIRE DISC TO ANOTHER DISC (COPY01, COPY60, AND BACKUP)

Disc-to-disc backup copies can be made using the following IDOS processors: COPY01 copies an entire 8231 or 8241 disc to another disc of the same type and capacity; COPY60 copies an entire 8261 disc to another 8261 disc, and runs much faster than COPY01 for this drive type.

Backing Up an 8231 or 8241 Disc to an Identical Disc

If the ForeWord system has two or more disc drives of the same type, backup discs may be created by the program COPY01. To create a backup disc, proceed as follows:

- a. Exit from ForeWord to IDOS (press CTRL E).
- b. Unload all disc drives except drive 0 and drive 1. The disc on drive 0 is the one that will be copied, the disc on drive 1 is the disc that will become the backup copy.
- c. When drive 1 is ready, type // COPY01 (COPY zero one) and then press CURSOR RETURN twice. The message *** HIT "CTRL-C" TO COPY FROM DRIVE 0 TO DRIVE 1 will display.
- d. Press CTRL-C. The contents of the disc on drive 0 will be copied to the disc 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. Unload drives 0 and 1.
- f. Remove the discs and label the disc from drive 1 with names of the documents copied. The date and disc drive number should also be included in the label.

g. To copy additional discs in a multiple-drive system, insert the next disc to be copied into drive 0, the disc that is to become its backup into drive 1, and ready both drives. Note that the COPY01 program remains in the processor's memory.

h. When the disc drives are ready, press CURSOR RETURN (type // before pressing CURSOR RETURN if this is the last disc to be copied). Repeat steps d through h.

i. When all discs have been copied, idle the system for the day; or return the original discs to their drives, ready the drives, and reload ForeWord.

Backing Up an 8261 Disc to Another 8261 Disc

COPY60 is a utility program for systems with an NP/80 processor and two 8261 disc drives. COPY60 is a fast version of COPY01, which reduces the copying time of an 8261 disc to about 8 minutes. (Copying time depends on synchronization of the input and output discs, as measured by what are known as stagger factors. If a copy takes longer than 10 minutes to complete, call your Four-Phase Systems Engineer.) To create a backup disc using COPY60, proceed as follows:

a. Unload all disc drives except drive 0 and 1. The disc on drive 0 is the one to be copied, the disc on drive 1 will become the backup copy.

b. Type // COPY60 and then press CURSOR RETURN.

c. In response to the prompts at the top of screen 0 (with the front panel open, as shown in Figure 3-1)

PUT ALL NP/80 KEYS DOWN THEN PUSH NP/80 RESET

HIT CTRL-C TO COPY FROM 0 TO 1

- (1) Set all the console keys down on the NP/80 control panel.
- (2) Press the RESET button on the NP/80 control panel.
- (3) Key CTRL C at the keyboard.

d. As soon as CTRL-C is keyed, the following message briefly appears on screen 0:

WAITING FOR NP/80 TO START COPY

This message should remain on the screen while the NP/80 program is being transferred to the NP/80. If for some reason the message remains on the screen longer than a second or two, there has been an error. Should this occur, repeat steps a through c.

e. One of two messages will now appear on the second line of screen 0:

STAGGERS ARE EQUAL
or
STAGGERS ARE NOT EQUAL

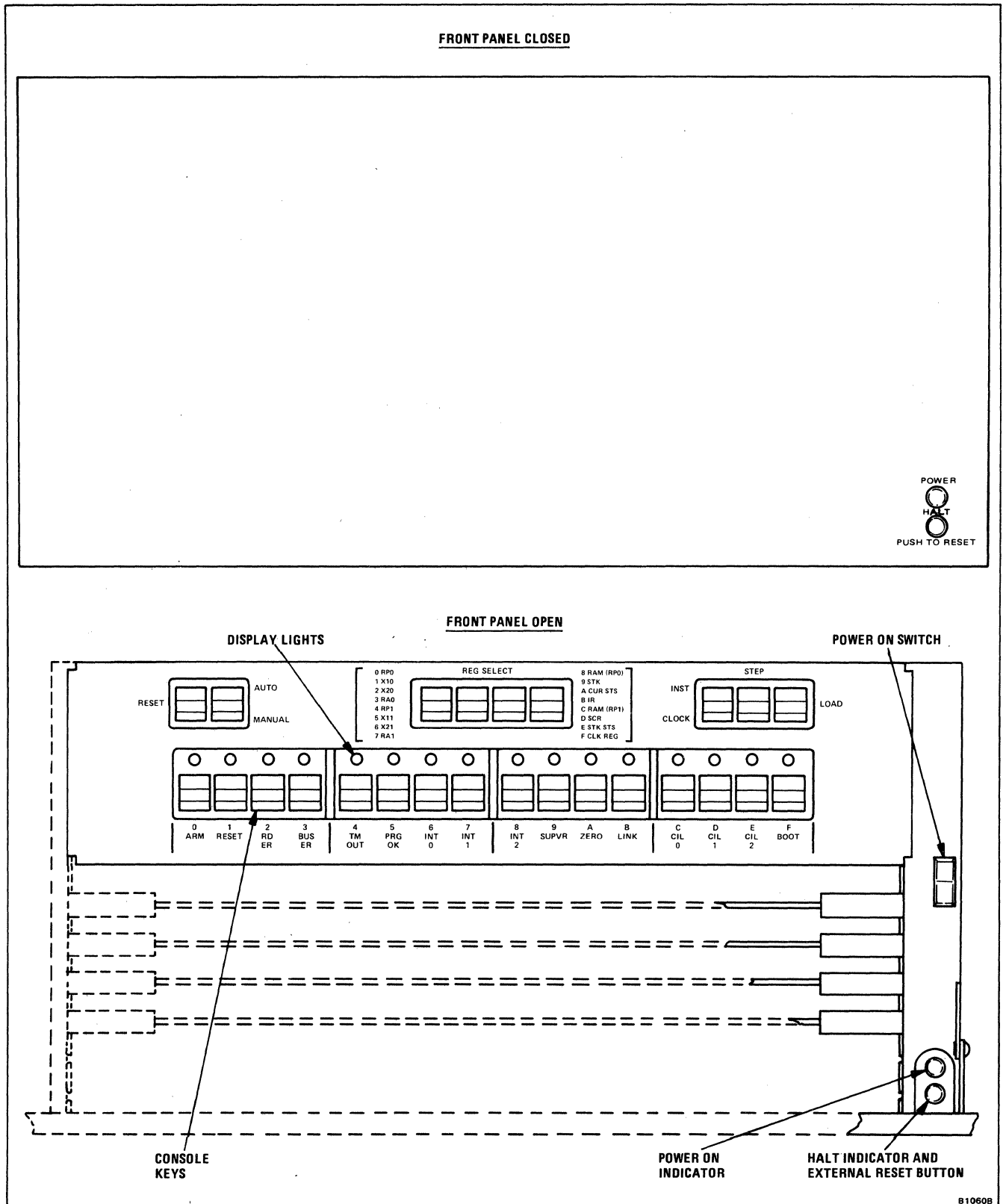


Figure 3-1. NP/80 (7080) Control Panel

The significance of these messages is explained in the first paragraph of this section.

f. The current cylinder message should next appear on screen 0:

NOW COPYING CYLINDER #XXX. MAX=330

This message is continually updated during the execution of the copy, reflecting the current cylinder (in hexadecimal) that is being copied. If errors are encountered, error messages are displayed on the screen. If this occurs, call your Four-Phase Systems Engineer.

g. Upon completion of the copy (when the cylinder count reaches 330), one of two completion messages is displayed on screen 0, followed by HIT CTRL-C TO COPY FROM 0 TO 1.

(1) The completion message indicates whether the copy was successful or unsuccessful. If the copy is a success, the following message is displayed:

COPY60 HAS COMPLETED SUCCESSFULLY

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

UNSUCCESSFUL COMPLETION, UNRECOVERABLE ERRORS

(2) At this point, the COPY60 program may be either terminated by rebooting both the Series IV and the NP/80 or re-executed by keying CTRL-C (see step c). If the program is to be re-executed, then new packs should be mounted as described in step a.

h. If CTRL-C is keyed, the following intermediate message is displayed on screen 0 while the copy program is getting restarted:

RESTARTING 8260 DISK COPY

This message will remain on the screen until the NP/80 has been notified of the restart. When the NP/80 has restarted, the current cylinder message should appear on the screen.

Backing Up an 8271 Disc to 8231 Discs

If you have a ForeWord system with 8271 discs and an 8231-04 disc as a backup device, you can use the IDOS program BACKUP to copy an 8271 disc to multiple 8231 discs.

To backup an 8271 disc, proceed as follows:

- a. Exit from ForeWord to IDOS (Press CTRL-E).
- b. Ensure that the 8271 and 8231 disc drives are loaded and ready. The 8271 contains the disc to be copied and the 8231 contains a scratch disc that will become a backup disc.

- c. Key // BACKUP 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.
```

- d. Key the following statements, pressing CURSOR RETURN after each:

```
/MODE=BACKUP
```

```
/I=@numberi      (where numberi is the number of the input disc
                  drive that contains the 8271 disc; if /I is omitted
                  disc 0 is assumed to be the input disc)
```

```
/O=nameo@numero  (where nameo is the name of the output file to be
                  created; any legal IDOS file name, such as IWWORD,
                  may be used; numero is the number of the 8231 disc
                  drive on which the copy is to be made)
```

```
/CLEAR           (required for copying to an 8231 disc--clears the
                  output disc cartridge)
```

```
/H              (optional--specifies copying up to the highest
                  allocated sector on the input disc; if /H is
                  omitted, the entire input disc is copied)
```

```
message         (enter a message to identify the disc being copied)
```

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

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

- f. 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.
```

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

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

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

h. Repeat step f each time a backup disc is filled. As many as five 8231 backup discs may be required to copy an 8271 disc. When the backup operation is complete the following message displays:

BACKUP COMPLETE.

i. Remove the last backup cartridge. If another 8271 disc is to be copied, load another 8231 scratch disc, then repeat the procedure starting with step c. If this is the last 8271 disc to be copied, key // and press CURSOR RETURN, then re-load ForeWord.

COPYING ENTIRE DISCS TO TAPE (DTUX AND NPDTUX)

If the ForeWord system has a tape deck, backup tapes of ForeWord discs may be created by using the IDOS processors DTUX (for 8231, 8271 and 8241 discs) and NPDTUX (for 8261 discs) as described below.

For 8231 discs, the recommended procedure is to create one tape per disc, although several discs may be copied to the same tape if necessary. For 8241 or 8261 discs, it is usually necessary to create multiple tapes for a single disc.

DTUX and NPDTUX allow the entry of an 80-character message that will be displayed on the screen when the backup tape is loaded. Use this message to provide pertinent information that will identify the tape.

Backing Up an 8231 Disc to Tape

The following procedure copies a single 8231 disc to tape:

- a. Exit from ForeWord to IDOS (Press CTRL E).
- b. 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 more information about tape deck operation see the Equipment Operators Manual.
- c. Type 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)
```

```
/O={ TAPE7 }           (for 7-track tape)  
   { TAPE8 }           (for 9-track, 800 bpi tape)  
   { TAPE16 }          (for 9-track, 1600 bpi tape)
```

```
//
```

When DTUX displays the prompt to enter a message, enter your message (80 characters maximum) then press CURSOR RETURN. A backup tape is then created. The tape automatically rewinds to the load point when complete. To remove the tape, press RESET and REWIND on the tape drive.

Backing Up an 8271 or 8241 Disc to Tape

Several tapes are usually required to copy an 8271 or 8241 disc. The following procedure describes how to copy a single disc to tape. If multiple discs must be copied, steps b and c may be repeated.

- a. Exit from ForeWord to IDOS (Press CTRL E).
- b. 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 more information about tape deck operation see the Equipment Operators Manual.
- c. Enter the following statements when the cursor appears. Press CURSOR RETURN after each statement:

```
// DTUX

/I=D@number           (where number is the number of the disc
                        drive containing the disc to be copied.)

/O= { TAPE7 }          (for 7-track tape)
     { TAPE8 }          (for 9-track, 800 bpi tape)
     { TAPE16 }         (for 9-track, 1600 bpi tape)

/H=high               (where high is the highest sector address on
                        the disc to be copied. To copy the entire
                        disc, enter 12800 for an 8271 or 64960 for an
                        8241. To reduce the time required to copy an
                        8241 to tape, you may wish to specify the
                        highest sector address in use rather than the
                        highest sector address on the entire disc.
                        To find the highest sector in use, execute
                        DIRDMP as described in Appendix C. Then look
                        for the highest sector address under the
                        heading LAST on the DIRDMP listing.)

//
```

When DTUX displays the prompt to enter a message, type your message and press CURSOR RETURN to start the tape copy.

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?
```

Mount a new tape, ready it, then type Y and press CURSOR RETURN. Writing of the disc to tape continues. Label the tapes as they are created to note

the correct sequence in which they were generated. When the final tape is written, it automatically rewinds. To remove the tape, press RESET and REWIND on the tape drive.

Backing Up an 8261 Disc To Tape

If your system includes the 8261 disc storage system (7030 NP/80 Network Processor), the program NPDTUX is used to create backup tapes. As with 8241 discs, it is usually necessary to create multiple tapes for each disc.

- a. Exit from ForeWord to IDOS (Press CTRL E).
- b. 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 more information about tape deck operation see the Equipment Operators Manual.
- c. Type 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.)

/O={ TAPE7 }          (for 7-track tape)
   { TAPE8 }          (for 9-track, 800 bpi tape)
   { TAPE16 }         (for 9-track, 1600 bpi tape)

/H=high               (where high is the highest sector address on
                       the disc to be copied. To reduce the time
                       required to copy an 8261 to tape, you may
                       wish to specify the highest sector address in
                       use rather than the highest sector address on
                       the entire disc. To find the highest sector
                       in use, execute DIRDMP as described in
                       Appendix C. Then look for the highest sector
                       address under the heading LAST on the DIRDMP
                       listing.)

//
```

When NPDTUX displays the prompt to enter a message, type your message and press CURSOR RETURN to start the tape copy.

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?

Mount a new tape, ready it, then TYPE Y and press CURSOR RETURN. Writing of the disc to tape continues. Label the tapes as they are created to note the correct sequence in which they were generated. When the final tape is written, it automatically rewinds. To remove the tape, press RESET and REWIND on the tape drive.

COPYING TEXT AREAS OR ARCHIVE DOCUMENTS DISC-TO-DISC (COPY)

The IDOS processor COPY can be used to transfer either all text areas and archive documents or a single text area or archive document from one disc to another. With COPY, the transfer can be made from one disc type to another. For example, a text area on an 8231 disc can be copied onto an 8261 disc.

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

- a. Make sure that the input and output discs are loaded and ready, the system is in IDOS status, and 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. If neither the
                           input name namei nor the output name nameo is
                           specified (/INPUT=@0,OUTPUT=@1), all text
                           areas and archive documents are copied.)
```

```
/OUTPUT=nameo@numero      (where nameo is the name to be given to the
                           archive document or text area when it is
                           copied, and numero is the number of the disc
                           drive on which the copy is to be made. If
                           the output name is omitted, the copy will
                           have the same name as the input name.)
```

```
//
```

The input file is copied to the output file providing there are enough 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.

If an unprotected archive document or text area on the output disc has the same name as an input name, this unprotected file is overwritten 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.

COPY Example 1

This example copies all archive documents and text areas from disc 0 to disc 1:

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

COPY Example 2

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

```
// COPY
/INPUT=TX TAR1@0
/OUTPUT=TEXTAR@1
//
```

COPYING TEXT AREAS WHILE FOREWORD IS RUNNING

Entire text areas may be copied while ForeWord is running by the use of the COPY command. This will usually be done to provide a backup of the text area on another disc. To do this, display 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 to store the backup copy under 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 3-2 gives an example of the COPY command to copy text area TEXT01 on disc 0 to disc 1 under the name BACK01.

This procedure may also be used to copy any other contiguous file, such as a checkpoint file. The procedure for copying a checkpoint file is given in the ForeWord Supervisors Handbook (SIV/70-12-15).

```
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
will be copied into/from the archival area of the disc.
```

Figure 3-2. Copying a Text Area With the COPY Command

COPYING ALL DOCUMENTS WITHIN A TEXT AREA TO ARCHIVE STORAGE (XTXFIL)

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

To transfer all documents within a text area to archive storage, proceed as follows:

- a. Exit ForeWord by pressing CTRL E.
- b. Type the following statements and press CURSOR RETURN after each statement:

```
// XTXFIL
```

```
/OUTPUT=@numero (where numero 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. If the /NAME
statement is omitted, the default name TXAREA
and disc drive 0 are assumed.)
```

```
//
```

- c. When the transfer is complete, the blinking cursor reappears on the screen and ForeWord may be reloaded.

XTXFIL Example 1

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

```
// XTXFIL  
  
/OUTPUT=@0  
  
//
```

XTXFIL Example 2

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  
  
//
```

COPYING TEXT AREAS OR ARCHIV DOCUMENTS DISC-TO-TAPE (WRTAPE)

The program WRTAPE may be used to copy archive documents or text areas from disc to tape. Such files may then be read from tape to disc using RDTAPE, as described in Section 4.

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

- a. Exit from ForeWord to IDOS (press CTRL E).
- b. 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.
- c. Type // WRTAPE and press CURSOR RETURN.
- d. When the "ENTER OPTIONS" prompt appears, enter one or more of the statements listed below, pressing CURSOR RETURN after each statement:

/TAPE=	$\left\{ \begin{array}{l} \text{TAPE7} \\ \text{TAPE8} \\ \text{TAPE16} \end{array} \right\}$	(for 7-track tape) (for 9-track 800 bpi tape) (for 9-track 1600 bpi tape)
/DISC=@n		(where <u>n</u> 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 may 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 may 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 may 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 in which the /FILE statements are entered. If no /FILE statements precede a /REMAINDER statement, all files on the disc are written to the tape.

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 will be destroyed and new information will be written over it. It is not possible to add files to a tape with WRTAPE.

WRTAPE Example 1

This 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=TX TAR1  
  
blank record  
  
/FILE=TX TAR2  
  
blank record  
  
/FILE=INTRO  
  
//
```

WRTAPE Example 2

This 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  
  
//
```

Section 4

Recovery Procedures

This section describes procedures for recovering ForeWord after system failure, repairing chain linkage errors in documents, and restoring from backup.

SYSTEM FAILUREPreliminary Steps

Generally, data on disc will not be lost as a result of a power failure or other system halt, although it is possible. To guard against this possibility, follow the procedures given in this section for recovery. System termination is indicated by disappearance of the cursor and loss of keyboard control.

- a. Check for a machine malfunction (see Figure 4-1.) This is achieved by setting the AUTO/MANUAL switch (7, Figure 4-2) to MANUAL, and selecting RP by setting the second DISPLAY SELECT switch (8) up and the first and third switches down. If none of the lights on the bottom of the control panel changes when RP is selected, press SYSTEM RESET (5), then press STEP (10). If light 1 (the one marked MM) is on with RP selected, a machine malfunction has occurred and the Four-Phase Field Engineer should be called.
- b. After pressing SYSTEM RESET and STEP, or after the Field Engineer has corrected the machine malfunction, follow the procedure described in the ForeWord Supervisor's Handbook under "Loading ForeWord from Disc". If the blinking cursor does not display, try a second or third time, ensuring that all steps are performed in the correct order. A common mistake is to set the keys at the bottom of the control panel incorrectly.

For ForeWord systems that include the checkpoint routine CKPT, proceed as follows after a system failure:

- a. If the system has detected an error, it automatically takes a checkpoint, and the message CKPT TAKEN appears in the center of screen 0; proceed to step b. If an automatic checkpoint is not taken, run checkpoint manually (see "Memory Dump Procedures" in the ForeWord Supervisors Handbook) to dump the contents of memory to the disc file named CKPT. If you have a line printer, your Four-Phase Systems Engineer may ask you to print the checkpoint file (see "Printing a CKPT File" below).
- b. Back up the entire disc to tape or disc for the Four-Phase System Engineer.
- c. Execute CHKTXT, as described below, on all text areas that were on discs in use at the time of failure.
- d. Start the system.

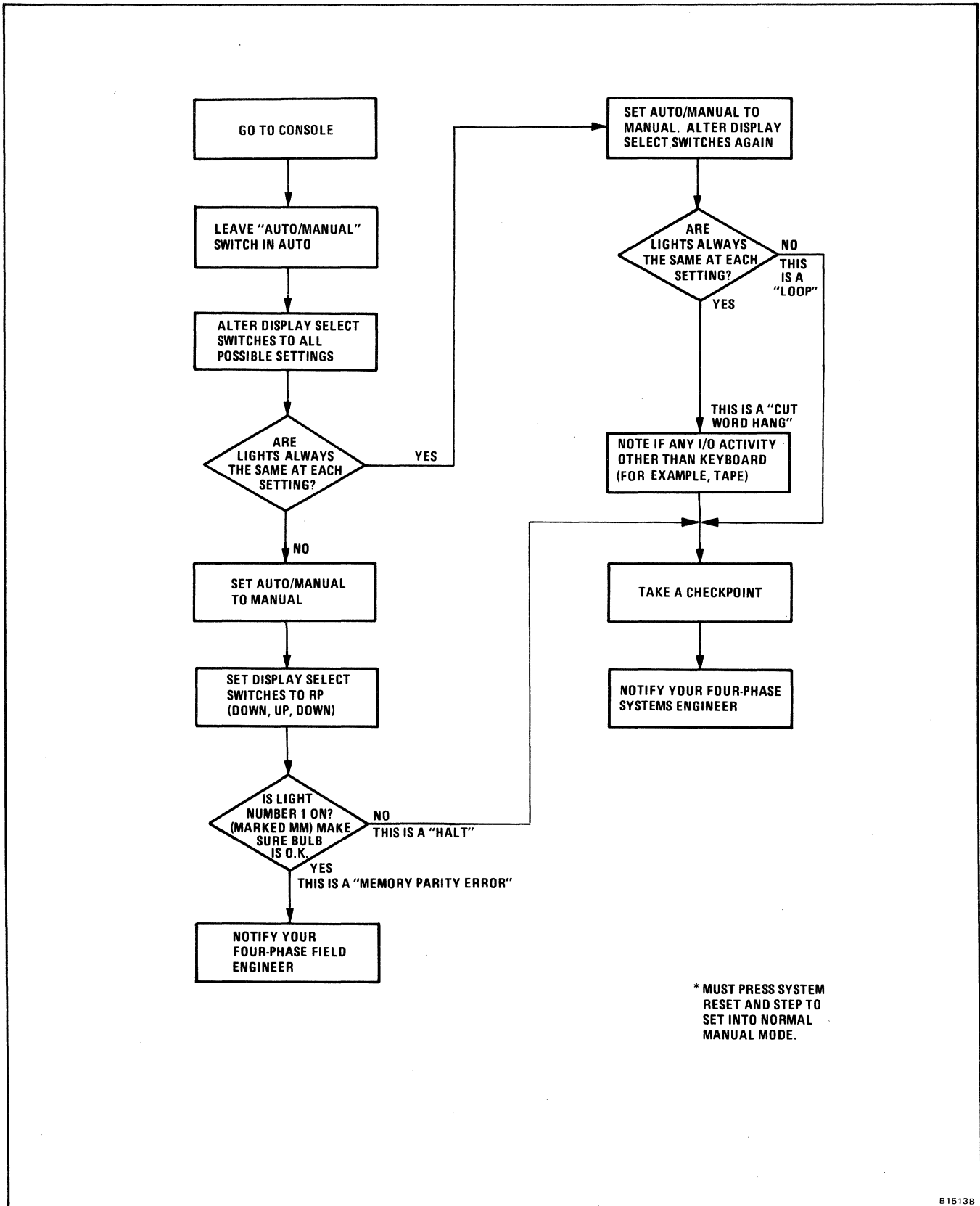


Figure 4-1. ForeWord Procedures for System Malfunction

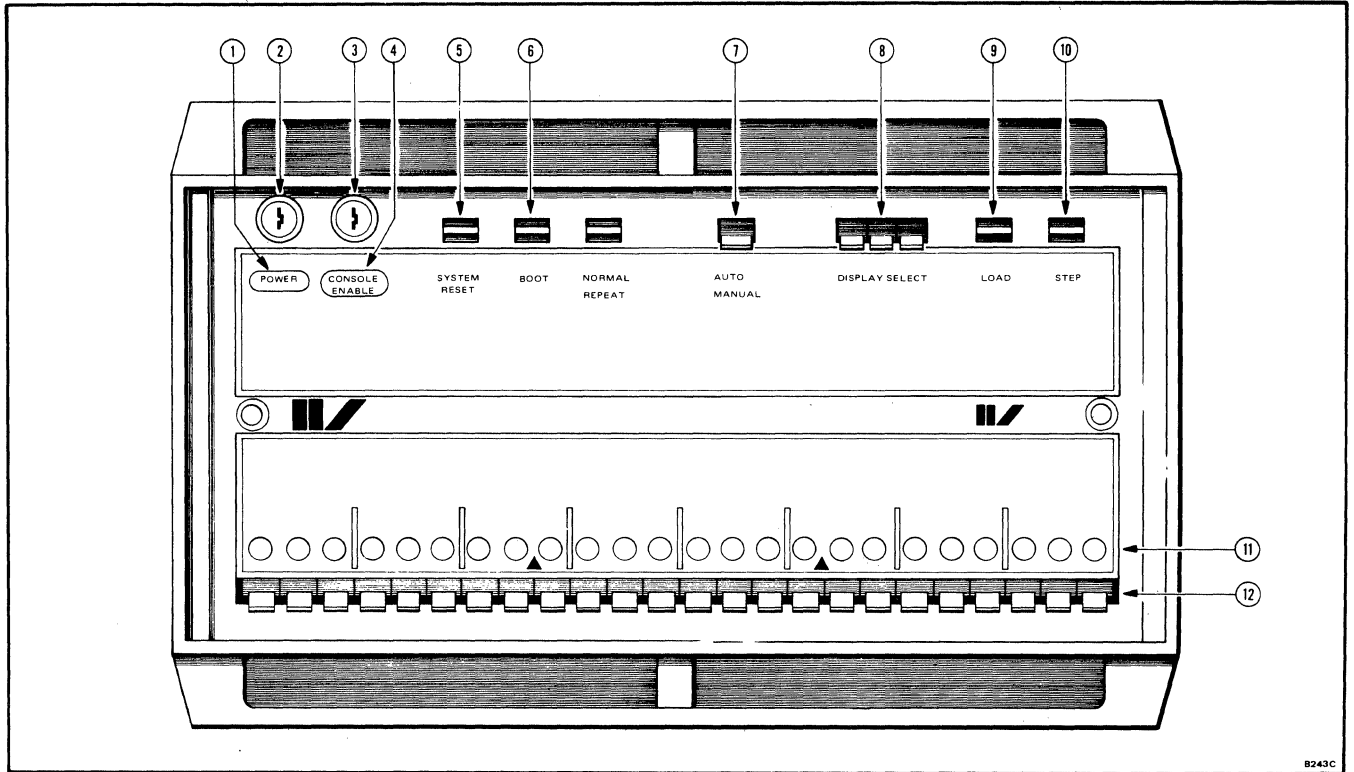
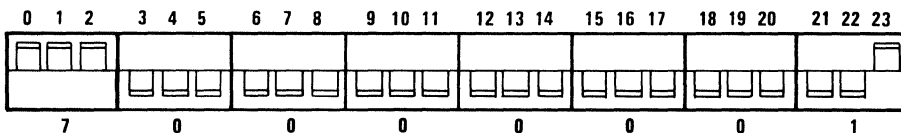


Figure 4-2. System IV/70 and IV/90 Controls and Indicators

Printing a CKPT File

If you have a line printer and wish to print a formatted copy of CKPT, proceed as follows:

- a. Type // CKPT and press CURSOR RETURN to load the contents of CKPT into memory.
- b. Set AUTO/MANUAL switch to MANUAL.
- c. Press STEP twice (to restore RP to its value when checkpoint was taken).
- d. Set the CONSOLE KEYS to 70000001.



- e. Set all the DISPLAY switches down (select TIR).
- f. Press RESET.
- g. Press STEP.
- h. Press LOAD.

- i. Set AUTO/MANUAL switch to AUTO.
- j. When the processor halts, set AUTO/MANUAL switch to MANUAL.
- k. Set all console keys down.
- l. Set the DISPLAY SELECT switches to 011 (RA).
- m. Press LOAD.
- n. Set all the DISPLAY SELECT switches down (select TIR).
- o. Set AUTO/MANUAL switch to AUTO.

Correcting a Chain Linkage Error (CHKTXT)

A chain linkage error is detected by a user when text from different documents appears in one document, or when the software detects chain pointer discrepancies, such as during CTRL DEL or FIND. When the software detects a chain linkage error, the message "CHAIN LINKAGE ERROR, RUN CHKTXT" is displayed on the bottom of the user's screen. The upper portions of the display show the last two sectors of text in the document that are known to be correctly linked. Under these circumstances, the ForeWord utility CHKTXT must be executed as described below and the system restarted.

CHKTXT must be used to check the integrity of documents on the disc after any abnormal termination of ForeWord processing. This will help to correct any chain linkage errors and help ForeWord keep track of which sectors are in use in the text areas. If CHKTXT is not executed, ForeWord may not know which sectors have been recently allocated, and chain linkage errors may occur when ForeWord is again in use. CHKTXT should be used if a disc drive is accidentally powered down or if a power failure occurs. Also use CHKTXT immediately before performing daily backup procedures.

After all documents have been checked, CHKTXT displays a summary of sector usage.

To run CHKTXT, proceed as follows:

- a. Exit from ForeWord to IDOS (press CTRL E).
- b. Key in // CHKTXT and press CURSOR RETURN. CHKTXT may be followed by one or more of the statements listed below. Press CURSOR RETURN after each statement.

/TEXT AREA=xxxxxx@n (where xxxxxx is the name of the text area to be checked; n is the number of the disc drive on which it resides. If the name is omitted, TXAREA is assumed; if the disc drive number is omitted, 0 is assumed.)

/DRIVE=n (where n is as above)

NOTE: You must select at least one of the following options to use all of the commands listed under step c. Otherwise, you may use only Y, N, and T.

/ALL SECTORS	(optional; causes all sectors in the text area to be scanned if an error is found. If omitted, only the allocated sectors are scanned.)
/SUPPRESS SCAN	(optional; suppresses scanning of sectors when an error is found. The error is displayed but no attempt is made to correct it.)
/LIST	(optional; lists reclaimed sector addresses on the printer.)
blank record	(optional; if there are other text areas to be checked, press CURSOR RETURN twice to start checking the specified text area. Other TEXT AREA statements may then be entered when the block cursor reappears. If this is the only (or last) text area to be checked, press CURSOR RETURN once, type // and press CURSOR RETURN again.)
//	(indicates end of statements.)

c. The program begins checking for chain linkage errors in the documents. If chain linkage errors are found, they can be corrected by linking the correct sectors in the document by typing one of the following operating commands:

L or Y	Indicates that the part of the document shown in the bottom third of the screen is to be linked to the part shown in the middle third of the screen. Checking will continue.
N	Do not link the sector in the bottom third of the screen and continue to scan the text area. No pointers are changed.
B	Read the previous sector into the bottom third of the screen.
F	Read the next (forward) sector into the bottom third of the screen.
C	Continue with the next document. The error is not fixed.
R	Reset the bottom third of the screen to the sector in error.
E	Read into the bottom third of the screen the last sector of the document.
T	Indicates that the document is to be terminated at the point shown in the middle of the screen. If T is typed, the remainder of the document will be lost and document-checking will continue.

d. When the block cursor reappears in the left corner of the screen, reload ForeWord if desired.

All error messages from CHKTXT are displayed on the top third of the screen. The messages that may be displayed as a document is scanned are shown in Table 4-1.

Table 4-1. Scanning Messages for CHKTXT

Message	Comments
nnnnnn NOT FOUND	Text area <u>nnnnnn</u> is not on the disc specified. Re-enter the name of the text area.
zzzzz SECTORS IN DOCUMENT nnnnnn, LAST SECTOR = yyyyy	Information only--no response required. <u>zzzzz</u> is decimal, <u>yyyyy</u> is octal, and <u>nnnnnn</u> is alphanumeric.
xxx CHAIN LINKAGE ERROR AT SECTOR yyyyy PREVIOUS SECTOR = yyyyy	<u>xxx</u> may be either BP, FP, or PP to indicate back, forward, or present pointer.
COULD SECTOR yyyyy LINK TO SECTOR yyyyy ?	Key in the appropriate response from the list of operating commands above.
SECTOR xxxxxx OVERLAP IN DOCUMENT nnnnnn	Doubly-allocated sector.
DISC REJECT STATUS = xxxxxx	Hardware error. Call Four-Phase Field Engineer.

If the sector pointers in the documents scanned by CHKTXT are wrong, CHKTXT displays a message (if the /SUPPRESS SCAN option is not specified) on the screen and printer (if the printer is enabled), asking the user if the sector displayed in the middle eight lines of the screen links to the sector displayed in the bottom eight lines of the screen. Often, a sector may be missing between the two displayed sectors. If this is the case, use the L command to link the two displayed sectors.

After all documents have been checked, CHKTXT displays a summary of sector usage. The messages that are displayed to summarize execution of CHKTXT are shown in Table 4-2.

Table 4-2. Summary Messages for CHKTXT

Message	Comments
zzzzz SECTORS ARE IN USE	Information only. <u>zzzzz</u> 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.

<p>zzzzz SECTORS ABOVE ARE COUNTED TWICE</p>	<p>Sector overlaps have been found. Exit CHKTXT and load ForeWord. The name of the erroneous document will have been displayed with a sector overlap message. Use the COPY command to copy that document into a new document with a new name. When the COPY is completed, delete the original document. Rerun CHKTXT on the text area that contains the defective document to verify that there are no other errors.</p>
<p>CHAIN LINK ERRORS PREVENT ALLOCATOR RE-WRITE</p>	<p>Chain linkage errors have not been corrected and CHKTXT's record of which sectors are in use has not been updated.</p>

RESTORATION FROM BACKUP

When ForeWord documents are damaged because of system failure, hardware failure, or operator error, it may be necessary to restore the damaged information from a backup copy. The procedures for restoring damaged documents from various backup media are described below.

Restoring Documents From Disc Backup

The following procedures describe how to recover individual documents or entire discs from disc backup. It is important to note that if a hardware problem is suspected in one of the disc drives on the system, the backup disc should not be loaded into that drive or the disc could be destroyed. Call your Four-Phase Field Engineer to check the suspect disc drive.

RECOVERING A SINGLE DOCUMENT

To recover a single document from disc backup, proceed as follows:

- a. Ensure that ForeWord is operational.
- b. Delete the bad document if it exists.
- c. At drive 1, insert the backup disc containing the required document, and ready the disc drive.
- d. When drive 1 is ready, press COMMAND to display the command directory, and then move the cursor to the COPY command and press COMMAND again.
- e. 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.
- f. Press COMMAND to execute the COPY command.

RECOVERING AN ENTIRE DISC

Recovering an 8231, 8241, or 8261 Disc

To recover an entire disc (that is, to create a second backup), proceed as follows:

- a. Press CTRL E to exit from ForeWord to IDOS.
- b. Insert the backup disc in drive 0 and ready the drive.
- c. Insert the original disc in drive 1 and ready the drive.
- d. When drives 0 and 1 are ready, enter // COPY01 (for 8231 or 8241 discs) or // COPY60 (for 8261 discs), and press CURSOR RETURN (twice for COPY01). (For details on COPY01 and COPY60 see "Copying Entire Discs to Another Disc" in Section 3.)
- e. When the copy is completed, remove both discs and replace the original disc in drive 0. ForeWord may then be restarted.

Recovering an 8271 Disc

An 8271 disc may be restored from multiple 8231 backup discs, using the IDOS program BACKUP. To restore the 8271, proceed as follows:

- a. Exit from ForeWord to IDOS (press CTRL-E). Load and ready the first 8231 disc of the backup 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.

- b. Key // BACKUP 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 the following statements, pressing CURSOR RETURN after each:

```
/MODE=RESTORE
```

/I=namei@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; if /O is omitted, disc 0 is assumed to be the output disc)

//

d. 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.

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

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

f. 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.)

g. 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.

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

RESTORE COMPLETE.
 BOOT TO CONTINUE.

- i. Press the BOOT switch, then reload ForeWord or restore another 8271 disc starting with step a.

Restoring Discs from Tapes Created by DTUX or NPDTUX

The following procedure describes how to restore an entire disc from a tape that contains a copy of the disc.

- 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. Set the console keys on processor front panel to the appropriate bootstrap word for the tape drive on the system as follows:

Tape Drive Type	Bootstrap Word
7 Track	37705261
800 BPI	37705221
1600 BPI	37705241

- d. Press BOOT on the processor front panel.
- e. When the message HIT "CTRL-C" TO CONTINUE is displayed, press CTRL-C on the keyboard. The tape to disc copy should now begin.
- f. 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 may be used as required.

To restore a disc from a tape that contains copies of several discs, it is necessary to restore all discs on the tape that are written before the desired copy. If the desired copy is the first copy on the tape, the above procedure may be used, but the tape will not automatically rewind as described in step f. To rewind the tape, press RESET then 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 f. 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

RECOVERING A TEXT DOCUMENT FROM TAPE

To recover an individual text document from a tape written by WRTAPE, you must read in the entire text area in which the document resides. If there is sufficient space on your ForeWord disc, the text area can be copied directly to

that disc from the tape. However, the following procedure assumes that you have two disc drives and there is not enough contiguous space on your ForeWord working discs to read the entire text area from tape. Therefore, the text area is read to a scratch disc and then the document is copied from the scratch disc to the ForeWord disc using the ForeWord COPY command.

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

- a. Type CTRL E to exit from ForeWord to IDOS.
- b. Insert a scratch disc in disc drive 1.
- c. Load and ready the tape deck as described in the Equipment Operator's Manual.
- d. When the disc drive and tape deck are ready, type // RDTAPE and press CURSOR RETURN.
- e. When the "ENTER OPTIONS" prompt appears on the screen, enter the statements listed below. Press CURSOR RETURN after each statement.

/TAPE=	}	TAPE7 TAPE8 TAPE16	(for 7-track tape) (for 9-track 800 bpi tape) (for 9-track 1600 bpi tape)
/DISC=@n		(optional, where <u>n</u> is the number of the disc drive to which the tape is to be read. If the /DISC statement is omitted, the number of the disc that was used to write the tape is assumed. For this procedure, 1 must be specified as the disc drive number.)	
/INCLUSIVE MODE		(required statement.)	
/ALL		(required statement.)	
/FILE=textarea		(where <u>textarea</u> is the name of the text area that is to be copied from the tape to the disc.)	
//		(indicates end of statements.)	

- f. When the blinking cursor reappears, reload ForeWord.
- g. If the bad document still exists on disc 0, delete it.
- h. Press COMMAND to display the command directory, move the cursor to the COPY command, and then press COMMAND again.
- i. 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.

- j. Press COMMAND to execute the COPY command.

RECOVERING ARCHIVE DOCUMENTS FROM TAPE

The following procedure assumes that there is enough space on your ForeWord disc to read archive documents directly from a backup tape written by WRTAPE. If there is not enough space, you must 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 WRTAPE, proceed as follows:

- a. Exit from ForeWord to IDOS (press CTRL E).
- b. Load and ready the tape deck as described in the Equipment Operator's Manual.
- c. When the tape deck is ready, key in // RDTAPE and press CURSOR RETURN.
- d. When the "ENTER OPTIONS" prompt appears on the screen, enter the statements listed below. Press CURSOR RETURN after each statement.

/TAPE=	$\left\{ \begin{array}{l} \text{TAPE7} \\ \text{TAPE8} \\ \text{TAPE16} \end{array} \right\}$	(for 7-track tape) (for 9-track 800 bpi tape) (for 9-track 1600 bpi tape)
/DISC=@n		(optional, where <u>n</u> is the number of the disc drive to which the archive documents are to be copied. If the /DISC statement is omitted, the number of the disc that was used to write the tape is assumed.)
/INCLUSIVE MODE		(required statement.)
/ALL		(required statement.)
/FILE=name		(where <u>name</u> is the name of the archive document to be read from the tape. Press CURSOR RETURN twice to start reading the tape. Other statements may be entered when the block cursor reappears. If this is the only archive document to be read, press CURSOR RETURN once, type // and press CURSOR RETURN again.)
.		
.		
.		

/FILE=name (enter the name of the next archive document to be read, then press CURSOR RETURN twice. Other statements may be entered when the block cursor reappears. If this is the last archive document to be read, press CURSOR RETURN once, type // and press CURSOR RETURN again.)

// (indicates end of statements.)

e. When the blinking cursor reappears, restart ForeWord. The archive documents will be located in archive storage on the disc.

RDTAPE EXAMPLE 1

The following example recovers a text area named TXTAR1 from a backup tape on a system with two 8231 disc drives and one 8513 (1600 BPI) 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=TX TAR1
//
```

RDTAPE EXAMPLE 2

This example recovers three archive documents, SEC1, SEC2, and SEC3, from an 8-track backup tape created by WRTAPE. The archive documents are read directly to the ForeWord disc in drive 0.

```
//RDTAPE
//TAPE=TAPE8
//DISC=@0
//INCLUSIVE MODE
//ALL
//FILE=SEC1
```

blank record

/FILE=SEC2

blank record

/FILE=SEC3

//

Appendix A

Computing Storage Space

Each ForeWord text area, as noted in Section 2, is a contiguous disc file that contains individual chained files of text (documents). As also noted, documents that are to be retained but are not needed for immediate use may be placed in archive (ARCHIV) storage, i.e., as compressed chained files in IDOS format.

Given a disc drive (8231, 8271, 8241, or 8261), how many text areas and how many documents can be assigned to one disc, and how much space will be available for these text areas and documents? And how much space will be available for archival storage? To answer these questions, we must begin with the following assumptions:

1. One 8231, 8271, 8241, or 8261 disc pack stores 3,150, 12,800, 63,000, or 87,500 total sectors, respectively.
2. The IDOS and ForeWord programs presently occupy 1179 sectors (see "IDOS and ForeWord Programs" later in this section).
3. Each sector contains 8 lines of text.
4. Each text area requires 7 sectors for its own use (6 for the directory, 1 for allocation)
5. Each document normally requires 3 sectors for header information.
6. Documents transferred to archive storage will be compressed 33 to 67%, depending on the amount of blank space in the documents.

DISC CAPACITY

Taking the first three assumptions, we can construct a table of maximum disc space values (see Table A-1). The values are shown according to disc type, with one set of values for a master system disc (with the IDOS and ForeWord programs) and one set for any other disc (with text areas only). Under each disc type, there are three columns of figures: the first column gives the total number of sectors; the second, the number of 40-line pages available; the third, the number of 56-line pages available.

On an all-text disc (i.e., on any disc other than the master system disc), the number of sectors given in Table A-1 will be the same as the number given in assumption 1; on a master system disc, the number of sectors given in the table will equal the number given in assumption 1, minus the number of sectors occupied by the IDOS and ForeWord programs (1179), as given in assumption 2.

On an all-text disc, the number of 40-line pages available will be the total number of sectors divided by 5; on a master system disc, the number of 40-line pages available will be the number available on an all-text disc, minus the

number of 40-line pages occupied by the IDOS and ForeWord programs (235, or 1179 divided by 5). The figures for 40-line pages will probably be the figures most commonly used, since a typical document with tables and illustrations usually averages about 40 lines per page. We divide by 5 to obtain these figures because one sector contains 8 lines of text (assumption 3), so 40 lines would occupy 5 sectors.

On an all-text disc, the number of 56-line pages available will be the total number of sectors divided by 7; on a master system disc, the number of 56-line pages available will be the number available on an all-text disc, minus the number of 56-line pages occupied by the IDOS and ForeWord programs (168, or 1179 divided by 7.) The figures for 56-line pages will be useful only to those users whose documents are completely filled with text. We divide by 7 to obtain these figures because 56 lines would occupy 7 sectors.

Table A-1. Maximum Capacity of ForeWord Discs

Disc Type	Master System Disc			Each Successive Disc		
	No. of Sectors	Pages Available		No. of Sectors	Pages Available	
		(40 lines per page)	(56 lines per page)		(40 lines per page)	(56 lines per page)
8231	1,971	394	281	3,150	630	450
8271	11,621	2,324	1,660	12,800	2,560	1,828
8241	61,821	12,364	8,831	63,000	12,600	9,000
8261	86,321	17,264	12,331	87,500	17,500	12,500

TEXT SPACE

Table A-1 gives us a rough idea of the amount of space available for text on each type of disc. However, to determine the exact amount, we must take into account the sectors required by text areas and documents for their own use (assumptions 4 and 5 above). For a small number of text areas and larger documents, the values shown in Table A-1 will be close to the actual values; but for a large number of text areas and many smaller documents, the difference will be substantial. The following equation may be used to compute from Table A-1 the exact number of pages available to a particular user:

$$p = P - \frac{7t + 3d}{s}$$

- where
- p = actual number of pages available
 - P = maximum number of pages from Table A-1
 - t = number of text areas assigned to the disc
 - d = total number of documents on the disc
 - s = average number of sectors per page (number of lines per page divided by 8)

Example 1: Suppose we have 35 documents stored in one large text area on a master system disc, each document having 40 lines per page. Then the actual number of pages available to us on an 8261 disc will be

$$\begin{aligned}
 p &= 17,264 - \frac{[7 + 3(35)]}{5} \\
 &= 17,264 - \frac{(7 + 105)}{5} \\
 &= 17,264 - 22.4 \\
 &= 17,241.6
 \end{aligned}$$

Example 2: Suppose we have 140 documents stored in 10 text areas, each document having 56 lines per page. Then the actual number of pages available to us on an all-text 8231 disc will be

$$\begin{aligned}
 p &= 450 - \frac{[7(10) + 3(140)]}{7} \\
 &= 450 - [10 + 3(20)] \\
 &= 450 - 70 \\
 &= 380
 \end{aligned}$$

ARCHIVE SPACE

As noted earlier in this appendix (assumption 6), documents transferred to archive storage will be compressed 33 to 67%. Therefore, to determine archive storage capacity, find the actual compression rate for your own documents and adjust the figures in Table A-1 accordingly.

Example 3: Suppose we have 189 documents stored in 5 text areas on an all-text 8261 disc, each document having 56 lines per page. And suppose we have found that our documents are typically compressed by 40%. Then the number of pages of archive storage space available to us on one disc will be

$$\begin{aligned}
 p &= \{12,500 - \frac{[7(5) + 3(189)]}{7}\} - 0.40 \\
 &= \{12,500 - [5 + 3(27)]\} - 0.40 \\
 &= (12,500 - 86) - 0.40 \\
 &= 12,414 - 0.40 \\
 &= 31,035
 \end{aligned}$$

IDOS AND ForeWord PROGRAMS

The figure used in assumption 2 (1179 sectors) is based on the sector sizes of the following IDOS and ForeWord programs:

IDOS Program	<u>Sector Count</u>		ForeWord Program	<u>Sector Count</u>	
	Octal	Decimal		Octal	Decimal
\$DIR	0040	32	IVWORD	0107	71
\$BATCH	0071	57	(overlays)	0163	115
COPY	0032	26	WRDFIL	0200	128
DIRDMP	0004	4	IVBASE	0042	34
JOB	0011	9	SVSTAT	0003	3
\$COMMI	0006	6	ATUST1	0055	45
COPY01	0006	6	ATUST2	0061	49
BOJ	0010	8	ATUST3	0061	49
P8121	0001	1	ATUST5	0055	45
NOPRNT	0001	1	STATS	0002	2
P8146	0001	1	ATUST6	0050	40

Appendix A
Computing Storage Space

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CRTDMP	0006	6	ATUST7	0055	45
DIRSRT	0006	6	ATUST8	0100	64
RDTAPE	0101	65	CHKTXT	0042	34
WRTAPE	0102	66	XTXFIL	0040	32
\$COMM	0006	6	PRETXT	0004	4
DTUX	0020	16	LUCONV	0003	3
COPY60	0063	51			
NPDTUX	<u>0061</u>	<u>49</u>			
	0640	416		<u>01373</u>	<u>763</u>

Totals: 2233 octal 1179 decimal

If your installation is using additional programs, then the figures in Table A-1 under "Pages Available On Master System Disc" should be adjusted accordingly.

Appendix B

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 will be 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 B-1 shows the special symbols that may appear in the right-most column of a given line of text.

Table B-1. Control V System

Symbol	Meaning	Symbol	Meaning
●	Line not in use	e	Paragraph, Auto Tab, Change
@	Line in use	f	Paragraph, Auto Tab, Centering
A	Change	g	Paragraph, Auto Tab, Centering, Change
B	Centering	h	Paragraph, New Page
C	Centering, Change	i	Paragraph, New Page, Change
D	Auto Tab	j	Paragraph, New Page, Centering
E	Auto Tab, Change	k	Paragraph, New Page, Centering, Change
F	Auto Tab, Centering	l	Paragraph, New Page, Auto Tab
G	Auto Tab, Centering, Change	m	Paragraph, New Page, Auto Tab, Change
H	New Page	n	Paragraph, New Page, Auto Tab, Centering
I	New Page, Change	o	Paragraph, New Page, Auto Tab, Centering, Change
J	New Page, Centering	p	Paragraph, Tab
K	New Page, Centering, Change	q	Paragraph, Tab, Change
L	New Page, Auto Tab	r	Paragraph, Tab, Centering
M	New Page, Auto Tab, Change	s	Paragraph, Tab, Centering, Change
N	New Page, Auto Tab, Centering	t	Paragraph, Tab, Auto Tab
O	New Page, Auto Tab, Centering, Change	u	Paragraph, Tab, Auto Tab, Change
P	Tab	v	Paragraph, Tab, Auto Tab, Centering
Q	Tab, Change	w	Paragraph, Tab, Auto Tab, Centering, Change
R	Tab, Centering	x	Paragraph, Tab, New Page, Auto Tab
S	Tab, Centering, Change	y	Paragraph, Tab, New Page, Change
T	Tab, Auto Tab	z	Paragraph, Tab, New Page, Centering
U	Tab, Auto Tab, Change	{	Paragraph, Tab, New Page, Centering, Change
V	Tab, Auto Tab, Centering		Paragraph, Tab, New Page, Auto Tab
W	Tab, Auto Tab, Centering, Change	}	Paragraph, Tab, New Page, Auto Tab, Change
X	Tab, New Page	~	Paragraph, Tab, New Page, Auto Tab, Centering
Y	Tab, New Page, Change	//	Paragraph, Tab, New Page, Auto Tab, Centering, Change
Z	Tab, New Page, Centering		
÷	Tab, New Page, Centering, Change		
×	Tab, New Page, Auto Tab		
	Tab, New Page, Auto Tab, Change		
↑	Tab, New Page, Auto Tab, Centering		
-	Tab, New Page, Auto Tab Centering, Change		
\	Paragraph		
a	Paragraph, Change		
b	Paragraph, Centering		
c	Paragraph, Centering, Change		
d	Paragraph, Auto Tab		

Appendix C

Printing the IDOS Directory

Occasionally, it may be convenient to print the IDOS directory. The IDOS processor DIRDMP may be used to print an annotated listing of all IDOS files in directory.

To print the IDOS directory, using the IDOS program DIRDMP, proceed as follows:

- a. Ensure that the disc drive is loaded and ready.
- b. Exit from ForeWord to IDOS (type CTRL E).
- c. Type // DIRDMP and press CURSOR RETURN. If you wish, // DIRDMP may be followed by the parameter statement listed below. If you enter this statement, press CURSOR RETURN after it.

/DRIVE=n. (optional disc drive number if directories for all drives are not to be printed.)
- d. Type // and press CURSOR RETURN.
- e. The directory for drive n will be printed. If no drive is specified, the directories for all drives on the system will be printed.

A line is printed for each file listed in the directory. The information included on each line is as follows:

<u>Heading</u>	<u>Meaning of Field</u>
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 PARAMETERS	(currently used for ISAM, DISAM, and RBS files, and text area passwords)

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

Note: A file that is protected in ForeWord will not be recognized as protected by IDOS.

Appendix D

Copying a Non-ForeWord File to a Text Area

In some instances, you may wish to copy a non-ForeWord file to a text area so that it can be edited with ForeWord. For example, a source program or control file in the IDOS area of the disc could be copied to a text area. The ForeWord document has the same name as the file that is copied.

Using XTXFIL

To copy an IDOS file to the ForeWord text area, proceed as follows:

- a. Press CTRL E to exit to IDOS.
- b. Type the following statements, pressing CURSOR RETURN after each statement:

```
// XTXFIL

/INPUT=file@n          (where file is the name of the IDOS file that
                        is to be transferred to a ForeWord test area;
                        n is the number of the disc drive on which
                        the file resides.)

/NAME=textarea@n      (where textarea is the name of the text area
                        into which the file is to be transferred; n
                        is the number of the disc drive on which the
                        text area resides. If the /NAME statement is
                        omitted, TXAREA@0 is assumed.)

/PARAGRAPH            (optional but recommended, sets a paragraph
                        flag on each line of the file when it is
                        transferred.)

/TAB=t                (optional, sets a tab at column t in each
                        line of the file when it is transferred.
                        Multiple /TAB statements may be entered to
                        set more than one tab per line.)

.
.
.
/TAB=t

//                    (indicates end of statements)
```

- c. When the transfer is complete, the block cursor reappears and ForeWord may be restarted.

XTXFIL Example

The following example copies the IDOS file PROG1 on disc 0 to the text area named TXTAR9 on disc 1. A paragraph flag is set on each line, and tabs are set at columns 5 and 12 in each line.

```
// XTXFIL  
  
/INPUT=PROG1@0  
  
/NAME=TXTAR9@1  
  
/PARAGRAPH  
  
/TAB=5  
  
/TAB=12  
  
//
```

Using XFER and COPY

Non-ForeWord files may also be copied while ForeWord is running with the COPY command or the XFER key. The COPY command may be used in the normal way, specifying ARCHIV as the text area. The XFER key may be used with the IDOS directory the same way it is used with the ARCHIV directory (see displaying the IDOS directory in Section 2 of this manual). These methods do not allow the paragraph and tab options which are allowed with XTXFIL.

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USER'S COMMENTS

ForeWord System Reference Manual
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Your comments will be considered for improving future documentation. Please give specific page and line references if appropriate.

- Which of the following best describes your occupation:

- | | |
|---|--|
| <input type="checkbox"/> Programmer | <input type="checkbox"/> Instructor |
| <input type="checkbox"/> Systems Analyst/Designer | <input type="checkbox"/> Student |
| <input type="checkbox"/> Engineer | <input type="checkbox"/> Manager |
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| | <input type="checkbox"/> Other _____ |

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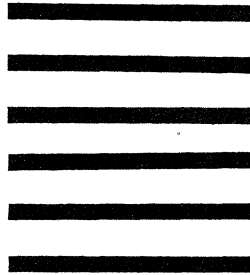
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MANUAL CHANGE

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MANUAL IDENTIFICATION

ForeWord System Reference Manual
Document Number SIV/70-55-26C
Change Number 1

GENERAL INFORMATION

The attached pages update the ForeWord System Reference Manual. Please replace the applicable pages in your copy.

All changes to the text are indicated by a vertical bar in the margin of the page. Page A (List of Effective pages) lists the issue date of each manual page; asterisks flag pages changed, added, or deleted by the current change.

SUMMARY OF CHANGE

This change revises the Control V display of Appendix B to reflect ForeWord release AY04.

MANUAL CHANGE
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MANUAL IDENTIFICATION

ForeWord System Reference Manual
Document Number: SIV/70-55-26C
Change Number: 2

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SUMMARY OF CHANGE

This change reflects release AY04A of ForeWord.

