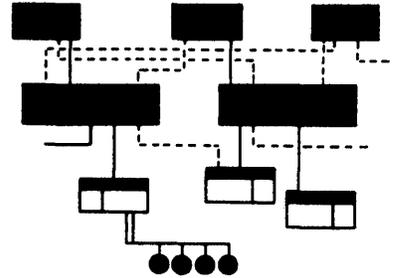


GE-625/635 UTILITY

TIBS: -198;220



GENERAL  ELECTRIC INFORMATION SYSTEMS DIVISION COMPUTER EQUIPMENT DEPARTMENT	GE-600 SERIES TECHNICAL INFORMATION BULLETIN	DATE Sept. 1968
		NO. 600-220
SUBJECT: Changes to GE-625/635 Utility Program		REF. CPB-1422A

This TIB includes features implemented in GECOS-III Systems Development Letter 1.

Replace old pages in GE-625/635 Utility reference manual, CPB-1422A, with attached new pages as follows:

<u>Old</u>	<u>New</u>
iii	iii
5-10	5-10
15-18	15-18

Vertical bars in the margins of these new pages indicate changes or additions to the existing text. This new information will be included in the next edition of the manual. The index changes required will also be made at that time.

Place this sheet in the front of your manual to show that the contents of this TIB have been incorporated.

TIBs that currently apply to CPB-1422A are:

600-198
600-220

GENERAL  ELECTRIC INFORMATION SYSTEMS DIVISION COMPUTER EQUIPMENT DEPARTMENT	GE-600 SERIES TECHNICAL INFORMATION BULLETIN	DATE April 1968
		NO. 600-198
SUBJECT: Discussion of the USE Option and other changes		REF. CPB-1422A

Please remove the following pages from your GE-625/635 Utility manual and replace them with the attached revised pages of the same number.

5 through 8
17 and 18

It is suggested that you add this page to the front of your manual to show that the TIB has been entered.

GE-625/635 UTILITY

REFERENCE MANUAL

PROGRAM NUMBER
CD600B3.001

July 1967

Rev. March 1968

GENERAL  **ELECTRIC**

INFORMATION SYSTEMS DIVISION

PREFACE

This manual explains how to use the Utility program with GE-625/635 Information Processing Systems. It is assumed that the reader is already familiar with the GE-625/635 System and its programming principles. Other manuals which present related material are:

GE-625/635 Comprehensive Operating Supervisor, CPB-1195

GE-625/635 Programming Reference Manual, CPB-1004

GE-625/635 General Loader, CPB-1008

GE-625/635 File and Record Control, CPB-1003

Suggestions and criticisms relative to form, content, and use of this manual are invited. Comments may be sent on the Document Review Sheet in the back of the manual or may be addressed directly to Documentation Standards and Publications, B-90, Computer Equipment Department, General Electric Company, 13430 North Black Canyon Highway, Phoenix, Arizona 85029.

THIS MANUAL INCLUDES NEW UTILITY
FEATURES IMPLEMENTED IN SYSTEMS
DEVELOPMENT LETTER 12.

© 1967, 1968 by General Electric Company

(2.9M 2-68)

CPB-1422A

CONTENTS

1. INTRODUCTION	1
Purpose	1
Capability	1
2. GENERAL USAGE	3
Utility Control Cards	3
Standard Options	3
Nonstandard Options	4
Physical Record Processing (PHYREC)	5
Utility Functions	6
Utility Processing Options	7
3. SPECIFIC USAGE	9
Calling in Utility	9
Other Control Cards	9
Utility Structure	10
Deck Setup	10
Utility Storage Requirements	13
Utility Messages	13
Fatal Error Messages	14
Function Completed Messages	16
Printout in Compare Function	16
Printout in Dump Function	17
Printout in DDUMP Function	18
Printout in Copy Function	18
4. DETAILED DESCRIPTION OF UTILITY FUNCTIONS	19
Copy	19
Logical Record Processing	19
Physical Record Processing	19
End-of-File Processing	19
Compare	19
Skip	20
Dump	20
DDump	20
Rewind	20
Hold	20

1. INTRODUCTION

PURPOSE

GE-625/635 Utility is a generalized system providing peripheral storage device processing capabilities. It permits copying, comparing, positioning, and printing.

Utility is expected to be used mainly for operational and debug purposes. It resides in system storage and is called by the user through the GE-625/635 Comprehensive Operating Supervisor, unconditionally by the \$ UTILITY card or conditionally by the \$ ABORT card.

CAPABILITY

Utility processes magnetic tapes (logically or physically), linked disc/drum files (logically only), or random disc/drum files as specified by user-supplied control cards. Utility system capabilities are:

- Copy (COPY) a specified number of files and/or records from first file code to second.
- Print (DUMP or DDUMP) a specified number of files and/or records.
- Compare (COMP) a specified number of files and/or records from first file code to second.
- Position a specified storage device:
 1. Rewind (REW or RWD).
 2. Skip (SKIP) a specified number of files and/or records on tape or disc/drum.
- Prevent (HOLD) a file from being closed at the termination of all of a \$ FUTIL card's functions. (A \$ FUTIL card is a Utility control card which is used to specify the functions Utility is to perform.)

2. GENERAL USAGE

UTILITY CONTROL CARDS

The following are control cards associated with Utility:

1	8	16	
\$	UTILITY	(DUMP/NDUMP)	} Utility call card(s)
\$	ABORT	(None)	
\$	(File)	(Variables)	STANDARD GECOS file control card(s) such as \$ TAPE, \$ TAPE9, \$ DISC and \$ DRUM.
\$	FFILE	(Variables)	Describes nonstandard file control blocks.
\$	FUTIL	(Variables)	Describes functions to be performed by Utility.
\$	QUTIL	(Variables)	Describes Utility processing options.
\$	ETC	(Variables)	Continuation card which can be used if parameters do not all fit on a \$ FFILE, \$ FUTIL, or \$ QUTIL card. (See example, page 11.)

STANDARD OPTIONS

The following standard options are assumed for a particular file code:

Block Size: Logical record processing: 320 words

Physical record processing: length of available storage for all but the Compare function. Because the Compare function must have two records in memory at the same time, it uses half of the available storage for each record.

Number of Buffers: Logical record processing: 2 buffers per file code.

Physical record processing: 2 buffers for Compare; all other functions, only 1 common buffer.

Record Form: Variable-length records

Labels: Standard GEFRC labels

Block Serial Numbers: Assumed

Density: High

Mode: Binary

Retention Period: 0

Mode of Processing: Logical record processing

NONSTANDARD OPTIONS

Nonstandard options are specified to Utility by means of a \$ FFILE card. This card is in the following format:

1	8	16	72
\$	FFILE	file code, parameters	

A file code is a two-character alphanumeric code assigned to the file. This is the same file code assigned by the user on the GECOS file card to uniquely identify a particular file. Parameters must be separated by commas.

The parameters for nonstandard options processed by Utility are:

NSTDLB	Do not create or verify standard labels.	} If the PHYREC option is used: for an input file--these are unnecessary. ¹ For an output file--these are ignored if ASIS is specified on a \$ QUTIL card preceding the \$ FUTIL card.
MODBCD	Set recording mode to BCD.	
LODENS	Set device to low density.	
ASA9	Set recording mode to ASA 9-track tape format. The RT9 command is used for reading and WT9 is used for writing by GEFRC. Applicable to 9-track magnetic tape only.	} If the PHYREC option is used and ASIS is specified on a QUTIL card preceding the \$ FUTIL card, this parameter is ignored for an output file.
BUFSIZ/n	Set buffer size to n. Limit is 4096 words or less, depending upon storage available.	} Ignored for an input file if the PHYREC option is being used for that file. Also ignored for an output file if it is a tape file being made by a physical (PHYREC) copy function.
FIXLNG/n	Records are fixed length, n words long.	
NOSRLS	Do not use block serial numbers.	

¹If an input tape is known to be in low density, or if the density is unknown (and physical record processing is used), the LODENS parameter on the input \$ FFILE card should be used.

RETPER/n	Place the retention period n into the output label. The upper limit for n is 999. If a retention period greater than 999 is specified, 999 will be used. Applicable only to labeled output magnetic tape files.
NDATE	For a COPY function of labeled magnetic tape to labeled magnetic tape, use the current (new) date as the creation date for the output file rather than copying the creation date from the input file. This option can be used only on an output \$ FFILE card.
MLTFIL	This is a multifile file. It need only be used if there is a possibility that an output magnetic tape file may exceed one reel. This will prevent the creation of an illegal file, illegal because of being both multifile and multireel. (See manual)
PHYREC	Utility determines the mode (except ASA9, which must be specified), density, and labeling conditions of the input magnetic tape file. Physical tape records, limited in size only by available storage, are processed (see next section, below) by means of DCW's generated within Utility. PHYREC is applicable only to magnetic tape files.
RANDOM/n	This input file is a random disc/drum file which can be DUMPed, DDUMPed or SKIPed. The dump or skip is on the basis of fixed-length records, n words long (n may not be larger than 1280 words). If n = 0, record size is assumed to be 40 for a disc storage file and 64 for a drum file. <u>Processing of a given RANDOM file must be completed on one \$ FUTIL card because all open data files are closed at the completion of a \$ FUTIL card.</u> Processing of a RANDOM file must also be completed before another file is started. (See Chapter 3 for an example of the use of the random disc/drum file dump/skip capability.)

See
COPY
10087E
8/1/72

Note that n is written as an unsigned decimal integer. Parameters not mentioned above are listed as illegal parameters and then ignored.

The nonstandard options specified on a \$ FFILE card remain in effect for that file code for the rest of the activity unless changed by another \$ FFILE card, which always (even if it contains nothing but an illegal parameter) completely resets Utility \$ FFILE tables for that file code. A \$ FFILE card must precede a \$ FUTIL card if the nonstandard options it specifies for a file are to be in effect for the functions specified on that \$ FUTIL card. This is because Utility processes its control cards one at a time.

PHYSICAL RECORD PROCESSING (PHYREC)

Physical record processing (PHYREC) provides the following capabilities not available with logical record processing.

1. It allows processing of magnetic tape input about which nothing is known (for example: mode and record form).
2. It allows processing of magnetic tape records larger in size than 4096 words, the maximum size for logical record processing.
3. It allows processing of mixed mode, mixed density magnetic tape files. Mixed mode is handled within files; density (and labeling conditions) may change only from file to file.

PHYREC need not be specified for an output file for a physical copy. The COPY function, when the PHYREC option has been specified for the input file, causes physical copying to the output file. The output file will be treated in a physical mode for all subsequent FUTIL functions on the same \$ FUTIL card. It will, however, be treated logically for any subsequent \$ FUTIL cards unless it is explicitly set for physical record processing by a (\$ FFILE) PHYREC option before the subsequent \$ FUTIL cards.

The user should be aware of the fact that during physical record processing, block serial numbers are considered only as data words if they appear on the input file. If a file with block serial numbers is being copied physically and any input records are skipped either by the SKIP function or the IGNORE option, the corresponding block serial numbers will also be missing in the output.

UTILITY FUNCTIONS

Utility functions are defined by the \$ FUTIL card as follows:

1	8	16	72
\$	FUTIL	filecode 1,filecode 2,options	

The operand field contains the file code of each of the two files (maximum per \$ FUTIL card) being serviced. Utility creates a file control block and, for logical record processing, reserves 2 buffers for each file code. These file control blocks are set to standard options unless previously modified by \$ FFILE cards. If two file codes are not needed, a comma must be used in place of the missing file code. Multiple \$ FUTIL cards are permitted within an activity.

The options permitted by Utility are as follows:

<u>Option</u>	<u>Meaning</u>
COPY/M/	Copy M from first file (filecode 1) to second file (filecode 2).
COMP/M/	Compare M from first file (filecode 1) to second file (filecode 2).
SKIP/M,N/	Skip M on first file (filecode 1) and N of second file (filecode 2).
DUMP/M,N/	Dump M from first file (filecode 1) and N from second file (filecode 2) in octal and BCD equivalent.
DDUMP/M,N/	Dump M from the first file (filecode 1) and N from the second file (filecode 2) in BCD representation only.
RWD (or REW)/filecode 1,filecode 2/	Rewind file filecode 1 and file filecode 2. (Random disc/drum files cannot be rewound.)
HOLD/filecode 1,filecode 2/	Do not close files filecode 1 and filecode 2 at the completion of the functions specified on this \$ FUTIL card.

The M represents the number of files (#F) and/or number of records (#R) from filecode 1, and the N represents the number of files and/or records from filecode 2. (Neither M nor N may be zero.) These parameters may be specified, for example, as 3F4R, 4F, or 5R. (If an end-of-file is encountered during a record countdown, the record count is considered exhausted.) File codes referred to here as filecode 1 and filecode 2 may be any two alphanumeric characters.

UTILITY PROCESSING OPTIONS

Optional courses of action which can be taken by Utility during its processing can be specified on the \$ QUTIL card.

1	8	16	72
\$	QUTIL	Options	

The options which can be specified on the \$ QUTIL card are as shown below. (If an option is not specified, the underlined option is assumed.)

<u>Option</u>	<u>Meaning</u>
EOF/ALL	Count all file marks (except octal 75, 76) as file delimiters. <u>Count only octal 17 file marks as file delimiters.</u>
ASIS	Copy to output tape in same mode, density, and labeling condition as input tape. Applicable only to PHYREC processing. <u>Copy according to nonstandard options indicated on output \$ FFILE card; where none, copy according to standards.</u>
TERM	If a fatal error is encountered in Utility processing, terminate the activity with a MME GEFINI. <u>In case of fatal error, terminate with a MME GEBORT.</u>
CMPERR/n	n is the number of compare errors which will be accepted. Utility terminates with a fatal error on the n + 1 compare error. n can range from 0 to 262,143. <u>Terminate activity with fatal error when 50 compare errors have been encountered.</u>
NBYPSS	Do not bypass noise records. The GEPR override option, which provides no noise record test, will be used. Applicable to input magnetic tape file only.

Option

Meaning

The NBYPSS option should be used if there is a possibility that the tape to be read contains any 1- or 2-word physical records. If the option is not used, 1- or 2-word physical records having bad parity will be treated as noise records and so bypassed.

Bypass noise records.

USE/nor IGNORE/n n is the number of input nonrecoverable parity errors which will be accepted (with the appropriate USE or IGNORE action taken) before the activity is terminated with a fatal error.

Terminate activity with fatal error when an input nonrecoverable parity error is encountered.

The following table summarizes action taken for the USE and IGNORE options on non-recoverable input parity errors until count n is exceeded:

Directive Option	Dump	Copy	Compare
Use	Dump complete physical record with error message. Continue.	Dump physical record on P* with error message. Copy and continue.	Dump physical record on P* with error message; compare and continue.
Ignore	Print error message only. Continue.	Dump physical record on P* with error message; do not copy; continue.	Dump physical record on P* with error message; terminate activity immediately with a fatal error.

The error message on P* is as follows:

FILE-XXXX BLOCK-XXXX FILE CODE XX NONRECOV. PARITY ERROR

For input nonrecoverable parity errors: the operator is always bypassed during physical record processing; he is bypassed during logical record processing if a USE or IGNORE option is used.

It is not recommended that the USE option be used for logical record processing of variable-length records. If the record-size field of one of the record-size control words is in error, the input record cannot be unblocked correctly; and the run will be aborted.

The options specified on a \$ QUTIL card remain in effect for the rest of the activity, with the following exception: three \$ QUTIL options can be reset in the same activity by use of another \$ QUTIL card. These are:

USE, IGNORE, and CMPERR

A \$ QUTIL card must be placed before a \$ FUTIL card if the processing options which it defines are to be in effect for the functions specified on the \$ FUTIL card.

3. SPECIFIC USAGE

CALLING IN UTILITY

Utility may be referred to as a separate activity or as a subactivity of a particular job. The following control card is needed to call Utility as a separate activity.

1	8	16
\$	UTILITY	Options

The following options can be specified in the operand field. (If an option is not specified, the underlined option is assumed.):

- DUMP: Dump all of slave core if the Utility activity is aborted.
- NDUMP: Dump only program registers if the Utility activity is aborted.

When GEIN encounters this card, it opens a U* file. All subsequent cards, up to the next \$ control card indicating a new activity, are placed on that file. The U* file then becomes the input file for Utility.

The following card (used instead of the \$ UTILITY card) calls Utility as an abort subactivity.

1	8	16
\$	ABORT	(Not used)

The \$ ABORT control card begins definition of a subactivity to be initiated only if the activity immediately preceding it is aborted. If this occurs, the \$ FFILE, \$ FUTIL, \$ QUTIL, and \$ ETC cards (the only cards following the \$ ABORT card that are written by GEIN on the U* file) are read in and processed by Utility.

OTHER CONTROL CARDS

A particular Utility activity may require a request for extra storage. (See "Utility Storage Requirements," page 13.) This may be done by placing a \$ LIMITS card immediately behind the \$ UTILITY control card. The \$ LIMITS card may also be used to change the Utility SYSOUT line limit, which is normally 10,000.

For further descriptions of the control cards, see the GE-625/635 Comprehensive Operating Supervisor (GECOS-III) reference manual, CPB-1518. (For GECOS-II, see GE-625/635 Comprehensive Operating Supervisor reference manual, CPB-1195.)

UTILITY STRUCTURE

Utility is a slave program which provides two modes for processing tapes. The processing can be either by logical records (normally) or by physical records (by designating PHYREC on the input \$ FFILE card). Only magnetic tape files may be handled by PHYREC processing. Logical records are read by means of the GET routine and written by the COPY routine. Physical records are read by the READ routine and written by the WRITE routine. These routines are explained in the GE-625/635 File and Record Control reference manual, CPB-1003.

During initialization, storage availability is checked and buffers are set up. The U* file, which was previously written by GEIN with Utility control cards, is opened.

Only \$ FFILE, \$ FUTIL, \$ QUTIL, and \$ ETC cards are processed. In the case of a \$ FFILE card, only options listed in the "Nonstandard Options" section are processed; all others are ignored. In the case of a \$ FUTIL card, file code parameters are checked. If a \$ FFILE card was present for the particular file code, the file control block is set to the desired options. If no \$ FFILE card was present, standard options are placed in the file control block. If Utility generates two file control blocks, FCB1 refers to the first file code and FCB2 to the second. Initialization for each \$ FUTIL card also includes reinitialization of "running" file and record counts. The \$ FUTIL card is then scanned for Utility functions, and as each function is recognized (a second slant encountered), this option is processed. All parameters in the \$ FUTIL card must conform to those specified in "Utility Functions," Chapter 2.

I/O activities within Utility are performed with standard GEFRC routines. When all functions specified on a \$ FUTIL card are completed, files are closed (without rewind and without lock) unless the Hold option was specified. If Hold was used, the file control block for that particular file code is not closed. The Utility activity terminates when an End-of-File is encountered on the U* file.

DECK SETUP

Particular attention should be paid to the description of nonstandard files as described under "Nonstandard Options." Note that Utility recognizes only nonstandard options; entries such as STDLBL are ignored.

An example of a Utility deck setup is as follows:

1	8	16
\$	SNUMB	
\$	IDENT	
\$	UTILITY	
\$	FUTIL	BD,,RWD/BD/,DUMP/1F/
\$	TAPE	BD,X1R,,1234
\$	ENDJOB	

In the example on the preceding page, file BD, is rewound and one file is dumped from it. Note that two file code parameters must be specified on \$ FUTIL cards, although one can be a null field. In subsequent examples, \$ SNUMB, \$ IDENT, and \$ ENDJOB cards are not mentioned but are assumed.

1	8	16
\$	UTILITY	
\$	LIMITS	,16384
\$	FFILE	F1,PHYREC, LODENS
\$	FUTIL	F1,F2,RWD/F1,F2/,COPY/10F/,RWD/F1,F2/,
\$	ETC	COMP/10F/,RWD/F1,F2/,DUMP/,10R/,RWD/F2/
\$	TAPE	F1,X1D,,1234
\$	TAPE	F2,X2D,,,COPYFILE

The above deck setup requests Utility to copy physically (rather than logically) 10 files from a tape of possibly unknown composition to a labeled, high density, binary tape. Both tapes are then to be verified by comparison, and 10 records are to be dumped from the second tape (F2). The 16,384 words of storage requested permit comparison of physical (tape) records of up to 4896 words in size or copying and dumping physical tape records of up to 9792 words. See "Utility Storage Requirements" which follows deck setup examples.

1	8	16
\$	UTILITY	
\$	QUTIL	EOF/ALL
\$	FUTIL	F1,,RWD/F1/,DUMP/99F/,RWD/F1/
\$	TAPE	F1,X1R

This deck setup asks for a dump of 99 files, all file marks (except 75 and 76) to be considered as file delimiters. If a partial label¹ is encountered, the dump is terminated. By specifying an unusually large number of files in this manner, it is possible to process any GEFRC produced labeled tape (logical and physical record processing) or unlabeled tape (physical record processing only) without knowing its precise number of files. Utility stops any processing function and proceeds to the next one upon encountering a partial label.

When a partial label is encountered, the tape is backspaced over the partial label and the following message is sent to P*:

```
FILE CODE xx FILE # nn __RECORD #1
IS END OF DATA LABEL. FUNCTION ENDED.
```

¹ A partial label is written by GEFRC on magnetic tapes as an end-of-information banner. It is distinguished from a standard label by the fact that it has zeros in its creation date field.

The partial label itself is counted as a new file; therefore, the number of useful data files on this device is nn - 1.

1	8	16
\$	UTILITY	
\$	FUTIL	F1,F3,RWD/F1,F3/,COPY/3R/,HOLD/F3/
\$	FUTIL	F2,F3,RWD/F2/,COPY/1R/,HOLD/F3/
\$	FUTIL	F1,F3,RWD/F1/,SKIP/4R/,COPY/1F/
\$	TAPE	F1,X1D,,1234
\$	TAPE	F2,X2D,,4321
\$	TAPE	F3,X3D,,,,OUT FILE

This deck setup is shown primarily to illustrate use of the HOLD function. One file from a standard magnetic tape file, F1, is copied to F3, except for the fourth logical record, which is skipped on F1 and copied from F2, a correction file. F2 is also a standard magnetic tape file. The HOLD's must be used to prevent the output file F3 from being closed before all of the required copying to make up a logical file is completed.

HOLD can also be used for holding within an input logical file. It could not, however, be used in the above example for F1 at the end of the first \$ FUTIL card. This is because two FCB's would have been kept open, tying up both of Utility's FCB's. No new file (F2) could then be introduced.

The following deck setup illustrates the use of Utility's random file SKIP/DUMP capability.

```

$  UTILITY
$  FFILE    AB,RANDOM/10
$  FFILE    BC,RANDOM/0
$  FUTIL    AB,BC,SKIP/5R/,DUMP/5R,1F/
$  DISC     AB,A1R,3R
$  DRUM     BC,B1R,2R

```

In this deck setup, a random 3-link disc file, AB, is to be skipped down by five 10-word records. Then, its next five 10-word records are to be dumped to P*. Finally, a 2-link random drum file, BC, is to be dumped to P* by 64-word records. (See the \$ FFILE parameter RANDOM/n in Chapter 2.)

UTILITY STORAGE REQUIREMENTS

A minimum of 8192 words of storage is required for Utility. This amount of storage is normally allocated to Utility by GECOS. (However, a \$ ABORT subactivity uses the storage available for the aborted activity.)

Following are descriptions of approximate record sizes that can be handled in 8k, and methods of calculating storage requirements when more than 8k is needed.

Logical Record Processing

<u>Physical Record Size</u>	<u>Words of Storage Required</u>
≤ 400 words	8k
> 400 words	$8192 + 4(\text{BUFSIZ} - 400)$

Physical Record Processing - All Utility Functions Except Compare

<u>Physical Record Size</u>	<u>Words of Storage Required</u>
≤ 1600 words	8k
> 1600 words	$8192 + (n - 1600)$

where n is the number of words in the largest physical record to be processed

Physical Record Processing for the Compare (COMP) Function

<u>Physical Record Size</u>	<u>Words of Storage Required</u>
≤ 800 words	8k
> 800 words	$8192 + 2(n - 800)$

where n is the number of words in the largest physical record to be compared

UTILITY MESSAGES

All Utility printer output is sent to P*, including the messages in the following list.

Fatal Error Messages

Any error which Utility considers to be fatal results in a fatal error message to P* and either a termination or abortion of the activity, depending on the presence of the TERM option. Aborts show one of Utility's three abort reason codes:

U1 - Control deck errors

U2 - Comparison errors

U3 - Hardware errors

<u>Message</u>	<u>Meaning</u>	<u>Abort Code</u>
CONTROL CARD ERROR	There is an error (other than an illegal parameter) on the preceding Utility control card. The error is one of the following: An illegal character A verb with too many parameters An illegal end-of-statement An illegal file code Missing file code(s) No \$ in column 1 The control card in error and error message are displayed on P*	U1
FILE CODE xx FILE #xxxxxx--BLOCK #xxxxxx IS mmmmmm WORDS. TOO BIG FOR MEMORY AVAILABLE yyyyyy WORDS	Utility does not have sufficient memory for handling this block size (mmmmm). Only yyyyyy words are available for buffers. See "Utility Storage Requirements" in this chapter for determining memory requirements.	U1
ILLEGAL FUNCTION FOR RANDOM FILE	A function other than SKIP, DUMP or DDUMP has been requested for a RANDOM file.	U1
ILLEGAL PARAMETER XXXXXX	A parameter (xxxxxx) unacceptable to Utility has been specified on a \$ FFILE, \$ FUTIL, or \$ QUTIL control card. If the parameter was specified on a \$ FUTIL or \$ QUTIL card, the Utility activity terminates with a fatal error.	U1
INSUFFICIENT MEMORY AVAILABLE	Either the BUFSIZ option in a \$ FFILE card has too large a parameter for the amount of memory available to Utility for buffers, or less than 8k is available for this Utility activity.	U1

Function Completed Messages

Function completed messages are sent to P* for the SKIP, COPY, and COMP functions.

SKIP Function. If the SKIP function was terminated by a record countdown, the following message is placed on P*:

FILE CODE xx SKIPPED xxxxxx FILES xxxxxx RECORDS

If the SKIP function was terminated by an end-of-file having been reached, the following message is placed on P*:

FILE CODE xx SKIPPED xxxxxx FILES. xxxxxx RECORDS IN LAST FILE

COPY Function. If the COPY function was terminated by a record countdown, the following message is placed on P*:

COPIED xxxxxx FILES xxxxxx RECORDS

The record count (xxxxxx) includes records IGNORE'd (input error records ignored by use of the IGNORE option).

If the COPY function was terminated by an end-of-file having been reached, the following message is placed on P*:

COPIED xxxxxx FILES. xxxxxx RECORDS IN LAST FILE

COMP Function--No Errors. If there were no compare errors and the COMP function was terminated by record countdown, the following message is placed on P*:

COMPARED xxxxxx FILES xxxxxx RECORDS

If there were no compare errors and the COMP function was terminated by an end-of-file having been reached, the following message is placed on P*:

COMPARED xxxxxx FILES. xxxxxx RECORDS IN LAST FILE

COMP Function--With Errors. If there were one or more compare errors when the compare function terminated, the following message is placed on P* and the activity is terminated with a fatal error.

COMP ERROR COUNT xxxxxx

Printout in Compare Function

Every specification of a COMP function results in the following printout which indicates that data on FILE (code) xx is to be compared with data on FILE (code) yy.

COMPARE - xx VS yy

The following printouts indicate that there was a noncomparison and they identify by number the two files (mm) and two records (nn) which do not compare.

```
FILE # mm -- RECORD # nn, AND FILE # mm -- RECORD # nn  
RECORDS DO NOT COMPARE
```

Noncomparison of Data Records. The reason for noncomparison is shown by either of two printouts. The following printout indicates that the two records just compared were not the same size. When sizes do not compare, the COMP ERROR COUNT is incremented by one and no further check is made on the two records. The printout is:

```
SIZES DIFFERENT xxxxxx VS yyyyyy
```

where: xxxxxx and yyyyyy are the sizes of the two records

The following printout indicates that the two compared records are the same size but the data does not compare. When the data does not compare, the following line is printed and the COMP ERROR COUNT is incremented by one for each noncomparison within the two records. The printout is:

```
#### aaaaaaaaaa bbbbbbbbbbbb cccccdddddd
```

where: #### = the word number within the record where the noncompare occurred
a--a = the octal representation of the data word from file code xx
b--b = the octal representation of the data word from file code yy
c--c = the BCD equivalent of the data word from file code xx
d--d = the BCD equivalent of the data word from file code yy

Noncomparison of End-of-File Marks. The following printouts indicate that the EOF marks are not aligned. They specify which unit first encountered the EOF. The other unit is then aligned for a matching EOF before comparisons are resumed. If the number of files to be compared is exhausted during this positioning, comparison is terminated. The printout will be either

```
END FILE MARK ON FIRST UNIT ONLY  
or  
END FILE MARK ON SECOND UNIT ONLY
```

When the EOF marks are aligned but do not compare, the second device is positioned until either the file marks agree or the number of files or records to be processed is exhausted. The printout for noncomparing file marks is:

```
END FILE MARK - xx VS yy
```

where: xx and yy are the disagreeing file marks

Printout in DUMP Function

A line is printed giving File number, Record number, File Code, Report Code (significant only if variable-length record format), mode, and density. (If the file being dumped is a random disc/drum file, only the File Code and Record number are printed.) Contents of the

record are printed with the following information appearing on each line: the word sequence number of the record and up to five data words in octal and BCD equivalent. For the BCD equivalent the 17₈ and 77₈ special editing characters are replaced by 37₈(\). End-of-file marks are displayed and their pattern given. On a labeled tape each 14-word tape label is printed with its file code. The 17₈ following a tape label is not shown, because GEFRC automatically bypasses it. Duplicate lines are suppressed, and an asterisk is shown next to the word number in a line following one or more suppressed lines.

Printout in DDUMP Function

The printout is the same as that described for the DUMP function with these exceptions:

1. Only the BCD representation of the data words is shown, up to 18 words per line.
2. The first word of the record is shown prefixed by an asterisk, and the last word is immediately followed by an asterisk. These show the exact starting and ending positions of the record.

Printout in COPY Function

ILLEGAL END FILE MARK xx--COPIED AS 67. The xx is the illegal file mark 77.

4. DETAILED DESCRIPTION OF UTILITY FUNCTIONS

Utility performs the functions of COPY, COMPARE, SKIP, DUMP, DDUMP, REWIND, and HOLD as follows:

COPY

When labeled tapes are copied, label words 7-14 of the most recently opened input tape are copied to the output label. Word 7 (creation date) and word 8 (retention days) can be changed by use of the NDATE and RETPER options of the \$ FFILE card.

Logical Record Processing:

The input file is read, and the record size is transferred to the output FCB. The output file is then written to by means of the COPY routine. If both devices call for the standard variable-length record format, the report and media codes are transferred to the output buffer.

Physical Record Processing:

After the input device has been read, the DCW string is adjusted for the correct record length. Writing to the output device from the input buffer is by means of the WRITE routine.

Utility cannot copy or dump checkpoints. This is because GEFRC bypasses them and Utility never sees them.

End-of-File Processing (both logical and physical)

If the EOF is not 178, the file mark is transferred to the output device by Call WEF. If it is a standard 178 end-of-file-mark, the output device is closed. A 238 filemark is standard on 9-track tape (rather than 178).

COMPARE

Record sizes are compared, and if they agree, a word-by-word comparison is made. If an end-of-file-mark is encountered on one device and not another, the other device is read (without comparison) until a similar end-of-file occurs. Then, comparison continues. When 50 (or $n + 1$ as specified in a CMPERR QUTIL parameter) compare errors are encountered, the Utility activity is terminated on a fatal error. Also, even if the upper limit of compare errors is not reached, the existence of one or more compare errors at the completion of the compare function causes a termination of the Utility activity on a fatal error.

SKIP

The first parameter refers to the first file code; the second parameter refers to the second. The device is read until the file/record count (as given in the \$ FUTIL card SKIP parameters) is exhausted or a partial label is encountered.

DUMP

Information on the device is written out in both octal and BCD formats to P*.

DDUMP

Information on the device is written out only in BCD format to P*.

REWIND

The appropriate device is rewound.

HOLD

The file control block pertaining to that particular file code is not closed at the termination of this \$ FUTIL card's functions.

INDEX

ACTIVITIES	
I/O activities within Utility	10
ASA9	
ASA9	4
ASIS	
ASIS	7
AVAILABLE	
INSUFFICIENT MEMORY AVAILABLE	14
NO FCB AVAILABLE	15
BLOCK	
Block Size: Logical record processing	3
Block Serial Numbers	4
BUFFERS	
Number of Buffers: Logical record processing	3
BUFSIZ/N	
BUFSIZ/n	4
CALLING	
CALLING IN UTILITY	9
CAPABILITY	
CAPABILITY	2
Utility's random file SKIP/DUMP capability	12
CARDS	
UTILITY CONTROL CARDS	3
TOO MANY FFILE CARDS	15
CARD	
\$ FFILE card	4
\$ FFILE card	5
\$ FUTIL card	5
\$ QUTIL card	7
\$ QUTIL card	8
\$ FUTIL card	8
CONTROL CARD ERROR	14
CMPERR/N	
CMPERR/n	7
COMPARE	

CPB-1422A

Printout in Compare Function	16
COMPARE	19
COMPARISON	
U2 - Comparison errors	14
COMPLETED	
Function Completed Messages	16
COMP	
COMP	2
COMP ERROR COUNT xxxxxx	15
COMP ERROR COUNT xxxxxx	16
COMP/M/	
COMP/M/	6
CONTROL	
UTILITY CONTROL CARDS	3
U1 - Control deck errors	14
CONTROL CARD ERROR	14
COPY	
COPY	2
COPY routine	10
copy physically	11
COPY function	16
Printout in COPY Function	18
COPY	19
COPY/M/	
COPY/M/	6
COUNT	
COMP ERROR COUNT xxxxxx	15
NONRECOV. PARITY ERROR COUNT EXCEEDED	15
COMP ERROR COUNT xxxxxx	16
DATA	
Noncomparison of Data Records	17
DECK	
DECK SETUP	10
U1 - Control deck errors	14
DENSITY	
Density	4
mixed mode, mixed density magnetic tape files	5
UNABLE TO READ IN ANY MODE OR DENSITY	15
DUMP	
DUMP	2

CPB-1422A

Printout in DUMP Function	17
DUMP	20
DUMP/M,N/ DUMP/M,N/	6
END-OF-FILE	
Noncomparison of End-of-File Marks	17
End-of-File Processing	19
EOF/ALL	
EOF/ALL	7
ERROR	
Fatal Error Messages	14
CONTROL CARD ERROR	14
COMP ERROR COUNT xxxxxx	15
NONRECOV. PARITY ERROR COUNT EXCEEDED	15
COMP ERROR COUNT xxxxxx	16
ERRORS	
U1 - Control deck errors	14
U2 - Comparison errors	14
U3 - Hardware errors	14
EXCEEDED	
PRINT LINES EXCEEDED	15
NONRECOV. PARITY ERROR COUNT EXCEEDED	15
FATAL	
Fatal Error Messages	14
FCB	
NO FCB AVAILABLE	15
FFILE	
\$ FFILE card	4
\$ FFILE card	5
TOO MANY FFILE CARDS	15
FILECODE	
RWD(or REW)/filecode 1 filecode 2/	6
HOLD/filecode 1,filecode 2/	6
FILES	
mixed mode, mixed density magnetic tape files	5
FILE	
U* file	9
U* file	10
Utility's random file SKIP/DUMP capability	12
ILLEGAL FUNCTION FOR RANDOM FILE	14

LOST FILE CODE	15
FIXLNG/N	
FIXLNG/n	4
FORM	
Record Form: Variable-length records	4
FUNCTIONS	
UTILITY FUNCTIONS	6
FUNCTION	
HOLD function	12
ILLEGAL FUNCTION FOR RANDOM FILE	14
Function Completed Messages	16
SKIP function	16
COPY function	16
Printout in Compare Function	16
Printout in DUMP Function	17
Printout in COPY Function	18
FUTIL	
\$ FUTIL card	5
\$ FUTIL card	8
GEFRC	
Labels: Standard GEFRC labels	4
GET	
GET routine	10
HARDWARE	
U3 - Hardware errors	14
HOLD	
HOLD	2
Hold option	10
HOLD function	12
HOLD	20
HOLD/FILECODE	
HOLD/filecode 1,filecode 2/	6
IGNORE/N	
USE/n or IGNORE/n	8
ILLEGAL	
ILLEGAL FUNCTION FOR RANDOM FILE	14
ILLEGAL PARAMETER XXXXXX	14
INPUT	
processing of magnetic tape input	5

CPB-1422A

INSUFFICIENT		
INSUFFICIENT MEMORY AVAILABLE		14
I/O		
I/O activities within Utility		10
LABEL		
partial label		11
LABELS		
Labels: Standard GEFRC labels		4
LARGER		
record larger in size than 4096 words		5
LINES		
PRINT LINES EXCEEDED		15
LINE/N		
LINE/n		7
LODENS		
LODENS		4
LOGICAL		
Block Size: Logical record processing		3
Number of Buffers: Logical record processing		3
Logical records		10
Logical Record Processing		19
LOST		
LOST FILE CODE		15
MAGNETIC		
processing of magnetic tape input		5
mixed mode, mixed density magnetic tape files		5
MANY		
TOO MANY FFILE CARDS		15
MARKS		
Noncomparison of End-of-File Marks		17
MEMORY		
INSUFFICIENT MEMORY AVAILABLE		14
MESSAGE		
message to P*		14
MESSAGES		
UTILITY MESSAGES		13

CPB-1422A

Fatal Error Messages	14
Function Completed Messages	16
messages are sent to P*	16
MIXED	
mixed mode, mixed density magnetic tape files	5
MLTFIL	
MLTFIL	5
MODBCD	
MODBCD	4
MODE	
Mode	4
Mode of Processing	4
UNABLE TO READ IN ANY MODE OR DENSITY	15
MODE,	
mixed mode, mixed density magnetic tape files	5
NBYPSS	
NBYPSS	7
NDATE	
NDATE	5
NO	
NO FCB AVAILABLE	15
NONCOMPARISON	
Noncomparison of Data Records	17
Noncomparison of End-of-File Marks	17
NONRECOV.	
NONRECOV. PARITY ERROR COUNT EXCEEDED	15
NONSTANDARD	
NONSTANDARD OPTIONS	4
NOSRLS	
NOSRLS	4
NSTDLB	
NSTDLB	4
NUMBERS	
Block Serial Numbers	4
NUMBER	
Number of Buffers: Logical record processing	3

CPB-1422A

OPTIONS		
STANDARD OPTIONS		3
NONSTANDARD OPTIONS		4
OPTION		
Hold option		10
OUTPUT		
printer output is sent to P*		13
UNABLE TO WRITE OUTPUT		15
PARAMETER		
ILLEGAL PARAMETER XXXXXX		14
PARITY		
NONRECOV. PARITY ERROR COUNT EXCEEDED		15
PARTIAL		
partial label		11
PERIOD		
Retention Period		4
PHYREC		
PHYREC		5
PHYSICAL RECORD PROCESSING (PHYREC)		5
PHYSICALLY		
copy physically		11
PHYSICAL		
PHYSICAL RECORD PROCESSING (PHYREC)		5
Physical records		10
Physical Record Size		13
Physical Record Processing		19
PRINT		
PRINT LINES EXCEEDED		15
PRINTER		
printer output is sent to P*		13
PRINTOUT		
Printout in Compare Function		16
Printout in DUMP Function		17
Printout in COPY Function		18
PROCESSING		
Block Size: Logical record processing		3
Number of Buffers: Logical record processing		3
Mode of Processing		4

PHYSICAL RECORD PROCESSING (PHYREC)	5
processing of magnetic tape input	5
Logical Record Processing	19
Physical Record Processing	19
End-of-File Processing	19
P*	
printer output is sent to P*	13
message to P*	14
messages are sent to P*	16
QUTIL	
\$ QUTIL card	7
\$ QUTIL card	8
RANDOM	
Utility's random file SKIP/DUMP capability	12
ILLEGAL FUNCTION FOR RANDOM FILE	14
RANDOM/N	
RANDOM/n	5
READ	
UNABLE TO READ IN ANY MODE OR DENSITY	15
RECORD	
Block Size: Logical record processing	3
Number of Buffers: Logical record processing	3
Record Form: Variable-length records	4
PHYSICAL RECORD PROCESSING (PHYREC)	5
record larger in size than 4096 words	5
record sizes	13
Physical Record Size	13
Logical Record Processing	19
Physical Record Processing	19
RECORDS	
Record Form: Variable-length records	4
Logical records	10
Physical records	10
Noncomparison of Data Records	17
REQUEST	
request extra storage	9
REQUIREMENTS	
UTILITY STORAGE REQUIREMENTS	13
RETENTION	
Retention Period	4
RETPER/N	

CPB-1422A

RETPER/n	5
REWIND	
Rewind	2
REWIND	20
REW/FILECODE	
RWD(or REW)/filecode 1 filecode 2/	6
ROUTINE	
GET routine	10
COPY routine	10
RWDOR	
RWD(or REW)/filecode 1 filecode 2/	6
SENT	
printer output is sent to P*	13
messages are sent to P*	16
SERIAL	
Block Serial Numbers	4
SETUP	
DECK SETUP	10
SIZE	
record larger in size than 4096 words	5
Physical Record Size	13
SIZES	
record sizes	13
SIZE:	
Block Size: Logical record processing	3
SKIP	
Skip	2
SKIP function	16
SKIP	20
SKIP/DUMP	
Utility's random file SKIP/DUMP capability	12
SKIP/M,N/	
SKIP/M,N/	6
STANDARD	
STANDARD OPTIONS	3
Labels: Standard GEFRC labels	4
STORAGE	

request extra storage	9
UTILITY STORAGE REQUIREMENTS	13
STRUCTURE	
UTILITY STRUCTURE	10
TAPE	
processing of magnetic tape input	5
mixed mode, mixed density magnetic tape	5
TERM	
TERM	7
TOO	
TOO MANY FFILE CARDS	15
U1	
U1 - Control deck errors	14
U2	
U2 - Comparison errors	14
U3	
U3 - Hardware errors	14
UNABLE	
UNABLE TO READ IN ANY MODE OR DENSITY	15
UNABLE TO WRITE OUTPUT	15
USE/N	
USE/n or IGNORE/n	8
UTILITY	
UTILITY CONTROL CARDS	3
UTILITY FUNCTIONS	6
CALLING IN UTILITY	9
UTILITY STRUCTURE	10
I/O activities within Utility	10
UTILITY STORAGE REQUIREMENTS	13
UTILITY MESSAGES	13
UTILITY'S	
Utility's random file SKIP/DUMP capability	12
U*	
U* file	9
U* file	10
VARIABLE-LENGTH	
Record Form: Variable-length records	4
WITHIN	

CPB-1422A

I/O activities within Utility	10
WORDS	
record larger in size than 4096 words	5
WRITE	
UNABLE TO WRITE OUTPUT	15
\$	
\$ FFILE card	4
\$ FFILE card	5
\$ FUTIL card	5
\$ QUTIL card	7
\$ QUTIL card	8
\$ FUTIL card	8

DOCUMENT REVIEW SHEET

TITLE: GE-625/635 Utility

CPB #: 1422A

FROM:

Name: _____

Position: _____

Address: _____

Comments concerning this publication are solicited for use in improving future editions. Please provide any recommended additions, deletions, corrections, or other information you deem necessary for improving this manual. The following space is provided for your comments.

COMMENTS: _____

Please cut along this line

NO POSTAGE NECESSARY IF MAILED IN U.S.A.
Fold on two lines shown on reverse
side, staple, and mail.

STAPLE

STAPLE

FOLD

FIRST CLASS
PERMIT, No. 4332
PHOENIX, ARIZONA

BUSINESS REPLY MAIL

NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

POSTAGE WILL BE PAID BY

GENERAL ELECTRIC COMPANY
COMPUTER EQUIPMENT DEPARTMENT
13430 NORTH BLACK CANYON HIGHWAY
PHOENIX, ARIZONA - 85029



ATTENTION: DOCUMENTATION STANDARDS AND PUBLICATIONS B-90

FOLD

Progress Is Our Most Important Product

GENERAL  ELECTRIC

INFORMATION SYSTEMS DIVISION