HP 19665A
2000/F to 2000 Access System

Upgrade Kit and Conversion Program

HEWLETT hp PACKARD

LIST OF EFFECTIVE PAGES

The List of Effective Pages gives the most recent date on which the technical material on any given page was altered. If a page is simply re-arranged due to a technical change on a previous page, it is not listed as a changed page. Within the manual, changes are marked with a vertical bar in the margin.

PRINTING HISTORY

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This manual consists of two sections. Section I describes the contents of the HP 19665A 2000/F to 2000 Access Upgrade Kit and the installation procedures for the kit. Section II describes the 2000/F to 2000 Access Conversion Program, including the conversion environment, user responsibilities, HP responsibilities, program availability, and operating instructions. It also discusses the Access system file conversion program named CONVERT and related file status (security) considerations.

CONTENTS

The HP 19665A Upgrade Kit is designed to provide the necessary hardware, firmware, and system software to upgrade 2000/F Timeshared Data Systems to 2000 Access Systems.

KIT CONTENTS

Table 1-1 indicates the software/firmware contents of the standard kit and options 013, 023, and 100. Table 1-2 indicates the hardware components for upgrade kit options 256 and 257.

Table 1-1. 19665A Software/Firmware Components

Upgrade Kit Product/Option	Processor	Tape Density	Software/Firmware Product/Option
19665A	21MX	800 BPI	22687A
19665A-013	2100	800 BPI	22687A-013
19665A-023	2100	1600 BPI	22687A-023
19665A-100	21MX	1600 BPI	22687A-100

Table 1-2. Upgrade Kit Optional Hardware Components

Kit Option No.	Quantity	Component Model Number	Description
256	1	12885A-002	8K Memory Module (2100)
	1	12885A-003	8K Memory Module (2100)
	1	12895A	Direct Memory Access
257	1	12885A-002	8K Memory Module (2100)
	1	12885A-003	8K Memory Module (2100)
	1	12885A-004	8K Memory Module (2100)
	1	12895A	Direct Memory Access

INSTALLATION PROCEDURE

1. Prior to installing the hardware, firmware and software, the 2000/F system libraries should be backed-up to magnetic tape using the HIBernate command, following procedures in the *Timeshared BASIC/ 2000, Level F System Operator's Manual* (02000-90074). Note also the information under "Customer Responsibilities" in Section II.

2. Turn off the system power.

3. Install and test the 2000 Access Communications Processor Firmware provided with the 22687A operating system. For 2100 computers the firmware product number is HP 13206A. For 21MX computers the firmware product number is HP 13207A. Installation procedures are described in 13206-90001 or 13207-90001, respectively.

4. Install and test the hardware in options 256 and 257 using procedures described in the appropriate component reference manuals. The memory modules and DMA (options 256 and 257) are installed in the communications processor.

5. Turn off system power and remove all four interface boards contained in the HP 12875B Processor Interconnect Kit. Using diagrams contained in 12875-90015, move the jumper W9 from the "A" position to the "B" position on each board.

6. Reinstall the 12875B Kit and restore system power.

7. Generate the 2000 Access system following procedures described in the *HP 2000 Access Operator's Manual* (22687-90005).

8. Return the operation of the system to the control of the customer.

This program (part number 19665-10001 or 19665-11001) converts only the BASIC programs stored on a HIBernate, SLEep or DUMp tape produced by a 2000/F System (HP 20854A software) into a selective LOAd magnetic tape set for a 2000 Access System (HP 22687A software). Magnetic tapes from 2000C and 2000C (High Speed) systems may also be converted to 2000 Access format. User data files contained on the HIBernate, SLEep or DUMp tape must be converted and loaded directly on the Access system (refer to paragraph 21 of "Customer Responsibilities" in this section).

CONVERSION ENVIRONMENT

This program runs in a HP 3000 System environment with a requirement for <u>two</u> magnetic tape drives. The input to the program consists of one or more reels of magnetic tape that constitute a conversion set for the 2000/F System. This set of tapes may be either 9 track/800 BPI or 9 track/1600 BPI. The HP 3000 System utilized for the conversion must have at least one tape drive of the same density (800 or 1600 BPI) as the conversion set. The second drive may be of either density. If mixed density drives are used, the conversion operator can use FCOPY/3000 to copy the output tape to the density required by the magnetic tape drive on the 2000 Access System.

CUSTOMER RESPONSIBILITIES

1. Program and File Names:

   The 2000 Access System allows only alphabetic (A-Z) and numeric (0-9) characters in program and file names. If 2000/F program or file names contain special characters (such as %,#,&, etc.) they must be changed to legal names. The user should change these names on the 2000/F before producing the conversion mag tape set, or may elect to wait until the conversion process. The conversion program allows the user to either have invalid names automatically re-named or require that invalid names be re-named by the operator. Automatic operation replaces any invalid character in a name with the character 'Z'. Under manual operation the program prompts the conversion operator for a new name upon each occurrence of an illegal name. In order for manual name changes to be made when the conversion program is run, the user is responsible for providing an annotated (with new names) directory listing to HP along with the conversion mag tape set. Note that the conversion program does <u>not</u> provide any means of changing program names referenced by CHAIN statements or of changing file names referenced in FILES statements or ASSIGN statements within user BASIC programs. These names may be changed on the 2000/F prior to conversion or after conversion on the 2000 Access System. The $ or * may continue to be used in 2000 Access as a prefix to file and program names in FILES, ASSIGN, and CHAIN statements.

2. Control characters in BASIC statements:

   2000/F programs allowed control over the carriage return function and line feed function when PRINTing output to the user terminal by use of control characters in the output string. Control (alpha letter) O (O^C) produced a carriage return and Control N (N^C) produced a line feed on the terminal. The conversion program changes the O^C into the "carriage return" ASCII character and the N^C into a "line feed" ASCII character within any quoted string (string literal) contained in a BASIC program. For example: 50 PRINT "HELLO THERE$O^C N^C$" would have the last two characters changed to "carriage return" and "line feed", which are non-printing ASCII characters. If the intent of the programmer of the 2000/F program was to use O^C or N^C for purposes <u>other</u> than for producing a "carriage return" or "line feed", (for example: in a string comparison), then it is the responsibility of the user to change these BASIC statements back to the intended syntax.

3. Control characters in data files:

   Control O and Control N characters contained within user data files are not changed in any manner. Any changes required by usage of O^c and N^c within data files are the responsibility of the user to change to the ASCII characters "carriage return" ('13) and "line feed" ('10) if he intends to have the appropriate functions performed when the string contained in the file is printed on the user terminal.

4. CSAVEd programs:

   Any user programs contained on the magnetic tape that are CSAVEd (instead of SAVEd) will be converted to SAVE status. After conversion and loading on the 2000 Access System, the user is responsible for CSAVing each of his programs that he wishes in that status.

5. Security status of programs and files:

   The security status of programs and files is converted as indicated in Table 2-1. After conversion and loading on 2000 Access, it is the users' responsibility to insure that the security status of the programs and files is in accordance with their needs.

Table 2-1. Conversion Security Status for Programs and Files

ACCOUNT TYPE	CATEGORY	2000/F STATUS	2000 Access STATUS
Group Master (including A000)	programs	unprotected	UNRestricted
	programs	protected	PROtected
	files	unprotected	PROtected
	files	protected	PRIvate
All non-Group Master Accounts (Lxyy where yy ≠ 00)	programs	unprotected	PRIvate
	programs	protected (can't exist)	PROtected
	files	unprotected	LOCked
	files	protected (can't exist)	PRIvate

6. ASSIGN statement return flag:

   On the 2000/F, a return flag of "1" from an ASSIGN statement could, under some circumstances, mean that read/write access had been granted (this would occur when the statement was executed by a semiprivileged user (Axxx accounts) who tried to assign a file that was already in use). On the 2000 Access system, however, a return flag of "1" from ASSIGN never means that write access is granted. It is the users' responsibility to review and revise any programs which may have taken advantage of this 2000/F capability. ASSIGN can be used with the "RR" restriction to establish whether other users are currently using the file.

7. Multiple Write Access (MWA):

Programs which were designed to provide simultaneous multiple write access to files in 2000/F semiprivileged accounts (Axxx) may not execute properly unless the owner's account is given the MWA capability on 2000 Access and the individual data file is given MWA status by its owner after loading on 2000 Access. Axxx series accounts are not automatically multiple write access in the 2000 Access System.

8. Destruction of COMmon:

2000/F programs which were designed to take advantage of the non-destruction of COMmon upon termination (other than CHAIN) will no longer properly execute after conversion. This capability has been removed in 2000 Access to prevent serious violations of system security. User redesign will be necessary for these programs. One approach is to write COMmon variables to a scratch disc file before program termination.

9. New return flags for ENTER:

2000 Access provides two new return flag values for the ENTER statement (-257 and -258). 2000/F programs which use negative return values should be reviewed to insure that the old logical checks still perform in accordance with the original design intent.

10. Line printer access:

The method of program access to the line printer is substantially different in 2000 Access. While the LPR command followed by a RUN or LIST command is directly simulated by RUN*OUT= filename* and LIST*OUT=filename*, the 2000/F use of Control Q and Control W from the terminal or Control L from a PRINT statement no longer has any effect on line printer operation. User procedures and programs which used Control Q, W, and L in this manner will require redesign.

The line printer is supported on the 2000 Access System in the same manner as any other device used through the ASCII file system. Access to the line printer is provided in two ways. Both require an ASCII file name equivalence for the device be established in the user's library: for example: FILE-SAM, LP. The line printer may then be declared in a FILES statement (or with an ASSIGN) and a PRINT statement may write to it as follows: 100 FILES *, SAM; 200 PRINT #2; A$. In the second mode, the RUN *OUT=SAM* construct allows all normal terminal output to be directed to the line printer. Error messages still print to the terminal. In the RUN*OUT=filename* approach, interaction with the user terminal is not available (Control Q and Control W have no effect). In the 2000 Access System, control of the line printer is achieved by the execution of the RUN*OUT=filename*, by the ASSIGN statement, or by the execution of the FILES statement. It is released when the file is closed (de-ASSIGNed), upon program termination, or CHAIN.

11. Corrections to subscripted string processing:

If a 2000/F program has a doubly subscripted source string on the right hand side of an assignment statement, the 2000/F did not pad the source string if the subscripts referred to more characters than were physically in the string. HP's documentation did indicate the padding would be performed (as it was for all other uses of doubly subscripted strings), however the system did not perform these functions. This error has been corrected in 2000 Access and therefore the user may need to review and revise programs which did not conform to the printed language specifications.

2-3

On the 2000/F system, the construction A$ (subscript, subscript-1), legally defined a null string. This construct would work in all cases except when the first subscript was "1" i.e., A$(1,0) was illegal because any subscript of zero was illegal. On the 2000 Access System, the second subscript of a doubly subscripted string may be zero if and only if the first subscript is "1" (i.e., A$(1,0) is now legal, but A$(2,0) is not).

12. Program length:

The user workspace on the 2000 Access System is slightly larger than on the 2000/F. The LEN function now requires an additional word for its internal representation. It is possible that a program with a large number of LEN functions may be larger than the available workspace. The PRINT USING statement will normally use slightly less space, and the GOSUB statement will use slightly more space than on the 2000/F.

13. Program input from paper tape:

Programs being input via paper tape from a user terminal now require the X-OFF character preceeding the carriage return. The terminal or peripheral device must be capable of using the X-OFF and X-ON control characters. The PUNCH command on the 2000 Access System includes the X-OFF character. It is identical to the 2000/F XPUNCH command. 2000/F programs on paper tape that the user desires to use on 2000 Access should be repunched on the 2000/F using the XPUNCH command before converting to 2000 Access.

14. Output buffering of terminals:

The 2000/F system had one buffer for each port, which was a wrap around buffer. The multiplexer started outputting characters to the terminal as soon as received from the system processor. The 2000 Access System uses two buffers for each port. The output data is placed in one buffer. The system directs the IOP to initiate the transmission of data to the terminal when the buffer is _full_, when the user is suspended (swapped), or before execution of an INPUT, LINPUT, or ENTER statement. The effect of this internal change may be to delay the start of printing to the terminal, and may produce a noticeable grouping of print characters when using high speed terminals. In certain applications (such as controlling specialized terminal devices) the user's application program may have to force the PRINT by executing an ENTER statement if only a few characters are being output.

15. New home for HELLO program:

The HELLO program on 2000 Access resides in account A000. On the 2000/F, it was in account Z999. The conversion program will not move the HELLO program from account Z999 to A000.

16. Writing file buffers:

On the 2000/F, the break key or a fatal error terminates program execution, but does not write out dirty file buffers (a dirty file buffer is a buffer that has been written to internally by a program but has not yet been written to the device associated with the buffer). On the 2000 Access System the break key still does not write dirty buffers, but fatal program errors _do_ cause data to be written before termination. The 2000/F uses Control C to break a program awaiting terminal input, and it does write dirty file buffers. The 2000 Access System uses the break key to terminate during input, and does _not_ write dirty buffers. The BRK(X) function should be used to preserve the integrity of data by disallowing "break" when critical file updating functions are performed.

17. End of File (EOF) and End of Record (EOR) considerations:

   The TYP function of 2000C' and 2000/F systems returned a value of 3 (EOF mark) when it read an EOR mark in the last record of a BASIC formatted file. This value was returned whether or not the user asked for EOR and EOF marks. The TYP function of the 2000 Access system returns a value of 4 (EOR mark) when positioned at an EOR mark in the last record of a BASIC formatted file and the user has asked that EOR marks be returned. (On current versions of 2000/E and 2000/F systems, the TYP functions operates the same as the Access system TYP function.)

18. Creation of the conversion mag tape set:

   After the user has reviewed and revised (if necessary) any programs and files on the 2000/F System, a HIBernate of the system to magnetic tape should be performed. This conversion tape should be given to the local HP representative in accordance with the schedule for conversion agreed to by HP and the user.

19. Creation of new account structure on 2000 Access:

   After HP has reconfigured the user's hardware and generated the new 2000 Access System, the user is responsible for creating all idcodes to be used on the new system.

20. Loading the conversion mag tape set:

   HP will return the converted BASIC programs to the user. The user is responsible for loading the conversion mag tape into the 2000 Access System and completing any program modifications necessary for proper operation. Loading is accomplished by doing a selective load of all programs to be used on the new system.

21. File Conversion considerations:

   User data file conversions and loading must be accomplished directly onto the 2000 Access system using the CONVERT utility supplied on the Access System Master Configurator Program (MCP) tape. This utility allows the operator to restore 2000/F and 2000C' files onto a slept 2000 Access system or to dump 2000 Access BASIC formatted files onto magnetic tape in 2000/F dump format.

   The CONVERT program resides on the MCP tape in four versions (one for each possible loader option). The program may be invoked by answering CONVERT to the LOAD WHICH MODULE? message and answering YES to one of the disc options messages (refer to the *2000 Access System Operator's Manual*, part number 22687-90005). The entire CONVERT operating procedure is presented in Appendix F of the Operator's Manual. However, we repeat it here for your convenience.

   - Load the master program using procedures as described in the SYSTEM STARTUP/RESTART section under the heading "Master Program Loading" (in the Operator's Manual).

   - Respond CONVERT (can be shortened to CONV) to the LOAD WHICH MODULE? message. After the module is loaded from the magnetic tape an introductory message 2000/ACCESS FILE CONVERSION PROGRAM is printed.

   - Answer affirmatively to one of the disc option messages 7905 OR 7905/7900 OPTION?, 7905/2883?, 7900? or 2883? The appropriate version is now loaded from tape.

   - The file conversion program will print "F" RESTORE OR DUMP COMMANDS?. Respond with NO or a carriage return if you want to terminate the program. Otherwise, enter RESTORE or DUMP. The two commands are equivalent to the ones in the loader and are discussed in detail in Sections IV & VII of the Access system Operator's Manual.

21. Continued.

- The message ENTER NAME LIST, ONE PER LINE; TERMINATE WITH 'END' is printed. The required response is the same as for the loader with the following RESTORE exceptions:

  a. A legal 2000/F, 2000C' name which is an illegal 2000/Access name may be entered but a legal 2000/Access name will be requested before the entry is loaded, if found on the tape.

  b. The message *id name* ILLEGAL NAME, ENTER ALTERNATE NAME is printed whenever an entry to be loaded has an illegal 2000/Access name. The response should be a legal 2000/Access name which does not already exist on the system.

- When the RESTORE or DUMP completes, the conversion program prints "F" RESTORE OR DUMP COMMANDS?. Respond accordingly if you desire to continue to RESTORE or DUMP. If you are done, respond with NO or just a carriage return. The conversion program will print END OF PROGRAM before terminating with a HALT (102077_8).

- The system is now in the same state it would be in after a system sleep.

RESTORE Example:

```
MAG TAPE SELECT CODE? 17
2754? NO
PATCH TAPE? NO
LOAD WHICH MODULE? CONVERT
2000/ACCESS FILE CONVERSION PROGRAM

7905 OR 7905/7900 OPTION? NO
7905/2883? N
7900? Y
"F" RESTORE OR DUMP COMMANDS? RESTORE
ENTER NAME LIST, ONE PER LINE; TERMINATE WITH 'END'
A000
A001
B000,B-INPO
B000,B-INUO
B000,BPRUTO
B001
C000
NO SUCH ID
END
MOUNT REEL NUMBER 1. PRESS RETURN
B000 B-INPO ILLEGAL NAME
ENTER ALTERNATE NAME
BXINPO

BOO B-INUO ILLEGAL NAME
ENTER ALTERNATE NAME
EXINUO

"F" RESTORE OR DUMP COMMANDS?    return
END OF PROGRAM
```

In converting files between 2000 Access and 2000/F, CONVERT assigns file security status as indicated in tables 2-2 and 2-3.

21. Continued.

Table 2-2. File Security After RESTORE From 2000/F File

ACCOUNT TYPE	2000/F	⟶ 2000 Access
GROUP MASTERS (Including A000)	unprotected protected	protected locked
PRIVATE USERS (All account ID's *not* ending in 00)	unprotected protected	locked can't exist

Table 2-3. File Security After DUMP From 2000 Access

ACCOUNT TYPE	2000 Access	⟶ 2000/F
GROUP MASTERS (Including A000)	unrestricted protected	} unprotected
	locked private	} protected
PRIVATE USERS (All account ID's not ending in 00)	unrestricted protected locked private	} unprotected

22. Use of HP 7260A Optical Mark Reader for program loading:

On 2000/F systems, a program could be entered in TAPE mode using the HP 7260A Optical Mark Reader in continuous pick mode. For proper operation on an Access system, the user must order Option G40 for his reader. Without this option, programs cannot be loaded using the 7260A.

HP RESPONSIBILITIES

1. HP will perform the physical conversion of the magnetic tape to 2000 Access System format as outlined above and return the tape to the user for loading by the user on the 2000 Access System after the hardware has been reconfigured and the new operating system has been generated by HP representatives. HP will turn over operation of the system to the user after the reconfiguration and generation in order for the user to complete his responsibilities as outlined above.

2. HP assumes no further responsibility for program conversion other than for the physical conversion process. The user is fully responsible for the proper operation of the BASIC programs he has provided for physical conversion by HP.

CONVERSION PROGRAM AVAILABILITY

Magnetic tape versions of the conversion program are available in two tape densities for use on HP 3000 systems. The part number for 9 track/800 CPI tape is 19665-10001. The 9 track/1600 CPI tape is 19665-11001. Either part may be ordered from the HP Customer Service Center. The conversion program must be separately ordered, as it is not included in the 19665A Upgrade Kit when shipped to the customer.

CONVERSION PROGRAM OPERATING INSTRUCTIONS

The 2000/F to 2000 Access Conversion Program is supplied on an HP 3000 STORE tape under the account FIELD.SUPPORT,PUB. After RESTOREing the program file, the conversion operator RUNs the program FCONVERT from a session. The only output produced by the program (besides the 2000 Access LOAD tape) is a list of ID codes and program/file names converted. The only operator interaction required is to select automatic or manual re-naming of invalid 2000/F file and program names. (If manual operation is selected the operator is requested to re-name invalid 2000/F file and program names.) For this reason, the program must be run from a session.

Example:

```
:  HELLO FIELD.SUPPORT, PUB

. . .

: FILE CONTAPE; DEV=TAPE

: RESTORE  CONTAPE (SYSTEM OPERATOR MOUNTS SUPPLIED TAPE)

. . .

: RUN FCONVERT (SYSTEM OPERATOR IS ASKED FOR 'FTAPE' (2000/F MAG TAPE)
                AND 'GTAPE' (NEW TAPE TO BE CREATED)).

DO YOU WANT INVALID NAMES AUTOMATICALLY RENAMED? NO   (REPLY YES IF SUBSTITUTION
                                                       OF THE LETTER 'Z' IS
                                                       SUFFICIENT FOR YOUR
                                                       PURPOSES.)
A000 FCOPY

     GRUNT

     GRUPPL

A001 DE-IOR

DE-IOR IS AN INVALID HP 2000 ACCESS SYSTEM NAME.

ENTER ALTERNATE NAME: DEIOR

     FRUMP

     HARBIG

     . . .

Z999 HELLO

END OF PROGRAM
```

Note: If automatic operation had been requested the interaction would have been
```
              :
              :
          GRUPPL
   A001 DE-IOR
   DE-IOR IS AN INVALID HP 2000 ACCESS SYSTEM NAME.
   RENAMED DEZIOR
          FRUMP
              :
              :
```

If the output tape requires copying to a different density tape, use FCOPY/3000. To use FCOPY/3000 to copy tape 1 (the output tape) to tape 2 (new density output tape), proceed as follows:

1. `:FILE TAPE1;DEV=TAPE;REC=1036,1,U`
   `:FILE TAPE2;DEV=TAPE;REC=1036,1,U`

2. `:RUN FCOPY.PUB.SYS`
   .
   .
   `>FROM=*TAPE1;TO=*TAPE2`

3. When done, FCOPY prints:

   AN UNLABELED TAPE OPERATION ENDS WITH AN ERROR

   It then prints an MPE/3000 "tombstone." This indicates normal completion of the task.

4. `>EXIT`
   .
   .

5. Back to MPE.

READER COMMENT SHEET

19665-90001   MAY 1976

HP 19665A
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We welcome your evaluation of this manual. Your comments and suggestions help us improve our publications. Please use additional pages if necessary.

Is this manual technically accurate?

Is this manual complete?

Is this manual easy to read and use?

Other comments?

_____

FROM:

Name   _____

Company   _____

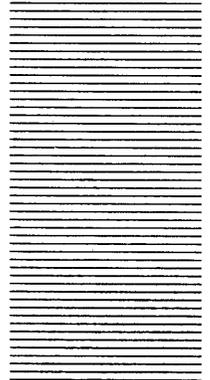Address   _____

            _____

            _____