2000E
TIME-SHARED BASIC SYSTEM
OPERATOR'S GUIDE
This guide describes the Hewlett-Packard 2000E Time-shared BASIC system, explains system commands used by the operator, and presents system operating procedures.

Section I introduces the system hardware.

Section II, “TSB System Operation,” explains system organization and operation, system communication and how to restart the system after power failure.

The system commands are described in section III.

Section IV describes how to load the system from paper tape and disc. Magnetic tape loading is described in Appendix B, “Utility Program.”

The appendices show system error messages (Appendix A) and describe the 2000E Utility program (Appendix B). The appendices are followed by a glossary of terms and an index.
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TIME-SHARED BASIC SYSTEM

The HP 2000E Time-shared BASIC (TSB) system consists of a 2100A Computer, a disc mass storage device, an operator’s console, a paper tape photoreader, a multiplexer, and a software program to supervise the system. As many as 16 user terminals may be used with the system. Figure 1-1 shows the logical organization of the system.

Figure 1-1. HP 2000E TSB System Organization
Hardware Requirements

The system computer is an HP 2100A with the following features:

- 16K words of main memory
- Direct memory access
- Time base generator
- HP 2100A asynchronous channel multiplexer
- Floating-point hardware
- Telephone autodisconnect (for 16 lines)

In addition, the following peripheral equipment is required:

- Paper tape photoreader
- HP 7900A disc memory
- ASR-35 (or ASR-33) teleprinter operator’s console
- Up to 16 user terminals with data set compatibility modifications

Hardware Configuration

The HP 2000E TSB system is configured as follows:

<table>
<thead>
<tr>
<th>I/O Channel</th>
<th>Device</th>
</tr>
</thead>
<tbody>
<tr>
<td>10_s</td>
<td>Time base generator</td>
</tr>
<tr>
<td>11–12_s</td>
<td>HP 7900A disc interface</td>
</tr>
<tr>
<td>13_s</td>
<td>Operator’s console</td>
</tr>
<tr>
<td>14_s</td>
<td>Paper tape photoreader</td>
</tr>
<tr>
<td>15–16_s</td>
<td>Multiplexer</td>
</tr>
<tr>
<td>17_s</td>
<td>Phones control</td>
</tr>
</tbody>
</table>

Hardware Options

The 2000E system Utility program allows the addition of the following equipment:

- One HP 7970A magnetic tape unit
- One additional HP 7900A or HP 7901A disc drive
SECTION II

TSB System Operation

SYSTEM ORGANIZATION

The TSB system software supervises the operation of the computer, operator's console, mass storage device, photoreader, and the multiplexer. In normal operating mode, the system does not require operator supervision. After the operator has brought the system to its normal operating condition, the system recognizes properly identified users, acknowledges legitimate requests, and permits controlled user access to two levels of mass storage libraries. Messages showing user logging activity are printed at the operator's console.

System Computer

The system computer controls the execution of user programs, operation of the mass storage device, and communication between the system and users through the multiplexer.

Mass Storage

The moving-head storage device (disc) is used for both system storage and user programs and files. One device is required for the basic system. Optionally, one more disc device may be added (HP 7900A or HP 7901A).

SYSTEM OPERATOR

The system operator is responsible for loading and initializing the TSB system and for periodic shutdown and startup procedures.

NOTE: For recovery procedures following an emergency shutdown, consult an HP software representative.

Detailed operation of individual system devices is described in the appropriate module of the Software Operating Procedures.

OPERATOR'S CONSOLE

The operator communicates with the TSB system through an HP 2754A or 2754B (ASR-35) teleprinter (optionally an ASR-33 can be used). Using the console, the system operator may enter commands to obtain reports on system status, alter system hardware characteristics, and control user access, access time, disc space, and libraries.
Console Operation

When the TSB system is loaded, the operator's console power switch must be set to ON LINE (Figure 2-1).

![Figure 2-1. Teleprinter Power Switch](image1)

The console mode switch has five positions; only three are enabled: K, T, and KT. During system operation, the mode switch is set to one of these positions (Figure 2-2).

![Figure 2-2. Teleprinter (ASR-35) Mode Switch](image2)

The KT position is the normal setting. In this position, all system messages to the operator are printed at the console; only LOGON and LOGOFF messages are punched on paper tape. When set to K, the teleprinter prints only; it does not punch paper tape. When set to T, the teleprinter both prints and punches all messages.

System Log

A log, indicating all user logging activity, is normally printed and punched at the operator's console. Each LOGON or LOGOFF message includes user idcode, time, and port number.

COMMUNICATIONS

The main communications channel—that between the TSB system and the user—is described in 2000E: A Guide to Time-Shared BASIC (02000-90048).

Communication between the system operator and the users is confined to messages sent by the operator to all users during system shutdown (SLEEP command) or by the ANNOUNCE command, which may be directed to a specific user or to all users at any time. A user command, MESSAGE, permits users to send messages to the system operator.
Communication between the system and the operator is extensive during startup, consisting largely of a dialogue initiated by the system requesting specific information from the operator. During normal operation the operator may request reports from the system; otherwise, the only communication to him from the system are the reports of user logging activity, error messages, and messages from users.

Users

To log on to the 2000E TSB system, each user must enter an idcode and password. The idcode is a single alphabetic character followed by three decimal digits, A000 through Z999. The password may consist of as many as six characters and contain nonprinting characters for privacy. Both idcode and password are assigned to the user by the system operator (see the NEWID command in section III).

PRIVILEGED USER. The user assigned idcode A000 is a privileged user. Programs and files stored in the library by this user become the system library which can be accessed by any other user. Two system commands, PROTECT and UNPROTECT, are available only to idcode A000. These commands are used to control access to the entries in the system library.

SEMIPRIVILEGED USERS. User idcodes beginning with the character A (A001 through A999) are semiprivileged. When users with the same semiprivileged idcode are logged on at more than one terminal, they can alter files simultaneously. Nonprivileged users can only read files simultaneously.

NONPRIVILEGED USERS. All users who are assigned idcodes B000 through Z999 are nonprivileged users.

Libraries

The portion of the system disc (subchannel 0) not devoted to system usage is used for storing a library of programs and files. Each user has access to two levels of libraries—a private library, and a system library.

USER LIBRARY. Any user may save programs and files in a library which is completely under his control. No other user has access to this library without knowledge of the associated idcode and password.

SYSTEM LIBRARY. The user with idcode A000 may save programs and files which are accessible to every user on the system. In addition, two commands, PROTECT and UNPROTECT, are available only to user idcode A000. These commands are entered in the form

\[
\text{PROTECT—name}
\]

and

\[
\text{UNPROTECT—name}
\]

where \text{name} is either a program name or a file name.

Protected programs can be executed (RUN) by any user; they cannot be listed, punched, modified, or saved except by user idcode A000.
Protected files cannot be accessed by any user except A000. If referenced by any other user’s program, an informative message is returned to the user.

When user A000 releases a protected program (references it in an UNPROTECT command), the program then can be listed, punched, modified or saved by any user. Similarly, a protected file referenced in an UNPROTECT command becomes accessible to every user.

POWER FAILURE

The power fail/auto restart feature of the TSB system protects against loss of data in core and registers in the event of a power failure. After a power failure, active users are placed in the idle state (executing programs are terminated).

RESTART/HALT Switch

The RESTART/HALT switch on the power fail/auto restart board must be set to RESTART. If, after a power failure, the switch is found to be set to HALT, the system operator can set it to RESTART with the correct results, if he has not altered the computer front panel switch settings.

CAUTION: DO NOT ALTER THE COMPUTER FRONT PANEL SWITCH SETTINGS at any time during power-down or power-up operations.

Power Failure During System Operation

If power fails or drops below the minimum required voltage during system operation, an orderly system shutdown is initiated automatically. For low line voltage, a halt (1030048) is displayed in the MEMORY DATA register until sufficient power is restored to the system. Otherwise, the panel lights remain off until power is restored.

The auto restart routine is entered when power is restored; the computer remains in a halted condition until proper operating voltage is supplied. The computer resumes normal system operation after all disc drives are ready. The system automatically restarts any mass storage transfers interrupted by the power failure.

Power Failure During Sleep Operation

If the DONE message has been typed at the console, shutdown was completed before the power failure and no operator action is required.

For a disc SLEEP operation, the disc transfer is terminated and the SLEEP command must be re-entered.

If a magnetic tape SLEEP is requested, and the first write operation has taken place, the system should be loaded from disc and the SLEEP command re-entered. If the write operation has not begun, consult an HP software representative for emergency recovery procedures.
The operator controls the system through a set of system commands. When entering these commands, only the first three characters are significant; the remainder are ignored by the system and need not be included. If the command requires or permits entry of parameters, a hyphen must separate the command from the parameters. Parameters within a command are separated by commas; blanks are ignored, except in SLEEP and ANNOUNCE commands. Entry of each command is terminated by a return.

**NOTE:** If bit 0 of the switch register is on, input from the operator’s console is ignored by the system. This feature may be used to prevent unauthorized access to system operations.

If the system cannot interpret a command, three consecutive question marks (???) are printed at the terminal. If command syntax is incorrect, the message ILLEGAL FORMAT is printed.

On the operator's console, the back arrow (←) acts as a character delete key. Typing this key causes the computer to erase the previous character. Each character delete entered erases one previously entered character. For example, the sequence

\[ \text{ABC} \rightarrow \text{DE} \rightarrow \text{F} \]

is equivalent to the sequence

\[ \text{ADF} \]

The character, control X (X©) acts as a line delete key. When X© is entered, the computer erases the line currently being typed, and responds by printing a back slash (\) followed by return and line feed.

All numbers used with the TSB system are decimal numbers, except those I/O select codes used in hardware configuration commands; these are specified as octal numbers.

Printed output produced by the system commands can be interrupted by pressing any key; printing terminates at the end of the current output line.

Brief descriptions of system operator commands, arranged alphabetically, are given in Table 3-1. Detailed descriptions, arranged according to command function, follow the table.
### Table 3-1. Operator Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANNOUNCE</td>
<td>Transmits a message from the operator to a specific active user or to all active users.</td>
</tr>
<tr>
<td>CHANGE</td>
<td>Modifies an idcode's password, terminal time limit, or disc space limit.</td>
</tr>
<tr>
<td>DIRECTORY</td>
<td>Returns a list of library programs and files.</td>
</tr>
<tr>
<td>DISC</td>
<td>Informs the system of addition or removal of a user disc. Used during system startup or shutdown and to add or remove disc packs.</td>
</tr>
<tr>
<td>KILLID</td>
<td>Removes an idcode from the system.</td>
</tr>
<tr>
<td>MOVE</td>
<td>Transfers programs and files from one disc to another.</td>
</tr>
<tr>
<td>NEWID</td>
<td>Enters a new idcode into the system.</td>
</tr>
<tr>
<td>PHONES</td>
<td>Sets the maximum number of seconds which a user has to log onto the system (through a data set).</td>
</tr>
<tr>
<td>PORT</td>
<td>Returns current configuration list for all ports.</td>
</tr>
<tr>
<td>PURGE</td>
<td>Removes library programs and files which have not been used since a specified date.</td>
</tr>
<tr>
<td>REPORT</td>
<td>Returns a list of each idcode's total time used and amount of disc space in use.</td>
</tr>
<tr>
<td>RESET</td>
<td>Resets terminal time clock of one idcode or all idcodes.</td>
</tr>
<tr>
<td>ROSTER</td>
<td>Returns a list of currently active idcodes and ports.</td>
</tr>
<tr>
<td>SLEEP</td>
<td>Causes orderly shutdown of the TSB system.</td>
</tr>
<tr>
<td>SPEED</td>
<td>Informs the system of a new configuration (baud rate and number of stop bits) for a specific port or for all ports.</td>
</tr>
</tbody>
</table>

### COMMAND DESCRIPTION CONVENTIONS

When entering a command, only the first three characters are significant; the remainder are ignored by the system and need not be included. In the following descriptions, the full commands are shown in uppercase characters. In the examples, only the required characters are shown.

When required parameters are shown, a hyphen separates the command from the parameter string.

When parameters are optional, the hyphen and the parameter string are enclosed in brackets, [ ].

A parameter list enclosed in braces, { }, indicates the operator may choose one parameter from the list.
For example,

NEW- idcode , password , time , disc  Parameters are required.

DIR [ - { idcode subchannel } ]  Parameters are optional; if selected, only one may be specified.

DIS- { UP } { DN }  A parameter is required; only one may be specified.

SYSTEM ID-TABLE COMMANDS

NEWID

This command is used to enter a new idcode into the system. The NEWID command establishes a unique idcode and password combination for each user, plus maximum limits on terminal time and disc storage space. The command is entered in the form:

NEWID- idcode , password , time , disc

idcode  User’s identification consisting of a letter followed by three decimal digits.

password  User’s password associated with idcode; consists of from 1 to 6 printing or nonprinting characters other than NULL, RUBOUT, Xe, comma, space, return, linefeed, or X-OFF.

time  Maximum number of minutes (decimal) of total terminal time the user is allowed to accumulate. Time may not exceed 65535 minutes.

disc  Maximum number of disc sectors (decimal) the user is allowed for storage of programs and files. Disc may not exceed 65535 sectors.

Characters in password can be specified as nonprinting characters by holding down the control key while entering a character. This combination is symbolized in text by a superscript “c” following the character, such as Zc. Using this feature, the user can define a secret password which does not appear on the user’s terminal.

If the idcode specified already exists within the system, the following message is returned to the operator:

DUPLICATE ENTRY

If the system id-table cannot accommodate another entry, the operator receives the following message:

ID TABLE FULL

Allotment of disc storage space does not reserve a particular area of disc for the user, nor does it guarantee that he will obtain that much on request. The amount specified is a limit which
he is not permitted to exceed. If the user requests storage greater than his allotment, the following message is printed at his terminal:

**FILE SPACE FULL**

If the user exceeds his allotted terminal time, a system flag is set but the user may continue the current session. However, the next time the user attempts to log on to the system, the following message is returned to his terminal:

**NO TIME LEFT**

**EXAMPLES:**

**NEW–A000,MASTER,6000,150**

User A000 with the password MASTER is entered into the system with 6000 minutes (100 hours) of terminal time, and 150 sectors (19,200 words) of disc storage space allowed.

**NEW–Q123,BASCONTROL,100,200**

User Q123 with the password BASCONTROL is entered into the system (S, I, and C are non-printing characters; they are entered while the control key is held down so only B and A appear at the user's terminal). This user has 100 minutes of terminal time and is allotted 200 sectors (25,600 words) of disc storage space.

**CHANGE**

The CHANGE command is used to modify any or all of the parameters of an existing idcode. This command has the form:

**CHANGE– idcode , [password] , [time] , [disc]**

- **idcode** Identification code of a specific user.
- **password** If specified, this becomes the new password associated with idcode.
- **time** If specified, this becomes the new time (in minutes) assigned to idcode. May not exceed 65535.
- **disc** If specified, this becomes the new disc space (in sectors) allowed idcode. May not exceed 65535.

At least one parameter other than idcode must be specified and the parameters must be entered in the order shown; a comma must be entered as a place marker for any missing parameter (trailing commas are not required).

If the specified idcode does not exist or is not recognized by the system, the following message is printed:

**NO SUCH ID**
EXAMPLES:

CHA-Q123,BASIC
changes the password of idcode Q123 to BASIC. Time and disc allotments remain unchanged.

CHA-Q123,,1000
changes the terminal time allotment of idcode Q123 to 1000 minutes. Password and
disc allotment remain unchanged.

CHA-Q123,,,500
changes disc storage allotment of idcode Q123 to 500 sectors. The other parameters
remain unchanged.

RESET

The RESET command allows the operator to change the value of an idcode's total terminal
time used. Command format follows:

RESET- \{ \{ idcode \} \{ ALL \} \} [, time]

idcode Identification code of a specific user. If chosen, terminal time of
this idcode is changed to value of time.

ALL If chosen in place of idcode, terminal time of all users is reset.

time Optional value expressed in minutes. If omitted, system assumes
a value of zero. May not exceed 65535.

If the specified idcode cannot be found, the following message is returned to the operator:

NO SUCH ID

EXAMPLES:

RES-Q123,20
resets total terminal time used for idcode Q123 to 20 minutes.

RES-A455,0 or RES-A455
either of these entries resets idcode A455 terminal time to zero.

REPORT

This command is used to obtain a listed report of terminal time and disc space used to date by
each idcode. The command is entered in the form

REPORT
The report appears in the following format:

\[ idcode \quad time \quad disc \]

time is reported in minutes and disc in the number of sectors.

EXAMPLE:

```
REP

<table>
<thead>
<tr>
<th>ID</th>
<th>TIME</th>
<th>DISC</th>
<th>ID</th>
<th>TIME</th>
<th>DISC</th>
<th>ID</th>
<th>TIME</th>
<th>DISC</th>
</tr>
</thead>
<tbody>
<tr>
<td>A000</td>
<td>01150</td>
<td>01157</td>
<td>A001</td>
<td>00275</td>
<td>00001</td>
<td>A111</td>
<td>01083</td>
<td>00025</td>
</tr>
<tr>
<td>A201</td>
<td>00216</td>
<td>00103</td>
<td>A300</td>
<td>00254</td>
<td>00004</td>
<td>A301</td>
<td>01706</td>
<td>00438</td>
</tr>
<tr>
<td>A810</td>
<td>05442</td>
<td>00893</td>
<td>A920</td>
<td>00181</td>
<td>00023</td>
<td>B000</td>
<td>00020</td>
<td>00086</td>
</tr>
<tr>
<td>B050</td>
<td>01188</td>
<td>00257</td>
<td>B100</td>
<td>00001</td>
<td>00000</td>
<td>B111</td>
<td>00214</td>
<td>00133</td>
</tr>
<tr>
<td>G000</td>
<td>02326</td>
<td>00665</td>
<td>G100</td>
<td>00000</td>
<td>00000</td>
<td>G101</td>
<td>00000</td>
<td>00000</td>
</tr>
<tr>
<td>H000</td>
<td>00000</td>
<td>00000</td>
<td>H100</td>
<td>02728</td>
<td>00349</td>
<td>H111</td>
<td>03637</td>
<td>00019</td>
</tr>
<tr>
<td>Q111</td>
<td>00000</td>
<td>00000</td>
<td>X001</td>
<td>00193</td>
<td>00030</td>
<td>Z999</td>
<td>00842</td>
<td>00010</td>
</tr>
</tbody>
</table>
```

KILLID

The KILLID command is used to remove an idcode from the system. It is entered in the form:

```
KILLID- idcode
```

The idcode is deleted from the system directory. Any files or programs associated with idcode are removed and the disc space is returned to the system.

If the specified idcode is currently active, the associated user is immediately disconnected from the system. If he attempts to log on with his old idcode the following message is printed on his terminal:

```
ILLEGAL ACCESS
```

The system master, idcode A000, may not be removed from the system. If attempted, the following message is returned to the operator:

```
A000 NOT ALLOWED
```

Specification of a nonexistent idcode results in the message

```
NO SUCH ID
```

DISC DIRECTORY COMMANDS

DIRECTORY

The operator can enter this command to obtain a list of library programs and files. The DIRECTORY command format is
DIRECTORY [ - { idcode

<table>
<thead>
<tr>
<th>idcode</th>
<th>subchannel</th>
</tr>
</thead>
</table>

\* idcode \* Identification code of a specific user. If chosen, only programs and files for this \textit{idcode} are returned to the operator's console.

\* subchannel \* A single digit value, 0–3, indicating a specific disc. If chosen, programs and files contained on this disc (\textit{subchannel}) are returned to the operator.

If neither parameter is specified, a list is printed beginning with disc 0, user \textit{idcode} A000 and continuing through the complete directory of all discs on the system.

The following information is included for each program and file:

<table>
<thead>
<tr>
<th>ID</th>
<th>NAME</th>
<th>DATE</th>
<th>SUB</th>
<th>TR/SEC</th>
<th>LEN</th>
<th>FP</th>
</tr>
</thead>
</table>

\* ID \* User \textit{idcode}.

\* NAME \* Program or file name (1 to 6 characters).

\* DATE \* Date named item was last accessed (day-of-year/year).

\* SUB \* Subchannel number of disc containing program or file.

\* TR/SEC \* Disc address indicating track and sector numbers.

\* LEN \* Size of program or file in sectors (decimal).

\* FP \* If F appears, the item is a file. Otherwise, it is a program. \textbf{P} indicates the file or program is protected from unauthorized access.

\textbf{EXAMPLE:}

\texttt{DIR-A000}

returns a directory listing for \textit{idcode} A000, as follows:

<table>
<thead>
<tr>
<th>ID</th>
<th>NAME</th>
<th>DATE</th>
<th>SUB</th>
<th>TR/SEC</th>
<th>LEN</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>A000</td>
<td>AAA</td>
<td>151/72</td>
<td>0</td>
<td>100/24</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BASFIL</td>
<td>142/72</td>
<td>0</td>
<td>052/05</td>
<td>10</td>
<td>FP</td>
</tr>
<tr>
<td></td>
<td>TEMP1</td>
<td>150/72</td>
<td>0</td>
<td>040/01</td>
<td>32</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>TEST</td>
<td>151/72</td>
<td>1</td>
<td>006/30</td>
<td>28</td>
<td>P</td>
</tr>
</tbody>
</table>

\textbf{MOVE}

This command can be used to transfer library programs and files from one disc (\textit{subchannel}) to another. The command format is:

\texttt{MOVE - idcode , name , subchannel}

<table>
<thead>
<tr>
<th>idcode</th>
<th>name</th>
<th>subchannel</th>
</tr>
</thead>
</table>

\* idcode \* Identification code of a specific user.

\* name \* Either a program name or a file name to be moved from the library associated with the specified \textit{idcode}.

\* subchannel \* A single digit value, 0–3, indicating a specific disc. The program or file specified by \textit{name} is moved to this disc.
If the program name or file name cannot be found in the system directory, the following message is returned to the operator:

NO SUCH PROGRAM

If the indicated subchannel does not have room for the named program or file, the following message is printed on the operator's console:

SYSTEM OVERLOAD

PURGE

The operator can use the PURGE command to remove user library programs and files from the system directory which have not been used since a specific date. The disc space that would otherwise be unavailable is returned to the system. Command format is

PURGE- $ddd$/yy

$ddd$ A decimal value from 1 to 366, representing a day-of-year. Must be less than or equal to the current day-of-year.

$/$ Required to separate the elements of this parameter.

$yy$ A decimal value representing the year; that is, 72 for 1972. Must be less than or equal to the current year.

If the day-of-year or year specified has not occurred, the following message is printed:

ILLEGAL PARAMETER

If a file which qualifies for purging is in use, the PURGE command is not allowed and the following message is returned:

BUSY FILES

The system does not inform the operator which programs and files are removed. The DIRECTORY command should be used before and after the PURGE command to obtain this information.

A HELLO program under idcode A000 cannot be purged.

EXAMPLE:

PUR–153/72

results in the removal of any library programs or files which have not been used since June 1, 1972.
HARDWARE CONFIGURATION COMMANDS

DISC

The addition of a new disc or removal of an old disc is accomplished through the DISC command. Command format follows:

\[ \text{DISC} - \{ \text{UP} \} , \text{subchannel} \]

\text{UP} \quad \text{If chosen, informs the system that a disc is added on the indicated subchannel.}

\text{DN} \quad \text{If chosen, informs the system that the disc on the indicated subchannel is removed.}

\text{subchannel} \quad \text{Disc number, 1–3, to which new discs may be added or old discs removed.}

The disc pack must be running and the disc READY light must be on before the DISC command is entered. User discs must be formatted (see "Formatting User Discs," Appendix B).

The 2000E TSB system can accommodate up to four discs (two disc drives) numbered 0 to 3. Disc 0 is the system disc. If an attempt is made to remove the system disc, the following message is returned to the operator:

\text{CANNOT SET SYSTEM DISC DOWN}

Discs 1 through 3 are user discs.

If a subchannel outside the range 1–3 is specified, a message is printed at the operator’s console, as follows:

\text{SUBCHANNEL ERROR}

If the indicated disc is not a user disc the following message is printed on the operator’s console:

\text{NOT USER DISC}

The disc is not added to the system.

If the indicated disc has an identification code that differs from the system identification code, the following message is printed on the operator’s console:

\text{DISC ID CODE NOT SAME AS SYSTEM ID CODE}

\text{WARNING ONLY}

The disc is added to the system. If this disc was not supposed to be added to the system, the operator should immediately issue a DISC-DN command.
If files on the indicated disc are being used, the following message is printed on the operator's console:

BUSY FILES

The disc is not removed from the system.

SPEED

Initially, all ports are configured for a baud-rate of 130 and a stop-bit count of 2. Port configuration can be changed with the SPEED command. Command format follows:

```
SPEED - baud-rate , stop-bit , \{ port-number [ , port-number , . . . ] \} 
   \{ ALL \}
```

- **baud-rate**: The data transfer rate of the user terminal type for which the port is to be configured (see table 3-2).
- **stop-bit**: The total number of stop bits included in the bit composition of a character; may be either 1 or 2 (see Table 3-2).
- **port-number**: A decimal value, 0-15, representing a specific port to be configured; more than one port number may be specified.
- **ALL**: If chosen in place of port-number, all ports are reconfigured.

If the specified port-number is greater than the number of ports allowed in the system (see "System Loading," Section IV), the command is ignored and a message is returned to the operator, as follows:

ILLEGAL FORMAT

If a port referenced by port-number is logged on when the SPEED command is entered, the command is ignored. If the busy port is within a list of specified port-numbers, configuration occurs up to the busy port. At that point, the configuration process is interrupted; command execution terminates. If ALL is specified, configuration occurs at all except busy ports. In any case, no message is returned.

However, the ROSTER command can be used to examine port activity prior to entry of the SPEED command. Following execution of the SPEED command, configuration specifications can be verified with the PORT command.
EXAMPLES:

SPE-47,1,0
configures port 0 to a data transfer rate of 30 characters per second.

SPE-95,1,1,3,5,7,9
configures ports 1, 3, 5, 7, and 9 to a data transfer rate of 15 characters per second.

SPE-47,1,ALL
configures every port to a data transfer rate of 30 characters per second.

<table>
<thead>
<tr>
<th>Terminal Type</th>
<th>Speed (cps)</th>
<th>Character Composition</th>
<th>Bit Rate (baud)</th>
<th>Baud Rate (decimal)</th>
<th>Stop Bits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP 2749A Teleprinter</td>
<td>10</td>
<td>8 data bits +</td>
<td>110</td>
<td>130</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 start bit +</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 stop bits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HP 2600A Keyboard-Display</td>
<td>10</td>
<td>8 data bits +</td>
<td>110</td>
<td>130</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 start bit +</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 stop bits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>8 data bits +</td>
<td>150</td>
<td>95</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 start bit +</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 stop bit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>8 data bits +</td>
<td>300</td>
<td>47</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 start bit +</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 stop bit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HP 2605A Console Printer</td>
<td>10</td>
<td>8 data bits +</td>
<td>110</td>
<td>130</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 start bit +</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 stop bits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>8 data bits +</td>
<td>150</td>
<td>95</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 start bit +</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 stop bit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terminal Type</td>
<td>Speed (cps)</td>
<td>Character Composition</td>
<td>Bit Rate (baud)</td>
<td>Baud Rate (decimal)</td>
<td>Stop Bits</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-------------</td>
<td>-----------------------</td>
<td>-----------------</td>
<td>---------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>HP 2605A</td>
<td>30</td>
<td>8 data bits + 1 start bit + 1 stop bit</td>
<td>300</td>
<td>47</td>
<td>1</td>
</tr>
<tr>
<td>Console Printer</td>
<td>10</td>
<td>8 data bits + 1 start bit + 2 stop bits</td>
<td>110</td>
<td>130</td>
<td>2</td>
</tr>
<tr>
<td>GE TermiNet 300</td>
<td>15</td>
<td>8 data bits + 1 start bit + 1 stop bit</td>
<td>150</td>
<td>95</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>8 data bits + 1 start bit + 1 stop bit</td>
<td>150</td>
<td>95</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>8 data bits + 1 start bit + 1 stop bit</td>
<td>300</td>
<td>47</td>
<td>1</td>
</tr>
<tr>
<td>Memorex 1240</td>
<td>10</td>
<td>8 data bits + 1 start bit + 2 stop bits</td>
<td>110</td>
<td>130</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>8 data bits + 1 start bit + 1 stop bit</td>
<td>150</td>
<td>95</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>8 data bits + 1 start bit + 1 stop bit</td>
<td>300</td>
<td>47</td>
<td>1</td>
</tr>
<tr>
<td>Execuport 300</td>
<td>10</td>
<td>8 data bits + 1 start bit + 2 stop bits</td>
<td>110</td>
<td>130</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>8 data bits + 1 start bit + 1 stop bit</td>
<td>150</td>
<td>95</td>
<td>1</td>
</tr>
</tbody>
</table>

**NOTE:** A manufacturer’s option is available which provides 2 stop bits in the character composition of data transferred at 15 cps. If this option is selected, the terminal characteristics are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Speed (cps)</th>
<th>Character Composition</th>
<th>Bit Rate (baud)</th>
<th>Baud Rate (decimal)</th>
<th>Stop Bits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASR-37</td>
<td>15</td>
<td>8 data bits + 1 start bit + 1 stop bit</td>
<td>150</td>
<td>95</td>
<td>1</td>
</tr>
</tbody>
</table>
PORT

Entry of this command returns a list of port configurations. The command format is

\[ \text{PORT} \]

The list returned to the operator shows the stop-bit count followed by the baud-rate for which a port is configured. The list appears as two rows of items. Each item in row 1 corresponds to a port beginning with port 0 and ending with port 7. Each item in row 2 corresponds to a port beginning with port 8 and ending with port 15. The items are displayed in the form

\[ s-bbb \]

where \( s = \text{stop-bit count} \)

\( bbb = \text{baud-rate} \)

The baud-rate and stop-bit count for each user terminal type are given in Table 3-2.

EXAMPLES:

\[
\begin{array}{cccccccc}
\text{POR} & 2-130 & 2-130 & 1-047 & 1-047 & 1-095 & 2-130 & 1-047 & 2-130 \\
2-130 & 2-130 & 1-047 & 2-130 & 2-130 & 2-130 & 2-130 & 1-047 \\
\end{array}
\]

Ports 0, 1, 5, 7, 8, 9, 11, 12, 13, and 14 support a data transfer rate of 10 characters per second. Ports 2, 3, 6, 10, and 15 support 30 characters per second. Port 4 supports 15 characters per second.

\[
\begin{array}{cccccccc}
\text{POR} & 2-130 & 2-130 & 2-130 & 2-130 & 2-130 & 2-130 & 2-130 \\
2-130 & 2-130 & 2-130 & 2-130 & 2-130 & 2-130 & 2-130 \\
\end{array}
\]

All ports are configured to support a data transfer rate of 10 characters per second.

PHONES

When connection is established through a data set, the TSB system allows the user 120 seconds to log on. The system operator uses the PHONES command to reset or change the number of seconds allowed. The command is entered in the form:

\[
\text{PHONES-} \text{nnn}
\]

\( \text{nnn} \) A decimal value from 1 to 255 representing the number of seconds allowed to log on. If omitted, the system returns the ILLEGAL FORMAT message.

If the user fails to log on within the time allowed, a disconnect occurs.
EXAMPLES:

PHO-90
allows the user 1½ minutes to log on after the system acknowledges his call.

PHO-180
allows the user 3 minutes to log on.

MISCELLANEOUS COMMANDS

ROSTER

A listing of currently active idcodes can be obtained with the ROSTER command. This command is entered in the form:

ROSTER

The list appears as two rows of eight items. Each item corresponds to a port beginning with port 0 and ending with port 15. An active port is denoted by a user’s idcode. An inactive port is denoted by four consecutive dots (. . . .). The same idcode can be active at more than one port.

EXAMPLE:

ROS

. . . . . . . . . . A000 . . .
Q123 . . . A455 . . . A455 . . . . .

user idcode A000 is logged on at port 6, Q123 at port 8, and A455 at ports 10 and 12. The remaining ports are inactive.

ANNOUNCE

The ANNOUNCE command allows the operator to send a one-line message to active user terminals. The command has the following form:

\[
\text{ANNOUNCE-} \left\{ \begin{array}{c}
\text{port-number} \\
\text{ALL}
\end{array} \right\}, \text{ character-string}
\]

port-number A decimal value from 0 to 15, designating a specific user terminal. If chosen, character-string is transmitted to this port.

ALL If chosen, character-string is transmitted to all active ports.

character-string A message of up to 66 characters that is transmitted to a specific user terminal or to all terminals.

The character-string is printed literally, including blanks, at the designated port or at all ports. Any output being printed at the user's terminal is interrupted.
The ANNOUNCE command should be used with care, because it produces unexpected text in the user's output. It is appropriate, however, to use ANNOUNCE to warn users shortly before system shutdown (see SLEEP command).

The user has a complementary command, MESSAGE, that can be used to communicate with the operator.

EXAMPLES:

ANN-ALL, SYSTEM WILL BE SHUT DOWN IN 15 MINUTES.
warns all users of approaching system shutdown.

ANN-10, YOUR REQUEST FOR MORE FILE SPACE IS GRANTED.
informs user at port 10 that his request for additional file space has been granted.

SYSTEM SHUTDOWN COMMAND

SLEEP

The SLEEP command is used to shut down the TSB system. The command provides a systematic shutdown procedure that allows easy startup at a later time.

Before entering the SLEEP command, the user discs must be removed from the system with the DISC command. SLEEP command format is

SLEEP [character-string]

character-string A message of as many as 68 characters which, if specified, is printed at all active user ports.

Entry of the SLEEP command results in the following action:

1. The character-string message is transmitted to all active ports.
2. Active users are immediately disconnected from the system.
3. The system disc library is packed to eliminate "dead" or unassigned space.
4. The system prints
   MAG TAPE SLEEP?
   If the system is to be stored on magnetic tape, enter YES. The Utility program is called from disc and takes control (see "Utility Program," Appendix B).
5. If the system is to be stored on disc, enter NO. The system responds
   INSERT CARTRIDGE FOR SYSTEM DISC DUMP
   PRESS 'RUN' WHEN DISC READY
6. The system halts with 1020118 in the MEMORY DATA register. Remove the user cartridge on subchannel 1 and replace it with a cartridge to be used to store the TSB system. Ready the equipment; press RUN.
7. The contents of the system disc (subchannel 0) are dumped to the disc on subchannel 1. The system prints

    SYSTEM SLEEP COMPLETE

    A halt occurs with 102077₈ displayed in the MEMORY DATA register; system power may be shut off.

If the user discs were not deactivated with the DISC command before the SLEEP command was entered, the system prints:

    REMOVE DISC SUBCHANNEL n

    n is the subchannel number, 1–3, of an active user disc.

The SLEEP command is ignored and must be re-entered following deactivation of the user discs.
The TSB system can be loaded initially from paper tape or reloaded from disc storage following a shutdown, using the Utility program (Appendix B). In addition, the Utility program can be used to load the TSB system from magnetic tape.

PAPER TAPE LOADING

When the 2000E TSB System is being generated for the first time, loading is done through the high-speed paper tape photoreader. Operating procedures for the photoreader are described in the Software Operating Procedures module "Peripheral Equipment Manual Functions" (5951-1373). Operating procedures for the 2100A computer, including BBL, are contained in Software Operating Procedures module HP 2100A Front Panel Procedures (5951-1371).

To load the system from paper tape:

1. Press HALT, INTERNAL PRESET, and then EXTERNAL PRESET on the system computer.
2. Place the TSB LOADER/UTILITY paper tape into the photoreader.
3. Set the BBL starting address (P register) to 37700\textsubscript{8}.
4. Clear the switch register and press LOADER ENABLE.
5. Press RUN; the TSB loader program will be read in from paper tape.
6. After the computer halts, set the loader starting address (P-register) to 2000\textsubscript{8}.
7. Press RUN; the Utility program responds:
   
   \begin{verbatim}
   2000E UTILITY PROGRAM
   *
   
   The asterisk is a prompt character from the program. Enter the command:
   LOAD
   \end{verbatim}
8. The loading procedure now becomes a dialog between the loader program and the system operator. The loader prints the disc library request:
   
   \begin{verbatim}
   LIBRARY?
   
   Because this is a new system, there is no existing library. Enter NO.
   \end{verbatim}
9. The loader requests:
  
   SYSTEM ID CODE?

   Enter a decimal value, 0 to 65532, representing the identification code of this system.

10. The loader requests:

   NUMBER OF PORTS?

   Enter a decimal value, 1 to 16, representing the number of ports allowed. If operator response is only a return, the system assumes 16.

11. At this point, the TSB system is read in from paper tape. When reading is complete, the loader requests:

   DATE?

   Enter date in the form:

   \( ddd/yyyy \)

   where \( ddd \) = current day-of-year (1 - 366)

   \( yy \) = last two digits of current year (e.g., 72 for 1972)

12. The loader requests:

   TIME?

   Enter time in the form:

   \( hh/mm \)

   where \( hh \) = current hour (00 - 24)

   \( mm \) = current minute (00 - 60)

13. The system prints:

   READY

   Loading is complete.

SYSTEM UPDATE FROM PAPER TAPE

The 2000E TSB system can be updated by loading a new system from paper tape while retaining an existing library of programs and files. The old system containing the library must have been copied to disc by execution of the SLEEP command at the last system shutdown. To update the system from paper tape:

1. Press HALT, INTERNAL PRESET, and then EXTERNAL PRESET on the system computer.

2. Place the updated TSB LOADER/UTILITY paper tape into the photoreader.

3. Set the BBL starting address (P register) to \( 37700_8 \).

4. Clear the switch register and press LOADER ENABLE.

5. Press RUN; the TSB loader program will be read in from paper tape.

6. After the computer halts, set the loader starting address (P register) to \( 2000_8 \).
7. Press RUN; the Utility program responds:

   2000E UTILITY PROGRAM

   *

   The asterisk is a prompt character from the program. Enter the command:

   LOAD

8. The loading procedure now becomes a dialog between the loader program and the system operator. The loader prints the disc library request:

   LIBRARY?

   Because this is a system update with an existing library, enter YES.

9. The loader requests:

   NUMBER OF PORTS?

   Enter a decimal value, 1 to 16, representing the number of ports allowed. If the operator response is only a carriage return, the system assumes 16.

10. At this point, the TSB system is read in from paper tape. When reading is complete, the loader requests:

    DATE?

    Enter the date in the form:

    \[ dd/yy \]

    where \( dd \) = current day-of-year (1-366)

    \( yy \) = last two digits of current year (e.g., 72 for 1972)

11. The loader requests:

    TIME?

    Enter time in the form:

    \[ hh:mm \]

    where \( hh \) = current hour (00-24)

    \( mm \) = current minute (00-60)

12. The system prints:

    READY

    indicating that the system update is complete.
LOADING FROM DISC

If the 2000E TSB system has previously been shutdown (see SLEEP command, Section III) and written to a disc cartridge, loading from disc can be accomplished through the 2000E Bootstrap Loader.

First, load the Bootstrap Loader using BBL. Then, set the starting address (P register) to 2, press RUN.

1. The Bootstrap responds:
   
   IS SYSTEM ON SUBCHANNEL 0?

2. If the system resides on subchannel 0, and a user disc is assigned to subchannel 1, enter YES and go to step 5.

3. If the system resides on a disc cartridge, enter NO.

4. The system is copied to the fixed disc (subchannel 0) and halt 1020338 occurs. Remove the SLEEP cartridge and replace it with a user cartridge. Then, ready the disc drive; press RUN.

5. The system is loaded from the disc. On completion of system load, the Bootstrap requests:
   
   DATE?

   Enter date in the form:

   \[ ddd/yy \]

   where \( ddd = \) current day-of-year
   
   \( yy = \) last two digits of current year

6. The Bootstrap requests:

   TIME?

   Enter time in the form:

   \[ hhmm \]

   where \( hh = \) current hour (00 – 24)
   
   \( mm = \) current minute (00 – 60)

7. The system responds:

   READY

   Loading is complete.

If the disc cartridge is not a copy of the system disc as provided by the SLEEP command, and if NO was the response to step 1, the following message is printed on the operator’s console:

   INVALID DISC

At this point, insert the correct disc pack, press RUN and return to step 1.
LOADING FROM MAGNETIC TAPE

To load the 2000E TSB system from magnetic tape, the Utility program must first be loaded at address 377008 using BBL. Set the program starting address at 20008. Then, press INTERNAL PRESET, EXTERNAL PRESET, and RUN. The program responds:

2000E UTILITY PROGRAM
*

The asterisk is a prompt character from the program.

1. To load the system from magnetic tape, enter:
   LOAD, select-code
   select-code is the lower channel number of the magnetic tape unit.

2. The program loads the contents of the magnetic tape onto a disc which may then be loaded into the computer and initiated (see "Loading from Disc").

3. If the magnetic tape unit or disc drive is not ready, a diagnostic message is printed. Ready the equipment and press RUN.
APPENDIX A
System Error Messages

SYSTEM ERROR MESSAGES TO OPERATOR

The error message, ILLEGAL FORMAT, is printed whenever any operator command is entered which does not conform to the format rules given in the command descriptions, Section III.

The following error messages are listed alphabetically by command:

<table>
<thead>
<tr>
<th>Command</th>
<th>Message</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHANGE</td>
<td>NO SUCH ID</td>
<td>idcode specified does not exist in system id-table.</td>
</tr>
<tr>
<td>DISC</td>
<td>BUSY FILES</td>
<td>Files on specified disc are currently being used.</td>
</tr>
<tr>
<td></td>
<td>CANNOT SET SYSTEM DISC DOWN</td>
<td>System disc (subchannel 0) specified.</td>
</tr>
<tr>
<td></td>
<td>DISC ID CODE NOT SAME AS SYSTEM</td>
<td>User disc was formatted for a different system.</td>
</tr>
<tr>
<td></td>
<td>ID CODE WARNING ONLY</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NOT USER DISC</td>
<td>Subchannel specified does not contain a properly formatted user disc.</td>
</tr>
<tr>
<td></td>
<td>SUBCHANNEL ERROR</td>
<td>Subchannel specified out of range 1-3.</td>
</tr>
<tr>
<td>KILLID</td>
<td>A000 NOT ALLOWED</td>
<td>idcode A000 cannot be removed from the system.</td>
</tr>
<tr>
<td></td>
<td>NO SUCH ID</td>
<td>idcode specified does not exist in system id-table.</td>
</tr>
<tr>
<td>MOVE</td>
<td>NO SUCH PROGRAM</td>
<td>Program or file name specified does not exist in directory.</td>
</tr>
<tr>
<td></td>
<td>SYSTEM OVERLOAD</td>
<td>Disc subchannel specified is full.</td>
</tr>
<tr>
<td>NEWID</td>
<td>DUPLICATE ENTRY</td>
<td>idcode specified already exists in system id-table.</td>
</tr>
<tr>
<td></td>
<td>ID TABLE FULL</td>
<td>System id-table cannot accept any more entries.</td>
</tr>
<tr>
<td>PURGE</td>
<td>BUSY FILES</td>
<td>One or more qualifying files is in use.</td>
</tr>
<tr>
<td></td>
<td>ILLEGAL PARAMETER</td>
<td>Day or year specified has not yet occurred.</td>
</tr>
<tr>
<td>RESET</td>
<td>NO SUCH ID</td>
<td>idcode specified does not exist in system id-table.</td>
</tr>
</tbody>
</table>
ERROR MESSAGES DURING LOADING OR SHUTDOWN

The following messages are returned to the operator when errors are encountered during system loading or shutdown:

CHECKSUM ERROR
END OF TAPE
ILLEGAL DATE
ILLEGAL TIME

UTILITY PROGRAM ERROR MESSAGES

The following diagnostic messages are printed at the operator’s console when errors are encountered during Utility program operations:

DISC Diagnostics

DISC NOT READY
IRRECOVERABLE DISC ERROR
INVALID SUBCHANNEL

Magnetic Tape Diagnostics

MAG TAPE NOT READY
WRITE NOT ENABLED
APPENDIX B
Utility Program

The HP 2000E Utility program resides on the TSB system disc. The program provides disc and magnetic tape backup as well as system loading from disc or from magnetic tape.

UTILITY HARDWARE REQUIREMENTS

The minimum hardware requirement is that of the 2000E TSB system. In addition, the Utility program allows use of one HP 7970 Magnetic Tape unit and one additional HP 7900 Disc Drive.

UTILITY OPERATIONS

Procedures within the Utility program permit the following operations:

- System Shutdown (SLEEP) to Magnetic Tape
- System Loading from Magnetic Tape
- Disc-to-Disc Copy
- Selective Loading of Discs from Magnetic Tape
- Selective Dumping of Discs to Magnetic Tape in 2000E/DOS-M compatible format
- Formatting and Checking User Discs
- Packing User Discs

Commands are provided to initiate specific procedures. The commands and a brief description of their function follow:

<table>
<thead>
<tr>
<th>Command</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOAD</td>
<td>Loads system from magnetic tape.</td>
</tr>
<tr>
<td>COPY</td>
<td>Copies disc to disc.</td>
</tr>
<tr>
<td>SLOAD</td>
<td>Selective disc load from magnetic tape.</td>
</tr>
<tr>
<td>SDUMP</td>
<td>Selective disc dump to magnetic tape.</td>
</tr>
<tr>
<td>FORMAT</td>
<td>Formats a user disc.</td>
</tr>
<tr>
<td>PACK</td>
<td>Packs a user disc.</td>
</tr>
</tbody>
</table>
System SLEEP to Magnetic Tape

1. When the SLEEP command (see Section III) is entered, the system requests:
   
   MAG TAPE SLEEP?

   To dump the system to magnetic tape, enter:
   YES

2. The SLEEP routine calls the Utility program from disc and transfers control to it.

3. The program requests:
   
   MAG TAPE?

   Enter the lower channel select code of the magnetic tape unit

4. If the magnetic tape unit is ready, the contents of all discs on the system are dumped to magnetic tape. If the magnetic tape unit is not ready, a diagnostic message is printed. Ready the unit and press RUN.

For the remaining procedures, the Utility program must be loaded at address 37700₈ using BBL. Set the starting address at 2000₈. Then, press INTERNAL PRESET, EXTERNAL PRESET, and RUN. The program responds:

2000E UTILITY PROGRAM
*

The asterisk is a prompt character from the program. Any of the Utility program procedure commands may be entered in reply to the prompt character.

System Loading From Magnetic Tape

The procedure for loading the 2000E TSB system from magnetic tape is described in Section IV, “System Loading.”

Disc-to-Disc Copy

1. Following the asterisk, enter
   
   COPY, subchannel-1, subchannel-2

   subchannel-1 is an integer, 0–3, representing the origin disc.
   subchannel-2 is an integer, 0–3, representing the destination disc.
   subchannel-1 and subchannel-2 cannot be equal.

2. The contents of the disc specified by subchannel-1 are copied to the disc specified by subchannel-2.
   If an invalid subchannel number is entered, or if a specified disc is not ready, a diagnostic message is printed; the COPY command must be re-entered.
Selective Loading From Magnetic Tape

1. In response to the asterisk, enter

   SLOAD, subchannel, select-code, [file]

   subchannel is an integer, 0–3, representing the destination disc.
   select-code is the lower channel select code of the origin magnetic tape.
   file is an optional value, representing the file number selected for loading. A file is the contents of one disc as dumped out either by a magnetic tape SLEEP operation or by a selective dump. If omitted, first file of the magnetic tape specified by select-code is loaded.

2. The contents of the magnetic tape are written on the disc. If file is specified the magnetic tape is advanced to the indicated file before loading occurs. If the magnetic tape unit or disc drive is not ready or if an invalid subchannel or select-code is entered, a diagnostic message is printed; the SLOAD command must be re-entered.

Selective Dumping to Magnetic Tape

1. In response to the asterisk, enter

   SDUMP, subchannel, select-code, [file]

   subchannel is an integer, 0–3, representing the origin disc.
   select-code is the lower channel select code representing the destination magnetic tape unit.
   file is an optional value representing a specific file position on the magnetic tape. A file is the contents of one disc as dumped out either by a magnetic tape SLEEP operation or by a selective dump. If omitted, the disc is dumped as the first file on the magnetic tape.

2. The contents of the disc are dumped to magnetic tape. If file is specified, the magnetic tape is advanced to the indicated file position before dumping occurs.

   If an invalid subchannel or select-code is entered or if the magnetic tape unit or disc drive is not ready, a diagnostic message is printed; the SDUMP command is ignored and must be re-entered.

Formatting User Discs

1. Following the asterisk, enter

   FORMAT, subchannel

   subchannel is an integer, 1–3, representing the user disc to be formatted. Subchannel 0 is not allowed because it is the system disc.
2. The disc is checked for bad tracks. Those encountered are locked out of the system. The program then types the request

    LABEL?

    enter a label from 1 to 6 characters.

3. The program returns the number of bad tracks encountered.

   NOTE: If track 0, 1, or 2 are found to be bad, the following message is printed:

   TRACK 0, 1, OR 2 BAD
   CANNOT USE THIS DISC

   The formatting procedure terminates.

Packing User Discs

1. In response to the asterisk, enter:

    PACK, subchannel

   subchannel is an integer, 1–3, representing the user disc to be packed. Subchannel 0 is not allowed because it is the system disc.

2. Each track of the specified disc is packed to eliminate “dead” spaces caused by the removal of user programs and files by entry of the user command, KILL.
**Glossary**

Italicized words are defined elsewhere in the glossary.

<table>
<thead>
<tr>
<th>Word</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directory</td>
<td>A table within the TSB System that records all library programs and files, including for each the name, disc location, and last date referenced.</td>
</tr>
<tr>
<td>Disc</td>
<td>Mass storage device used to store the TSB System and user files; a disc is a moving-head rotating disc memory.</td>
</tr>
<tr>
<td>Idcode</td>
<td>An alphanumeric code consisting of one letter and three digits that acts as an accounting vehicle within the TSB System. Each idcode has associated with it a password, the amount of terminal time allowed, the amount of disc space used, and the maximum amount of disc space allowed. Each user on a terminal must have an idcode, although more than one user can use the same idcode at the same time.</td>
</tr>
<tr>
<td>Id-table</td>
<td>A table within the TSB System that records the information associated with each idcode. To modify the id-table, use the commands in section III.</td>
</tr>
<tr>
<td>Logging On (And Off) the System</td>
<td>Whenever a user types a HELLO command on his terminal, he is logged onto the system and time begins accumulating on his idcode. Whenever a user types a BYE command, he is logged off the system. Messages are printed on the operator console to record these events.</td>
</tr>
<tr>
<td>Operator</td>
<td>The person who is responsible for starting, monitoring, controlling access to, and shutting down a TSB System and carries out these functions by entering operator commands through an operator console.</td>
</tr>
<tr>
<td>Operator Commands</td>
<td>On-line commands that the operator types on the operator console to control operation of a TSB system. Commands modify the id-table, directory, hardware configuration, system status, and terminal usage.</td>
</tr>
<tr>
<td>Word</td>
<td>Definition</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Operator Console</td>
<td>Teleprinter (ASR-33 or ASR-35) that the operator uses to communicate with the TSB System.</td>
</tr>
<tr>
<td>Password</td>
<td>A unique combination of up to six characters, printing or non-printing, that is associated with each idcode. When a user logs on to the system, he must give his password. This keeps unauthorized persons from using a particular idcode.</td>
</tr>
<tr>
<td>Privileged User</td>
<td>One user idcode, A000, is privileged. Programs that are stored in the library files by A000 become system library programs and can be accessed by all users regardless of idcode. A000 has two system commands, PROTECT AND UNPROTECT, that allow him to control access to his programs.</td>
</tr>
<tr>
<td>Semiprivileged User</td>
<td>Any user idcode beginning with the character A (e.g., A067) is semiprivileged. When a semiprivileged idcode is logged on to more than one terminal, the current users with that idcode can all alter their files simultaneously. Nonprivileged users, however, can only access their files simultaneously; they cannot alter them simultaneously.</td>
</tr>
<tr>
<td>SLEEP The System</td>
<td>To issue a SLEEP command through the operator console that causes the system to dump a copy of itself on disc or on magnetic tape (if available), log all the current users off the system, and halt the system. The system can be restarted from the disc or from the magnetic tape copy.</td>
</tr>
<tr>
<td>System Library</td>
<td>A collection of BASIC language programs stored by user A000, the privileged user, which can be used by all user idcodes.</td>
</tr>
<tr>
<td>Terminals</td>
<td>A keyboard device through which a user communicates with the TSB System. Terminals are connected to the system through direct wiring or over telephone lines. Up to 16 terminals can be logged on the system at a time, and each has an assigned number between 0 and 15.</td>
</tr>
<tr>
<td>User</td>
<td>A person with access to a legal idcode and a terminal. More than one user can use the same idcode at the same time.</td>
</tr>
</tbody>
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