

2000E
TIME-SHARED BASIC SYSTEM
OPERATOR'S GUIDE

02000-90049

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PREFACE

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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SECTION I

Introduction

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.

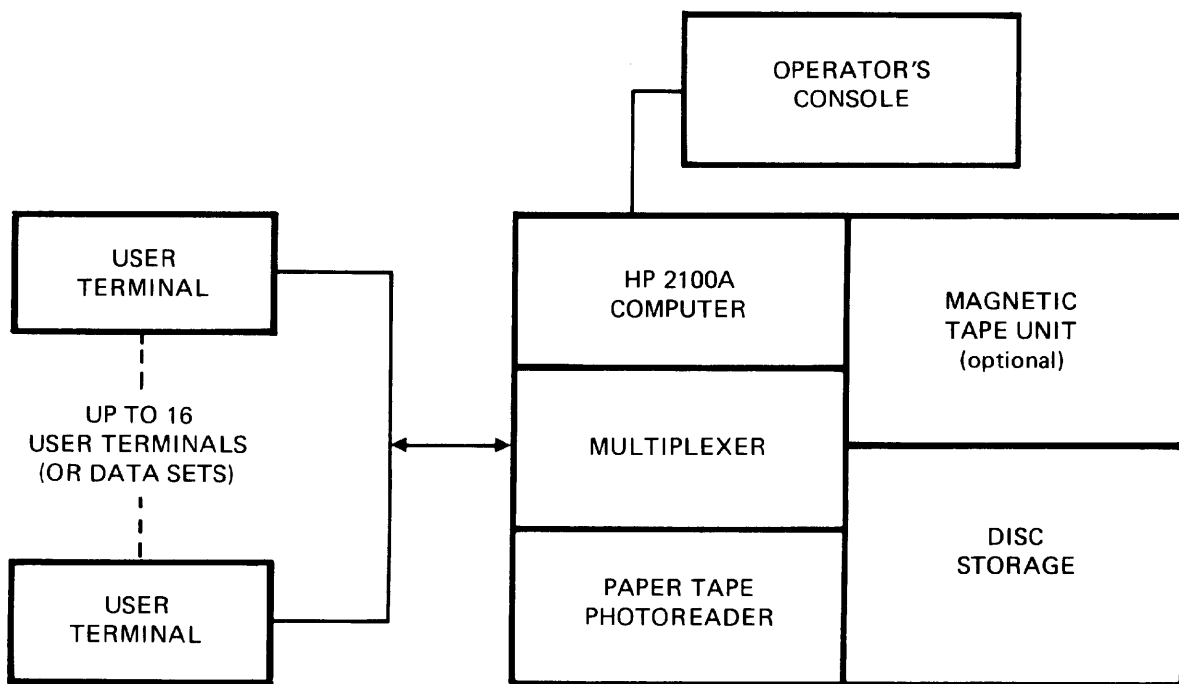


Figure 1-1. HP 2000E TSB System Organization

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:

I/O Channel	Device
10 ₈	Time base generator
11-12 ₈	HP 7900A disc interface
13 ₈	Operator's console
14 ₈	Paper tape photoreader
15-16 ₈	Multiplexer
17 ₈	Phones control

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).

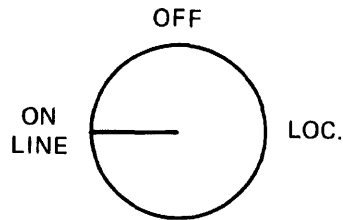


Figure 2-1. Teleprinter Power Switch

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).

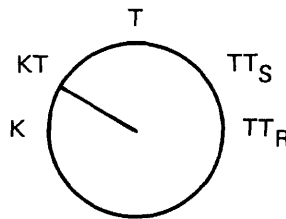


Figure 2-2. Teleprinter (ASR-35) Mode Switch

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.

SEMPRIVILEGED 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

PROTECT—*name*

and

UNPROTECT—*name*

where *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 (103004_g) 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.

SECTION III

System Commands

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

ABC←←DE←F

is equivalent to the sequence

ADF

The character, *control X* (X^c) acts as a line delete key. When X^c 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

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

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 chose one parameter from the list.

For example,

NEW-	<i>idcode</i> , <i>password</i> , <i>time</i> , <i>disc</i>	Parameters are required.
DIR	[- { <i>idcode</i> <i>subchannel</i> }]	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*

<i>idcode</i>	User's identification consisting of a letter followed by three decimal digits.
<i>password</i>	User's password associated with <i>idcode</i> ; consists of from 1 to 6 printing or nonprinting characters other than NULL, RUBOUT, X ^c , comma, space, <i>return</i> , <i>linefeed</i> , or X-OFF.
<i>time</i>	Maximum number of minutes (decimal) of total terminal time the user is allowed to accumulate. <i>Time</i> may not exceed 65535 minutes.
<i>disc</i>	Maximum number of disc sectors (decimal) the user is allowed for storage of programs and files. <i>Disc</i> 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 Z^c. 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,BAS^cI^cC^c,100,200

User Q123 with the password BAS^cI^cC^c 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*]

<i>idcode</i>	Identification code of a specific user.
<i>password</i>	If specified, this becomes the new password associated with <i>idcode</i> .
<i>time</i>	If specified, this becomes the new time (in minutes) assigned to <i>idcode</i> . May not exceed 65535.
<i>disc</i>	If specified, this becomes the new disc space (in sectors) allowed <i>idcode</i> . 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* } [, *time*]
 ALL

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 *time* *disc*

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

EXAMPLE:

REP

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

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* } *subchannel*]

idcode Identification code of a specific user. If chosen, only programs and files for this *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 (*subchannel*) are returned to the operator.

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

The following information is included for each program and file:

ID	User <i>idcode</i>
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. P indicates the file or program is protected from unauthorized access.

EXAMPLE:

DIR-A000

returns a directory listing for *idcode* A000, as follows:

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

MOVE

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

MOVE- *idcode* , *name* , *subchannel*

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 *idcode*.

subchannel A single digit value, 0-3, indicating a specific disc. The program or file specified by *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*

<i>ddd</i>	A decimal value from 1 to 366, representing a day-of-year. Must be less than or equal to the current <i>day-of-year</i> .
/	Required to separate the elements of this parameter.
<i>yy</i>	A decimal value representing the year; that is, 72 for 1972. Must be less than or equal to the current <i>year</i> .

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:

$$\text{DISC-} \left\{ \begin{array}{l} \text{UP} \\ \text{DN} \end{array} \right\}, \textit{subchannel}$$

UP	If chosen, informs the system that a disc is added on the indicated <i>subchannel</i> .
DN	If chosen, informs the system that the disc on the indicated <i>subchannel</i> is removed.
<i>subchannel</i>	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:

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:

SUBCHANNEL ERROR

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

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:

**DISC ID CODE NOT SAME AS SYSTEM ID CODE
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 3-2. User Terminal Characteristics

Terminal Type	Speed (cps)	Character Composition	Bit Rate (baud)	Baud Rate (decimal)	Stop Bits
HP 2749A Teleprinter	10	8 data bits + 1 start bit + 2 stop bits	110	130	2
HP 2600A Keyboard-Display	10	8 data bits + 1 start bit + 2 stop bits	110	130	2
	15	8 data bits + 1 start bit + 1 stop bit	150	95	1
	30	8 data bits + 1 start bit + 1 stop bit	300	47	1
HP 2605A Console Printer	10	8 data bits + 1 start bit + 2 stop bits	110	130	2
	15	8 data bits + 1 start bit + 1 stop bit	150	95	1

Table 3-2. User Terminal Characteristics (continued)

Terminal Type	Speed (cps)	Character Composition	Bit Rate (baud)	Baud Rate (decimal)	Stop Bits
HP 2605A Console Printer (continued)	30	8 data bits + 1 start bit + 1 stop bit	300	47	1
GE TermiNet 300	10	8 data bits + 1 start bit + 2 stop bits	110	130	2
	15	8 data bits + 1 start bit + 1 stop bit	150	95	1
	30	8 data bits + 1 start bit + 1 stop bit	300	47	1
Memorex 1240	10	8 data bits + 1 start bit + 2 stop bits	110	130	2
	15	8 data bits + 1 start bit + 1 stop bit	150	95	1
	30	8 data bits + 1 start bit + 1 stop bit	300	47	1
Execuport 300	10	8 data bits + 1 start bit + 2 stop bits	110	130	2
	15	8 data bits + 1 start bit + 1 stop bit	150	95	1
<p><i>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:</i></p>					
	15	8 data bits + 1 start bit + 2 stop bits	165	86	2
	30	8 data bits + 1 start bit + 1 stop bit	300	47	1
ASR-37	15	8 data bits + 1 start bit + 1 stop bit	150	95	1

PORT

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

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* = *stop-bit* count

bbb = *baud-rate*

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

EXAMPLES:

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

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.

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	2-130	2-130

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:

PHONES- *nnn*

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:

ANNOUNCE- { *port-number* } , *character-string*
 ALL

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 102077_8 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.

SECTION IV

System Loading

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_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 new system, there is no existing library. Enter NO.

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/yy
 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:
 hhmm
 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:

ddd/yy

where *ddd* = 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:

hhmm

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

mm = current minute (00-60)

12. The system prints:

READY

indicating that the system update is complete.

Copy System Disk to Zero
first user disk in 1

Bit 15 on in
Switch Reg to
Stop between
overly.

Type of system console

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 102033_8 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:

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

Command	Function
LOAD	Loads system from magnetic tape.
COPY	Copies disc to disc.
SLOAD	Selective disc load from magnetic tape.
SDUMP	Selective disc dump to magnetic tape.
FORMAT	Formats a user disc.
PACK	Packs a user disc.

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 37700_8 using BBL. Set the starting address at 2000_8 . 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.

Word	Definition
Directory	A table within the TSB System that records all library programs and files, including for each the name, <i>disc</i> location, and last date referenced.
Disc	Mass storage device used to store the TSB System and <i>user</i> files; a disc is a moving-head rotating disc memory.
Idcode	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 <i>password</i> , the amount of <i>terminal</i> time allowed, the amount of <i>disc</i> space used, and the maximum amount of <i>disc</i> space allowed. Each <i>user</i> on a <i>terminal</i> must have an idcode, although more than one <i>user</i> can use the same idcode at the same time.
Id-table	A table within the TSB System that records the information associated with each <i>idcode</i> . To modify the <i>id-table</i> , use the commands in section III.
Logging On (And Off) the System	Whenever a <i>user</i> types a HELLO command on his <i>terminal</i> , he is logged onto the system and time begins accumulating on his <i>idcode</i> . Whenever a <i>user</i> types a BYE command, he is logged off the system. Messages are printed on the <i>operator console</i> to record these events.
Operator	The person who is responsible for starting, monitoring, controlling access to, and shutting down a TSB System and carries out these functions by entering <i>operator commands</i> through an <i>operator console</i> .
Operator Commands	On-line commands that the <i>operator</i> types on the <i>operator console</i> to control operation of a TSB system. Commands modify the <i>id-table</i> , <i>directory</i> , hardware configuration, system status, and terminal usage.

Word	Definition
Operator Console	Teleprinter (ASR-33 or ASR-35) that the <i>operator</i> uses to communicate with the TSB System.
Password	A unique combination of up to six characters, printing or non-printing, that is associated with each <i>idcode</i> . When a <i>user logs on to the system</i> , he must give his password. This keeps unauthorized persons from using a particular <i>idcode</i> .
Privileged User	One <i>user idcode</i> , A000, is privileged. Programs that are stored in the library files by A000 become <i>system library</i> programs and can be accessed by all <i>users</i> regardless of <i>idcode</i> . A000 has two system commands, PROTECT AND UNPROTECT, that allow him to control access to his programs.
Semiprivileged User	Any <i>user idcode</i> beginning with the character A (e.g., A067) is semiprivileged. When a semiprivileged <i>idcode</i> is <i>logged on</i> to more than one <i>terminal</i> , the current <i>users</i> with that <i>idcode</i> can all alter their files simultaneously. Nonprivileged <i>users</i> , however, can only access their files simultaneously; they cannot alter them simultaneously.
SLEEP The System	To issue a SLEEP command through the <i>operator console</i> that causes the system to dump a copy of itself on disc or on magnetic tape (if available), <i>log</i> all the current <i>users off the system</i> , and halt the system. The system can be restarted from the disc or from the magnetic tape copy.
System Library	A collection of BASIC language programs stored by <i>user</i> A000, the privileged user, which can be used by all <i>user idcodes</i> .
Terminals	A keyboard device through which a <i>user</i> communicates with the TSB System. Terminals are connected to the system through direct wiring or over telephone lines. Up to 16 terminals can be <i>logged on the system</i> at a time, and each has an assigned number between 0 and 15.
User	A person with access to a legal <i>idcode</i> and a <i>terminal</i> . More than one user can use the same <i>idcode</i> at the same time.

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