PERKIN-ELMER

SYSTEM GENERATION/32 (SYSGEN/32)

Reference Manual

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TABLE OF CONTENTS

CHAPTERS (Continued)

CHAPTERS (continued)

CHAPTERS (Continued)

APPENDIXES

FIGURES

TABLES

PREFACE

This manual describes the System Generation/32 (Sysgen/32) program and the procedures to produce a 32-bit operating system. This manual is intended for system programmers and operators.

Chapter 1 introduces the SYSGEN CSS procedure and describes its phases. Chapter 1 also explains how to load and start the Sysgen/32 program. The Sysgen/32 commands that cause a configuration input file to be processed are described in detail. Chapter 2 details the sysgen configuration input statements that make up the input file, and now includes data communication configuration statements. Chapter 3 lists and describes the libraries required by the Sysgen/32 program and explains how to tailor library modules to user needs and include the modified modules in the appropriate library. Chapter 3 also explains how to include user-written drivers and modules in the system. Chapter 4 details the OS/32 supported devices. Chapter 5 is written for the less experienced user and contains sample Sysgen/32 sessions.

Appendix A compares the Sysgen/32 and the OS/32 Configuration Utility Program (CUP) configuration statement defaults. Appendix B lists the sysgen messages, and Appendix C is a summary of the Sysgen/32 commands and configuration statements. Appendix D compares OS/32 CUP and Sysgen/32 configuration statements.

The R06.2 release introduces the new SPL/32 program. The R06.2 operating system supports both the old Spooler (OS/32 Spooler) and SPL/32, and support for both of the Spooler programs is explained. Support for a new bi-directional input/output (BIOC) driver, a letter quality printer, and a 256Mb fixed disk is explained. Also included in this release are sysgen data communication configuration statements. Two new file types, nonbuffered indexed and extendable contiguous, are introduced and explained. New configuration statements have been added to enable the generation of an operating system for a Model 3200MPS System. This manual applies to the OS/32 R06.2 software release and higher. Information pertaining to the Model 3200MPS System applies to the OS/32 R07.1 software release and higher. Where this information appears, it is clearly marked as pertaining to the Model 3200MPS System only.

For information on the contents of all Perkin-Elmer 32-bit manuals, see the 32-Bit Systems User Documentation Summary.

CHAPTER 1
INTRODUCTION TO SYSGEN/32

1.1 INTRODUCTION

System generation/32 (Sysgen/32) is a program designed to enable a user to create and tailor an operating system to accommodate particular system requirements. In Sysgen/32, hardware and software features for the operating system are selected and defined through the use of sysgen configuration statements. These statements are defined in a sysgen configuration input file. Driver and system modules provided in the OS/32 package are selected by Sysgen/32, based on the requirements indicated in these sysgen statements.

The user can create a new configuration input file or modify an existing configuration input file using Sysgen/32 commands. The EDIT command enables the user to use all of the OS/32 EDIT command repertoire. The HELP command and the CONVERSATIONAL command are available to help the user create a configuration input file.

Once a configuration input file is created, it is processed by the Sysgen/32 program to produce macro calls. These macros are subsequently expanded, assembled, and linked to yield an operating system. Figure 1-1 details the step-by-step process that results in the generation of an operating system using Sysgen/32.

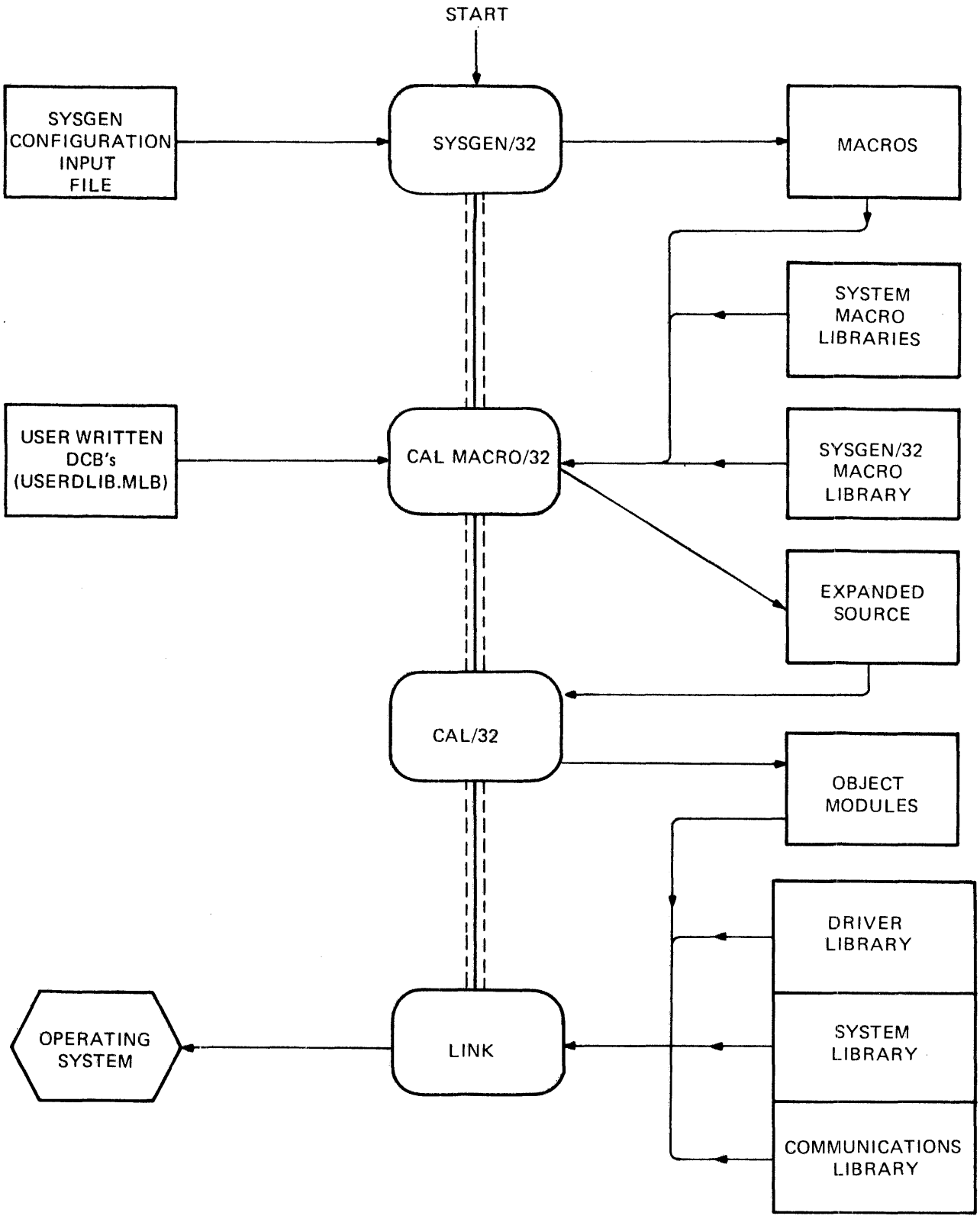


Figure 1-1 Generation of an Operating System Using Sysgen/32

As shown in Figure 1-1, the system generation process involves four general steps:

1. A configuration input file is created and processed via the Sysgen/32 program, resulting in a set of macro calls.

2. The macro calls are expanded using CAL Macro/32.

3. The expanded macros are assembled using CAL/32, resulting in object modules.

4. The object modules are linked using OS/32 Link to yield an operating system.

The user has the option to perform these steps in a single process, by using a command substitution system (CSS) procedure called system generation (SYSGEN), and executing each program in the overall procedure.

1.2 CREATING AN OPERATING SYSTEM USING THE SYSTEM GENERATION (SYSGEN) COMMAND SUBSTITUTION SYSTEM (CSS)

The SYSGEN CSS can be used to create an operating system with minimal user interaction. The user creates the sysgen configuration input file and passes the filename and other optional parameters to the CSS.

The macro generation, expansion, assembly, and linkage steps are performed automatically according to the SYSGEN CSS instructions. Figure 1-2 details the components of the SYSGEN CSS.

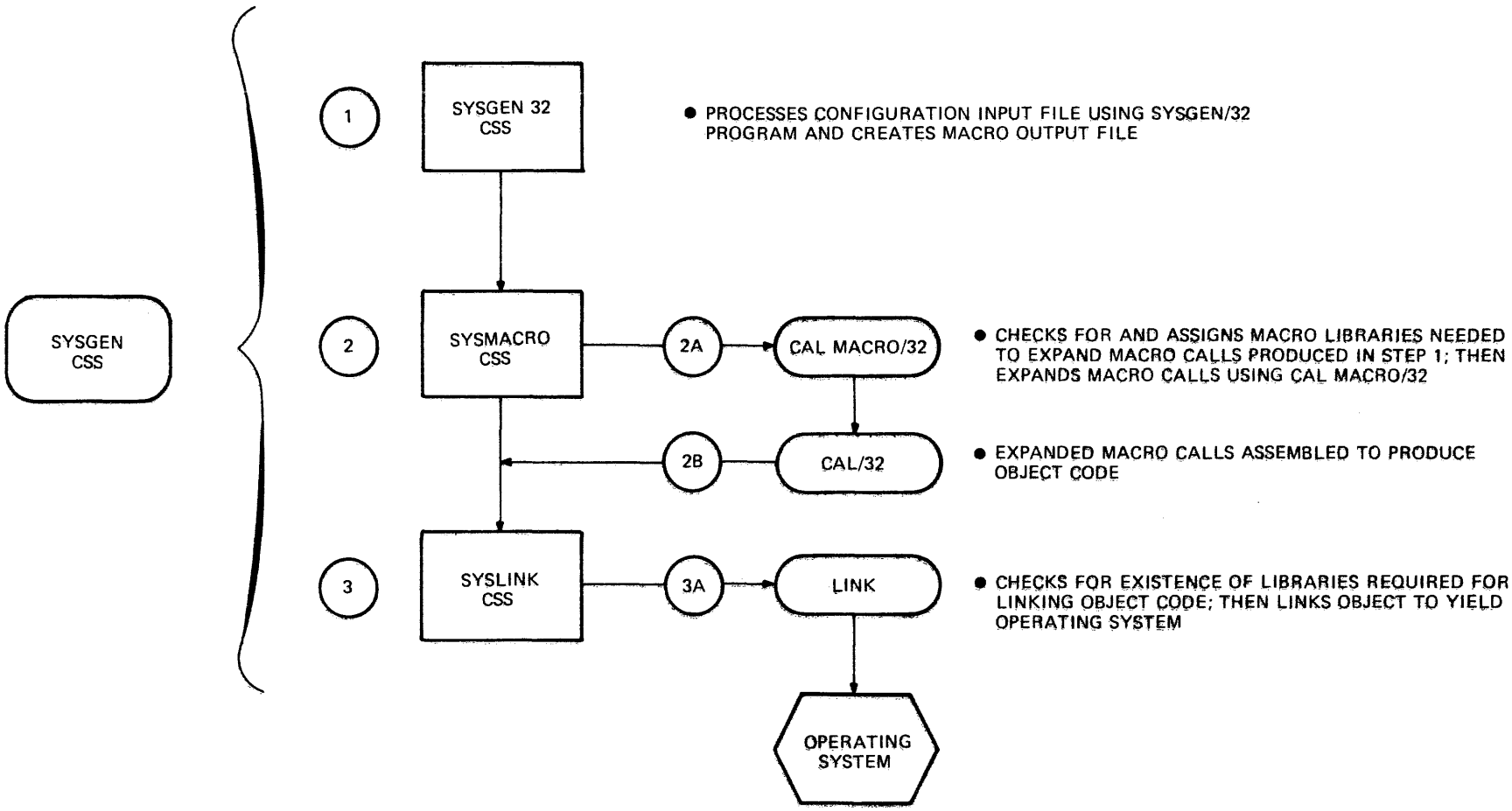


Figure 1-2 Generation of an Operating System Using the SYSGEN CSS

1.2.1 Starting the SYSGEN CSS

The following format is used when starting the SYSGEN CSS.

Format:

```
SYSGEN input filename [,segsize increment]  [,{library volume}]
                                             {user volume  }

    [,Macro and CAL listing flag]  [,file save flag]

    [,list filename]
```

Parameters:

input filename	is the 1- to 8-character name of the sysgen configuration input file. The CSS assumes a default extension of .SYS for the configuration input file. If the file specified does not exist, an error message is generated and the CSS will abort.
segsize increment	is a decimal number specifying the number of kilobytes of workspace required by the sysgen task. The default is 40kb.
library volume	is a 1- to 4-character name (with colon) of the disk volume containing the libraries used by CAL Macro/32 and Link during CSS execution. If this parameter is omitted, the user volume is the default.
Macro and CAL listing flag	This parameter determines what files will be printed in the list file. If this parameter is entered, all intermediate files are sent to the list file after the sysgen process is completed. If this parameter is omitted, only error messages are sent to the list file after the sysgen process is completed. Enter a YES to indicate that intermediate files are to be printed.

Example:

```
SYSGEN CONFIG1,10,M300:,M301:,PRINT1
                ,LIST1,,YES
```

This example initiates the SYSGEN CSS and passes the following information to the CSS:

- CONFIG1 is the configuration input fle. An extension of .SYS is assumed by the CSS.
- LIST1 is the list file for messages.
- 10 is the segment size increment.
- M300: is the library volume containing the libraries used by CAL Macro/32 and Link.
- M301: is the volume on which the new operating system will reside.
- PRINT1 is the file that will contain the CAL Macro/32 or CAL/32 list output for debugging purposes.
- YES flag indicates all intermediate files are not to be deleted.

file save flag

This parameter causes the CSS to save all intermediate files created during the sysgen process. If this parameter is omitted, all of the intermediate files created during the sysgen procedure are deleted. Enter a YES to indicate that intermediate files are to be saved.

Example:

```
SYSGEN CONFIG1,10,M300:,M301:,PRINT1
                    ,LIST1,,YES
```

list filename

is the file descriptor of the list file to which all messages are written. If this parameter is omitted, a default file with the input filename.PRT, is allocated.

Functional Details:

If an error occurs during the execution of the SYSGEN CSS, an error message is written to the console and the CSS is aborted. If the CSS reaches a successful completion, the following information is displayed to the console:

- The operating system map filename = (input filename) .LST or user-specified fd
- The operating system object filename = (input filename) .OBJ
- The operating system task filename = (output volume name + input filename) .OS

1.2.2 Components of the SYSGEN CSS

The SYSGEN CSS is comprised of three CSS modules:

- SYSGEN32 CSS,
- SYSMACRO CSS, and
- SYSLINK CSS.

These modules can be run independently, outside of the SYSGEN CSS procedure. However, when they are executed independently, the user must pass the appropriate parameters to each CSS. It is particularly useful to be able to execute the SYSLINK CSS routine independently, since this enables a previously linked operating system to be relinked to incorporate changes in system and driver library modules. The following sections detail the procedures for executing the SYSGEN32, SYSMACRO, and SYSLINK CSS routines independently.

1.2.2.1 Executing the SYSGEN32 CSS

The SYSGEN32 CSS executes the Sysgen/32 program which processes the sysgen configuration input file and generates macro calls.

Format:

SYSGEN32 input filename [,list filename] [,segsize increment]

Parameters:

input filename	is the 1- to 8-character name of the sysgen configuration input file. The CSS assumes an .SYS extension for the configuration input file. If the file specified does not exist, an error messge is generated and the CSS aborts.
list filename	is the file descriptor of the list file to which messages are written. If this parameter is omitted, a list file (input filename .LST) is allocated.
segsize increment	is a decimal number specifying the number of kilobytes of workspace required by the sysgen task. The default is 40kb.

Functional Details:

If the CSS encounters an error while executing (end of task code other than 0), an error message is generated and the CSS aborts. The list file should be checked for errors. If the CSS reaches a successful completion (end of task code = 0), the file containing the macro calls generated by the Sysgen/32 program will be contained in a file named:

(input filename).MAC

This file is used by the next CSS procedure, SYSMACRO.

1.2.2.2 Executing the SYSMACRO CSS

The SYSMACRO CSS takes the macro calls generated by the Sysgen/32 program, expands them using CAL Macro/32, and assembles the expanded source modules using CAL/32.

Format:

SYSMACRO macro output filename [,{library volume / user volume}]

[,delete files flag] [,listing flag] [,list filename]

Parameters:

macro output filename	is the 1- to 8-character name of the file containing the macro calls generated by the Sysgen/32 program. The CSS assumes an extension of .MAC. If the specified file does not exist, an error message is generated and the CSS will abort.
library volume	is the name (colon included) of the disk volume containing the libraries used by CAL Macro/32 during CSS execution. If this parameter is omitted, the user volume is the default.
delete files flag	means that intermediate files created during the sysgen process are to be saved. If this parameter is not entered, all intermediate files are deleted. If this parameter is not entered, all intermediate files are deleted.
listing flag	means a complete listing of macro expansion and assembly is desired. If this parameter is omitted only error messages are listed.
list filename	is the fd of the last file to which all messages are written. If this parameter is omitted, a default file with the name input filename.LST is allocated.

Functional Details:

If the CSS encounters an error (end of task code other than 0), an error message is generated and the CSS will abort.

If the CSS reaches a successful completion (end of task code = 0), the object module assembled by CAL/32 will be contained in a file named:

(macro output filename).OBJ

This file will be used by the next CSS routine, SYSLINK CSS.

1.2.2.3 Executing the SYSLINK CSS

The SYSLINK CSS takes the object modules assembled in the SYSMACRO CSS and links the object with the appropriate libraries to produce an operating system.

Format:

```
SYSLINK object filename [,map filename] [,{library volume}]
                                         [,{user volume }]

                                  [,{output volume}]
                                    {user volume }
```

Parameters:

object filename	is the 1- to 8-character name of the file containing the CAL produced object code generated during the SYSMACRO CSS. If the specified file does not exist, an error message is generated and the CSS is aborted.
map filename	is the file descriptor of a file to which the operating system map is appended. If this parameter is omitted, the CSS will append the map to a file called (CAL object filename) .LST, allocating it, if necessary.
library volume	is the name (colon included) of the volume where the system and driver libraries reside. If this parameter is omitted, the user volume is the default.
output volume	is the name (colon included) of the disk where the newly created operating system will reside. If this parameter is omitted, the default is the user volume.

Functional Details:

If an error occurs during execution of the SYSLINK CSS (end of task code other than 0), an error message is generated and the CSS is aborted.

If this CSS reaches a successful completion, the following information is displayed:

```
Operating system map filename = (object filename).LST or a
                                user-specified fd

Operating system object file = (object filename).OBJ

Operating system task file = (output volume name + object
                             filename).OS
```

1.3 USING THE SYSGEN/32 PROGRAM

The Sysgen/32 program enables a user to create and/or process a sysgen configuration input file to generate macro calls. The option to process a previously generated configuration input file or interactively create and process a new configuration input file is available.

The Sysgen/32 program runs in batch and interactive environments. In a batch environment, the program processes the configuration input file without user interaction. In an interactive environment, the user can create the configuration input file directly from the command device and correct run-time errors as they occur.

1.3.1 Loading and Starting the Sysgen/32 Program

The following commands are used to load and start the Sysgen/32 program.

| LOAD |

1.3.1.1 LOAD Command

The system LOAD command loads Sysgen/32 into memory.

Format:

```
LOAD SYSGEN32 [,segsize increment]
```

Functional Details:

segsize increment	is an optional parameter that specifies the workspace required by the sysgen task. This increment must be large enough to accommodate processing of all the configured devices. The default is 40kb.
	If the segsize is not large enough, the message:

```
LINE____ADDR____STACK OVERFLOW
TASK PAUSED
```

will be displayed. The task should then be cancelled and reloaded with a larger increment.

1.3.1.2 START Command

The system START command begins execution of the Sysgen/32 program. All parameters are optional. The INPUT and OUTPUT parameters specify the configuration input file and the macro output file, respectively. The LIST parameter specifies the list device or file. The COMMAND parameter specifies the command input device and establishes whether the Sysgen/32 program will execute in a batch or interactive environment.

Format:

START [,INPUT=fd_1] [,OUTPUT=fd_2] [,COMMAND=fd_3] [,LIST=fd_4]

Parameters:

INPUT=	fd_1 specifies the configuration input file to be processed by the Sysgen/32 program.
OUTPUT=	fd_2 specifies the output file to which macro calls generated by Sysgen/32 will be written. The output file cannot be an existing file.
COMMAND=	fd_3 specifies the command input device. This parameter establishes whether the environment is batch or interactive. If an interactive device is specified, the environment is interactive. CON: is the default for a command device.
LIST=	fd_4 specifies the device or file to which all list output and messages generated during sysgen execution are sent. If the list parameter specifies a file, the file must already exist. PR: is the default list device.

Functional Details:

If the START command is entered with both INPUT and OUTPUT parameters specified and the command device is omitted, the Sysgen/32 program will immediately process the configuration input file and assume a batch environment unless the input file is empty.

If the specified input file is empty, the program will display the following message:

```
READY FOR CONFIGURATION INPUT
```

The program then waits for the user to interactively input configuration input statements that will be used to create the configuration input file.

If the START command is entered without the INPUT and OUTPUT parameters, the Sysgen/32 commands described in the following sections can be used to: create a sysgen input file in a conversational mode (CONVERSATIONAL), specify the configuration input file (INPUT), specify the macro output file (OUTPUT), modify the sysgen configuration input file (EDIT), and initiate processing of the sysgen configuration input file (PROCESS). The HELP command is also available as a user aid.

1.4 SYSGEN/32 COMMANDS

The following Sysgen/32 commands are available:

- INPUT
- OUTPUT
- PROCESS
- EDIT
- CONVERSATIONAL
- HELP
- PAUSE
- END

1.4.1 INPUT Command

The INPUT command specifies a configuration input file to be used as input to the Sysgen/32 program. This command is used if the INPUT parameter was not specified with the START command.

Format:

```
INPUT fd
```

Parameter:

fd	is the file descriptor of a configuration input file to be processed by the Sysgen/32 program.

Functional Details:

If the specified input file is empty, and the command device is an interactive device, the input file can be created either by entering configuration statements directly from the command device after the PROCESS command is entered, or conversationally. See Section 1.4.5.

| OUTPUT |

1.4.2 OUTPUT Command

The OUTPUT command specifies an output file to receive the macro calls generated by Sysgen/32. This command is used if the OUTPUT parameter was not specified with the START command.

Format:

OUTPUT fd

Parameter:

fd	is the file descriptor of the file that receives the Sysgen/32 generated macro calls.

Functional Details:

The specified output file must be an empty, nonexistent file. If the OUTPUT command is entered with the name of an existing file, an error is generated.

1.4.3 PROCESS Command

The PROCESS command initiates processing of the sysgen configuration input file.

Format:

PROCESS

Functional Details:

Do not use the PROCESS command if both a nonempty input file and an output file were specified as parameters of the START command but no command device was entered.

1.4.4 EDIT Command

The EDIT command makes the entire OS/32 EDIT command repertoire available to the user. This command is available during program execution in interactive mode only.

Format:

```
EDIT
```

Functional Details:

All of the OS/32 EDIT commands can be used to correct or modify the configuration input file. When the changes are made and the file is saved, the END or DONE command terminates the edit session and returns control to the Sysgen/32 program.

Example:

```
>INPUT  SYS1.SYS                 } specify input and output
>OUTPUT  SYS1.MAC                } files
>PROCESS

ILLEGAL VALUE     3280           } error encountered
READY FOR SYSGEN COMMANDS        } sysgen program enters command
                                   input mode
>EDIT                            )
READY FOR EDIT COMMANDS          (
>GET SYS1.SYS                    (
>OPT LIST=CON:                   } enter edit mode and correct
>T/3280/                         ( error
2 CPU 3280                       (
>SU/3280/3230/                   (
>DONE                            )
WORKFILE = FIXD:SYS1.000
RENUMBERED INPUT FILE AVAILABLE FIXD:SYS1.SYS
READY FOR SYSGEN COMMANDS        } resume Sysgen/32 processing
>PROCESS                         }
```

1.4.5 CONVERSATIONAL Command

The CONVERSATIONAL command initiates a sysgen prompt and user response session in an interactive environment. This prompt and response session is a user aid in creating a configuration input file.

Format:

CONVERSATIONAL

Functional Details:

The Sysgen/32 program issues interactive prompts relating to the hardware configuration and software options. The possible responses, in parentheses, and the defaults, in brackets, are displayed after each prompt where applicable. Defaults are taken if CR is depressed for all but device prompts. A response must be entered for all device prompts.

The program will create sysgen configuration statements based on the responses to the prompts. Acceptable statements will be written to the specified input file. Nonacceptable statements or responses will cause the program to generate an error message and to reissue the appropriate prompt or prompts until an acceptable response is entered.

If the CONVERSATIONAL command is entered before an input file was defined via the INPUT command or INPUT parameter of the START command, the following message is displayed:

INPUT MUST BE ENTERED

When in CONVERSATIONAL mode, the user can access the Help file by entering a question mark (?) in response to a prompt. The question mark causes the Help file to display pertinent information about a configuration statement or parameter, and briefly describes its use. The program then reissues the prompt sequence for the configuration statement. After all prompts have been issued, the following message is displayed:

CONVERSATIONAL PROCESSING COMPLETE

The PROCESS command can then be entered to start processing of the newly created input file. Certain errors will not be detected during the conversational session, but will be detected in the processing phase. These errors can be corrected using the EDIT command. See Section 1.4.4.

Example:

```
 PROCESSOR MODEL (7/32,8/32,3210,3220,3230,3240,3250) [3220]
>?
 CPU:  SPECIFIES THE 32-BIT PROCESSOR MODEL.

        COMMAND FORMAT:  CPU [N][,R]


                  N IS THE MODEL NUMBER OF THE PROCESSOR.

                    THE VALUE FOR N MAY BE:
                           7/32, 8/32, 3210, 3220, 3230, 3240,
                           3250.

                  R SPECIFIES THE NUMBER OF REGISTER SETS,
                    2 OR 8.


                  THE DEFAULT VALUES FOR THE CPU COMMAND ARE
                    3220 WITH 8 REGISTER SETS.
 PROCESSOR MODEL (7/32,8/32,3210,3220,3230,3240,3250) [3220]
>CR
 NUMBER OF REGISTER SETS (2 OR 8) [8]
>CR
 O/S VERSION (8 CHAR. ALPHANUMERIC STRING) [BLANKS]
```

1.4.6 HELP Command

The HELP command accesses the Help file and displays sysgen commands and configuration statements with a brief description of each and how to use it.

Format:

```
HELP [name]
     [ * ]
```

Parameters:

name	specifies the name of a specific sysgen statement or command to be displayed.
*	specifies that all sysgen statements and commands be displayed.

Functional Details:

If the HELP command is entered without a parameter, the following message is displayed:

```
FOR A LIST OF COMMANDS TYPE HELP *
FOR HELP ON ANY COMMAND MNEMONIC, TYPE HELP MNEMONIC
```

Example 1:

```
>HELP *
 I(NPUT)          O(UTPUT)       CONV(ERSATIONAL)   ED(IT)
 PA(USE)          PR(OCESS)      END                ACC(OUNTING)
 B(ACKGROUND)     CL(OCK)        CM(DLEN)           CP(U)
 CS(S)            DA(TE)         DEVA(DS)           DEVI(CES)
 DIR(ECTORY)      DI(SCBLOCK)    DS(YS)             ENDC
 ERRORR(EC)       F(LOAT)        IOC(LASS)          IL(EVEL)
 INT(ERCEPT)      IR(EADER)      IT(AM)             J(OURNAL)
 L(OGLEN)         LPU            MAXAPU             MAX(TASK)
 MCON(FIG)        MEMCHECK       ME(MORY)           MO(DULE)
 NOSE(G)          TG(D)          QU(EUE)            R(OLL)
 SP(OOL)          SPL(32)        ST(ARTUP)          SST(ABLE)
 TC(OM)           TE(MP)         VER(SION)          V(OLUME)
 COOR(DINATION)   COPY
 For HELP on any of the above command mnemonics, TYPE HELP
 mnemonic.
```

Example 2:

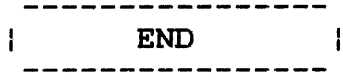
```
>HELP ACC
 ACCOUNTING: INCLUDES ACCOUNTING SUPPORT.

       COMMAND FORMAT:  ACCOUNTING [{N}] [,NOFILEACCOUNTING]

           N = DECIMAL VALUE FROM 2 THROUGH 32, SPECIFYING
               THE MAXIMUM NUMBER OF ACCOUNTING CLASSES.
               DEFAULT FOR N = 4.

           NO FILE ACCOUNTING SPECIFIES THAT FILE ACCOUNTING
           SUPPORT IS EXCLUDED.
```

1.4.7 PAUSE Command

The PAUSE command pauses execution of the Sysgen/32 program and returns control to the operating system.

Format:

PAUSE



1.4.8 END Command

The END command ends the Sysgen/32 program.

Format:

```
END
```

Functional Details:

An end of task code other than zero indicates that an error occurred during Sysgen/32 execution in a batch environment.

CHAPTER 2
SYSGEN/32 CONFIGURATION STATEMENTS

2.1 INTRODUCTION

Sysgen configuration statements make up the configuration input file that defines the hardware and software features of the target operating system. The sysgen configuration statements are:

ACCOUNTING	ENDC	MEMCHECK
BACKGROUND	ERRORREC	MEMORY
CLOCK	FLOAT	MODULE...ENDM
CMDLEN	ILEVEL	NOSEG
COORDINATION	INTERCEPT	QUEUE
COPY...ENDCOPY	IOCLASS	ROLL
CPU	IREADER	SPOOL
CSS	ITAM	SPL32
DATE	JOURNAL	SSTABLE
DEVADS	LOGLEN	STARTUP...ENDS
DEVICES...ENDD	LPU	TCOM
DIRECTORY	MAXAPU	TEMP
DISCBLOCK	MAXTASK	TGD
DSYS	MCONFIG	VERSION
		VOLUME

Certain statements may span more than one line. A comma as the last nonblank character indicates that the statement is continued on the next line.

Any characters following an asterisk (*) are treated as comments. If an asterisk is in column 1, the entire line is treated as a comment line. Comment lines are copied to the list device.

2.2 FILE TYPES

In addition to indexed files and contiguous files, there are two new file types added to the file manager for the R06.2 release: nonbuffered indexed and extendable contiguous files.

2.2.1 Nonbuffered Indexed Files

Nonbuffered indexed files are open-ended files composed of a chain of indexed blocks and a series of data blocks. The index blocks are linked together and contain fullword pointers to one or more data blocks, depending on the number of blocks in the file.

The primary difference between nonbuffered indexed files and indexed files is that in nonbuffered indexed files, data is moved directly between the user buffer and the disk, avoiding the central processing unit (CPU) overhead and system space memory requirements of buffered indexed files. As a result, each logical record starts on a physical sector boundary, and some unused space might exist between the logical records.

Nonbuffered indexed files support ASCII, binary, and image operations. Also supported are test and set, forward space record, and backspace record operations.

See the OS/32 Application Level Programmer Reference Manual for details of nonbuffered indexed files.

2.2.2 Extendable Contiguous Files

Extendable contiguous files have essentially the same features as contiguous files with one important exception: they are extendable up to the capacity limit of the disk. By making suitable choices of block sizes, random access performance of these files will be equivalent to that of contiguous files.

See the OS/32 Application Level Programmer Reference Manual for details of extendable contiguous files.

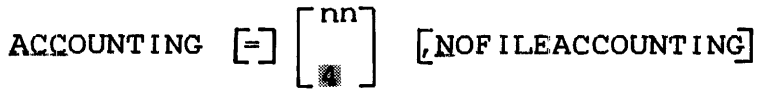
2.3 SYSTEM GENERATION (SYSGEN) CONFIGURATION STATEMENTS

The following sections alphabetically present and describe in detail each sysgen configuration statement.

2.3.1 ACCOUNTING Statement

The ACCOUNTING statement specifies that accounting support is included in the system.

Format:



Parameters:

nn	is a decimal number from 2 through 32 specifying the maximum number of device or file classes to be supported by the accounting facility. The minimum number of classes must be 2, because two classes are needed to handle the four file types. If this parameter is omitted, 4 is the default.
NOFILEACCOUNTING	prevents logging of accounting data when files are deleted or renamed.

Functional Details:

Each device or file class supported by the accounting facility must be defined by the IOCLASS statement. Each input/output (I/O) class supported by the accounting facility occupies 12 bytes in the user task control block (TCB) and 4 bytes in the multi-terminal monitor (MTM) for each MTM user of the accounting facility. If the ACCOUNTING statement is omitted, accounting support is not included in the system.

See the IOCLASS statement or IOCLASS parameter of the device statement for file or device classes.

The NOFILEACCOUNTING option allows the user to reduce the size of the account transaction file (ATF).

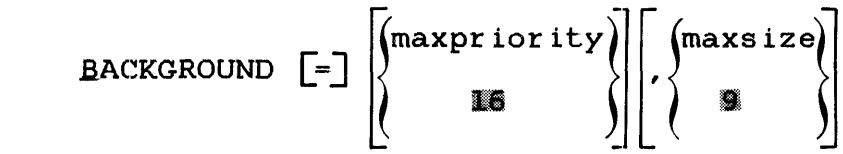
NOTE

The maximum number of I/O classes that is currently processed by the accounting reporting utility is 10. See the OS/32 System Support Utilities Reference Manual.

2.3.2 BACKGROUND Statement

The BACKGROUND statement establishes the maximum priority and maximum amount of system space for a background task in the system.

Format:



Parameters:

maxpriority	is a decimal value from 11 through 248 specifying the highest priority at which a background task can run. If this parameter is omitted, 16 is the default.
maxsize	is a decimal value in increments of 0.25kb specifying the largest system space area in which system data structures i.e., file control block (FCB), task queue entry (TQE), TCB of a background task can be stored. If this parameter is omitted, 9 is the default.

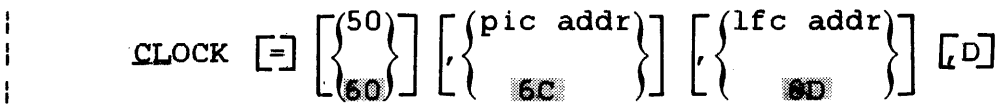
Functional Details:

If this statement is omitted, the default parameters are assumed.

2.3.3 CLOCK Statement

The CLOCK statement sets the line frequency of the clock and device addresses of both the precision interval clock (PIC) and line frequency clock (LFC) for the system. Together, these clocks are called the universal clock module.

Format:



Parameters:

50	is a hexadecimal number indicating the line frequency value. If this parameter is omitted, 60 is the default.
pic addr	is a hexadecimal number specifying the physical device address of the PIC. The user-specified address must not be greater than the maximum device address specified by the DEVADS statement. If this parameter is omitted, 6C is the default.
lfc addr	is a hexadecimal number specifying the physical device address of the LFC. The user-specified address must not be greater than the maximum device address specified by the DEVADS statement. If this parameter is omitted, 6D is the default.
D	is the alphabetic character D specifying that the date and time are to be displayed on the display panel. This parameter should be specified only if the CPU statement indicates that the target system is a Perkin-Elmer Model 7/32 or 8/32 processor.

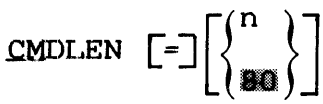
Functional Details:

If this statement is omitted, the default parameters are assumed.

2.3.4 CMDLEN Statement

The CMDLEN statement specifies the maximum length of the system command buffer or buffers if command substitution system (CSS) is supported in the system.

Format:



Parameters:

n	is a decimal number from 32 through 1024 specifying the number of bytes in the system's command buffers. If this parameter is omitted, 80 is the default.

Functional Details:

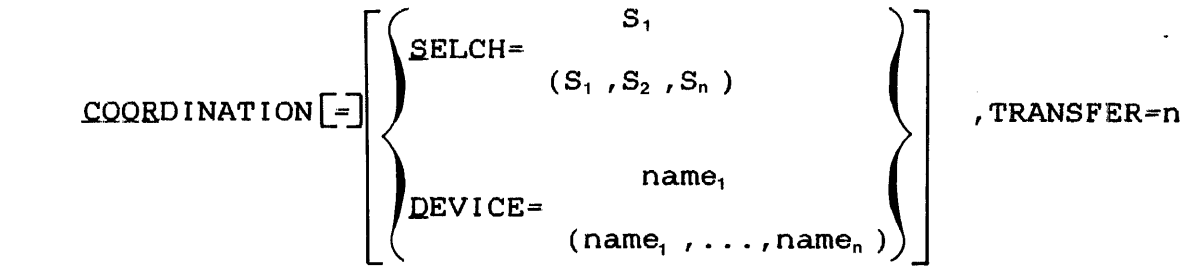
If CSS is supported, or commands are read from devices or files with record lengths greater than 80, a larger command buffer length must be specified. If CSS is supported, parameter substitution causes a small input line length to be expanded to a greater length that must be less than or equal to the system command buffer length.

If this statement is omitted, 80 is the default.

2.3.5 COORDINATION Statement

The COORDINATION statement establishes the maximum number of simultaneous data transfers allowed on the specified selector channels (SELCH). This statement must be entered if the number of SELCHs is greater than the number of simultaneous data transfers allowed in the target system.

Format:



Parameters:

SELCH= S_1-S_n specifies the SELCH to be coordinated.

DEVICE= $name_1$-$name_n$ specifies the devices requiring coordination.

TRANSFER= n specifies the maximum number of simultaneous transfers. If 1 is specified, the resulting extended direct memory access (EDMA) node functions in a way similar to a supernode (the main coordination node that coordinates the other nodes and their attached devices), providing coordination only, without impact on the transfer rate. Table 2-1 provides recommended numbers of simultaneous transfers for the various Perkin-Elmer 32-bit processors.

TABLE 2-1 RECOMMENDED NUMBER OF SIMULTANEOUS DIRECT MEMORY ACCESS (DMA) TRANSFERS

NUMBER OF TRANSFERS	SYSTEM
1	Model 7/32
1	Model 8/32 with one or more nonbuffered selector channels; extended selector channel (ESELCH)
4	Model 8/32 with buffered selector channels (BSELCH)
4	Models 3210, 3220, and 3230 with buffered selector channels (BSELCH)
*	Models 3240, 3250, and Model 3200MPS

* This value is dependent on the hardware configuration.

Functional Details:

The COORDINATION statement should be used if the number of SELCHs in a system with MSM80 or MSM300 disks or 6250 bits per inch (bpi) magnetic tape drives is greater than the number of simultaneous data transfers allowed in the system.

One COORDINATION statement must be entered for every group of SELCHs or devices requiring coordination.

| COPY |

2.3.6 COPY Statement

The COPY statement copies data into the macro output file. Statements are copied to the file in the format in which they are read until the ENDCOPY statement is encountered in column 1.

Format:

```
COPY
[line1]
   .
   .
   .
[linen]
ENDCOPY
```

Parameter:

line	specifies data to be copied into the macro output file.

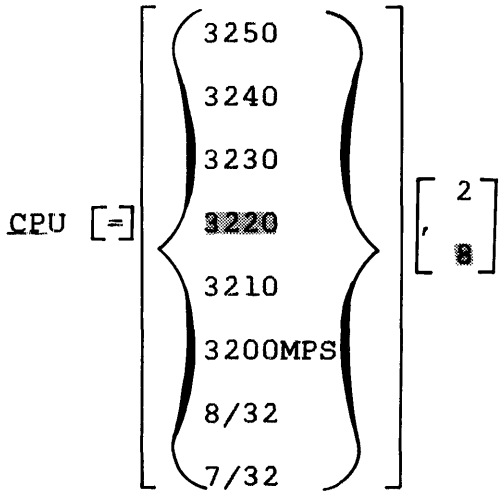
Functional Details:

The COPY statement is useful when a user wants to include user-specified macros in the generated macro file.

2.3.7 CPU Statement

The central processing unit (CPU) statement specifies the Perkin-Elmer 32-bit processor for which the system is being configured.

Format:



Parameters:

3250 3240 3230 3220 3210 3200MPS 8/32 7/32	specify the target system processor model number. If this parameter is omitted, 3220 is the default. 3200MPS is valid for the multiprocessor system (Model 3200MPS) only.
2 8	are decimal numbers that specify the number of register sets supported by the hardware. The Perkin-Elmer Models 3200MPS, 3210, 3220, 3230, 3240, 3250, and 8/32 support eight register sets. If this parameter is omitted for the Model 7/32 processor, 2 is the default. If this parameter is omitted for all other processors, 8 is the default.

Functional Details:

If this statement is omitted, the default parameters are assumed.

2.3.8 CSS Statement

The CSS statement specifies the maximum number of nested CSS calls allowed in one routine for the target system.

Format:

CSS [=] [n / 5]

Parameter:

n	is a decimal number from 1 through 249 specifying the maximum number of nested CSS calls in one routine; i.e., the number of routines that can be active at one time. If CSS is not supported, 1 must be specified. If this parameter is omitted, 5 is the default.

Functional Details:

The operating system allocates the amount of memory required for a CSS by the following equation:

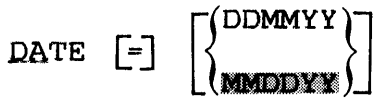
MEMORY = CMDLEN n x CSS n

If this statement is omitted, the default is 5.

2.3.9 DATE Statement

The DATE statement specifies the format in which the current date is expressed for the system.

Format:



Parameters:

DDMMYY	is day-month-year format. If this parameter is omitted, MMDDYY is the default.
MMDDYY	is month-day-year format.

2.3.10 DEVADS Statement

The DEVADS statement specifies the maximum number of devices, maximum device address, maximum number of bytes occupied by the interrupt service pointer (ISP) table, and the starting address of the memory access controller (MAC) or SSTABLE in the system.

Format:

DEVADS [=] [{3 / 1 / 0}]

Parameters:

3 1 0	are decimal numbers specifying a table entry containing established maximum values. If this parameter is not specified, 0 is the default. The established values specified in the DEVADS statement must correspond to the hardware configuration. Table 2-2 lists the maximum values associated with each DEVADS statement.

TABLE 2-2 DEVADS STATEMENT VALUES

ENTRY NUMBER	NUMBER OF DEVICES	MAXIMUM DEVICE ADDRESS	NUMBER OF BYTES IN ISP	MAC,MAT, OR SST STARTING ADDRESS
3	*1023	X'3FF'	2048	X'900'
1	511	X'1FF'	1024	X'500'
0	255	X'0FF'	512	X'300'

* This number refers to the number of device addresses supported by the operating system.

2.3.11 DEVICES...ENDD Statements

The DEVICES...ENDD statements are used to delimit the device descriptor statements. Every device to be configured in the target system must be defined by a device descriptor statement.

Each device descriptor statement requires three parameters, the device name specification, the device address, and the device code. These three parameters must be entered in the order described. Optional parameters describing other device details can be entered in any order.

Format:

```
DEVICES
   dev name:,dev address,dev dcode [,CLOCK={XA|XB|XC|XD}] [,CM=n]
      [,CONSOLE] [,CONTROLLER=n] [,DISC] [,DUAL] [,EOV] [,ILEVEL=n]
      [,INTIMER={n|10}] [,IOCLASS={n|global I/O class}] [,IOLIMIT={n|10}]
      [,LEADCOUNT=n] [,LINESTATUS=n] [,MAXFRAMES=n]
      [,MAXWRITEBUFF={n|1024}] [,MINREADBUFF={n|64}] [,MTO=n] [,N2={n|10}]
      [,NCS={n|none}] [,NODISC] [,NONSHARED] [,OUTIMER={n|10}]
      [,PADCOUNT=n] [,POLLDELAY=n] [,POLLIMIT=n] [,POLLTIME={n|0}]
      [,QUEUE=name] [,READCONTROL=n] [,RECLEN=n]
      [,RESPONSETIME={n|7FFF.3}] [,SCREENTIME=n] [,SELCH=n] [,SIZE=n]
      [,SPINDLE=n] [,SSA=name] [,TO2={n|30}] [,TRANSLATE=name]
      [,USCI=n] [,USCO=n] [,USER=(uparm[=parameter])] [,WAKEUP={n|30}]
      [,WRITECONTROL=n] [,XDCOD=n]
   .
   .
   .
ENDD
```

Parameters:

dev name	is a 1- to 4-character device mnemonic specifying a unique device name. The first character must be alphabetic, the remaining characters, alphanumeric.
dev address	is a hexadecimal number specifying the physical address of a device. This number must not be greater than the maximum device address specified in the DEVADS statement. For pseudo devices, specify 0.
dev dcode	is a decimal number ranging from 16 through 254 specifying the device code. If the system is to be configured with devices defined as pseudo output devices, spooling must be supported. A pseudo device is a virtual device that establishes a correlation between a user and a physical output device. Each pseudo device is logically linked to a physical output device so many users or tasks can output to the same logical device simultaneously. If pseudo device PR1: is logically linked to PRT1: and PRT2:, an assignment to PR1: will eventually generate output on either PRT1: or PRT2:.
	If the pseudo spooling output device is chosen, the extended device code (XDCOD=), the record length (RECLEN=), and the size (SIZE=) parameters can be optionally chosen.

Example:

```
PR1:, 0, 1, XDCOD=114, RECLEN=80, SIZE=56
```

*CLOCK= XA specifies the A clock
XB specifies the B clock
XC specifies the C clock
XD specifies the D clock

The data communications clock configuration must be specified with the XDCOD parameter.

CM= n is a hexadecimal number that specifies the channel manager device address. This parameter specifies a channel manager supported device.

CONSOLE identifies the device as the console device.

CONTROLLER= n is a 2-digit hexadecimal number specifying the controller address.

DISC device specifies OS/32 directory support. This is the default parameter for disk devices only.

DUAL specifies that dual port option is in effect for MSM disks.

EOV indicates that end of volume (EOV) labels on magnetic tapes are to be processed. If this parameter is not specified, EOV labels are not supported.

ILEVEL= n is a decimal number from 0 through 3 specifying the hardware interrupt level of each individual device. If this parameter is omitted, the global interrupt level (see the ILEVEL statement) is assumed for this device.

INTIMER= n specifies in seconds the input error timer used at the SVC 15 level. The default is 10 seconds.

IOCLASS= n is a decimal number from 0 through 31 specifying the I/O class of each individual device. This number must not be greater than the maximum number of device or file classes specified in the ACCOUNTING statement. If this parameter is omitted, the global IOCLASS is assumed.

IOLIMIT= n specifies the number of retries that will be attempted for an I/O error. The default is 10 retries.

*LEADCOUNT= n is a decimal number specifying the number of leading synchronous characters within a unit of data.

LINESTATUS=	n defines the static line status (SLS) as used in ZDLC. This parameter also defines the subprotocol that ZDLC wll use on the communications line. Options include normal response mode, asynchronous response mode, symmetrical response mode, LAP, LAPB, etc. All protocols may not be supported.
MAXFRAMES=	n specifies the maximum number of unacknowledged frames that can be outstanding in ZDLC. The maximum possible values are 7 for normal control mode and 127 for extended control mode.
MAXWRITEBUFF=	n specifies the maximum number of bytes that is the size of a write buffer that can be received or transmitted. The default is 1024 bytes.
MINREADBUFF=	n specifies the minimum number of bytes required for a read buffer. The default is 64 bytes.
MTO=	n specifies the number of tenths of seconds that must expire before devices are repolled if there were no positive responses to the previous polls. If this parameter is not specified, devices are not repolled.
N2=	n specifies the N2 count as defined in the X.25 specifications and indicates the number of times an information frame can be retransmitted following a T1 timeout or similiar error. The default is 10 times.
NCS	n is a hexadecimal number that defines the numbered and information control commands that can be used on a ZDLC line. The default is E8E8.
NODISC	specifies no OS/32 directory support for a device.
NONSHARED	specifies that an existing shared-busy condition for the device should be ignored.
OUTTIMER=	n specifies the output error timer used at the SVC 15 level. The default is 10 seconds.
*PADCOUNT=	n is a decimal number specifying the length of a pad sequence within a unit of data. For asynchronous devices, this parameter specifies the length of the carriage return/line feed sequence that is appended at the end of the user buffer. For synchronous devices, this parameter is for the number of bits (XFF) appended to the end of the write transmission.

POLLDELAY= n specifies the amount of time certain data communications protocols take to go into a delay following an unfruitful polling cycle. If this parameter is not specified, there is no delay.

*POLLIMIT= n is a decimal number specifying the limit of polling retries allowed on a line.

POLLTIME= n specifies in seconds the time allowed for a response following the transmission of a poll sequence. The default is 30 units of 100 milliseconds (3 seconds).

QUEUE= name is a 1- to 8-character alphanumeric string indicating the name of an alternate disk I/O scheduling routine.

*READCONTROL= n is a hexadecimal or decimal mask specifying read control characters. If specified in hexadecimal, the value must be preceded by an X. Setting bits in this field can enable the special character handling required by the terminal. Changing this value enables specification of which special characters can be used to terminate a line, for a line delete, or for a backspace. See Table 2-3 for a discription of options.

TABLE 2-3 SPECIAL ASYNCHRONOUS CHARACTERS

TYPE	CHARACTER	ASCII	MEANING	READ MASK	WRITE MASK
Termination characters	CR	X'0D'	Carriage Return	X'8000'	X'8000'
	ETX	X'03'	End of Text (CTRL C)	X'4000'	X'4000'
	EOT	X'04'	End of Transmission (CTRL D)	X'2000'	X'2000'
	User defined		Terminate Read/ Write	X'0200'	X'0200'
	Any enabled line delete character		Terminate Read on Line Delete	X'0100'	

TABLE 2-3 SPECIAL ASYNCHRONOUS CHARACTERS (Continued)

TYPE	CHARACTER	ASCII	MEANING	READ MASK	WRITE MASK
Back-space	BS	X'08'	Backspace (CTRL H)	X'0080	
	<--	X'5F'	Back Arrow or Underscore Shift 0)	X'0040'	
	User defined	---		X'0010'	
Line Delete	#	23	Number sign	X'0108'	
	User defined			X'0102'	
	NAK or	15	NAK (CTRL-U)	X'0101'	
	CAN	18	CANCEL (CTRL-X)	X'0101'	
Control	DC1, DC2	11,12	Carousel/Printer (START)		X'0400'
	DC3, DC4	13,14	Buffer Controls (STOP)		X'0400'
Break	BREAK		Break fulfills prepare		X'0001'
			Do not begin write if break status present. Return break error.		X'0010'
	ESC	X'1B'	Allow Escape to break write		X'0008'

RECLEN= n specifies the physical record length of a device.

*RESPONSETIME= n specifies in seconds the amount of response time to a nonscreen read. For multi-drop terminals involving a microcomputer response, this should be a short time. For point-to-point terminals involving human response time, the amount of time should be longer.

The defaults are:

DCBs 156 and 157	7FFF seconds
DCB 158	3 seconds

SCREENTIME= n is a decimal or hexadecimal number specifying the amount of time required to read a full screen of data. This parameter is used for error recovery purposes. If the time allotted is not large enough, an I/O could fail in the middle of a screen read. If too much time is allotted, there could be excessive error recovery time expended. The recommended times are:

For DCBs 156 and 157	25 seconds
For DCB 158	20 seconds

SELCH= n is a 2-digit hexadecimal number specifying the selector channel address.

SIZE= n specifies the page size for pseudo devices.

SPINDLE= n is a decimal number from 0 through 3 specifying the floppy disk spindle number.

SSA= name specifies the secondary station address polling address generated for a ZDLC station and applies only to stations defined at sysgen. Additional stations can be dynamically generated later. The recommended polling addresses are:

For DCBs 181 and 183	01
For DCB 186	01 for the first station and 03 for the second.

TO2= n is a hexadecimal number that specifies T1 timeout specified in the X.25 protocol. This parameter indicates the time that can be allotted for a response after transmitting an information frame. The default is 30 seconds.

TRANSLATE= name specifies a 1- to 8-character alphanumeric name of the translation table used for the device.

USCI= n specifies a hexidecimal 32-bit mask that defines the unnumbered protocol commands used with the ZDLC protocol. This parameter defines the input commands accepted on the line. See the USCO parameter for the default fields of this parameter.

USCO= n specifies a hexadecimal 32-bit mask that defines the unnumbered protocol commands used within the ZDLC protocol. This parameter defines the output commands that can be sent on the line.

The default for these fields differs depending upon the subprotocol defined by the LINESTATUS parameter.

Example:

Normal Response Mode, Primary, Extended Control

```
UCSO = 00800010
UCSI = 10884000
```

Normal Response Mode, Secondary, Extended Control

```
UCSO = 10884000
UCSI = 00800010
```

Normal Response Mode, Primary, Normal Control

```
UCSO = 00808000
UCSI = 10884000
```

Normal Response Mode, Secondary, Normal Control

```
UCSO = 10884000
UCSI = 00808000
```

Asynchronous Response Mode, Primary, Extended Control

```
UCSO = 00904000
UCSI = 10884000
```

Asynchronous Response Mode, Secondary, Extended Control

```
UCSO = 10884000
UCSI = 00904000
```

Asynchronous Response Mode, Primary, Normal Control

UCSO = 10804000
UCSI = 10884000

Asynchronous Response Mode, Secondary, Normal Control

UCSO = 10884000
UCSI = 10804000

Symetrical Response Mode, Extended Control

UCSO = 10984000
UCSI = 10984000

Symetrical Response Mode, Normal Control

UCSO = 10884000
UCSI = 10884000

LAP Response Mode, Extended Control

UCSO = 10984000
UCSI = 10984000

LAP Response Mode, Normal Control

UCSO = 10884000
UCSI = 10884000

LAPB Response Mode, Extended Control

UCSO = 10894000
UCSI = 10894000

LAPB Response Mode, Normal Control

UCSO = 11884000
UCSI = 11884000

USER= uparm is a user defined parameter of up to seven characters that is defined in the device control block (DCB) macro definition.

Parameter is a maximum of 30 characters and must be preceded by the 'equal to' sign (=). Multiple user statements are allowed.

This option allows a user to have Sysgen/32 pass a user defined macro parameter to the .MAC file. The user parameter is written to the macro call first, allowing positional parameters to be used.

Examples:

```
TTY1:,2,16,USER=(MYPARM)

CAR1:,3,22,USER=(PARM1=(12,15))

CAR2:,4,22,USER=(PARM1),USER=(PARM2)
     ,USER=(PARM3=5)
```

WAKEUP= n defines the amount of time in seconds that a certain protocol will go into a time delay if it has nothing to do. The default is 30 units of 100 milliseconds (3 seconds).

*WRITECONTROL= n is a hexadecimal mask specifying the write control character. The value must be preceded by an X. By setting bits in this field, the user can enable the special character handling required by the terminal.

XDCOD= xdcod is a decimal or hexadecimal halfword used to specify additional configuration information within a device. If a hexadecimal value is specified, it must be preceded by an X. For local asynchronous devices, XDCOD can be used to define the CMD2 byte if XDCOD=X01nn, where nn is the CMD2 byte.

Example:

CMD2 byte is X'6E' which gives:

```
Clock B
7 data bits
2 stop bits
Even parity
```

This parameter is used for clock selection for data communication asynchronous devices. The bit settings are:

```
0000 = A clock
0010 = B clock
0020 = C clock
0030 = D clock
```

If it is for switched lines, this parameter is set at X800 for the line, and a clock is selected from the bit settings shown.

Example:

```
X820
```

This setting indicates a switched line with a C clock.

This parameter can be used to request full BIOC support.

Example:

```
XDCOD = X80D
```

In this example, bit 8 specifies full BIOC support, and bits 0D specify the D clock. See the OS/32 Operator Reference Manual and the Multi-Terminal Monitor (MTM) Reference Manual for a description of the features of the BIOC driver.

NOTE

The asterisk (*) preceding some of the parameters denotes parameters applicable to data communication devices only. See Section 2.3.11.2.

Table 2-4 shows the extended device codes for data communications devices.

TABLE 2-4 EXTENDED DEVICE CODES FOR DATA COMMUNICATION DEVICES

BIT	HEX MASK (DECIMAL VALUE)	MEANING
0	8000	Master/slave bit (processor-to-processor link only)
	8000 (32768)	Indicates that this end of processor-to-processor link is master
	0000 (0)	Indicates that this end of processor-to-processor link is slave
1-3	7000	Reserved - must be zero
4-5	0C00	Line configuration bits
	0800 (2048)	Automatic dial-in or manual dial-out
	0400 (1024)	Leased line
	0000 (0)	Directly connected (null modem cable)
6-7	0300	Line protocol bits
	0300 (768)	Half duplex 2-wire
	0200 (512)	Simplex write *
	0100 (256)	Simplex read *
	0000 (0)	Half duplex 4-wire *
8	0080	Explicit connect request bit
	0000	Indicates system will do an automatic connect if an SVC 1 read/write request is issued to a line that is not connected. Status returned is 8225. If the line is disconnected during read/write request, A0XX status is returned. Next read/write issued will cause system to automatically connect the line.

TABLE 2-4 EXTENDED DEVICE CODES FOR DATA COMMUNICATION DEVICES (Continued)

BIT	HEX MASK (DECIMAL VALUE)	MEANING
	0080	Indicates system will return error A018 if SVC 1 read/ write request is issued to a line that is not connected.
9	0040	Reserved - must be zero
10-11	0030	Clock bits (PALS/PASLA only)
	0030 (48)	Clock D
	0020 (32)	Clock C
	0010 (16)	Clock B
	0000 (0)	Clock A
12-15	000F	Default option index for Models 1200 and 1250/1251. Must be zero for all other devices.

* Requires adapter-strapped full duplex

The common physical record lengths for data communication terminals are shown in Table 2-5.

TABLE 2-5 PHYSICAL RECORD LENGTHS FOR DATA COMMUNICATION TERMINALS

TERMINAL	RECORD LENGTH
Model 550/550B	80
Model 1100 VDU	80
Model 1200 VDU	80
VDU Models 1250/1251	80
Carousel	128
M33 TTY	72
M35 TTY	80
SIGMA 10 terminal	73
Remote line printer	132

Functional Details:

Device codes and device addresses determine shared-busy conflicts between devices, such as fixed and removable disks in the same drive, cassettes, and TTY/KP with TTY/RP on the same device. The shared-busy conflicts can be overridden by the NONSHARED parameter. Only one channel control block (CCB) is created for disks with a shared-busy conflict.

Shared device leafs will be created by specifying the same device address for each device sharing a leaf.

Example:

```
CRT1:,10,39
CRT2:,10,39
CRT3:,10,39
```

In this example, each device will share the same device leaf.

If ILEVEL and IOCLASS statements precede a group of devices, they remain in effect until another ILEVEL or IOCLASS statement is read. The ILEVEL and IOCLASS parameters in the device statement can be used to override the global setting specified in the global ILEVEL or IOCLASS statement for a specific device.

Default values for all standard devices supported by Sysgen/32 are maintained in the Sysgen/32 Macro Library. These defaults represent driver initialization and termination routines, disk sizes, device attributes, defaults for communications devices, etc. Certain defaults can be overridden by entering the appropriate parameter in the device statements.

2.3.11.1 Coding Examples of Device Statements

The following examples show the coding of the OS/32 Configuration Utility Program (CUP) device statements on the left, and the Sysgen/32 device statements on the right.

Examples:

OS/32 CUP STATEMENTS	SYSGEN/32 STATEMENTS
DEVICES	DEVICES
1:F0,0	DSC1:, C6, 51, SELCH=F0, CONTR=B6
2:B6,0	DSC2:, C7, 50, SELCH=F0, CONTR=B6
3 DSC1:C6,51,D	MAG1, 85, 65, ILEVEL=1, SELCH=F1, CONTR=0
* DSC2:C7,50,D	CON:, 10, 39, CONSOLE, ILEVEL=2
ILEVEL 1	ILEVEL 3
1:F1,0	PRT:, 62, 114
2:0,0	VDU1:, 12, 39
3 MAG1:85,65	VDU2:, 14, 39
ILEVEL 2	ILEVEL 1
1 CON:10,39,C	MAG2:, C5, 65, SELCH=F2, CONTR=1
ILEVEL 3	*NOTE THAT THE CONTROLLERS FOR MAG1: and MAG2:
1 PRT:62,114	*ARE UNIQUE.
1 VDU1:12,39	ENDD
1 VDU2:14,39	
ILEVEL 1	
1:F2,0	
2:0,0	
3 MAG2,C5,65	
ENDD	

2.3.11.2 Configuring Data Communication Devices

The following sysgen configuration statements can be used to configure data communications devices in the system. The parameters are explained under the DEVICES...ENDD statements in Section 2.3.11.

- Asynchronous communications lines - Device code 144

```
LINE:, 40, 144, XD=X0830, REA=XE1C9, WRI=XE809, PAD=2
LIN2:, 42, 144, XD=X0020
```

- Remote line printer and letter quality printer - Device code 145

```
90, 145, XD=X0830
```

- SIGMA 10 terminal - Device code 146

```
SGMA:, 100, 146, XD=X0300, REC=80, REA=X8181, PAD=2
```

- Nonediting VDU - Device code 147

```
CRT3:, 50, 147, XD=XFFFF, REC=80, REA=X8181, WRI=X0400,
     PAD=3
CRT4:, 52, 147
```

- Model 1200 VDU - Device code 156

```
OWL1:, 60, 156, XD=X0830, REC=80, PAD=2
OWL2:, 62, 156
```

- Model 1250 point-to-point VDU - Device code 157

```
SWL1:, 70, 157
```

- Model 1250 multidrop VDU - Device code 158

```
MULT:, 80, 158, XD=X0000, REC=80, PAD=2
MUL2:, 82, 158, XD=X0820
```

- Binary synchronous communications line on 201 (DSA) - Device code 160

```
BQL1:, 120, 160, XD=X8000, REC=80, PAD=1, LEA=2,
     TR=BECB.TOP

BQL2:, 122, 160
```

- IBM 3780 RJE emulation on 201 (DSA) - Device code 161

```
BQZ1:, 160, 161, REC=80, PAD=1, LEA=2

BQZ2:, 162, 161
```

- IBM 2780 RJE emulation on 201 DSA - Device code 162

```
Q278:, 170, 162
```

- Binary synchronous processor-to-processor link on 201 DSA - Device code 163 163 on 201 DSA

```
P2P1:, 200, 163, REC=80, PAD=1, LEA=2

P2P2:, 202, 163
```

- Binary synchronous communications line on QSA - Device code 168

```
BQSL:, 130, 168, XD=X8000, REC=80, PAD=1, LEA=2,
     TR=BEBC.TOP

BQS2:, 132, 168
```

- IBM 3780 RJE emulation on QSA - Device code 169

```
SSA:, 170, 169, REC=80, PAD=1, LEA=2

SSA2:, 172, 169
```

- IBM 2780 RJE emulation on QSA - Device code 170

```
Q378:, 190, 170
```

- Binary synchronous processor-to-processor link on QSA - Device code 171

```
PQP:, 210, 171
```

- DMA I/O subsystem (DIOS) - Device code 192

```
DIOS:, 100, 192
```

DIOS is always configured with a device code of 192. The addresses of the devices under the DIOS must have an even address in increments of 2.

The line printer driver and the point-to-point terminal manager support vertical forms control (VFC) read and write operations. However, the point-to-point terminal manager supports VFC in conversational mode only.

The teletype (TTY) driver and the asynchronous terminal manager will not support VFC read or write operations. However, the affected software (TTY and asynchronous terminal manager) is modified to treat a VFC write operation as if a formatted write operation had been received. The forms control character will be ignored rather than interpreted or printed. Table 2-6 shows the sysgen default parameter values for each communication device.

TABLE 2-6 SYSGEN DEFAULT PARAMETER VALUES FOR DATA COMMUNICATION DEVICES

	DEVICE CODE	XDCOD	READ CONTROL	WRITE CONTROL	PAD COUNT	RECLEN	LEAD-COUNT	POL-LIMIT	SCREEN-TIME	RESPONSE-TIME	TRANSLATE
ASYNCH-RONOUS DEVICES	144	X400	E1C9	E809	-	-	-	-	-	-	ASYN.XLT
	145	X400	-	X410	2	132	-	-	30	300	ASYN.XLT
	146	X300	X8181	-	3	80	-	-	30	300	ASYN.XLT
	147	X400	X8181	X400	3	80	-	-	30	300	ASYN.XLT
	156	-	-	-	2	80	-	-	25	X7FFF	ASYNCTOP
	157	-	-	-	2	80	-	-	25	X7FFF	ASYNCTOP
	158	-	-	-	2	80	-	-	20	3	ASYNCTOP
BINARY SYNCH-RONOUS DEVICES	160	-	-	-	1	80	2	-	-	-	BEBC.TOP
	161	-	-	-	1	80	2	-	-	-	BEBC.TOP
	162	-	-	-	1	80	2	-	-	-	BEBC.TOP
	163	-	-	-	1	80	2	-	-	-	BEBC.TOP
	168	-	-	-	1	80	2	-	-	-	BEBC.TOP
	169	-	-	-	1	80	2	-	-	-	BEBC.TOP
	170	-	-	-	1	80	2	-	-	-	BEBC.TOP
	171	-	-	-	1	80	2	-	-	-	BEBC.TOP

2.3.11.3 Configuring ZDLC Devices

The following coding examples are for including ZDLC data communication devices in the system.

- 3270 binary synchronous support on QSA - Device code 172

```
SPT1:,BA,172,XDCOD=X0400,IOL=10,POLLTIME=10,WAKEUP=10
PADCOUNT=3,LEADCOUNT=3
```

- ZBID on QSA; SVC 15 access - Device code 176

```
ZBD1:,B8,176,XDCOD=X0300
```

- ZBID on QSA; SVC 15 access; simplex I/O - Device code 177

```
ZBD2:,B8,177,XDCOD=X0100 (simplex read)
ZBD3:,B9,177,XDCOD=X0200 (simplex write)
```

- ZBID CTM on QSA; SVC 1 access; simplex write - Device code 178

```
ZB4R:,BA,178,XDCOD=X0100,POLLIMIT=5,IOL=5,MINREAD=264
LINESTATUS=X00F9,USCI=XD0884024
```

- ZBID CTM on QSA; SVC 1 access; simplex read; daughter to device code 178 - Device code 179

```
ZB4W:,BB,179,XDCOD=X0200
```

- ZBID CTM on QSA; SVC 1 access; - Device code 180

```
ZBID:,B8,180,XDCOD=X0300,POLLIMIT=5,IOL=5,MINREAD=264,
LINESTATUS=X0099,UCSI=XD0884020
```

- ZBID CTM on QSA; SVC 1 access; simplex write - Device code 181

```
ZB:,B8,181,XDCOD=X0100,POLLIMIT=5,IOL=5,MINREAD=264
LINESTATUS=X00F9,UCSI=XD0884020
```

- ZBID CTM on QSA; SVC 1 access; simplex read; daughter to device code 181 - Device code 182

```
ZB:,B9,182,XDCOD=X0200
```

- ZBID CTM on QSA; SVC 1 access; half-duplex with assembled DCT - Device code 183

```
ZB:,BA,183,,XDCOD=X0300,POLLIMIT=5,MINREAD=264,
LINESTATUS=X0099,UCSI=XD0884020,UCSO=X18900030,NCS=XF8F8
```

- 3270 binary synchronous support on QSA - Device code 185

```
EMT1:,BA,185,XDCOD=X1B00,PADCOUNT=3,LEADCOUNT=3
```

| DIRECTORY |

2.3.12 DIRECTORY Statement

The DIRECTORY statement specifies that secondary directory support is included in the system.

Format:

DIRECTORY

Functional Details:

If this statement is omitted, no secondary directory support is included. If a disk is marked on with the CDIRECTORY parameter specified in the operator MARK command, and the system is built with directory support, file search time is reduced. Marked on disks require the following additional working storage areas:

- system space of 64 bytes for access control blocks (ACBs), and
- a secondary directory buffer with a default buffer size equal to 1024 bytes. The default value can be overridden when the disk is marked on.

Secondary directory support occupies 2.5kb of memory. See the OS/32 Application Level Programmer Reference Manual for detailed information.

2.3.13 DISCBLOCK Statement

The DISCBLOCK statement specifies the maximum physical block size for data; index blocks for an indexed file; and index blocks for nonbuffered indexed and extendable contiguous files.

Format:

DISCBLOCK [=] [n / 4]

Parameter:

n	is a decimal number from 1 through 255 indicating the maximum number of 256-byte segments that can be specified for data or index blocks in an ALLOCATE command or an SVC 7. If this parameter is omitted, 4 is the default.

Functional Details:

Allocation of the physical block size occurs when the file is assigned. If no direct access devices exist in the system, omit this statement. Larger block sizes occupy more system space, but reduce physical I/O and improve system performance. See the OS/32 System Level Programmer Reference Manual for the required program block size.

```
 -----------------
|      DSYS       |
 -----------------
```

2.3.14 DSYS Statement

The DSYS statement specifies the default number of kilobytes (kbs) of available dynamic system space. The size of system space can be adjusted by the SET SYS operator command after the system is built. The following dynamic control blocks are allocated in system space:

- Private file control block (PFCB)
- File control blocks (FCB)
- Task control blocks (TCB)
- Timer queue elements (TQE)
- Access control blocks (ACB)
- Segment description elements (SDE)
- Private segment tables (PST)

Format:

DSYS [=] [n / 25]

Parameter:

n	is a decimal number from 1 to the total number of kilobytes of memory. If n is omitted, 25kb is the default.

Functional Details:

If this statement is omitted, 25kb is the default.

2.3.15 ENDC Statement

The ENDC statement must be the last sysgen statement specified and indicates the end of all sysgen configuration statements.

Format:

```
ENDC
```

```
-----------------
|    ERRORREC    |
-----------------
```

2.3.16 ERRORREC Statement

The ERRORREC statement specifies that error recording support is included in the system.

Format:

ERRORREC [=] fd,size,period

Parameters:

fd	is the file descriptor of the default error recording file. The specified file is assigned by the system as the default error recording file.
size	is a decimal number from 1 through 32,767 specifying the maximum number of 256-byte records in the default error recording file.
period	is a decimal number from 1 through 1,440 specifying the minutes that elapse between memory error recording readouts on the Models 3210, 3220, 3230, 3240, and 3250 processors only. The recommended period is 2 minutes.

Functional Details:

Error recording supports recording of:

- I/O errors for all processors
- System errors for all processors
- Memory errors for Perkin-Elmer Series 3200

There is no significant increase in overhead cost incurred by recording I/O and system errors.

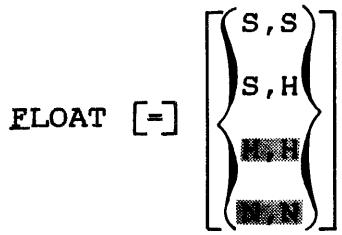
The Perkin-Elmer Series 3200 processors contain error recording memory and an optional error logger. If this statement is specified, the hardware error logger is periodically read and the data is written to the error recording file for subsequent reporting. If this statement is omitted, error recording support is not included in the system.

If this statement is specified when configuring a Series 3200 processor in the system, the MCONFIG statement must also be included.

2.3.17 FLOAT Statement

The FLOAT statement specifies that floating point support (software or hardware) is included in the system.

Format:



Parameters:

S	indicates software floating point is supported for single precision floating point in the first parameter and for double precision floating point in the second parameter.
H	indicates hardware floating point is supported for single precision floating point in the first parameter and for double precision floating point in the second parameter.
N	indicates no floating point is supported.

Functional Details:

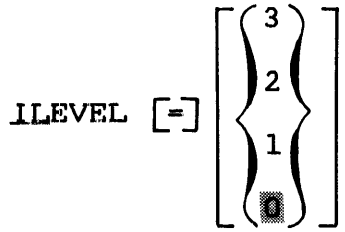
Software floating point support should be included only in systems that do not support hardware floating point. If the hardware floating point parameter is not specified for a system with hardware floating point, memory is wasted and unpredictable results occur after a power fail/restore sequence. Single precision floating point support occupies 1.9kb of memory, and double precision floating point support occupies 2.9kb of memory.

If the FLOAT statement is omitted, H,H is the default for the Perkin-Elmer Series 3200 processors, and N,N is the default for the Model 7/32 or 8/32 processors.

2.3.18 ILEVEL Statement

The ILEVEL statement specifies the hardware interrupt levels for all devices that are specified between this ILEVEL statement and another ILEVEL statement or the ENDD statement.

Format:



Parameters:

3	is a decimal number indicating the fourth and lowest interrupt level at which a device can interrupt.
2	is a decimal number indicating the third interrupt level at which a device can interrupt.
1	is a decimal number indicating the second interrupt level at which a device can interrupt.
0	is a decimal number indicating the first and highest interrupt level at which a device can interrupt. If this parameter is omitted, 0 is the default.

Functional Details:

If multiple I/O interrupt levels are not to be included in the system, omission of this statement causes all devices to be configured at the highest interrupt level, 0. A group of devices configured with the same SELCH or disk controller address must be configured at the same interrupt level. Therefore, the ILEVEL statement should directly precede the group of devices to be configured at a specific interrupt level.

The ILEVEL parameter in the device statement is used to redefine the interrupt level for a particular device without affecting the global interrupt level setting.

| INTERCEPT |

2.3.19 INTERCEPT Statement

The INTERCEPT statement indicates that SVC interception support is to be included in the system.

Format:

INTERCEPT

Functional Details:

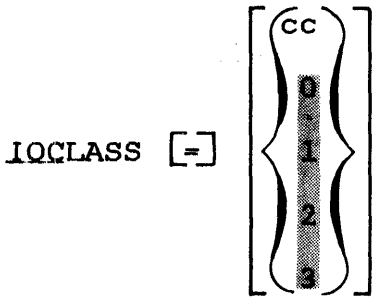
If this statement is omitted, SVC interception is excluded from the operating system.

This is a required parameter for SPL/32 Spooling support.

2.3.20 IOCLASS Statement

The IOCLASS statement specifies the global class setting to be associated with a particular device or group of devices used for accounting.

Format:



Parameter:

cc	is a decimal number from 0 through 31 specifying the class associated with devices or files. If this statement or the parameters are omitted, 0, 1, 2, and 3 are the default classes.

Functional Details:

A global IOCLASS can be specified or changed by entering the IOCLASS statement immediately preceding the device or group of devices to be associated with that class. All devices are associated with that IOCLASS statement until the next IOCLASS statement is entered.

The IOCLASS parameter in the device statement redefines the I/O class of a particular device and does not affect the global I/O class setting.

User-specified I/O classes must be within the range specified by the ACCOUNTING statement. See Section 2.3.1. Table 2-7 lists the default device and file classes.

TABLE 2-7 DEFAULT DEVICE AND FILE CLASSES

CLASS	DEFAULT
0	Logical I/O (indexed files)*
1	Physical I/O with SELCH* (contiguous files)
2	Physical I/O with multiplexor channel (VDUs)
3	Logical spooled I/O (spooled output)

* The accounting facility requires classes 0 and 1.

2.3.21 IREADER Statement

The IREADER statement specifies that internal reader support is to be configured in the system. This statement allows a console-loaded task to send input messages to the command processor.

Format:

IREADER

Functional Details:

If this statement is omitted, internal reader support cannot be configured in the system.

This statement must be used in order to utilize the operator IRBUFF command and SVC 2 code 14.

2.3.22 ITAM Statement

The ITAM statement indicates that communications support is to be included in the system.

Format:

ITAM

Functional Details:

Communications support consists of system modules, drivers, and device control blocks (DCBs, CCBs, etc.). The drivers are stored in either the communications driver library or extended communications driver library. The system modules are stored in the system communications library. See Chapter 3.

2.3.23 JOURNAL Statement

The JOURNAL statement specifies the maximum number of journal entries for the system. The system journal is a list of data entries that records operating system events and is used for tracing the cause of a system failure.

Format:

JOURNAL [=] [n / 0]

Parameters:

n	is a decimal number from 0 through 12,999 specifying the maximum number of journal entries. The number 0 is the default.

Functional Details:

The amount of memory required for the user-specified number of journal entries is calculated as:

number of bytes for journal = 20 x (n+8)

2.3.24 LOGLEN Statement

The LOGLEN statement specifies the maximum number of bytes of message buffer size in the system.

Format:

LOGLEN [=] [n / 72]

Parameters:

n	is a decimal number from 32 through 132 specifying the maximum number of bytes of message buffer size. If this parameter is omitted, 72 is the default.

Functional Details:

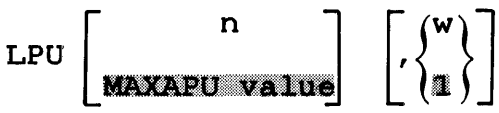
This statement sets the message buffer size for user tasks (u-tasks) executing SVC 2 code 7 log message calls. If the length of the user-specified message is greater than the message buffer size, the right-most bytes of the message are truncated.

When a u-task running under MTM issues an SVC 2 code 7 to the system console, the user buffer is truncated to LOGLEN. If the SVC 2 code 7 is directed to the user terminal, LOGLEN has no effect. If this statement is omitted, 72 is the default.

2.3.25 LPU Statement

The LPU statement is used to specify that one or more logical processing units (LPUs) are to be configured in the system. An LPU is used to assign tasks to processors. This statement is valid for a Model 3200MPS System only.

Format:



Parameters:

n	is a decimal number that specifies the maximum number of LPUs that can be configured in the sytem. If this parameter is omitted, the default is the value specified in the MAXAPU statement. See Section 2.3.26. This ensures a one-to-one LPU to APU mapping capability.
w	specifies the size of the LPU/APU mapping table. This parameter must be 1.

Functional Details:

An LPU is always mapped to an APU or a CPU. Each LPU can be mapped to only one APU. However, several LPUs can be mapped to the same APU.

Each task is assigned an LPU at Link time. The LPU assignment can be changed by the task itself, by another task, or by the system operator.

2.3.26 MAXAPU Statement

The MAXAPU statement is used to specify the maximum number of APUs to be configured in the system and map these APUs to their APU controllers. This configuration statement is only valid for a Model 3200MPS System.

Format:

```
MAXAPU [n]
       [ ]

[APU1 ,contr1 ]
[APU2 ,contr2 ]
[     .       ]
[     .       ]
[     .       ]
[APUn ,contrn ]
ENDAPU
```

Parameters:

n	is a decimal number specifying the maximum number of APUs to be configured in the system. If this parameter is omitted, the default is 9.
$APU_1 \ldots APU_n$	is the identity of the APU to be configured in the system. The only allowed values for this parameter are 1 through 9.
$contr_n$	is a hexadecimal number specifying the number of the APU controller (RTSM digital I/O) for APU n. This parameter is called an APU controller statement.

Functional Details:

One APU controller statement must be entered for each APU to be configured in the system.

Example:

Examples of the standard controller assignments are:

```
    MAXAPU

     APU1,08
     APU2,50
     APU3,52
        .
        .
        .
     APU9,5E
    ENDAPU
```

The hexadecimal numbers in the example are device addresses.

2.3.27 MAXTASK Statement

The MAXTASK statement specifies the maximum number of tasks (including rolled-out tasks) that can be in the system at one time.

Format:

MAXTASK [=] [n / 32]

Parameters:

n	is a decimal number from 1 through 252 specifying the maximum number of tasks in the system at one time. If this parameter is omitted, 32 is the default.

Functional Details:

If this statement is omitted, 32 is the default.

2.3.28 MCONFIG Statement

The MCONFIG statement must be used if memory error recording is desired for a Perkin-Elmer Series 3200 processor.

Format:

```
MCONFIG  BLOCK=nn,START=xx,RANGE=yy  [,INTERL={2|4|0}]
         [,SHARED={NORECORD|NVRECORD|RECORD}]
```

Parameters:

BLOCK= nn is a decimal number from 0 through 15 specifying the area of memory in megabytes (Mbs) for which a particular memory controller is strapped. Blocks have to be specified in numerically ascending order starting with 0 for the lowest megabyte address. For Perkin-Elmer Series 3200 processors, 1Mb is the minimum specified amount of memory.

START= xx is a decimal number from 0 through 15 specifying the starting megabyte address of the block. Fractional megabytes should be rounded up to the next full megabyte.

RANGE= yy is a decimal number from 0 through 16 specifying the number of megabytes in the block. For processors containing less than 1Mb, specify 1.

INTERL= 2 specifies 2-way interleaving.
4 specifies 4-way interleaving.
0 specifies noninterleaving of memory.

This parameter is optional and if omitted, 0 is the default.

SHARED= defines the memory block as part of shared memory. This parameter is optional.

NORECORD — inhibits the processor from reading the error logger for the designated block. The block configuration is not verified.

NVRECORD — specifies that the processor should read the error logger for the designated block. The block configuration is not verified. This facilitates bringing an error logger readout online in a multiprocessor configuration without destroying valid data in shared memory. If this parameter is omitted, the designated block is assumed to be in local memory.

RECORD — specifies that the processor should read the error logger for the designated block. The block configuration is verified at system startup time.

Functional Details:

As part of the system configuration process, the physical memory configuration must be defined if memory error recording is included in the system.

In multiprocessor systems with shared memory, only one processor should be designated to read the shared memory error logger. This prevents scattering of error logger recordings.

One MCONFIG statement is required for each group of memory controllers that is strapped for a different address range. Typically, there is only one group of controllers unless the configuration contains shared memory.

Examples:

For a Model 3250 processor with 4Mb 2-way interleaved local memory:

```
MCONFIG BLOCK=0,START=0,RANGE=4,INTERL=2
```

For a Model 3220 with 3/4Mb local memory:

```
MCONFIG BLOCK=0,START=0,RANGE=1
```

For a Model 3240 processor with 3Mb 4-way interleaved local memory, 1.5Mb 2-way interleaved shared memory starting at Y'500000', and 2Mb non-interleaved shared memory starting at Y'800000':

```
MCONFIG BLOCK=0,START=0,RANGE=3,INTERL=4
MCONFIG BLOCK=1,START=5,RANGE=2,INTERL=2,SHARED=RECORD
MCONFIG BLOCK=2,START=8,RANGE=2,SHARED=NORECORD
```

For a Model 3230 processor with 3.5Mb local memory and 1.5Mb shared memory starting at Y'400000':

```
MCONFIG BLOCK=0,START=0,RANGE=4
MCONFIG BLOCK=1,START=4,RANGE=2,SHARED=NVRECORD
```

```
 -----------------
|     MEMCHECK    |
 -----------------
```

2.3.29 MEMCHECK Statement

The MEMCHECK statement indicates that memory diagnostics support is included in the system.

Format:

```
MEMCHECK
```

Functional Details:

The memory diagnostics program is executed at initial program load (IPL) time. If any bad or unavailable pages exist in memory (256-byte pages for Models 3210 and 3220 processors; 2048-byte pages for Models 3230, 3240, 3250, and 3200MPS processors), the operating system marks them as unavailable. Memory can also be tested, marked off, and marked on by the operator MEMORY command if memory diagnostics support is included.

2.3.30 MEMORY Statement

The MEMORY statement specifies the maximum number of kb of available local memory for the system. Local memory is a contiguous memory area starting at absolute address 0 and consists of the:

- operating system,
- dynamic system space,
- reentrant library segments (optional),
- task common segments (optional), and
- pure and impure segments.

Format:

```
MEMORY [=] [ n   ]
           [256]
```

Parameters:

n	is a decimal number specifying the maximum number of kb of available local memory. The number is in increments of 16 and ranges from 256 through 1,024, or 4,096 for a Model 3210 processor, and 16,384 for the Models 3230, 3240, 3250, and 3200MPS processors. If this parameter is omitted, 256 is the default.

Functional Details:

If the operating system memory size exceeds the memory size specified by n, the error is not detected until a load module is created by OS/32 Link. The size of local memory can be changed by the operator MEMORY command. If this statement is omitted, the default is 256.

2.3.31 MODULE...ENDM Statements

The MODULE...ENDM statements substitute a user-written or user-modified system module for a Perkin-Elmer standard system module.

Format:

```
MODULE

[new module name1
 new module name2
        .
        .
        .
 new module namen]

ENDM
```

Parameters:

new module name	is a 4-character name, a period, and a 3-character variation (ffff.xxx) indicating the user-written or user-modified module to be selected. If the name (ffff) is the same as the standard module name, the variation (xxx) overrides the variation normally selected at sysgen time. However, if the name is not the same as a standard module name or USER.xxx, an error is generated.

2.3.32 NOSEG Statement

The NOSEG statement specifies that memory segmentation support is excluded from the system.

Format:

NOSEG

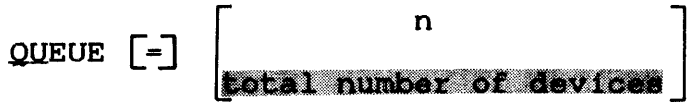
Functional Details:

When segmentation support is excluded, tasks that were previously established in pure and impure segments cannot be loaded into the system. Exclusion of segmentation support causes inefficient use of memory through the loss of shared pure segments. If this statement is omitted, segmentation support is included.

2.3.33 QUEUE Statement

The QUEUE statement defines the maximum number of entries in the system queue used to schedule driver operation.

Format:



Parameters:

n	is a decimal number from 1 through 64,999 specifying the maximum number of entries in the system queue. If this parameter is omitted, the total number of devices in the system is the default.

Functional Details:

The minimum number of entries should be equal to the total number of devices (including nodes, channels, and controllers), because driver termination routines do not check for sufficient room on the system queue when adding entries.

If this statement is omitted, the total number of devices in the system is the default.

2.3.34 ROLL Statement

The ROLL statement specifies that roll support is included in the system.

Format:

```
ROLL [=] [rvoln]
```

Parameters:

rvoln	is a 1- to 4-character volume name specifying the default roll volume. The first character of the volume name must be alphabetic and the remaining, alphanumeric. If this parameter is omitted, blanks are generated as the volume name.

Functional Details:

When roll support is specified, at least one direct access device must be included. If this statement is omitted, roll support is excluded from the system.

```
 -----------------
|      SPOOL      |
 -----------------
```

2.3.35 SPOOL Statement

The SPOOL statement specifies that OS/32 Spooler support is included in the system.

Format:

SPOOL [=] [spvoln]

Parameters:

spvoln	is a 1- to 4-character volume name specifying the spool volume. The first character of the volume name must be alphabetic and the remaining, alphanumeric. If this parameter is omitted, blanks are generated as the volume name.

Functional Details:

When spool support is specified, at least one direct access device must be included. If this statement is omitted, spool support is excluded from the system.

2.3.36 SPL32 Statement

The SPL32 statement specifies that SPL/32 support is to be included in the target system.

Format:

SPL32

Functional Details:

This statement and the SPOOL statement explained in Section 2.3.35 are mutually exclusive statements. If this statement is entered, the user cannot specify any Spooler pseudo devices in the DEVICES...ENDD statments.

When this statement is entered, INTERCEPT is automatically included in the system.

2.3.37 SSTABLE Statement

The SSTABLE statement specifies the maximum number of shared segment table (SST) entries to be reserved in the system.

Format:

SSTABLE [=] [n / 32]

Parameters:

n	is a decimal number from 1 through 8,192 specifying the maximum number of SST entries allowed in the system. If this parameter is omitted, the default is 32.

Functional Details:

The Models 3210, 3230, and 3240 processors use an SST. Each SST entry requires 8 bytes. Space for the table is allocated in 256-byte blocks. If this statement is omitted, 32 is the default.

2.3.38 STARTUP...ENDS Statements

The STARTUP...ENDS statements define a startup CSS procedure, executed at system startup. This feature allows DISCHECK to run automatically and loads the tasks necessary to create the system environment.

Format:

```
STARTUP
.
.
.
ENDS
```

Functional Details:

The CSS procedure is executed before the SET TIME request is issued by the system. If a SET TIME request is issued from the startup CSS, the operating system ENTER DATE AND TIME request is not made.

The CSS commands are stored in memory in packed format. This memory is not reused during system operation. A large number of startup CSS routines could affect the amount of memory available for task execution, so startup requests should be as brief as possible, making use of such commands as $TRANSFER.

The BUILD...ENDB and $BUILD...$ENDB commands are not allowed in a startup CSS procedure, but are allowed in a CSS called from a startup CSS procedure.

Example:

```
STARTUP
SE T  1/17/81,07:59:59
$J
MA DSC1:,ON,,CD=200
$T
$IFNE 0
   $JOB
   MA DSC1:,ON,P
   L .BG,DISCHECK,50
   T .BG
   MA DSC1:,OFF
   ST,DSC1:,CON:,NOR
   MA DSC1:,ON,,CD=200
   $TERMJOB
   $IFNE 0
      $WR *** MARK OR CHECK ERROR ON DSC1: ***
      $EX
   $EN
$EN
$TR STARTUP
ENDS
```

2.3.39 TCOM Statement

The TCOM statement defines and reserves system storage for TCOM segments in global memory. Global memory (shared memory) is located outside of local memory. Local memory is defined by the operator MEMORY command.

Format:

TCOM [=] $name_1$,$address_1$,$size_1$ [/.../$name_n$,$address_n$,$size_n$]

Parameters:

name	is a TCOM segment name from 1- to 8-characters corresponding to a labeled common segment name in a user program. The first character of the segment name must be alphabetic and the remaining, alphanumeric.
address	is a hexadecimal number within the ranges specified in Table 2-8 specifying the absolute address of a TCOM segment located outside local memory. The user-specified number is rounded down to the nearest 256-byte page address.
size	is a decimal number in increments of .25kb, from .25kb to the maximum amount of global memory.

Functional Details:

Global memory is located above MTOP, the area specified in the operator MEMORY command, and is limited by the physical memory of the system. If the address specified is greater than the physical memory of the machine, the error is not displayed by Sysgen/32. All TCOM segments must be specified in order of ascending physical addresses. A maximum of 14 TCOM segments can be defined. Overlapping TCOM segments are not allowed.

TABLE 2-8 TCOM ADDRESS RANGE

CPU MODEL	ADDRESS RANGE	SEGMENT SIZE (KB) INCREMENT
7/32	1-FFF00	.25
8/32	1-FFF00	.25
3210	1-3FF800	2.0
3220	1-FFF00	.25
3230	1-FFF800	2.0
3240	1-FFF800	2.0
3250	1-FFF800	2.0
3200MPS	1-FFF800	2.0

2.3.40 TEMP Statement

The TEMP statement specifies the default volume name to be used for temporary (scratch) file support.

Format:

TEMP [=] [tvoln]

Parameters:

tvoln	is a 1- to 4-character volume name specifying the default temporary volume. The first character of the volume name must be alphabetic and the remaining alphanumeric. If this parameter is omitted, blanks are generated as the volume name.

Functional Details:

Temporary file support is always included in the system. If this statement is omitted, the default temporary volume name is set to blanks. Temporary files are allocated at assign time and deleted at close time. To exclude temporary file support, a source sysgen must be performed on modules CMDB, CMSP, and FMS7.

2.3.41 TGD Statement

The TGD statement specifies that TGD device support is included in the system.

Format:

TGD

Functional Details:

If this statement is omitted, TGD support is excluded. See the OS/32 Application Level Programmer Reference Manual.

2.3.42 VERSION Statement

The VERSION statement specifies a user version that is associated with a particular operating system sysgen.

Format:

VERSION [=] [vvvvvvvv]

Parameters:

vvvvvvvv	is an 8-character alphanumeric string specifying the version of a particular operating system sysgen. If this parameter is omitted, blanks are generated as the version number.

Functional Details:

The 8-character version, in addition to the operating system revision and update number, is displayed on the system console at system initialization time in this format:

OS32MTrr-uu.vvvvvvvv

If this statement is omitted, blanks are generated as the version.

| VOLUME |

2.3.43 VOLUME Statement

The VOLUME statement specifies the name of the default system volume.

Format:

VOLUME [=] [voln]

Parameters:

voln	is a 1- to 4-character volume name specifying the default system volume. The first character of the volume name must be alphabetic and the remaining, alphanumeric. If this parameter is omitted, blanks are generated as the volume name.

Functional Details:

After sysgen, the operator can change the volume name through the operator VOLUME command.

If this statement is omitted, blanks are generated as the volume name.

CHAPTER 3
LIBRARIES REQUIRED FOR SYSTEM GENERATION (SYSGEN)

3.1 INTRODUCTION

The Sysgen/32 process requires standard system libraries, general purpose driver libraries to support the devices listed in Chapter 4, and system and Sysgen/32 macro libraries. These libraries are required for the macro expansion and link phases of the sysgen procedure. Other system libraries that may be required by the Sysgen/32 process are system communications libraries if communication devices are configured in the operating system, and user libraries if user-written devices are configured in the operating system.

OS/32 supports two types of sysgen:

- Object-level
- Source-level

The object-level sysgen enables a user to configure an operating system tailored to specific needs by selecting driver and system modules provided in the OS/32 package. Assemblies of system modules are not required in performing an object-level sysgen.

The source-level sysgen enables a user to modify the OS/32 system modules and drivers. This procedure requires reassembling one or more system and/or driver source modules, replacing existing versions of these modules in the system or driver libraries with the user-modified modules, and executing the object-level sysgen procedure. Section 3.6 presents sample source sysgen procedures.

3.2 STANDARD LIBRARIES (OPERATING SYSTEM)

There are two standard libraries required for the Sysgen/32 process:

- The standard system library (SYS.LIB)
- The standard driver library (DRIVER.LIB)

These libraries are used in the link phase of the Sysgen/32 process and are available in both object and source versions.

3.2.1 Standard System Library (SYS.LIB)

Table 3-1 presents a description of the source sysgen options that can be included in a target system.

The source sysgen modules of SYS.LIB are listed in Table 3-2. These modules can be altered by the sysgen parameters in the sysgen parameter file. Table 3-3 is a list of the source sysgen parameters and the amount of memory the desired sysgen option occupies.

Each module has an extension number corresponding to functional variations supporting various sysgen options. Table 3-4 is a list of module variations in SYS.LIB. The standard variations provided in SYS.LIB are a subset of possible variations. A source-level sysgen may be optionally performed to include or eliminate options in a specific module. A source-level sysgen may also be optionally performed to eliminate specific source-level sysgen options included in all module variations.

TABLE 3-1 SOURCE SYSGEN OPTION DEFINITIONS

OPTION	MNEMONIC	DEFINITION
Journal support	JRNL	Supports recording of normal internal system events on a circular list in memory. Used as a debugging tool for operating system development and is recommended for installations where user-written or user-modified modules are tested.
Safety check support	SAFE	Supports consistency checking within the operating system. Detected inconsistencies result in a system failure.
System debug software support	DBUG	Supports debugging of the operating system. Includes consistency checks not intended for operational systems.
Bulk command module support	BCMD	Supports bulk storage operator commands such as WRITE FILEMARK, FORWARD FILEMARK, FORWARD RECORD, BACKSPACE FILEMARK, BACKSPACE RECORD, and REWIND.
Contiguous file support	CO	Supports contiguous files on direct access devices.

TABLE 3-1 SOURCE SYSGEN OPTION DEFINITIONS (Continued)

OPTION	MNEMONIC	DEFINITION
Indexed and nonbuffered indexed file support	INX	Supports indexed and nonbuffered files on direct access devices.
Direct access device support	DA	Supports direct access bulk storage devices (disks) beyond the basic I/O device level, including primary directory support, sector allocation, bitmap support, and volume mechanism support. Includes the DISPLAY FILES, DELETE, XDELETE, VOLUME, MARK operator commands.
Secondary directory support	DIR	Supports the secondary directory feature that provides an in-memory paged index to the disk directory to reduce access time for directory operations. Requires direct access support.
Spooling support	SPOL	Supports OS/32 Spooler.
SPL/32 support	SPL32	Supports SPL/32 Spooler.
Roll support	ROLL	Supports rolling of tasks to disks to execute more tasks than can fit into available task memory.
Temporary file support	TEMP	Supports temporary files. Requires direct access support.
Shared segmentation support	SEG	Supports use of sharable segments such as pure (reentrant) segments, run-time libraries (RTLs), and task commons.
Link overlay support	AOVL	Supports loading and executing overlaid tasks produced by OS/32 Link. Requires direct access support.
Communications support	ITAM	Supports communications devices.

TABLE 3-1 SOURCE SYSGEN OPTION DEFINITIONS (Continued)

OPTION	MNEMONIC	DEFINITION
Trap-generating device support	TGD	Supports the 8-line interrupt module, providing task traps in response to external interrupts.
Double precision floating point software support	DF	Supports double precision floating point in a system without the hardware to support it. Includes software emulation routines for double precision instructions.
Single precision floating point software support	SF	Supports single precision floating point in a system without the hardware to support it. Includes software emulation routines for single precision instructions.
Power fail operator intervention support	PWF	Supports operator control for power fail/restore sequence.
Time delay on power restore support	DLAY	Supports a time delay on power restore prior to enabling interrupts. This is required for configurations with multiplexor bus switches.
Seek support	SEEK	Supports C-scan seek scheduling on disk devices. Selection of a scheduling algorithm is specified in each disk device control block (DCB). Standard driver library has seek scheduling enabled for all disks except floppy. This option is required to support those disks. Requires direct access support.

TABLE 3-1 SOURCE SYSGEN OPTION DEFINITIONS (Continued)

OPTION	MNEMONIC	DEFINITION
Extended direct memory access support	EDMA	Supports coordination of multiple extended direct memory access (EDMA) devices. required if the EDMA devices exceeds the bandwidth capability of the EDMA bus. This coordination mechanism is also used for floppy disk systems where the adapter bandwidth is limited. Requires direct access support.
Memory diagnostics support	MCHK	Supports memory testing features for initial system load and at the request of particular operator commands. Finds and marks off bad memory.
Memory error recording support	MERC	Supports recording of memory errors generated by the system. Requires that general error recording is selected. Available for the Perkin-Elmer Series 3200 processors.
General error recording	GERC	Supports error recording of memory, I/O, system errors and system milestones.
Models 3210, 3220, 3230, 3240, and 3250 support	3200	Supports the Perkin-Elmer Series 3200 processors.
Memory access translator Models 3210, 3230, 3240, and 3250 support	ATM	Supports MAT on Models 3210, 3230, 3240, and 3250 processors. Must be removed for Models 7/32, 8/32, and 3220 processors.
Accounting facility support	ACCT	Supports job accounting of system resources. Requires direct access support.
No file accounting	ACCF	No accounting records are generated for file renames and deletes. Requires accounting support. Requires direct access support.

TABLE 3-2 SYSTEM SOURCE MODULES AND SUPPORTED FEATURES

SOURCE MODULES		SUPPORTED FEATURES																																
FUNCTION	NAME	JRNL	SAFE	DBUG	BCMD	CO	INX	DA	DIR	SPL32	SPOL	ROLL	TEMP	SEG	AOVL	ITAM	TGD	DF	SF	PWF	DLAY	SEEK	EDMA	MCHK	MERC	GERC	320	ATM	ACCT	ACCF	IRDR
Console Driver	CDVR.MAC																																	
Display and Bulk Command	CMDB.MAC			x	x			x	x	x	x	x	x			x																		
Command Executors	CMEX.MAC									x	x					x								x										
Internal Reader	CMIR.MAC																																	x
Console Monitor	CMON.MAC																																	
Console and CSS Supervisor	CMSP.MAC	x																						x										
Error Recording	ERRC.MAC																								x	x								
Accounting Facility	EXAC.MAC																													x	x			
Interrupt Handler	EXIN.MAC	x	x	x											x	x				x	x			x	x		x	x	x					
Input/Output	EXIO.MAC	x	x																			x	x						x					
Loader and Segment Control	EXLD.MAC											x		x	x									x				x						
Memory Manager	EXMY.MAC		x					x				x				x																		
Supervisor Services	EXSP.MAC	x									x																	x						
SVC 3,4,5 6,7,14	EXSV.MAC											x		x	x		x																	

TABLE 3-2 SYSTEM SOURCE MODULES AND SUPPORTED FEATURES (Continued)

SOURCE MODULES		SUPPORTED FEATURES																															
FUNCTION	NAME	JRNL	SAFE	DBUG	BCMD	CO	INX	DA	DIR	SPL32	SPOL	ROL	TEMP	SEG	AOVL	ITAM	TGD	DF	SF	PWF	DLAY	SEEK	EDMA	MCHK	MERC	GERC	320	ATM	ACCT	ACCF	IRDR		
Timer Manager	EXTI.MAC		x													x												x					
Task Manager	EXTM.MAC	x	x									x		x																x			
Floating Point Traps	FLTP.MAC																	x	x														
Contiguous File SVC 1 Interrupt	FMCO.MAC					x																											
Indexed File SVC 1 Interrupt	FMIN.MAC			x			x			x	x																						
Nonbuffered File SVC 1 Interrupt	FMNB.MAC																																
SVC 7 Interrupt	FMS7.MAC			x		x	x	x	x		x		x			x													x	x		
File Manager Utility Routine	FMUT.MAC			x			x	x	x																								
Intercept Manager	INTC.MAC INTCD2.MAC																																
Memory Diagnostics	MCHK.MAC			x																				x								
Panic Dump	DUMP.MAC																																
End of System Modules	UBOT.MAC																																
Communications Support	ITFM.MAC																																

LEGEND

x = supported source module features

Certain features supported by the system source modules might not be desired in the user operating system. Therefore, the user can change the features that a source module supports. By choosing a module whose value equals 0, support for that feature is excluded. To include support for a feature, choose a module whose value for the specified sysgen option equals 1.

Example:

```
SGN.SPOL=1      Spooling support included

SGN.SPOL=0      Spooling support excluded
```

Table 3-3 lists the system source modules, source sysgen parameters and the amount of memory the desired sysgen option occupies.

TABLE 3-3 DEFINITIONS OF SOURCE SYSGEN PARAMETERS

SYSGEN PARAMETERS	DEFINITION	APPROXIMATE MEMORY REQUIRED
SGN.JRNL = 0	System journal support excluded	N/A
SGN.JRNL = 1	System journal support included	2.5kb
SGN.SAFE = 0	Safety check support excluded	N/A
SGN.SAFE = 1	Safety check support included	1.0kb
SGN.DBUG = 0	System debug support excluded	N/A
SGN.DBUG = 1	System debug support included	20kb
SGN.BCMD = 0	Bulk file command support excluded	N/A
SGN.BCMD = 1	Bulk file command support included	0.5kb
SGN.CO = 0	Contiguous file support excluded	N/A
SGN.CO = 1	Contiguous file support included	1.0kb

TABLE 3-3 DEFINITIONS OF SOURCE SYSGEN PARAMETERS (Continued)

SYSGEN PARAMETERS	DEFINITION	APPROXIMATE MEMORY REQUIRED
SGN.INX = 0	Indexed and nonbuffered file support excluded	N/A
SGN.INX = 1	Indexed and nonbuffered file support included	3.8kb
SGN.DIR = 0	Secondary directory support excluded	N/A
SGN.DIR = 1	Secondary directory support included	2.5kb
SGN.SPOL = 0	Spooling support excluded	N/A
SGN.SPOL = 1	Spooling support included	1.25kb
SGN.SP32 = 0	SPL/32 Spooling support not included	N/A
SGN.SP32 = 1	SPL/32 Spooling support included	1.25kb
SGN.ROLL = 0	Roll-in support excluded	N/A
SGN.ROLL = 1	Roll-in support included	3.1kb
SGN.TEMP = 0	Temporary file support excluded	N/A
SGN.TEMP = 1	Temporary file support included	0.5kb
SGN.SEG = 0	Sharable segmentation support excluded	N/A
SGN.SEG = 1	Sharable segmentation support included	0.5kb
SGN.AOVL = 0	Link overlay support excluded	N/A
SGN.AOVL = 1	Link overlay support included	1.75kb
SGN.ITAM = 0	Communications support excluded	N/A
SGN.ITAM = 1	Communications support included	0.5kb

TABLE 3-3 DEFINITIONS OF SOURCE SYSGEN PARAMETERS (Continued)

SYSGEN PARAMETERS	DEFINITION	APPROXIMATE MEMORY REQUIRED
SGN.TGD = 0	Trap-generating device support excluded	N/A
SGN.TGD = 1	Trap-generating device support included	0.25kb
SGN.DF = 0	Double precision floating point support excluded	N/A
SGN.DF = 1	Double precision floating point support included	2.9kb
SGN.SF = 0	Single precision floating point support excluded	N/A
SGN.SF = 1	Single precision floating point support included	1.9kb
SGN.PWF = 0	Operator intervention not required on power failure	32 bytes
SGN.PWF = 1	Operator intervention required on power failure	88 bytes
SGN.DLAY = 0	No time delay following power fail/restore	N/A
SGN.DLAY = n	Time delay following power fail/restore = n seconds	N/A
SGN.SEEK = 0	Seek scheduling support excluded	N/A
SGN.SEEK = 1	Seek scheduling support included	400 bytes
SGN.EDMA = 0	Extended direct memory access support excluded	N/A
SGN.EDMA = 1	Extended direct memory access support included	250 bytes
SGN.MCHK = 0	Memory diagnostics support excluded	N/A
SGN.MCHK = 1	Memory diagnostics support included	3.5kb

TABLE 3-3 DEFINITIONS OF SOURCE SYSGEN PARAMETERS (Continued)

SYSGEN PARAMETERS	DEFINITION	APPROXIMATE MEMORY REQUIRED
SGN.MERC = 0	Memory error recording support excluded	N/A
SGN.MERC = 1	Memory error recording support included	3.7kb
SGN.GERC = 0	General error recording support excluded	N/A
SGN.GERC = 1	General error recording support included	2.5kb
SGN.3200 = 0	Perkin-Elmer Series 3200 processors support excluded	N/A
SGN.3200 = 1	Perkin-Elmer Series 3200 processors support included	1.5kb
SGN.MAT = 0	Models 7/32, 8/32, and 3220 memory management	N/A
SGN.MAT = 1	Models 3210, 3230, 3240, 3250, 3200MPS memory management	N/A
SGN.ACCT = 0	Accounting support excluded	N/A
SGN.ACCT = 1	Accounting support included	2.0kb
SGN.ACCF = 0	Delete/rename file accounting reporting support excluded	N/A
SGN.ACCF = 1	Delete/rename file accounting reporting support included	0.25kb
SGN.IRDR== 0	Internal reader support excluded	N/A
SGN.IRDR = 1	Internal reader support included	1.50kb

TABLE 3-4 SYSTEM OBJECT MODULES AND SYSGEN OPTIONS

SYSTEM OBJECT MODULE		OBJECT SYSGEN OPTIONS																																
FUNCTION	VARIATION NAME	JRNL	SAFE	DBUG	BCMD	CO	INX	DA	DIR	SPL32	SPOL	ROLL	TEMP	SEG	AOVL	ITAM	TGD	DF	SF	PWF	DLAY	SEEK	EDMA	MCHK	MERC	GERC	3201	ATM	ACCT	ACCF	IRDR
Console Driver	CDVR.F01																																	
Display and Bulk Commands	CMDB.F31			0	1	0	0	0																										
	CMDB.F32			0	1	1	1	1	0	0	1	1	1																					
	CMDB.F33			0	1	1	1	1	1	1	1	1	1																					
Command Executors	CMEX.F33									1	1					1								1										
Internal Reader	CMIR.F01																																	0
	CMIR.F02																																	1
Console Monitor	CMON.F01																																	
Console and CSS Supervisor	CMSP.F33	0																						1										
Error Recording	ERRC.F01																								0	0								
	ERRC.F02																								0	1								
	ERRC.F03																								1	1								
Accounting	EXAC.F01																													0	0			
	EXAC.F02																													1	0			
	EXAC.F03																													1	1			
Interrupt Handler	EXIN.F51	0	0	0											1	1				1	5			1	0		0	0	1				
	EXIN.F53	0	0	0											1	1				1	5			1	1		1	1	1				
Input/ Output Supervisor	EXIO.F01	0	0																			1	1						0					
	EXIO.F02	0	0																			1	1						1					
Loader and Segment Control	EXLD.F50											0		1	1									1				0						
	EXLD.F51											1		1	1									1				0						
	EXLD.F52											0		1	1									1				1						
	EXLD.F53											1		1	1									1				1						
Memory Manager	EXMY.F52		0			1	1	1				0				1																		
	EXMY.F53		0			1	1	1				1				1																		

TABLE 3-4 SYSTEM OBJECT MODULES AND SYSGEN OPTIONS (Continued)

SYSTEM OBJECT MODULE		OBJECT SYSGEN OPTIONS																															
FUNCTION	VARIATION NAME	JRNL	SAFE	DBUG	BCMD	CO	INX	DA	DIR	SPL32	SPOL	ROLL	TEMP	SEG	AOVL	ITAM	TGD	DF	SF	PWF	DLAY	SEEK	EDMA	MCHK	MERC	GERC	320	ATM	ACCT	ACCF	IRDR
Supervisor Services	EXSP.F51	0									1																	0			
	EXSP.F53	0									1																	1			
SVC 3,4, 5,6,9,14	EXSV.F01							0						1			1															
	EXSV.F52							1				0		1	1		1															
	EXSV.F53							1				1		1	1		1															
Timer Manager	'EXTI.F01		0													0											0				
	EXTI.F02		0													1											0				
Task Manager	EXTM.F52	0	0									0		1															1		
	EXTM.F53	0	0									1		1															1		
Floating Point Traps	FLTP.F02																	0	1													
	FLTP.F03																	1	0													
	FLTP.F04																	1	1													
Contiguous File SVC 1 Interrupt	FMCO.F33					1																										
Indexed File SVC 1 Interrupt	FMIN.F33			0			1			1	1																					
Nonbuffered File SVC 1 Interrupt	FMNB.F33																															
SVC 7 Interrupt	FMS7.F31			0		0	0	0								1																
	FMS7.F33			0		1	1	1	1		1		1			1														1	1	
	FMS7.F34			0		1	1	1	1		0		1			1														1	1	
File Manager Utility	FMUT.F31			0			0	0																								
	FMUT.F32			0			1	1	0																							
	FMUT.F33			0			1	1	1																							
SVC Interception Support	INTC.F01																															
	INTC.F02																															
Memory Diagnostics	MCHK.F01			0																				0								
	MCHK.F02			0																				1								
Panic Dump	DUMP.F01																															

LEGEND

0 = feature is not supported
1 = feature is supported
shading = variation

3.2.2 Standard Driver Library (DRIVER.LIB)

The standard driver library, DRIVER.LIB, is required in the link phase of the Sysgen/32 process. DRIVER.LIB is available in object and source versions. The source modules can be modified and included in the driver or user library.

3.3 STANDARD COMMUNICATIONS LIBRARIES

There are two standard communications libraries required in the link phase of the Sysgen/32 process, if communications devices are to be configured in the operating system:

- The standard communications system libraries
- The standard communications driver libraries
- User-defined driver DCB macro library

3.3.1 Standard Communications System Libraries

Table 3-5 presents the standard communications system libraries.

TABLE 3-5 STANDARD COMMUNICATIONS SYSTEM LIBRARIES

LIBRARY DESCRIPTION	LIBRARY NAME
Basic communications package library	ITBSYS.LIB
2780/3780 enhancement package library	ITES2780.LIB

These libraries are available in object and source versions.

3.3.2 Standard Communications Driver Libraries

Table 3-6 presents the standard communications driver libraries.

TABLE 3-6 STANDARD COMMUNICATIONS DRIVER LIBRARIES

LIBRARY DESCRIPTION	LIBRARY NAME
Basic communications package driver library	ITEDLIB.LIB
2780/3780 enhancement package driver library	ITED2780.LIB

3.4 USER-DEFINED LIBRARIES

If a user-written communication protocol and/or driver is to be included in the operating system, it must be included in one of the following user-defined libraries:

- user-defined system library
- user-defined driver library

3.4.1 User-Defined System Library

Table 3-7 presents the user-defined system library provided to contain user-written/enhanced system modules.

TABLE 3-7 USER-DEFINED SYSTEM LIBRARY

LIBRARY DESCRIPTION	LIBRARY NAME
User-defined system library	USERSYS.LIB

3.4.2 User-Defined Driver Library

Table 3-8 presents the user-defined driver library provided to contain user-written device drivers.

TABLE 3-8 USER-DEFINED DRIVER LIBRARY

LIBRARY DESCRIPTION	LIBRARY NAME
User-written drivers	USERDLIB.LIB

3.4.3 User-Defined Driver DCB Macro Library

The DCB macro library provided for user-written drivers is shown in Table 3-9.

TABLE 3-9 USER-DEFINED DRIVER DCB MACRO LIBRARY

LIBRARY DESCRIPTION	LIBRARY NAME
User-written DCB macros	USERDLIB.MLB

3.5 MACRO LIBRARIES

The macro libraries presented in Table 3-10 are required in the macro expansion phase of the Sysgen/32 process. The macros that comprise the Sysgen/32 macro library are listed and explained in Table 3-11.

TABLE 3-10 MACRO LIBRARIES

LIBRARY DESCRIPTION	LIBRARY NAME
The Sysgen/32 macro library	SYSGEN32.MLB
The macro library containing system structures	SYSSTRUC.MLB
The basic communication system macro library (required only if communication support is included)	ITMS.MLB
The general driver macro library	DVRM.MLB
The system macro library	SYSMACRO.MLB

TABLE 3-11 MACROS IN SYSGEN/32 MACRO LIBRARY

MACRO CALL NAME	FUNCTION
CCBI	Generates and initializes the channel control block (CCB) for non-ITAM devices.
DCBI	Creates the DCBs and initializes the DCB fields for non-ITAM devices.
DEF	Defines storage or constants, optionally repeats the define the specified number of times.
DFLIST	Defines a list and generates a label and entry based on the parameters passed.
DMT	Generates the device mnemonic table (DMT). Entries are generated using the information in the sysgen device statements.
EVNGEN	Generates device, directory and bitmap leaves; generates required nodes (Coordination, SELCH, Controller).
FLTPINIT	Generates external entries (EXTRNS) for the appropriate floating point modules depending on support specified in the FLOAT configuration statement. (The EXTRN for a user-specified module is generated by the Sysgen/32 program. Generates labels and reserves memory for the program status word (PSW) and register save areas.
ITAMCCB	Generates and initializes the CCBs for ITAM devices.
ITDC1 ITDC2 ITDC3	Creates and initializes the device dependent portion of the DCB for ITAM devices.
IVTGEN	Generates the initial value table (IVT) from information entered in the configuration input file.

TABLE 3-11 MACROS IN SYSGEN/332 MACRO LIBRARY (Continued)

MACRO CALL NAME	FUNCTION
MMDGEN	Generates the mass storage media (MSM) or multi-media diagnostic (MMD) device dependent portion of the DCB for MSM or MMD disks.
MTPI	Initializes the additional DCB fields needed for magnetic tapes.
$CRDP	Contains the extended DCB structures for card reader/punches.
SLABEL	Used to create a label and an entry for the passed parameter.
SMCONFIG	Defines the memory configuration for Perkin-Elmer Series 3200 processors based on the information in the MCONFIG statement.
SPDMT	Flags virtual devices in the DMT.
SPTINIT	Defines and initializes the system pointer table (SPT); sets the panic address and system queue pointer; generates the ISPT, task control blocks (TCB), and the TCB table; generates the journal and pointer stack. Defines and initializes the system pointers and tables, and reserves memory for system structures.
STARTUP	Builds the command stream to run at system startup using STARTUP...ENDS statement input.
TCOMINIT	Generates and reserves memory for the global task common segments using TCOM statement input.
VMTGEN	Generates a label and reserves space for the volume mnemonic table.
$UP $REV	Used by SPTINIT macro (when generating the SPT) to update the operating system revision ID.

3.6 INCLUDING USER-WRITTEN DRIVERS

If a nonstandard device is to be included in the operating system, it must be defined in the sysgen device statements. The library containing the user-written driver (USERDLIB.LIB) for the device must be specified during the link phase of the Sysgen/32 process.

Use the reserved device codes 240-254 to configure a user-written driver in the system.

Each device configured in the system gets an appropriate DCBxxx macro call written to the .MAC output file (xxx is the device code; e.g., DCB39, DCB147, DCB245, etc.) The DCBxxx macro creates the device DCB and external references to the device driver (in DRIVER.LIB or USERDLIB.LIB). The user must create the DCBxxx macro definition and put it in the user USERDLIB.MLB file.

3.6.1 Creating the DCBxxx Macro

Creating the DCBxxx macro entails a few intermediate steps:

1. Use MLU32 to get the DCBFORM macro from the SYSGEN32.MLB file to use as the pattern.

2. Make the appropriate changes noted in DCBFORM to create the DCB macro.

3. Save the file as DCBxxx.MAC.

4. Use the MLU32 (macro library) utility to add the DCBxxx macro definition to your USERDLIB.MLB file. This library will be searched by MACRO32 before the SYSGEN32.MLB in the normal sysgen process. Use care when creating definitions of macros with names identical to macro names in other libraries.

5. Use COPY/32 or the LIBLDR utility to add the driver code to your USERDLIB.LIB file. The USERDLIB.LIB file will be edited by OS/32 Link before the standard DRIVER.LIB file. Therefore, modified Perkin-Elmer drivers that use standard Perkin-Elmer device codes can also be placed in USERDLIB.LIB, thereby preempting the standard Perkin-Elmer driver.

6. Perform a sysgen using the standard SYSGEN.CSS. The USERDLIB.MLB file will be assignd and the DCBxxx definition will be used.

See the DCBFORM macro in the SYSGEN32.MLB file.

3.7 INCLUDING USER-WRITTEN MODULES

The Sysgen/32 interface allows a user to include user-written or user-modified modules in the system. To include user-written or modified source modules, follow these steps:

1. Copy the source sysgen parameters from the appropriate file, SYSGEN.MAC, to a backup file.

2. Copy the system source module library to a backup file.

3. Change the source parameters in SYSGEN.MAC to include or exclude the desired options.

4. If the name of the modified module differs from the original module name, the PROG, ENTRY, and EQUATE statement labels must be changed to the modified module name. The $OSPROG macro can be used to change the original module name to the modified module name.

5. The following assignments must be made to expand the internal operating system macros using the CAL Macro/32 processor:

```
AL usermodule.EXP,IN,80
L  .BG,MACRO32
T  .BG
AS 1,usermodule.CAL
AS 2,usermodule.EXP
AS 3,NULL:
AS 8,SYSSTRUC.MLB,SRO
AS 9,SYSMACRO.MLB,SRO
AS 10,ITMS.MLB,SRO
ST
```

To assemble module EXSV, lu 11 must be assigned to SYSMAC32.MLB. To assemble module FMS7, lu 11 must be assigned to SYSMAC32.MLB, and lu 12 must be assigned to DVRM.MLB.

NOTE

If user-written macros are to be included in the expansion, assign lu 11 to the appropriate macro library and start MACRO32 by entering:

```
ST ,ML=(8,9,10,11)
```

When assembling a driver from the general purpose driver library, assign lu 11 to DVRM.MLB and start MACRO32 by entering:

```
ST ,ML=(8,9,10,11)
```

6. Assemble the modified source module using CAL/32 with the CROSS and SQUEZ options specified. (The SQUEZ option is required to assemble the floating point module.)

```
AL usermodule.OBJ,IN,126
L  .BG,CAL32,55
T  .BG
AS 1,usermodule.EXP
AS 2,usermodule.OBJ
AS 3,PR:
TE 5,IN,256//4
AS 7,SYSGEN.MAC,SRO
ST ,CROSS,ERS,SQUEZ=99
```

7. Use the following LIBLDR commands to create the USERSYS.LIB.

```
LO .BG,LIBLDR
TA .BG
AL newsys.LIB,IN
AS 0,NULL:
AS 1,SYS.LIB
AS 2,USERSYS.LIB
AS 3,CON:
AS 4,usermod.OBJ
AS 5,CON:
ST
.BG>TAB 1,3
.BG>RW 1
.BG>TAB 4,3
.BG>RW 4
.BG>DUPE 1,2 sysmod.nnn
.BG>COPY 4,2
.BG>COPY 1,0
.BG>DUPE 1,2
.BG>RW 2
.BG>TAB 2,3
.BG>END
```

8. Perform a sysgen using the modified system library. Include the MODULE...ENDM statements to include the modified module if the module name changed.

3.8 SOURCE-LEVEL SYSGEN EXAMPLE

To change the variable time delay (SGN.DLAY) option affecting the system source module EXIN.MAC and replace the system object module EXIN.F13, follow these steps:

1. See Table 3-3 for the source module EXIN.MAC affected by the sysgen variable SGN.DLAY.

2. Copy EXIN.MAC, the affected source module, to a backup file with the new filename, NEWEXIN.MAC. The object-module variation EXIN.F13 now in the system library must be changed and assembled to generate a new variation, and be replaced with the new variation.

3. Change the option variables in the SYSGEN.MAC file to:

   ```
   SGN.ITAM = 0

   SGN.DLAY = 7
   ```

   The communications and Perkin-Elmer Series 3200 processor's sysgen variable settings generate the object module variation EXIN.F13. A value of 7 is selected for a time delay of 7 seconds. Communications support is not desired, so 0 is entered.

4. Use the EDIT commands to change the source sysgen options in the SYSGEN.MAC file:

   ```
   LO .BG,EDIT32
   TA .BG
   ST ,C=CON:
   .BG>GET SYSGEN.MAC
   .BG>T /SGN.ITAM/
         21    SGN.ITAM     EQU    1
   .BG>CH / 1/,/ 0/
         21    SGN.ITAM     EQU    0
   .BG>TYPE/SGN.DLAY/
         26    SGN.DLAY     EQU    5
   .BG>CH/5/,/7/
         26    SGN.DLAY     EQU    7
   .BG>SAVE NEWSGN.MAC
   .BG>END
   ```

5. Make the following assignments to expand the internal operating system macros using the CAL Macro/32 processor:

```
LO .BG,MACRO32,20
TA .BG
AL EXIN.EXP,IN,80/4
AS 1,NEWEXIN.MAC
AS 2,EXIN.EXP
AS 3,NULL:
AS 7,NEWSGN.MAC,SRO
AS 8,SYSSTRUC.MLB,SRO
AS 9,SYSMACRO.MLB,SRO
AS 10,ITMS.MLB,SRO
ST ,ML=(7,8,9,10)
```

6. Assemble the user-modified EXIN.EXP module using CAL/32:

```
LO .BG,CAL32,55
TA .BG
AS 1,EXIN.EXP
AL EXINF13.OBJ,IN,126
AS 2,EXINF13.OBJ
AS 3,PR:
TEMP 5,IN,256//4
AS7, NEWSGN.MAC,SRO
ST ,CROSS,SQUEZ=99,ERS
```

7. Perform a sysgen using the modified system library.

CHAPTER 4
STANDARD OS/32 SUPPORTED DEVICES

4.1 INTRODUCTION

OS/32 supported devices and device characteristics are described in this chapter. These characteristics must be defined in the Sysgen/32 device statements when a device is included in the operating system. Nonstandard devices supported by user-written drivers must use reserved device codes and also must be defined in the device statements to be included in the system. See Chapter 3 for information on configuring user-written modules and drivers in the system.

4.2 OS/32 SUPPORTED LOCAL AND REMOTE DEVICES

Table 4-1 lists, by local and remote device codes, the OS/32 supported devices. Table 4-3 lists the categories (card reader/punch, local video display unit (VDU), etc.) of OS/32 supported devices and their local and remote device codes.

TABLE 4-1 DEVICE CODES FOR OS/32-SUPPORTED DEVICES

LOCAL DEVICE CODE	REMOTE DEVICE CODE	DEVICE TYPE	INTERFACE
0 -15		Reserved	
16		Model 33 Teletype (TTY) keyboard/printer	CLI
17		Model 35 (TTY) keyboard/printer	CLI
18		Nonediting VDU	CLI, CLCM RS232C
19-20		Reserved	
21		Carousel 15, 30, 35, 80-character line	CLI
22		Carousel 15, 30, 35, 132-character line	CLI
23		Model 1100 VDU	CLI, CLCM
24-33		Reserved	
34	147	Nonediting VDU 2- or 8-line	RS232C, CLCM, CLI
35		Reserved	

TABLE 4-1 DEVICE CODES FOR OS/32-SUPPORTED DEVICES (Continued)

LOCAL DEVICE CODE	REMOTE DEVICE CODE	DEVICE TYPE	INTERFACE
36	147	Graphic display terminal 2- or 8-line	RS232C, CLCM
37	147	Carousel 300 2- or 8-line	RS232C, CLCM, CLI
38	147	Carousel 300 with electronic forms control 2- or 8-line	RS232C, CLCM,CLI
39		Model 550 and 1100 VDU 2- or 8-line	RS232C, CLCM,CLI
40		Line printer (BIOC)	
41-43		Reserved	
44		256Mb disk, fixed	
45		1.5Mb head per track (HPT)	
46		160Mb, fixed	
47		1.5 HPT	
48		2.5Mb disk, fixed	
49		2.5Mb disk, removable	
50		5Mb disk, fixed	
51		5Mb disk, removable	
52		40Mb disk, removable	
53		67Mb disk, removable	
54		256Mb disk, removable	
55		Floppy disk	
56		68.5Mb disk, fixed	
57		1.5Mb HPT	
58		67Mb disk, fixed	
59		16Mb disk, removable	
60		16Mb disk, fixed	
61		48Mb disk, fixed	
62		80Mb disk, fixed	
63		675Mb disk, fixed	
64		800 magnetic tape	
65		800/1600 magnetic tape	
66		Intertape cassette	
67		Reserved	
68		6250/1600/800 STC magnetic tape	
69		6250/1600/800 STC magnetic tape (halfword mode)	
70		6250/1600/800 TELEX magnetic tape (halfword mode)	
71-79		Reserved	
80		High-speed paper tape reader/ punch	
81		Model 33 TTY reader/punch	CLI
82		Model 35 TTY reader/punch	CLI
83		Carousel 35 with paper tape reader, 80-character line	

TABLE 4-1 DEVICE CODES FOR OS/32-SUPPORTED DEVICES (Continued)

LOCAL DEVICE CODE	REMOTE DEVICE CODE	DEVICE TYPE	INTERFACE
84		Carousel 35, card reader, 132-character line	
85-95		Reserved	
96		Card reader with software translate, 029 card encoding	
97		Card reader with hardware translate, 029 card encoding	
98		Card reader with software translate, 026 card encoding	
99-103		Reserved	
104		Card reader, high speed, 029 card encoding	
105		Card reader/punch, 029 card encoding	
106		Card reader/punch with print option separate, 029 card encoding	
107-111		Reserved	
112		Low-speed line printer	
113		Medium-speed line printer	
114		High-speed line printer	
115-127		Reserved	
128		8-line interrupt module	
129		Digital multiplexor controller	
130-135		Reserved	
136		Real-time analog system with internal clock	
137		Real-time analog system with user-supplied external clock	
138		Mini input/output (I/O) analog input	
139		Mini I/O analog output	
140		Mini I/O digital	
141-143		Reserved	
	144	Asynchronous communications line	Line Driver Only
	145	Remote line printer (ITAM) and letter quality printer	
	146	SIGMA 10 terminal (communications)	
18	147	Nonediting VDU (communications)	RS232C, CLCM
	148-155	Reserved	
	156	Model 1200 VDU (communications)	CLCM
	156	Model 1250 VDU	CLCM
	157	Model 1250 point-to-point VDU	
	158	Model 1250 multidrop VDU	CLCM

TABLE 4-1 DEVICE CODES FOR OS/32-SUPPORTED DEVICES (Continued)

LOCAL DEVICE CODE	REMOTE DEVICE CODE	DEVICE TYPE	INTERFACE
	159	Reserved	
	160	Binary synchronous communications line on 201 DSA	Line driver only
	161	IBM 3780 remote job entry (RJE) emulation on 201 DSA	
	162	IBM 2780 RJE emulation on 201 DSA	
	163	Binary synchronous processor-to-processor link on 201 DSA	
	164-167	Reserved	
	168	Binary synchronous communications line on quad synchronous adapter (QSA)	Line driver only
	169	IBM 3780 RJE emulation on QSA	
	170	IBM 2780 RJE emulation on QSA	
	171	Binary synchronous processor-to-processor link on QSA	
	172	Binary synchronous IBM 3270 support on QSA	
	173-175	Reserved	
	176	ZBID line driver on QSA; SVC 15 access only; half-duplex	
	177	ZBID line driver on QSA; SVC 15 access only; simplex I/O	
	178	ZBID CTM on QSA; TWS operational mode; SVC 1 access only; simplex input; "mother" to device 179	179
	179	ZBID CTM on QSA; TWS operational mode; SVC 1 access only; simplex output; "daughter" to device 178	178
	180	ZBID CTM on QSA; TWA operational mode; SVC 1 access only; half-duplex	
	181	ZBID CTM on QSA; TWS operational mode; SVC 1 access only; simplex input; "mother" (with assembled DCT) to device 182	182
	182	ZBID CTM on QSA; TWS operational mode; SVC 1 access only; simplex output; "daughter" to device 181	181
	183	ZBID CTM on QSA; TWA operational mode; SVC 1 access only; half-duplex; with assembled DCT	

TABLE 4-1 DEVICE CODES FOR OS/32-SUPPORTED DEVICES (Continued)

LOCAL DEVICE CODE	REMOTE DEVICE CODE	DEVICE TYPE	INTERFACE
	184	Reserved	
	185	Binary synchronous IBM 3270 emulation on QSA	
	186	ZBID CTM for X.25 level 3 on QSA; TWS operational mode; SVC 1 access only; simplex input; "mother" to device 187	187
	187	ZBID CTM for X.25 level 3 on QSA; TWS operational mode; SVC 1 access only; simplex output; "daughter" to device 186	186
	188-191	Reserved	
	192	DMA I/O subsystem (DIOS)	
	193-223	Reserved	
	224-239	Reserved for CAMAC access method	
	240-254	Reserved for user-written drivers	
	255	Null device	

CLI = Current loop interface
CLCM = Current loop communications multiplexor
RS232C = programmable asynchronous line system (PALS), programmable asynchronous single line adapter (PASLA), 2- or 8-line communications multiplexor

NOTES

1. CLI is equivalent to TTY interface.

2. Device code 145 now supports the remote serial line printer (ITAM) and the letter quality printer.

3. Device codes 34 and 36 through 40 can be utilized to invoke the BIOC driver and can be used for local or dial-in applications. The BIOC driver supports vertical forms control.

4. The 3270 communication devices are not part of the standard Perkin-Elmer operating system. To have 3270 support in the target system, the modules must be ordered from a Perkin-Elmer sales office. If 3270 devices are configured for the standard operating system, their specification will result in undefined symbols at Link time.

TABLE 4-2 CATEGORIES OF OS/32 SUPPORTED DEVICES

TYPE	DEVICE	LOCAL DEVICE CODE	REMOTE DEVICE CODE
Card reader	With software translate, 029 card encoding	96	
	With hardware translate, 029 card encoding	97	
	With software translate, 026 card encoding	98	
	Carousel 35 reader	84	
Card reader/ punch	High-speed, 029 card encoding	104	
	029 card encoding	105	
	With print option separate, 029 card encoding	106	
TTY reader/ punch	Model 33 (CLI)	81	
	Model 35 (CLI)	82	
	Carousel 35 with paper tape reader, 80-character line	83	
	Carousel 35 card reader, 132-character line	84	
TTY keyboard printer	Model 33 (CLI)	16	
	Model 35 (CLI)	17	
	Nonediting VDU (CLI)	18	
	Carousel 15, 30, 35, 80-character line (CLI))	21	
	Carousel 15, 30, 35, 132-character line (CLI)	22	
	Model 1100 VDU (CLI)	23	
High-speed paper tape reader/punch	High-speed	80	

TABLE 4-2 CATEGORIES OF OS/32 SUPPORTED DEVICES (Continued)

TYPE	DEVICE	LOCAL DEVICE CODE	REMOTE DEVICE CODE
Line printer (ITAM) and letter quality printer	Low-speed	112	
	Medium-speed	113	
	High-speed	114	
	Remote		145
Line printer (BIOC)	Local	40	
Tape cassette	Intertape	66	
Magnetic tape	800 bpi	64	
	1600/800 bpi	65	
	6250/1600/800 bpi STC	68	
	6250/1600/800 bpi STC halfword mode	69	
	6250/1600/800 bpi TELEX tape with standard controller	70	
Disks	256Mb disk, fixed	44	
	1.5Mb, HPT	45	
	160Mb, fixed	46	
	1.5Mb HPT	47	
	2.5Mb disk, fixed	48	
	2.5Mb disk, removable	49	
	5Mb disk, fixed	50	
	5Mb disk, removable	51	
	40Mb disk, removable	52	
	67Mb disk, removable	53	
	256Mb disk, removable	54	

TABLE 4-2 CATEGORIES OF OS/32 SUPPORTED DEVICES (Continued)

TYPE	DEVICE	LOCAL DEVICE CODE	REMOTE DEVICE CODE
Disks (Con't)	68.5Mb disk, fixed	56	
	1.5Mb disk, HPT	57	
	67Mb disk, fixed	58	
	16Mb disk, removable	59	
	16Mb disk, fixed	60	
	48Mb disk, fixed	61	
	80Mb disk, fixed	62	
	675Mb disk, fixed	63	
Floppy disk	Floppy disk	55	
Local VDU	Nonediting VDU (CLCM) (RS232C)	34	147
	Graphic display terminal (CLCM) (RS232C)	36	147
	Carousel 300 (CLCM) (RS232C)	37	147
	Carousel 300 with electronic forms control (CLCM) (RS232C)	38	147
	Models 550 and 1100 VDU (CLCM) (RS232C)	39	147
8-line interrupt module	8-line interrupt module	128	
Digital multiplexor	Digital multiplexor controller	129	
Conversion equipment	Real time analog system with internal clock	136	
	Real time analog system with user-supplied external clock	137	

TABLE 4-2 CATEGORIES OF OS/32 SUPPORTED DEVICES (Continued)

TYPE	DEVICE	LOCAL DEVICE CODE	REMOTE DEVICE CODE
Analog I/O Controller	Mini I/O analog input	138	
	Mini I/O analog output	139	
Digital I/O Controller	Mini I/O digital	140	
Communications Devices	Asynchronous communications line, line driver only		144
	Remote line printer and letter quality printer		145
	SIGMA 10 terminal		146
	Nonediting VDU (CLI)	18	147
	Models 550 and 1100 VDU (CLI)	39	147
	TEC 455 editing VDU		155
	Model 1200 VDU		156
	Model 1250 point-to-point VDU		157
	Model 1250 multidrop VDU		158
	Binary synchronous on 201 DSA, line driver only		160
	IBM 3780 RJE emulation on 201 DSA		161
	IBM 2780 RJE emulation on 201 DSA		162
	Binary synchronous processor-to-processor on 201 DSA		163
	Binary synchronous on QSA, line driver only		168

TABLE 4-2 CATEGORIES OF OS/32 SUPPORTED DEVICES (Continued)

TYPE	DEVICE	LOCAL DEVICE CODE	REMOTE DEVICE CODE
Communications Devices (Continued)	IBM 3780 RJE emulation on QSA		169
	IBM 2780 RJE emulation on QSA		170
	Binary synchronous processor-to-processor link on QSA		171
	Binary synchronous IBM 3270 link on QSA		172
	ZBID line driver on QSA; SVC 15 access only; half-duplex		176
	ZBID line driver on QSA; SVC 15 access only; simplex I/O		177
	ZBID CTM on QSA; TWS operational mode; SVC 1 access only; simplex input; "mother" to device 179		178
	ZBID CTM on QSA; TWS operational mode; SVC 1 access only; simplex output; "daughter" to device 178		179
	ZBID CTM on QSA; TWA operational mode; SVC 1 access only; half-duplex		180
	ZBID CTM on QSA; TWS operational mode; SVC 1 access only; simplex input; "mother" (with assembled DCT) to device 182		181
	ZBID CTM on QSA; TWS operational mode; SVC 1 access only; simplex output; "daughter" to device 181		182

TABLE 4-2 CATEGORIES OF OS/32 SUPPORTED DEVICES (Continued)

TYPE	DEVICE	LOCAL DEVICE CODE	REMOTE DEVICE CODE
Communications Devices (Continued)	ZBID CTM on QSA; TWA operational mode; SVC 1 access only; half-duplex; with assembled DCT		183
	Binary synchronous IBM 3270 emulation on QSA		185
	ZBID CTM for X.25 level 3 on QSA;TWS operational mode; SVC 1 access only; simplex input; "mother" to device 187		186
	ZBID CTM for X.25 level 3 on QSA;TWS operational mode; SVC 1 access only; simplex output; "daughter" to device 186		187
	DMA I/O subsystem (DIOS)		192

4.3 DEVICES USING CURRENT LOOP INTERFACE (CLI)

Devices using CLI can be used as the console device. These devices connected to the CLI can be configured in the system:

- Carousel 15, 30, 35
- Carousel 300
- Model 33 TTY
- Model 35 TTY
- Nonediting VDU
- Model 550
- Model 1100

When the paper tape reader/punch and keyboard/printer features of the TTY and carousel devices are both supported, a shared-busy condition exists, since these devices are configured at the same address.

NOTE

If the reader/punch feature is supported by an (ASR) TTY console device, the reader/punch feature must not be assigned to a user task.

If a carousel supports paper tape, it can only support the paper tape reader feature.

Examples:

```
TTY1:,2,016,CONS    *Model 33, console device
TRP1:,2,081         *Reader/punch, same device
```

4.4 DEVICES USING STANDARD RS232C INTERFACE (PALS, PASLA, 2- OR 8-LINE COMMUNICATIONS MULTIPLEXOR) OR CURRENT LOOP COMMUNICATIONS MULTIPLEXOR (CLCM)

Devices using the standard RS232C interface or CLCM can be used as the console device. The following devices connected to the standard RS232C interface or CLCM can be configured in the system:

- Nonediting VDU
- Graphic display terminal
- Carousel 300
- Carousel 300 with electronic format control (EFC)
- Model 550 (nonediting) VDU
- Model 1100 (nonediting) VDU
- Model 1200 (editing) VDU
- Model 1250 (editing) VDU

Because the editing features of Models 1200 and 1250 are not currently supported by the VDU driver, both models must be configured as nonediting VDU. Communications supports the editing features of Models 1200 and 1250. See the OS/32 Basic Data Communications Reference Manual for details of this support.

CAUTION

DO NOT USE MODELS 1200 AND 1250 WITH THE EDITING FEATURE AS THE CONSOLE DEVICE, AS DATA WRITTEN TO THE DEVICE CAN LOCK THE KEYBOARD.

The default strapping for PALS, PASLA, 2- and 8-line communications multiplexor, and CLCM is:

- The clocks are strapped to a baud rate between 110 and 9600. A clock is selected when the device begins an I/O operation.
- The function switches for Model 1100, 1200, and 1250 should be set for even parity. All other devices should be set for no parity.
- The interface must be strapped full duplex, disable CARR status, disable DSRDY status, and disable CL2S for nonediting VDUs, graphic display terminals, and carousels. For the Models 1100, 1200, and 1250 VDUs, the interface must be strapped full duplex, enable CARR status, enable DSRDY status, and enable CL2S status.

4.4.1 The Asynchronous Input/Output Controller (BIOC)

With the release of OS R06.2, the standard local CRT driver is the BIOC driver which will be configured in the system by default at sysgen time. Certain features of the BIOC driver can be enabled and disabled. To do this, the following parameters can be specified in the DEVICES...ENDD statements:

RECLEN=n	where n is the number of characters per line.
SIZE=n	where n is the number of lines per page.
XCOD=n	where n specifies a halfword with bit definitions explained in Table 4-3.

TABLE 4-3 BIOC XDCOD BIT DESCRIPTIONS

BIT	HEX	MEANING
0	8000	Support ITAM extended options disconnect for write. Selection of this option disconnects a dial-in line upon signoff from MTM.
1	4000	Suppress BREAK/ESC function. Selection of this option prevents actuation of a BREAK from causing an I/O error on remote printers.

TABLE 4-3 BIOC XDCOD BIT DESCRIPTIONS (Continued)

BIT	HEX	MEANING
2	2000	Enable CTRL-A to cause entry into baud adjust routine. Selection of this option allows local terminals to select different baud rates.
3	1000	Suppress write timeout if carrier is off. Selection of this option allows a dial-in user to be welcomed by MTM's ID message at the completion of baud adjust.
4	0800	Support full BIOC funtions. Selection of this option enables the full compliment of BIOC features. If this option is not selected, the ASCII read functions will be limited to CTRL-H, as a non-destructive backspace, and CTRL-X, as a cancel line request. In addition, CTRL-Q through CTRL-T will be stripped from the input to allow full implementation of flow control as used by some data-concentrators.
5	0400	Suppress mark off of devices at sys-init time for false sync. At system boot or hot-start, BIOC addresses every device that has been sysgened with its DCBs. If BIOC receives a false sync in response to an output command, it marks that device OFF. If a system has devices on bus-switches, the power fail delay may result in these devices being marked off. If the above conditions cause problems, it is advisable to suppress this feature at sysgen time.
6	0200	Support CR as termination for image read. Normally image reads are terminated only with buffer-full or break. Selection of this option enables CTRL-M to terminate the read. If CTRL-M is used to terminate the read, it will not be echoed to the terminal but it will be placed into the buffer as data.
7-15	01FF	Select command 2 for choice of stop bits, data bits, parity, and clock rate. (Consult interface programming manual for specific information.) If bit 7 is a one, bits 8-15 will be used as the entire command 2. If bit 7 is a zero, bits 8-11 must be zero, and bits 12-15 can be A, B, C, D or zero to select only the clock rate. When bit 7 is zero, the default defined by the DCB is used for the other options.

TABLE 4-3 BIOC XDCOD BIT DESCRIPTIONS (Continued)

BIT	HEX	MEANING
	LN	Specifies terminal/printer logical record length. Normally this length is the number of characters that can be printed on one line.
	PS	Specifies terminal/printer page size. Normally this size is the number of lines that can be printed on one page.

4.5 INTERTAPE CASSETTES

The two cassettes located in a transport are interlocked in the hardware, causing a shared-busy condition.

Example:

```
CAS1:,45,066     *Two cassettes on
CAS2:,55,066     *same transport
```

4.6 CARD READERS

These card readers can be configured in the system:

- Card reader 029 with software code translation
- Card reader 029 with hardware code translation
- Card reader 026 with software code translation

There is an additional feature of the 026 and 029 card reader drivers that can be included in the system at sysgen time. The driver can translate the Hollerith code into EBCDIC instead of ASCII code. This feature can be included by specifying the following translate tables in the device statement:

- INITRE26, which converts all 026 card reader codes directly to EBCDIC representation in memory
- INITRE29, which converts all 029 card reader codes directly to EBCDIC representation in memory

Example:

```
CR29:,04,96     *Standard card reader, software translate, 029
                 card encoding

CRHW:,04,97     *Card reader, hardware translate, 029 card
                 encoding

CR26:,04,98     *Standard card reader, software translate, 026
                 card encoding
```

4.7 CARD PUNCHES

These card punches can be configured in the system:

- High-speed 029 card encoding
- Card reader/punch (interpreting)
- Card reader/punch 029 card encoding with print option

As supplied, these devices translate 029 Hollerith code to/from ASCII. There is an additional feature of the card punch and card reader/punch that can be included in the system. Optionally, the devices can translate 026 Hollerith code to/from ASCII, 026 Hollerith code to/from EBCDIC, or 029 Hollerith code to/from EBCDIC. These features can be included by referencing the following translate tables in the device statement:

- INITPA26 or INITRA26, which converts all 026 card codes directly to ASCII representation in memory
- INITPE29 or INITRE29, which converts all 029 card codes directly to EBCDIC representation in memory
- INITPE26 or INITRE26, which converts all 026 card codes directly to EBCDIC representation in memory

Example:

```
CP:,7,104       *High-speed card punch
CRP:,8,105      *Card reader/punch
CRPS:,9,106     *Card reader/punch with print separate
```

4.8 LINE PRINTERS

These line printers can be configured in the system:

- 60-200 lines per minute (LPM) printer
- 300 LPM printer
- 600, 1000 LPM printer
- Remote serial line printer and letter quality printer

NOTE

Full VFC read and write operations are supported by the BIOC driver, the line printer driver, and the point-to-point terminal manager. However, the point-to-point terminal manager supports VFC in conversational mode only.

Example:

```
LPR1:,62,112              *Low-speed printer (60-200 LPM)
LPR2:,63,113              *Medium-speed printer (300 LPM)
LPR3:,72,114              *High-speed printer (600, 1000 LPM)
RMOT:,48,145,XDCD=X'800    Serial line printer (110 baud
                           through 9600)
```

4.9 HIGH-SPEED PAPER TAPE READER/PUNCH

High-speed paper tape reader/punches can be configured in the system.

Example:

```
PRTP:,13,80     *High-speed paper tape reader/punch
```

4.10 MAGNETIC TAPE CONTROLLERS AND TAPES

Magnetic tape controllers are specified in the controller option of the device statements. A magnetic tape controller supports from one to four transports.

The device statement for the tapes must identify the tapes for each controller. Each tape requires a device statement that allows more than one tape to be active at one time. The following magnetic tapes can be configured in the system:

- 800 bpi magnetic tapes
- 1600 bpi magnetic tapes
- 1600/800 bpi dual density magnetic tape drives
- 6250 bpi magnetic-tapes - special systems controller (STC)
- 6250 bpi - halfword mode controller (STC)
- 6250 bpi - TELEX tape device

The 6250 tape drives may require extended direct memory access (EDMA) bandwidth coordination. The 6250 tape drives can run with gaps or in gapless mode.

Example:

```
MAG1:,85,64,CONTR=0,SELCH=F0        *Tape1 (800 bpi)
MAG2:,95,64,CONTR=0,SELCH=F0        *Tape2 (800 bpi)
MAG3:,C5,65,CONTR=1,SELCH=F0        *Tape3 (1600 bpi)
MAG4:,D5,65,CONTR=1,SELCH=F0        *Tape4 (1600 bpi)
MAG5:,80,68,SELCH=F0,CONTR=2        *Tape5 (6250 bpi)
MAG6:,90,68,SELCH=F0,CONTR=2        *Tape6 (6250 bpi)
```

4.11 DISKS

All Perkin-Elmer supported disks have one disk volume per disk drive, except for the 10Mb disk (M46-416), which is composed of two 5Mb disk volumes, and the 68.5Mb disk, which is composed of a 1.5Mb disk and a 67Mb disk.

Three algorithms are available for scheduling I/O queued to a disk: priority, first-in/first-out (FIFO) and C-SCAN (seek optimization). The C-SCAN algorithm is supplied as a default and is used to produce the highest throughput on the disk by reducing the number and range of seek operations. It includes an adjustment to prevent one task from queuing many consecutive I/Os. If a task request is queued ahead of all other requests, and the current I/O is being executed for this same task, then this request is scheduled on the next scan of the arm.

The priority and FIFO algorithms are selected by specifying the QUEUE option in the device statement. For priority scheduling, DISKQ is changed to COMQ. For FIFO, it is changed to COMFIFO. Priority schedules by calling task priority and then FIFO within each priority level. FIFO schedules without regard to priority or disk position.

A second available option is the elimination of the EDMA coordination overhead in systems that do not require EDMA coordination. The field DCB.EDMA should be left at zero. This is accomplished in the DCBINI macro in the macro library SYSGEN32.MLB by omitting EDMA=SEEKCHK.

4.11.1 Moving-Head Disks

A moving-head disk controller supports from one to four disk drives. The device statements for the disks must identify the SELCH and controller address.

The following disks can be configured in the system:

- 2.5Mb, fixed
- 2.5Mb, removable
- 5Mb, fixed } Composes a 10Mb disk
- 5Mb, removable }
- 40Mb, removable

The 10Mb disk is composed of two 5Mb disks. These two disks share the same drive, causing a shared-busy condition. Two device statements must be specified for a 10Mb disk. The shared-busy conflict is resolved by Sysgen/32 based on the device code/device address.

Example:

```
DSC1:,C6,51,SELCH=F0,CONTR=B6    *Removable
DSC2:,C7,50,SELCH=F0,CONTR=B6    *Fixed
DSC3:,D6,51,SELCH=F0,CONTR=B6    *Removable
DSC4:,D7,50,SELCH=F0,CONTR=B6    *Fixed
```

DSC1 and DSC2 have a shared-busy condition, as do DSC3 and DSC4.

4.11.2 Mass Storage Media (MSM) Disks

These disks can be configured in the system:

- MSM300 256Mb, fixed
- MSM300 256Mb, removable
- MSM80 67Mb, removable
- MSM80 67Mb, fixed
- MSM80 HPT 1.5Mb, fixed

} Composes a 68.5Mb disk

- MSM80 HPT 68.5Mb, fixed and removable
- MSM1.5 HPT of 675, fixed
- MSM160, fixed

The 68.5Mb MSM HPT disk is composed of a 1.5Mb fixed head disk and a MSM 67Mb fixed-disk.

If the disk drive requires dual port support, the dual port option should be specified in the device statement. The driver will treat alternate channel busy conditions from a single port drive as an error condition.

I/O error recording is supported for MSM disks only. Tables 4-1 and 4-2 contain the device codes for MSM disks.

4.11.3 Direct Memory Access (DMA) Coordination Nodes

It is possible to configure DMA devices whose total bandwidth would exceed the capacity of the EDMA bus. To prevent the resultant data overruns and inefficient operation, coordination of EDMA activity can be configured by using the EDMA node. Generally, the 6250 bpi, 125 IPS, and the MSM disks are considered for EDMA coordination. Only when present in extreme numbers on the Model 7/32 processor would the slower tapes and disks be considered for coordination.

If the number of channels is greater than the number of simultaneous data transfers allowed in the system, a DMA coordination node must be configured. However, if the number of channels is less than or equal to the number of simultaneous data transfers allowed, no coordination statements are required.

DMA coordination is specified in the COORDINATION statement.

Example:

```
DSC1:,FC,53,SELCH=F0,CONTR=FB      *67Mb (MSM80) disk
DSC2:,EC,53,SELCH=F1,CONTR=EB      *67Mb (MSM80) disk2
Mag1:,85,68,SELCH=F2,CONTR=0       *6250 bpi, 125 IPS magnetic
                                     tape driver
COORDINATION=TRANSFER=4,SELCH=(F0,F1,F2)
```

4.11.4 Floppy Disk Subsystems

A floppy disk subsystem consists of one controller with one to four spindles. The controller is transparent to the user. All spindles share the same controller, causing a shared-busy condition. The shared-busy conflict is resolved by Sysgen/32 based on the device address configuration described in Section 2.3.11.

The device statement for the disk has a device mnemonic associated with the drive only when the disk is marked offline.

Two algorithms are available for scheduling I/O queued to a floppy disk: priority and FIFO.

The priority algorithm is selected by specifying the QUEUE option in the device statement. For priority scheduling, COMFIFO is changed to COMQ. Priority schedules by calling task priority and then FIFO within each priority level. The default algorithm is FIFO. FIFO schedules without regard to priority or disk position.

A second option available is elimination of the EDMA coordination overhead in systems that do not require EDMA coordination. The field DCB.EDMA should be left at zero. This is accomplished in the DCBINI macro in SYSGEN32.MLB by omitting EDMA=SEEKCHK.

If there is more than one floppy disk subsystem in the system, a DMA coordination node must be configured above the subsystems it controls. If a DMA coordination node is not defined, intermittent I/O errors, loss of data, or system failure can occur. Although the floppy disk is not a DMA device, it uses the same coordination methods to operate within the bandwidth limitations of the controller.

The device statement for each spindle has a:

- device mnemonic associated with the spindle, and a
- spindle number (0, 1, 2, or 3) specified in the SPINDLE option of the device statement.

Examples:

```
FLP1:C1,055,SPINDLE=0       *First floppy disk spindle
FLP2:C1,055,SPINDLE=1       *Second floppy disk spindle
FLP3:C1,055,SPINDLE=2       *Third floppy disk spindle


FLP1:C1,055,SPINDLE=0       *First spindle for subsystem1
FLP2:C1,055,SPINDLE=1       *Second spindle for subsystem1
FLP3:C1,055,SPINDLE=2       *Third spindle for subsystem1
FLPA:C2,055,SPINDLE=0       *First spindle for subsystem2
FLPB:C2,055,SPINDLE=1       *Second spindle for subsystem2
COORD DEV=(FLP1,FLP2,FLP3,FLPA,FLPB),TRANSFER=1
```

4.12 8-LINE INTERRUPT MODULE

Each 8-line interrupt module must be defined by a device statement. Trap-generating device (TGD) support must be included in the system at sysgen time for an 8-line interrupt module.

Example:

```
LIN0:,20,128
LIN1:,21,128
LIN2:,22,128
LIN3:,23,128
LIN4:,24,128
LIN5:,25,128
LIN6:,26,128
LIN7:,27,128
```

4.13 SYSGENING A SYSTEM WITH A COMMUNICATIONS MULTIPLEXOR

The communication multiplexor (COMM MUX) interfaces a Perkin-Elmer processor system, via a multiplexor bus, to various device controllers. It is available in the 2- and 8-line version. Each line can be strapped for one of four groups, with each group containing four program-selectable clock rates. The COMM MUX baud rate is made compatible to the device by selecting the clock that matches the desired baud rate. The selected clock is specified by the CLOCK option of the device statement. See Table 4-4.

TABLE 4-4 BAUD RATES WITHIN AN INSTALLED GROUP

STRAP OPTION	BAUD RATE	CLOCK
Group 1	50	XA
	110	XB
	1 800	XC
	2 400	XD
Group 2	75	XA
	134.5	XB
	2 000	XC
	3 600	XD
Group 3	150	XA
	600	XB
	4 800	XC
	9 600	XD
Group 4	300	XA
	1 200	XB
	7 200	XC
	19 200	XD

4.14 CONVERSION EQUIPMENT CONTROLLER

These conversion equipment controllers can be configured in the system:

- Real-time analog system
- Analog input controller
- Analog output controller
- Digital I/O controller

Example:

```
RTAS:,83,136     *Real time analog system
AIC:,88,138      *Analog input controller
AOC:,98,139      *Analog output controller1
AOC2:,99,139     *Analog output controller2
DIC:,A9,140      *Digital input controller
DOC:,A8,140      *Digital output controller
```

CHAPTER 5
SAMPLE SYSGEN/32 SESSIONS

5.1 INTRODUCTION

This chapter is presented to aid the less experienced user through the initial Sysgen/32 session. It is assumed that the user has read the previous chapters (Chapter 1 in particular) in this manual before attempting to use Sysgen/32. This chapter identifies three general situations, and then presents a sample Sysgen/32 session that can be used for each situation. One of these situations should apply to a user about to use Sysgen/32 for the first time. The sample Sysgen/32 sessions presented are not the only way Sysgen/32 can be used in these situations. As the user becomes more familiar with the Sysgen/32 process, these samples need not be used. However, for the first-time user they do provide an easy to follow procedure for using Sysgen/32.

5.2 SYSGEN/32 STARTUP SITUATIONS

When the user is prepared to perform a system generation (sysgen), one of the following three situations will likely exist:

- A configuration input file has been previously created and now must be processed.
- No previously created configuration input file exists. The user wishes to create a configuration input file in the conversational mode and then process it.
- No previously created configuration input file exists. The user wishes to create a configuration input file in the interactive mode and then process it.

In each situation, the user must first load and then start the Sysgen/32 program using the system LOAD and START commands, respectively. The following three sections provide a sample Sysgen/32 session for each of the three situations described above. The user should note that these are sample Sysgen/32 sessions and the user is not required to use these procedures in every case.

5.2.1 Processing a Previously Created Configuration Input File

The following commands will load and start the Sysgen/32 program and process a previously created configuration input file:

```
*LOAD SYSGEN32
*START, INPUT=FIGUR1.SYS, OUTPUT=MACRO1.MAC, LIST=PR:
-
-SYSGEN/32 R00-00
```

When these commands are entered, the configuration input file (FIGUR1.SYS) is processed by the Sysgen/32 program in batch mode. The macro calls generated by the Sysgen/32 program are written to the output file (MACRO1.MAC). List output is written to the list file (PR:).

The user can now follow the procedures outlined in Chapter 1 for expanding the macros, assembling the expanded macros, and linking the object-module to yield an operating system.

5.2.2 Creating a Configuration Input File Conversationally and Processing the Input File

The following commands will load and start the Sysgen/32 program and allow the user to create a configuration input file in the conversational mode and then process the newly created file:

```
*LOAD SYSGEN32
*START, LIST=PR:, COMMAND=CON:
-
-SYSGEN/32 R00-00
>INPUT=FIGUR2.SYS
>OUTPUT=MACRO2.MAC    <must not exist>
>CONVERSATIONAL
 .
 .
```

At this point, a conversational prompt and response session begins. (Section 5.3 presents a sample conversational prompt session.) Each response entered by the user is translated into a configuration input statement and then written to the designated input file (FIGUR2.SYS). When the prompt session has completed, the user processes the input file by entering the following command:

```
 .
 .
>PROCESS
 .
 .
 .
-END OF TASK CODE=0
```

When the Sysgen/32 program has successfully completed processing the configuration input file, the output file contains the macro calls generated. The user can now follow the procedures outlined in Chapter 1 for expanding the macros, assembling the expanded macros, and linking the object module to yield an operating system.

5.2.3 Creating a Configuration Input File Interactively and Processing the Input File

The following commands will load and start the Sysgen/32 program and allow the user to create a configuration input file in an interactive mode and then process the newly created file:

```
*ALLOCATE FIBUR3.SYS,IN,80
*LOAD SYSGEN/32
*START, INPUT=FIGUR3.SYS,OUTPUT=MACRO3.MAC,LIST=PR:
       ,COMMAND=CON:
-
-SYSGEN/32 R00-00
>PROCESS
 READY FOR CONFIGURATION INPUT
>.
 .
 .
```

At this point the user can interactively enter the required sysgen configuration statements. Chapter 2 describes the format and content of these sysgen statements. It is important to note that the specified input file (FIGUR3.SYS) must be an empty file or the interactive prompt will not appear. When the sysgen statements have been entered, the following commands are entered to complete the input file and begin processing:

```
>ENDC
 READY FOR SYSGEN COMMANDS
>PROCESS
 .
 .
 .
-END OF TASK CODE=0
```

When the task has reached a successful completion, the macro calls generated by the Sysgen/32 program are located in the output file, MACRO3.MAC. The user can now follow the procedures outlined in Chapter 1 for expanding the macros, assembling the expanded macros, and linking the object module to yield an operating system.

5.3 CREATING A CONFIGURATION INPUT FILE

As the examples in the previous section show, Sysgen/32 allows the user to create a configuration input file in two modes:

- conversational mode, and
- interactive mode

For the less experienced user the conversational mode is ideal, since the user merely has to respond to a series of prompts supplied by the Sysgen/32 program. The user responses are translated to create configuration input statements which are written to the configuration input file. This file is then processed via the Sysgen/32 PROCESS command.

The interactive mode requires more knowledge on the part of the user because no Sysgen/32 prompts are issued. The user enters sysgen configuration statements interactively from the command device and, therefore, must know what statements to include and the format of each statement. The sections that follow provide examples of creating a configuration input file in both conversational and interactive modes.

5.3.1 Using the Conversational Mode

A conversational prompt and user response session allows the user to create a configuration input file from the command device. The responses are translated into configuration input statements and are written to the specified configuration input file. This file is specified with either the INPUT parameter of the START command or with the INPUT command. If a user response to a system prompt is not acceptable, the Sysgen/32 program continues issuing the prompt until an acceptable response is entered. All conversational prompts follow this general format:

```
QUESTION (POSSIBLE CHOICES) [DEFAULT CONDITION]
```

A conversational session does not end until the Sysgen/32 program has issued all of the prompts contained in the conversational file. When all of the prompts have been displayed, Sysgen/32 informs the user that the program is ready to accept Sysgen/32 commands. At this point, the user specifies the name of the macro output file using the Sysgen/32 OUTPUT= command and then begins processing of the configuration input file by entering the Sysgen/32 PROCESS command. The Sysgen/32 END command terminates the session. A successful completion has been reached if an end of task code of 0 is received. The following is an example of a conversational session.

```
*LOAD SYSGEN32
*START, INPUT= FIGURE1.SYS, COMMAND=CON:
-
-SYSGEN/32 R00-00
>CONVERSATIONAL
 PROCESSOR MODEL (7/32, 8/32, 3210, 3220, 3230, 3240, 3250) [3220]
>3220
 NUMBER OF REGISTER SETS (2 OR 8) [8]
>8
 O/S VERSION (8 CHAR. ALPHANUMERIC STRING) [BLANKS]
>3220.N13
SIZE OF MEMORY IN KB (64-16384, DIVISIBLE BY 16) [256]
>CR
 DYNAMIC SYSTEM SPACE IN KB (1 TO TOP OF MEMORY) [25]
>CR
 MAX. NUMBER OF TASKS (1 TO 252) [32]
>35
 BACKGROUND MAX. PRIORITY (11 TO 248) [16]
>15
 BACKGROUND MAX. SYSTEM SPACE (0.25 KB INCREMENTS) [9]
>9
 COMMAND BUFFER LENGTH (32 TO 1024 BYTES) [80]
>CR
 LOG MESSAGE BUFFER LENGTH (32 TO 132 BYTES) [72]
>CR
 CSS LEVELS (1 TO 249) [5]
>5
 NUMBER OF QUEUE ENTRIES (10 TO 64999) [TOTAL NUMBER OF DEVICES]
>CR
 NUMBER OF JOURNAL ENTRIES (0 TO 12999) [0]
>20
 MAC/MAT ADDRESS (300, 500, 900) [X"300"]
>CR
 LINE CLOCK FREQUENCY (50 OR 60) [60]
  .
  .
  .
 ENTER STARTUP PROCEDURES (COMMANDS OR CR) [NO STARTUP PROC.]
>CR
 MEMORY DIAGNOSTIC SUPPORT (YES OR NO) [NO]
>Y
 ERROR RECORDING SUPPORT (YES OR NO) [NO]
>CR
 TCOM SUPPORT (YES OR NO) [NO]
>Y
 ENTER TCOM NAME
>TCM1
 ENTER START ADDR OF TCOM
>10000
 ENTER TCOM SIZE (IN 0.25 KB INCREMENTS)
>.25
 COORDINATION (EDMA) SUPPORT (YES OR NO) [NO]
>Y
```

```
 ENTER DEVICES THIS GROUP
>FLP1:
>FLP2:
>FLP3:
>FLP4:
 ENTER SELECTOR CHANNELS THIS GROUP
>CR
 ENTER TRANSFER RATE
>1
 COORDINATION (EDMA) SUPPORT (YES OR NO) [NO]
>N
 MCONFIG (YES OR NO) [NO]
>Y
 BLOCK (0-15)
>0
 START (0-15)
>0
 RANGE (1-16)
>1
 INTERL (0,2,4 OR CR)
>CR
 SHARED (RECORD,NORECORD,NVRECORD OR CR)
>RECORD
 NAME OF CONSOLE DEVICE (CON:)
>CR
 NAME OF CONSOLE DEVICE (CON:)
>CON:
 TTY/RP MODEL 33 (CURRENT LOOP INTERFACE),DCOD 16:
 DEVICE NAME [TTY:]
>/
 TTY/RP MODEL 33 (CURRENT LOOP INTERFACE),DCOD 81:
 DEVICE NAME [TTY:]
>TTY1:
 DEVICE ADDRESS [002]
>002
 INTERRUPT LEVEL [0]
>0
 IOCLASS [2]
>2
 TTY/RP MODEL 33 (CURRENT LOOP INTERFACE),DCOD 81:
 DEVICE NAME [TTY:]
>TTY2:
 DEVICE ADDRESS [002]
>006
 INTERRUPT LEVEL [0]
>0
 IOCLASS [2]
>2
 TTY/KP MODEL 35 (CURRENT LOOP INTERFACE),DCOD 17:
 DEVICE NAME [TTY:]
>/
 TTY/RP MODEL 35 (CURRENT LOOP INTERFACE),DCOD 82:
 DEVICE NAME [TTY:]
>/
```

```
 NONEDITING CRT (Current LOOP INTERFACE), DCOD18:
 DEVICE NAME [TTY:]
>/
 CAROUSEL 15, 30, 35 (80 CHARACTERS, CLI), DCOD21:
 DEVICE NAME [TTY:]
>/
  .
  .
  .
CONVERSATIONAL PROCESSING COMPLETE
>OUTPUT=MACRO3.MAC
>PROCESS
>END
-END OF TASK CODE=0
```

NOTE

In a conversational session there is no default for device names and addresses. The user must enter a response to the device prompt or the program will continue to issue the same device prompt until a response is received. A slash (/) bypasses a device prompt, indicating that the device displayed is not desired in the system being configured or that no further devices of this type are to be configured in the system.

Table 5-1 describes the parameters involved in device prompts.

TABLE 5-1 DEVICE PROMPT PARAMETER DESCRIPTIONS

PARAMETER	DESCRIPTION
DEVICE NAME	Four-character mnemonic the system associates with a device
DEVICE ADDRESS	Hexadecimal number specifying the physical address of a device
INTERRUPT LEVEL	Decimal number from 0 (highest) through 3 (lowest) specifying the hardware interrupt level for device interruption
I/O CLASS	Decimal number from 0 through 31 specifying the device or file class

TABLE 5-1 DEVICE PROMPT PARAMETER DESCRIPTIONS (Continued)

PARAMETER	DESCRIPTION
CLOCK A, B, C, D	Baud rate at which data can be transmitted to and from a terminal
SELECTOR CHANNEL	Two-digit hexadecimal number specifying the SELCH address
CONTROLLER	Two-digit hexadecimal number specifying the CONTROLLER address
SPINDLE NUMBER	Decimal number from 0 through 3 specifying the floppy disk spindle number
TRANSFER RATE	Number of simultaneous transfers if coordination is specified

5.3.1.1 Accessing The HELP File in Conversational Mode

To access the HELP file during a conversational session, enter a question mark (?) in response to a program prompt. Information pertinent to the last prompt issued will be displayed to the command device.

Example:

```
 BACKGROUND MAX. SYSTEM SPACE (0.25 KB INCREMENTS) [9]
>?
 BACKGROUND:ESTABLISHES BACKGROUND PRIORITY AND SYSTEM SPACE
 COMMAND FORMAT: BACKGROUND [MAXPRI] [,MAXSIZE]
                 MAXPRI=DECIMAL NUMBER FROM 11
                        THROUGH 248
                        DEFAULT=16
                MAXSIZE=DECIMAL NUMBER, INCREMENTS OF
                        0.25 KB
                        DEFAULT=9
>CR
 BACKGROUND MAX. SYSTEM SPACE (0.25 KB INCREMENTS)  [9]
>10
```

5.3.2 A Configuration Input File Created Interactively

To create a configuration input file interactively, the user must load and start the Sysgen/32 program either with the name of an interactive device specified as the command device, or by taking the default CON:

The user may use the START command format shown in Example 3 in Section 5.2, or the user may specify only the command device in the START command and then specify the input and output files using the Sysgen/32 commands, as shown in the following example.

Example:

```
*LOAD SYSGEN/32
*START,COMMAND=CON:
-
-SYSGEN/32 R00-00
>INPUT = FIGUR1.SYS          <  must be an empty file  >
>OUTPUT= MACRO7.MAC          <  Must not pre-exist  >
>PROCESS
 READY FOR CONFIGURATION INPUT
>
  .
  .
  .
>ENDC
 READY FOR SYSGEN/32 COMMANDS
>PROCESS
>END
-END OF TASK CODE=0
```

The user enters the sysgen configuration statements after the following message appears:

```
READY FOR CONFIGURATION INPUT
```

The ENDC command terminates entry of configuration statements and returns the user to the Sysgen/32 command mode. The PROCESS command initiates processing of the configuration input file. When an end of task code of zero is received, the program has reached a successful completion.

5.3.2.1 Accessing the HELP File in Interactive Mode

To access the HELP file while creating a configuration input file interactively, the user must exit the configuration input mode using the ENDC command. The Sysgen/32 HELP command can then be used to access the HELP file. When the HELP command is entered, the following message is displayed:

```
FOR A LIST OF COMMANDS TYPE HELP*
FOR HELP ON ANY COMMAND MNEMONIC, TYPE HELP (MNEMONIC)
```

When the HELP command is entered with an asterisk (*) all Sysgen/32 commands and configuration statements are displayed. When the HELP command is entered with the mnemonic of a configuration statement or Sysgen/32 command, information pertinent to that specific mnemonic is displayed.

Once the user has obtained the desired information from the HELP file, the Sysgen/32 EDIT command can be used to continue creating the configuration input file. Enter EDIT, get the input filename, and position yourself where you left off prior to using the HELP command.

Example:

```
*LOAD SYSGEN/32
*START,COMMAND=CON:
-
-SYSGEN/32 R00-00
>INPUT= FIGUR7.SYS          < empty input file >
>OUTPUT= MACRO7.MAC        < non existent output file >
>PROCESS
 READY FOR CONFIGURATION INPUT
>VERSION 3220
>CPU 3220
>MEM 1024
>DSYS 150
>ENDC
 READY FOR SYSGEN COMMANDS
>HELP ACCOUNTING
     ACCOUNTING: INCLUDES ACCOUNTING SUPPORT
          COMMAND FORMAT: ACCOUNTING [ N ] [,NO FILE ACCOUNTING]
          N= Decimal Value From 2 through 32, SPECIFYING THE
             MAXIMUM NUMBER OF ACCOUNTING CLASSES
             DEFAULT FOR N=4
             NO FILE ACCOUNTING SPECIFIES THAT FILE
             ACCOUNTING SUPPORT IS EXCLUDED
>EDIT
 READY FOR EDIT COMMANDS
>GET FIGUR7.SYS
 APPEND BOTTOM
 5  ENDC
 7  -1
 4  DSYS 150
 7  INS
 4.01 ACCOUNTING 4
 .
 .
 .
>DONE
 READY FOR SYSGEN COMMANDS
>PROCESS
>END
-END OF TASK CODE=0
```

5.3.3 Modifying A Configuration Input File Via EDIT/32

Regardless of how it was created, a configuration input file that contains an error or an improperly specified configuration statement can be modified using the Sysgen/32 EDIT command. The EDIT command invokes EDIT/32 and makes all of the EDIT/32 commands available to the Sysgen/32 user. After modification, the input file may then be processed via the PROCESS command.

Example:

```
*LOAD SYSGEN32
*START,INPUT= FIGUR1.SYS, COMMAND=CON:
-
-SYSGEN/32 R00-00
>EDIT                          < invokes editor >
 READY FOR EDIT COMMANDS
>GET FIGUR1.SYS                < specifies file to be edited >
>T 1-4                         < displays lines 1-4 >
1 VERSION 3220
2 CPU 3220
3 MEM 1024
4 DSYS 200
>CHANGE /200/, /150/,4         < modifies line 4 >
4 DSYS 150
>DONE                          < saves file and exits EDIT/32 >
 READY FOR SYSGEN COMMANDS
>OUTPUT= MACRO1.MAC
>PROCESS
>END
-END OF TASK CODE=0
```

APPENDIX A
COMPARISON OF SYSGEN/32 AND OS/32 CUP CONFIGURATION STATEMENT DEFAULTS

STATEMENT	CUP DEFAULT	SYSGEN DEFAULT
ACCOUNTING	4	4
BACKGROUND PRIO	16	16
BACKGROUND SIZE	9	9
CLOCK	60,6C,6D	60,6C,6D
CMDLEN	80	80
CPU	7/32	3220
REGISTERS	2	8 for all but 7/32
CSS	5	5
DATE	MMDDYY	MMDDYY
DEVADS	0	0
DIRECTORY	OFF	OFF
DISCBLOCK	4	4
DSYS	25	25
ERRORREC	OFF	OFF
FLOAT (CPU 7/32,8/32)	N,N	N,N
FLOAT (P-E SERIES 3200)	H,H	H,H
ILEVEL	0	0
INTERCEPT	OFF	OFF
IOCLASS	0,1,2,3	0,1,2,3
IREADER	NOIREADER	NOIREADER
ITAM	OFF	OFF
JOURNAL	0	0
LOGLEN	72	72
LPU	N/A	1
MAXAPU	N/A	9
MAXTASK	32	32
MCONFIG	OFF	OFF
MEMCHECK	OFF	OFF
MEMORY	128	256
LIMITS:		16384 for 3250, 3240, 3230 4096 for 3210 1024 for 3220, 7/32, 8,32
NOSEG	ON	ON
TGD	TGD	NOTGD
QUEUE	NO. OF DEVICES	NO. OF DEVICES
RESPONSETIME	OFF	OFF
ROLL	OFF	OFF
SCREENTIME	OFF	OFF

SPOOL (with parameter)	SPOOLER	SPOOLER
SPOOL (without parameter)	SPL/32	N/A
SPL32	N/A	SPL/32
SSTABLE	32	32
TEMP	BLANK	BLANK
TGD	ON	OFF
VERSION	BLANK	BLANK
VOLUME	BLANK	BLANK

APPENDIX B
SYSGEN/32 MESSAGES

ACCOUNTING ERROR

The maximum number of device or file classes to be supported was specified by a decimal number less than 2 or exceeding 32.

The ACCOUNTING statement was entered with a conflicting NOFILEACCOUNTING parameter.

ADDRESS ERROR address

Device address exceeds the maximum allowable range set in the DEVADS statement.

COMMAND DEVICE ERROR

Specified device or file is syntactically incorrect or failed to assign.

COMMAND NOT RECOGNIZED

An invalid command mnemonic was entered.

CONSOLE ERROR

A console device was not specified, or more than one device was specified as a console device.

CONVERSATIONAL PROCESSING COMPLETE

All conversational prompts have been displayed. The PROCESS command can now be entered.

COORDINATION ERROR name

Named device not recognized as a valid device.

DUPLICATE START OPTION: xxx

Start options were entered more than once.

ERRORS IN ASSEMBLY, SYSGEN ABORTED

System generator (sysgen) command substitution system (CSS) message indicating that errors were encountered in the macro assembly phase.

ERRORS IN MACRO EXPANSION, SYSGEN ABORTED

Sysgen CSS message indicating that errors were encountered in the macro expansion phase.

FILE DESCRIPTOR ERROR

A device or filename entered in a command was either invalid or omitted.

```
              INPUT:
              OUTPUT:
FILE ERROR ON LIST:              [Text]
              CONVERSATIONAL:
```

Text specifies one of the following:

```
ACCOUNT ERROR
ASSIGNMENT ERROR
BUFFER ERROR
FILE DESCRIPTOR ERROR
I/O ERROR
ILLEGAL FUNCTION
INVALID LU
NAME ERROR
PRIVILEGE ERROR
PROTECT ERROR
SIZE ERROR
SVC7 ERROR
TGD ASSIGNMENT ERROR
TYPE ERROR
VOLUME ERROR
```

An error was encountered during the allocation or assignment of the device or file identified by file descriptor (fd).

ILEVEL ERROR ilevel

An invalid ilevel value was issued, or an ilevel other than 0 was specified with only 2 register sets.

ILLEGAL SEPARATOR: xxx

A separator was omitted or incorrectly entered.

ILLEGAL TCOM: ADDRESS / NAME / SIZE

TCOM address is not in global memory, TCOMs overlap, the names of two TCOMs are the same, or the name TSKCOM was specified.

ILLEGAL VALUE: xxxx

The characters replacing xxxx represent the flagged illegal value.

INPUT FILENAME OMITTED

Sysgen CSS message indicating the name of the configuration input file was not entered as input to the Sysgen/32 CSS procedure.

INPUT FILE filename.SYS DOES NOT EXIST, SYSGEN ABORTED

Sysgen CSS message indicating that the specified configuration input file does not exist.

INPUT MUST BE ENTERED

CONVERSATIONAL or PROCESS command was entered before an input file was specified.

INVALID ARGUMENT: argument

An illegal argument was located while processing the configuration input file.

INVALID COMMAND IN BATCH: CONVERSATIONAL/EDIT

The EDIT or CONVERSATIONAL command was entered in batch mode.

INVALID START OPTION: option

Program does not recognize a START command option.

```
                INPUT:
                OUTPUT:
I/O ERROR ON    LIST:     text ON fd
                COMMAND:
```

Text specifies one of the following:

```
DEVICE UNAVAILABLE
END OF FILE
END OF MEDIUM
ILLEGAL OR UNASSIGNED LU
ILLEGAL FUNCTION
PARITY OR RECOVERABLE ERROR
UNRECOVERABLE ERROR
```

fd identifies the assigned file or device on which the error occurred.

LINE xxx ADDR xxxxx STACK OVERFLOW TASK PAUSED

The program does not have sufficient memory to process the input file. Reload the program with a larger segment size increment.

LIST DEVICE ERROR

Specified device or file is syntactically incorrect or failed to assign.

MACRO FILE filename.MAC DOES NOT EXIST, SYSGEN ABORTED

Sysgen CSS message output in macro expansion phase indicating that the filename of the macro output file does not exist.

MACRO LIBRARY filename.MLB NOT FOUND, SYSGEN ABORTED

Sysgen CSS message indicating a required macro library was not found.

MAX. NUMBER OF TCOMS EXCEEDED

Too many TCOMs were specified.

MISSING ARGUMENT

A required argument was omitted.

MODULE NOT INCLUDED: module name

The module identified by module name was not included in the system. There might be a combination of invalid option settings.

NO DEVICES

No devices were specified in the input file.

NO DIRECT ACCESS SUPPORT

DIRECTORY, ROLL, SPOOL, TEMP, or VOLUME statements were entered, but no disk devices were specified.

OBJECT LIB filename NOT FOUND, OS LINKING ABORTED

Sysgen CSS message indicating that a required system or driver object library was not found.

OS32MT rr-uu.vvvvvvvv

The 8-character operating system version with revision and update number displayed on system console at system initialization.

OUTPUT FILE ERROR: xxx

The output file already exists, or the fd is incorrect.

OUTPUT MUST BE ENTERED

The output file was not specified.

READY FOR CONFIGURATION INPUT

The program is waiting for the user to interactively enter configuration input statements to be used to create the configuration input file.

READY FOR EDIT COMMANDS

The editor was invoked via the EDIT command, and the system is waiting for edit commands.

READY FOR SYSGEN COMMANDS

The Edit END or DONE command ended the edit session and control is returned to the sysgen program. Sysgen program is waiting for commands to resume processing the configuration input file.

SEQUENCE ERROR

The statement preceeding the message was entered more than once, or a corresponding required statement was omitted.

ILEVEL or IOCLASS statement was entered after all devices were processed; i.e., after the ENDD statement was read.

SPECIFIED FILE filename DOES NOT EXIST, LINK OF OS ABORTED

Sysgen CSS message indicating that a file required in the Link procedure cannot be found.

STATEMENT NOT RECOGNIZED

A statement in the input file is not recognized by the program.

SYSGEN32 ERROR, SYSGEN32 ABORTED

An error in running the Sysgen/32 program was detected. The sysgen procedure is aborted.

xxxx ERROR

The characters replacing xxxx specify ROLL, SPOOL, SPL32, TEMP, VOLUME, MEMORY, MODULE, FLOAT, ILEVEL, ERROR RECORDING, ACCOUNTING, NAME, ADDRESS, DCOD, SELCH, or COORDINATION.

Invalid syntax in the volume.

More than 16 pseudo devices specified (SPOOL), or spool support was requested but no pseudo devices were found.

The memory specified exceeds the allowed range for the requested central processing unit (CPU).

A MODULE statement was entered with a name that could not be recognized by the program, or the MODULE name was syntactically incorrect.

Invalid floating point options or combinations were entered. No single precision floating point, but hardware double precision. Or, for the Perkin-Elmer Series 3200 CPUs, the options were H,S or S,H.

SELCH, controller, and connected devices have different ILEVELS.

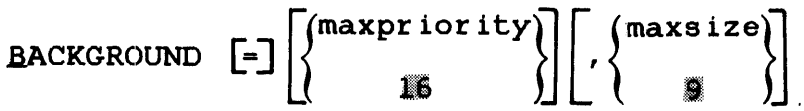
Syntax error was detected in the name field of a device statement, the same name was entered twice, or a blank device name was found.

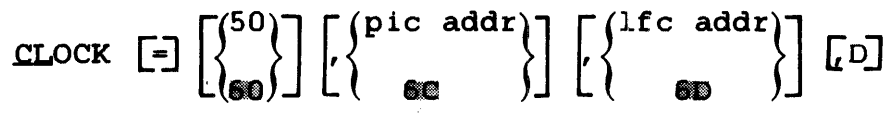
The device address was invalid, greater than the maximum physical address specified, or not zero for spool devices. Device address was zero, indicating a spool device, but the device code was not zero or one.

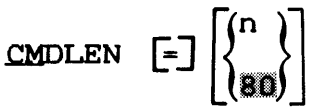
Specified device code was invalid, not a number from 16 to 254, or not 0 or 1 for spool devices.

More than one device specified the same controller with different SELCH specifications.

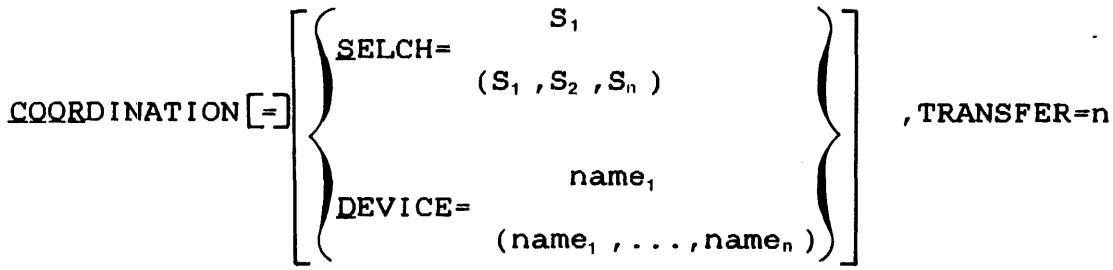
APPENDIX C
SYSGEN/32 COMMAND AND STATEMENT SUMMARY







CONVERSATIONAL



COPY

[line$_1$
.
.
.
line$_n$]

ENDCOPY

CPU [=] [{3250, 3240, 3230, **3220**, 3210, 3200MPS, 8/32, 7/32}] [2, **8**]

CSS [=] [n, **5**]

DATE [=] [{DDMMYY, **MMDDYY**}]

DEVADS [=] [{3, 1, **0**}]

DEVICES

dev name:,dev address,dev dcode [,CLOCK={XA|XB|XC|XD}] [,CM=n]

[,CONSOLE] [,CONTROLLER=n] [,DISC] [,DUAL] [,EOV] [,ILEVEL=n]

[,INTIMER={n|10}] [,IOCLASS={n|global I/O class}] [,IOLIMIT={n|10}]

[,LEADCOUNT=n] [,LINESTATUS=n] [,MAXFRAMES=n]

[,MAXWRITEBUFF={n|1024}] [,MINREADBUFF={n|64}] [,MTO=n] [,N2={n|10}]

[,NCS={n|E8E8}] [,NODISC] [,NONSHARED] [,OUTIMER={n|10}]

[,PADCOUNT=n] [,POLLDELAY=n] [,POLLIMIT=n] [,POLLTIME={n|3}]

[,QUEUE=name] [,READCONTROL=n] [,RECLEN=n]

[,RESPONSETIME={n|7FFF,3}] [,SCREENTIME=n] [,SELCH=n] [,SIZE=n]

[,SPINDLE=n] [,SSA=name] [,TO2={n|30}] [,TRANSLATE=name]

[,USCI=n] [,USCO=n] [,USER=(uparm[=parameter])] [,WAKEUP={n|30}]

[,WRITECONTROL=n] [,XDCOD=n]

.
.
.

ENDD

DIRECTORY

DISCBLOCK [=][n|*]

DSYS [=] [n / 25]

EDIT

END

ENDC

ERRORREC [=] fd,size,period

FLOAT [S,S / S,H / H,H / N,N]

HELP [name / *]

ILEVEL [3 / 2 / 1 / 0]

INPUT fd

INTERCEPT

IOCLASS [cc / 0 / 1 / 2 / 3]

IREADER

ITAM

JOURNAL [=] [n / 0]

LOGLEN [=] [n / 72]

LPU [n / MAXAPU value] [, { w / 1 }]

MAXAPU [n / 9]

[APU$_1$, contr$_1$
APU$_2$, contr$_2$
.
.
.
APU$_n$, contr$_n$]
ENDAPU

MAXTASK [=] [n / 32]

MCONFIG BLOCK=nn,START=xx,RANGE=yy [, INTERL= { 2 / 4 / 0 }]
[, SHARED= { NORECORD / NVRECORD / RECORD }]

MEMCHECK

MEMORY [=] [n / 256]

MODULE

[new module name$_1$
 new module name$_2$
 .
 .
 .
 new module name$_n$]

ENDM

NOSEG

OUTPUT fd

PAUSE

PROCESS

QUEUE [=] [n | total number of devices]

ROLL [=] [rvoln]

SPOOL [=] [spvoln]

SPL32

SSTABLE [=] [n | 32]

START [,INPUT=fd$_1$] [,OUTPUT=fd$_2$] [,COMMAND=fd$_3$] [,LIST=fd$_4$]

[STARTUP
 .
 .
 .
 ENDS]

TCOM [=] name$_1$,address$_1$,size$_1$ [/.../name$_n$,address$_n$,size$_n$]

TEMP [=] [tvoln]

TGD

VERSION [=] [vvvvvvvv]

VOLUME [=] [voln]

APPENDIX D
SYSGEN/32 AND OS/32 CUP STATEMENT COMPARISONS

SYSGEN/32 STATEMENTS	OS/32 CUP STATEMENTS
ACCOUNTING [=] [nn] [,NOFILEACCOUNTING]	ACCOUNTING [nn]
BACKGROUND [=] [maxpriority] [,maxsize]	BACKGROUND [maxpriority] [,maxsize]
CLOCK [=] [50] [,pic addr] [,lfc addr] [,D]	CLOCK [50], [pic addr], [lfc addr] [,D]
CMDLEN [=] [n]	CMDLEN [n]
COORDINATION [=] [SELCH= S_1 / (S_1, S_2, S_n) / DEVICE= $name_1$ / $(name_1, \ldots, name_n)$] ,TRANSFER=n	
COPY [$line_1$ . . . $line_n$] ENDCOPY	

6678

SYSGEN/32 STATEMENTS	OS/32 CUP STATEMENTS
CPU [=] [3250 | 3240 | 3230 | **3220** | 3210 | 3200MPS | 8/32 | 7/32] [, 2 | **8**]	CPU [3250 | 3240 | 3230 | **3220** | 3210 | 8/32 | 7/32] [, **8** | **2**]
CSS [=] [n | **5**]	CSS [n | **5**]
DATE [=] [DDMMYY | **MMDDYY**]	DATE [DDMMYY | **MMDDYY**]
DEVADS [=] [3 | 1 | **0**]	DEVADS [3 | 1 | **0**]

6679

SYSGEN/32 STATEMENTS

DEVICES

dev name:,dev address,dev dcode [,CLOCK=(XA|XB|XC|XD)] [,CM=n]

[,CONSOLE] [,CONTROLLER=n] [,DISC] [,DUAL] [,EOV] [,ILEVEL=n]

[,INTIMER={n|10}] [,IOCLASS={n|Global I/O class}] [,IOLIMIT={n|10}]

[,LEADCOUNT=n] [,LINESTATUS=n] [,MAXFRAMES=n]

[,MAXWRITEBUFF={n|1024}] [,MINREADBUFF={n|56}] [,MTO=n] [,N2={n|10}]

[,NCS={n|1000}] [,NODISC] [,NONSHARED] [,OUTIMER={n|10}]

[,PADCOUNT=n] [,POLLDELAY=n] [,POLLLIMIT=n] [,POLLTIME={n|1}]

[,QUEUE=name] [,READCONTROL=n] [,RECLEN=n]

[,RESPONSETIME={n|1000}] [,SCREENTIME=n] [,SELCH=n] [,SIZE=n]

[,SPINDLE=n] [,SSA=name] [,TO2={n|10}] [,TRANSLATE=name]

[,USCI=n] [,USCO=n] [,USER=(uparm[=parameter])] [,WAKEUP={n|10}]

[,WRITECONTROL=n] [,XDCOD=n]

.
.
.

ENDD

OS/32 CUP STATEMENTS

DEVICES

{level|*} [dmnem]:dnum,dcod,{C|D|E|S} [,{xdcod|Xxdcod}] [,{recl|132}]

[,{size|56}]

{level|*} [dmenm]:dnum,dcod,{C|D|E|S} [,{xdcod|Xxdcod}] [,{recl|132}]

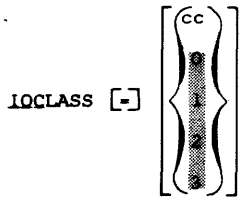
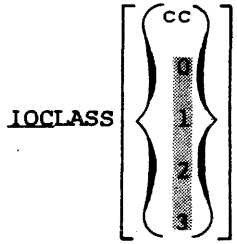
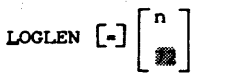
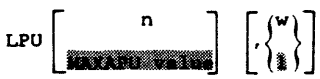
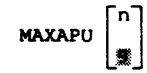
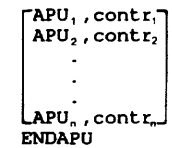
[,{size|56}]

.
.
.

ENDD

SYSGEN/32 STATEMENTS	OS/32 CUP STATEMENTS
DIRECTORY	DIRECTORY
DISCBLOCK [=] [n / 4]	DISCBLOCK [{n / 4}]
DSYS [=] [n / 25]	DSYS [{n / 25}]
ENDC	ENDC
ERRORREC [=] fd,size,period	ERRORREC fd,size,period
FLOAT [=] [{S,S / S,H / H,H / N,N}]	FLOAT [{S,S / S,H / H,H / N,N}]
ILEVEL [=] [{3 / 2 / 1 / 0}]	ILEVEL [{3 / 2 / 1 / 0}]
INTERCEPT	

6681

SYSGEN/32 STATEMENTS	OS/32 CUP STATEMENTS
	
	
	
	
	
	
	

SYSGEN/32 STATEMENTS	OS/32 CUP STATEMENTS
MAXTASK [=] [n / 32]	MAXTASK [{ n / 32 }]
MCONFIG BLOCK=nn,START=xx,RANGE=yy [,INTERL={2/4/8}] [,SHARED={NORECORD/NVRECORD/RECORD}]	
MEMCHECK	MEMCHECK
MEMORY [=] [n / 256]	MEMORY [{ n / 256 }]
MODULE [new module name$_1$ new module name$_2$ . . . new module name$_n$]	MODULE [new module name new module name . . . new module name]
ENDM	ENDM
NOSEG	NOSEG
	NOTGD
QUEUE [=] [n / total number of devices]	QUEUE [{ n / total number of devices }]

6683

SYSGEN/32 STATEMENTS	OS/32 CUP STATEMENTS
ROLL [=] [rvoln]	ROLL [rvoln]
SPOOL [=] [spvoln]	SPOOL [spvoln]
SPL32	SPOOL
SSTABLE [=] [n / 32]	SSTABLE [{n / 32}]
[STARTUP / . / . / . / ENDS]	[STARTUP / . / . / . / ENDS]
TCOM [=] name$_1$,address$_1$,size$_1$ [/.../name$_n$,address$_n$,size$_n$]	TCOM name$_1$,address$_1$,size$_1$ [/.../name$_n$,address$_n$,size$_n$]
TEMP [=] [tvoln]	TEMP [tvoln]
TGD	
VERSION [=] [vvvvvvvv]	VERSION vvvvvvvv
VOLUME [=] [voln]	VOLUME voln

INDEX

T

U

V

W,X,Y

Z

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