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Crash Dump Analyzer Reference Manual

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CONTENTS

			Page
PREFACE			vii
CHAPTER 1		INTRODUCTION	
	1.1	SYSTEM REQUIREMENTS	1-1
	1.2	OBTAINING A CRASH DUMP	1-2
	1.3	RUNNING CDA	1-3
	1.4	CDA COMMAND LINES	1-3
	1.5	INDIRECT COMMAND FILES	1-5
	1.6	BASIC CDA OUTPUT LISTING	1-5
CHAPTER 2		SWITCHES	
	2.1	ANALYSIS SWITCHES	2-1
	2.1.1	/ACT or /ATL (Task Control Blocks for Active Tasks)	2-3
	2.1.2	/ADV (All Devices)	2-3
	2.1.3	/ALL (All Analysis Routines)	2-3
	2.1.4	/CLI or /CPB (Command Line Interpreter Parser Blocks)	2-3
	2.1.5	/CLQ (Clock Queue)	2-3
	2.1.6	CTL (Device Controllers)	2-4
	2.1.7	/DEV, /DCB, /SCB, or /UCB (Devices in System)	2-4
	2.1.8	/DUMP:a:b:[c] or /DMP (Physical Memory)	2-4
	2.1.9	/HDR (Headers for Memory-Resident Tasks)	2-4
	2.1.10	/KDS:a:b (Kernel Data Space)	2-4
	2.1.11	/KIS:a:b (Kernel Instruction Space)	2-4
	2.1.12	/PCB or /PAR (Partition Control Blocks)	2-5
	2.1.13	/POOL:a:b (System Pool)	2-5
	2.1.14	/SECPOOL[:a:b] (Secondary Pool)	2-5
	2.1.15	/STD, TCB, or /TAL (System Task Directory)	2-5
	2.1.16	/-SYS (System Information)	2-5
	2.1.17	/TASK:name:a:b, /TAS, or /TSK (Task Virtual Address Space)	2-5
	2.1.18	/TDS:name[:a:b]	2-5
	2.1.19	/TIS:name:a:b	2-6
	2.2	FUNCTION SWITCHES	2-6
	2.2.1	/BL:n (Identify Starting Block Number)	2-7
	2.2.2	/DENS:n (Sets Tape Density)	2-7
	2.2.3	/EXIT:n (Exit After n Errors)	2-7
	2.2.4	/LIMIT:n (Limit Output Listing)	2-7
	2.2.5	/LINES:n (Print n Lines per Page)	2-7
	2.2.6	/MEMSIZ:n (Establish Size of Binary Output File)	2-8
	2.2.7	/KMR (Assign Kernel Mapping Register Values)	2-8
	2.2.8	/-SP (Do Not Spool)	2-8
	2.2.9	/STB (File Specified Contains the Executive Symbol Table)	2-8

CONTENTS

Page

CHAPTER 3 ANALYSIS LISTINGS

3.1 SYSTEM INFORMATION 3-1
3.1.1 Volatile Registers 3-2
3.1.2 Kernel Stack 3-5
3.1.3 System Common 3-6
3.1.4 System Common Alphabetized Dump 3-9
3.1.5 Pool Statistics 3-15
3.1.6 Assign Table 3-17
3.1.7 Group Global Event Flags 3-18
3.1.8 Error Log Packets 3-19
3.1.9 Low Core Memory Dump (RSX-11M-PLUS Only) . . . 3-20
3.2 OPTIONAL INFORMATION 3-21
3.2.1 Active Tasks 3-21
3.2.2 Active Task (MCR) 3-26
3.2.3 Task Headers 3-28
3.2.4 CLI Parser Block 3-31
3.2.5 Partition Information 3-31
3.2.6 Common Block Directory 3-36
3.2.7 Device Information 3-38
3.2.8 System Task Directory 3-44
3.2.9 Pool Dump 3-45
3.2.10 Task Dump 3-48
3.2.11 Clock Queue 3-50
3.2.12 Controller Information 3-52
3.2.13 Kernel Data Space 3-54
3.2.14 Kernel Instruction Space 3-54
3.2.15 Task Data Space 3-54
3.2.16 Task Instruction Space 3-54

CHAPTER 4 INTERPRETING A CRASH DUMP LISTING

4.1 HELPFUL CONCEPTS 4-1
4.1.1 Determining What Was Mapped 4-1
4.1.2 Interpreting the Kernel Stack 4-2

APPENDIX A CDA MESSAGES

APPENDIX B RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

APPENDIX C RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

INDEX

FIGURES

FIGURE 3-1 Volatile Registers 3-3
3-2 Kernel Stack 3-5
3-3 System Common 3-7
3-4 System Common Alphabetized Dump 3-14
3-5 Pool Statistics 3-16
3-6 Logical Device Assignment Table 3-17
3-7 Group Global Event Flags 3-18

CONTENTS

		Page
3-8	Error Log Packets	3-19
3-9	Low Core Memory	3-20
3-10	Active Tasks (Truncated)	3-25
3-11	Active Task (MCR)	3-27
3-12	Task Headers (Truncated)	3-30
3-13	CLI Parser Blocks	3-31
3-14	Partition Information	3-32
3-15	Partition Control Blocks and Attachment Descriptors	3-35
3-16	Common Block Directory	3-37
3-17	Device Information and I/O Packet (Truncated)	3-43
3-18	System Task Directory (Truncated)	3-44
3-19	Pool Dump (Truncated)	3-46
3-20	Task Dump (Truncated)	3-49
3-21	Clock Queue	3-51
3-22	Controller Information	3-53
3-23	Kernel Data Space	3-55
3-24	Kernel Instruction Space	3-56
3-25	Task Data Space	3-57
3-26	Task Instruction Space	3-58
4-1	Kernel Page Address Registers	4-1

TABLES

TABLE	1-1	File Default Values	1-4
	2-1	Summary of CDA Analysis Switches	2-1
	2-2	Summary of CDA Function Switches	2-6
	B-1	Summary of System Data Structure Macros	B-1
	C-1	Summary of System Data Structure Macros	C-2

PREFACE

MANUAL OBJECTIVES

This manual describes the operation of the Crash Dump Analyzer. It does not describe the operation of the RSX-11M-PLUS Executive or the significance of the individual data structures. The Executive Reference Manual and the Guide to Writing an I/O Driver for RSX-11M and RSX-11M-PLUS describe these data structures.

INTENDED AUDIENCE

This manual is intended for system managers who are responsible for interpreting system failures or system operators who run CDA to generate dumps. Understanding CDA output requires a working knowledge of assembly language programming and the Executive data structures.

STRUCTURE OF THIS DOCUMENT

Chapter 1 explains the purpose of the Crash Dump Analyzer. It describes the system resources and the procedures necessary for obtaining a crash dump. It explains how to run CDA and describes the command string format. Finally, Chapter 1 describes indirect command files as they pertain to CDA.

Chapter 2 describes the switches associated with CDA. Two summary tables provide quick reference on switch operation. Expanded descriptions for each switch follow each table.

Chapter 3 consists of actual CDA output listings. Each entry of each listing is numbered to correspond to the numbered explanatory text preceding it. Cross-reference information is provided where necessary.

Chapter 4 contains helpful hints for interpreting CDA output listings.

Appendix A contains a short description of each CDA error message.

Appendix B lists system macros that supply symbolic offsets for system data structures for RSX-11M.

Appendix C lists system macros that supply symbolic offsets for system data structures for RSX-11M-PLUS.

ASSOCIATED DOCUMENTS

Refer to the RSX-11M/RSX-11S Information Directory and Index for a brief description of each manual in the RSX-11M documentation set.

Refer to the RSX-11M-PLUS Information Directory and Index for a brief description of each manual in the RSX-11M-PLUS documentation set.

CONVENTIONS USED IN THIS DOCUMENT

Red ink in the examples of this manual denotes user input.

The symbol (RET) indicates a carriage return.

Pink shading in this manual denotes features that appear only on RSX-11M systems.

Gray shading denotes features that appear only on RSX-11M-PLUS systems.

SUMMARY OF TECHNICAL CHANGES

This manual contains documentation for the following new features in the Crash Dump Analyzer:

- New format for the system data base
- /DENS switch specifies the density of a crash input tape
- Displays parent/offspring task relationships
- Displays group global event flags and task overlay segments
- /TCB dumps tasks installed in primary and secondary pool
- /TIS and /TDS dumps task instruction or data space
- /TAS dumps task instruction and data space between a range of addresses
- /POOL dumps primary pool
- /SECPOL dumps secondary pool on RSX-11M-PLUS systems
- /HDR dumps both I and D space windows
- System information includes an alphabetized list of lowcore memory symbols

In addition, this version of CDA adds the following RSX-11M-PLUS features to RSX-11M:

- Displays the Assign Table
- Modifies the /ADV switch to dump the control blocks of all devices
- Modifies the /DEV switch to dump the registers of active devices only
- Modifies the /DUMP switch to accept a starting virtual address label for a dump
- Adds the /LINES switch to specify the number of lines per page in a dump.

CHAPTER 1

INTRODUCTION

The Crash Dump Analyzer (CDA) is a specialized utility that helps you establish the cause of system crashes. CDA reads the contents of a memory dump created by the Executive Crash Dump Routine. It formats the dump using the information contained in the Executive Symbol Table file RSX11M.STB. Finally, CDA outputs the dump to a line printer in human-readable format.

CDA is a nonprivileged task that any user can run.

1.1 SYSTEM REQUIREMENTS

To use CDA, you must request Crash Dump Analysis support and specify a crash notification device and a crash dump device at system generation. This causes system generation to build an Executive Crash Dump Routine which writes all of memory onto the crash dump device when the system crashes. You can change the crash dump or notification devices only by doing another system generation. (See the RSX-11M or RSX-11M-PLUS System Generation and Installation Guide for details on including CDA in your system.) To include CDA support, you must also have one of the following mass storage devices in addition to your system disk:

- MT magnetic tape
- MS magnetic tape
- MM magnetic tape
- DD cassette
- DT DECtape
- DX floppy diskette (RSX-11M only)
- DY floppy diskette
- DK disk cartridge
- DL disk cartridge
- DM disk cartridge
- DR disk pack
- DB disk pack

1.2 OBTAINING A CRASH DUMP

To obtain a crash dump, control of the processor must be transferred to the Executive Crash Dump Routine following a system crash. How this control is transferred depends on the way in which the crash occurred and whether you built the Executive Debugging Tool (XDT) into your system at SYSGEN.

System crashes occur in three ways:

1. The processor encounters a program condition that causes it to trap to location 40 or to XDT.

2. An infinite loop condition occurs.

3. The processor encounters an unintentional halt instruction in kernel mode (000000).

When a program condition causes a processor trap and XDT is included in your system, control transfers automatically to XDT. You can then type X at the console terminal, and XDT transfers control to the crash dump routine. (Refer to the RSX-11M or RSX-11M-PLUS Guide to Writing an I/O Driver for a description of XDT.)

When your system does not include XDT, a processor trap causes control to transfer to the Executive Crash Dump Routine.

When a system crash is the result of a HALT instruction or an infinite loop condition, you must restart the processor manually at location 40.

Regardless of how control is transferred, once the processor enters the crash dump routine, the routine prints the following informational message on the crash notification device:

```
CRASH-CONT WITH SCRATCH MEDIA ON (device mnemonic)
```

After displaying the message, the crash dump routine halts the processor so you can put the crash dump device on line. When the device is on line, depress the continue switch on the processor console. The routine then dumps memory on the crash dump device and halts the processor again when the dump finishes. At this point, the volume in the crash dump device contains a binary representation of the contents of memory at the time of the crash to use as input to CDA. You can then reboot the system and run CDA to analyze the dump.

If you attempt to crash to an illegal device, the CRASH routine displays the following message on the crash notification device and halts:

```
CRASH -- ILLEGAL CRASH DEVICE
```

This error occurs if the crash device is a fixed media device. If you have a removable media device on the same controller, you can switch the physical unit number plugs on the devices to make the removable media device the crash device. Then press continue on the operator's console and the CRASH routine will attempt the dump again.

1.3 RUNNING CDA

You can run CDA as either an installed or an uninstalled task.

If CDA is installed, use the following format to return control to the monitor (CLI) upon completion of the analysis:

```
>CDA command line (RET)
```

To return control to CDA upon completion of the analysis, use the following format:

```
>CDA (RET)
CDA>command line (RET)
```

When you run CDA as an uninstalled task, control always returns to CDA after the analysis completes. The command sequence for running an uninstalled CDA is:

```
RUN $CDA (RET)
CDA>command line (RET)
```

These commands require CDA.TSK to be present in the UFD corresponding to the system UIC on device LB: for RSX-11M, or the library UIC for RSX-11M-PLUS.

An alternate command sequence is:

```
RUN CDA (RET)
CDA>command line (RET)
```

These commands require CDA.TSK to be present in the UFD corresponding to the current UIC on SY:.

1.4 CDA COMMAND LINES

Use the following format to input commands to CDA:

```
[listfile/sw],[binaryfile/sw]=[symbolfile/STB],crash-input[/sw]
```

listfile

The optional human-readable CDA output listing file. This file is described in Chapter 3.

binaryfile

An optional binary file. This file is a copy of the binary data that the crash dump routine wrote on the crash dump device. It allows you to selectively create a historical record of crash dumps. If you create this file during an initial analysis, you can use it for input to CDA at a later time. Since the crash dump routine overwrites the information on the crash dump volume with each dump to it, this feature allows you to use a single volume for all crash dumps.

Specifying this file can significantly reduce the analysis time if the input is from a secondary storage device, particularly if it is a sequential device.

symbolfile/STB

The symbol definition file for the crashed system. The /STB switch is an integral part of this file specification. If you omit this file specification and switch, CDA defaults to the file RSX11M.STB under the current UIC.

crash-input

The source of the binary input to CDA. This specification can be either a device name (the crash dump device) or a binary file that was created during a previous CDA analysis. If it is a binary file, the "binaryfile" field in the output must be left blank.

/sw

An optional CDA switch. Each switch is associated with a specific file and cannot be used without a file specification or with any other file specifications. Chapter 2 describes CDA switches in detail.

Output file specifications are position dependent meaning that when you include both output specifications, you must place them in the command line in the positions shown. If you omit the list file, you must place a comma before the binary file specification.

Input file specifications are position independent and can appear in either order.

File specifications in the command line can appear in complete FILES-11 format, with device, UFD, file name, file type, and version number. When you omit any of these elements, CDA uses the defaults shown in Table 1-1. Note that not all of the elements in file specifications have defaults.

Table 1-1
File Default Values

File	Device	UFD	Default Value	
			File Name	File Type
listing file	SY:	current	none	.LST
binary file	SY:	current	none	.CDA
symbol file/STB	SY:	current	RSX11M	.STB
crash-input	SY:	current	none	.CDA

The following examples illustrate the CDA file default values. Assume that the user in these examples is logged in under UIC [301,356] and that the crash dump device is DT1:. Also, assume that CDA is running as an installed task.

Example 1

```
>CDA RET
CDA>19OCT81,19OCT81=RSX11M.STB/STB,DT1: RET
```

This command line creates:

- A listing file, 19OCT81.LST, in UFD [301,356], which is printed automatically.
- A binary file, 19OCT81.CDA, in UFD [301,356]. CDA reads the binary input from DECtape Unit 1 and analyzes it according to the information in the symbol definition file RSX11M.STB in UFD [301,356].

Example 2

```
>CDA RET
CDA>,19OCT81=[1,54]/STB,DT1: RET
```

This command line creates a binary file, 19OCT81.CDA, in UFD [301,356].

CDA reads the binary input from DECtape Unit 1 and analyzes it according to the information in the symbol definition file RSX11M.STB in UFD [1,54].

Example 3

```
>CDA RET
CDA>LP:=[1,54]/STB,19OCT81 RET
```

This command line creates an output listing on device LP:.

CDA reads the binary input from a previously created binary file, 19OCT81.CDA, and analyzes it in accordance with the information contained in the symbol definition file RSX11M.STB under UFD [1,54].

1.5 INDIRECT COMMAND FILES

As with other utilities, you can enter CDA command lines directly from the terminal or from an indirect command file. CDA indirect command files must not contain a reference to another command file.

1.6 BASIC CDA OUTPUT LISTING

While the Crash Dump Analyzer provides many output listing options, fundamental system information appears on the first six pages of output listing. However, you may suppress this information by using the /-SYS switch. These six pages contain the following information:

Page 1 -- Volatile registers

Page 2 -- Kernel stack

Page 3 -- System common

Page 4 -- System common labeled dump

Page 5 -- Pool statistics

Page 6 -- Assign table

Sections 3.1.1 through 3.1.6 of this manual describe these pages in detail.

The system information section also includes three more pages if the relevant information is in memory at the time of the crash. These pages display group global event flags, error log packets, and, on RSX-11M-PLUS systems, the contents of low core memory. Section 3.1.7 describes the group global event flag page, Section 3.1.8 describes the error log page and Section 3.1.9 describes the RSX-11M-PLUS low core memory page that is part of the system common dump.

CHAPTER 2

SWITCHES

Two kinds of switches allow you to control CDA operation: analysis switches and function switches.

Analysis switches determine which analysis routines CDA applies to the crash input, depending on what information you want. For example, the analysis switches might list information on all devices in the system or only on active devices.

Function switches provide a number of control options. For example, such switches might terminate an analysis after CDA encounters a specified number of errors, or limit the number of pages of output listing.

Both types of switches are file specific. That is, each switch applies to a particular file and may not be used either alone or with any other file.

2.1 ANALYSIS SWITCHES

Table 2-1 summarizes the analysis switches and gives a brief description of their effects. Following Table 2-1 is an expanded description of each switch. Some of the switches in Table 2-1 have synonyms or alternate mnemonics. These are shown under each switch.

Table 2-1
Summary of CDA Analysis Switches

Switch	Meaning	Applies to File
/ACT /ATL	Lists the contents of the Task Control Block for each active task	crash-input
/ADV	Lists information on all devices in the system	crash-input
/ALL	Lists the output of all analysis routines	crash-input
/CLI /CPB	Lists the contents of the CLI parser blocks in the system	crash-input
/CLQ	Lists the contents of the clock queue	crash-input

(continued on next page)

Table 2-1 (Cont.)
Summary of CDA Analysis Switches

Switch	Meaning	Applies to File
/CTL	Lists information on each device controller	crash-input
/DEV /DCB /SCB /UCB	Lists information on all active devices in the system	crash-input
/DUMP:a:b:c /DMP:a:b:c	Lists the contents of physical memory between address a and address b; (c is an optional virtual starting address)	crash-input
/HDR	Lists the contents of the task headers for each task resident in memory	crash-input
/KDS:a:b	Lists contents of kernel data space from virtual address a to virtual address b	crash-input
/KIS:a:b	Lists contents of kernel instruction space from virtual address a to virtual address b	crash-input
/PCB /PAR	Lists the contents of each Partition Control Block	crash-input
/POOL	Lists the contents of the system pool	crash-input
/SECPOL	Lists the contents of the system secondary pool (RSX-11M-PLUS only).	
/-SYS	Suppresses listing of the system information	crash-input
/TASK:name:a:b /TAS:name:a:b /TSK:name:a:b	Lists the contents of task "name" between virtual address a and virtual address b; Lists the contents of task data space (if task includes data space) on RSX-11M-PLUS	crash-input
/TCB /TAL /STD	Lists the contents of the Task Control Block for every task in the System Task Directory	crash-input
/TDS:name:a:b	Lists the contents of task data space (RSX-11M-PLUS only)	
/TIS:name:a:b	Lists the contents of task instruction space (RSX-11M-PLUS only)	crash-input

2.1.1 /ACT or /ATL (Task Control Blocks for Active Tasks)

File: crash-input

Effect: CDA lists the contents of the Task Control Block for each active task.

2.1.2 /ADV (All Devices)

File: crash-input

Effect: CDA lists the contents of the control blocks for all devices in the system. To list active devices, use the /DEV switch.

2.1.3 /ALL (All Analysis Routines)

File: crash-input

Effect: CDA applies all of its analysis routines (except those associated with memory and task dumps) to the specified crash-input. The output from these routines is listed in the following order:

1. System information
2. Active tasks
3. Task headers
4. Partition information
5. Common block directory
6. Device information
7. Clock queue
8. Controller information
9. Pool dump

2.1.4 /CLI or /CPB (Command Line Interpreter Parser Blocks)

File: crash-input

Effect: CDA lists the contents of all Command Line Interpreter Parser Blocks (CPBs) in the system.

2.1.5 /CLQ (Clock Queue)

File: crash-input

Effect: CDA lists the contents of the clock queue.

2.1.6 CTL (Device Controllers)

File: crash-input

Effect: CDA lists the contents of the controller table and controller request block for each device controller in the system.

2.1.7 /DEV, /DCB, /SCB, or /UCB (Devices in System)

File: crash-input

Effect: CDA scans the system device tables and lists the contents of the control blocks for each active device in the system. To list all devices, use the /ADV switch.

2.1.8 /DUMP:a:b:[c] or /DMP (Physical Memory)

File: crash-input

Effect:

a:b - CDA dumps the contents of physical addresses a through b inclusive and labels them with their physical addresses.

a:b:c - CDA dumps the contents of physical addresses a through b, but labels them with dummy virtual addresses, starting at c.

CDA allows you to specify a virtual starting address because RSX-11M/M-PLUS systems use physical memory in terms of virtual addresses. If you dump physical memory, labeled with the corresponding virtual addresses, you do not have to translate physical to virtual addresses as you read the dump.

2.1.9 /HDR (Headers for Memory-Resident Tasks)

File: crash-input

Effect: CDA lists the contents of the task headers for each task resident in memory.

2.1.10 /KDS:a:b (Kernel Data Space)

File: crash-input

Effect: CDA lists the contents of kernel data space between the virtual addresses a and b inclusive.

2.1.11 /KIS:a:b (Kernel Instruction Space)

File: crash-input

Effect: CDA lists the contents of kernel instruction space between the virtual addresses a and b inclusive.

2.1.12 /PCB or /PAR (Partition Control Blocks)

File: crash-input

Effect: CDA outputs a map that lists all the occupants of memory and the contents of each Partition Control Block.

2.1.13 /POOL:a:b (System Pool)

File: crash-input

Effect: CDA lists the system pool in octal, RAD50, and ASCII.

2.1.14 /SECPOOL[:a:b] (Secondary Pool)

File: crash-input

Effect: Lists the contents of secondary pool on RSX-11M-PLUS systems.

2.1.15 /STD, TCB, or /TAL (System Task Directory)

File: crash-input

Effect: CDA lists the contents of all Task Control Blocks in the System Task Directory.

2.1.16 /-SYS (System Information)

File: crash-input

Effect: CDA suppresses the system information listing.

2.1.17 /TASK:name:a:b, /TAS, or /TSK (Task Virtual Address Space)

File: crash-input

Effect: CDA lists the virtual address space of task "name" between the 16-bit virtual addresses a and b inclusive. If you do not specify addresses, CDA lists the task's entire virtual address space.

2.1.18 /TDS:name[:a:b]

File: crash-input

Effect: CDA lists the contents of the task data space between the virtual addresses a and b inclusive. If you do not specify addresses, CDA lists the entire task data space.

2.1.19 /TIS:name:a:b

File: crash-input

Effect: CDA lists the contents of the task instruction space between the virtual addresses a and b inclusive. If you do not specify addresses, CDA lists the entire task instruction space.

2.2 FUNCTION SWITCHES

Table 2-2 summarizes the function switches and gives a brief description of their effects. Following Table 2-2 is an expanded description of each switch.

Table 2-2
Summary of CDA Function Switches

Switch	Meaning	Applies to File	Default[1]
/BL:n	Identifies the starting block number of the crash-input device (The value of n must be less than 65535.)	crash-input	n=1
/DENS:n :HIGH :LOW	Sets density of crash input tape to 800 or 1600 bits per inch (bpi)	crash-input	n=800
/EXIT:n	Terminates analysis after encountering n analysis errors	list file	--
/LIMIT:n	Limits output listing to n pages	list file	n=300.
/LINES:n	Limits page length to n lines	list file	n=60.
/MEMSIZ:n	Saves nK memory from crash in a binary file	binary file	n=124.
/KMR	Forces the assignment of Kernel Address Register values for the crashed system	crash-input	/-KMR
/-SP	Does not print analysis output listing	list file	/SP
/STB	Identifies the file specification that contains the Executive Symbol Table	symbol file	--

1. n can be expressed as an octal or decimal number. A decimal point (.) following the number denotes decimal.

2.2.1 /BL:n (Identify Starting Block Number)

File: crash-input

Effect: CDA reads the dump from the input device beginning at block n. If the crash dump device is not a disk or DECtape, CDA ignores this switch.

Default: n = 1

2.2.2 /DENS:n (Sets Tape Density)

:HIGH
:LOW

File: crash-input

Effect: CDA reads the crash input tape at the density specified: 800 or 1600 bpi. You can also use LOW to indicate 800 bpi or HIGH to indicate 1600 bpi.

Default: n=800

2.2.3 /EXIT:n (Exit After n Errors)

File: list file

Effect: CDA maintains an error count. As it encounters inconsistencies in the system data structure, it increments this count. If you specify the /EXIT:n switch, CDA terminates analysis after n errors. If you specify the /EXIT switch but do not specify n, CDA exits after one error.

Default: CDA runs to completion.

2.2.4 /LIMIT:n (Limit Output Listing)

File: list file

Effect: The /LIMIT:n switch limits the number of pages of analysis output. When CDA has generated n pages, it terminates the analysis and prints a message on the user terminal indicating that it has done so.

Default: n = 300.

2.2.5 /LINES:n (Print n Lines per Page)

File: list file

Effect: This switch lets you specify the number of lines you want CDA to print per page. After n lines are printed, a new page is ejected.

Default: n=60.

2.2.6 /MEMSIZ:n (Establish Size of Binary Output File)

File: binary file

Effect: This switch causes CDA to create a Binary Output File 4*n blocks long and to transfer nK words to it from the crash-input file. The value of n must be greater than 16.

This switch is particularly useful when transferring binary crash dumps from disk or DECtape. Since disks and DECtapes have no physical EOFs, it is necessary to specify the size of the actual memory dump.

When the crash input resides on magtape, the binary output file is filled with zeroes if the EOF is read before nK words are transferred.

Default: n = 124.

2.2.7 /KMR (Assign Kernel Mapping Register Values)

File: crash-input

Effect: On mapped systems, when CDA reads incorrect Page Address Register (PAR) values from the crash stack, it aborts the analysis and prints an error message on the terminal. When this happens, you can use the /KMR switch to retry the analysis. When you specify /KMR, CDA uses standard mapping values to convert kernel virtual addresses to physical memory addresses.

Default: CDA uses existing Page Address Registers.

2.2.8 /-SP (Do Not Spool)

File: list file

Effect: CDA does not print the analysis output listing. It creates an output listing file on the device indicated in the output file specification. If you do not specify a device with /-SP, CDA creates the file on SY0:.

Default: /SP

2.2.9 /STB (File Specified Contains the Executive Symbol Table)

File: symbol file (RSX11M.STB)

Effect: The /STB switch identifies a file containing the Executive Symbol Table. This file must correspond to the crashed system. CDA opens the specified file and extracts the necessary symbol values. If it fails to find any required symbol values, CDA aborts the analysis and prints an error message on the console terminal user's.

Default: [current UIC]RSX11M.STB

CHAPTER 3

ANALYSIS LISTINGS

The CDA output listings in this chapter illustrate CDA operation. Each item of each listing is keyed to the brief explanatory text that precedes it.

Dumps shown in offset mode use relative addresses. They are offset from the beginning of the displayed data. They are not physical or virtual addresses of the data.

NOTE

These listings came from several different crash dumps. Therefore, values that would normally correlate across the various listings do not necessarily correlate here. Those listings that extend across several pages in an actual dump of a crashed system are truncated here and reflect only a typical printout format for them.

3.1 SYSTEM INFORMATION

The first six pages of a CDA output listing normally contain the system information described in Sections 3.1.1 through 3.1.6. The system information consists of the following:

- Volatile registers
- Kernel stack
- System common
- System common alphabetized dump
- Pool statistics
- Assign table

If group global event flag blocks are in memory when the system crashes, the listing described in Section 3.1.7 appears. If Error Log Packets are in memory at the time of the crash, the listing described in Section 3.1.8 appears. On RSX-11M-PLUS systems, CDA generates the listing of low core memory shown in Section 3.1.9 as part of the system common dump.

3.1.1 Volatile Registers

Figure 3-1 is a listing that reflects the state of the hardware registers at the time of the crash. Refer to the appropriate PDP-11 processor handbook for detailed information on these registers. Each item in the following list describes a correspondingly numbered item in Figure 3-1.

Item	Description
1.	Contents of Processor Status Word and kernel and user stack pointers after crash
2.	Program counter and Processor Status Word (that the system pushed onto the kernel stack) just prior to system crash (These values are valid only if the system trapped.)
3.	General registers
4.	Contents of memory management registers
5.	Contents of Page Address and Page Description Registers (See Section 4.1.1 for information on how to interpret this information.)
6.	UNIBUS map registers (This field is suppressed if the processor does not have a UNIBUS map.)
7.	CPU error register - identifies the source of the abort or trap that used the vector at location 4. (On RSX-11M-PLUS systems, this field is suppressed if the processor does not have a UNIBUS map.)
8.	Memory system error register (On RSX-11M-PLUS systems, this field is suppressed if the processor does not have a UNIBUS map.)
9.	Cache control register (On RSX-11M-PLUS systems, this field is suppressed if the processor does not have a UNIBUS map.)

```
RSX-11M CRASH DUMP ANALYZER        V3.2        21-MAY-79    10:58        PAGE 1
VOLATILE REGISTERS

AFTER CRASH:  PS=000000   SP(K)=000616   SP(U)=001674 (1)

BEFORE CRASH:  PC=000000   PS=120476 (2)

R0=007760   R1=007377   R2=007530   R3=000000   R4=000001   R5=000000 (3)

MMR0=000000   MMR1=000000   MMR2=002256   MMR3=000000 (4)

                    U S E R

  I   S P A C E              D   S P A C E
  PDR        PAR             PDR        PAR
 077506     000000          000000     000000
 077406     000200          000000     000000
 077506     000400          000000     000000
 077406     000600          000000     000000
 077406     001000          000000     000000
 037506     001600          000000     000000
 000000     003123          000000     000000
 077406     177600          000000     000000

                 S U P E R V I S O R

  I   S P A C E              D   S P A C E
  PDR        PAR             PDR        PAR
 000000     000000          000000     000000
 000000     000000          000000     000000
 000000     000000          000000     000000
 000000     000000          000000     000000
 000000     000000          000000     000000
 000000     000000          000000     000000
 000000     000000          000000     000000
 000000     000000          000000     000000

                    K E R N E L

  I   S P A C E              D   S P A C E
  PDR        PAR             PDR        PAR
 077506     000000          000000     000000
 077506     000200          000000     000000
 077506     000400          000000     000000
 077506     000600          000000     000000
 077506     001000          000000     000000
 077406     001600          000000     000000
 077406     003123          000000     000000
 077506     177600          000000     000000

                    U N I B U S   M A P

                 1   00000000
                 2   00020000
                 3   00040000
                 4   00060000
                 5   00100000
                 6   00120000
                 7   00140000
                 8   00327024
                 9   01132134
                10   01152134
                11   01157134
                12   01200134
                13   01674220
                14   00430770
                15   01636100
                16   17416700
                17   17416700
                18   17416700
                19   17416700
                20   17416700
                21   17416700
                22   17416700
                23   17416700
                24   17416700
                25   17416700
                26   17416700
                27   17416700
                28   17416700
                29   17416700
                30   17416700
                31   17416700
```

(5) (6)

Figure 3-1 Volatile Registers

```
RSX-11M-PLUS CRASH DUMP ANALYZER    V01     21-FEB-79   14:03        PAGE 1
VOLATILE REGISTERS

AFTER CRASH:  PS=000344   SP(K)=000604   SP(S)=001212   SP(U)=120362
                  (7)                        (8)                  (9)
              CPU ERR = 000100   MEM SYS ERR = 000000   CACHE CTL REG = 000001

BEFORE CRASH:  PC=045210   PS=030005

R0=000401   R1=053550   R2=000000   R3=000010   R4=000102   R5=120526

MMR0=000001   MMR1=000000   MMR2=011710   MMR3=000066

                 U S E R                                  U N I B U S   M A P

  I   S P A C E            D   S P A C E                    1  00000000
  PDR        PAR           PDR        PAR                   2  00074400
 015006     000000        000000     000000                  3  00114400
 077406     000744        000000     000000                  4  00134400
 077406     001144        000000     000000                  5  00154400
 077406     001344        000000     000000                  6  00243400
 077406     001544        000000     000000                  7  00263400
 037506     001744        000000     000000                  8  00461124
 000000     027255        000000     000000                  9  02642064
 077406     177600        000000     000000                 10  02662064
                                                            11  02702064
                                                            12  02722064
            S U P E R V I S O R                             13  02742064
                                                            14  02762064
  I   S P A C E            D   S P A C E                   15  15350622
  PDR        PAR           PDR        PAR                  16  17776366
 077402     006210        077406     020347                 17  07720376
 004402     006410        014406     020547                 18  13340176
 000000     000000        000000     022713                 19  11420312
 000000     000000        000000     023113                 20  14020346
 000000     000000        000000     023313                 21  12100272
 000000     000000        000000     016267                 22  03140176
 000000     000000        074406     004750                 23  04410272
 000000     000000        000000     005142                 24  00020200
                                                            25  06335600
                                                            26  04637510
                 K E R N E L                                27  17567456
                                                            28  17357734
  I   S P A C E            D   S P A C E                   29  10217500
  PDR        PAR           PDR        PAR                  30  00217404
 077506     000000        077506     000000                 31  11357560
 077406     000200        077506     000744
 077406     000400        077506     001144
 077406     000600        077506     001344
 077406     001000        077506     001544
 077406     001744        077406     001744
 077406     027255        077406     027255
 077406     177600        077506     177600
```

Figure 3-1 (Cont.) Volatile Registers

3.1.2 Kernel Stack

Figure 3-2 shows the contents of the kernel stack area beginning at V$$CTR and ending at $STACK. The kernel stack pointer points to a location within this area. See Section 4.1.2 for information on interpreting the contents of the kernel stack.

```
RSX-11M CRASH DUMP ANALYZER      V4.0      21-MAY-81   15:13      PAGE 2
KERNEL STACK

  KERNEL STACK:

    000400    000000  000000  000000  000000  000000  000000  000000  000000
    000420    000000  000000  000000  000000  000000  000000  000000  000000
    000440    000000  000000  000000  000000  000000  000000  000000  000000
    000460    000000  000000  000000  000000  000000  000000  000000  000000
    000500    000000  000000  000000  000000  000000  000000  000000  000000
    000520    000000  000000  000000  000000  000000  000000  000000  000000
    000540    000000  000000  000000  000000  000000  000000  000000  000000
    000560    000000  000000  000000  123064  177613  120204  000251  000251
    000600    123224  116506  000000  122710  000014  120344  123064  001446
    000620    120204  123064  123064  001446  120204  161121  006066  110160
    000640    114514  025160  000000  023540  006066  133362  126570  000000
    000660    140672  130054  160020  136744  122026  000000  137062  160020
    000700    130110  130054  006066  105664  000000  120644  022402  011762
    000720    030011  000700  007736  121000  003306  120212  025616  177777
    000740    106036  000000  106004  120220  170000
```

Figure 3-2 Kernel Stack

3.1.3 System Common

The listing in Figure 3-3 provides a selective interpretation of some of the items in system common. Each item in the list describes the correspondingly numbered item in Figure 3-3. (Refer to the RSX-11M Guide to Writing an I/O Driver or the RSX-11M-PLUS Guide to Writing an I/O Driver for more information.)

Item	Description
1.	Time and date of crash, as set in the system
2.	The task that was running at the time of the crash (If no task was running, this field contains the null task. This condition could develop if all the active tasks are blocked at the time of the crash. For information on determining which task or driver was mapped at the time of the crash, see Section 4.1.1.)
3.	The address of the Task Control Block of the current task
4.	The contents of the 4-byte system ID indicating system base level
5.	The first address available for partitions (the last address of the Executive + 1)
6.	The system size in 32-word blocks and in total words
7.	System UIC
8.	Stack depth count
9.	Contents of the global event flag words
10.	Name of the system for which dump is generated
11.	Network UIC
12.	Device from which the system was booted
13.	Logical block number of the beginning of the system image
14.	Size of system image file in blocks
15.	The octal value of the system feature masks and the meaning of each set bit
16.	Octal dump of system common in offset mode in numerical order by address

```
RSX-11M CRASH DUMP ANALYZER      V4.0       21-MAY-81   15:13       PAGE 3
SYSTEM COMMON

CRASH OCCURRED AT 09:53:51  21-MAY-81 (1)

        (2)                          (3)
CURRENT TASK = LDR...     TCB ADDRESS = 112050
        (4)                (5)                (6)                (7)
$SYSID = 30E     $EXSIZ = 115000     $SYSIZ = 16384./512K     $SYUIC = [2,54]
        (8)                                (9)
$STKDP = 000000      $COMEF:  <33-48> 000000  <49-64> 000000
          (10)                     (11)
SYSTEM NAME = QUASAR      $NTUIC = [102,54]
          (12)                (13)                (14)
LOAD DEVICE = DB0      LBN = 00124461      FILE SIZE = 496.

SYSTEM FEATURE MASK (FIRST WORD) = 033377

      BIT SET                MEANING
      -------                -------
        EXT          22-BIT EXTENDED MEMORY SUPPORT
        MUP          MULTI-USER PROTECTION SUPPORT
        EXV          20K EXEC SUPPORTED
        DRV          LOADABLE DRIVER SUPPORT
        PLA          PLAS SUPPORT
        CAL          DYNAMIC CHECKPOINT SPACE ALLOCATION
        PKT          PREALLOCATION OF I/O PACKETS
        EXP          EXTEND TASK DIRECTIVE SUPPORTED
        OFF          PARENT/OFFSPRING TASKING SUPPORTED
        FDT          FULL DUPLEX TERMINAL DRIVER
        DYM          DYNAMIC MEMORY ALLOCATION SUPPORTED
        CEX          COMMUNICATIONS EXEC IS LOADED

SYSTEM FEATURE MASK (SECOND WORD) = 167400

      BIT SET                MEANING
      -------                -------
        DPR          DIRECTIVE PARTITION SUPPORT
        IRR          INSTALL, REQUEST, AND REMOVE TASK SUPPORT
        GGF          GROUP GLOBAL EVENT FLAG SUPPORT
        RAS          RECEIVE/SEND DATA PACKET SUPPORT
        RBN          ROUND ROBIN SCHEDULING SUPPORTED
        SWP          EXECUTIVE LEVEL DISK SWAPPING SUPPORTED
        STP          EVENT FLAG MASK IS IN THE TCB

SYSTEM FEATURE MASK (THIRD WORD) = 025215

      BIT SET                MEANING
      -------                -------
        CLI          MULTIPLE CLI SUPPORT
        EIS          SYSTEM REQUIRES THE EXTENDED INSTRUCTION SET
        CRA          SYSTEM SPONTANEOUSLY CRASHED (1=YES)
        STM          SYSTEM HAS SET SYSTEM TIME DIRECTIVE
        AST          SYSTEM HAS AST SUPPORT
```

(15)

Figure 3-3 System Common

```
RSX-11M CRASH DUMP ANALYZER      V4.0       21-MAY-81   15:13       PAGE 4
SYSTEM COMMON DUMP
                                        (16)
 ADDR   LABEL  VALUE          ADDR   LABEL  VALUE          ADDR   LABEL  VALUE

007660         000760        010020 $POLST 000403        010160         000000
               010316               $PRIHL 003100                       000000
               000207               $PRILL 001130                       000000
       $HEADR  111700               $PFRSZ 000310                       000000
               174000               $POLBP 000063                       000000
       $COMEF  000000               $POLFL 000200                       000000
               000000               $POLLW 000144                       000000
       $SYSID  030063               $PARPT 017226                       000000

007700         020105        010040 $CLKHD 044414        010200         000000
       $TKNPT  107134               $COPT  037356                       000000
       $SHFPT  106704               $PARHD 114734                       000000
       $CKCNT  177546               $LDRPT 112050                       000000
       $CKCSR  177546               $TSKHD 112050                       000000
       $CKLDC  000000               $XCOM1 001600                       000000
       $SYUIC  001054               $XCOM2 001746                       000000
               000000               $GGEF  000000                       000000

007720 $EXSIZ  115000        010060 $GFTCB 010064        010220         000000
       $PWRFL  000000               $GEFPT 010064                $ERBAF  051423
       $SIGFL  000000               $GEFDM 000356                       030131
       $LOGHD  052254               $IDLCT 000000                       055472
       $MCRCB  104360               $IDLPT 103741                       026061
       $LSTLK  103640               $DYPMN 020035                       056466
               000003                      020037                       040502
       $CRAVL  045074                      020037                       045503

007740         000000        010100        017440        010240         050125
       $ACTHD  112050                      017440                       042456
       $DICSV  001051                      020040                       051122
       $TKTCB  112050               $BTMSK 000001                       000000
       $LBUIC  000454                      000002                       000000
       $ABTIM  007572                      000004                       000000
       $RQSCH  000000                      000010                       000000
       $STKDP  000000                      000020                       000000

007760 $DEVHD  063460        010120        000040        010260         000000
       $RNDCT  000005                      000100                       000000
       $SWPCT  000036                      000200                       000000
       $ERRPT  000000                      000400                $ERFID  000000
       $CFLPT  046444                      001000                       000000
               000000                      002000                       000000
               026222                      004000                       000000
       $INTCT  177777                      010000                       000000

010000 $FRKHD  000000        010140        020000        010300 $PRMOD  000000
               010000                      040000                $SYSIZ  040000
       $FMASK  033377                      100000                       000000
               167400               $ERHEA 000000                       124461
               025215                      010146                       041104
       $HFMSK  000003               $ENTSQ 000001                       000760
       $PTTCB  053510               $ERRSQ 000000                       177777
       $PRISZ  003370               $ERFLA 000000                       000015
```

Figure 3-3 (Cont.) System Common

3.1.4 System Common Alphabetized Dump

The listing in Figure 3-4 represents an alphabetical list of the locations in system common that have a label associated with them. The octal numbers represent the contents of those locations, not the addresses of the labels. The following summary lists the labels and their meanings. Note that some of these labels may not appear on your listing, or additional labels may appear, depending upon the options you selected at system generation.

$ABTIM	Absolute time counter
$ACCLK	Absolute time clock for accounting
$ACNFE	Accounting feature mask word
$ACTHD	Active task listhead
$ACTPS	Clock rate for accounting
$APLIM	Free secondary pool space ACNT reserves
$AVRHD	Automatic volume recognition listhead
$BTTIM	Absolute time when system was booted
$CBDHD	Common block directory listhead
$CFLPT	Checkpoint file PCB listhead
$CKCNT	Address of clock count register
$CKCSR	Clock Control Status Register (CSR)
$CKLDC	Clock load count
$CKUAB	UAB for task run from clock queue
$CKURM	URM of processor that keeps the clock
$CLICQ	Command queue listhead
$CLKHD	Clock queue listhead
$COPT	Pointer to Console Output (CO0:) Unit Control Block (UCB)
$CPMSK	Processor bit clear mask
$CPPAR	Pointer to partition for CPU local memory
$CPTBL	Pointer to CLI Parser Block Table
$CRAVL	Free system pool listhead
$CRCSR	Crash device CSR address with no KRB
$CRFLG	Flag indicating saved registers
$CRFPR	Number of first processor to crash
$CRKRB	Crash dump device KRB address

```
$CRLCK    One CPU dumps memory
$CRSUN    Crash physical unit number
$CTLST    Start of the CTB list
$CURPR    Current task priority
$CXDBL    Context switching disabled flag
$DEVHD    Pointer to first Device Control Block (DCB)
$DICSV    Temporary storage for directive services
$DRAPR    APR value to map directive partition
$DVSAV    Saved CSR contents for error logging
$ENTSQ    Error log entry sequence number
$ERFLA    Error Logger flag word
$ERHEA    Error Log message queue listhead
$ERRPT    Pointer to Error Logger Task Control Block (TCB)
$ERRSQ    Universal error sequence number
$EVBSQ    Buffer sequence number
$EVDIS    Buffer position for next event
$EVKS6    KISAR6 offset to buffer
$EVLEN    Pointer to word beyond end of buffer
$EVLOS    Number of events lost through saturation
$EVSEQ    Event sequence number
$EVTCB    TCB address of event logger task
$EXCRC    Executive read-only code CRC
$EXECL    Serialize access to executive data lock
$EXSIZ    Executive size
$FMASK    System feature mask
$FORKL    Serialize access to fork list lock
$FRKHD    Fork queue listhead
$FXRPT    Pointer to parity error task
$GEFDM    Group global dummy mask address word
$GEFPT    Group global mask address pointer
$GFTCB    Group global user TCB pointer
$GGEF     Group global event flags listhead
$GNLST    General use pool packet listhead
```

$HEADR	Pointer to current task header
$HFMSK	Hardware system feature mask
$HRCPT	Pointer to HRC... task
$ICAVL	ICB pool, same as core pool if no D space on system
$IDLCT	Idle pattern count byte
$IDLFL	Idle pattern flag in bytes
$IDLPT	Idle pattern word
$IICPU	Mask of URMs that have been interrupted
$IIFNL	Serialize access to $MPTAB lock
$IIMSK	IIst interrupt mask word
$IINXT	Round robin word for $IISVC
$IIPND	Pending URM work word
$INTCT	Clock interrupt ticks count
$LBUIC	Library UIC
$LDPCB	Current loader PCB pointer
$LDRPT	Pointer to loader TCB
$LOGHD	Logical device assignment listhead
$LSTLK	Lock word -- TCB address of owner
$MCRPT	Pointer to MCR TCB
$MOULS	Mount listhead
$MXEXT	Last address in system common
$NCPU	Number of processors in system
$NTUIC	Network UIC
$PARHD	Pointer to partition list
$PASTH	Partition AST listhead
$PFRSZ	Minimum size of largest fragment in pool
$PFURM	URM to powerfail
$PKAVL	Pointer to first preallocated I/O packet
$PKMAX	Maximum number of preallocated I/O packets
$PKNUM	Number of preallocated I/O packets currently in list
$PLPAR	Pointer to secondary pool PCB
$POLBP	Minimum priority for nonprivileged task to execute at low pool

$POLFL	Exec pool usage control flags
$POLHD	Listhead for secondary pool free list
$POLST	Exec-pool communications word
$PRIFR	Current amount of free pool
$PRIHL	Upper limit for pool monitoring
$PRILL	Lower limit for pool monitoring
$PRISZ	Minimum size of largest pool fragment
$PRMOD	Processor model number
$PRTAB	Processor current task priority table
$PTCBL	Prototype TCB listhead
$PTCPT	KISAR6 bias of prototype TCB
$PTTCB	TCB address of pool recovery task
$PWRFL	Powerfail recovery request flag
$PWRLK	Serialize access to $PWRMK lock
$PWRMK	Mask of CPU in powerfail code
$RNDC	Clock ticks for each scheduling interval
$RNDCT	Number of clock ticks until next schedule interval
$RNDH	Highest priority class to consider
$RNDL	Lowest priority class to consider
$ROEND	End of read-only part of the executive
$RQSCH	Schedule request TCB address
$RQTAB	Reschedule pointer to TCB table
$SABPT	Pointer to system account block
$SAHDB	Bias of current task header
$SAHPT	Virtual address of current task header
$SAVSP	Saved stack pointer
$SCCTB	CTB if $SCDEV CONTAINS KRB
$SCDEV	UCB or KRB for status change
$SCERR	Error return from driver
$SCMOF	Offset to data space
$SCOFL	On-line or off-line parameter
$SECFR	Number of free blocks in secondary pool
$SGFFR	Pointer into stack for $SGFIN

$SHERR	Points to TCB of shadow error task
$SHFCT	Minimum ticks between shuffler requests
$SHFPT	Pointer to shuffler TCB
$SHFTM	Time remaining before next possible request to shuffler
$SHLIM	Error packet limit
$SHLOS	Number of packets lost from saturation
$SHPCT	Current shadow error count
$SHUMB	Root for UMB list
$SIGFL	Task waiting for significant event
$STALR	Sanity timer alarm enabled on CPU
$STENB	Sanity timer enabled
$STKDP	Stack depth indicator
$SWPC	Clock ticks for each swapping interval
$SWPCT	Number of clock ticks to next swapping interval
$SWPR	Swapping priority
$SWR	Multiprocessor console switch register
$SYLHD	Listhead for Syslog input queue
$SYSIZ	Size of memory in 32K-word blocks
$SYUAB	Address of UAB for system tasks
$SYUIC	System User Identification Code (UIC)
$TKNPT	Pointer to TKTN TCB
$TKPS	Ticks per second
$TNAME	Multiuser task name
$TSKHD	Pointer to System Task Directory (STD)
$TTNS	Tick of second
$ULDPT	Microcode loader task TCB address
$UMRST	Unibus run mask status table
$VECTR	Highest vector address
$XDTFL	XDT initialization table
$XDTPR	Flag for prompts from XDT

```
RSX-11M CRASH DUMP ANALYZER      V4.0       21-MAY-81   15:13       PAGE 6
SYSTEM COMMON ALPHABETIZED DUMP

$ABTIM 007572        $ERRPT 000000        $NETPF 000000        $SWPCT 000036
$ACTHD 112050        $ERRSQ 000000        $NTUIC 041054        $SYSIZ 040000
$AVRHD 000000        $EXSIZ 115000        $PARHD 114734        $SYSNM 052521
$CFLPT 046444        $FMASK 033377        $PARPT 017226        $SYUIC 001054
$CKCNT 177546        $FRKHD 000000        $PFRSZ 000310        $TEMP0 110160
$CKCSR 177546        $GEFDM 000356        $PKAVL 072230        $TEMP1 064170
$CKLDC 000000        $GEFPT 010064        $PKMAX     017       $TEMP2 013356
$CLICQ 000000        $GFTCB 010064        $PKNUM     012       $TEMP4 000000
$CLKHD 044414        $GGEF  000000        $POLBP 000063        $TKNPT 107134
$COPT  037356        $HEADR 111700        $POLFL 000200        $TKPS  000074
$CPTBL 010472        $HFMSK 000003        $POLLW 000144        $TKTCB 112050
$CRAVL 045074        $IDLCT     000       $POLST 000403        $TSKHD 112050
$CURPR     370       $IDLFL     000       $PRIHL 003100        $TTNS  000066
$CXDBL     000       $IDLPT 103741        $PRILL 001130        $UMRHD 052642
$DEVHD 063460        $INTCT 177777        $PRISZ 003370        $UMRPT 170200
$DICSV 001051        $LBUIC 000454        $PRMOD 000000        $UMRWT 000000
$DPM   000040        $LDRPT 112050        $PTTCB 053510        $WTCSR 017226
$ENTSQ 000001        $LOGHD 052254        $PWRFL 000000        $WTDUM 017226
$ERBAF     023       $LSTLK 103640        $RNDCT 000005        $XCOM1 001600
$ERFID 000000        $MCRCB 104360        $RQSCH 000000        $XCOM2 001746
$ERFLA     000       $MCRPT 110160        $SHFPT 106704
$ERHEA 000000        $MOULS 046614        $SIGFL 000000
$ERLOF     000       $MXEXT 177777        $STKDP 000000
```

Figure 3-4 System Common Alphabetized Dump

3.1.5 Pool Statistics

The listing in Figure 3-5 contains information concerning the system pool. CDA derives Items 2, 3, and 4 by scanning the free block pointers of the pool. The minimum block size (item 5) (that is, pool granularity), comes from the contents of $CRAVL-2. Each item in the following list describes a correspondingly numbered item in Figure 3-5.

Item	Description
1.	Pool size in decimal bytes
2.	The largest fragment of pool space
3.	Total number of free bytes in pool
4.	Number of fragments not allocated
5.	Smallest possible block (This is the minimum number of bytes which may be requested at a time. The minimum block size is always four bytes.)
6.	Bit map in octal

Each bit in the bit map represents one 4-byte block. If the bit is set, the block is free. The first block in pool is bit 0 of the first octal word in the bit map. The bits are numbered as follows:

Bit Number	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Binary	0	0	1	1	1	0	1	1	1	1	1	1	1	0	0	0
Octal	0	3			5			7			7			0		

Any bits left over in the last word of the bit map are cleared.

```
RSX-11M CRASH DUMP ANALYZER      V3.2        21-MAY-79   10:58       PAGE 5
POOL STATISTICS

POOL SIZE (BYTES) = 16532. (1)

LARGEST FREE BLOCK (BYTES) = 12416. (2)

TOTAL FREE BYTES = 12676. (3)

NUMBER OF FRAGMENTS = 10. (4)

MINIMUM BLOCK SIZE (BYTES) = 4. (5)

POOL BITMAP (CONSTRUCTED FROM LINKED POOL, BLOCK FREE IF BIT SET): (6)

      000000  100434  000000  007000  000040  140000  002001  000000
      000000  000000  000000  000000  000004  000000  000000  000000
      176000  177777  177777  017777  000000  000000  177740  177777
      177777  177777  177777  177777  177777  177777  177777  177777
      177777  177777  177777  177777  177777  177777  177777  177777
      177777  177777  177777  177777  177777  177777  177777
```

3.1.6 Assign Table

Figure 3-6 is a listing of the logical device assignment table.

Item	Description
1.	Logical name assigned to device
2.	Physical name of device
3.	Whether assignment is login, local, or global
4.	Terminal that made the logical assignment

```
RSX-11M CRASH DUMP ANALYZER      V4.0       21-MAY-81   15:13       PAGE 8
ASSIGN TABLE

LOGICAL    PHYSICAL    TYPE
-------    --------    ----
   (1)        (2)        (3)          (4)
 SY0:       DB0:       LOCAL      TI - TT54:
 SY0:       DB2:       LOCAL      TI - TT15:
 SY0:       DB1:       LOCAL      TI - TT51:
 OU0:       DM0:       LOCAL      TI - TT51:
 OU0:       DB0:       LOCAL      TI - TT57:
 IN0:       DB1:       LOCAL      TI - TT57:
 SY0:       DB2:       LOCAL      TI - TT24:
 MP0:       DB0:       GLOBAL
```

Figure 3-6 Logical Device Assignment Table

3.1.7 Group Global Event Flags

Figure 3-7 shows a group global event flag dump. If there are no group global event flags, this dump does not appear.

Item	Description
1.	Group number
2.	Access count
3.	Group Global Event Flag block dump The last two words are the group global event flags.

```
RSX-11M-PLUS CRASH DUMP ANALYZER    V2.0    26-AUG-81    10:17        PAGE 18
GROUP GLOBAL EVENT FLAGS


      (1)                          (2)
GROUP NUMBER =1          ACCESS COUNT =177476

GGEF  DUMP:        (3)

    000000    056660  000401  177476  000015  000000


GROUP NUMBER =7          ACCESS COUNT =006332

GGEF  DUMP:

    000000    020000  000007  006332  000014  000000
```

Figure 3-7 Group Global Event Flags

3.1.8 Error Log Packets

The listing shown in Figure 3-8 contains error logging information that was residing in memory at the time of the crash. This page does not appear if no error log packets were in memory at the time of the crash. This data is not written to the Error Log file on disk.

Item	Description
1.	Address of error log buffer
2.	Error log packet entry type code
3.	Error log packet entry type subcode
4.	Time the packet was logged.
5.	Dump of error log packet in octal

```
RSX-11M CRASH DUMP ANALYZER      V4.0       14-JUL-81   13:58       PAGE 8
ERROR LOG BUFFERS

                (1)                          (2)                          (3)
    BUFFER ADDRESS = 072304    ENTRY TYPE CODE = 000002   ENTRY TYPE SUBCODE = 000001

    TIME = 7-JUL-81   07:46:11
                                        (4)
    000000    000000  000210  000034  000055  000401  030463  020040  003401
    000020    000025  000013  000402  003521  003407  005456  000106  000001
    000040    000046  046504  000001  000001  000000  047115  052105  031526
    000060    041117  000112  000000  000000  000000  000001  064766  000000
    000100    011532  000000  000000  000030  045662  131574  000424  047503  (5)
    000120    000400  001000  000003  000017  004010  177000  000000  000056
    000140    101220  172741  044702  000424  004301  100301  000000  000000
    000160    000253  177777  033065  022000  004066  000000  010341  100000
    000200    101721  000001  000001  105262  030111
```

Figure 3-8 Error Log Packets

3.1.9 Low Core Memory Dump (RSX-11M-PLUS Only)

The listing shown in Figure 3-9 contains a dump of RSX-11M-PLUS low core memory, alphabetized by label.

The following summary lists labels found in RSX-11M-PLUS low core memory and their meanings:

$CRSBF	Internal crash stack
$CRUPC	Scratch user PC
$CRUST	Scratch user PS
$CURPR	Pointer to current task priority
$CXDBL	Context switch disable flag
$DICSV	Temporary storage for directive service
$DXDEP	Entry point to dynamic executive debugger interface
$DXDK5	Saved KINAR5 for dynamic executive debugger interface
$DXDRL	Relocation bias for dynamic executive debugger interface
$HEADR	Pointer to current task header
$PARLV	Interrupt recursion level counter
$RQSCH	Pointer to current reschedule pointer
$SAHDB	Bias of current task header
$SAHPT	Virtual address of current task header
$SAVSP	Saved stack pointer
$SIRWF	Supervisor instruction space read/write flag
$STKDP	Stack depth indicator
$SUPFL	Supervisor window flag
$TKTCB	Pointer to current task TCB

```
RSX-11M-PLUS CRASH DUMP ANALYZER    V2.0    9-OCT-81   15:44       PAGE 3
LOWCORE ALPHABETIZED DUMP

$CRSBF 000000          000000          000000       $RQSCH 021712
       000000          000000          000000       $SAHDB 000000
       000000          000000          000000       $SAHPT 000000
       000000          000000          000000       $SAVSP 000000
$CRUPC 000000          000000       $DXDEP 000000   $SIRWF    000
$CRUST 000000          000000       $DXDK5 000000   $STKDP 000000
$CURPR 021722          000000       $DXDRL 000000   $SUPFL    000
$CXDBL    000          000000       $HEADR 000000   $TKTCB 000000
$DICSV 000000          000000       $PARLV 177777
```

Figure 3-9 Low Core Memory

3.2 OPTIONAL INFORMATION

CDA gives you additional information when you use the analysis switches described in Chapter 2. Figures 3-10 through 3-24 illustrate the output CDA provides when you use these switches.

3.2.1 Active Tasks

The listing shown in Figure 3-10 contains active task information. The Receive Queue, AST Queue, Receive by Reference Queue, and Offspring Control Block sections of this example appear only if the task has them; otherwise, they are suppressed. Section 3.2.2 describes the additional information in the active task listing when the active task is MCR.

Item	Description
1.	Task name
2.	Address of Task Control Block for the task
3.	The name of the partition in which the task runs
4.	Address of Partition Control Block
5.	The base address for the partition in which the task runs
6.	The device that contains task image
7.	The beginning Logical Block Number of the task on the device
8.	The running priority
9.	The number of outstanding QIO requests
10.	Current UIC (either the login UIC or the UIC specified with a SET command)
11.	Physical name of task's pseudo-device
12.	Maximum size of task image in 32.-word blocks
13.	State of local event flags for task
14.	First status word (blocking bits). The 3-letter codes have the following meanings: -EXE - Task not executing RDN - I/O rundown in progress CIP - Task blocked for checkpoint in progress MSG - Abort message being output CKR - Task has checkpoint request (M-PLUS only) BLC - Increment blocking count STP - Task stopped by CLI command

15. Second status word (state bits). The 3-letter codes have the following meanings:

AST - Asynchronous system trap (AST) in progress

SIO - Task stopped for buffered I/O

DST - AST recognition disabled

AFF - Task installed with affinity

-CHK - Task not checkpointable

SEF - Stopped for event flag

REX - Exit AST specified

HLT - Task being halted

ABO - Task marked for abort

STP - Task stopped

SPN - Task suspended

WFR - Task in wait-for state

16. Third status word (attribute bits). The 3-letter codes have the following meanings:

ACP - Task is an Ancillary Control Processor.

-PMD - Task not dumped on synchronous abort.

CMD - Task is executing a CLI command

REM - Remove task on exit.

PRV - Task is privileged.

MCR - Task requested as an external MCR function.

SLV - Task is a slave task.

CLI - Task is a command line interpreter.

RST - Task is restricted.

NSD - Task does not allow send data.

CAL - Task has checkpoint space in task image.

ROV - Task has resident overlays.

NET - Network protocol level.

GFL - Group global event flags are locked.

SWS - Reserved for Software Services.

MPC - Mapping change with outstanding I/O.

17. Fourth status word. The three-letter codes have the following meanings:

    MUT - Task is a multiuser task

    LDD - Task load device is dismounted

    PRO - TCB is a prototype

    PRV - Task was privileged but has cleared TB.PRV with the GIN directive

    DSP - Task was built for user D space

    SNC - Task uses common sync

18. Octal dump of Task Control Block in offset mode

RECEIVE QUEUE (if task has one)

19. Starting address of receive block

20. Name of task

21. Octal dump of receive block in offset mode

AST QUEUE (if task has one)

An item appearing in the AST queue may be one of the following things:

- An unsolicited AST
- floating point AST
- Receive data AST
- Receive by reference AST
- Parity error AST
- Requested exit AST
- Power fail
- CLI command arrival AST
- A buffered I/O AST
- Offspring task AST
- Segmented buffered I/O completion AST
- Task force T-bit trap AST
- Delayed I/O completion AST
- Group global rundown AST

- An I/O Request packet
  - Address of AST block
  - A 2-byte indicator (The high-order byte is an offset into the header of the AST control block; the low-order byte is the length of the AST control block in bytes.)

NOTE

If the low-order byte is negative, the block is not an AST block, but an I/O request packet internal to the system. If the low-order byte is 0, the block is an unsolicited character AST.

  - Number of bytes allocated on task stack
  - Entry point of AST routine
  - Number of AST parameters
  - Octal dump of the AST block in offset mode (On RSX-11M-PLUS systems, two additional negative offset words appear in the dump.)

RECEIVE BY REFERENCE QUEUE (if task has one)

  - Address of Receive by Reference queue block
  - Address of the Task Control Block (TCB) for the task that initiated the Send by Reference
  - Contents of event flag mask
  - Address of event flag mask
  - Pointer to created attachment descriptor
  - Offset into partition as specified in window definition
  - Length to be mapped
  - The receiving task's access rights to region being mapped
  - Octal dump of Receive by Reference block in offset mode

OFFSPRING CONTROL BLOCK (OCB) LIST (if task has one)

22. Exit event flag number of offspring task
23. Name of parent task
24. Octal dump of offspring control block in offset mode

```
RSX-11M-PLUS CRASH DUMP ANALYZER    V2.0    27-DEC-81   13:02       PAGE 13
ACTIVE TASKS

...LDR (1)
------
                (2)                 (3)                 (4)
  TCB ADDRESS = 111650     PAR = SYSPAR     PCB ADDRESS = 111434
                (5)                 (6)                 (7)
  LOAD ADDRESS = 00461600     LOAD DEVICE = LB0:     LBN = 00076636
      (8)                 (9)                 (10)                (11)
  PRI = 248.     I/O COUNT = 0.     UIC = [1,24]     TI = CO0:
          (12)                 (13)
  MAX SIZE = 000035     EVENT FLAGS = <1-16> 000001  <17-32> 000000

  T.STAT:  000000 (14)

  T.ST2:   020020  -CHK  STP (15)

  T.ST3:   050200  -PMD  PRV  NSD (16)

  T.ST4:   000000 (17)

  TCB DUMP:

    000000    000000  000370  000000  131574  045662  000000  111662  000000
    000020    111666  000001  000000  022370  111300  000000  020020  050200
    000040    000370  076636  031420  111434  000035  033500  111426  111426 (18)
    000060    000000  000000  000000  000001  111672  000035  000000  000000
    000100    000000  111750  000000  111754  000000  000000  000000  000000

      .
      .
      .

    RECEIVE QUEUE
    -------------

                (19)                                (20)
    RECEIVE BLOCK ADDRESS = 062000   TASK NAME = TU$KRD

    000000    000000  100143  043624  062640  050210  016000  121502  024172
    000020    140002  133406  000000  000000  000000  000000  000000  000000 (21)
    000040    046522  000000

      .
      .
      .

  OCB LIST:
  ---------

    EXIT EVENT FLAG (O.EFN) = 000000 (22)

    PARENT TASK NAME = QMG... (23)

    OCB DUMP:

    000000    000000  000000  106424  121350  000000  000000  066117  131574 (24)
    000020    000000  000000  000000  000000  000000  000000
```

Figure 3-10 Active Tasks (Truncated)

3.2.2 Active Task (MCR)

The active task listing for MCR... contains more information than the active task listing for other tasks. Figure 3-11 shows a listing in which the first 17 items are the same as those in Figure 3-10. The following list describes only the items that are different from those in the previous figure, when the active task is MCR....

Item	Description
1.	Address of MCR input buffer
2.	Address of Unit Control Block of the requesting terminal
3.	Device name and unit number of the terminal that sent block to MCR (ASCII characters)
4.	Octal dump of the MCR input buffer in offset mode
5.	Address of command buffer
6.	Address of Task Control Block of the requesting task
7.	ASCII dump of command buffer
8.	Octal dump of command buffer in offset mode

```
RSX-11M-PLUS CRASH DUMP ANALYZER     V01      21-FEB-79    16:23        PAGE 10
ACTIVE TASKS


MCR...
------

  TCB ADDRESS = 114610      PAR = SYSPAR      PCB ADDRESS = 037050

  LOAD ADDRESS = 00174400      LOAD DEVICE = LB0       LBN = 00073747

  PRI = 160.      I/O COUNT = 0.      UIC = [1,24]      TI = TT3

  MAX SIZE = 000100      EVENT FLAGS = <1-16> 000001  <17-32> 040000

  T.STAT:  000000

  T.ST2:   000020  STP

  T.ST3:   051300  -PMD PRV  CLI  NSD  CAL

TCB DUMP

    000000    000000  000240  000000  050712  131574  000000  114622  000000
    000020    114626  000001  040000  024552  113760  000000  000020  051300
    000040    000240  073747  035636  037050  000100  112330  036046  036046
    000060    000000  000000  000000  114674  000000  114700  000000  000000
    000100    004256

    RECEIVE QUEUE
    -------------

                                      (1)                    (2)
    COMMAND LINE INPUT BUFFER ADDRESS = 036730     UCB = 030245

    TT50 : (3)

    000000    043214  030245  035770  000050  000020  000000  030244  000400
    000020    120430  001750  140030  000000  001751  140010  000027  000361
    000040    000040  000000  000000  000000  000000  000000  000000  000214   } (4)
    000060    026226  000000  000000  117404  005627  000362  000000  000362
    000100    000000  113234  000010  037050  000000  036120  036120  000000

    MCR COMMAND BLOCKS
    ------------------

                  (5)                 (6)
    BUFFER ADDRESS = 103100     TCB = 102730

     ASN DB01:=SY:/LOGIN (7)

    000000    000000  102730  051501  020116  041104  030460  036472  054523
    000020    027472  047514  044507  015516  026226  000000  000000  117404   } (8)
    000040    024600  000420  000000  000420  000000  103020  000010  104074
    000060    000000  060440  060440  060370  103370  000114  000612  033406
    000100    170000  126122  000000  000000  000000  000000  000012  000137
    000120    000000  000000
```

Figure 3-11 Active Task (MCR)

3.2.3 Task Headers

Figure 3-12 is an example of a task header listing. The following list describes its contents.

Item	Description
1.	Task name
2.	Pointer to the first word in the task header
3.	Pointer to the first word in the Task Control Block
4.	Contents of Processor Status Word and program counter
5.	Contents of the general registers
6.	Initial contents of the Processor Status Word, the program counter, and the stack pointer
7.	The task header size in decimal bytes, the number of windows required to map the task, and the number of logical unit numbers assigned to the task
8.	Current and default UIC
9.	Pointer to number of window blocks
10.	Pointer to header guard word
11.	Work area extension vector pointer
12.	Priority difference for swapping
13.	Directive Status Word
14.	Address of File Control Services (FCS) impure area
15.	Address of FORTRAN impure area
16.	Address of overlay impure storage

LOGICAL UNIT TABLE

17.	Logical Unit Number
18.	Physical device name before redirect
19.	Window pointer in header

20. The low-order byte of this word indicates the number of map entries active; the high-order byte has the following bit assignments:

    WI.RDV=400 - read virtual address allowed if set

    WI.WRV=1000 - write virtual block allowed if set

    WI.EXT=2000 - extend allowed if set

    WI.LCK=4000 - set if locked against shared access

    WI.DLK=10000 - set if deaccess lock enabled

    WI.BPS=100000 - bypass access interlock if set

21. Address of File Control Block

22. File number

23. File sequence number

24. File Control Block status word

25. Number of accesses

26. Number of block locks

WINDOW BLOCKS

27. The name of the partition in which the task runs

28. The virtual limits of the task

29. Address of attachment descriptor

30. Window size in 32-word blocks

31. Offset into partition

32. Address of the first Page Description Register (PDR) used to map the window

33. Number of PDRs used

34. The contents of the last PDR used

35. Octal dump of task header in offset mode

```
RSX-11M CRASH DUMP ANALYZER      V4.0        21-MAY-81    15:13        PAGE 37
TASK HEADERS

TKTN  (1)
------
                (2)                                (3)
  HEADER ADDRESS = 076060       TCB ADDRESS = 107134

  PS=170000      PC=122630 (4)

  R0=120254  R1=000065  R2=000060  R3=140354  R4=120702  R5=051024  SP=120226 (5)

  INITIAL PS = 170017   INITIAL PC = 120764   INITIAL SP = 120230 (6)

  HEADER SIZE = 102.    NO. OF WINDOWS = 1.   NO. OF LUNS = 1. (7)

  CURRENT UIC = [1,24]       DEFAULT UIC = [1,24] (8)
        (9)                  (10)                (11)                  (12)
  H.WND = 076162     H.GARD = 076224     H.VEXT = 000000      H.SPRI = 5.
      (13)                  (14)                (15)                  (16)
  DSW = 000001       H.FCS = 000000      H.FORT = 000000      H.OVLY = 000000


  LOGICAL UNIT TABLE:

 (17) (18)    (19)      (20)      (21)      (22)      (23)      (24)      (25)   (26)
  #   DEV   WINDOW    W.CTL     W.FCB    F.FNUM    F.FSEQ    F.STAT    NAC    NLCK
  -   ---   ------    -----     -----    ------    ------    ------    ---    ----
  1   TI0:  000000


  WINDOW BLOCKS:

   (27)          (28)            (29)        (30)       (31)       (32)      (33)     (34)
   PAR      VIRT LIMITS     ATT DESC   WND SIZE   OFFSET   1ST PDR   NO.   LAST PDR
   ---      -----------     --------   --------   ------   -------   ---   --------
  TKNPAR   120000 127777     045220     000100    000000   177612     1     037406


  HEADER:

    000000     120226  000146  140354  163500  000424  000424  170017  120764
    000020     120230  000000  000000  000000  000000  000000  000000  000000
    000040     000000  000000  076162  000001  000000  000000  000000  000000 (35)
    000060     000005  000000  000000  000000  000000  076224  000001  044570
    000100     000000  000001  114450  120000  127777  045220  000100  000000
    000120     000612  037406  170000  122630  051024  120702  140354  000060
    000140     000065  120254  000000
```

Figure 3-12 Task Headers (Truncated)

3.2.4 CLI Parser Block

The listing shown in Figure 3-3 contains the CLI Parser Block for MCR.

Item	Description
1.	Task name of the command line interpreter
2.	Starting address of the command line interpreter parser block (CPB)
3.	C.PSTS - CPB status word
4.	Dump of the CLI parser block in octal

```
RSX-11M CRASH DUMP ANALYZER      V4.0       21-MAY-81   15:13       PAGE 9
CLI PARSER BLOCKS

CLI TASK NAME   MCR... (1)
CPB ADDRESS = 010472    CLI NAME = MCR (2)
C.PSTS:   SGL (3)

CPB DUMP:

    000000    110160  050712  000000  000040  003404  005015  000076  005015 (4)
    000020    041515  037122  000000
```

Figure 3-13 CLI Parser Blocks

3.2.5 Partition Information

CDA outputs partition information in two segments. The listing shown in Figure 3-14 contains system partition information, and the listing shown in Figure 3-15 represents individual partition information. The following list describes elements of Figure 3-14. Individual partitions include attachment Descriptors and Wait Queues when they apply.

Item	Description
1.	Partition names
2.	Partition Control Block address
3.	Base address of partition in memory
4.	Size of the partition
5.	Type of partition
6.	Task or tasks occupying the partition

```
RSX-11M CRASH DUMP ANALYZER        V4.0        21-MAY-81    15:13        PAGE 54
PARTITION INFORMATION


                    M E M O R Y    M A P

   ①          ②          ③          ④          ⑤          ⑥
PARTITION   PCB ADR     BASE       SIZE       TYPE       OCCUPIED BY
---------   -------     ----       ----       ----       -----------

<EXEC>                  00000000   00044700
<POOL>                  00044700   00050100

CEXPAR      114734      00115000   00003000   MAIN COMMON

TTPAR       114670      00120000   00040000   MAIN DRIVER    TT:

EXCOM1      114624      00160000   00014600   MAIN COMMON

EXCOM2      114560      00174600   00006100   MAIN COMMON

SYSPAR      114514      00202700   00010000   MAIN TASK      MCR...

TKNPAR      114450      00212700   00010000   MAIN TASK      TKTN

DRVPAR      114404      00222700   00030200   MAIN SYS
            114340      00222700   00002100   SUB  DRIVER    DB:
            114240      00225000   00001200   SUB  DRIVER    DK:
            114140      00226200   00003000   SUB  DRIVER    DM:
            114040      00231200   00003000   SUB  DRIVER    DR:
            113740      00234200   00001000   SUB  DRIVER    EM:
                        00235200   00000100    <HOLE>
            113640      00235300   00001100   SUB  DRIVER    DT:
            113540      00236400   00001400   SUB  DRIVER    DX:
            113440      00240000   00002200   SUB  DRIVER    DL:
            113340      00242200   00002600   SUB  DRIVER    DD:
            113240      00245000   00001300   SUB  DRIVER    LP:
            113104      00246300   00004300   SUB  DRIVER    MM:
            112450      00252600   00000300   SUB  DRIVER    CO:

LDRPAR      112404      00253100   00002500   MAIN TASK      LDR...

BASIC2      112340      00255600   00040000   MAIN COMMON

FCSRES      112274      00315600   00040000   MAIN COMMON

TSTPAR      112230      00355600   00100000   MAIN TASK

GEN         112164      00455600   03322200   MAIN SYS
            045620      00455600   00024000   SUB  TASK      DB2FCP
            057144      00501600   00025500   SUB  TASK      NETACP
                        00527300   00005200    <HOLE>
            064060      00534500   00023300   SUB  TASK      RMHACP
            053004      00560000   00005200   SUB  TASK      CA.T6
            073534      00565200   00005200   SUB  TASK      CA.T30
                        00572400   00005700    <HOLE>
            045010      00600300   00005700   SUB  TASK      PMT...
```

Figure 3-14 Partition Information

Each item in the following list describes a correspondingly numbered item in Figure 3-15.

Item	Description

PARTITION CONTROL BLOCK

1. Partition name
2. Pointer to first word of Partition Control Block
3. Type of partition
4. Name of main partition
5. Physical base address of partition in 32-word blocks
6. Partition size in 32-word blocks
7. Pointer to the first word of the Task Control Block of attached task
8. Partition protection word (mapped system only)
9. Priority of attached task or partition
10. I/O count of attached task or partition
11. Partition status flags. The 3-letter codes have the following meanings:

    OUT - Partition is out of memory.

    CKP - Partition checkpoint in progress.

    CKR - Partition checkpoint is requested.

    CAF - Checkpoint space allocation failure.

    -CHK - Partition is not checkpointable.

    FXD - Partition is fixed.

    LFR - Last head of region failure.

    PER - Parity error in partition.

    LIO - Marked by shuffler for long I/O.

    NSF - Partition cannot be shuffled.

    COM - Library or common block.

    DEL - Partition should be deleted when not attached.

12. Octal dump of Partition Control Block in offset mode.

Item	Description

ATTACHMENT DESCRIPTOR

13. Address of attachment descriptor

14. Partition to which attachment occurs

15. Name of attaching task

16. Partition Control Block attachment queue thread word

17. Task Control Block (TCB) attachment queue thread word

18. Priority of highest priority task attached to this partition

19. I/O count of attached task on RSX-11M systems; I/O count of attached partition on RSX-11M-PLUS systems

20. The number of times task is mapped through this attachment descriptor

21. Attachment descriptor status byte. The 3-letter codes have the following meaning:

    DEL - task has delete access

    EXT - task has extend access

    WRT - task has write access

    RED - task has read access

    PRO - TCB is secondary pool TCB bias

    SPB - Cache bypass request

    RBP - Request to not bypass cache

22. Octal dump of attachment descriptors in offset mode

PARTITION WAIT QUEUE ITEM DESCRIPTION

23. Name of the task awaiting access to the partition

24. Address of Task Control Block for the task

25. TI: device for the task

26. Task's priority

27. Second status word (state bits)--same as item 15 of the active task dump (Section 3.2.1)

RSX-11M-PLUS SYSTEMS ONLY ADDITIONAL ITEM DESCRIPTION

28. Resident mapped task count

29. Wait queue contains partition description rather than task description if this is an RSX-11M-PLUS system

```
PARTITION  PCB ADR  TYPE   MAIN   BASE    SIZE   P.TCB    PRO    PRI  IOC
---------  ------   ----   ----   ----    ----   -----    ---    ---  ---
 DRVPAR    117270   SUB   DRVPAR 001312  000060  040754  000000  0.   0.

  P.STAT:  SYS DRV

    000000    000000  000000  015746  062072  000000  117734  001312  000060
    000020    000000  000000  000000  040754  000060  000000  000000  000000
    000040    117326
```

```
   (1)        (2)      (3)     (4)     (5)      (6)      (7)      (8)     (9)   (10)
PARTITION  PCB ADR  TYPE   MAIN   BASE    SIZE   P.TCB    PRO    PRI  IOC
---------  ------   ----   ----   ----    ----   -----    ---    ---  ---
 SYSPAR    117074   MAIN  SYSPAR 001372  000105  115264  000000  0.   0.

  P.STAT: (11)

    000000    117030  000000  075273  062072  000000  117074  001372  000105 }
    000020    115764  115764  100200  115264  000000  042760  000000  042000 } (12)
    000040    041764                                                          }
```

```
WAIT QUEUE:
  (23)       (24)      (25)     (26)            (27)
 TASK     TCB ADR     TI     T.PRI     STATE BITS (T.ST2)
 ----     -------     --     -----     ------------------
F11ACP    115764     C00     149.         CAF  STP
```

```
ATTACHMENT DESCRIPTORS:
  (13)        (14)          (15)        (16)       (17)      (18)   (19)      (20)
ADDRESS   PARTITION    ATT TASK    A.PCBL    A.TCBL    PRI    IOC   MAP COUNT
-------   ---------    --------    ------    ------    ---    ---   ---------
042000     SYSPAR       ...MCR     041764    000000    160.   0.      0.

A.STAT:  WRT RED (21)

000000    041764  000240  115264  000000  000003  117074 (22)
```

Figure 3-15 Partition Control Blocks and Attachment Descriptors

```
RSX-11M-PLUS CRASH DUMP ANALYZER    V01     21-FEB-79   15:36       PAGE 83
PARTITION INFORMATION

                                                                        (28)
  NAME     PCB ADR  TYPE   MAIN   BASE    SIZE    P.OWN     PRO     PRI  RMCT
--------- ------  ----   ----   ----    ----    -----     ---     ---  ----
GEN       117404   MAIN   GEN    004432  047346  000000    000000  0.   0.

 P.STAT:  000000

 P.ST2:   000000

   000000    000000  000000  026226  000000  035724  117404  004432  047346
   000020    061774  063170  000000  000000  000000  000000  000000  000000
   000040    000000


   WAIT QUEUE: (29)

  NAME     PCB ADR  TYPE   MAIN   BASE    SIZE    P.TCB     PRO     PRI  RMCT
--------- ------  ----   ----   ----    ----    -----     ---     ---  ----
BAP2      061774   SUB    GEN    012731  000372  061670    000000  50.  0.

 P.STAT:  140010   OUT  CKP  DEL

   000000    063170  000062  026226  000000  063170  117404  012731  000372
   000020    000000  000372  074114  061670  140010  062474  000000  037360
   000040    037360
```

Figure 3-15 (Cont.) Partition Control Blocks and Attachment Descriptors

3.2.6 Common Block Directory

CDA lists partition information, status words, and PCBs for each installed, named common region. The listing in Figure 3-16 shows a common block directory entry. The following list describes the items in Figure 3-16.

Item	Description
1.	Name of the installed common region partition
2.	Address of Partition Control Block (PCB)
3.	Type of partition
4.	Name of the main partition
5.	Physical base address of partition
6.	Size of partition in 32. word blocks
7.	Owning UIC of the common region
8.	Partition protection word

9. Resident mapped task count

10. Partition status words (refer to Section 3.2.4)

11. Octal dump of Partition Control Block

12. Address of PCB of the common task image file

13. Address of Unit Control Block of the device on which the common resides

14. Starting logical block number (LBN) of the common task image file

15. This word always contains a 0.

```
RSX-11M-PLUS CRASH DUMP ANALYZER    V01     21-FEB-79   14:03       PAGE 75
COMMON BLOCK DIRECTORY

  (1)        (2)      (3)     (4)     (5)      (6)      (7)      (8)          (9)
  NAME      PCB ADR   TYPE    MAIN    BASE     SIZE    P.OWN     PRO    PRI   RMCT
---------   ------    ----    ----    ----     ----    -----    ---    ---   ----
 BASIC2     043254    SUB     GEN     017747   000400   001454   000000  0.    0.

  P.STAT:   000200    COM  }
                           } (10)
  P.ST2:    000006    APR  }

    000000    000000  000000  006273  034330  040370  117404  017747  000400 }
    000020    053550  000000  045240  001454  000200  000006  000000  000000 } (11)
    000040    043312                                                          }

    COMMON TASK IMAGE FILE PCB
      (12)        (13)            (14)          (15)
      PCB ADR     P.UCB          P.LBN         P.REL
      -------     -----          -----         -----
      045240      035662   000001,023653      000000

  NAME      PCB ADR   TYPE    MAIN    BASE     SIZE    P.OWN     PRO    PRI   RMCT
---------   ------    ----    ----    ----     ----    -----    ---    ---   ----
 FCSSUP     053550    SUB     GEN     000000   000212   000401   000000  0.    0.

  P.STAT:   100200    OUT     COM

  P.ST2:    000000

    000000    000000  000400  023013  075030  000000  117404  000000  000212
    000020    047304  000212  040114  000401  100200  000000  000000  000000
    000040    053606

    COMMON TASK IMAGE FILE PCB

      PCB ADR     P.UCB          P.LBN         P.REL
      -------     -----          -----         -----
      040114      035662   000002,001071      000000
```

Figure 3-16 Common Block Directory

3.2.7 Device Information

CDA lists information on all devices known to the system. The listing in Figure 3-17 shows a typical terminal device listing with an I/O packet. The Terminal Status Words (items 15, 16, and 17) appear only in listings for terminal devices. The codes given for Items 15, 16, and 17 apply only to the full duplex terminal driver. The section labeled I/O Request Packets appears only for devices that have an I/O request in progress or an I/O request queued at the time of the system crash. The following list describes the items in Figure 3-17.

Item	Description
1.	Device name
2.	Address of offset 0 in Unit Control Block (UCB)
3.	Address of offset 0 in Device Control Block (DCB)
4.	Address of offset 0 in Status Control Block (SCB)
5.	Device to which unit is redirected
6.	Name of Ancillary Control Processor (ACP)
7.	Name of attached task
8.	Pointer to the Unit Control Block (UCB) name of owning terminal
9.	User Identification Code (UIC) used to log onto the system
10.	Unit status byte. The 3-letter codes have the following meanings: BSY - unit is busy -MNT - unit is not mounted FOR - unit is mounted as a foreign volume MDM - unit is marked for dismount PWF - powerfail occurred WCK - write check enabled SPU - unit is spinning up VV - volume is valid
11.	Unit status extension byte. The 3-letter codes have the following meanings: OFL - unit off line -RED - unit is not redirectable PUB - unit is public device UMD - unit attached for diagnostics PDF - privileged diagnostic functions only

12. Control Processing flags. The 3-letter codes have the following meanings:

    -ALG - byte alignment not allowed

    NPR - device is a NPR device

    QUE - call driver before queuing

    PWF - always call driver at power fail entry point

    ATT - call driver on attach/detach

    KIL - always call driver at I/O kill

13. First device characteristics word. The 3-letter codes have the following meanings:

    REC - record-oriented device

    CCL - carriage control device

    TTY - terminal device

    DIR - file-structured device

    SDI - single directory device

    SQD - sequential device

    MSD - mass storage device

    EXT - unit on extended 22-bit Unibus controller

    UMD - user-mode diagnostics supported

    MBC - MASSbus device

    SWL - unit software write locked

    ISP - input spooled device

    OSP - output spooled device

    PSE - pseudo device

    COM - device is mountable as COM channel

    F11 - device is mountable as Files-11 device

    MNT - device is mountable

14. Second device characteristics word. The 3-letter codes have the following meanings:

    DH1 - unit is a multiplexer

    DJ1 - unit is a DJ11

    RMT - unit is remote

    HFF - unit handles hardware form feeds

    NEC - solicited input not echoed

CRT - unit is a CRT

ESC - unit generates escape sequences

-LOG - user not logged on terminal

SLV - unit is a slave terminal

DZ1 - unit is a DZ11

HLD - terminal is in hold screen mode

AT. - MCR command AT. is being processed

PRV - unit is privileged terminal

L3S - unit is a LA30S terminal

VT5 - unit is a VT05B terminal

LWC - lowercase to uppercase conversion

15. Terminal status word. The codes have the following meaning:

RST - read with special terminators in progress

RUB - rubout sequence (non-CRT) in progress

ESC - escape sequence in progress

RAL - read pass all in progress

RNE - echo suppressed

CTO - output disabled

OBY - output busy

IBY - input busy

BEL - bell pending

DPR - defer processing of character in buffer

DEC - defer echo of character in buffer

DSI - input processing disabled

CTS - output stopped by CTRL-S

USI - unsolicited input in progress

OBF - buffered output in progress

IBF - buffered input in progress

16. Second terminal status word. The codes have the following meanings:

    ACR - wrap-around required

    CR - trailing carriage return required on output

    BRQ - break-through write is queued

    WRA - control for wraparound

    SRQ - special request is queued

    WRB - low bit in 52-WRA bit pattern

    ORQ - output request is queued

    IRQ - input request is queued

    HFL - horizontal fill required

    VFL - vertical fill required

    HHT - hardware horizontal tab is present

    HFF - hardware form-feed is present

    FLF - force line feed before next echo

    FDX - line is full duplex mode

17. Fourth terminal status word. The codes have the following meanings:

    RAL - terminal is in read-pass-all mode

    WES - task waiting for escape sequence

    RPO - read with prompt output in progress

    TAB - type-ahead buffer allocation requested

    8BC - pass eight bits on input

    ABD - autobaud speed detection enabled

    RCU - restore cursor

    ABP - autobaud speed detection in progress

    WAL - terminal is in write-pass-all mode

    VER - last character in type-ahead buffer has a parity error

    BCC - last character in type-ahead buffer has a framing error

DAO - last character in type-ahead buffer has a data overrun error

PCU - position cursor

NOTE

On RSX-11M systems that use the half duplex terminal driver, CDA dumps two terminal status words.

UNIT CONTROL BLOCK

18. Octal dump of Unit Control Block, including negative offsets, and octal dump of Unit Control Block Extension if a UCB extension is present

DEVICE CONTROL BLOCK

19. Octal dump of Device Control Block

STATUS CONTROL BLOCK

20. Octal dump of Status Control Block

I/O REQUEST PACKETS

21. Address of the first word of the I/O packet

22. The name of the task requesting I/O

23. The priority of the task requesting I/O

24. Event flag number used to signal I/O completion

25. Logical unit number used by requesting task

NOTE

If the task was checkpointed while the packet was queued, this number may not be correct. If the address in I.LN2 is within the task header, the logical unit number is correct.

26. I/O function codes (for detailed information on the legal I/O function codes for each device, refer to the RSX-11M/M-PLUS I/O Drivers Reference Manual)

27. Status of the I/O request - current or queued

28. Octal dump of I/O request packet in offset mode

29. I.LN2 - pointer to the second word of the LUN

```
RSX-11M CRASH DUMP ANALYZER      V4.0       21-MAY-81   15:13       PAGE 110
DEVICE INFORMATION

TT11:
-----

  UCB ADR   DCB ADR   SCB ADR   REDIRECT   ACP     ATT     OWNER   LOGIN UIC
  -------   -------   -------   --------   ---     ---     -----   ---------
  040474    037630    044266                       ...MAI  NONE    [7,37]

  U.STS:

  U.ST2:

  U.CTL:   QUE  PWF  ATT  KIL

  U.CW1:   TTY  CCL  REC

  U.CW2:   DH1  CRT  PRV  LWC

  U.TSTA:       IBY  IBF

  U.TSTA+2:     ACR  ORQ  IRQ  HHT  FLF

  U.TSTA+4:     TAB


    UNIT CONTROL BLOCK:

    040466    000000  003437  000000  037630  040474  000474  000010  000007
    040506    102011  000335  000120  044266  056604  145100  100200  050301
    040526    000100  141730  000030  000001  013400  003437  000015  000004
    040546    000000  000000  000000

    UNIT CONTROL BLOCK EXTENSION:

    145100    075670  146730  146734  000044  000054  146730  000000  000000
    145120    127147  000001  146734  146470  000000  000000  002400  000022
    145140    000000  013400  000000  023531

    DEVICE CONTROL BLOCK:

    037630    044434  037674  052124  030001  000060  121274  163177  000130
    037650    160000  000000  000007  000000  000001  000006  114670

    STATUS CONTROL BLOCK:

    044260    100200  000011  000004  000000  044266  034240  001000  000000
    044300    160020  067454  031000  170500  000000  000000  001200  000000
    044320    044316  035240  001000  000002  160040


    I/O REQUEST PACKETS:

    PACKET ADR    REQUESTOR    PRI    EFN    LUN    FUNCTION CODE    STATUS
    ----------    ---------    ---    ---    ---    -------------    ------

      075670        ...MAI      65.    32.     5.        IO.RLB        INPUT


    000000    000000  020101  056604  074354  040474  001000  057220  017645
    000020    140020  000000  000572  140040  000120  100000  000000  000056
    000040    000000  075624
```

Figure 3-17 Device Information and I/O Packet (Truncated)

3.2.8 System Task Directory

CDA scans the System Task Directory and outputs the information contained in Figure 3-18. The information in this format is identical to the first 17 items described in Figure 3-11 of this manual.

```
RSX-11M CRASH DUMP ANALYZER      V3.2       21-MAY-79   15:15       PAGE 31
SYSTEM TASK DIRECTORY


. LDR.
------

  TCB ADDRESS = 041572     PAR = LDR        PCB ADDRESS = 041536

  LOAD ADDRESS = 00000000     LOAD DEVICE = LB0      LBN = 00000000

  PRI = 248.     I/O COUNT = 0.     UIC = [1,1]     TI = C00

  MAX SIZE = 000000     EVENT FLAGS = <1-16> 000001  <17-32> 000000

  T.STAT:

  T.ST2:   -CHK FXD  STP

  T.ST3:   PRV

    000000    000000  000370  000000  127414  015754  000000  041604  000000
    000020    041610  000001  000000  041304  114564  000000  022020  010000
    000040    000370  000000  041354  041536  000000  115264  000000  041646
    000060    000000  000000  000000  041656  000000  041662  000000  000000


TKTN
------

  TCB ADDRESS = 114564     PAR = SYSPAR     PCB ADDRESS = 117074

  LOAD ADDRESS = 00137200     LOAD DEVICE = LB0      LBN = 00057410

  PRI = 248.     I/O COUNT = 0.     UIC = [0,0]     TI = NONE

  MAX SIZE = 000105     EVENT FLAGS = <1-16> 000000  <17-32> 000000

  T.STAT:  -EXE OUT

  T.ST2:

  T.ST3:   -PMD PRV  CAL

    000000    000000  000370  000000  077314  053600  000000  114576  000000
    000020    114602  000000  000000  000000  116064  100400  000000  050100
    000040    000370  057410  041354  117074  000105  000000  000000  000000
    000060    114642  000000  000000  000000  114652  000000  114656  000000
```

Figure 3-18 System Task Directory (Truncated)

3.2.9 Pool Dump

As shown in Figure 3-19, CDA prints the system pool in octal, RAD50, and ASCII. On RSX-11M-PLUS systems with secondary pool support, CDA prints a dump of secondary pool with the /SECPOL switch. If a line is repeated more than nine times, CDA prints it once and then prints a message indicating the number of identical lines.

The symbols in Figure 3-19 have the following meanings:

- `*` indicates that the next word is allocated.
- `+` indicates that the next word is contained in an unused, preallocated I/O packet (in $PKAVL free list).

  NOTE

  $PKAVL is a list containing fixed-size blocks. The blocks in this list are used for fast allocation, and I.LGTH determines the length of these blocks.

- `-` indicates that the next word is allocated in both $CRAVL and $PKAVL (This is an error condition).

  NOTE

  $CRAVL is the free pool list head.

```
RSX-11M CRASH DUMP ANALYZER      V3.2        21-MAY-79   15:15        PAGE 42
POOL DUMP


                              S Y S T E M     P O O L


    * = NEXT WORD ALLOCATED                FIRST FREE BLOCK ($CRAVL) = 041760
    + = NEXT WORD IS IN $PKAVL LIST                  $PKAVL = 042120
    - = NEXT WORD IS IN $PKAVL AND ALSO IN $CRAVL

041674    * 000000 * 042710 * 042164 * 042164  !     KFX J8D J8D!!   HEtDtD!
041704    * 000400 * 000002 * 003204 * 000407  ! FP    B AA.  FW!!          !
041714    * 000007 * 002400 * 002112 * 000401  !  G  2   $R  FQ!!     J    !
041724    * 000000 * 000030 * 160000 * 000000  !        X 53X     !!      .  !
041734    * 177400 * 002347 * 051522 * 030530  ! 2   10 MMJ G52!!   g RSX1!
041744    * 046461 * 046102 * 032462 * 000000  !LNA LHB HTR      !!1MBL25  !
041754    * 000000 * 044506   042014   000004  !     K.8 J5T    D!!   FI D  !
041764    * 000000 * 000225 * 115764 * 000000  !      C/ X8D     !!     t   !
041774    * 000003 * 117074 * 041764 * 000240  !  C YL. J46  D !!   < tC  !
042004    * 115264 * 000000 * 000003 * 117074  !X0D         C YL.!!4       <  !
042014      042064   000004 + 042264 + 000044  !J6T    D J9.   6!!4D   4D$  !
042024    + 000020 + 000000 + 040212 + 001010  !  P       JMB  M !!      @   !
042034    + 121200 + 002111 + 140000 + 000000  !Z     $Q 0.2     !! "I   @   !
042044    + 000020 + 012054 + 001350 + 000000  !  P CID  RX      !!  , h     !
042054    + 000553 + 001016 + 000000 + 000000  !  IC  MF         !!k        !
042064      042240   000034   115264   007422  !J9H    . X0D BPR!!  D   4    !
042074      000000   000000   100000   115306  !          TSH X0V!!       F  !
042104      042240   000014   000000   000000  !J9H    L          !! D       !
042114      000003   000011 + 042020 + 000044  !  C    I J5X   6!!       D$  !
042124    + 000020 + 000000 + 041016 + 000400  !  P       JV0  FP!!       B   !
042134    + 120426 + 001376 + 140026 + 000000  !Y0B  SF 0/N      !! !~   @   !
042144    + 001412 + 140047 + 000003 + 000000  ! SR 0/1   C      !!  '@       !
042154    + 000000 + 000000 + 000000 + 041260  !                JZ2!!        0B!
042164    + 000000 + 000001 + 000001 + 000000  !      A    A     !!           !
042174    * 000401 * 000000 * 000000 * 000000  ! FQ                !!           !
042204    * 000003 * 000000 * 000000 * 000000  !  C               !!           !
042214    * 002112 * 000401 * 000000 * 000000  ! $R  FQ           !!J          !
042224    * 000000 * 000000 * 000000 * 000001  !                  A!!          !
042234    * 000000 * 122022   042330   000024  !     ZJB K X     T!!    $XD    !
042244      115264   005374   000000   000000  !X0D A0L           !!4 !        !
042254      100000   115306   042760   000004  !TSH X0V KGX     D!!  F pE     !
042264    + 042504 + 002114 + 140054 + 000000  !KCL  $T 0/6      !!DEL ,@     !
042274    + 040212 + 001000 + 120636 + 001400  !JMB  L2 Y4N    SH!! @    !    !
042304    + 140036 + 000000 + 000000 + 141750  !0/V           1M2!! @      hC!
042314    + 001000 + 000000 + 000040 + 000025  ! L2          2   U!!          !
042324    + 000000 + 000020   042550   000154  !        P KDH  B.!!     hE1  !
042334      050061   020105   030066   000415  !L3I EFU G.V   F/!!1PE 60   !
042344      170017   120374   120252   000000  !8PO Y0L Y.J      !! p! *     !
042354      000000   120712   000016   000000  !    Y5R    N     !!  J!      !
042364      000000   000000   000000   000000  ! `                !!          !
042374      042436   000001   000000   000000  !KBN   A           !! E        !
042404      123550   000000   000375   000000  !Z1P        FM     !!h'  )     !
042414      000000   000000   000000   042500  !                KCH!!       @E!
042424      000002   040212   000000   041354  !  B JMB         J.L!!    @   1B!
042434      000000   000001   117074   120000  !       A YL. YX !!     <     !
042444      130477   041764   000105   000000  !.NO J46  A/      !!?1tCE     !
```

Figure 3-19 Pool Dump (Truncated)

```
RSX-11M-PLUS CRASH DUMP ANALYZER    V2.0    12-NOV-81   13:55       PAGE 1
SECONDARY POOL DUMP

                    S E C O N D A R Y   P O O L

    NUMBER OF FREE BYTES = 00037500      FIRST FREE BYTE = 00656700

    LENGTH = 00120000 BYTES

    START ADDRESS = 00625000             ENDING ADDRESS = 00627500

  00625000    000000  000101  000000  131574    |      AY      ...||  A   |3|
  00625010    003273  000000  140012  000000    |ACC      0/B     ||;     @  |
  00625020    140016  002040  000000  000000    |0/F   ZP         ||  @      |
  00625030    006314  100000  020000  050000    |BA6  TSH  ED2  L2 ||L       P|
  00625040    001101  041072  042334  113634    | NQ  JW4  K .  XJL||A  !B\D  |
  00625050    000415  000000  000000  140054    | F/           0/6||       ,@|
  00625060    000010  000002  000000  000000    |  H    B          ||         |
  00625070    000000  000143  000002  000000    |      BS    B     ||  c      |
  00625100    000000  140100  000000  140104    |     00P       00T||  @@   D@|
  00625110    000000  000000  000000  000000    |                  ||         |
  00625120    000000  000000  000000  000000    |                  ||         |
  00625130    000000  000000  000000  000000    |                  ||         |
  00625140    000000  000000  000000  000000    |                  ||         |
  00625150    000000  000000  000000  000000    |                  ||         |
  00625160    000000  000000  000000  000000    |                  ||         |
  00625170    000000  000000  000000  000000    |                  ||         |
  00625200    000000  000106  000000  131574    |      A0      ...||  F   |3|
  00625210    003313  000000  140012  000000    |ACS      0/B     ||K     @  |
  00625220    140016  001660  000000  000000    |0/F   WX         ||  @@      |
  00625230    006651  100000  020000  050000    |BGQ  TSH  ED2  L2 ||)       P|
  00625240    000506  002346  042334  113634    | HF   1N  K .  XJL||F  f \D  |
  00625250    000164  000000  000000  140054    | B6           0/6||t      ,@|
  00625260    000010  000002  000000  000000    |  H    B          ||         |
  00625270    000000  000162  000002  000000    |      B4    B     ||  r      |
  00625300    000000  140100  000000  140104    |     00P       00T||  @@   D@|
  00625310    000000  000000  000000  000000    |                  ||         |
  00625320    000000  000000  000000  000000    |                  ||         |
  00625330    000000  000000  000000  000000    |                  ||         |
  00625340    000000  000000  000000  000000    |                  ||         |
  00625350    000000  000000  000000  000000    |                  ||         |
  00625360    000000  000000  000000  000000    |                  ||         |
  00625370    000000  000000  000000  000000    |                  ||         |
  00625400    000000  141504  141510  000044    |    1I. 1I2    61|| DCHCS  |
  00625410    000120  141504  000000  000000    | B  1I.           ||P DC     |
  00625420    022126  000000  000000  142514    |E2V           1V.||V$     LE|
  00625430    000000  000000  000400  000072    |          FP  AR||       :  |
  00625440    000000  022126  000000  047517    |     E2V      L$W||  VS   OO|
  00625450    053000  015563  071517  047433    |M@P  DO$  RQ9  LZK||  V@  O@  O|
  00625460    047563  047563  047560  047560    |L.$  L.$  L.P  L.P||@O@OpOpO@|
  00625470    047520  077560  077577  077577    |L$X  TOX  TO9  TO9||POp      |
  00625500    077577  077577  077564  077577    |TO9  TO9  TO.  TO9||    t     |
  00625510    077541  077577  077577  077577    |TOI  TO9  TO9  TO9||@         |
  00625520    077577  077577  077577  077577    |TO9  TO9  TO9  TO9||          |
  00625530    077577  077577  077577  077577    |TO9  TO9  TO9  TO9||          |
```

Figure 3-19 (Cont.) Pool Dump (Truncated)

3.2.10 Task Dump

CDA prints all or a portion of the task's virtual address space if the /TASK switch is specified. Figure 3-20 and the following list illustrate this output.

Item	Description
1.	Task name
2.	Address of the first word of the Task Control Block for the task
3.	Address of the first word of the task's header

WINDOW BLOCKS

4.	Name of the partition to which the task is mapped
5.	Task virtual address limits
6.	Address of the attachment descriptor
7.	Size of window in 32-word blocks
8.	Offset to memory region within partition in 32-word blocks
9.	First Page Description Register used to map the task
10.	Number of Page Description Registers used to map task
11.	Contents of the last Page Description Register used to map the task
12.	Task virtual address limits
13.	Physical starting address of the memory region being dumped
14.	Dump of the data within the window, formatted in octal, RAD50, and ASCII

```
RSX-11M CRASH DUMP ANALYZER      V3.2        22-MAY-79   13:52        PAGE 1
TASK DUMP


                    TASK DUMP OF ...MCR (1)
                    -------------------

                  (2)                          (3)
        TCB ADDRESS = 115264        HEADER ADDRESS = 042760


WINDOW BLOCKS:
 (4)        (5)            (6)        (7)        (8)       (9)      (10)     (11)
 PAR     VIRT LIMITS    ATT DESC   WND SIZE   OFFSET   1ST PDR   NO.   LAST PDR
 ---     -----------    --------   --------   ------   -------   ---   --------
SYSPAR  120000 130477    042000     000105    000000   177612    1     042006


WINDOW #1 -- TASK VIRTUAL LIMITS 120000-130477 (12)
-----------------------------------------------

  PHYSICAL STARTING ADDRESS = 00137200 (13)
  ------------------------------------

  120000    120362  000162  040000  115310    |Y0B  B4 JIX X0X||r r  @H |
  120010    000424  000424  170017  120636    | F6  F6 8PO Y4N||     p ||
  120020    120362  000000  000000  000000    |Y0B            ||r       |
  120030    000000  000000  000000  000000    |               ||        |
  120040    000000  000000  043076  000001    |        KIV   A||    >F  |
  120050    000000  000000  121176  000000    |        Y98    ||    ~"  |
  120060    000004  000000  000000  000000    |  D            ||        |
  120070    000000  043140  000004  041260    |    KJP   D JZ2||  `F  0B|
  120100    000000  041400  000000  041400    |    J.2     J.2||   C   C|
  120110    000000  041354  000000  000001    |    J.L       A||  1B    |
  120120    117074  120000  130477  042000    |YL. YX  .NO J5H||<   ?1 D|
  120130    000105  000000  000612  042006    | A/      I4 J5N||E      D|
  120140    170000  122360  000000  000000    |8P  ZOX        || pp$    |
  120150    120426  000070  120472  000000    |Y08  AP Y14    || 18 :|  |
  120160    000000  000000  000000  000000    |               ||        |

                  [ABOVE LINE REPEATED 10. TIMES]

  120310    000000  000000  006001  001010    |        A63  M ||        |
  120320    000004  000037  121202  000000    |  D   1 Z B    ||     "  |
  120330    121634  004130  000000  000001    |ZGD AMP       A|| #X     |
  120340    125512  060100  120515  000000    |$PJ OP  Y2M    ||J+@`M|  |
  120350    121232  001453  001047  125040    |Z Z  TK  M1 $H2|| "+ '  *|
```

(14)

Figure 3-20 Task Dump (Truncated)

3.2.11 Clock Queue

The example in Figure 3-21 shows a clock queue listing. The following list explains the example.

Item	Description
1.	Address of the clock queue entry.
2.	The type of time schedule request. There are six types: Type 0 - mark time request Type 2 - request with periodic rescheduling Type 4 - single-shot task request Type 6 - single-shot internal system subroutine with system subroutine identification Type 10- single-shot internal system subroutine without system subroutine identification Type 12- clear stop bit (shuffler)
3.	Task Control Block address or system subroutine identification.
4.	Task issuing the clock request.
5.	The hour, minute, and second that time request comes due.
6.	This field varies with each type of time schedule request. For a Mark Time request, the following labels apply: C.AST - AST address C.SRC - event flag mask word C.DST - event flag mask address Event Flag Number For a request with periodic rescheduling the labels are: C.RSI - reschedule internal C.UIC - scheduling UIC

For a single-shot task request the field contains only one label:

C.UIC - scheduling UIC

For a single-shot internal subroutine (both with and without system subroutine identification), the field contains:

C.SUB - subroutine address

C.AR5 - relocation base address (for loadable drivers)

7. Octal dump of clock queue in offset mode.

```
RSX-11M CRASH DUMP ANALYZER      V4.0       21-MAY-81   15:13       PAGE 116
CLOCK QUEUE

          (1)                  (2)                  (3)              (4)
   ADDRESS = 054210    REQUEST TYPE = 0    TCB = 107134    TASK = TKTN

   TIME REQUEST BECOMES DUE = 09:54:06.8 (5)

   C.AST = 000000    C.SRC = 100000    C.DST = 107156    EVENT FLAG = 16. (6)

   000000    057250  010000  107134  011374  000000  000000  100000  107156} (7)


   ADDRESS = 057250    REQUEST TYPE = 0    TCB = 053510    TASK = PMT...

   TIME REQUEST BECOMES DUE = 09:54:10.2

   C.AST = 124602    C.SRC = 000002    C.DST = 053532    EVENT FLAG = 2.

   000000    046760  001000  053510  011707  000000  124602  000002  053532


   ADDRESS = 046760    REQUEST TYPE = 0    TCB = 053510    TASK = PMT...

   TIME REQUEST BECOMES DUE = 09:54:50.2

   C.AST = 000000    C.SRC = 000004    C.DST = 053532    EVENT FLAG = 3.

   000000    000000  001400  053510  016447  000000  000000  000004  053532
```

Figure 3-21 Clock Queue

3.2.12 Controller Information

Figure 3-22 shows the information associated with a device controller. This information appears only in crash dumps of RSX-11M-PLUS systems. The following list explains the items in Figure 3-22.

Item	Description
1.	Name of the device controller
2.	Address of the Controller Table (CTB)
3.	Address of the DCB for this device
4.	CTB status byte. The following is a list of 3-letter status codes that may appear in this byte: CLK - there is a clock block at the top of the CTB MDC - this is a multidriver CTB CBL - the clock block is linked into the clock queue CIN - the controller uses the common interrupt dispatch table NET - this is a DECnet device
5.	Octal dump of the CTB
6.	Common Interrupt Address
7.	DCB for each device interfaced by this controller
8.	Name of each device interfaced by this controller
9.	Address of the Controller Request Block (KRB)
10.	Controller status. The following is a list of possible status values and their meanings: OFL - controller is off line MOF - controller is marked for off line UOP - controller supports overlapped operations MBC - device is a MASSbus controller SDX - seek operations allowed during data transfers POE - parallel operations enabled UCB - UCB table present DIP - data transfer in progress PDF - privileged diagnostic functions only
11.	Octal dump of Controller Request Block (KRB) in one or two parts

```
RSX-11M-PLUS CRASH DUMP ANALYZER    V01     21-FEB-79   15:08       PAGE 149
CONTROLLER INFORMATION



  RH (1)
  --          (2)                 (3)
     CTB ADDRESS = 020454      L.DCB = 022020
  (4) L.STS:  MDC CIN
     CONTROLLER TABLE BLOCK

     020454    022200  044122  022020  005004  022044  022102  022134  022160  (5)


     DEVICES INTERFACED BY THIS CONTROLLER
     COMMON INTERRUPT ADDRESS = 017526 (6)
     (7) DCB      DEVICE NAME (8)
       ---      -----------
     020474         DB
     021142         DR
     021410         DS
     021616         MM


     KRB ADDRESS = 022044 (9)
     K.STS:  SDX UOP MBC POE UCB DIP (10)

     022026    021410  021616  000000  177777  025640  000400  000374  176700
     022046    000016  000003  020534  021112  021112  000050  020534  020602
     022066    020650  020716  177777  015240                                  (11)

     022046    000016  000003  020534  021112  021112  000050  020534  020602
     022066    020650  020716


     KRB ADDRESS = 022102
     K.STS:  SDX UOP MBC POE UCB

     022064    020602  020650  020716  177777  015240  000002  000174  176300
     022104    000016  000001  000000  000000  022112  000050  021202  021252
     022124    177777  020640  000004  000030

     022104    000016  000001  000000  000000  022112  000050  021202  021252


     KRB ADDRESS = 022134
     K.STS:  SDX MBC

     022116    000050  021202  021252  177777  020640  000004  000030  172040
     022136    000016  000001  021516  000000  022144  000030  022640  000006
     022156    000030  172440  000016  000000

     022136    000016  000001  021516  000000  022144  000030  022640  000006


     KRB ADDRESS = 022160
     K.STS:  SDX MBC

     022142    021516  000000  022144  000030  022640  000006  000030  172440
     022162    000016  000000  000000  000000  022170  000034  004270  022454
     022202    045504  022212  000001  022372

     022162    000016  000000  000000  000000  022170  000034  004270
```

Figure 3-22 Controller Information

3.2.13 Kernel Data Space

Figure 3-23 shows a dump of kernel data space from the specified starting virtual address to the specified ending virtual address.

3.2.14 Kernel Instruction Space

Figure 3-24 shows a dump of kernel instruction space from the specified starting virtual address to the specified ending virtual address.

3.2.15 Task Data Space

Figure 3-25 shows a dump of task data space. This dump occurs only on RSX-11M-PLUS systems.

3.2.16 Task Instruction Space

Figure 3-26 shows a dump of task instruction space. This dump occurs only on RSX-11M-PLUS systems.

```
RSX-11M-PLUS CRASH DUMP ANALYZER     V01      16-MAY-79    12:51        PAGE 6
KERNEL DATA SPACE DUMP


          VIRTUAL ADDRESS:  001000       PHYSICAL ADDRESS:  00001000

    001000    000000  000000  000000  000000   !                !!         !

                    [ABOVE LINE REPEATED 28. TIMES]

    001350    000000  000000  020422  000000   !        EKZ     !!      !  !
    001360    177400  000000  000000  020416   ! 2           EKV!!        !!
    001370    005015  025052  042452  042530   !AXM F/4 KBZ KC2!!  ***EXE!
    001400    020103  040520  044522  054524   !EFS JR  K/J NK.!!C PARITY!
    001410    042440  051122  051117  051440   !KBP MF4 MF1 ML !! ERROR S!
    001420    047524  025120  025052  005015   !L$. F02 F/4 AXM!!TOP***  !
    001430    000012  177777  172020  003110   !  J  80 9B  A H!!     tH !
    001440    160377  177401  000366  000000   !599  2A  FF    !! '  v   !
    001450    000001  001450  001450  001450   !  A  TH  TH  TH!!  ( ( ( !
    001460    001450  001450  001450  001450   ! TH  TH  TH  TH!!( ( ( ( !
    001470    001450  001450  001450  001450   ! TH  TH  TH  TH!!( ( ( ( !
    001500    001450  001450  001450  001450   ! TH  TH  TH  TH!!( ( ( ( !
    001520    177746  177750  177752  177766   ! 70  72  74  8F!!f h j v !
    001530    000000  000000  000000  000000   !                !!         !
    001540    000000  000000  050044  000000   !        L26     !!    $P   !
    001550    120030  000000  000000  000001   !YXX            A!!         !
    001560    000001  042220  005015  041412   !  A J82 AXM J/B!!   D   C!
    001570    040522  044123  026440  020055   !JRB KV5 GH2 EE7!!RASH -- !
    001600    047503  052116  053440  052111   !L$K MSV M7X MSQ!!CONT WIT!
    001610    020110  041523  040522  041524   !EFX J05 JRB J06!!H SCRATC!
    001620    020110  042515  044504  020101   !EFX KCU K.6 EFQ!!H MEDIA !
    001630    047117  042040  030113  005015   !LUG J6  G/C AXM!!ON DK0  !
    001640    000012  005015  051103  051501   !  J AXM MFS ML3!!    CRAS!
    001650    020110  026455  044440  020117   !EFX GIE K.  EF1!!H -- IO !
    001660    051105  047522  020122  047117   !MFU L$Z EF4 LUG!!ERROR ON!
    001670    041440  040522  044123  042040   !J/X JRB KV5 J6 !! CRASH D!
    001700    046525  020120  042504  044526   !LN7 EF2 KCL K/N!!UMP DEVI!
    001710    042503  006400  041412  040522   !KCK BCH J/B JRB!!CE   CRA!
    001720    044123  026440  020055  040523   !KV5 GH2 EE7 JRC!!SH -- SA!
    001730    044516  054524  052040  046511   !K/F NK. MRP LNY!!NITY TIM!
    001740    051105  042440  050130  051111   !MFU KBP L4H MFY!!ER EXPIR!
    001750    042105  047440  020116  051120   !J67 LZP EF0 MF2!!ED ON PR!
    001760    041517  051505  047523  020122   !J01 ML7 L$$ EF4!!OCESSOR !
    001770    050103  006400  041412  040522   !L3$ BCH J/B JRB!!CP   CRA!
    002000    044123  026440  000003  116301   !KV5 GH2   C YCI!!SH -  A !


[END OF ANALYSIS OUTPUT]
```

Figure 3-23 Kernel Data Space

```
RSX-11M-PLUS CRASH DUMP ANALYZER     V01      16-MAY-79    12:51          PAGE 5
KERNEL INSTRUCTION SPACE DUMP


          VIRTUAL ADDRESS:  001000       PHYSICAL ADDRESS:  00001000

    001000    000000  000000  000000  000000   !                !!         !

                    [ABOVE LINE REPEATED 28. TIMES]

    001350    000000  000000  020422  000000   !        EKZ     !!     !  !
    001360    177400  000000  000000  020416   ! 2           EKV!!        !!
    001370    005015  025052  042452  042530   !AXM F/4 KBZ KC2!!  ***EXE!
    001400    020103  040520  044522  054524   !EFS JR  K/J NK.!!C PARITY!
    001410    042440  051122  051117  051440   !KBP MF4 MF1 ML !! ERROR S!
    001420    047524  025120  025052  005015   !L$. F02 F/4 AXM!!TOP***  !
    001430    000012  177777  172020  003110   !  J  80 9B  A H!!     tH !
    001440    160377  177401  000366  000000   !599  2A  FF    !! '  v   !
    001450    000001  001450  001450  001450   !  A  TH  TH  TH!!  ( ( ( !
    001460    001450  001450  001450  001450   ! TH  TH  TH  TH!!( ( ( ( !
    001470    001450  001450  001450  001450   ! TH  TH  TH  TH!!( ( ( ( !
    001500    001450  001450  001450  001450   ! TH  TH  TH  TH!!( ( ( ( !
    001520    177746  177750  177752  177766   ! 70  72  74  8F!!f h ] v !
    001530    000000  000000  000000  000000   !                !!         !
    001540    000000  000000  050044  000000   !        L26     !!    $P   !
    001550    120030  000000  000000  000001   !YXX            A!!         !
    001560    000001  042220  005015  041412   !  A J82 AXM J/B!!   D   C!
    001570    040522  044123  026440  020055   !JRB KV5 GH2 EE7!!RASH -- !
    001600    047503  052116  053440  052111   !L$K MSV M7X MSQ!!CONT WIT!
    001610    020110  041523  040522  041524   !EFX J05 JRB J06!!H SCRATC!
    001620    020110  042515  044504  020101   !EFX KCU K.6 EFQ!!H MEDIA !
    001630    047117  042040  030113  005015   !LUG J6  G/C AXM!!ON DK0  !
    001640    000012  005015  051103  051501   !  J AXM MFS ML3!!    CRAS!
    001650    020110  026455  044440  020117   !EFX GIE K.  EF1!!H -- IO !
    001660    051105  047522  020122  047117   !MFU L$Z EF4 LUG!!ERROR ON!
    001670    041440  040522  044123  042040   !J/X JRB KV5 J6 !! CRASH D!
    001700    046525  020120  042504  044526   !LN7 EF2 KCL K/N!!UMP DEVI!
    001710    042503  006400  041412  040522   !KCK BCH J/B JRB!!CE   CRA!
    001720    044123  026440  020055  040523   !KV5 GH2 EE7 JRC!!SH -- SA!
    001730    044516  054524  052040  046511   !K/F NK. MRP LNY!!NITY TIM!
    001740    051105  042440  050130  051111   !MFU KBP L4H MFY!!ER EXPIR!
    001750    042105  047440  020116  051120   !J67 LZP EF0 MF2!!ED ON PR!
    001760    041517  051505  047523  020122   !J01 ML7 L$$ EF4!!OCESSOR !
    001770    050103  006400  041412  040522   !L3$ BCH J/B JRB!!CP   CRA!
    002000    044123  026440  000003  116301   !KV5 GH2   C YCI!!SH -  A !
```

Figure 3-24 Kernel Instruction Space

```
RSX-11M-PLUS CRASH DUMP ANALYZER    V2.0    30-DEC-81   16:13       PAGE 1

                        TASK DUMP OF LITT27
                        -------------------

          D A T A   S P A C E
          -------------------

           TCB ADDRESS = 042204        HEADER ADDRESS = 011323


 WINDOW BLOCKS:

  PAR      VIRT LIMITS    ATT DESC  WND SIZE  OFFSET  1ST PDR  NO.  LAST PDR
  ---      -----------    --------  --------  ------  -------  ---  --------
 GEN      000000 002077   040030    000021    000015  177620    1    010006
          160000 160177   041040    000002    000010  177636    1    000402


 WINDOW #2 -- TASK VIRTUAL LIMITS 000000-002077
 ----------------------------------------------

   PHYSICAL STARTING ADDRESS = 01134000
   ------------------------------------

   000000    000000  000252  140313  160400    ¦      DJ 035 6  ¦¦  * K@ a¦
   000010    003471  003471  170017  160000    ¦AFI AFI 8P0 53X¦¦9 9  p `¦
   000020    001334  000000  000000  000000    ¦ RL             ¦¦\      ¦
   000030    000000  000000  000000  000000    ¦                ¦¦       ¦
   000040    000000  140252  140126  000001    ¦     03B 008    A¦¦  *@V@  ¦
   000050    000000  000000  000000  000000    ¦                ¦¦       ¦
   000060    000000  000000  000000  000000    ¦                ¦¦       ¦
   000070    000000  140250  000006  022520    ¦     03     F E02¦¦  (@  P%¦
   000100    000000  022520  000000  022520    ¦     E82      E82¦¦  P%  P%¦
   000110    000000  022520  000000  037462    ¦     E82      JDR¦¦  P%  2?¦
   000120    000000  037506  000000  000004    ¦     JD8        D¦¦  F?    ¦
   000130    107544  000000  001077  000000    ¦V7,          NO  ¦¦d   ?   ¦
   000140    000011  000004  000600  004006    ¦  I    D    IX AKN¦¦       ¦
   000150    107544  000000  002077  000000    ¦V7,          $G  ¦¦d   ?   ¦
   000160    000021  000021  000620  010006    ¦  Q    Q    J  BVV¦¦       ¦
   000170    040144  160000  160577  000000    ¦JLD 53X 6CG     ¦¦d@ ` a  ¦
   000200    000006  000000  000616  002402    ¦  F         I8  2B¦¦       ¦
   000210    040144  160000  160177  000000    ¦JLD 53X 561     ¦¦d@ ` `  ¦
   000220    000002  000010  000636  000402    ¦  B    H    JN  FR¦¦       ¦
   000230    017747  000004  000000  160400    ¦EDG    D       6 ¦¦g      a¦
   000240    140313  046174  131574  000000    ¦035 LIT ...     ¦¦K@¦L¦3   ¦
   000250    000000  000000  000000  000000    ¦                ¦¦       ¦

                    [ABOVE LINE REPEATED 63. TIMES]

      .
      .
      .
```

Figure 3-25 Task Data Space

```
RSX-11M-PLUS CRASH DUMP ANALYZER    V2.0    30-DEC-81   13:46       PAGE 1
TASK DUMP


                          TASK DUMP OF ...LDR


          INSTRUCTION   SPACE


           TCB ADDRESS = 117300        HEADER ADDRESS = 117130


  WINDOW BLOCKS:

   PAR      VIRT LIMITS    ATT DESC  WND SIZE  OFFSET  1ST PDR  NO.  LAST PDR
   ---      -----------    --------  --------  ------  -------  ---  --------
  SYSPAR  120000 123777    117114    000040    000000  177612    1    017406


  WINDOW #1 -- TASK VIRTUAL LIMITS 120000-123777


    PHYSICAL STARTING ADDRESS = 00530100


    120000    000000  000146  140664  140630    !      BV 09. 09 !!   ' 4A A!
    120010    000424  000424  170017  120226    ! F6   F6 8PO YS01!!      p  !
    120020    120166  000000  000000  000000    !YZ8                !!v       !
    120030    000000  000000  000000  000000    !                   !!        !
    120040    000000  000000  000102  000000    !         AZ        !!     B  !
    120050    000000  000000  000000  000000    !                   !!        !
    120060    000000  000000  000000  000000    !                   !!        !
    120070    000000  000144  000001  037602    !      BT    A JFR!!   d     ?!
    120100    000000  000001  117610  120000    !       A YU  YX !!          !
    120110    123777  000000  000040  000000    !Z5G          2     !! '       !
    120120    000612  017406  000143  000003    ! I4 D8V  BS    C!!     c    !
    120130    000000  140630  140664  045662    !     09  09. LDR!!    A4A2K!
    120140    131574  000000  000000  000000    !...                !!!3      !
    120150    000000  000000  000000  140630    !                   09 !!      A!
    120160    000002  120166  102700  006003    !  B YZ8 UP   A65!!   v *     !
    120170    001000  000001  000001  120214    ! L2   A    A YST!!          !
    120200    000000  140000  101700  000000    !    0.2 UCH     !!    **     !
    120210    000000  000000  047660  000000    !         L0 -   !!     0Q    !
    120220    000000  000000  031401  104376    !         HFQ U601!!     3~    !
    120230    120454  005067  100570  016700    !Y1T AYO T.X D0P!!.17 x *  !
    120240    061024  062700  000012  004767    !0$. PKH    J AW1!! b*e   w  !
      .
      .
      .
```

Figure 3-26 Task Instruction Space

CHAPTER 4

INTERPRETING A CRASH DUMP LISTING

This chapter introduces basic concepts that are helpful in analyzing a CDA output listing to determine the cause of a crash. The chapter is not intended as a complete guide to interpreting a crash dump.

4.1 HELPFUL CONCEPTS

Two concepts are helpful in using CDA output listings to determine the cause of a system failure:

- Determining what was mapped at the time of the crash
- Interpreting stack depth and the kernel stack

4.1.1 Determining What Was Mapped

To determine what was mapped at the time of the crash, look at the dump of the Kernel Page Address Registers on the first page of the CDA listing (I-space registers on RSX-11M systems, both I- and D-space registers on RSX-11M-PLUS systems). This listing, titled Volatile Registers, is shown in Figure 3-1.

The contents of the sixth and seventh words (shown in Figure 4-1) of this dump are the block numbers of the task or driver that was mapped at the time of the crash. You can find out what occupied that portion of memory from the memory map on the first page of partition information in the CDA output listing under the heading BASE (for base address of the mapped partition.)

This information should be used along with the current task at the time of the crash, which is listed on page three of the CDA listing.

K E R N E L

I S P A C E		D S P A C E	
PDR	PAR	PDR	PAR
077506	000000	000000	000000
077506	000200	000000	000000
077506	000400	000000	000000
077406	000600	000000	000000
077506	001000	000000	000000
077406	001372	000000	000000
077406	002077	000000	000000
077506	007600	000000	000000

Figure 4-1 Kernel Page Address Registers

4.1.2 Interpreting the Kernel Stack

$STKDP, appearing on the first page of system common information, is the stack depth indicator. It indicates which state the system was in at the time of the crash:

User state	$STKDP = 1
System state	$STKDP = 0
Interrupt state	$STKDP = -1,-2,-3,-4,...

Two things can decrement stack depth:

- SST - a synchronous system trap:
  a directive
  switch stack
  trap instruction
  other SST
- INTSV - an interrupt save

When an SST occurs, the following information from the current task is pushed onto the stack:

PS
PC
R5 - on mapped systems only
R4 - on mapped systems only
R3
R2
R1
R0

Address of return to DIRSV

SST specific information

When an interrupt occurs, the following are pushed onto the stack:

PS
PC

If a call to INTSV is then issued, the following are pushed onto the stack after the PC:

R5
R4

Address of return to INTSV

Then $STKDP is decremented. If $STKDP is 0 and the currently mapped driver issues a call to FORK, the following items are pushed onto the stack:

R3 - which replaces the return to INTSV
R2
R1
R0

Return to FORK

If the driver issues a call to FORK when $STKDP is not 0, the registers are saved in a fork block, which is queued for later execution.

Since interrupts can still occur, more of both basic types of stack contents (interrupt or INTSV) can be pushed. If an SST occurs in the EXEC, SST information will be pushed onto the stack, possibly followed by a system crash.

This information, along with the kernel stack pointer SP(K), which appears on the first page of the CDA listing, can be used to interpret the contents of the dump of the kernel stack.

The PC and PS before the crash appear on the first page of the CDA listing, and may be used along with the PS and PC on the stack to help locate the cause of the crash.

(See the RSX-11M or RSX-11M-PLUS Guide to Writing an I/O Driver for further description of the contents of the kernel stack.)

APPENDIX A

CDA MESSAGES

CDA displays a message on your terminal when it detects one of the error conditions described below. These messages reflect operational conditions. Do not confuse these messages with the diagnostic analysis messages that CDA generates during the analysis and prints in the analysis listing.

Note that not all of the messages listed below terminate the analysis. Some provide information, while others are nonfatal errors.

CDA -- ACP out of memory or not in execution

Type: Analysis Diagnostic

Explanation: The partition containing the File Control Block (FCB) for the current logical unit number (LUN) was not in memory.

CDA -- Address out of range

Type: Fatal

Explanation: CDA was unable to read a block from the crash-input file. Possible causes for this are:

1. A device failure
2. A bad block on the volume
3. The crashed system had a corrupted data base
4. The binary file does not contain all of the crashed system's memory

CDA -- Analysis output must be directed to an explicit device or file

Type: Fatal

Explanation: CDA requires an explicit output file specification. There are no default output file names.

CDA -- Analysis terminated after n. pages

Type: Informational

Explanation: CDA terminated the analysis after generating n pages of analysis output. If you have not specified the /LIMIT switch in the CDA command string, this message indicates that CDA has generated more than 300. pages of output.

CDA -- Command I/O error

Type: Fatal

Explanation: The system returned an error when CDA attempted to read a command line.

CDA -- Command line syntax error

Type: Fatal

Explanation: CDA detected an error in the syntax of a CDA command line. CDA will point to the beginning of the error within the command line.

CDA -- Crash dump must be input from an explicit device or file

Type: Fatal

Explanation: The crash dump input file specification must be explicit. There is no default file specification for the crash dump input.

CDA -- Device driver missing

Type: Fatal

Explanation: You have not loaded the driver for the crash dump input device.

CDA -- Dump aborted - kernel PARs clobbered

Type: Fatal

Explanation: This message appears on mapped systems only. It indicates that the values contained in the kernel PARs are invalid. To restart the analysis, you must specify the /KMR switch. This switch forces CDA to use standard mapping values when converting kernel virtual addresses to physical memory addresses.

CDA -- Error reading crash dump

Type: Fatal

Explanation: The system returned an error when CDA attempted to read the crash dump file. This could be caused by:

1. A device failure
2. A bad block on the volume
3. On RSX-11M-PLUS systems, the device might not be mounted foreign

CDA -- Error reading file filename

Type: Fatal

Explanation: The system returned an error when CDA attempted to read the crash dump file. This could be caused by:

1. A device failure
2. A bad block on the volume

CDA -- Error reading symbol file filename

Type: Fatal

Explanation: The system returned an error when CDA attempted to read the symbol table file indicated. Possible causes for the error are:

1. A device failure
2. A bad block on the volume
3. The specified symbol file was not an STB file

CDA -- Errors detected: n.

Type: Informational

Explanation: CDA has detected n analysis errors during the run.

CDA -- Error writing analysis file

Type: Fatal

Explanation: The system returned an error when CDA attempted to write a line into the analysis listing file. This could be caused by:

1. A full volume
2. A problem with the device
3. A bad block on the volume

CDA -- Error writing dump file filename

Type: Fatal

Explanation: The system returned an error when CDA attempted to write into the binary output file. This condition could be caused by:

1. A full volume
2. A problem with the device
3. A bad block on the volume

CDA -- Exiting due to illegal trap - snapshot dump being attempted

Type: Fatal

Explanation: CDA has aborted after detecting an odd address or some other type of fault. If PMD is installed in the system, the system will generate a snapshot dump. This is an indication of a software problem. You should include any available dumps when you send to DIGITAL your SPRs related to this type of failure.

Also preserve the following until your SPR is answered:

1. From the crashed system:
   - All applicable user task images
   - RSX11M.SYS
   - RSX11M.STB
   - RSXMC.MAC
   - All applicable privileged task images
   - Crash dump volume
2. From the system used for analysis:
   - RSX11M.SYS
   - RSX11M.STB
   - CDA.TSK

CDA -- Failed to assign LUN to input device ddu

Type: Fatal

Explanation: The Assign LUN directive failed when CDA attempted to use it to attach the specified input device before reading the crash dump from the device. The Assign LUN will fail if the device name in the CDA command line is invalid.

CDA -- Failed to extend page buffer - n. pages available

Type: Informational

Explanation: The Extend Task directive failed when CDA attempted to use it to expand the page buffer. This problem will cause the analysis to take longer, but the analysis will continue with a buffer of n pages, each 256 words long.

NOTE

CDA uses the extend task directive to obtain additional buffering space. CDA does not use space allocated by a /INC= qualifier on the INStall command.

CDA -- Failed to open input file filename

Type: Fatal

Explanation: One of the following conditions exists:

1. Specified device does not exist.
2. The volume is not mounted.
3. A problem exists with the device.
4. Specified UFD does not exist.
5. Specified file does not exist.
6. You do not have read access privileges.

CDA -- Failed to open output file filename

Type: Fatal

Explanation: One of the following conditions exists:

1. Specified device does not exist.
2. The volume is not mounted.
3. A problem exists with the device.
4. Specified UFD does not exist.
5. The volume is full or the device is write-protected.
6. You do not have write access privilege to UFD.

CDA -- Illegal switch

Type: Fatal

Explanation: You have specified an unknown switch or have used a legal switch after the wrong file specification. CDA will point to the error within the command line.

CDA -- Inconsistency in dynamic storage

Type: Informational

Explanation: CDA detected an inconsistency while scanning the pool pointers. This condition could be associated with the crash. However, it may mean that you specified the wrong executive symbol table file.

CDA -- Indirect command syntax error

Type: Fatal

Explanation: The name of the indirect command file (@filename) is syntactically incorrect.

CDA -- Indirect file open failure

Type: Fatal

Explanation: CDA could not open an indirect command file specified as "@filename" in the CDA command line.

CDA -- Invalid address range

Type: Fatal

Explanation: You specified an address that was not consistent with APR mapping.

CDA -- List count expired

Type: Analysis diagnostic

Explanation: The linked list of data structures has too many entries. The list may be corrupted, or contains a loop.

CDA -- Maximum indirect file depth exceeded

Type: Fatal

Explanation: You have exceeded the maximum allowable number of nested indirect command files. (Only one level of indirection is permitted in CDA.)

CDA -- No input file specified

Type: Fatal

Explanation: You did not supply an input file specification for the crash dump.

CDA -- No output file specified

Type: Fatal

Explanation: You have not specified an output file.

CDA -- Output dump filename must be explicit

Type: Fatal

Explanation: You have not specified an output file.

CDA -- Pool link error found - continuing

Type: Analysis diagnostic

Explanation: CDA detected a link error while scanning the pool free block pointers ($CRAVL). This condition can be associated with the crash. It can also mean that you specified the wrong Executive symbol table file. If the latter is true, the entire analysis will be meaningless and you should abort CDA.

CDA -- Premature end of dump input - filename being zero-filled

Type: Informational

Explanation: CDA reached the end of the medium (or-end-of-file mark, if magtape) before the crash dump output file had been completely filled. If you expected the file to be completely filled by the dump, this condition could indicate a problem.

CDA -- Processor n failed to dump its registers

Type: Informational

Explanation: On a multiprocessor system, when the system crashes, each on-line processor is notified by an interrupt. If the processor does not respond to the interrupt (for example, if it halted or is off line), it won't dump its registers into the crash buffer. CDA notes this and prints the informational message.

CDA -- Redirect error (U.RED=0)

Type: Analysis Diagnostic

Explanation: CDA detected an error in the pointer to the UCB of a redirected unit. This condition may be associated with the cause of the crash.

CDA -- Symbol symbolname not defined in symbol file

Type: Fatal

Explanation: CDA did not find a symbol that it required for the analysis in the specified Executive symbol table file. You have probably entered the wrong File name or have mistakenly used the default file name.

CDA -- Symbol file filename has illegal format

Type: Fatal

Explanation: The specified Executive symbol table file has an improper format, probably caused by entry of the wrong file name. However, this message could also indicate a problem with the device or medium on which the file is located.

CDA -- Task 'taskname' not in memory

Type: Analysis Diagnostic

Explanation: The above message can be caused by two conditions:

1. You have requested a dump of a task which does not have an entry in the System Task Directory, or
2. The task has an entry in the System Task Directory, but it is marked out of memory.

You can verify the state of the task by examining a dump of the Task Control Blocks.

CDA -- Transfer complete - ddu may be unloaded

Type: Informational

Explanation: The transfer of the crash dump to the output file is finished; you may unload the crash dump device. This message occurs only when you have specified a binary file in the output of the command string to CDA.

CDA -- Unknown AST type

Type: Analysis Diagnostic

Explanation: CDA has detected an AST block which is not one of the following valid types of ASTs:

1. Unsolicited character AST
2. Buffered I/O AST
3. Emit status AST
4. Completion AST from:

   QIO$
   MRKT$
   SPWN$
   CNCT$
   CINT$

5. Specified AST from:

   SFPA$
   SRDA$
   SRRA$
   SPFA$

CDA -- Unknown get command line error

Type: Fatal

Explanation: An unrecognized error occurred when CDA attempted to read a command line.

CDA -- $PKVAL link error at n --FWD PTR = n

Type: Analysis diagnostic

Explanation: CDA detected a link error while scanning the pool free packet list $PKVAL. This condition can be associated with the crash. It can also mean that you specified the wrong executive symbol table file.

APPENDIX B

RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

This appendix describes the RSX-11M system macros that supply symbolic offsets for data structures listed in Table B-1.

The data structures are defined by macros in the Executive macro library. To reference any of the data structure offsets from your code, include the macro name in an .MCALL directive and invoke the macro. For example:

```
.MCALL  DCBDF$
DCBDF$                  ;Define DCB offsets
```

NOTE

All physical offsets and bit definitions are subject to change in future releases of the operating system. Code that accesses system data structures should always use the symbolic offsets rather than the physical offsets.

The first two arguments, <:> and <=>, make all definitions global. If they are left blank, the definitions will be local. The SYSDEF argument causes the variable part of a data structure to be defined.

All of these macros are in the Executive macro library LB:[1,1]EXEMC.MLB. All except ITBDF$ and MTADF$ are also in the Executive definition library LB:[1,1]EXELIB.OLB.

Table B-1
Summary of System Data Structure Macros

Macro	Arguments	Data Structures
ABODF$	<:>,<=>	Task abort and termination notification message codes
CLKDF$	<:>,<=>	Clock queue control block
DCBDF$	<:>,<=>	Device Control Block
EPKDF$	<:>,<=>	Error message block

(continued on next page)

Table B-1 (Cont.)
Summary of System Data Structure Macros

Macro	Arguments	Data Structures
F11DF$	<:>,<=>,SYSDEF	Files-11 data structures (volume control block, mount list entry, file Control Block, file window block, locked block list node)
HDRDF$	<:>,<=>	Task header and window block
HWDDF$	<:>,<=>	Hardware register addresses and feature mask definitions
ITBDF$	<:>,<=>,SYSDEF	Interrupt transfer block
LCBDF$	<:>,<=>	Logical assignment control block
MTADF$	<:>,<=>	ANSI magtape data structures (volume set control block)
PCBDF$	<:>,<=>,SYSDEF	Partition Control Block and attachment descriptor
PKTDF$	<:>,<=>	I/O packet, AST control block, offspring control block, group global event flag control block, and CLI parser block
SCBDF$	<:>,<=>,SYSDEF	Status Control Block and UMR assignment block
TCBDF$	<:>,<=>,SYSDEF	Task Control Block
UCBDF$	<:>,<=>,TTDEF,SYSDEF	Unit Control Block

ABODF$

```
        ABODF$

;
; TASK ABORT CODES
;
; NOTE: S.COAD-S.CFLT ARE ALSO SST VECTOR OFFSETS
;
S.CACT=-4.              ;TASK STILL ACTIVE
S.CEXT=-2.              ;TASK EXITTED NORMALLY
S.COAD=0.               ;ODD ADDRESS AND TRAPS TO 4
S.CSGF=2.               ;SEGMENT FAULT
S.CBPT=4.               ;BREAK POINT OR TRACE TRAP
S.CIOT=6.               ;IOT INSTRUCTION
S.CILI=8.               ;ILLEGAL OR RESERVED INSTRUCTION
S.CEMT=10.              ;NON RSX EMT INSTRUCTION
S.CTRP=12.              ;TRAP INSTRUCTION
S.CFLT=14.              ;11/40 FLOATING POINT EXCEPTION
S.CSST=16.              ;SST ABORT-BAD STACK
S.CAST=18.              ;AST ABORT-BAD STACK
S.CABO=20.              ;ABORT VIA DIRECTIVE
S.CLRF=22.              ;TASK LOAD REQUEST FAILURE
S.CCRF=24.              ;TASK CHECKPOINT READ FAILURE
S.IOMG=26.              ;TASK EXIT WITH OUTSTANDING I/O
S.PRTY=28.              ;TASK MEMORY PARITY ERROR
S.CPMD=30.              ;TASK ABORTED WITH PMD REQUEST
S.CINS=32.              ;TASK INSTALLED IN TWO SYSTEMS


;
; TASK TERMINATION NOTIFICATION MESSAGE CODES
;
T.NDNR=0                ;DEVICE NOT READY
T.NDSE=2                ;DEVICE SELECT ERROR
T.NCWF=4                ;CHECKPOINT WRITE FAILURE
T.NCRE=6                ;CARD READER HARDWARE ERROR
T.NDMO=8.               ;DISMOUNT COMPLETE
T.NUER=10.              ;UNRECOVERABLE ERROR
T.NLDN=12.              ;LINK DOWN (NETWORKS)
T.NLUP=14.              ;LINK UP (NETWORKS)
T.NCFI=16.              ;CHECKPOINT FILE INACTIVE
T.NUDE=18.              ;UNRECOVERABLE DEVICE ERROR
T.NMPE=20.              ;MEMORY PARITY ERROR
T.NKLF=22.              ;UCODE LOADER NOT INSTALLED
T.NDEB=24.              ;TASK HAS NO DEBUGGING AID
T.NRCT=26.              ;REPLACEMENT CONTROL TASK NOT INSTALLED
T.NWBL=28.              ;WRITE BACK CACHING DATA LOST
                        ;UNIT WRITE LOCKED
```

CLKDF$

```
                CLKDF$

        ;
        ; CLOCK QUEUE CONTROL BLOCK OFFSET DEFINITIONS
        ;
        ; CLOCK QUEUE CONTROL BLOCK
        ;
        ; THERE ARE SIX TYPES OF CLOCK QUEUE CONTROL BLOCKS. EACH CONTROL
        ; BLOCK HAS THE SAME FORMAT IN THE FIRST FIVE WORDS AND DIFFERS IN
        ; THE REMAINING THREE.
        ;
        ; THE FOLLOWING CONTROL BLOCK TYPES ARE DEFINED:
        ;
        C.MRKT=0                ;MARK TIME REQUEST
        C.SCHD=2                ;TASK REQUEST WITH PERIODIC RESCHEDULING
        C.SSHT=4                ;SINGLE SHOT TASK REQUEST
        C.SYST=6                ;SINGLE SHOT INTERNAL SYSTEM SUBROUTINE (IDENT)
        C.SYTK=8.               ;SINGLE SHOT INTERNAL SYSTEM SUBROUTINE (TASK)
        C.CSTP=10.              ;CLEAR STOP BIT (CONDITIONALIZED ON SHUFFLING)


        ;
        ; CLOCK QUEUE CONTROL BLOCK TYPE INDEPENDENT OFFSET DEFINITIONS
        ;
                .ASECT
        .=0
000000  C.LNK:  .BLKW   1        ;CLOCK QUEUE THREAD WORD
000002  C.RQT:  .BLKB   1        ;REQUEST TYPE
000003  C.EFN:  .BLKB   1        ;EVENT FLAG NUMBER (MARK TIME ONLY)
000004  C.TCB:  .BLKW   1        ;TCB ADDR OR SYSTEM SUBROUTINE IDENTIFICATION
000006  C.TIM:  .BLKW   2        ;ABSOLUTE TIME WHEN REQUEST COMES DUE


        ;
        ; CLOCK QUEUE CONTROL BLOCK-MARK TIME DEPENDENT OFFSET DEFINITIONS
        ;
        .=C.TIM+4               ;START OF DEPENDENT AREA
000012  C.AST:  .BLKW   1        ;AST ADDRESS
000014  C.SRC:  .BLKW   1        ;FLAG MASK WORD FOR 'BIS' SOURCE
000016  C.DST:  .BLKW   1        ;ADDRESS OF 'BIS' DESTINATION


        ;
        ; CLOCK QUEUE CONTROL BLOCK-PERIODIC RESCHEDULING DEPENDENT OFFSET
        ; DEFINITIONS
        ;
        .=C.TIM+4               ;START OF DEPENDENT AREA
```

CLKDF$ (Cont.)

```
000012  C.RSI:  .BLKW   2       ;RESCHEDULE INTERVAL IN CLOCK TICKS
000016  C.UIC:  .BLKW   1       ;SCHEDULING UIC


        ;
        ; CLOCK QUEUE CONTROL BLOCK-SINGLE SHOT DEPENDENT OFFSET DEFINITIONS
        ;
        .=C.TIM+4               ;START OF DEPENDENT AREA
000012          .BLKW   2       ;TWO UNUSED WORDS
000016          .BLKW   1       ;SCHEDULING UIC


        ;
        ; CLOCK QUEUE CONTROL BLOCK-SINGLE SHOT INTERNAL SUBROUTINE OFFSET
        ; DEFINITIONS
        ;
        ; THERE ARE TWO TYPE CODES FOR THIS TYPE OF REQUEST:
        ;
        ;       TYPE 6 = SINGLE SHOT INTERNAL SUBROUTINE WITH A 16 BIT VALUE
        ;                AS AN IDENTIFIER.
        ;
        ;       TYPE 8 = SINGLE SHOT INTERNAL SUBROUTINE WITH A TCB ADDRESS
        ;                AS AN IDENTIFIER.
        ;
        .=C.TIM+4               ;START OF DEPENDENT AREA
000012  C.SUB:  .BLKW   1       ;SUBROUTINE ADDRESS
000014  C.AR5:  .BLKW   1       ;RELOCATION BASE (FOR LOADABLE DRIVERS)
000016          .BLKW   1       ;ONE UNUSED WORD

000020  C.LGTH=.                ;LENGTH OF CLOCK QUEUE CONTROL BLOCK

                .PSECT
```

DCBDF$

```
                DCBDF$

        ;
        ; DEVICE CONTROL BLOCK
        ;
        ; THE DEVICE CONTROL BLOCK (DCB) DEFINES GENERIC INFORMATION ABOUT
        ; A DEVICE TYPE AND THE LOWEST AND HIGHEST UNIT NUMBERS. THERE IS
        ; AT LEAST ONE DCB FOR EACH DEVICE TYPE IN A SYSTEM. FOR EXAMPLE,
        ; IF THERE ARE TELETYPES IN A SYSTEM, THEN THERE IS AT LEAST ONE
        ; DCB WITH THE DEVICE NAME 'TT'. IF PART OF THE TELETYPES WERE
        ; INTERFACED VIA DL11-A'S AND THE REST VIA A DH11, THEN THERE
        ; WOULD BE TWO DCB'S. ONE FOR ALL DL11-A INTERFACED TELETYPES,
        ; AND ONE FOR ALL DH11 INTERFACED TELETYPES.
        ;
                .ASECT
        .=0
000000  D.LNK:  .BLKW   1       ;LINK TO NEXT DCB
000002  D.UCB:  .BLKW   1       ;POINTER TO FIRST UNIT CONTROL BLOCK
000004  D.NAM:  .BLKW   1       ;GENERIC DEVICE NAME
000006  D.UNIT: .BLKB   1       ;LOWEST UNIT NUMBER COVERED BY THIS DCB
000007          .BLKB   1       ;HIGHEST UNIT NUMBER COVERED BY THIS DCB
000010  D.UCBL: .BLKW   1       ;LENGTH OF EACH UNIT CONTROL BLOCK IN BYTES
000012  D.DSP:  .BLKW   1       ;POINTER TO DRIVER DISPATCH TABLE
000014  D.MSK:  .BLKW   1       ;LEGAL FUNCTION MASK  CODES 0-15.
000016          .BLKW   1       ;CONTROL FUNCTION MASK CODES 0-15.
000020          .BLKW   1       ;NOP'ED FUNCTION MASK CODES 0-15.
000022          .BLKW   1       ;ACP FUNCTION MASK CODES 0-15.
000024          .BLKW   1       ;LEGAL FUNCTION MASK CODES 16.-31.
000026          .BLKW   1       ;CONTROL FUNCTION MASK CODES 16.-31.
000030          .BLKW   1       ;NOP'ED FUNCTION MASK CODES 16.-31.
000032          .BLKW   1       ;ACP FUNCTION MASK CODES 16.-31.
000034  D.PCB:  .BLKW   1       ;LOADABLE DRIVER PCB ADDRESS

                .PSECT


        ;
        ; DRIVER DISPATCH TABLE OFFSET DEFINITIONS
        ;
        D.VDEB=177776           ;DEALLOCATE INTERNAL BUFFERS (FD TTDRV)
        D.VINI=0                ;DEVICE INITIATOR
        D.VCAN=2                ;CANCEL CURRENT I/O FUNCTION
        D.VOUT=4                ;DEVICE TIMEOUT
        D.VPWF=6                ;POWERFAIL RECOVERY
```

```
        EPKDF$

;
; ERROR MESSAGE BLOCK DEFINITIONS
;
        .ASECT


;
; HEADER SUBPACKET
;
;
;       +-----------------------------------------------+
;       | SUBPACKET LENGTH IN BYTES                     |
;       +-----------------------------------------------+
;       | SUBPACKET FLAGS                               |
;       +----------------------+------------------------+
;       | FORMAT IDENTIFICATION | OPERATING SYSTEM CODE |
;       +----------------------+------------------------+
;       | OPERATING SYSTEM IDENTIFICATION               |
;       |                                               |
;       +----------------------+------------------------+
;       | FLAGS                | CONTEXT CODE           |
;       +----------------------+------------------------+
;       | ENTRY SEQUENCE                                |
;       +-----------------------------------------------+
;       | ERROR SEQUENCE                                |
;       +----------------------+------------------------+
;       | ENTRY TYPE SUBCODE   | ENTRY TYPE CODE        |
;       +----------------------+------------------------+
;       | TIME STAMP                                    |
;       |                                               |
;       |                                               |
;       +----------------------+------------------------+
;       | RESERVED             | PROCESSOR TYPE         |
;       +----------------------+------------------------+
;       | PROCESSOR IDENTIFICATION (URM)                |
;       +-----------------------------------------------+
;
        .=0
000000  E$HLGH: .BLKW   1       ; SUBPACKET LENGTH IN BYTES
000002  E$HSBF: .BLKW   1       ; SUBPACKET FLAGS
000004  E$HSYS: .BLKB   1       ; OPERATING SYSTEM CODE
000005  E$HIDN: .BLKB   1       ; FORMAT IDENTIFICATION
000006  E$HSID: .BLKB   4       ; OPERATING SYSTEM IDENTIFICATION
000012  F$HCTX: .BLKB   1       ; CONTEXT CODE
000013  E$HFLG: .BLKB   1       ; FLAGS
000014  E$HENS: .BLKW   1       ; ENTRY SEQUENCE NUMBER
000016  E$HERS: .BLKW   1       ; ERROR SEQUENCE NUMBER
000020  E$HENC:                 ; ENTRY CODE
000020  E$HTYC: .BLKB   1       ; ENTRY TYPE CODE
000021  E$HTYS: .BLKB   1       ; ENTRY TYPE SUBCODE
000022  E$HTIM: .BLKB   6       ; TIME STAMP
000030  E$HPTY: .BLKB   1       ; PROCESSOR TYPE
000031          .BLKB   1       ; RESERVED
000032  E$HURM: .BLKW   1       ; PROCESSOR IDENTIFICATION (URM)
                .EVEN
```

EPKDF$ (Cont.)

```
000034  E$HLEN:                 ; LENGTH

        ;
        ; SUBPACKET FLAGS FOR E$HSBF
        ;
                SM.ERR  =     1 ; ERROR PACKET
                SM.HDR  =     1 ; HEADER SUBPACKET
                SM.TSK  =     2 ; TASK SUBPACKET
                SM.DID  =     4 ; DEVICE IDENTIFICATION SUBPACKET
                SM.DOP  =    10 ; DEVICE OPERATION SUBPACKET
                SM.DAC  =    20 ; DEVICE ACTIVITY SUBPACKET
                SM.DAT  =    40 ; DATA SUBPACKET
                SM.MBC  = 20000 ; 22-BIT MASSBUS CONTROLLER PRESENT
                SM.CMD  = 40000 ; ERROR LOG COMMAND PACKET
                SM.ZER  =100000 ; ZERO I/O COUNTS

        ;
        ; CODES FOR FIELD E$HIDN
        ;
                EH$FOR  =     1 ; CURRENT PACKET FORMAT

        ;
        ; FLAGS FOR THE ERROR LOG FLAGS BYTE ($ERFLA) IN THE EXEC
        ;
                ES.INI  =     1 ; ERROR LOG INITIALIZED
                ES.DAT  =     2 ; ERROR LOG RECEIVING DATA PACKETS
                ES.LIM  =     4 ; ERROR LIMITING ENABLED
                ES.LOG  =    10 ; ERROR LOGGING ENABLED

        ;
        ; TYPE AND SUBTYPE CODES FOR FIELDS E$HTYC AND E$HTYS
        ;
        ;       SYMBOLS WITH NAMES E$CXXX ARE TYPE CODES FOR FIELD E$HTYC,
        ;       SYMBOLS WITH NAMES E$SXXX ARE SUBTYPE CODES FOR FIELD E$HTYS.
        ;
                E$CCMD  =     1 ; ERROR LOG CONTROL
                E$SSTA  =     1 ;       ERROR LOG STATUS CHANGE
                E$SSWI  =     2 ;       SWITCH LOGGING FILES
                E$SAPP  =     3 ;       APPEND FILE
                E$SBAC  =     4 ;       DECLARE BACKUP FILE
                E$SSHO  =     5 ;       SHOW
                E$SCHL  =     6 ;       CHANGE LIMITS

                E$CERR  =     2 ; DEVICE ERRORS
                E$SDVH  =     1 ;       DEVICE HARD ERROR
                E$SDVS  =     2 ;       DEVICE SOFT ERROR
                E$STMO  =     3 ;       DEVICE INTERRUPT TIMEOUT
                E$SUNS  =     4 ;       DEVICE UNSOLICITED INTERRUPT

                E$CDVI  =     3 ; DEVICE INFORMATION
                E$SDVI  =     1 ;       DEVICE INFORMATION MESSAGE

                E$CDCI  =     4 ; DEVICE CONTROL INFORMATION
                E$SMOU  =     1 ;       DEVICE MOUNT
                E$SDMO  =     2 ;       DEVICE DISMOUNT
                E$SRES  =     3 ;       DEVICE COUNT RESET
                E$SRCT  =     4 ;       BLOCK REPLACEMENT
```

EPKDF$ (Cont.)

```
                E$CCPU  =     5 ; CPU DETECTED ERRORS
                E$SMEM  =     1 ;       MEMORY ERROR
                E$SINT  =     2 ;       UNEXPECTED INTERRUPT

                E$CSYS  =     6 ; SYSTEM CONTROL INFORMATION
                E$SPWR  =     1 ;       POWER RECOVERY

                E$CCTL  =     7 ; CONTROL INFORMATION
                E$STIM  =     1 ;       TIME CHANGE
                E$SCRS  =     2 ;       SYSTEM CRASH
                E$SLOA  =     3 ;       DEVICE DRIVER LOAD
                E$SUNL  =     4 ;       DEVICE DRIVER UNLOAD
                E$SHRC  =     5 ;       RECONFIGURATION STATUS CHANGE
                E$SMES  =     6 ;       MESSAGE

                E$CSDE  =    10 ; SOFTWARE DETECTED EVENTS
                E$SABO  =     1 ;       TASK ABORT

        ;
        ; CODES FOR CONTEXT CODE ENTRY E$HCTX
        ;
                EH$NOR  =     1 ; NORMAL ENTRY
                EH$STA  =     2 ; START ENTRY
                EH$CRS  =     3 ; CRASH ENTRY

        ;
        ; CODES FOR FLAGS ENTRY E$HFLG
        ;
                EH$VIR  =     1 ; ADDRESSES ARE VIRTUAL
                EH$EXT  =     2 ; ADDRESSES ARE EXTENDED
                EH$COU  =     4 ; ERROR COUNTS SUPPLIED


        ;
        ; TASK SUBPACKET
        ;
        ;       +-----------------------------------------------+
        ;       | TASK SUBPACKET LENGTH                         |
        ;       +-----------------------------------------------+
        ;       | TASK NAME IN RAD50                            |
        ;       |                                               |
        ;       +-----------------------------------------------+
        ;       | TASK UIC                                      |
        ;       +-----------------------------------------------+
        ;       | TASK TI: DEVICE NAME                          |
        ;       +-----------------------+-----------------------+
        ;       | FLAGS                 | TASK TI: UNIT NUMBER  |
        ;       +-----------------------+-----------------------+
        ;
        .=0
000000  E$TLGH: .BLKW   1       ; TASK SUBPACKET LENGTH
000002  E$TTSK: .BLKW   2       ; TASK NAME IN RAD50
000006  E$TUIC: .BLKW   1       ; TASK UIC
000010  E$TTID: .BLKB   2       ; TASK TI: DEVICE NAME
000012  E$TTIU: .BLKB   1       ; TASK TI: UNIT
000013  E$TFLG: .BLKB   1       ; FLAGS
                .EVEN
```

EPKDF$ (Cont.)

```
000014  E$TLEN:

        ;
        ; FLAGS FOR ENTRY E$TFLG
        ;
               ET$PRV  =     1 ; TASK IS PRIVILEGED
               ET$PRI  =     2 ; TERMINAL IS PRIVILEGED


        ;
        ; DEVICE IDENTIFICATION SUBPACKET
        ;
        ;      +-----------------------------------------------+
        ;      | DEVICE IDENTIFICATION SUBPACKET LENGTH        |
        ;      +-----------------------------------------------+
        ;      | DEVICE MNEMONIC NAME                          |
        ;      +-----------------------+-----------------------+
        ;      | CONTROLLER NUMBER     | DEVICE UNIT NUMBER    |
        ;      +-----------------------+-----------------------+
        ;      | PHYSICAL SUBUNIT #    | PHYSICAL UNIT #       |
        ;      +-----------------------+-----------------------+
        ;      | PHYSICAL DEVICE MNEMONIC (RSX-11M-PLUS ONLY)  |
        ;      +-----------------------+-----------------------+
        ;      | RESERVED              | FLAGS                 |
        ;      +-----------------------+-----------------------+
        ;      | VOLUME NAME OF MOUNTED VOLUME                 |
        ;      |                                               |
        ;      |                                               |
        ;      |                                               |
        ;      |                                               |
        ;      |                                               |
        ;      +-----------------------------------------------+
        ;      | PACK IDENTIFICATION                           |
        ;      |                                               |
        ;      +-----------------------------------------------+
        ;      | DEVICE TYPE CLASS                             |
        ;      +-----------------------------------------------+
        ;      | DEVICE TYPE                                   |
        ;      |                                               |
        ;      +-----------------------------------------------+
        ;      | I/O OPERATION COUNT LONGWORD                  |
        ;      |                                               |
        ;      +-----------------------+-----------------------+
        ;      | HARD ERROR COUNT      | SOFT ERROR COUNT      |
        ;      +-----------------------+-----------------------+
        ;      | BLOCKS TRANSFERRED COUNT (RSX-11M-PLUS ONLY)  |
        ;      |                                               |
        ;      +-----------------------------------------------+
        ;      | CYLINDERS CROSSED COUNT (RSX-11M-PLUS ONLY)   |
        ;      |                                               |
        ;      +-----------------------------------------------+
        ;
        .=0
000000  E$ILGH: .BLKW   1       ; DEVICE IDENTIFICATION SUBPACKET LENGTH
000002  E$ILDV: .BLKW   1       ; DEVICE MNEMONIC NAME
000004  E$ILUN: .BLKB   1       ; DEVICE UNIT NUMBER
000005  E$IPCO: .BLKB   1       ; CONTROLLER NUMBER
000006  E$IPUN: .BLKB   1       ; PHYSICAL UNIT NUMBER
000007  E$IPSU: .BLKB   1       ; PHYSICAL SUBUNIT NUMBER
```

EPKDF$ (Cont.)

```
                .IF DF R$$MPL

        E$IPDV: .BLKW   1       ; PHYSICAL DEVICE MNEMONIC

                .ENDC ; R$$MPL

000010  E$IFLG: .BLKB   1       ; FLAGS
000011          .BLKB   1       ; RESERVED
000012  E$IVOL: .BLKB   12.     ; VOLUME NAME
000026  E$IPAK: .BLKB   4       ; PACK IDENTIFICATION
000032  E$IDEV:                 ; DEVICE TYPE
000032  E$IDCL: .BLKW   1       ; DEVICE TYPE CLASS
000034  E$IDTY: .BLKW   2       ; DEVICE TYPE
000040  E$IOPR: .BLKW   2       ; I/O OPERATION COUNT LONGWORD
000044  E$IERS: .BLKB   1       ; SOFT ERROR COUNT
000045  E$IERH: .BLKB   1       ; HARD ERROR COUNT

                .IF DF R$$MPL

        E$IBLK: .BLKW   2       ; BLOCKS TRANSFERRED COUNT
        E$ICYL: .BLKW   2       ; CYLINDERS CROSSED COUNT

                .ENDC ; R$$MPL

                .EVEN
000046  E$ILEN:                 ; SUBPACKET LENGTH

        ;
        ; FLAGS FOR FIELD E$IFLG
        ;
                EI$SUB  =     1 ; SUBCONTROLLER DEVICE


        ;
        ; DEVICE OPERATION SUBPACKET
        ;
        ;       +-----------------------------------------------+
        ;       | DEVICE OPERATION SUBPACKET LENGTH             |
        ;       +-----------------------------------------------+
        ;       | TASK NAME IN RAD50                            |
        ;       |                                               |
        ;       +-----------------------------------------------+
        ;       | TASK UIC                                      |
        ;       +-----------------------------------------------+
        ;       | TASK TI: LOGICAL DEVICE MNEMONIC              |
        ;       +-----------------------+-----------------------+
        ;       | RESERVED              | TASK TI: DEVICE UNIT  |
        ;       +-----------------------+-----------------------+
        ;       | I/O FUNCTION CODE                             |
        ;       +-----------------------+-----------------------+
        ;       | RESERVED              | OPERATION FLAGS       |
        ;       +-----------------------+-----------------------+
        ;       | TRANSFER OPERATION ADDRESS                    |
        ;       |                                               |
        ;       +-----------------------------------------------+
        ;       | TRANSFER OPERATION BYTE COUNT                 |
        ;       +-----------------------------------------------+
        ;       | CURRENT OPERATION RETRY COUNT                 |
        ;       +-----------------------------------------------+
        ;
        .=0
```

EPKDF$ (Cont.)

```
000000  E$OLGN: .BLKW   1       ; SUBPACKET LENGTH
000002  E$OTSK: .BLKW   2       ; TASK NAME IN RAD50
000006  E$OUIC: .BLKW   1       ; TASK UIC
000010  E$OTID: .BLKB   2       ; TASK TI: LOGICAL DEVICE MNEMONIC
000012  E$OTIU: .BLKB   1       ; TASK TI: LOGICAL DEVICE UNIT
000013          .BLKB   1       ; RESERVED
000014  E$OFNC: .BLKW   1       ; I/O FUNCTION CODE
000016  E$OFLG: .BLKB   1       ; OPERATION FLAGS
000017          .BLKB   1       ; RESERVED
000020  E$OADD: .BLKW   2       ; TRANSFER OPERATION ADDRESS
000024  E$OSIZ: .BLKW   1       ; TRANSFER OPERATION BYTE COUNT
000026  E$ORTY: .BLKW   1       ; CURRENT OPERATION RETRY COUNT
                .EVEN
000030  E$OLEN:                 ; DEVICE OPERATION SUBPACKET LENGTH

        ;
        ; FLAGS FOR FIELD E$OFLG
        ;
                EO$TRA  =     1 ; TRANSFER OPERATION
                EO$DMA  =     2 ; DMA DEVICE
                EO$EXT  =     4 ; EXTENDED ADDRESSING DEVICE
                EO$PIP  =    10 ; DEVICE IS POSITIONING


        ;
        ; I/O ACTIVITY SUBPACKET
        ;
        ;       +-----------------------------------------------+
        ;       | I/O ACTIVITY SUBPACKET LENGTH                 |
        ;       +-----------------------------------------------+
        ;
        .=0
000000  E$ALGH: .BLKW   1       ; SUBPACKET LENGTH
```

EPKDF$ (Cont.)

```
        ;
        ; I/O ACTIVITY SUBPACKET ENTRY
        ;
        ;       +-----------------------------------------------+
        ;       | LOGICAL DEVICE NAME MNEMONIC                  |
        ;       +----------------------+------------------------+
        ;       | CONTROLLER NUMBER    | LOGICAL DEVICE UNIT    |
        ;       +----------------------+------------------------+
        ;       | PHYSICAL SUBUNIT #   | PHYSICAL UNIT NUMBER   |
        ;       +----------------------+------------------------+
        ;       | PHYSICAL DEVICE MNEMONIC (RSX-11M-PLUS ONLY)  |
        ;       +----------------------+------------------------+
        ;       | TASK TI: LOGICAL UNIT | DEVICE FLAGS          |
        ;       +----------------------+------------------------+
        ;       | REQUESTING TASK NAME IN RAD50                 |
        ;       |                                               |
        ;       +-----------------------------------------------+
        ;       | REQUESTING TASK UIC                           |
        ;       +-----------------------------------------------+
        ;       | TASK TI: LOGICAL DEVICE NAME                  |
        ;       +-----------------------------------------------+
        ;       | I/O FUNCTION CODE                             |
        ;       +----------------------+------------------------+
        ;       | RESERVED             | FLAGS                  |
        ;       +----------------------+------------------------+
        ;       | TRANSFER OPERATION ADDRESS                    |
        ;       |                                               |
        ;       +-----------------------------------------------+
        ;       | TRANSFER OPERATION BYTE COUNT                 |
        ;       +-----------------------------------------------+
        ;
        .=0
000000  E$ALDV: .BLKW   1       ; LOGICAL DEVICE NAME MNEMONIC
000002  E$ALUN: .BLKB   1       ; LOGICAL DEVICE UNIT
000003  E$APCO: .BLKB   1       ; CONTROLLER NUMBER
000004  E$APUN: .BLKB   1       ; PHYSICAL UNIT NUMBER
000005  E$APSU: .BLKB   1       ; PHYSICAL SUBUNIT NUMBER

                .IF DF R$$MPL

        E$APDV: .BLKW   1       ; PHYSICAL DEVICE MNEMONIC

                .ENDC ; R$$MPL

000006  E$ADFG: .BLKB   1       ; DEVICE FLAGS
000007  E$ATIU: .BLKB   1       ; TASK TI: LOGICAL UNIT
000010  E$ATSK: .BLKW   2       ; REQUESTING TASK NAME IN RAD50
000014  E$AUIC: .BLKW   1       ; REQUESTING TASK UIC
000016  E$ATID: .BLKW   1       ; TASK TI: LOGICAL DEVICE NAME
000020  E$AFNC: .BLKW   1       ; I/O FUNCTION CODE
000022  E$AFLG: .BLKB   1       ; FLAGS
000023          .BLKB   1       ; RESERVED
000024  E$AADD: .BLKW   2       ; TRANSFER OPERATION ADDRESS
000030  E$ASIZ: .BLKW   1       ; TRANSFER OPERATION BYTE COUNT
                .EVEN
000032  E$ALEN:                 ; SUBPACKET ENTRY LENGTH
```

EPKDF$ (Cont.)

```
;
; FLAGS FOR FIELD E$ADFG
;
        EA$SUB  =     1 ; SUBCONTROLLER DEVICE

;
; FLAGS FOR FIELD E$AFLG
;
        EA$TRA  =     1 ; TRANSFER OPERATION
        EA$DMA  =     2 ; DMA DEVICE
        EA$EXT  =     4 ; DEVICE HAS EXTENDED ADDRESSING
        EA$PIP  =    10 ; DEVICE IS POSITIONING

        .PSECT
```

F11DF$

```
                F11DF$  ,,SYSDEF

        ;
        ; VOLUME CONTROL BLOCK
        ;
                .ASECT
        .=0
000000  V.TRCT: .BLKW   1       ; TRANSACTION COUNT

                .IF DF R$$11M

000002  V.TYPE: .BLKB   1       ; VOLUME TYPE DESCRIPTOR
        VT.SL1= 1               ; FILES-11 STRUCTURE LEVEL 1
        VT.ANS= 10              ; ANSI LABELED TAPE
        VT.UNL= 11              ; UNLABELED TAPE
000003  V.VCHA: .BLKB   1       ; VOLUME CHARACTERISTICS
        VC.SLK= 1               ; CLEAR VOLUME VALID ON DISMOUNT
        VC.HLK= 2               ; UNLOAD THE VOLUME ON DISMOUNT
        VC.DEA= 4               ; DEALLOCATE THE VOLUME ON DISMOUNT
        VC.PUB= 10              ; SET (CLEAR) US.PUB ON DISMOUNT
000004  V.LABL: .BLKB   14      ; VOLUME LABEL (ASCII)
000020  V.PKSR: .BLKW   2       ; PACK SERIAL NUMBER FOR ERROR LOGGING

000024  V.SLEN:                 ; LENGTH OF SHORT VCB

                .ENDC ;R$$11M

000024  V.IFWI: .BLKW   1       ; INDEX FILE WINDOW

                .IF DF R$$11D

        V.STD:  .BLKW   1       ; STD OF TASK CHARGED WITH NODE

                .ENDC ;R$$11D

000026  V.FCB:  .BLKW   2       ; FILE CONTROL BLOCK LIST HEAD
000032  V.IBLB: .BLKB   1       ; INDEX BIT MAP 1ST LBN HIGH BYTE
000033  V.IBSZ: .BLKB   1       ; INDEX BIT MAP SIZE IN BLOCKS
000034          .BLKW   1       ; INDEX BITMAP 1ST LBN LOW BITS
000036  V.FMAX: .BLKW   1       ; MAX NO. OF FILES ON VOLUME
000040  V.WISZ: .BLKB   1       ; DEFAULT SIZE OF WINDOW IN RTRV PTRS
                                ; VALUE IS < 128.
000041  V.SBCL: .BLKB   1       ; STORAGE BIT MAP CLUSTER FACTOR
000042  V.SBSZ: .BLKW   1       ; STORAGE BIT MAP SIZE IN BLOCKS
000044  V.SBLB: .BLKB   1       ; STORAGE BIT MAP 1ST LBN HIGH BYTE
000045  V.FIEX: .BLKB   1       ; DEFAULT FILE EXTEND SIZE
000046          .BLKW   1       ; STORAGE BIT MAP 1ST LBN LOW BITS

                .IF DF R$$11M

000050  V.VOWN: .BLKW   1       ; VOLUME OWNER'S UIC
000052  V.VPRO: .BLKW   1       ; VOLUME PROTECTION

                .ENDC ;R$$11M
```

F11DF$ (Cont.)

```
000054  V.FPRO: .BLKW   1       ; VOLUME DEFAULT FILE PROTECTION
000056  V.FRBK: .BLKB   1       ; NUMBER OF FREE BLOCKS ON VOLUME HIGH BYTE
000057  V.LRUC: .BLKB   1       ; COUNT OF AVAILABLE LRU SLOTS IN FCB LIST
000060          .BLKW   1       ; NUMBER OF FREE BLOCKS ON VOLUME LOW BITS
000062  V.STS:  .BLKB   1       ; VOLUME STATUS BYTE, CONTAINING THE FOLLOWING
        VS.IFW= 1               ; INDEX FILE IS WRITE ACCESSED
        VS.BMW= 2               ; STORAGE BITMAP FILE IS WRITE ACCESSED
000063  V.FFNU: .BLKB   1       ; FIRST FREE INDEX FILE BITMAP BLOCK
000064  V.EXT:  .BLKW   1       ; POINTER TO VCB EXTENSION

000066  V.LGTH:                 ; SIZE IN BYTES OF VCB


        ;
        ; MOUNT LIST ENTRY
        ;
        ; EACH ENTRY ALLOWS ACCESS TO A SPECIFIED USER FOR A NON-PUBLIC DEVICE
        ;
        ; TO ALLOW EXPANSION, ONLY THE ONLY TYPE CODE DEFINED IS "1" FOR
        ; DEVICE ACCESS BLOCKS
        ;
                .ASECT
        .=0
000000  M.LNK:  .BLKW   1       ; LINK WORD
000002  M.TYPE: .BLKB   1       ; TYPE OF ENTRY
        MT.MLS= 1               ; MOUNTED VOLUME USER ACCESS LIST
000003  M.ACC:  .BLKB   1       ; NUMBER OF ACCESSES
000004  M.DEV:  .BLKW   1       ; DEVICE UCB
000006  M.TI:   .BLKW   1       ; ACCESSOR TI: UCB

000010  M.LEN:                  ; LENGTH OF ENTRY


        ;
        ; FILE CONTROL BLOCK
        ;
                .ASECT
        .=0
000000  F.LINK: .BLKW   1       ; FCB CHAIN POINTER

                .IF DF R$$11D

        F.FEXT: .BLKW   1       ; POINTER TO EXTENSION FCB
        F.STD:  .BLKW   1       ; STD OF TASK CHARGED WITH NODE

                .ENDC ;R$$11D

000002  F.FNUM: .BLKW   1       ; FILE NUMBER
000004  F.FSEQ: .BLKW   1       ; FILE SEQUENCE NUMBER
000006          .BLKB   1       ; NOT USED
000007  F.FSQN: .BLKB   1       ; FILE SEGMENT NUMBER
000010  F.FOWN: .BLKW   1       ; FILE OWNER'S UIC
000012  F.FPRO: .BLKW   1       ; FILE PROTECTION CODE
000014  F.UCHA: .BLKB   1       ; USER CONTROLLED CHARACTERISTICS
000015  F.SCHA: .BLKB   1       ; SYSTEM CONTROLLED CHARACTERISTICS
000016  F.HDLB: .BLKW   2       ; FILE HEADER LOGICAL BLOCK NUMBER
```

F11DF$ (Cont.)

```
                                        ; BEGINNING OF STATISTICS BLOCK
000022  F.LBN:  .BLKW   2              ; LBN OF VIRTUAL BLOCK 1 IF CONTIGUOUS
                                        ; 0 IF NON CONTIGUOUS
000026  F.SIZE: .BLKW   2              ; SIZE OF FILE IN BLOCKS
000032  F.NACS: .BLKB   1              ; NO. OF ACCESSES
000033  F.NLCK: .BLKB   1              ; NO. OF LOCKS

000012  S.STBK=.-F.LBN                 ; SIZE OF STATISTICS BLOCK

000034  F.STAT:                        ; FCB STATUS WORD
000034  F.NWAC: .BLKB   1              ; NUMBER OF WRITE ACCESSORS
000035          .BLKB   1              ; STATUS BITS FOR FCB CONSISTING OF
        FC.WAC= 100000                 ; SET IF FILE ACCESSED FOR WRITE
        FC.DIR= 40000                  ; SET IF FCB IS IN DIRECTORY LRU
        FC.CEF= 20000                  ; SET IF DIRECTORY EOF NEEDS UPDATING
        FC.FCO= 10000                  ; SET IF TRYING TO FORCE DIRECTORY CONTIG
000036  F.DREF: .BLKW   1              ; DIRECTORY EOF BLOCK NUMBER
000040  F.DRNM: .BLKW   1              ; 1ST WORD OF DIRECTORY NAME

                .IF DF R$$11M

000042  F.FEXT: .BLKW   1              ; POINTER TO EXTENSION FCB

                .ENDC ;R$$11M

000044  F.FVBN: .BLKW   2              ; STARTING VBN OF THIS FILE SEGMENT
000050  F.LKL:  .BLKW   1              ; POINTER TO LOCKED BLOCK LIST FOR FILE
000052  F.WIN:  .BLKW   1              ; WINDOW BLOCK LIST FOR THIS FILE

000054  F.LGTH:                        ; SIZE IN BYTES OF FCB


        ;
        ; WINDOW
        ;
                .ASECT
        .=0
000000  W.ACT:                        ; NUMBER OF ACTIVE MAPPING POINTERS
                                        ;  WHEN NO SECONDARY POOL
000000  W.BLKS:                       ; BLOCK SIZE OF SECONDARY POOL SEGMENT
                                        ;  WHEN SECONDARY POOL
000000  W.CTL:  .BLKW   1              ; LOW BYTE = # OF MAP ENTRIES ACTIVE
                                        ; HIGH BYTE CONSISTS OF CONTROL BITS
        WI.RDV= 400                    ; READ VIRTUAL BLOCK ALLOWED IF SET
        WI.WRV= 1000                   ; WRITE VIRTUAL BLOCK ALLOWED IF SET
        WI.EXT= 2000                   ; EXTEND ALLOWED IF SET
        WI.LCK= 4000                   ; SET IF LOCKED AGAINST SHARED ACCESS
        WI.DLK= 10000                  ; SET IF DEACCESS LOCK ENABLED

                .IF DF R$$11M

        WI.PND= 20000                  ; WINDOW TURN PENDING BIT

                .ENDC ;R$$11M

        WI.EXL= 40000                  ; SET IF MANUAL UNLOCK DESIRED
        WI.WCK= 100000                 ; DATA CHECK ALL WRITES TO FILE
```

F11DF$ (Cont.)

```
                .IF NDF R$$11M  ; IF NOT RSX-11

        W.FCB:  .BLKW   1       ; FILE CONTROL BLOCK ADDRESS
        W.STD:  .BLKW   1       ; STD OF TASK CHARGED WITH WIDOW NODE
        W.VBN:  .BLKB   1       ; HIGH BYTE OF 1ST VBN MAPPED BY WINDOW
        W.WISZ: .BLKB   1       ; SIZE IN RTRV PTRS OF WINDOW (7 BITS)
                .BLKW   1       ; LOW ORDER WORD OF 1ST VBN MAPPED
        W.LKL:  .BLKW   1       ; POINTER TO LIST OF USERS LOCKED BLOCKS
        W.WIN:  .BLKW   1       ; WINDOW BLOCK LIST LINK WORD
        W.RTRV:                 ; OFFSET TO 1ST RETRIEVAL POINTER IN WINDOW

                .IFF            ; IF RSX-11

000002  W.IOC:  .BLKB   1       ; COUNT OF I/O THROUGH THIS WINDOW
000003          .BLKB   1       ; RESERVED
000004  W.FCB:  .BLKW   1       ; FILE CONTROL BLOCK ADDRESS
000006  W.LKL:  .BLKW   1       ; POINTER TO LIST OF USERS LOCKED BLOCKS
000010  W.WIN:  .BLKW   1       ; WINDOW BLOCK LIST LINK WORD

                .IF NB SYSDEF   ; IF SYSDEF SPECIFIED IN CALL

                .IF NDF P$$WND  ; IF SECONDARY POOL WINDOWS NOT ALLOWED

        ;
        ; NON-SECONDARY POOL WINDOW BLOCK
        ;       IF SECONDARY POOL WINDOWS ARE NOT ENABLED, THE WINDOW BLOCK
        ;       CONTAINS THE CONTROL INFORMATION AND RETRIEVAL POINTERS.
        ;
000012  W.VBN:  .BLKB   1       ; HIGH BYTE OF 1ST VBN MAPPED BY WINDOW
000013  W.MAP:                  ; DEFINE LABEL WITH ODD ADDR TO CATCH BAD REFS
000013  W.WISZ: .BLKB   1       ; SIZE IN RTRV PTRS OF WINDOW (7 BITS)
000014          .BLKW   1       ; LOW ORDER WORD OF 1ST VBN MAPPED
000016  W.RTRV:                 ; OFFSET TO 1ST RETRIEVAL POINTER IN WINDOW

                .IFF            ; IF WINDOWS IN SECONDARY POOL

        ;
        ; SECONDARY POOL WINDOW CONTROL AND MAPPING BLOCK
        ;       IF SECONDARY POOL WINDOW BLOCKS ARE ENABLED, LUTN2 POINTS
        ;       TO A CONTROL BLOCK IN SYSTEM POOL WHICH CONTAINS THE
        ;       FOLLOWING CONTROL FIELDS AND THE MAPPING INFORMATION
        ;       FOR THE SECONDARY POOL WINDOW.
        ;
        W.MAP:  .BLKW   1       ; ADDR TO THE MAPPING PTRS IN SECONDARY POOL

        ;
        ; SECONDARY POOL WINDOW
        ;       IF SECONDARY POOL WINDOW BLOCKS ARE ENABLED, THE RETRIEVAL
        ;       POINTERS ARE MAINTAINED IN SECONDARY POOL IN THE FOLLOWING
        ;       FORMAT.
        ;
        .=0
```

F11DF$ (Cont.)

```
                ASSUME  W.CTL,0
                .BLKB   1       ; NUMBER OF ACTIVE MAPPING POINTERS
        W.USE:  .BLKB   1       ; STATUS OF BLOCK
        W.VBN:  .BLKB   1       ; HIGH BYTE OF 1ST VBN MAPPED BY WINDOW
        W.WISZ: .BLKB   1       ; SIZE IN RTRV PTRS OF WINDOW (7 BITS)
                .BLKW   1       ; LOW ORDER WORD OF 1ST VBN MAPPED
        W.RTRV:                 ; OFFSET TO 1ST RETRIEVAL POINTER IN WINDOW

                .ENDC ;P$$WND   ; END SECONDARY POOL WINDOW CONDITIONAL

                .ENDC ;SYSDEF   ; END SYSDEF CONDITIONAL

                .ENDC ;R$$11M   ; END RSX-11M CONDITIONAL


        ;
        ; LOCKED BLOCK LIST NODE
        ;
                .ASECT
        .=0
000000  L.LNK:  .BLKW   1       ; LINK TO NEXT NODE IN LIST
000002  L.WI1:  .BLKW   1       ; POINTER TO WINDOW FOR FIRST ENTRY

                .IF DF R$$11D

        L.STD:  .BLKW   1       ; POINTER TO STD OF TASK NODE CHARGED TO
        L.VB1:  .BLKW   2       ; STARTING VBN OF FIRST ENTRY
        L.VB2:  .BLKW   2       ; STARTING VBN OF SECOND ENTRY
        L.CNT:  .BLKB   1       ; COUNT FOR FIRST ENTRY
                .BLKB   1       ; COUNT FOR SECOND ENTRY

                .IFF

000004  L.VB1:  .BLKB   1       ; HIGH ORDER VBN BYTE
000005  L.CNT:  .BLKB   1       ; COUNT FOR ENTRY
000006          .BLKW   1       ; LOW ORDER VBN

                .ENDC ;R$$11D

000010  L.LKSZ:

                .PSECT
```

HDRDF$

```
                HDRDF$

        ;
        ; TASK HEADER OFFSET DEFINITIONS
        ;
                .ASECT
        .=0
000000  H.CSP:   .BLKW   1       ;CURRENT STACK POINTER
000002  H.HDLN:  .BLKW   1       ;HEADER LENGTH IN BYTES
000004  H.EFLM:  .BLKW   2       ;EVENT FLAG MASK WORD AND ADDRESS
000010  H.CUIC:  .BLKW   1       ;CURRENT TASK UIC
000012  H.DUIC:  .BLKW   1       ;DEFAULT TASK UIC
000014  H.IPS:   .BLKW   1       ;INITIAL PROCESSOR STATUS WORD (PS)
000016  H.IPC:   .BLKW   1       ;INITIAL PROGRAM COUNTER (PC)
000020  H.ISP:   .BLKW   1       ;INITIAL STACK POINTER (SP)
000022  H.ODVA:  .BLKW   1       ;ODT SST VECTOR ADDRESS
000024  H.ODVL:  .BLKW   1       ;ODT SST VECTOR LENGTH
000026  H.TKVA:  .BLKW   1       ;TASK SST VECTOR ADDRESS
000030  H.TKVL:  .BLKW   1       ;TASK SST VECTOR LENGTH
000032  H.PFVA:  .BLKW   1       ;POWER FAIL AST CONTROL BLOCK ADDRESS
000034  H.FPVA:  .BLKW   1       ;FLOATING POINT AST CONTROL BLOCK ADDRESS
000036  H.RCVA:  .BLKW   1       ;RECIEVE AST CONTROL BLOCK ADDRESS
000040  H.EFSV:  .BLKW   1       ;EVENT FLAG ADDRESS SAVE ADDRESS
000042  H.FPSA:  .BLKW   1       ;POINTER TO FLOATING POINT/EAE SAVE AREA
000044  H.WND:   .BLKW   1       ;POINTER TO NUMBER OF WINDOW BLOCKS
000046  H.DSW:   .BLKW   1       ;TASK DIRECTIVE STATUS WORD
000050  H.FCS:   .BLKW   1       ;FCS IMPURE POINTER
000052  H.FORT:  .BLKW   1       ;FORTRAN IMPURE POINTER
000054  H.OVLY:  .BLKW   1       ;OVERLAY IMPURE POINTER
000056  H.VEXT:  .BLKW   1       ;WORK AREA EXTENSION VECTOR POINTER
000060  H.SPRI:  .BLKB   1       ;PRIORITY DIFFERENCE FOR SWAPPING
000061  H.NML:   .BLKB   1       ;NETWORK MAILBOX LUN
000062  H.RRVA:  .BLKW   1       ;RECEIVE BY REFERENCE AST CONTROL BLOCK ADDRESS
000064  H.X25:   .BLKB   1       ;FOR USE BY X.25 SOFTWARE
000065           .BLKB   1       ;FIVE RESERVED BYTES
000066           .BLKW   2       ;
000072  H.GARD:  .BLKW   1       ;POINTER TO HEADER GUARD WORD
000074  H.NLUN:  .BLKW   1       ;NUMBER OF LUN'S
000076  H.LUN:   .BLKW   2       ;START OF LOGICAL UNIT TABLE

        ;
        ; LENGTH OF FLOATING POINT SAVE AREA
        ;
        H.FPSL=25.*2            ;


        ;
        ; WINDOW BLOCK OFFSETS
        ;
        .=0
```

HDRDF$ (Cont.)

```
000000  W.BPCB: .BLKW   1       ;PARTITION CONTROL BLOCK ADDRESS
000002  W.BLVR: .BLKW   1       ;LOW VIRTUAL ADDRESS LIMIT
000004  W.BHVR: .BLKW   1       ;HIGH VIRTUAL ADDRESS LIMIT
000006  W.BATT: .BLKW   1       ;ADDRESS OF ATTACHMENT DESCRIPTOR
000010  W.BSIZ: .BLKW   1       ;SIZE OF WINDOW IN 32W BLOCKS
000012  W.BOFF: .BLKW   1       ;PHYSICAL MEMORY OFFSET IN 32W BLOCKS
000014  W.BFPD: .BLKB   1       ;FIRST PDR ADDRESS
000015  W.BNPD: .BLKB   1       ;NUMBER OF PDR'S TO MAP
000016  W.BLPD: .BLKW   1       ;CONTENTS OF LAST PDR

000020  W.BLGH:                 ;LENGTH OF WINDOW DESCRIPTOR

                .PSECT
```

HWDDF$

```
        HWDDF$

;
; HARDWARE REGISTER ADDRESSES AND STATUS CODES
;
MPCSR=177746            ;ADDRESS OF PDP-11/70 MEMORY PARITY REGISTER
MPAR=172100             ;ADDRESS OF FIRST MEMORY PARITY REGISTER
PIRQ=177772             ;PROGRAMMED INTERRUPT REQUEST REGISTER
PR0=0                   ;PROCESSOR PRIORITY 0
PR1=40                  ;PROCESSOR PRIORITY 1
PR4=200                 ;PROCESSOR PRIORITY 4
PR5=240                 ;PROCESSOR PRIORITY 5
PR6=300                 ;PROCESSOR PRIORITY 6
PR7=340                 ;PROCESSOR PRIORITY 7
PS=177776               ;PROCESSOR STATUS WORD
SWR=177570              ;CONSOLE SWITCH AND DISPLAY REGISTER
TPS=177564              ;CONSOLE TERMINAL PRINTER STATUS REGISTER


;
; EXTENDED ARITHMETIC ELEMENT REGISTERS
;
        .IF DF E$$EAE

AC=177302               ;ACCUMULATOR
MQ=177304               ;MULTIPLIER-QUOTIENT
SC=177310               ;SHIFT COUNT

        .ENDC ;E$$EAE


;
; MEMORY MANAGEMENT HARDWARE REGISTERS AND STATUS CODES
;
        .IF DF M$$MGE

KDSAR0=172360           ;KERNEL D PAR 0
KDSDR0=172320           ;KERNEL D PDR 0
KISAR0=172340           ;KERNEL I PAR 0
KINAR0=KISAR0           ;KERNEL I PAR 0
KISAR5=172352           ;KERNEL I PAR 5
KINAR5=KISAR5           ;KERNEL I PAR 5
KISAR6=172354           ;KERNEL I PAR 6
KINAR6=KISAR6           ;KERNEL I PAR 6
KISAR7=172356           ;KERNEL I PAR 7
KINAR7=KISAR7           ;KERNEL I PAR 7
KISDR0=172300           ;KERNEL I PDR 0
KISDR6=172314           ;KERNEL I PDR 6
KISDR7=172316           ;KERNEL I PAR 7
SISDR0=172200           ;SUPERVISOR I PDR 0
UDSAR0=177660           ;USER D PAR 0
UDSDR0=177620           ;USER D PDR 0
UISAR0=177640           ;USER I PAR 0
UISAR4=177650           ;USER I PAR 4
UISAR5=177652           ;USER I PAR 5
UISAR6=177654           ;USER I PAR 6
UISAR7=177656           ;USER I PAR 7
UISDR0=177600           ;USER I PDR 0
UISDR4=177610           ;USER I PDR 4
```

HWDDF$ (Cont.)

```
UISDR5=177612           ;USER I PDR 5
UISDR6=177614           ;USER I PDR 6
UISDR7=177616           ;USER I PDR 7
UBMPR=170200            ;UNIBUS MAPPING REGISTER 0
CMODE=140000            ;CURRENT MODE FIELD OF PS WORD

        .IFTF ;M$$MGE

PMODE=30000             ;PREVIOUS MODE FIELD OF PS WORD

        .IFT  ;M$$MGE

SR0=177572              ;SEGMENT STATUS REGISTER 0
SR3=172516              ;SEGMENT STATUS REGISTER 3

        .ENDC ;M$$MGE


;
; FEATURE SYMBOL DEFINITIONS
;
FE.EXT=1                ;22-BIT EXTENDED MEMORY SUPPORT
FE.MUP=2                ;MULTI-USER PROTECTION SUPPORT
FE.EXV=4                ;EXECUTIVE IS SUPPORTED TO 20K
FE.DRV=10               ;LOADABLE DRIVER SUPPORT
FE.PLA=20               ;PLAS SUPPORT
FE.CAL=40               ;DYNAMIC CHECKPOINT SPACE ALLOCATION
FE.PKT=100              ;PREALLOCATION OF I/O PACKETS
FE.EXP=200              ;EXTEND TASK DIRECTIVE SUPPORTED
FE.LSI=400              ;PROCESSOR IS AN LSI-11
FE.OFF=1000             ;PARENT OFFSPRING TASKING SUPPORTED
FE.FDT=2000             ;FULL DUPLEX TERMINAL DRIVER
FE.X25=4000             ;X.25 COM EXECUTIVE LOADED (1=YES)
FE.DYM=10000            ;DYNAMIC MEMORY ALLOCATION SUPPORTED
FE.CEX=20000            ;COM EXEC IS LOADED
FE.MXT=40000            ;MCR EXIT AFTER EACH COMMAND MODE
FE.NLG=100000           ;LOGINS DISABLED - MULTI-USER SUPPORT


;
; SECOND FEATURE MASK SYMBOL DEFINITIONS
;
F2.DAS=1                ;KERNEL DATA SPACE      (M-PLUS ONLY)
F2.LIB=2                ;SUPERVISOR MODE LIBRARIES      "
F2.MP=4                 ;MULTIPROCESSING SUPPORT        "
F2.EVT=10               ;EVENT TRACE SUPPORT            "
F2.ACN=20               ;CPU ACCOUNTING                 "
F2.SDW=40               ;SHADOW RECORDING               "
F2.POL=100              ;SECONDARY POOLS                "
F2.WND=200              ;SECONDARY POOL FILE WINDOWS    "
F2.DPR=400              ;DIRECTIVE PARTITION SUPPORT
F2.IRR=1000             ;INSTALL, REQUEST AND REMOVE SUPPORT
F2.GGF=2000             ;GROUP GLOBAL EVENT FLAG SUPPORT
F2.RAS=4000             ;RECEIVE/SEND DATA PACKET SUPPORT
```

HWDDF$ (Cont.)

```
F2.AHR=10000            ;ALT. HEADER REFRESH AREAS SUPPORTED
F2.RBN=20000            ;ROUND ROBIN SCHEDULING SUPPORT
F2.SWP=40000            ;EXECUTIVE LEVEL DISK SWAPPING SUPPORT
F2.STP=100000           ;EVENT FLAG MASK IS IN THE TCB (1=YES)


;
; THIRD FEATURE MASK SYMBOL DEFINITIONS
;
F3.CRA=1                ;SPONTANEOUS CRASH (1=YES)
F3.NWK=2                ;SYSTEM HAS NETWORK SUPPORT
F3.EIS=4                ;SYSTEM REQUIRES THE EXTENDED INST. SET
F3.STM=10               ;SYSTEM HAS SET SYSTEM TIME DIRECTIVE
F3.UDS=20               ;USER DATA SPACE (M-PLUS ONLY)
F3.PRO=40               ;PROTO TCBS OUT OF POOL   "
F3.XHR=100              ;EXTERNAL HEADER SUPPORT  "
F3.AST=200              ;SYSTEM HAS AST SUPPORT
F3.11S=400              ;SYSTEM IS RSX-11S
F3.CLI=1000             ;SYSTEM HAS MULTIPLE CLI SUPPORT
F3.TCM=2000             ;TERMINAL COMMON (M-PLUS ONLY)
F3.PMN=4000             ;POOL MONITORING SUPPORT
F3.WAT=10000            ;WATCHDOG TIMER SUPPORT
F3.RLK=20000            ;'RMS' RECORD LOCKING SUPPORT
F3.SHF=40000            ;MEMORY SHUFFLER SUPPORTED
;F3.RES=100000          ;RESERVED FOR FUTURE EXPANSION OF 11M


;
; HARDWARE FEATURE MASK SYMBOL DEFINITIONS
;
HF.UBM=1                ;SYSTEM HAS A UNIBUS MAP (1=YES)
HF.EIS=2                ;SYSTEM HAS EXTENDED INSTRUCTION SET
HF.CIS=200              ;SYSTEM HAS COMMERCIAL INSTRUCTION SET
HF.FPP=100000           ;SYSTEM SUPPORTS FLOATING POINT (1=NO)
```

ITBDF$

```
                ITBDF$  ,,SYSDEF

        ;
        ; INTERRUPT TRANSFER BLOCK (ITB) OFFSET DEFINITIONS
        ;
                .IF DF A$$TRP

                .MCALL  PKTDF$
                PKTDF$          ; DEFINE AST BLOCK OFFSETS

                .ENDC ;A$$TRP

                .ASECT
        .=0
000000  X.LNK:  .BLKW   1       ; LINK WORD FOR ITB LIST STARTING IN TCB
000002  X.JSR:  JSR     R5,@#0  ; CALL $INTSC
000006  X.PSW:  .BLKB   1       ; LOW BYTE OF PSW FOR ISR
000007          .BLKB   1       ; UNUSED
000010  X.ISR:  .BLKW   1       ; ISR ENTRY POINT (APR5 MAPPING)
000012  X.FORK:                 ; FORK BLOCK
000012          .BLKW   1       ; THREAD WORD
000014          .BLKW   1       ; FORK PC
000016          .BLKW   1       ; SAVED R5
000020          .BLKW   1       ; SAVED R4

                .IF DF M$$MGE

        X.REL:  .BLKW   1       ; RELOCATION BASE FOR APR5

                .ENDC ;M$$MGE

        X.DSI:  .BLKW   1       ; ADDRESS OF DIS.INT. ROUTINE
        X.TCB:  .BLKW   1       ; TCB ADDRESS OF OWNING TASK

                .IF NB SYSDEF

                .IF DF A$$TRP

                .BLKW   1       ; A.DQSR FOR AST BLOCK
        X.AST:  .BLKB   A.PRM   ; AST BLOCK

                .ENDC ;A$$TRP

        X.VEC:  .BLKW   1       ; VECTOR ADDRESS (IF AST SUPPORT,
                                ; THIS IS FIRST AND ONLY AST PARAMETER)
        X.VPC:  .BLKW   1       ; SAVED VECTOR PC
        X.LEN:                  ; LENGTH IN BYTES OF ITB

                .ENDC ;SYSDEF

                .PSECT
```

LCBDF$

```
                LCBDF$

        ;
        ; LOGICAL ASSIGNMENT CONTROL BLOCK
        ;
        ; THE LOGICAL ASSIGNMENT CONTROL BLOCK (LCB) IS USED TO ASSOCIATE A
        ; LOGICAL NAME WITH A PHYSICAL DEVICE UNIT.  LCB'S ARE LINKED TOGETHER
        ; TO FORM THE LOGICAL ASSIGNMENTS OF A SYSTEM.  ASSIGNMENTS MAY BE ON
        ; A SYSTEM WIDE OR LOCAL (TERMINAL) BASIS.
        ;
                .ASECT
        .=0
000000  L.LNK:  .BLKW   1       ;LINK TO NEXT LCB
000002  L.NAM:  .BLKW   1       ;LOGICAL NAME OF DEVICE
000004  L.UNIT: .BLKB   1       ;LOGICAL UNIT NUMBER
000005  L.TYPE: .BLKB   1       ;TYPE OF ENTRY (0=SYSTEM WIDE)
000006  L.UCB:  .BLKW   1       ;TI UCB ADDRESS
000010  L.ASG:  .BLKW   1       ;ASSIGNMENT UCB ADDRESS

000012  L.LGTH=.-L.LNK          ;LENGTH OF LCB

                .PSECT
```

MTADF$

```
                MTADF$

        ;
        ; ANSI MAGTAPE SPECIFIC DATA STRUCTURES
        ;
        ; VOLUME SET CONTROL BLOCK OFFSET DEFININTIONS (VSCB)
        ;
        ; VOLUME SET AND PROCESS CONTROL SECTION
        ;
                .ASECT
        .=0
000000  V.TCNT: .BLKW   1       ;TRANSACTION COUNT
000002  V.TYPE: .BLKB   1       ;VOLUME TYPE DESCRIPTOR
000003  V.VCHA: .BLKB   1       ;VOLUME CHARACTERISTICS
000004  V.LABL: .BLKB   12.     ;FILE SET ID (FIRST SIX BYTES)
000020  V.NXT:  .BLKW   1       ;PTR TO NEXT VSCB NODE
000022  V.MVL:  .BLKW   1       ;PTR TO MOUNTED VOL LIST
000024  V.UVL:  .BLKW   1       ;PTR TO UNMOUNTED VOL LIST
000026  V.ATL:  .BLKW   1       ;ATL ADDR OF ACCESSING TASK TCB IN RSX11M
000030  V.UCB:  .BLKW   1       ;ADDR OF CURRENT UCB OR PUD
000032  V.RVOL: .BLKB   1       ;CURRENT RELATIVE VOL #
000033  V.MOU:  .BLKB   1       ;MOUNT MODE BYTE
000034  V.TCHR: .BLKW   1       ;UINT CHAR. FOR ALL UNITS USED FOR VOL SET
000036  V.SEQN: .BLKW   1       ;CURRENT FILE SEQUENCE #
000040  V.SECN: .BLKW   1       ;CURRENT FILE SECTION #
000042  V.TPOS: .BLKB   1       ;POSITION OF TAPE IN TM'S TO NXT HDR1
000043  V.PSTA: .BLKB   1       ;PROCESS STATUS BYTE
000044  V.TIMO: .BLKW   1       ;BLOCKED PROCESS TIMEOUT COUNTER
000046  V.STAT: .BLKW   3       ;STATUS WORDS USED BY COMMAND EXECUTION MODULES
000054  V.TRTB: .BLKB   1       ;TRANSLATION CONTROL BYTE
000055  V.EFTV: .BLKB   1       ;FOR MAG TO RETURN IE.EOF, EOT, EOV


        ;
        ; LABEL DATA SECTION
        ;
000056  V.BLKL: .BLKW   1       ;BLOCK LENGTH
000060  V.RECL: .BLKW   1       ;RECORD LENGTH
000062  V.FNAM: .BLKW   3       ;FILE NAME
000070  V.FTYP: .BLKW   1       ;FILE TYPE
000072  V.FVER: .BLKW   1       ;FILE VERSION #
000074  V.CDAT: .BLKW   2       ;CREATION DATE
000100  V.EDAT: .BLKW   2       ;EXPRIATION DATE
000104  V.BLKC: .BLKW   2       ;BLOCK COUNT FOR FILE SECTION
000110  V.RTYP: .BLKB   1       ;RECORD TYPE
000111  V.FATT: .BLKB   1       ;FILE ATTRIBUTES FOR CARRIAGE CONTROL
000112          .BLKB   30.     ;REMAINDER OF FILE ATTRIBUTES


        ;
        ; NULL WINDOW SECTION
        ;
000150  V.WIND: .BLKW   4.      ;NULL WINDOW
000160  V.MST2: .BLKW   1       ;MAGTAPE STATUS BITS
000162  V.FABY: .BLKB   1       ;FILE ACCESSIBILITY BYTE (HDR1)
000163          .BLKB   1       ;SPARE
000164  V.ANSN: .BLKB   17.     ;ANSI 17 CHARACTER FILE NAME
000205  V.BOFF: .BLKB   1.      ;BUFFER OFFSET
```

MTADF$ (Cont.)

```
000206  V.DENS: .BLKB   1.      ;REQUESTED UNIT DENSITY
000207  V.DRAT: .BLKB   1.      ;DEFAULT RECORD ATTRIBUTES
000210  V.DBLK: .BLKW   1.      ;DEFAULT BLOCK SIZE
000212  V.DREC: .BLKW   1.      ;DEFAULT RECORD SIZE

000214  S.VSCB=.                ;SIZE OF VSCB

                .PSECT

        ;
        ; DEFINE OFFSETS INTO NULL WINDOW SECTION
        ;
                .ASECT
        .=0
000000  W.CTL:  .BLKW   1       ;CONTROL WORD IN WINDOW
        V.WINC=V.WIND+W.CTL     ;CNTRL WORD IN NULL WINDOW
                                ;RELATIVE TO THE VSCB

                .PSECT

        ;
        ; MOUNTED VOLUME LIST OFFSET DEFININTIONS (MVL)
        ;
                .ASECT
        .=0

                .IF DF R$$11M

000000  M.NXT:  .BLKW   1       ;PTR TO NXT MVL NODE (11M)

                .ENDC ;R$$11M

000002  M.UIC:  .BLKW   1       ;OWNER UIC FROM RVOL #1
000004  M.CH:   .BLKW   1       ;U.CH/U.VP (11D)
000006  M.PROT: .BLKW   1       ;PROTECTION U.AR IN 11D

                .IF NDF R$$11M

                .BLKW   2       ;ACP WORDS 11D
        M.NXT:  .BLKW   1       ;PTR TO NEXT MVL NODE (11D)

                .ENDC ;R$$11M

000010  M.RVOL: .BLKB   1       ;RELATIVE VOL # OF MOUNTED VOLUME
000011  M.STAT: .BLKB   1       ;VOLUME STATUS
000012  M.VIDP: .BLKW   1       ;VOLUME ID POINTER
000014  M.UCB:  .BLKW   1       ;ADDR OF ASSOC UCB OR PUD

000016  S.MVL=.                 ;SIZE OF MVL NODE

                .PSECT

        ;
        ; UNMOUNTED VOLUME AND VOLUME  LIST OFFSET DEFINITIONS (UVL)
        ;
                .ASECT
        .=0
```

MTADF$ (Cont.)

```
000000  L.NXT:  .BLKW   1       ;PTR TO NXT UVL NODE
000002  L.VOL1: .BLKB   1       ;REL VOL # OF 1'ST VOL IN NODE
000003  L.VOL2: .BLKB   1       ;REL VOL # OF 2'ND VOL IN NODE
000004  L.VID1: .BLKB   6       ;VOL ID OF 1'ST VOL IN NODE
000012  L.VID2: .BLKB   6       ;VOL ID OF 2'ND VOL IN NODE

000020  S.UVL=.                 ;SIZE OF UVL NODE

        .PSECT

;
; SYSTEM DATA STRUCTURE CONTENT VALUES
;

;
; VSCB VALUES
;
; V.MOU VALUES
;
VM.OLD  =       200     ;OLD .FL300 VOLUME -- VM.BYP WILL ALSO BE SET
VM.BYP  =       100     ;BYPASS LABEL PROCESSING
VM.ULB  =       40      ;UNLABELED TAPE
VM.FSC  =       20      ;OVERRIDE FILE SET ID CHECK
VM.EXC  =       10      ;OVERRIDE EXPRIATION DATE CHECK


;
; V.MST2 VALUES
;
V2.INI  =       1       ;MAG WANTS US TO INITIALIZE NEXT OUTPUT
V2.XH2  =       2       ;THIS FILE HAS NO HDR2, DON'T WRITE EOF2
V2.XH3  =       4       ;THIS FILE HAS NO HDR3, DON'T WRITE EOF3
V2.NH3  =       10      ;DON'T WRITE HDR3/EOX3 LABELS
V2.OAC  =       20      ;OVERRIDE FILE/VOLUME ACCESSIBILITY


;
; V.PSTA VALUES - UNBLOCKED TRANSITION STATE
;
VP.RM   =       2       ;READ DATA MODE
VP.WM   =       4       ;WRITE DATA MODE
VP.UCM  =       6       ;UNLABELLED CREATE POSITIONING MODE
VP.SM   =       10      ;SEARCH MODE
VP.MOU  =       20      ;MOUNT MODE
VP.RWD  =       40      ;REWIND OR VOL VERIFICATION WAIT
VP.VFY  =       VP.RWD
VP.POS  =       100     ;PROCESS IN POSITIONING MODE
                        ;(MULTI-SECTION FILE)


;
; BLOCKED STATE = -(UNBLOCKED TRANSITION STATE VALUES)
;
; PROCESS TIMED OUT BIT 0 = 1
;
VP.TO=1
```

MTADF$ (Cont.)

```
;
; NULL WINDOW CONTROL BIT DEFINITIONS
;
WI.RDV  =       400     ;ACCESSED FOR READ
WI.WRV  =       1000    ;ACCESSED FOR WRITE
WI.EXT  =       2000    ;ACCESSED FOR EXTEND
WI.LCK  =       4000    ;LOCKED


;
; MVL VALUES IN THE M.STAT FIELD
;
MS.VER  =       200     ;VOL ID NOT VERIFIED
MS.RID  =       1       ;VOL ID TO BE READ NOT CHECKED
MS.NMO  =       2       ;MOUNT MESSAGE NOT GIVEN YET
MS.TMO  =       4       ;ONE TIMEOUT ALREADY EXPRIED
MS.EXP  =       10      ;EXPIRATION DATE MESSAGE GIVEN


;
; MISC BITS USED IN MOUNT (STORED IN V.STS)
;
MO.OVR  =       1       ;OVER RIDE VOL NAME SWITCH
MO.UIC  =       2       ;EXPLICIT UIC GIVEN
MO.PRO  =       4       ;EXPLICIT PROTECTION GIVEN
MO.160  =       10      ;1600 BPI SPECIFIED
```

PCBDF$

```
                PCBDF$  ,,SYSDEF

        ;
        ; PARTITION CONTROL BLOCK OFFSET DEFINITIONS
        ;
                .ASECT
        .=0
000000  P.LNK:  .BLKW   1       ;LINK TO NEXT PARTITION PCB
000002  P.PRI:  .BLKB   1       ;PRIORITY OF PARTITION
000003  P.IOC:  .BLKB   1       ;I/O + I/O STATUS BLOCK COUNT
000004  P.NAM:  .BLKW   2       ;PARTITION NAME IN RAD50
000010  P.SUB:  .BLKW   1       ;POINTER TO NEXT SUBPARTITION
000012  P.MAIN: .BLKW   1       ;POINTER TO MAIN PARTITION

                .IF NB  SYSDEF

                .IF NDF M$$MGE

        P.HDR:                  ;POINTER TO HEADER CONTROL BLOCK

                .ENDC   ;M$$MGE

                .IFTF

000014  P.REL:  .BLKW   1       ;STARTING PHYSICAL ADDRESS OF PARTITION
000016  P.BLKS:
000016  P.SIZE: .BLKW   1       ;SIZE OF PARTITION IN:
                                ;   UNMAPPED SYSTEMS - BYTES
                                ;   MAPPED SYSTEMS   - 32 WORD BLOCKS
000020  P.WAIT: .BLKW   1       ;PARTITION WAIT QUEUE LISTHEAD (2 WORDS)
000022  P.SWSZ: .BLKW   1       ;PARTITION SWAP SIZE (SYSTEM ONLY)
000024  P.BUSY: .BLKB   2       ;PARTITION BUSY FLAGS
000026  P.OWN:
000026  P.TCB:  .BLKW   1       ;TCB ADDRESS OF OWNER TASK
000030  P.STAT: .BLKW   1       ;PARTITION STATUS FLAGS

                .IFT

                .IF DF  M$$MGE

        P.HDR:  .BLKW   1       ;POINTER TO HEADER CONTROL BLOCK

                .ENDC   ;M$$MGE

        P.PRO:  .BLKW   1       ;PROTECTION WORD [DEWR,DEWR,DEWR,DEWR]
        P.ATT:  .BLKW   2       ;ATTACHMENT DESCRIPTOR LISTHEAD

                .IF NDF P$$LAS

        P.LGTH=P.PRO            ;LENGTH OF PARTITION CONTROL BLOCK

                .IFF

        P.LGTH=.                ;LENGTH OF PARTITION CONTROL BLOCK

                .ENDC   ;P$$LAS

                .IFF

                .PSECT
```

PCBDF$ (Cont.)

```
        ;
        ; PARTITION STATUS WORD BIT DEFINITIONS
        ;
        PS.OUT=100000           ;PARTITION IS OUT OF MEMORY(1=YES)
        PS.CKP=40000            ;PARTITION CHECKPOINT IN PROGRESS (1=YES)
        PS.CKR=20000            ;PARTITION CHECKPOINT IS REQUESTED (1=YES)
        PS.CHK=10000            ;PARTITION IS NOT CHECKPOINTABLE (1=YES)
        PS.FXD=4000             ;PARTITION IS FIXED (1=YES)
        PS.PER=2000             ;PARITY ERROR IN PARTITION (1=YES)
        PS.LIO=1000             ;MARKED BY SHUFFLER FOR LONG I/O (1=YES)
        PS.NSF=400              ;PARTITION IS NOT SHUFFLEABLE (1=YES)
        PS.COM=200              ;LIBRARY OR COMMON BLOCK (1=YES)
        PS.PIC=100              ;POSITION INDEPENDENT LIBRARY OR COMMON (1=YES)
        PS.SYS=40               ;SYSTEM CONTROLLED PARTITION (1=YES)
        PS.DRV=20               ;DRIVER IS LOADED IN PARTITION (1=YES)
        PS.DEL=10               ;PARTITION SHOULD BE DELETED WHEN NOT ATTACHED
                                ;(1=YES)
        PS.APR=7                ;STARTING APR NUMBER MASK


        ;
        ; ATTACHMENT DESCRIPTOR OFFSETS
        ;
                .ASECT
        .=0
000000  A.PCBL: .BLKW   1       ;PCB ATTACHMENT QUEUE THREAD WORD
000002  A.PRI:  .BLKB   1       ;PRIORITY OF ATTACHED TASK
000003  A.IOC:  .BLKB   1       ;I/O COUNT THROUGH THIS DESCRIPTOR
000004  A.TCB:  .BLKW   1       ;TCB ADDRESS OF ATTACHED TASK
000006  A.TCBL: .BLKW   1       ;TCB ATTACHMENT QUEUE THREAD WORD
000010  A.STAT: .BLKB   1       ;STATUS BYTE
000011  A.MPCT: .BLKB   1       ;MAPPING COUNT OF TASK THRU THIS DESCRIPTOR
000012  A.PCB:  .BLKW   1       ;PCB ADDRESS OF ATTACHED TASK

000014  A.LGTH=.                ;LENGTH OF ATTACHMENT DESCRIPTOR


        ;
        ; ATTACHMENT DESCRIPTOR STATUS BYTE BIT DEFINITIONS
        ;
                .PSECT
        AS.DEL=10               ;TASK HAS DELETE ACCESS (1=YES)
        AS.EXT=4                ;TASK HAS EXTEND ACCESS (1=YES)
        AS.WRT=2                ;TASK HAS WRITE ACCESS (1=YES)
        AS.RED=1                ;TASK HAS READ ACCESS (1=YES)

                .ENDC   ;SYSDEF
```

```
                PKTDF$

        ;
        ; ASYNCHRONOUS SYSTEM TRAP CONTROL BLOCK OFFSET DEFINITIONS
        ;
        ; SOME POSITIONAL DEPENDENCIES BETWEEN THE OCB AND THE AST CONTROL
        ; BLOCK ARE RELIED UPON IN THE ROUTINE $FINXT IN THE MODULE SYSXT.
        ;
                .ASECT
        .=177774
177774  A.KSR5: .BLKW   1       ;SUBROUTINE KISAR5 BIAS (A.CBL=0)
177776  A.DQSR: .BLKW   1       ;DEQUEUE SUBROUTINE ADDRESS (A.CBL=0)
000000          .BLKW   1       ;AST QUEUE THREAD WORD
000002  A.CBL:  .BLKW   1       ;LENGTH OF CONTROL BLOCK IN BYTES
                                ;IF A.CBL = 0, THE AST CONTROL BLOCK IS
                                ;TO BE DEALLOCATED BY THE DEQUEUE SUBROUTINE
                                ;POINTED TO BY A.DQSR MAPPED VIA APR 5
                                ;VALUE A.KSR5. THIS IS CURRENTLY USED ONLY
                                ;BY THE FULL DUPLEX TERMINAL DRIVER FOR
                                ;UNSOLICITED CHARACTER ASTS.
                                ;IF THE LOW BYTE OF A.CBL = 0, AND THE
                                ;HIGH BYTE IS NOT = 0, THE AST CONTROL BLOCK
                                ;IS A SPECIFIABLE AST, WITH LENGTH, C.LGTH.
                                ;IF THE HIGH BYTE OF A.CBL = 0 AND THE LOW
                                ;BYTE > 0, THEN THE LOW BYTE IS THE LENGTH
                                ;OF THE AST CONTROL BLOCK.  IF THE HIGH BYTE
                                ;OF A.CBL = 0 AND THE LOW BYTE IS NEGATIVE,
                                ;THIS IS A KERNEL AST. SEE BELOW FOR
                                ;A DESCRIPTION OF A.CBL FOR KERNEL ASTS.
000004  A.BYT:  .BLKW   1       ;NUMBER OF BYTES TO ALLOCATE ON TASK STACK
000006  A.AST:  .BLKW   1       ;AST TRAP ADDRESS
000010  A.NPR:  .BLKW   1       ;NUMBER OF AST PARAMETERS
000012  A.PRM:  .BLKW   1       ;FIRST AST PARAMETER


        ;
        ; THE SPECIFIABLE AST CODES MUST NOT BE 0.
        ;
        AS.FPA=1                ;CODE FOR FLOATING POINT AST
        AS.RCA=2                ;CODE FOR RECEIVE DATA AST
        AS.RRA=3                ;CODE FOR RECEIVE BY REFERENCE AST
        AS.PFA=4                ;CODE FOR POWERFAIL AST
        AS.REA=5                ;CODE FOR REQUESTED EXIT (ABORT) AST
        AS.CAA=6                ;CODE FOR COMMAND ARRIVAL AST FOR CLIS


        ;
        ; ABORTER SUBCODES FOR ABORT AST (AS.REA) TO BE RETURNED ON USER'S
        ; STACK
        ;
        AB.NPV=1                ;ABORTER IS NONPRIVILEGED (1=YES)
        AB.TYP=2                ;ABORT FROM DIRECTIVE (0=YES)
                                ;ABORT FROM CLI COMMAND (1=YES)
```

PKTDF$ (Cont.)

```
                ;
                ; KERNEL AST CONTROL BLOCK DEFINITIONS
                ;
                ; THE LOW BYTE OF A.CBL FOR A KERNEL AST HAS THE FOLLOWING FORMAT:
                ;
                ;       BIT #200 ALWAYS EQUALS 1
                ;       BIT #100 IS ZERO IF $SGFIN MUST BE CALLED DURING AST PROCESSING
                ;       THE REMAINING SIX BITS ARE USED AS THE KERNEL AST TYPE FIELD
                ;
                ; BECAUSE THERE ARE ONLY 6 BITS AVAILABLE TO THE KERNEL AST
                ; INDEX FIELD, ONLY (2**6)-1 KERNEL AST TYPES ARE POSSIBLE.
                ;
                AK.BUF=200              ;BUFFERED I/O COMPLETION AST
                AK.OCB=201              ;OFFSPRING EXIT
                AK.GBI=202              ;GENERAL BUFFERED I/O AST
                AK.GGF=303              ;GROUP GLOBAL RUNDOWN AST


                ;
                ; OFFSPRING CONTROL BLOCK DEFINITIONS
                ;
                ; SOME POSITIONAL DEPENDENCIES EXIST BETWEEN THE OCB AND THE AST
                ; CONTROL BLOCK IN ROUTINE $FINXT IN MODULE SYSXT
                ;
                .=0
000000  O.LNK:  .BLKW   1       ;OCB LINK WORD
000002  O.MCRL: .BLKW   1       ;ADDRESS OF MCR COMMAND LINE
000004  O.PTCB: .BLKW   1       ;PARENT TCB ADDRESS
000006  O.AST:  .BLKW   1       ;EXIT AST ADDRESS
000010  O.EFN:  .BLKW   1       ;EXIT EVENT FLAG
000012  O.ESB:  .BLKW   1       ;EXIT STATUS BLOCK VIRTUAL ADDRESS
000014  O.STAT: .BLKW   8.      ;EXIT STATUS BUFFER

000034  O.LGTH=.                ;LENGTH OF OCB


                ;
                ; I/O PACKET OFFSET DEFINITIONS
                ;
                        .ASECT
                .=0
000000  I.LNK:  .BLKW   1       ;I/O QUEUE THREAD WORD
000002  I.PRI:  .BLKB   1       ;REQUEST PRIORITY
000003  I.EFN:  .BLKB   1       ;EVENT FLAG NUMBER
000004  I.TCB:  .BLKW   1       ;TCB ADDRESS OF REQUESTOR
000006  I.LN2:  .BLKW   1       ;POINTER TO SECOND LUN WORD
000010  I.UCB:  .BLKW   1       ;POINTER TO UNIT CONTROL BLOCK
000012  I.FCN:  .BLKW   1       ;I/O FUNCTION CODE
000014  I.IOSB: .BLKW   1       ;VIRTUAL ADDRESS OF I/O STATUS BLOCK
000016          .BLKW   1       ;I/O STATUS BLOCK RELOCATON BIAS
000020          .BLKW   1       ;I/O STATUS BLOCK ADDRESS
000022  I.AST:  .BLKW   1       ;AST SERVICE ROUTINE ADDRESS
000024  I.PRM:  .BLKW   1       ;RESERVED FOR MAPPING PARAMETER #1
000026          .BLKW   6       ;PARAMETERS 1 TO 6
000042          .BLKW   1       ;USER MODE DIAGNOSTIC PARAMETER WORD
```

PKTDF$ (Cont.)

```
000044  I.ATTL=.                ;MINIMUM LENGTH OF I/O PACKET (USED BY
                                ;FILE SYSTEM TO CALCULATE MAXIMUM
                                ;NUMBER OF ATTRIBUTES)
000044  I.LGTH=.                ;LENGTH OF I/O REQUEST CONTROL BLOCK


        ;
        ; GROUP GLOBAL EVENT FLAG CONTROL BLOCK OFFSETS
        ;
        .=0
000000  G.LNK:  .BLKW   1       ;LINK WORD
000002  G.GRP:  .BLKB   1       ;GROUP NUMBER
000003  G.STAT: .BLKB   1       ;STATUS BYTE
000004  G.CNT:  .BLKW   1       ;ACCESS COUNT
000006  G.EFLG: .BLKW   2       ;EVENT FLAGS

000012  G.LGTH=.                ;LENGTH OF GROUP GLOBAL CONTROL BLOCK


        ;
        ; STATUS BYTE DEFINITIONS
        ;
        GS.DEL=1                ;GROUP MARKED FOR DELETE


        ;
        ; EXECUTIVE POOL MONITOR CONTROL FLAGS
        ;

        ;
        ; $POLST IS THE SYNCHRONIZATION WORD BETWEEN THE EXEC AND POOL MONITOR
        ;
        PC.HIH=1                ;HIGH POOL LIMIT CROSSED (1=YES)
        PC.LOW=2                ;LOW POOL LIMIT CROSSED (1=YES)
        PC.ALF=4                ;FAILED TO ALLOCATE LARGE BLOCK (1=YES)
        PC.XAF=10               ;FAILED TO ALLOCATE SMALL BLOCK (1=YES)
        PC.XIT=200              ;FORCE POOL MONITOR TASK TO EXIT
        PC.NRM=PC.HIH*400       ;POOL TASK INHIBIT BIT FOR HIGH POOL
        PC.ALM=PC.LOW*400       ;POOL TASK INHIBIT BIT FOR LOW POOL

        ;
        ; $POLFL IS THE POOL USAGE CONTROL WORD
        ;
        PF.INS=40               ;REJECT NONPRIVILEGED INS/RUN/REM
        PF.LOG=100              ;LOGINS ARE DISABLED
        PF.REQ=200              ;STALL REQUEST OF NONPRIV. TASKS
        PF.ALL=177777           ;TAKE ALL POSSIBLE ACTIONS TO SAVE POOL


        ;
        ; CLI PARSER BLOCK (CPB) DEFINITIONS
        ;
        .=0
```

PKTDF$ (Cont.)

```
000000  C.PTCB: .BLKW   1       ;ADDRESS OF CLI'S TCB
000002  C.PNAM: .BLKW   2       ;CLI NAME
000006  C.PSTS: .BLKW   1       ;STATUS MASK
000010  C.PDPL: .BLKB   1       ;LENGTH OF DEFAULT PROMPT
000011  C.PCPL: .BLKB   1       ;LENGTH OF CNTRL/C PROMPT
000012  C.PRMT:                 ;START OF ASCII PROMPT STRINGS
                                ;THE DEFAULT STRING IS CONCANTENATED
                                ;WITH THE ^C STRING

        ;
        ; STATUS BIT DEFINITIONS
        ;
        CP.NUL=1                ;PASS EMPTY COMMAND LINES TO CLI
        CP.MSG=2                ;CLI DESIRES SYSTEM MESSAGES
        CP.LGO=4                ;CLI WANTS COMMANDS FROM LOGGED OFF TTYS
        CP.DSB=10               ;CLI IS DISABLED
        CP.PRV=20               ;USER MUST BE PRIV TO SET TTY TO THIS CLI
        CP.SGL=40               ;DON'T HANDLE CONTINUATIONS (M-PLUS ONLY)
        CP.NIO=100              ;MCR..., HEL, BYE DO NO I/O TO TTY
                                ;HEL, BYE ALSO DO NOT SET CLI ETC.
        CP.RST=200              ;ABILITY TO SET TO THIS CLI IS RESTRICTED
                                ;TO THE CLI ITSELF
        CP.EXT=400              ;PASS TASK EXIT PROMPT REQUESTS TO CLI


        ;
        ; IDENTIFIER CODES FOR SYSTEM TO CLI MESSAGES.
        ;
        ; CODES 0 - 127. ARE RESERVED FOR USE BY DIGITAL,
        ; CODES 128. - 255. ARE RESERVED FOR USE BY CUSTOMERS
        ;
        CM.INE=1                ;CLI INITIALIZED ENABLED
        CM.IND=2                ;CLI INITIALIZED DISABLED
        CM.CEN=3                ;CLI ENABLED
        CM.CDS=4                ;CLI DISABLED
        CM.ELM=5                ;CLI BEING ELIMINATED
        CM.EXT=6                ;CLI MUST EXIT IMMEDIATELY
        CM.LKT=7                ;NEW TERMINAL LINKED TO CLI
        CM.RMT=8.               ;TERMINAL REMOVED FROM CLI
        CM.MSG=9.               ;GENERAL MESSAGE TO CLI


        ;
        ; ANCILLARY CONTROL BLOCK (ACB) DEFINITIONS
        ;
        .=0
000000  A.REL:  .BLKW   1       ;ACD RELOCATION BIAS
000002  A.DIS:  .BLKW   1       ;ACD DISPATCH TABLE POINTER
000004  A.MAS:  .BLKW   1       ;ACD FUNCTION MASK
000006  A.NUM:  .BLKB   1       ;ACD IDENTIFICATION NUMBER
000007          .BLKB   1       ;RESERVED
000010  A.LIN:  .BLKW   1       ;ACD LINK WORD
000012  A.ACC:  .BLKB   1       ;ACD ACCESS COUNT
000013  A.STA:  .BLKB   1       ;ACD STATUS BYTE

000014  A.LEN1=.                ;LENGTH OF PROTOTYPE ACB
```

PKTDF$ (Cont.)

```
                .=A.LIN                 ;FULL ACB OVERLAPS PROTOTYPE ACB
000010  A.IMAP: .BLKW   1               ;ACD INTERRUPT BUFFER RELOCATION BIAS
000012  A.IBUF: .BLKW   1               ;ACD INTERRUPT BUFFER ADDRESS
000014  A.ILEN: .BLKW   1               ;ACD INTERRUPT BUFFER LENGTH
000016  A.SMAP: .BLKW   1               ;ACD SYSTEM STATE BUFFER RELOCATION BIAS
000020  A.SBUF: .BLKW   1               ;ACD SYSTEM STATE BUFFER ADDRESS
000022  A.SLEN: .BLKW   1               ;ACD SYSTEM STATE BUFFER LENGTH
000024  A.IOS:  .BLKW   2               ;ACD I/O STATUS
000030  A.RES:  .BLKW   1               ;RESERVED FOR USE BY THE ACD

000032  A.LEN2=.                        ;LENGTH OF FULL ACB


                ;
                ; DEFINE THE FLAG VALUES IN THE OFFSET U.AFLG
                ;
                UA.ACC=1                ;ACCEPT THIS CHARACTER
                UA.PRO=2                ;PROCESS THIS CHARACTER
                UA.ECH=4                ;ECHO THIS CHARACTER
                UA.TYP=10               ;FORCE THIS CHARACTER INTO TYPEAHEAD
                UA.SPE=20               ;THIS CHARACTER HAS A SPECIAL ECHO
                UA.PUT=40               ;PUT THIS CHARACTER IN THE INPUT BUFFER
                UA.CAL=100              ;CALL THE ACD BACK AFTER THE TRANSFER
                UA.COM=200              ;COMPLETE THE INPUT REQUEST
                UA.ALL=400              ;ALLOW PROCESSING OF THIS I/O REQUEST
                UA.TRA=1000             ;TRANSFER CHARS. WHEN I/O COMPLETES


                ;
                ; DEFINE THE ACD ENTRY POINTS (OFFSETS INTO THE DISPATCH TABLE)
                ;
                .=0
000000  A.ACCE: .BLKW   1               ;I/O REQUEST ACCEPTANCE ENTRY POINT
000002  A.DEQU: .BLKW   1               ;I/O REQUEST DEQUEUE ENTRY POINT
000004  A.POWE: .BLKW   1               ;POWER FAILURE ENTRY POINT
000006  A.INPU: .BLKW   1               ;INPUT COMPLETION ENTRY POINT
000010  A.OUTP: .BLKW   1               ;OUTPUT COMPLETION ENTRY POINT
000012  A.CONN: .BLKW   1               ;CONNECTION ENTRY POINT
000014  A.DISC: .BLKW   1               ;DISCONNECTION ENTRY POINT
000016  A.RECE: .BLKW   1               ;INPUT CHARACTER RECEPTION ENTRY POINT
000020  A.PROC: .BLKW   1               ;INPUT CHARACTER PROCESSING ENTRY POINT
000022  A.CALL: .BLKW   1               ;CALL ACD BACK AFTER TRANSFER ENTRY POINT


                ;
                ; DEFINE THE STATUS BITS IN A.STA OF THE PROTOTYPE ACB
                ;
                AS.DEL=1                ;ACD IS MARKED FOR DELETE
                AS.DIS=2                ;ACD IS DISABLED

                        .PSECT
```

SCBDF$

```
                SCBDF$  ,,SYSDEF

        ;
        ; STATUS CONTROL BLOCK
        ;
        ; THE STATUS CONTROL BLOCK (SCB) DEFINES THE STATUS OF A DEVICE
        ; CONTROLLER.  THERE IS ONE SCB FOR EACH CONTROLLER IN A SYSTEM.
        ; THE SCB IS POINTED TO BY UNIT CONTROL BLOCKS. TO EXPAND ON THE
        ; TELETYPE EXAMPLE ABOVE, EACH TELETYPE INTERFACED VIA A DL11-A
        ; WOULD HAVE A SCB SINCE EACH DL11-A IS AN INDEPENDENT INTERFACE
        ; UNIT.  THE TELETYPES INTERFACED VIA THE DH11 WOULD ALSO EACH HAVE
        ; AN SCB SINCE THE DH11 IS A SINGLE CONTROLLER BUT MULTIPLEXES MANY
        ; UNITS IN PARALLEL.
        ;
                .ASECT
        .=177772
177772  S.RCNT: .BLKB   1       ;NUMBER OF REGISTERS TO COPY ON ERROR
177773  S.ROFF: .BLKB   1       ;OFFSET TO FIRST DEVICE REGISTER
177774  S.BMSV: .BLKW   1       ;SAVED I/O ACTIVE BITMAP AND POINTER TO EMB
177776  S.BMSK: .BLKW   1       ;DEVICE I/O ACTIVE BIT MASK
000000  S.LHD:  .BLKW   2       ;CONTROLLER I/O QUEUE LISTHEAD
000004  S.PRI:  .BLKB   1       ;DEVICE PRIORITY
000005  S.VCT:  .BLKB   1       ;INTERRUPT VECTOR ADDRESS /4
000006  S.CTM:  .BLKB   1       ;CURRENT TIMEOUT COUNT
000007  S.ITM:  .BLKB   1       ;INITIAL TIMEOUT COUNT
000010  S.CON:  .BLKB   1       ;CONTROLLER INDEX
000011  S.STS:  .BLKB   1       ;CONTROLLER STATUS (0=IDLE,1=BUSY)
000012  S.CSR:  .BLKW   1       ;ADDRESS OF CONTROL STATUS REGISTER
000014  S.PKT:  .BLKW   1       ;ADDRESS OF CURRENT I/O PACKET
000016  S.FRK:  .BLKW   1       ;FORK BLOCK LINK WORD
000020  S.DMCS:                 ;DM11-BB CSR FOR FDX TTDRV
000020          .BLKW   1       ;FORK-PC
000022          .BLKW   1       ;FORK-R5
000024          .BLKW   1       ;FORK-R4

                .IF NB  SYSDEF

                .IF DF  L$$DRV & M$$MGE

                .BLKW   1       ;FORK-DRIVER RELOCATION BASE

                .ENDC   ;L$$DRV & M$$MGE

        S.CCB:                  ;MIXED MASSBUS CHANNEL CONTROL BLOCK
        S.MPR:  .BLKW   6       ;11/70 EXTENDED MEMORY UNIBUS DEVICE C-BLOCK
                .BLKW   1       ;BUFFER WORD
        S.UMHD: .BLKW   2       ;LIST HEAD FOR UMR ASSIGNMENT BLOCK(S)
        S.UMCT: .BLKW   1       ;COUNT OF AVAILABLE UMR ASSIGNMENT BLOCK(S)

                .IFF

                .PSECT

        ;
        ; STATUS CONTROL BLOCK PRIORITY BYTE CONDITION CODE STATUS BIT
        ; DEFINITIONS
        ;
        SP.EIP=1                ;ERROR IN PROGRESS (1=YES)
        SP.ENB=2                ;ERROR LOGGING ENABLED (0=YES)
        SP.LOG=4                ;ERROR LOGGING AVAILABLE (1=YES)
        SPARE=10                ;SPARE BIT
```

SCBDF$ (Cont.)

```
        ;
        ; MAPPING ASSIGNMENT BLOCK (FOR UNIBUS MAPPING REGISTER ASSIGNMENT)
        ;
                .ASECT
        .=0
000000  M.LNK:  .BLKW   1        ;LINK WORD
000002  M.UMRA: .BLKW   1        ;ADDRESS OF FIRST ASSIGNED UMR
000004  M.UMRN: .BLKW   1        ;NUMBER OF UMR'S ASSIGNED * 4
000006  M.UMVL: .BLKW   1        ;LOW 16 BITS MAPPED BY 1ST ASSIGNED UMR
000010  M.UMVH: .BLKB   1        ;HIGH 2 BITS MAPPED IN BITS 4 AND 5
000011  M.BFVH: .BLKB   1        ;HIGH 6 BITS OF PHYSICAL BUFFER ADDRESS
000012  M.BFVL: .BLKW   1        ;LOW 16 BITS OF PHYSICAL BUFFER ADDRESS

000014  M.LGTH=.                 ;LENGTH OF MAPPING ASSIGNMENT BLOCK

                .ENDC   ;SYSDEF

                .PSECT
```

TCBDF$

```
                TCBDF$  ,,SYSDEF

        ;
        ; TASK CONTROL BLOCK OFFSET AND STATUS DEFINITIONS
        ;
        ; TASK CONTROL BLOCK
        ;
                .ASECT
        .=0
000000  T.LNK:  .BLKW   1       ;UTILITY LINK WORD
000002  T.PRI:  .BLKB   1       ;TASK PRIORITY
000003  T.IOC:  .BLKB   1       ;I/O PENDING COUNT
000004  T.CPCB: .BLKW   1       ;POINTER TO CHECKPOINT PCB
000006  T.NAM:  .BLKW   2       ;TASK NAME IN RAD50
000012  T.RCVL: .BLKW   2       ;RECEIVE QUEUE LISTHEAD
000016  T.ASTL: .BLKW   2       ;AST QUEUE LISTHEAD
000022  T.EFLG: .BLKW   2       ;TASK LOCAL EVENT FLAGS 1-32
000026  T.UCB:  .BLKW   1       ;UCB ADDRESS FOR PSEUDO DEVICE 'TI'
000030  T.TCBL: .BLKW   1       ;TASK LIST THREAD WORD
000032  T.STAT: .BLKW   1       ;FIRST STATUS WORD (BLOCKING BITS)
000034  T.ST2:  .BLKW   1       ;SECOND STATUS WORD (STATE BITS)
000036  T.ST3:  .BLKW   1       ;THIRD STATUS WORD (ATTRIBUTE BITS)
000040  T.DPRI: .BLKB   1       ;TASK'S DEFAULT PRIORITY
000041  T.LBN:  .BLKB   3       ;LBN OF TASK LOAD IMAGE
000044  T.LDV:  .BLKW   1       ;UCB ADDRESS OF LOAD DEVICE
000046  T.PCB:  .BLKW   1       ;PCB ADDRESS OF TASK PARTITION
000050  T.MXSZ: .BLKW   1       ;MAXIMUM SIZE OF TASK IMAGE (MAPPED ONLY)
000052  T.ACTL: .BLKW   1       ;ADDRESS OF NEXT TASK IN ACTIVE LIST
000054  T.SAST: .BLKW   1       ;SPECIFIED AST LISTHEAD
000056          .BLKB   1       ;RESERVED BYTE (CURRENTLY MUST BE 0)
000057  T.TIO:  .BLKB   1       ;BUFFERED I/O COUNT
000060  T.TKSZ: .BLKW   1       ;TASK SIZE (FROM L$BLDZ IN LABEL BLK) IN:
                                ;     UNMAPPED SYSTEMS - BYTES
                                ;     MAPPED SYSTEMS   - 32 WORD BLOCKS
                                ;TASK SIZE (FROM L$BMXZ IN LABEL BLK)
                                ;FOR RSX11S SYSTEMS ONLY
                                ;     MAPPED SYSTEMS   - 32 WORD BLOCKS
                                ;     UNMAPPED SYSTEMS - BYTES


        $$$=.                   ;MARK START OF PLAS AREA
        T.ATT:  .BLKW   2       ;ATTACHMENT DESCRIPTOR LISTHEAD
        T.OFF:  .BLKW   1       ;OFFSET TO TASK IMAGE IN PARTITION
                                ;IF A$$HDR IS DEFINED, THIS WORD ALSO
                                ;INCLUDES THE LENGTH OF THE ALTERNATE
                                ;HEADER REFRESH AREA STORED IN T.HDLN
                .BLKB   1       ;RESERVED
        T.SRCT: .BLKB   1       ;SREF WITH EFN COUNT IN ALL RECEIVE QUEUES
        T.RRFL: .BLKW   2       ;RECEIVE BY REFERENCE LISTHEAD

                .IF NDF P$$LAS
        .=$$$                   ;POINT TO START OF PLAS AREA
                .ENDC   ;P$$LAS
```

TCBDF$ (Cont.)

```
        .IF NB SYSDEF

$$$=.                       ;MARK START OF PARENT OFFSPRING TASKING AREA
T.OCBH: .BLKW   2           ;OFFSPRING CONTROL BLOCK LISTHEAD
T.RDCT: .BLKW   1           ;OUTSTANDING OFFSPRING COUNT

        .IF NDF P$$OFF
.=$$$                       ;POINT TO START OF PARENT OFFSPRING AREA
        .ENDC   ;P$$OFF


$$$=.                       ;MARK START OF EVENT FLAG MASK AREA
T.EFLM: .BLKW   2           ;EVENT FLAG MASK WORD
                            ;EVENT FLAG MASK ADDRESS

        .IF NDF S$$TOP & T$$BUF
.=$$$                       ;POINT TO START OF EVENT FLAG MASK AREA
        .ENDC   ;S$$TOP & T$$BUF


$$$=.
T.HDLN: .BLKB   1           ;TASK HEADER LENGTH IN 32-WORD BLOCKS

        .IF NDF A$$HDR
.=$$$                       ;NOT SUPPORTED IF NDF
        .ENDC   ;A$$HDR


$$$=.
T.GGF:  .BLKB   1           ;GROUP GLOBAL USE COUNT FOR TASK

        .IF NDF R$$SND & G$$EFN ! A$$CLI & G$$EFN
.=$$$
        .ENDC   ;R$$SND & G$$EFN ! A$$CLI & G$$EFN


        .EVEN

T.LGTH=.                    ;LENGTH OF TASK CONTROL BLOCK
T.EXT=0                     ;LENGTH OF TCB EXTENSION

        .IFF

;
; TASK STATUS DEFINITIONS
;
; FIRST STATUS WORD (BLOCKING BITS)
;
TS.EXE=100000               ;TASK NOT IN EXECUTION (1=YES)
TS.RDN=40000                ;I/O RUN DOWN IN PROGRESS (1=YES)
TS.MSG=20000                ;ABORT MESSAGE BEING OUTPUT (1=YES)
TS.NRP=10000                ;TASK MAPPED TO NONRESIDENT PARTITION (1=YES)
TS.RUN=4000                 ;TASK IS RUNNING ON ANOTHER PROCESSOR (1=YES)
TS.HLD=2000                 ;TASK HALF-LOADED BY TASK LOADER
TS.STP=1000                 ;TASK EXTERNALLY BLOCKED VIA CLI COMMAND
TS.OUT=400                  ;TASK IS OUT OF MEMORY (1=YES)
TS.CKP=200                  ;TASK IS BEING CHECKPOINTED (1=YES)
TS.CKR=100                  ;TASK CHECKPOINT REQUESTED (1=YES)
```

TCBDF$ (Cont.)

```
;
; TASK BLOCKING STATUS MASK
;
TS.BLK=TS.CKP!TS.CKR!TS.EXE!TS.MSG!TS.NRP!TS.OUT!TS.RDN!TS.STP


;
; SECOND STATUS WORD (STATE BITS)
;
T2.AST=100000           ;AST IN PROGRESS (1=YES)
T2.DST=40000            ;AST RECOGNITION DISABLED (1=YES)
T2.CHK=20000            ;TASK NOT CHECKPOINTABLE (1=YES)
T2.CKD=10000            ;CHECKPOINTING DISABLED (1=YES)
T2.SEF=4000             ;TASK STOPPED FOR EVENT FLAGS (1=YES)
T2.FXD=2000             ;TASK FIXED IN MEMORY (1=YES)
T2.REX=1000             ;ABORT AST EFFECTED OR IN PROGRESS (1=YES)
T2.CAF=400              ;DYN CHECKPOINT SPACE ALLOCATION FAILURE
T2.HLT=200              ;TASK IS BEING HALTED (1=YES)
T2.ABO=100              ;TASK MARKED FOR ABORT (1=YES)
T2.STP=40               ;SAVED T2.STP ON AST IN PROGRESS
T2.STP=20               ;TASK STOPPED (1=YES)
T2.SPN=10               ;SAVED T2.SPN ON AST IN PROGRESS
T2.SPN=4                ;TASK SUSPENDED (1=YES)
T2.WFR=2                ;SAVED T2.WFR ON AST IN PROGRESS
T2.WFR=1                ;TASK IN WAITFOR STATE (1=YES)


;
; THIRD STATUS WORD (ATTRIBUTE BITS)
;
T3.ACP=100000           ;ANCILLARY CONTROL PROCESSOR (1=YES)
T3.PMD=40000            ;DUMP TASK ON SYNCHRONOUS ABORT (0=YES)
T3.REM=20000            ;REMOVE TASK ON EXIT (1=YES)
T3.PRV=10000            ;TASK IS PRIVILEGED (1=YES)
T3.MCR=4000             ;TASK REQUESTED AS EXTERNAL MCR FUNCTION(1=YES)
T3.SLV=2000             ;TASK IS A SLAVE TASK (1=YES)
T3.CLI=1000             ;TASK IS A COMMAND LINE INTERPRETER (1=YES)
T3.RST=400              ;TASK IS RESTRICTED (1=YES)
T3.NSD=200              ;TASK DOES NOT ALLOW SEND DATA
T3.CAL=100              ;TASK HAS CHECKPOINT SPACE IN TASK IMAGE
T3.ROV=40               ;TASK HAS RESIDENT OVERLAYS
T3.NET=20               ;NETWORK PROTOCOL LEVEL
T3.GFL=10               ;TASK HAS ITS GRP GBL EVENT FLAGS LOCKED
;     =4                ;RESERVED FOR FUTURE USE
T3.SWS=2                ;RESERVED FOR USE BY SOFTWARE SERVICES
;     =1                ;RESERVED FOR FUTURE USE

        .ENDC   ;SYSDEF

        .PSECT
```

UCBDF$

```
        UCBDF$  ,,TTDEF,SYSDEF

;
; UNIT CONTROL BLOCK
;
; THE UNIT CONTROL BLOCK (UCB) DEFINES THE STATUS OF AN INDIVIDUAL
; DEVICE UNIT AND IS THE CONTROL BLOCK THAT IS POINTED TO BY THE
; FIRST WORD OF AN ASSIGNED LUN. THERE IS ONE UCB FOR EACH DEVICE
; UNIT OF EACH DCB. THE UCB'S ASSOCIATED WITH A PARTICULAR DCB ARE
; CONTIGUOUS IN MEMORY AND ARE POINTED TO BY THE DCB. UCB'S ARE
; VARIABLE LENGTH BETWEEN DCB'S BUT ARE OF THE SAME LENGTH FOR A
; SPECIFIC DCB. TO FINISH THE TELETYPE EXAMPLE ABOVE, EACH UNIT ON
; BOTH INTERFACES WOULD HAVE A UCB.
;
        .ASECT

        .IF NB  SYSDEF

        .IF DF  E$$DVC

        .IF DF  M$$MUP  ;IS U.OWN THERE?
.=177766
        .IFF
.=177770
        .ENDC   ;M$$MUP

U.IOC:  .BLKW   2       ;I/O COUNT SINCE MOUNT (ERROR LOG DEVS ONLY)
U.ERSL: .BLKB   1       ;SOFT ERROR LIMIT
U.ERHL: .BLKB   1       ;HARD ERROR LIMIT
U.ERSC: .BLKB   1       ;SOFT ERROR COUNT
U.ERHC: .BLKB   1       ;HARD ERROR COUNT

        .ENDC   ;E$$DVC

        .ENDC   ;SYSDEF

.=177772
177772  U.MUP:                  ;MULTIUSER PROTECTION FLAG WORD
177772  U.CLI:  .BLKW   1       ;TCB OF COMMAND LINE INTERPRETER
177774  U.LUIC: .BLKW   1       ;LOGIN UIC - MULTI USER SYSTEMS ONLY
177776  U.OWN:  .BLKW   1       ;OWNING TERMINAL - MULTI USER SYSTEMS ONLY
000000  U.DCB:  .BLKW   1       ;BACK POINTER TO DCB
000002  U.RED:  .BLKW   1       ;POINTER TO REDIRECT UNIT UCB
000004  U.CTL:  .BLKB   1       ;CONTROL PROCESSING FLAGS
000005  U.STS:  .BLKB   1       ;UNIT STATUS
000006  U.UNIT: .BLKB   1       ;PHYSICAL UNIT NUMBER
000007  U.ST2:  .BLKB   1       ;UNIT STATUS EXTENSION
000010  U.CW1:  .BLKW   1       ;FIRST DEVICE CHARACTERISTICS WORD
000012  U.CW2:  .BLKW   1       ;SECOND DEVICE CHARACTERISTICS WORD
000014  U.CW3:  .BLKW   1       ;THIRD DEVICE CHARACTERISTICS WORD
000016  U.CW4:  .BLKW   1       ;FOURTH DEVICE CHARACTERISTICS WORD
000020  U.SCB:  .BLKW   1       ;POINTER TO SCB
000022  U.ATT:  .BLKW   1       ;TCB ADDRESS OF ATTACHED TASK
000024  U.BUF:  .BLKW   1       ;RELOCATION BIAS OF CURRENT I/O REQUEST
000026          .BLKW   1       ;BUFFER ADDRESS OF CURRENT I/O REQUEST
000030  U.CNT:  .BLKW   1       ;BYTE COUNT OF CURRENT I/O REQUEST
```

UCBDF$ (Cont.)

```
000032  U.ACP=U.CNT+2           ;ADDRESS OF TCB OF MOUNTED ACP
000034  U.VCB=U.CNT+4           ;ADDRESS OF VOLUME CONTROL BLOCK
000032  U.CBF=U.CNT+2           ;CONTROL BUFFER RELOCATION AND ADDRESS
000032  U.KCSR=U.CNT+2          ;CSR ADDRESS OF KMC-11
000034  U.KCS6=U.KCSR+2         ;CSR+6 OF KMC-11


        ;
        ;       MAGTAPE DRIVER DEFINITIONS
        ;
000036  U.SPC=U.CNT+6           ;SPACING COUNT
000036  U.SUB=U.CNT+6           ;SUBCONTROLLER, PHYSICAL UNIT #.
000040  U.FNUM=U.CNT+10         ;FORMATTER NUMBER
000042  U.FCDE=U.CNT+12         ;FUNCTION CODE AND INDEX


        ;
        ;       MSCP DISK DRIVER UCB OFFSETS
        ;
000036  U.UTMO=U.VCB+2          ;UNIT COMMAND TIME OUT
000040  U.LHD=U.VCB+4           ;UNIT OUTSTANDING I/O PACKET LISTHEAD
000044  U.BPKT=U.VCB+10         ;UNIT BAD BLOCK PACKET WAITING LIST


        ;
        ; CHARACTERISTICS OBTAINED FROM "GET UNIT STATUS" END PACKETS
        ;
000050  U.MLUN=U.VCB+14         ;MULTI-UNIT CODE
000052  U.UNFL=U.VCB+16         ;UNIT FLAGS
000054  U.HSTI=U.VCB+20         ;HOST IDENTIFIER
000060  U.UNTI=U.VCB+24         ;UNIT IDENTIFIER
000070  U.MEDI=U.VCB+34         ;MEDIA IDENTIFIER
000074  U.SHUN=U.VCB+40         ;SHADOW UNIT
000076  U.SHST=U.VCB+42         ;SHADOW UNIT STATUS
000100  U.TRCK=U.VCB+44         ;UNIT TRACK SIZE
000102  U.GRP=U.VCB+46          ;UNIT GROUP SIZE
000104  U.CYL=U.VCB+50          ;UNIT CYLINDER SIZE
000110  U.RCTS=U.VCB+54         ;UNIT RCT TABLE SIZE
000112  U.RBNS=U.VCB+56         ;UNIT RBN 'S / TRACK
000113  U.RCTC=U.VCB+57         ;UNIT RCT COPIES


        ;
        ; CHARACTERISTICS OBTAINED FROM "ONLINE" OR "SET UNIT CHARACTERISTICS"
        ; END PACKETS
        ;
000114  U.UNSZ=U.VCB+60         ;UNIT SIZE
000120  U.VSER=U.VCB+64         ;VOLUME SERIAL NUMBER


        ;
        ; CHARACTERISTICS STORED FROM "GET COMMAND STATUS" END PACKETS
        ;
000124  U.OTRF=U.VCB+70         ;OUTSTANDING COMMAND STATUS REQUEST REGISTER
000126  U.CMST=U.VCB+72         ;COMMAND STATUS PROGRESS REGISTER
```

UCBDF$ (Cont.)

```
                ;
                ; TERMINAL DRIVER DEFINITIONS
                ;
                .=U.BUF
000024  U.TUX:  .BLKW   1       ;POINTER TO UCB EXTENSION (UCBX)
000026  U.TSTA: .BLKW   3       ;STATUS TRIPLE-WORD
000034  U.TTAB: .BLKW   1       ;IF 0: U.TTAB+1 IS SINGLE-CHARACTER TYPE-AHEAD
                                ;       BUFFER, CURRENTLY EMPTY
                                ;IF ODD: U.TTAB+1 IS SINGLE-CHARACTER
                                ;        TYPE-AHEAD BUFFER AND HOLDS A
                                ;        CHARACTER
                                ;IF NON-0 AND EVEN: POINTER TO MULTI-CHARACTER
                                ;       TYPE-AHEAD BUFFER
000036  U.TLPP: .BLKB   1       ;LINES PER PAGE
000037  U.TFRQ: .BLKB   1       ;FORK REQUEST BYTE
000040  U.TFLK: .BLKW   1       ;FORK LIST LINK WORD
000042  U.TCHP: .BLKB   1       ;CURRENT HORIZONTAL POSITION
000043  U.TCVP: .BLKB   1       ;CURRENT VERTICAL POSITION
000044  U.UIC:  .BLKW   1       ;TERMINAL UIC
000046  U.TTYP: .BLKB   1       ;TERMINAL TYPE
000047  U.TMTI: .BLKB   1       ;MODEM TIMER
000050  U.CTYP: .BLKW   1       ;CONTROLLER TYPE
000052  U.ACB:  .BLKW   1       ;ANCILLARY CONTROL DRIVER BLOCK ADDR
000054  U.AFLG: .BLKW   1       ;ANCILLARY CONTROL DRIVER FLAGS WORD
000056  U.ADMA: .BLKW   1       ;ANCILLARY CONTROL DRIVER DMA BUFFER


                ;
                ; CONSOLE DRIVER DEFINITIONS
                ;
                .=U.BUF+2
000026  U.CTCB: .BLKW   1       ;ADDRESS OF CONSOLE LOGGER TCB
000030  U.COTQ: .BLKW   2       ;I/O PACKET LIST QUEUE
000034  U.RED2: .BLKW   1       ;REDIRECT UCB ADDRESS


                ;
                ; DEFINE BITS IN STATUS WORD 1 (U.TSTA)
                ;
                S1.RST=1                ;READ WITH SPECIAL TERMINATORS IN PROGRESS
                S1.RUB=2                ;RUBOUT SEQUENCE IN PROGRESS (NON-SCOPE)
                S1.ESC=4                ;ESCAPE SEQUENCE IN PROGRESS
                S1.RAL=10               ;READ ALL IN PROGRESS
                S1.RNE=20               ;ECHO SUPPRESSED
                S1.CTO=40               ;OUTPUT STOPPED BY CTRL-O
                S1.OBY=100              ;OUTPUT BUSY
                S1.IBY=200              ;INPUT BUSY
                S1.BEL=400              ;BELL PENDING
                S1.DPR=1000             ;DEFER PROCESSING OF CHAR. IN U.TECB
                S1.DEC=2000             ;DEFER ECHO OF CHAR. IN U.TECB
                S1.DSI=4000             ;INPUT PROCESSING DISABLED
                S1.CTS=10000            ;OUTPUT STOPPED BY CTRL-S
                S1.USI=20000            ;UNSOLICITED INPUT IN PROGRESS
                                        ;BIT 14 RESERVED FOR NON-BUFFERED OUTPUT
                S1.OBF=40000            ;BUFFERED OUTPUT IN PROGRESS
                S1.IBF=100000           ;BUFFERED INPUT IN PROGRESS
```

UCBDF$ (Cont.)

```
;
; DEFINE BITS IN STATUS WORD 2 (U.TSTA+2)
;
S2.ACR=1                ;WRAP-AROUND (AUTOMATIC CR-LF) REQUIRED
S2.WRA=6                ;CONTEXT FOR WRAP-AROUND
S2.WRB=2                ;LOW BIT IN S2.WRA BIT PATTERN
S2.CR=10                ;TRAILING CR REQUIRED ON OUTPUT
S2.BRQ=20               ;BREAK-THROUGH-WRITE REQUEST IN QUEUE
S2.SRQ=40               ;SPECIAL REQUEST IN QUEUE
                        ;(IO.ATT, IO.DET, SF.SMC)
S2.ORQ=100              ;OUTPUT REQUEST IN QUEUE (MUST = S1.OBY)
S2.IRQ=200              ;INPUT REQUEST IN QUEUE (MUST = S1.IBY)
S2.HFL=3400             ;HORIZONTAL FILL REQUIREMENT
S2.VFL=4000             ;VERTICAL FILL REQUIREMENT
S2.HHT=10000            ;HARDWARE HORIZONTAL TAB PRESENT
S2.HFF=20000            ;HARDWARE FORM-FEED PRESENT
S2.FLF=40000            ;FORCE LINE FEED BEFORE NEXT ECHO
S2.FDX=100000           ;LINE IS IN FULL DUPLEX MODE


;
; DEFINE BITS IN STATUS WORD 3 (U.TSTA+4)
;
S3.RAL=10               ;TERMINAL IS IN READ-PASS-ALL MODE
                        ;(S3.RAL MUST = S1.RAL)
S3.RPO=20               ;READ W/PROMPT OUTPUT IN PROGRESS
S3.WES=40               ;TASK WANTS ESCAPE SEQUENCES
S3.TAB=100              ;TYPE-AHEAD BUFFER ALLOCATION REQUESTED
S3.8BC=200              ;PASS 8 BITS ON INPUT
S3.RCU=400              ;RESTORE CURSOR (MUST = TF.RCU*400)
S3.ABD=1000             ;AUTO-BAUD SPEED DETECTION ENABLED
S3.ABP=2000             ;AUTO-BAUD SPEED DETECTION IN PROGRESS
S3.WAL=4000             ;WRITE-PASS-ALL (MUST = TF.WAL*400)
S3.VER=10000            ;LAST CHAR. IN TYPE-AHEAD BUFFER
                        ;HAS PARITY ERROR
S3.BCC=20000            ;LAST CHAR. IN TYPE-AHEAD BUFFER
                        ;HAS FRAMING ERROR
S3.DAO=40000            ;LAST CHAR. IN TYPE-AHEAD BUFFER
                        ;HAS DATA OVERRUN ERROR
                        ;NOTE - THE 3 BITS ABOVE MUST CORRESPOND
                        ;TO THE RESPECTIVE ERROR FLAGS IN THE
                        ;HARDWARE RECEIVE BUFFER
S3.PCU=100000           ;POSITION CURSOR (MUST = TF.PCU*400)

        .PSECT
```

UCBDF$ (Cont.)

```
;
; DEVICE TABLE STATUS DEFINITIONS
;
; DEVICE CHARACTERISTICS WORD 1 (U.CW1) DEVICE TYPE DEFINITION BITS.
;
DV.REC=1                ;RECORD ORIENTED DEVICE (1=YES)
DV.CCL=2                ;CARRIAGE CONTROL DEVICE (1=YES)
DV.TTY=4                ;TERMINAL DEVICE (1=YES)
DV.DIR=10               ;FILE STRUCTURED DEVICE (1=YES)
DV.SDI=20               ;SINGLE DIRECTORY DEVICE (1=YES)
DV.SQD=40               ;SEQUENTIAL DEVICE (1=YES)
DV.MSD=100              ;MASS STORAGE DEVICE (1=YES)
DV.UMD=200              ;USER MODE DIAGNOSTICS SUPPORTED (1=YES)
DV.MBC=400              ;DEVICE IS ON MASSBUS CONTROLLER (1=YES)
DV.EXT=400              ;DEVICE ON EXTENDED ADDRESSING CONTROLLER
DV.SWL=1000             ;UNIT SOFTWARE WRITE LOCKED (1=YES)
DV.ISP=2000             ;INPUT SPOOLED DEVICE (1=YES)
DV.OSP=4000             ;OUTPUT SPOOLED DEVICE (1=YES)
DV.PSE=10000            ;PSEUDO DEVICE (1=YES)
DV.COM=20000            ;DEVICE IS MOUNTABLE AS COM CHANNEL (1=YES)
DV.F11=40000            ;DEVICE IS MOUNTABLE AS F11 DEVICE (1=YES)
DV.MNT=100000           ;DEVICE IS MOUNTABLE (1=YES)


;
; TERMINAL DEPENDENT CHARACTERISTICS WORD 2 (U.CW2) BIT DEFINITIONS
;
U2.DH1=100000           ;UNIT IS A MULTIPLEXER (1=YES)
U2.DJ1=40000            ;UNIT IS A DJ11 (1=YES)
U2.RMT=20000            ;UNIT IS REMOTE (1=YES)
U2.HFF=10000            ;UNIT HANDLES HARDWARE FORM FEEDS (1=YES)
U2.L8S=10000            ;OLD NAME FOR U2.HFF
U2.NEC=4000             ;DON'T ECHO SOLICITED INPUT (1=YES)
U2.CRT=2000             ;UNIT IS A CRT (1=YES)
U2.ESC=1000             ;UNIT GENERATES ESCAPE SEQUENCES (1=YES)
U2.LOG=400              ;USER LOGGED ON TERMINAL (0=YES)
U2.SLV=200              ;UNIT IS A SLAVE TERMINAL (1=YES)
U2.DZ1=100              ;UNIT IS A DZ11 (1=YES)
U2.HLD=40               ;TERMINAL IS IN HOLD SCREEN MODE (1=YES)
U2.AT.=20               ;MCR COMMAND AT. BEING PROCESSED (1=YES)
U2.PRV=10               ;UNIT IS A PRIVILEGED TERMINAL (1=YES)
U2.L3S=4                ;UNIT IS A LA30S TERMINAL (1=YES)
U2.SCS=4                ;SCS-11 COMMAND TERMINAL (1=YES)
U2.VT5=2                ;UNIT IS A VT05B TERMINAL (1=YES)
U2.LWC=1                ;LOWER CASE TO UPPER CASE CONVERSION (0=YES)


;
; BIT DEFINITIONS FOR U.MUP (SYSTEMS WITH ALTERNATE CLI SUPPORT ONLY)
;
UM.OVR=1                ;OVERRIDE CLI INDICATOR
UM.CLI=36               ;CLI INDICATOR BITS
UM.DSB=200              ;TERMINAL DISABLED SINCE CLI ELIMINATED
UM.NBR=400              ;NO BROADCAST
```

UCBDF$ (Cont.)

```
;
; RH11-RS03/RS04 CHARACTERISTICS WORD 2 (U.CW2) BIT DEFINITIONS
;
U2.R04=100000           ;UNIT IS A RS04 (1=YES)


;
; RH11-TU16 CHARACTERISTICS WORD 2 (U.CW2) BIT DEFINITIONS
;
U2.7CH=10000            ;UNIT IS A 7 CHANNEL DRIVE (1=YES)


;
; TERMINAL DEPENDENT CHARACTERISTICS WORD 3 (U.CW3) BIT DEFINITIONS
;
U3.UPC=20000            ;UPCASE OUTPUT FLAG


;
; TERMINAL DEPENDENT CHARACTERISTICS WORD 4 (U.CW4) BIT DEFINITIONS
;
U4.CR=100               ;LOOK FOR CARRIAGE RETURN


;
; UNIT CONTROL PROCESSING FLAG DEFINITIONS
;
UC.ALG=200              ;BYTE ALIGNMENT ALLOWED (1=NO)
UC.NPR=100              ;DEVICE IS AN NPR DEVICE (1=YES)
UC.QUE=40               ;CALL DRIVER BEFORE QUEUING (1=YES)
UC.PWF=20               ;CALL DRIVER AT POWERFAIL ALWAYS (1=YES)
UC.ATT=10               ;CALL DRIVER ON ATTACH/DETACH (1=YES)
UC.KIL=4                ;CALL DRIVER AT I/O KILL ALWAYS (1=YES)
UC.LGH=3                ;TRANSFER LENGTH MASK BITS


;
; UNIT STATUS BIT DEFINTIONS
;
US.BSY=200              ;UNIT IS BUSY (1=YES)
US.MNT=100              ;UNIT IS MOUNTED (0=YES)
US.FOR=40               ;UNIT IS MOUNTED AS FOREIGN VOLUME (1=YES)
US.MDM=20               ;UNIT IS MARKED FOR DISMOUNT (1=YES)
US.PWF=10               ;POWERFAIL OCCURRED (1=YES)


;
; CARD READER DEPENDENT UNIT STATUS BIT DEFINITIONS
;
US.ABO=1                ;UNIT IS MARKED FOR ABORT IF NOT READY (1=YES)
US.MDE=2                ;UNIT IS IN 029 TRANSLATION NODE (1=YES)


;
; FILES-11 DEPENDENT UNIT STATUS BITS
;
US.WCK=10               ;WRITE CHECK ENABLED (1=YES)
US.SPU=2                ;UNIT IS SPINNING UP (1=YES)
US.VV=1                 ;VOLUME VALID IS SET (1=YES)
```

UCBDF$ (Cont.)

```
;
; KMC-11-LP DEPDENDENT UNIT STATUS BITS
;
US.KPF=1                ;KMC-11 POWERFAIL INTERLOCK


;
; TERMINAL DEPENDENT UNIT STATUS BIT DEFINITIONS
;
        .IF NB  TTDEF

        .IF DF T$$CPW

US.CRW=4                ;UNIT IS WAITING FOR CARRIER (1=YES)
US.DSB=2                ;UNIT IS DISABLED (1=YES)
US.OIU=1                ;OUTPUT INTERRUPT IS UNEXPECTED ON UNIT (1=YES)

        .IFF  ;T$$CPW

US.DSB=10               ;UNIT IS DISABLED (1=YES)
US.CRW=4                ;UNIT IS WAITING FOR CARRIER (1=YES)
US.ECH=2                ;UNIT HAS ECHO IN PROGRESS (1=YES)
US.OUT=1                ;UNIT IS EXPECTING OUTPUT INTERRUPT (1=YES)

        .ENDC  ;T$$CPW

        .ENDC  ;TTDEF

;
; LPS11 DEPENDENT UNIT STATUS BIT DEFINITIONS
;
US.FRK=2                ;FORK IN PROGRESS (1=YES)
US.SHR=1                ;SHAREABLE FUNCTION IN PROGRESS (0=YES)


;
; MAGTAPE DEPENDANT UNIT STATUS BITS
;
US.LAB=4                ;UNIT HAS LABELED TAPE ON IT (1=YES)
US.BSP=2                ;INTERNAL BACKSPACE IN PROGRESS (1=YES)


;
; UNIT STATUS EXTENSION (U.ST2) BIT DEFINITIONS
;
US.OFL=1                ;UNIT OFFLINE (1=YES)
US.RED=2                ;UNIT REDIRECTABLE (0=YES)
US.PUB=4                ;UNIT IS PUBLIC DEVICE (1=YES)
US.UMD=10               ;UNIT ATTACHED FOR DIAGNOSTICS (1=YES)


;
; MAG TAPE DENS SUPPORT IDENT IN CHAR WORD 3 (U.CW3) DEFENITION
;       ASSIGNMENTS PER NUMERICAL SEQUENCE 0 - 255.
;
UD.UNS=0                ;UNSUPPORTED
UD.200=1                ; 200BPI, 7 TRACK
UD.556=2                ; 556BPI, 7 TRACK
```

UCBDF$ (Cont.)

```
UD.800=3                ; 800BPI, 7 OR 9 TRACK
UD.160=4                ;1600BPI, 9 TRACK
UD.625=5                ;6250BPI, 9 TRACK
```

APPENDIX C

RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

This appendix describes the RSX-11M-PLUS system macros that supply symbolic offsets for data structures listed in Table C-1.

The data structures are defined by macros in the Executive macro library. To reference any of the data structure offsets from your code, include the macro name in an .MCALL directive and invoke the macro. For example:

```
.MCALL  DCBDF$
DCBDF$                  ;Define DBC offsets
```

NOTE

All physical offsets and bit definitions are subject to change in future releases of the operating system. Code that accesses system data structures should always use the symbolic offsets rather than the physical offsets.

The first two arguments, <:> and <=>, make all definitions global. If they are left blank, the definitions will be local. The SYSDEF argument causes the variable part of a data structure to be defined.

All of these macros are in the Executive macro library LB:[1,1]EXEMC.MLB. All except F11DF$, ITBDF$, MTADF$, OLRDF$, and SHDDF$ are also in the Executive definition library LB:[1,1]EXELIB.OLB.

Table C-1
Summary of System Data Structure Macros

Macro Arguments	Data Structures
ABODF$ <:>,<=>	Task abort and termination notification message codes
ACNDF$ <:>,<=>	Accounting data structures (user account block, task account block, system account block)
CLKDF$ <:>,<=>	Clock queue control block
CTBDF$ <:>,<=>	Controller table
DCBDF$ <:>,<=>,SYSDEF	Device Control Block
EPKDF$ <:>,<=>	Error message block
F11DF$ <:>,<=>,SYSDEF	FILES-11 data structures (Volume Control Block, mount list entry, File Control Block, file window block, locked block list node)
HDRDF$ <:>,<=>	Task header and window block
HWDDF$ <:>,<=>,SYSDEF	Hardware register addresses and feature mask definitions
ITBDF$ <:>,<=>,SYSDEF	Interrupt transfer block
KRBDF$ <:>,<=>	Controller request block
LCBDF$ <:>,<=>	Logical assignment control block
MTADF$ <:>,<=>	ANSI magtape data structures (volume set control block)
OLRDF$	On-line reconfiguration interface
PCBDF$ <:>,<=>,SYSDEF	Partition Control Block and attachment descriptor
PKTDF$ <:>,<=>	I/O packet, AST control block, offspring control block, group global event flag control block, and CLI parser block
SCBDF$ <:>,<=>,SYSDEF	Status Control Block and UMR assignment block
SHDDF$ <:>,<=>	Shadow recording linkage block
TCBDF$ <:>,<=>,SYSDEF	Task Control Block
UCBDF$ <:>,<=>,TTDEF,SYSDEF	Unit Control Block

ABODF$

```
        ABODF$

;
; TASK ABORT CODES
;
; NOTE: S.COAD-S.CFLT ARE ALSO SST VECTOR OFFSETS
;
S.CACT=-4.              ;TASK STILL ACTIVE
S.CEXT=-2.              ;TASK EXITED NORMALLY
S.COAD=0.               ;ODD ADDRESS AND TRAPS TO 4
S.CSGF=2.               ;SEGMENT FAULT
S.CBPT=4.               ;BREAK POINT OR TRACE TRAP
S.CIOT=6.               ;IOT INSTRUCTION
S.CILI=8.               ;ILLEGAL OR RESERVED INSTRUCTION
S.CEMT=10.              ;NON RSX EMT INSTRUCTION
S.CTRP=12.              ;TRAP INSTRUCTION
S.CFLT=14.              ;11/40 FLOATING POINT EXCEPTION
S.CSST=16.              ;SST ABORT-BAD STACK
S.CAST=18.              ;AST ABORT-BAD STACK
S.CABO=20.              ;ABORT VIA DIRECTIVE
S.CLRF=22.              ;TASK LOAD REQUEST FAILURE
S.CCRF=24.              ;TASK CHECKPOINT READ FAILURE
S.IOMG=26.              ;TASK EXIT WITH OUTSTANDING I/O
S.PRTY=28.              ;TASK MEMORY PARITY ERROR
S.CPMD=30.              ;TASK ABORTED WITH PMD REQUEST
S.CELV=32.              ;TI: VIRTUAL TERMINAL WAS ELIMINATED
S.CINS=34.              ;TASK INSTALLED IN 2 DIFFERENT SYSTEMS
S.CAFF=36.              ;TASK ABORTED DUE TO BAD AFFINITY (REQUIRED
                        ;BUS RUNS ARE OFFLINE OR NOT PRESENT)
S.CCSM=38.              ;BAD CSM PARAMETERS OR BAD STACK
S.COTL=40.              ;TASK HAS RUN OVER ITS TIME LIMIT


;
; TASK TERMINATION NOTIFICATION MESSAGE CODES
;
T.NDNR=0                ;DEVICE NOT READY
T.NDSE=2                ;DEVICE SELECT ERROR
T.NCWF=4                ;CHECKPOINT WRITE FAILURE
T.NCRE=6                ;CARD READER HARDWARE ERROR
T.NDMO=8.               ;DISMOUNT COMPLETE
T.NUER=10.              ;UNRECOVERABLE ERROR
T.NLDN=12.              ;LINK DOWN (NETWORKS)
T.NLUP=14.              ;LINK UP (NETWORKS)
T.NCFI=16.              ;CHECKPOINT FILE INACTIVE
T.NUDE=18.              ;UNRECOVERABLE DEVICE ERROR
T.NMPE=20.              ;MEMORY PARITY ERROR
T.NKLF=22.              ;UCODE LOADER NOT INSTALLED
T.NAAF=24.              ;ACCOUNTING ALLOCATION FAILURE
T.NTAF=26.              ;ACCOUTING TAB ALLOCATION FAILURE
T.NDEB=28.              ;TASK HAS NO DEBUGGING AID
T.NRCT=30.              ;REPLACEMENT CONTROL TASK NOT INSTALLED
T.NWBL=32.              ;WRITE BACK CACHING DATA LOST
                        ;UNIT WRITE LOCKED
```

ACNDF$

```
                ACNDF$

        ;
        ; ACCOUNTING  BLOCK OFFSET AND STATUS DEFINITIONS
        ; FOR EACH TRANSACTION TYPE.
        ;
        ;
        ; HEADER COMMON TO ALL TRANSACTIONS
        ;
                .ASECT
        .=0
000000  B.LNK:  .BLKW   1        ;LINK TO NEXT IN SYSLOG QUEUE
000002  B.TYP:  .BLKB   1        ;TRANSACTION TYPE
000003  B.LEN:  .BLKB   1        ;TRANSACTION LENGTH
000004  B.TIM:  .BLKW   3        ;ENDING TIME OF TRANSACTION
000012  B.HID=.                  ;START OF HEADER IDENTIFICATION AREA
000012  B.UID:  .BLKW   2        ;UNIQUE SESSION IDENT
                                 ;FIRST WORD-RAD50, SECOND-BINARY
000016  B.ACN:  .BLKW   1        ;ACCOUNT NUMBER
000020  B.TID:  .BLKB   1        ;ASCII TERMINAL TYPE (V,T,B OR C)
                                 ;(VIRTUAL,REAL,BATCH, OR CONSOLE)
000021          .BLKB   1        ;UNIT NUMBER
000022  B.HEND=.                 ;END OF HEADER ID AREA
000022  $$$HLN=.                 ;HEADER LENGTH


        ;
        ; ACCUMULATION FIELDS FOR TAB, UAB, AND SAB
        ;
000022  B.CPU:  .BLKW   2        ;TOTAL CPU TIME USED
000026  B.DIR:  .BLKW   2        ;TOTAL DIRECTIVE COUNT
000032  B.QIO:  .BLKW   2        ;TOTAL QIO$ COUNT
000036  B.TAS:  .BLKW   2        ;TOTAL TASK COUNT
000042  B.MEM:  .BLKW   3        ;RESERVED
000050  B.BEG:  .BLKW   3        ;BEGINNING/LOGIN TIME
000056  B.CPUL: .BLKW   2        ;CPU LIMIT
000062  B.PNT:  .BLKW   1        ;POINTER TO HIGHER LEVEL TOTALS
000064  B.STM:  .BLKB   1        ;STATUS MASK
000065  $$$TLN=.                 ;TOTAL'S LENGTH


        ;
        ; USER ACCOUNT BLOCK (UAB)
        ;       NOTE:  UAB'S MUST END ON A WORD BOUNDRY
        ;
        .=$$$TLN                 ;START AFTER TOTALS
000065  B.USE:  .BLKB   1        ;USE COUNT
000066  B.ACT:  .BLKW   1        ;NUMBER OF CURRENTLY ACTIVE TASKS
000070  B.UUIC: .BLKW   1        ;LOGIN UIC
000072  B.UCB:  .BLKW   1        ;POINTER TO UCB
000074  B.LGO:  .BLKW   3        ;LOGOFF TIME
000102  B.ULNK: .BLKW   1        ;LINK TO NEXT UAB
000104  B.RNA:  .BLKW   3        ;LOC IN SYSTEM ACCNT FILE
                                 ;(OFFSET,VBN-HI,VBN-LO)
000112  B.NAM:  .BLKB   14.      ;LAST NAME OF USER
000130          .BLKB   1        ;FIRST INITIAL OF USER
000131          .BLKB   1        ;UNUSED BYTE
000132  B.ULEN=.                 ;UAB LENGTH
000002  $$$=<.+77>/100           ;UAB LENGTH (ROUNDED UP TO 32 WORD BOUND)
```

ACNDF$ (Cont.)

```
                ;
                ; TASK ACCOUNT BLOCK (TAB)
                ;       NOTE: THE TAB MUST END ON A WORD BOUNDRY
                ;
                .=$$$TLN                        ;STARTS AFTER TOTALS
000065  B.PRI:  .BLKB   1               ;HIGHEST RUNNING PRIORITY
000066  B.TNAM: .BLKW   2               ;TASK NAME
000072  B.TCB:  .BLKW   1               ;TCB ADDRESS
000074  B.TST3: .BLKW   1               ;T.ST3 FROM TASK'S TCB
000076          .BLKW   1               ;RESERVED FOR FUTURE STATUS BITS
000100  B.CUIC: .BLKW   1               ;CURRENT UIC OF TASK
000102  B.PUIC: .BLKW   1               ;PROTECTION UIC OF TASK
000104  B.CTXT: .BLKW   2               ;NUMBER OF CONTEXT LOADS
000110  B.TCKP: .BLKW   2               ;TIMES TASK HAS BEEN CHECKPOINTED
000114  B.OVLY: .BLKW   2               ;NUMBER OF DISK OVERLAY LOADS
000120  B.EXST: .BLKW   2               ;EXIT STATUS AND ABORT CODE
000124  B.TLEN=.                        ;TAB LENGTH
000002  B.TBLK=<.+77>/100               ;NUMBER OF SEC POOL BLOCKS IN TAB


                ;
                ; SYSTEM ACCOUNT BLOCK (SAB)
                ;
                .=$$$TLN                        ;START AFTER TOTALS
000065  B.SHDN: .BLKB   1               ;ACCOUNTING SHUTDOWN REASON CODE
000066  B.UHD:  .BLKW   1               ;UAB LISTHEAD
000070  B.ULO:  .BLKW   1               ;NUMBER OF USERS CURRENTLY LOGGED ON
000072  B.ULT:  .BLKW   2               ;TOTAL NUMBER OF LOGONS
000076  B.CKP:  .BLKW   2               ;TOTAL NUMBER OF CHECKPOINTS
000102  B.SHF:  .BLKW   2               ;TOTAL NUMBER OF SHUFFLER RUNS
000106  B.RND:  .BLKW   2               ;NUMBER OF CPU INTERVALS ROUNDED UP TO 1
000112  B.FID:  .BLKW   3               ;FILE-ID OF TRANSACTION FILE
000120  B.DVNM: .BLKB   2               ;DEVICE  OF TRANSACTION FILE
000122  B.UNIT: .BLKW   1               ;UNIT    OF TRANSACTION FILE
000124  B.EXTS: .BLKW   1               ;EXTEND SIZE FOR TRANSACTION FILE
000126  B.LSCN: .BLKW   3               ;TIME OF LAST SCAN
000134  B.SCNR: .BLKW   1               ;SCAN RATE IN SECONDS
000136  B.DSCN: .BLKW   1               ;STATISTICAL SCAN RATE (IN SEC)
000140  B.STSP: .BLKW   2               ;RESERVED
000144  B.SYSM: .BLKW   1               ;RESERVED
000146  B.CKUS: .BLKW   3               ;RESERVED
000154  B.CKSP: .BLKW   2               ;RESERVED
000160  B.CKAL: .BLKW   1               ;RESERVED
000162  B.SLEN=.                        ;SAB LENGTH


                ;
                ; NEW FIELDS FOR EXTENDED ACCOUNTING
                ;
000162  B.CPUT: .BLKW   8.              ;CPU TIME USED PER PROCESSOR
000202  B.CTXP: .BLKW   8.              ;NUMBER OF CONTEXT SWITCHES (PER PROC)
000222  B.IDCT: .BLKW   8.              ;NUMBER OF IDLE LOOP ENTRIES (PER PROC)
000242  B.QIOC: .BLKW   8.              ;NUMBER OF I/O INITIATIONS (PER PROC)
000262  B.MIOC: .BLKW   8.              ;MASS STORE I/O COMPLETIONS (PER PROC)
000302  B.AIOC: .BLKW   8.              ;ALL I/O COMPLETIONS (PER PROC)
000322  B.IPSN: .BLKW   8.              ;IP INTERRUPTS SENT (PER PROC)
000342  B.IPRC: .BLKW   8.              ;IP INTERRUPTS RCVD (PER PROC)
```

ACNDF$ (Cont.)

```
000362  B.CKEX: .BLKW   2       ;CHECKPOINT DUE TO EXTEND TASKS
000366  B.CFCL: .BLKW   2       ;CALLS TO CFORK
000372  B.CFRK: .BLKW   2       ;CFORK FORKS
000376  B.TLOD: .BLKW   2       ;TASK LOADS
000402  B.RLOD: .BLKW   2       ;REGION LOADS
000406          .BLKB   82.     ;BUMP SIZE TO NEXT 32 WORD BLOCK
000346  B.SSBL=.-B.SLEN         ;EXTRA LENGTH OF SYSTEM STATISTICS BLOCK
000006  $$$=<.+77>/100          ;SAB LENGTH (ROUNDED UP TO 32 WORD BOUND)


        ;
        ; SYSLOG STARTUP TRANSACTION
        ;
        .=$$$HLN                ;START AFTER HEADER
000022  B.SSLN=.                ;TRANSACTION LENGTH


        ;
        ; CRASH RECOVERY TRANSACTION
        ;
        .=$$$HLN                ;START AFTER STANDARD HEADER
000022  B.CTLS: .BLKW   3       ;TIME OF LAST SCAN BEFORE CRASH
000030  B.CSRT: .BLKW   1       ;SCAN RATE BEFORE CRASH
000032  B.CRSN: .BLKB   60.     ;ASCII TEXT EXPLAINING CRASH
000126  B.CLEN=.                ;TRANSACTION LENGTH


        ;
        ; INVALID LOGIN TRANSACTION
        ;
        .=$$$HLN                ;
000022  B.INAM: .BLKB   14.     ;NAME FROM LOGIN LINE
000040  B.IUIC: .BLKB   6.      ;UIC FROM LOGIN LINE
000046  B.IPSW: .BLKB   6.      ;PASSWORD FROM LOGIN LINE
000054  B.ILEN=.                ;TRANSACTION LENGTH


        ;
        ; DEVICE TRANSACTIONS (ALLOCATION, DEALLOCATION, MOUNT, AND
        ;                      DISMOUNT)
        ;
        .=$$$HLN                ;
000022  B.DNAM: .BLKW   1       ;ASCII DEVICE NAME
000024  B.DUNT: .BLKB   1       ;OCTAL DEVICE UNIT NUMBER
000025  B.DLEN=.                ;TRANSACTION LENGTH FOR ALL, DEA, AND DMO
000025          .BLKB   1       ;UNUSED BYTE
000026  B.DLBL: .BLKW   6       ;VOLUME LABEL
000042  B.DMST: .BLKW   1       ;MOUNT STATUS BITS
000044  B.DUIC: .BLKW   1       ;OWNER UIC
000046  B.DVPR: .BLKW   1       ;VOLUME PROTECTION CODE
000050  B.DACP: .BLKW   2       ;NAME OF ACP FOR DEVICE
000054  B.MLEN=.                ;LENGTH OF MOUNT TRANSACTION
```

ACNDF$ (Cont.)

```
        ;
        ; STATUS BITS FOR MOUNT STATUS MASK (B.DMST)
        ;
        BM.SHR=1                ;DEVICE IS MOUNTED SHARED
        BM.NOS=2                ;DEVICE IS MOUNTED NOSHARE
        BM.SYS=4                ;DEVICE IS MOUNTED FOR THE SYSTEM (PUBLIC)
        BM.FOR=10               ;DEVICE IS MOUNTED FOREIGN


        ;
        ; SYSTEM TIME CHANGE TRANSACTION
        ;
        .=$$$HLN                ;
000022  B.TOLD: .BLKB   6       ;OLD TIME (YR, MON, DAY, HR, MIN, SEC)
000030  B.TNEW: .BLKB   6       ;NEW TIME (YR, MON, DAY, HR, MIN, SEC)
000036  B.TMLN=.                ;TRANSACTION LENGTH


        ;
        ; PRINT DESPOOLER TRANSACTION
        ;
        .=$$$HLN                ;START AFTER HEADER
000022  B.PNAM: .BLKW   3       ;PRINT JOB NAME  (RAD50)
000030  B.PPGS: .BLKW   1       ;PAGE COUNT
000032  B.PNFI: .BLKW   1       ;NUMBER OF FILES PRINTED
000034  B.PFRM: .BLKB   1       ;FORM NUMBER
000035  B.PPRI: .BLKB   1       ;PRINT PRIORITY
000036  B.PDEV: .BLKW   1       ;PRINT DEVICE NAME  (ASCII)
000040  B.PPUN: .BLKB   1       ;UNIT NUMBER OF PRINT DEVICE
000041  B.PLEN=.                ;TRANSACTION LENGTH


        ;
        ; CARD READER SPOOLING TRANSACTION
        ;
        .=$$$HLN                ;START AFTER HEADER
000022  B.RNAM: .BLKW   3       ;BATCH OR PRINT JOB NAME
000030  B.RCDS: .BLKW   1       ;NUMBER OF CARDS READ
000032  B.RDEV: .BLKW   1       ;READER DEVICE NAME (ASCII)
000034  B.RUNT: .BLKB   1       ;UNIT NUMBER OF READER DEVICE
000035  B.RSOP: .BLKB   1       ;SUBMIT OR PRINT (0=SUBMIT, 1=PRINT)
000036  B.RLEN=.                ;TRANSACTION LENGTH


        ;
        ; LOGIN TRANSACTION
        ;
        .=$$$HLN                ;START AFTER HEADER
000022  B.LUIC: .BLKW   1       ;LOGIN UIC
000024  B.LNAM: .BLKB   14.     ;USER'S LAST NAME
000042          .BLKB   1       ;AND FIRST INITIAL
000043  B.LLEN=.                ;TRANSACTION LENGTH


        ;
        ;  RESET TRANSACTION PARAMETERS
        ;
        .=$$$HLN                ;AFTER HEADER
```

ACNDF$ (Cont.)

```
000022  B.OFID: .BLKW   3       ;FILE-ID OF OLD TRN. FILE
000030  B.ODNM: .BLKB   2       ;DEVICE OF OLD TRN. FILE
000032  B.OUNT: .BLKW   1       ;UNIT OF OLD TRN. FILE
000034  B.NFID: .BLKW   3       ;FILE-ID OF NEW TRN. FILE
000042  B.NDNM: .BLKB   2       ;DEVICE OF NEW TRN. FILE
000044  B.NUNT: .BLKW   1       ;UNIT OF NEW TRN. FILE
000046  B.OEXS: .BLKW   1       ;EXT. SIZE FOR OLD TRN. FILE
000050  B.NEXS: .BLKW   1       ;EXT. SIZE FOR NEW TRN. FILE
000052  B.OSCR: .BLKW   1       ;OLD SCAN RATE IN SECONDS
000054  B.NSCR: .BLKW   1       ;NEW SCAN RATE IN SECONDS
000056  B.ODSC: .BLKW   1       ;OLD STATISTICAL SCAN RATE
000060  B.NDSC: .BLKW   1       ;NEW STATISTICAL SCAN RATE
000062  B.RTLN=.


        ;
        ; TRANSACTION TYPES
        ;
        ;       000 THRU 127            RESERVED FOR DEC USE
        ;       128 THRU 255            RESERVED FOR CUSTOMER USE
        ;
        BT.SAB=1                ;SYSTEM ACCOUNT BLOCK (SAB)
        BT.UAB=2                ;USER ACCOUNT BLOCK (UAB)
        BT.TAB=3                ;TASK ACCOUNT BLOCK (TAB)
        BT.SS=11                ;SYSLOG STARTUP TRANSACTION
        BT.INV=12               ;INVALID LOGIN TRANSACTION
        BT.TIM=13               ;SYSTEM TIME CHANGE TRANSACTION
        BT.ALL=14               ;ALLOCATE DEVICE TRANSACTION
        BT.DEA=15               ;DEALLOCATE DEVICE TRANSACTION
        BT.MOU=16               ;MOUNT DEVICE TRANSACTION
        BT.DMO=17               ;DISMOUNT DEVICE TRANSACTION
        BT.PRT=20               ;PRINT DESPOOLER TRANSACTION
        BT.DIR=21               ;DISK ACCOUNTING BY DIRECTORY  (UNSUPPORTED)
        BT.VOL=22               ;DISK ACCOUNTING BY VOLUME     (UNSUPPORTED)
        BT.LOG=23               ;LOGIN TRANSACTION
        BT.CRH=24               ;CRASH RECOVERY TRANSACTION
        BT.DST=25               ;DEVICE STATISTICS (UCB EXTENSION)
        BT.RTP=26               ;RESET TRANSACTION PARAMETERS
        BT.INP=27               ;CARD READER SPOOLING TRANSACTION


        ;
        ; STATUS MASK BIT DEFINITIONS (B.STM)
        ;
        BS.ACT=200              ;CONTROL BLOCK ACTIVE
        BS.CRH=100              ;RECORD FROM "TMP" FILE AFTER SYSTEM CRASH
        BS.LGO=40               ;LOGGED OFF WITH OUTSTANDING ACTIVITY (UAB)
        BS.CO=40                ;TASK'S TI: IS CO: (TAB ONLY)
        BS.TML=20               ;TAB EXISTS ONLY FOR TIME LIMIT (TAB ONLY)
        BS.ZER=10               ;LAST CPU INTERVAL WAS OF LENGTH ZERO
        BS.SCN=4                ;TRANSACTION READY FOR WRITE TO SCAN FILE


        ;
        ; ACCOUNTING FEATURE MASK ($ACNFE)
        ;
        BF.DST=40000            ;STATISTICAL SCAN RATE
        BF.WRT=2000             ;FORCE SYSLOG TO WRITE ITS BUFFER
        BF.SCN=1000             ;SCAN REQUESTED
```

ACNDF$ (Cont.)

```
        BF.SLR=400              ;SYSLOG IS RUNNING (NOT STOPPED)
        BF.ERR=200              ;ACCOUNTING STOPPED DUE TO FATAL ERROR
        BF.STR=100              ;ACCOUNTING IS STARTING UP / SHUTTING DOWN
        BF.LSS=40               ;ACCUMULATE SYSTEM STATISTICS
                                ;(POINT UAB TO SAB)
        BF.TRN=10               ;OUTPUT TO TRANSACTION FILE
        BF.XTK=4                ;CHECKPOINT REQUEST IS DUE TO EXTK$
        BF.TSK=2                ;TASK ACCOUNTING TURNED ON
        BF.XAC=1                ;EXTENDED ACCOUNTING ASSEMBLED IN


        ;
        ; SHUTDOWN CODES (B.SHDN)
        ;
        ; 1             MAINTENANCE
        ; 2             REBOOT
        ; 3             SCHEDULED SHUTDOWN
        ; 4             ACCOUNTING SHUTDOWN BY TASK "SHUTUP"
        ; 5             OTHER

        B.MAXL=128.             ;MAXIMUM TRANSACTION LENGTH
        B.MINL=$$$HLN           ;MINIMUM TRANSACTION LENGTH

                .PSECT


                ACTDF$


                .ASECT
        .=0
000000  A.GRP:  .BLKB   3       ;GROUP CODE (ASCII)
000003  A.MBR:  .BLKB   3       ;MEMBER CODE
000006  A.PSWD: .BLKB   6       ;PASSWORD
000014  A.LNM:  .BLKB   14.     ;LAST NAME
000032  A.FNM:  .BLKB   12.     ;FIRST NAME
000046  A.LDAT: .BLKB   6       ;DATE OF LAST LOG ON (DD/MM/YY HH:MM:SS
000054  A.NLOG: .BLKB   2       ;TOTAL NUMBER OF LOGONS
000056  A.SYDV: .BLKB   4       ;DEFAULT SYSTEM DEVICE
000062  A.ACN:  .BLKW   1       ;ACCOUNT NUMBER (BINARY)
000064  A.CLI:  .BLKW   2       ;RAD50 USER CLI
000070          .BLKW   2       ;UNUSED
000074  A.LPRV: .BLKW   1       ;LOGIN PRIVILEGE WORD
000076  A.SID:  .BLKW   1       ;SESSION IDENTIFIER
        A.LEN=128.              ;LENGTH OF CONTROL BLOCK


        ;
        ; BIT DEFINITIONS ON A.LPRV - LOGIN PRIVILEGE BITS
        ;
        AL.SLV=1                ;SLAVE TERMINAL ON LOGIN

                .PSECT
```

CLKDF$

```
                CLKDF$

        ;
        ; CLOCK QUEUE CONTROL BLOCK OFFSET DEFINITIONS
        ;
        ; CLOCK QUEUE CONTROL BLOCK
        ;
        ; THERE ARE FIVE TYPES OF CLOCK QUEUE CONTROL BLOCKS. EACH CONTROL
        ; BLOCK HAS THE SAME FORMAT IN THE FIRST FIVE WORDS AND DIFFERS IN
        ; THE REMAINING THREE.
        ;
        ; THE FOLLOWING CONTROL BLOCK TYPES ARE DEFINED:
        ;
        C.MRKT=0                ;MARK TIME REQUEST
        C.SCHD=2                ;TASK REQUEST WITH PERIODIC RESCHEDULING
        C.SSHT=4                ;SINGLE SHOT TASK REQUEST
        C.SYST=6                ;SINGLE SHOT INTERNAL SYSTEM SUBROUTINE
                                ;(IDENT)
        C.SYTK=8.               ;SINGLE SHOT INTERNAL SYSTEM SUBROUTINE
                                ;(TASK)
        C.CSTP=10.              ;CLEAR STOP BIT (CONDITIONALIZED ON
                                ;SHUFFLING)


        ;
        ; CLOCK QUEUE CONTROL BLOCK TYPE INDEPENDENT OFFSET DEFINTIONS
        ;
                .ASECT
        .=0
000000  C.LNK:  .BLKW   1       ;CLOCK QUEUE THREAD WORD
000002  C.RQT:  .BLKB   1       ;REQUEST TYPE
000003  C.EFN:  .BLKB   1       ;EVENT FLAG NUMBER (MARK TIME ONLY)
000004  C.TCB:  .BLKW   1       ;TCB ADR OR SYSTEM SUBROUTINE IDENTIFICATION
000006  C.TIM:  .BLKW   2       ;ABSOLUTE TIME WHEN REQUEST COMES DUE


        ;
        ; CLOCK QUEUE CONTROL BLOCK-MARK TIME DEPENDENT OFFSET DEFINITIONS
        ;
        .=C.TIM+4               ;START OF DEPENDENT AREA
000012  C.AST:  .BLKW   1       ;AST ADDRESS
000014  C.SRC:  .BLKW   1       ;FLAG MASK WORD FOR 'BIS' SOURCE
000016  C.DST:  .BLKW   1       ;ADDRESS OF 'BIS' DESTINATION
000020          .BLKW   1       ;UNUSED


        ;
        ; CLOCK QUEUE CONTROL BLOCK-PERIODIC RESCHEDULING DEPENDENT OFFSET
        ; DEFINITIONS
        ;
        .=C.TIM+4               ;START OF DEPENDENT AREA
000012  C.RSI:  .BLKW   2       ;RESCHEDULE INTERVAL IN CLOCK TICKS
000016  C.UIC:  .BLKW   1       ;SCHEDULING UIC
000020  C.UAB:  .BLKW   1       ;POINTER TO ASSOCIATED UAB
```

CLKDF$ (Cont.)

```
                ;
                ; CLOCK QUEUE CONTROL BLOCK-SINGLE SHOT DEPENDENT OFFSET DEFINITIONS
                ;
                .=C.TIM+4                       ;START OF DEPENDENT AREA
000012                  .BLKW   2               ;TWO UNUSED WORDS
000016                  .BLKW   1               ;SCHEDULING UIC
000020                  .BLKW   1               ;C.UAB


                ;
                ; CLOCK QUEUE CONTROL BLOCK-SINGLE SHOT INTERNAL SUBROUTINE OFFSET
                ; DEFINITIONS
                ;
                ; THERE ARE TWO TYPE CODES FOR THIS TYPE OF REQUEST:
                ;
                ;       TYPE 6 = SINGLE SHOT INTERNAL SUBROUTINE WITH A 16 BIT VALUE
                ;                AS AN IDENTIFIER.
                ;
                ;       TYPE 8 = SINGLE SHOT INTERNAL SUBROUTINE WITH A TCB ADDRESS
                ;                AS AN IDENTIFIER.
                ;
                .=C.TIM+4                       ;START OF DEPENDENT AREA
000012  C.SUB:  .BLKW   1               ;SUBROUTINE ADDRESS
000014  C.AR5:  .BLKW   1               ;RELOCATION BASE (FOR LOADABLE DRIVERS)
000016  C.URM:  .BLKW   1               ;URM TO EXECUTE ROUTINE ON
                                        ;(MP SYSTEMS, C.SYST ONLY)
000020          .BLKW   1               ;UNUSED
000022  C.LGTH=.                        ;LENGTH OF CLOCK QUEUE CONTROL BLOCK

                .PSECT
```

CTBDF$

```
                CTBDF$

        ;
        ; CONTROLLER TABLE (CTB)
        ;
        ; THE CONTROLLER TABLE IS A CONTROL BLOCK THAT CONTAINS A VECTOR
        ; OF KRB ADDRESSES.  THIS VECTOR MAY BE ADDRESSED BY THE CONTROLLER
        ; INDEX TAKEN FROM THE INTERRUPT PS BY $INTSV/$INTSE.
        ;
                .ASECT
        .=177756
177756  L.CLK:  .BLKW   8.      ;START OF CLOCK BLOCK (IF ANY)
177776  L.ICB:  .BLKW   1       ;ICB CHAIN FOR THIS CTB
000000  L.LNK:  .BLKW   1       ;CTB LINK WORD
000002  L.NAM:  .BLKW   1       ;GENERIC CONTROLLER NAME (ASCII)
000004  L.DCB:  .BLKW   1       ;DCB ADDRESS OF THIS DEVICE
000006  L.NUM:  .BLKB   1       ;NUMBER OF KRB ADDRESSES IN TABLE
000007  L.STS:  .BLKB   1       ;CTB STATUS BYTE
000010  L.KRB:  .BLKW   1       ;START OF KRB ADDRESSES


        ;
        ; NOTE: THE SYMBOL $XYCTB:: IS DEFINED FOR EACH CTB, WHERE THE
        ; CHARACTERS XY ARE THE SAME AS THOSE STORED IN L.NAM.  THE
        ; SYMBOL IS NOT THE START OF THE CTB, BUT INSTEAD THE START OF
        ; THE KRB TABLE AT THE END OF THE CTB (L.KRB).
        ;
                .PSECT


        ;
        ; CONTROLLER TABLE STATUS BYTE BIT DEFINITIONS
        ;
        LS.CLK=1                ;CLOCK BLOCK AT TOP OF CTB (1=YES)
        LS.MDC=2                ;MULTIDRIVER CTB (1=YES)
        LS.CBL=4                ;CLOCK BLK LINKED INTO CLK Q (1=YES)
        LS.CIN=10               ;CONT. USE COMMON INT TABLE (1=YES)
        LS.NET=20               ;THIS IS DECNET DEVICE.  ICB'S IN K.PRM
                                ;(1=YES)


        ;
        ; COMMON INTERRUPT TABLE DISPATCH ENTRY POINTS
        ;
        CI.CSR=-6               ;CSR TEST ENTRY POINT
        CI.KRB=-4               ;KRB STATUS CHANGE ENTRY POINT
        CI.PWF=-2               ;POWERFAIL ENTRY POINT
        CI.INT=0                ;COMMON INTERRUPT ADDRESS
        CI.DCB=2                ;START OF DCB TABLE (0 ENDS TABLE)
```

DCBDF$

```
                DCBDF$  ,,SYSDEF

                ;
                ; DEVICE CONTROL BLOCK
                ;
                ; THE DEVICE CONTROL BLOCK (DCB) DEFINES GENERIC INFORMATION ABOUT A
                ; DEVICE TYPE AND THE LOWEST AND HIGHEST UNIT NUMBERS.  THERE IS AT
                ; LEAST ONE DCB FOR EACH DEVICE TYPE IN A SYSTEM.  FOR EXAMPLE, IF
                ; THERE ARE TELETYPES IN A SYSTEM, THEN THERE IS AT LEAST ONE DCB
                ; WITH THE DEVICE NAME 'TT'.  IF PART OF THE TELETYPES WERE
                ; INTERFACED VIA DL11-A'S AND THE REST VIA A DH11, THEN THERE WOULD
                ; BE TWO DCB'S.  ONE FOR ALL DL11-A INTERFACED TELETYPES, AND ONE
                ; FOR ALL DH11 INTERFACED TELETYPES.
                ;
                        .ASECT
                .=0
000000  D.LNK:  .BLKW   1       ;LINK TO NEXT DCB
000002  D.UCB:  .BLKW   1       ;POINTER TO FIRST UNIT CONTROL BLOCK
000004  D.NAM:  .BLKW   1       ;GENERIC DEVICE NAME
000006  D.UNIT: .BLKB   1       ;LOWEST UNIT NUMBER COVERED BY THIS DCB
000007          .BLKB   1       ;HIGHEST UNIT NUMBER COVERED BY THIS DCB
000010  D.UCBL: .BLKW   1       ;LENGTH OF EACH UNIT CONTROL BLOCK IN BYTES
000012  D.DSP:  .BLKW   1       ;POINTER TO DRIVER DISPATCH TABLE
000014  D.MSK:  .BLKW   1       ;LEGAL FUNCTION MASK  CODES 0-15.
000016          .BLKW   1       ;CONTROL FUNCTION MASK CODES 0-15.
000020          .BLKW   1       ;NOP'ED FUNCTION MASK CODES 0-15.
000022          .BLKW   1       ;ACP FUNCTION MASK CODES 0-15.
000024          .BLKW   1       ;LEGAL FUNCTION MASK CODES 16.-31.
000026          .BLKW   1       ;CONTROL FUNCTION MASK CODES 16.-31.
000030          .BLKW   1       ;NOP'ED FUNCTION MASK CODES 16.-31.
000032          .BLKW   1       ;ACP FUNCTION MASK CODES 16.-31.
000034  D.PCB:  .BLKW   1       ;LOADABLE DRIVER PCB ADDRESS

                        .PSECT


                ;
                ; DRIVER DISPATCH TABLE OFFSET DEFINITIONS
                ;
                D.VDEB=-2               ;DEALLOCATE BUFFER(S)
                D.VCHK=-4               ;ADDRESS OF ROUTINE CALLED TO VALIDATE
                                        ;AND CONVERT THE LBN.  USED BY DRIVERS
                                        ;THAT SUPPORT SEEK OPTIMIZATION.
                D.VNXC=-4               ;ADDRESS OF ROUTINE IN TTDRV CALLED TO
                                        ;HAVE IT SEND THE NEXT COMMAND IN THE
                                        ;TYPEAHEAD BUFFER TO MCR...
                D.VINI=0                ;DEVICE INITIATOR
                D.VCAN=2                ;CANCEL CURRENT I/O FUNCTION
                D.VOUT=4                ;DEVICE TIMEOUT
                D.VPWF=6                ;POWERFAIL RECOVERY
                D.VKRB=10               ;CONTROLLER STATUS CHANGE ENTRY
                D.VUCB=12               ;UNIT STATUS CHANGE ENTRY


                        .IF NB SYSDEF

                D.VINT=14               ;BEGINNING OF INTERRUPT STUFF

                        .ENDC
```

EPKDF$

```
                EPKDF$

        ;
        ; ERROR MESSAGE BLOCK DEFINITIONS
        ;
                .ASECT


        ;
        ; HEADER SUBPACKET
        ;
        ;
        ;       +-----------------------------------------------+
        ;       | SUBPACKET LENGTH IN BYTES                     |
        ;       +-----------------------------------------------+
        ;       | SUBPACKET FLAGS                               |
        ;       +-----------------------+-----------------------+
        ;       | FORMAT IDENTIFICATION | OPERATING SYSTEM CODE |
        ;       +-----------------------+-----------------------+
        ;       | OPERATING SYSTEM IDENTIFICATION               |
        ;       |                                               |
        ;       +-----------------------+-----------------------+
        ;       | FLAGS                 | CONTEXT CODE          |
        ;       +-----------------------+-----------------------+
        ;       | ENTRY SEQUENCE                                |
        ;       +-----------------------------------------------+
        ;       | ERROR SEQUENCE                                |
        ;       +-----------------------+-----------------------+
        ;       | ENTRY TYPE SUBCODE    | ENTRY TYPE CODE       |
        ;       +-----------------------+-----------------------+
        ;       | TIME STAMP                                    |
        ;       |                                               |
        ;       |                                               |
        ;       +-----------------------+-----------------------+
        ;       | RESERVED              | PROCESSOR TYPE        |
        ;       +-----------------------+-----------------------+
        ;       | PROCESSOR IDENTIFICATION (URM)                |
        ;       +-----------------------------------------------+
        ;
        .=0
000000  E$HLGH: .BLKW   1       ; SUBPACKET LENGTH IN BYTES
000002  E$HSBF: .BLKW   1       ; SUBPACKET FLAGS
000004  E$HSYS: .BLKB   1       ; OPERATING SYSTEM CODE
000005  E$HIDN: .BLKB   1       ; FORMAT IDENTIFICATION
000006  E$HSID: .BLKB   4       ; OPERATING SYSTEM IDENTIFICATION
000012  E$HCTX: .BLKB   1       ; CONTEXT CODE
000013  E$HFLG: .BLKB   1       ; FLAGS
000014  E$HENS: .BLKW   1       ; ENTRY SEQUENCE NUMBER
000016  E$HERS: .BLKW   1       ; ERROR SEQUENCE NUMBER
000020  E$HENC:                 ; ENTRY CODE
000020  E$HTYC: .BLKB   1       ; ENTRY TYPE CODE
000021  E$HTYS: .BLKB   1       ; ENTRY TYPE SUBCODE
000022  E$HTIM: .BLKB   6       ; TIME STAMP
000030  E$HPTY: .BLKB   1       ; PROCESSOR TYPE
000031          .BLKB   1       ; RESERVED
000032  E$HURM: .BLKW   1       ; PROCESSOR IDENTIFICATION (URM)
                .EVEN
000034  E$HLEN:                 ; LENGTH
```

EPKDF$ (Cont.)

```
;
; SUBPACKET FLAGS FOR E$HSBF
;
        SM.ERR  =      1 ; ERROR PACKET
        SM.HDR  =      1 ; HEADER SUBPACKET
        SM.TSK  =      2 ; TASK SUBPACKET
        SM.DID  =      4 ; DEVICE IDENTIFICATION SUBPACKET
        SM.DOP  =     10 ; DEVICE OPERATION SUBPACKET
        SM.DAC  =     20 ; DEVICE ACTIVITY SUBPACKET
        SM.DAT  =     40 ; DATA SUBPACKET
        SM.MBC  =  20000 ; 22-BIT MASSBUS CONTROLLER PRESENT
        SM.CMD  =  40000 ; ERROR LOG COMMAND PACKET
        SM.ZER  = 100000 ; ZERO I/O COUNTS

;
; CODES FOR FIELD E$HIDN
;
        EH$FOR  =      1 ; CURRENT PACKET FORMAT

;
; FLAGS FOR THE ERROR LOG FLAGS BYTE ($ERFLA) IN THE EXEC
;
        ES.INI  =      1 ; ERROR LOG INITIALIZED
        ES.DAT  =      2 ; ERROR LOG RECEIVING DATA PACKETS
        ES.LIM  =      4 ; ERROR LIMITING ENABLED
        ES.LOG  =     10 ; ERROR LOGGING ENABLED

;
; TYPE AND SUBTYPE CODES FOR FIELDS E$HTYC AND E$HTYS
;
;       SYMBOLS WITH NAMES E$CXXX ARE TYPE CODES FOR FIELD E$HTYC,
;       SYMBOLS WITH NAMES E$SXXX ARE SUBTYPE CODES FOR FIELD E$HTYS
;
        E$CCMD  =      1 ; ERROR LOG CONTROL
        E$SSTA  =      1 ;       ERROR LOG STATUS CHANGE
        E$SSWI  =      2 ;       SWITCH LOGGING FILES
        E$SAPP  =      3 ;       APPEND FILE
        E$SBAC  =      4 ;       DECLARE BACKUP FILE
        E$SSHO  =      5 ;       SHOW
        E$SCHL  =      6 ;       CHANGE LIMITS

        E$CERR  =      2 ; DEVICE ERRORS
        E$SDVH  =      1 ;       DEVICE HARD ERROR
        E$SDVS  =      2 ;       DEVICE SOFT ERROR
        E$STMO  =      3 ;       DEVICE INTERRUPT TIMEOUT
        E$SUNS  =      4 ;       DEVICE UNSOLICITED INTERRUPT

        E$CDVI  =      3 ; DEVICE INFORMATION
        E$SDVI  =      1 ;       DEVICE INFORMATION MESSAGE

        E$CDCI  =      4 ; DEVICE CONTROL INFORMATION
        E$SMOU  =      1 ;       DEVICE MOUNT
        E$SDMO  =      2 ;       DEVICE DISMOUNT
        E$SRES  =      3 ;       DEVICE COUNT RESET
        E$SRCT  =      4 ;       BLOCK REPLACEMENT

        E$CCPU  =      5 ; CPU DETECTED ERRORS
        E$SMEM  =      1 ;       MEMORY ERROR
        E$SINT  =      2 ;       UNEXPECTED INTERRUPT
```

EPKDF$ (Cont.)

```
                E$CSYS  =     6 ; SYSTEM CONTROL INFORMATION
                E$SPWR  =     1 ;        POWER RECOVERY

                E$CCTL  =     7 ; CONTROL INFORMATION
                E$STIM  =     1 ;        TIME CHANGE
                E$SCRS  =     2 ;        SYSTEM CRASH
                E$SLOA  =     3 ;        DEVICE DRIVER LOAD
                E$SUNL  =     4 ;        DEVICE DRIVER UNLOAD
                E$SHRC  =     5 ;        RECONFIGURATION STATUS CHANGE
                E$SMES  =     6 ;        MESSAGE

                E$CSDE  =    10 ; SOFTWARE DETECTED EVENTS
                E$SABO  =     1 ;        TASK ABORT

        ;
        ; CODES FOR CONTEXT CODE ENTRY E$HCTX
        ;
                EH$NOR  =     1 ; NORMAL ENTRY
                EH$STA  =     2 ; START ENTRY
                EH$CRS  =     3 ; CRASH ENTRY

        ;
        ; CODES FOR FLAGS ENTRY E$HFLG
        ;
                EH$VIR  =     1 ; ADDRESSES ARE VIRTUAL
                EH$EXT  =     2 ; ADDRESSES ARE EXTENDED
                EH$COU  =     4 ; ERROR COUNTS SUPPLIED


        ;
        ; TASK SUBPACKET
        ;
        ;       +-----------------------------------------------+
        ;       | TASK SUBPACKET LENGTH                         |
        ;       +-----------------------------------------------+
        ;       | TASK NAME IN RAD50                            |
        ;       |                                               |
        ;       +-----------------------------------------------+
        ;       | TASK UIC                                      |
        ;       +-----------------------------------------------+
        ;       | TASK TI: DEVICE NAME                          |
        ;       +-----------------------+-----------------------+
        ;       | FLAGS                 | TASK TI: UNIT NUMBER  |
        ;       +-----------------------+-----------------------+
        ;
        .=0
000000  E$TLGH: .BLKW   1       ; TASK SUBPACKET LENGTH
000002  E$TTSK: .BLKW   2       ; TASK NAME IN RAD50
000006  E$TUIC: .BLKW   1       ; TASK UIC
000010  E$TTID: .BLKB   2       ; TASK TI: DEVICE NAME
000012  E$TTIU: .BLKB   1       ; TASK TI: UNIT
000013  E$TFLG: .BLKB   1       ; FLAGS
                .EVEN
000014  E$TLEN:
```

EPKDF$ (Cont.)

```
;
; FLAGS FOR ENTRY E$TFLG
;
        ET$PRV  =       1 ; TASK IS PRIVILEGED
        ET$PRI  =       2 ; TERMINAL IS PRIVILEGED


;
; DEVICE IDENTIFICATION SUBPACKET
;
;       +-----------------------------------------------+
;       | DEVICE IDENTIFICATION SUBPACKET LENGTH        |
;       +-----------------------------------------------+
;       | DEVICE MNEMONIC NAME                          |
;       +-----------------------+-----------------------+
;       | CONTROLLER NUMBER     | DEVICE UNIT NUMBER    |
;       +-----------------------+-----------------------+
;       | PHYSICAL SUBUNIT #    | PHYSICAL UNIT #       |
;       +-----------------------+-----------------------+
;       | PHYSICAL DEVICE MNEMONIC (RSX-11M-PLUS ONLY)  |
;       +-----------------------+-----------------------+
;       | RESERVED              | FLAGS                 |
;       +-----------------------+-----------------------+
;       | VOLUME NAME OF MOUNTED VOLUME                 |
;       |                                               |
;       |                                               |
;       |                                               |
;       |                                               |
;       |                                               |
;       +-----------------------------------------------+
;       | PACK IDENTIFICATION                           |
;       |                                               |
;       +-----------------------------------------------+
;       | DEVICE TYPE CLASS                             |
;       +-----------------------------------------------+
;       | DEVICE TYPE                                   |
;       |                                               |
;       +-----------------------------------------------+
;       | I/O OPERATION COUNT LONGWORD                  |
;       |                                               |
;       +-----------------------+-----------------------+
;       | HARD ERROR COUNT      | SOFT ERROR COUNT      |
;       +-----------------------+-----------------------+
;       | BLOCKS TRANSFERRED COUNT (RSX-11M-PLUS ONLY)  |
;       |                                               |
;       +-----------------------------------------------+
;       | CYLINDERS CROSSED COUNT (RSX-11M-PLUS ONLY)   |
;       |                                               |
;       +-----------------------------------------------+
;
        .=0
000000  E$ILGH: .BLKW   1       ; DEVICE IDENTIFICATION SUBPACKET LENGTH
000002  E$ILDV: .BLKW   1       ; DEVICE MNEMONIC NAME
000004  E$ILUN: .BLKB   1       ; DEVICE UNIT NUMBER
000005  E$IPCO: .BLKB   1       ; CONTROLLER NUMBER
000006  E$IPUN: .BLKB   1       ; PHYSICAL UNIT NUMBER
000007  E$IPSU: .BLKB   1       ; PHYSICAL SUBUNIT NUMBER
000010  E$IPDV: .BLKW   1       ; PHYSICAL DEVICE MNEMONIC
```

EPKDF$ (Cont.)

```
000012  E$IFLG: .BLKB   1       ; FLAGS
000013          .BLKB   1       ; RESERVED
000014  E$IVOL: .BLKB   12.     ; VOLUME NAME
000030  E$IPAK: .BLKB   4       ; PACK IDENTIFICATION
000034  E$IDEV:                 ; DEVICE TYPE
000034  E$IDCL: .BLKW   1       ; DEVICE TYPE CLASS
000036  E$IDTY: .BLKW   2       ; DEVICE TYPE
000042  E$IOPR: .BLKW   2       ; I/O OPERATION COUNT LONGWORD
000046  E$IERS: .BLKB   1       ; SOFT ERROR COUNT
000047  E$IERH: .BLKB   1       ; HARD ERROR COUNT
000050  E$IBLK: .BLKW   2       ; BLOCKS TRANSFERRED COUNT
000054  E$ICYL: .BLKW   2       ; CYLINDERS CROSSED COUNT
                .EVEN
000060  E$ILEN:                 ; SUBPACKET LENGTH

        ;
        ; FLAGS FOR FIELD E$IFLG
        ;
                EI$SUB  =     1 ; SUBCONTROLLER DEVICE
                EI$NUX  =     2 ; NO UCB EXTENSION, DATA INVALID


        ;
        ; DEVICE OPERATION SUBPACKET
        ;
        ;       +-----------------------------------------------+
        ;       | DEVICE OPERATION SUBPACKET LENGTH             |
        ;       +-----------------------------------------------+
        ;       | TASK NAME IN RAD50                            |
        ;       |                                               |
        ;       +-----------------------------------------------+
        ;       | TASK UIC                                      |
        ;       +-----------------------------------------------+
        ;       | TASK TI: LOGICAL DEVICE MNEMONIC              |
        ;       +-----------------------+-----------------------+
        ;       | RESERVED              | TASK TI: DEVICE UNIT  |
        ;       +-----------------------+-----------------------+
        ;       | I/O FUNCTION CODE                             |
        ;       +-----------------------+-----------------------+
        ;       | RESERVED              | OPERATION FLAGS       |
        ;       +-----------------------+-----------------------+
        ;       | TRANSFER OPERATION ADDRESS                    |
        ;       |                                               |
        ;       +-----------------------------------------------+
        ;       | TRANSFER OPERATION BYTE COUNT                 |
        ;       +-----------------------------------------------+
        ;       | CURRENT OPERATION RETRY COUNT                 |
        ;       +-----------------------------------------------+
        ;
        .=0
000000  E$OLGN: .BLKW   1       ; SUBPACKET LENGTH
000002  E$OTSK: .BLKW   2       ; TASK NAME IN RAD50
000006  E$OUIC: .BLKW   1       ; TASK UIC
000010  E$OTID: .BLKB   2       ; TASK TI: LOGICAL DEVICE MNEMONIC
000012  E$OTIU: .BLKB   1       ; TASK TI: LOGICAL DEVICE UNIT
000013          .BLKB   1       ; RESERVED
000014  E$OFNC: .BLKW   1       ; I/O FUNCTION CODE
000016  E$OFLG: .BLKB   1       ; OPERATION FLAGS
```

EPKDF$ (Cont.)

```
000017          .BLKB   1       ; RESERVED
000020  E$OADD: .BLKW   2       ; TRANSFER OPERATION ADDRESS
000024  E$OSIZ: .BLKW   1       ; TRANSFER OPERATION BYTE COUNT
000026  E$ORTY: .BLKW   1       ; CURRENT OPERATION RETRY COUNT
                .EVEN
000030  E$OLEN:                 ; DEVICE OPERATION SUBPACKET LENGTH

        ;
        ; FLAGS FOR FIELD E$OFLG
        ;
                EO$TRA  =     1 ; TRANSFER OPERATION
                EO$DMA  =     2 ; DMA DEVICE
                EO$EXT  =     4 ; EXTENDED ADDRESSING DEVICE
                EO$PIP  =    10 ; DEVICE IS POSITIONING


        ;
        ; I/O ACTIVITY SUBPACKET
        ;
        ;       +-----------------------------------------------+
        ;       | I/O ACTIVITY SUBPACKET LENGTH                 |
        ;       +-----------------------------------------------+
        ;
        .=0
000000  E$ALGH: .BLKW   1       ; SUBPACKET LENGTH


        ;
        ; I/O ACTIVITY SUBPACKET ENTRY
        ;
        ;       +-----------------------------------------------+
        ;       | LOGICAL DEVICE NAME MNEMONIC                  |
        ;       +-----------------------+-----------------------+
        ;       | CONTROLLER NUMBER     | LOGICAL DEVICE UNIT   |
        ;       +-----------------------+-----------------------+
        ;       | PHYSICAL SUBUNIT #    | PHYSICAL UNIT NUMBER  |
        ;       +-----------------------+-----------------------+
        ;       | PHYSICAL DEVICE MNEMONIC (RSX-11M-PLUS ONLY)  |
        ;       +-----------------------+-----------------------+
        ;       | TASK TI: LOGICAL UNIT | DEVICE FLAGS          |
        ;       +-----------------------+-----------------------+
        ;       | REQUESTING TASK NAME IN RAD50                 |
        ;       |                                               |
        ;       +-----------------------------------------------+
        ;       | REQUESTING TASK UIC                           |
        ;       +-----------------------------------------------+
        ;       | TASK TI: LOGICAL DEVICE NAME                  |
        ;       +-----------------------------------------------+
        ;       | I/O FUNCTION CODE                             |
        ;       +-----------------------+-----------------------+
        ;       | RESERVED              | FLAGS                 |
        ;       +-----------------------+-----------------------+
        ;       | TRANSFER OPERATION ADDRESS                    |
        ;       |                                               |
        ;       +-----------------------------------------------+
        ;       | TRANSFER OPERATION BYTE COUNT                 |
        ;       +-----------------------------------------------+
        ;
        .=0
```

EPKDF$ (Cont.)

```
000000  E$ALDV: .BLKW   1       ; LOGICAL DEVICE NAME MNEMONIC
000002  E$ALUN: .BLKB   1       ; LOGICAL DEVICE UNIT
000003  E$APCO: .BLKB   1       ; CONTROLLER NUMBER
000004  E$APUN: .BLKB   1       ; PHYSICAL UNIT NUMBER
000005  E$APSU: .BLKB   1       ; PHYSICAL SUBUNIT NUMBER
000006  E$APDV: .BLKW   1       ; PHYSICAL DEVICE MNEMONIC
000010  E$ADFG: .BLKB   1       ; DEVICE FLAGS
000011  E$ATIU: .BLKB   1       ; TASK TI: LOGICAL UNIT
000012  E$ATSK: .BLKW   2       ; REQUESTING TASK NAME IN RAD50
000016  E$AUIC: .BLKW   1       ; REQUESTING TASK UIC
000020  E$ATID: .BLKW   1       ; TASK TI: LOGICAL DEVICE NAME
000022  E$AFNC: .BLKW   1       ; I/O FUNCTION CODE
000024  E$AFLG: .BLKB   1       ; FLAGS
000025          .BLKB   1       ; RESERVED
000026  E$AADD: .BLKW   2       ; TRANSFER OPERATION ADDRESS
000032  E$ASIZ: .BLKW   1       ; TRANSFER OPERATION BYTE COUNT
                .EVEN
000034  E$ALEN:                 ; SUBPACKET ENTRY LENGTH

        ;
        ; FLAGS FOR FIELD E$ADFG
        ;
                EA$SUB  =     1 ; SUBCONTROLLER DEVICE
                EA$NUX  =     2 ; NO UCB EXTENSION, DATA INVALID

        ;
        ; FLAGS FOR FIELD E$AFLG
        ;
                EA$TRA  =     1 ; TRANSFER OPERATION
                EA$DMA  =     2 ; DMA DEVICE
                EA$EXT  =     4 ; DEVICE HAS EXTENDED ADDRESSING
                EA$PIP  =    10 ; DEVICE IS POSITIONING

                .PSECT
```

F11DF$

```
                F11DF$  ,,SYSDEF

        ;
        ; VOLUME CONTROL BLOCK
        ;
                .ASECT
        .=0
000000  V.TRCT: .BLKW   1       ; TRANSACTION COUNT
000002  V.TYPE: .BLKB   1       ; VOLUME TYPE DESCRIPTOR
        VT.SL1= 1               ; FILES-11 STRUCTURE LEVEL 1
        VT.ANS= 10              ; ANSI LABELED TAPE
        VT.UNL= 11              ; UNLABELED TAPE
000003  V.VCHA: .BLKB   1       ; VOLUME CHARACTERISTICS
        VC.SLK= 1               ; CLEAR VOLUME VALID ON DISMOUNT
        VC.HLK= 2               ; UNLOAD THE VOLUME ON DISMOUNT
        VC.DEA= 4               ; DEALLOCATE THE VOLUME ON DISMOUNT
        VC.PUB= 10              ; SET (CLEAR) US.PUB ON DISMOUNT
000004  V.LABL: .BLKB   14      ; VOLUME LABEL (ASCII)
000020  V.PKSR: .BLKW   2       ; PACK SERIAL NUMBER FOR ERROR LOGGING

000024  V.SLEN:                 ; LENGTH OF SHORT VCB

000024  V.IFWI: .BLKW   1       ; INDEX FILE WINDOW
000026  V.FCB:  .BLKW   2       ; FILE CONTROL BLOCK LIST HEAD
000032  V.IBLB: .BLKB   1       ; INDEX BIT MAP 1ST LBN HIGH BYTE
000033  V.IBSZ: .BLKB   1       ; INDEX BIT MAP SIZE IN BLOCKS
000034          .BLKW   1       ; INDEX BITMAP 1ST LBN LOW BITS
000036  V.FMAX: .BLKW   1       ; MAX NO. OF FILES ON VOLUME
000040  V.WISZ: .BLKB   1       ; DEFAULT SIZE OF WINDOW IN RTRV PTRS
                                ; VALUE IS < 128.
000041  V.SBCL: .BLKB   1       ; STORAGE BIT MAP CLUSTER FACTOR
000042  V.SBSZ: .BLKW   1       ; STORAGE BIT MAP SIZE IN BLOCKS
000044  V.SBLB: .BLKB   1       ; STORAGE BIT MAP 1ST LBN HIGH BYTE
000045  V.FIEX: .BLKB   1       ; DEFAULT FILE EXTEND SIZE
000046          .BLKW   1       ; STORAGE BIT MAP 1ST LBN LOW BITS
000050  V.VOWN: .BLKW   1       ; VOLUME OWNER'S UIC
000052  V.VPRO: .BLKW   1       ; VOLUME PROTECTION
000054  V.FPRO: .BLKW   1       ; VOLUME DEFAULT FILE PROTECTION
000056  V.FRBK: .BLKB   1       ; NUMBER OF FREE BLOCKS ON VOLUME HIGH BYTE
000057  V.LRUC: .BLKB   1       ; COUNT OF AVAILABLE LRU SLOTS IN FCB LIST
000060          .BLKW   1       ; NUMBER OF FREE BLOCKS ON VOLUME LOW BITS
000062  V.STS:  .BLKB   1       ; VOL STATUS BYTE, CONTAINING THE FOLLOWING
        VS.IFW= 1               ; INDEX FILE IS WRITE ACCESSED
        VS.BMW= 2               ; STORAGE BITMAP FILE IS WRITE ACCESSED
000063  V.FFNU: .BLKB   1       ; FIRST FREE INDEX FILE BITMAP BLOCK
000064  V.EXT:  .BLKW   1       ; POINTER TO VCB EXTENSION

000066  V.LGTH:                 ; SIZE IN BYTES OF VCB


        ;
        ; MOUNT LIST ENTRY
        ;
        ; EACH ENTRY ALLOWS ACCESS TO A SPECIFIED USER FOR A NON-PUB DEVICE
        ;
        ; TO ALLOW EXPANSION, ONLY THE ONLY TYPE CODE DEFINED IS "1" FOR
```

F11DF$ (Cont.)

```
        ; DEVICE ACCESS BLOCKS
        ;
                .ASECT
        .=0
000000  M.LNK:   .BLKW    1       ; LINK WORD
000002  M.TYPE:  .BLKB    1       ; TYPE OF ENTRY
        MT.MLS=  1                ; MOUNTED VOLUME USER ACCESS LIST
000003  M.ACC:   .BLKB    1       ; NUMBER OF ACCESSES
000004  M.DEV:   .BLKW    1       ; DEVICE UCB
000006  M.TI:    .BLKW    1       ; ACCESSOR TI: UCB

000010  M.LEN:                    ; LENGTH OF ENTRY


        ;
        ; FILE CONTROL BLOCK
        ;
                .ASECT
        .=0
000000  F.LINK:  .BLKW    1       ; FCB CHAIN POINTER
000002  F.FNUM:  .BLKW    1       ; FILE NUMBER
000004  F.FSEQ:  .BLKW    1       ; FILE SEQUENCE NUMBER
000006           .BLKB    1       ; NOT USED
000007  F.FSQN:  .BLKB    1       ; FILE SEGMENT NUMBER
000010  F.FOWN:  .BLKW    1       ; FILE OWNER'S UIC
000012  F.FPRO:  .BLKW    1       ; FILE PROTECTION CODE
000014  F.UCHA:  .BLKB    1       ; USER CONTROLLED CHARACTERISTICS
000015  F.SCHA:  .BLKB    1       ; SYSTEM CONTROLLED CHARACTERISTICS
000016  F.HDLB:  .BLKW    2       ; FILE HEADER LOGICAL BLOCK NUMBER

                                  ; BEGINNING OF STATISTICS BLOCK
000022  F.LBN:   .BLKW    2       ; LBN OF VIRTUAL BLOCK 1 IF CONTIGUOUS
                                  ; 0 IF NON CONTIGUOUS
000026  F.SIZE:  .BLKW    2       ; SIZE OF FILE IN BLOCKS
000032  F.NACS:  .BLKB    1       ; NO. OF ACCESSES
000033  F.NLCK:  .BLKB    1       ; NO. OF LOCKS

000012  S.STBK=.-F.LBN             ; SIZE OF STATISTICS BLOCK

000034  F.STAT:                   ; FCB STATUS WORD
000034  F.NWAC:  .BLKB    1       ; NUMBER OF WRITE ACCESSORS
000035           .BLKB    1       ; STATUS BITS FOR FCB CONSISTING OF
        FC.WAC=  100000           ; SET IF FILE ACCESSED FOR WRITE
        FC.DIR=  40000            ; SET IF FCB IS IN DIRECTORY LRU
        FC.CEF=  20000            ; SET IF DIRECTORY EOF NEEDS UPDATING
        FC.FCO=  10000            ; SET IF TRYING TO FORCE DIRECTORY CONT
000036  F.DREF:  .BLKW    1       ; DIRECTORY EOF BLOCK NUMBER
000040  F.DRNM:  .BLKW    1       ; 1ST WORD OF DIRECTORY NAME
000042  F.FEXT:  .BLKW    1       ; POINTER TO EXTENSION FCB
000044  F.FVBN:  .BLKW    2       ; STARTING VBN OF THIS FILE SEGMENT
000050  F.LKL:   .BLKW    1       ; POINTER TO LOCKED BLOCK LIST FOR FILE
000052  F.WIN:   .BLKW    1       ; WINDOW BLOCK LIST FOR THIS FILE

000054  F.LGTH:                   ; SIZE IN BYTES OF FCB
```

F11DF$ (Cont.)

```
        ;
        ; WINDOW
        ;
                .ASECT
        .=0
000000  W.ACT:                  ; NUMBER OF ACTIVE MAPPING POINTERS
                                ;  WHEN NO SECONDARY POOL
000000  W.BLKS:                 ; BLOCK SIZE OF SECONDARY POOL SEGMENT
                                ;  WHEN SECONDARY POOL
000000  W.CTL:  .BLKW   1       ; LOW BYTE = # OF MAP ENTRIES ACTIVE
                                ; HIGH BYTE CONSISTS OF CONTROL BITS
        WI.RDV= 400             ; READ VIRTUAL BLOCK ALLOWED IF SET
        WI.WRV= 1000            ; WRITE VIRTUAL BLOCK ALLOWED IF SET
        WI.EXT= 2000            ; EXTEND ALLOWED IF SET
        WI.LCK= 4000            ; SET IF LOCKED AGAINST SHARED ACCESS
        WI.DLK= 10000           ; SET IF DEACCESS LOCK ENABLED
        WI.PND= 20000           ; WINDOW TURN PENDING BIT
        WI.EXL= 40000           ; SET IF MANUAL UNLOCK DESIRED
        WI.WCK= 100000          ; DATA CHECK ALL WRITES TO FILE
000002  W.IOC:  .BLKB   1       ; COUNT OF I/O THROUGH THIS WINDOW
000003          .BLKB   1       ; RESERVED
000004  W.FCB:  .BLKW   1       ; FILE CONTROL BLOCK ADDRESS
000006  W.LKL:  .BLKW   1       ; POINTER TO LIST OF USERS LOCKED BLOCKS
000010  W.WIN:  .BLKW   1       ; WINDOW BLOCK LIST LINK WORD

                .IF NB SYSDEF   ; IF SYSDEF SPECIFIED IN CALL

                .IF NDF P$$WND  ; IF SECONDARY POOL WINDOWS NOT ALLOWED

        ;
        ; NON-SECONDARY POOL WINDOW BLOCK
        ;       IF SECONDARY POOL WINDOWS ARE NOT ENABLED, THE WINDOW BLOCK
        ;       CONTAINS THE CONTROL INFORMATION AND RETRIEVAL POINTERS.
        ;
        W.VBN:  .BLKB   1       ; HIGH BYTE OF 1ST VBN MAPPED BY WINDOW
        W.MAP:                  ; DEF LABEL WITH ODD ADDR TO CATCH BAD REFS
        W.WISZ: .BLKB   1       ; SIZE IN RTRV PTRS OF WINDOW (7 BITS)
                .BLKW   1       ; LOW ORDER WORD OF 1ST VBN MAPPED
        W.RTRV:                 ; OFFSET TO 1ST RETRIEVAL POINTER IN WINDOW

                .IFF            ; IF WINDOWS IN SECONDARY POOL

        ;
        ; SECONDARY POOL WINDOW CONTROL AND MAPPING BLOCK
        ;       IF SECONDARY POOL WINDOW BLOCKS ARE ENABLED, LUTN2 POINTS
        ;       TO A CONTROL BLOCK IN SYSTEM POOL WHICH CONTAINS THE
        ;       FOLLOWING CONTROL FIELDS AND THE MAPPING INFORMATION
        ;       FOR THE SECONDARY POOL WINDOW.
        ;
        W.MAP:  .BLKW   1       ; ADDR TO THE MAPPING PTRS IN SECONDARY POOL

        ;
        ; SECONDARY POOL WINDOW
        ;       IF SECONDARY POOL WINDOW BLOCKS ARE ENABLED, THE RETRIEVAL
        ;       POINTERS ARE MAINTAINED IN SECONDARY POOL IN THE FOLLOWING
        ;       FORMAT.
        ;
        .=0
```

F11DF$ (Cont.)

```
                ASSUME  W.CTL,0
                .BLKB   1       ; NUMBER OF ACTIVE MAPPING POINTERS
        W.USE:  .BLKB   1       ; STATUS OF BLOCK
        W.VBN:  .BLKB   1       ; HIGH BYTE OF 1ST VBN MAPPED BY WINDOW
        W.WISZ: .BLKB   1       ; SIZE IN RTRV PTRS OF WINDOW (7 BITS)
                .BLKW   1       ; LOW ORDER WORD OF 1ST VBN MAPPED
        W.RTRV:                 ; OFFSET TO 1ST RETRIEVAL POINTER IN WINDOW

                .ENDC ;P$$WND   ; END SECONDARY POOL WINDOW CONDITIONAL

                .ENDC ;SYSDEF   ; END SYSDEF CONDITIONAL


        ;
        ; LOCKED BLOCK LIST NODE
        ;
                .ASECT
        .=0
000000  L.LNK:  .BLKW   1       ; LINK TO NEXT NODE IN LIST
000002  L.WI1:  .BLKW   1       ; POINTER TO WINDOW FOR FIRST ENTRY
000004  L.VB1:  .BLKB   1       ; HIGH ORDER VBN BYTE
000005  L.CNT:  .BLKB   1       ; COUNT FOR ENTRY
000006          .BLKW   1       ; LOW ORDER VBN

000010  L.LKSZ:

                .PSECT
```

HDRDF$

```
                HDRDF$

        ;
        ; TASK HEADER OFFSET DEFINITIONS
        ;
                .ASECT
        .=0
000000  H.CSP:   .BLKW   1       ;CURRENT STACK POINTER
000002  H.HDLN:  .BLKW   1       ;HEADER LENGTH IN BYTES
000004  H.SMAP:  .BLKB   1       ;SUPERVISOR D SPACE OVERMAP MASK
000005  H.DMAP:  .BLKB   1       ;USER D SPACE OVERMAP MASK
000006           .BLKW   1       ;RESERVED
000010  H.CUIC:  .BLKW   1       ;CURRENT TASK UIC
000012  H.DUIC:  .BLKW   1       ;DEFAULT TASK UIC
000014  H.IPS:   .BLKW   1       ;INITIAL PROCESSOR STATUS WORD (PS)
000016  H.IPC:   .BLKW   1       ;INITIAL PROGRAM COUNTER (PC)
000020  H.ISP:   .BLKW   1       ;INITIAL STACK POINTER (SP)
000022  H.ODVA:  .BLKW   1       ;ODT SST VECTOR ADDRESS
000024  H.ODVL:  .BLKW   1       ;ODT SST VECTOR LENGTH
000026  H.TKVA:  .BLKW   1       ;TASK SST VECTOR ADDRESS
000030  H.TKVL:  .BLKW   1       ;TASK SST VECTOR LENGTH
000032  H.PFVA:  .BLKW   1       ;POWER FAIL AST CONTROL BLOCK ADDRESS
000034  H.FPVA:  .BLKW   1       ;FLOATING POINT AST CONTROL BLOCK ADDRESS
000036  H.RCVA:  .BLKW   1       ;RECIEVE AST CONTROL BLOCK ADDRESS
000040  H.EFSV:  .BLKW   1       ;EVENT FLAG ADDRESS SAVE ADDRESS
000042  H.FPSA:  .BLKW   1       ;POINTER TO FLOATING POINT/EAE SAVE AREA
000044  H.WND:   .BLKW   1       ;POINTER TO NUMBER OF WINDOW BLOCKS
000046  H.DSW:   .BLKW   1       ;TASK DIRECTIVE STATUS WORD
000050  H.FCS:   .BLKW   1       ;FCS IMPURE POINTER
000052  H.FORT:  .BLKW   1       ;FORTRAN IMPURE POINTER
000054  H.OVLY:  .BLKW   1       ;OVERLAY IMPURE POINTER
000056  H.VEXT:  .BLKW   1       ;WORK AREA EXTENSION VECTOR POINTER
000060  H.SPRI:  .BLKB   1       ;PRIORITY DIFFERENCE FOR SWAPPING
000061  H.NML:   .BLKB   1       ;NETWORK MAILBOX LUN
000062  H.RRVA:  .BLKW   1       ;RECEIVE BY REFERENCE AST CONTROL BLOCK ADDR
000064  H.X25:   .BLKB   1       ;FOR USE BY X25 SOFTWARE
000065           .BLKB   1       ;5 RESERVED BYTES
000066           .BLKW   2       ;
000072  H.GARD:  .BLKW   1       ;POINTER TO HEADER GUARD WORD
000074  H.NLUN:  .BLKW   1       ;NUMBER OF LUN'S
000076  H.LUN:   .BLKW   2       ;START OF LOGICAL UNIT TABLE


        ;
        ; LENGTH OF FLOATING POINT SAVE AREA
        ;
        H.FPSL=25.*2            ;


        ;
        ; WINDOW BLOCK OFFSETS
        ;
        .=0
```

HDRDF$ (Cont.)

```
000000  W.BPCB: .BLKW   1       ;PARTITION CONTROL BLOCK ADDRESS
000002  W.BLVR: .BLKW   1       ;LOW VIRTUAL ADDRESS LIMIT
000004  W.BHVR: .BLKW   1       ;HIGH VIRTUAL ADDRESS LIMIT
000006  W.BATT: .BLKW   1       ;ADDRESS OF ATTACHMENT DESCRIPTOR
000010  W.BSIZ: .BLKW   1       ;SIZE OF WINDOW IN 32W BLOCKS
000012  W.BOFF: .BLKW   1       ;PHYSICAL MEMORY OFFSET IN 32W BLOCKS
000014  W.BFPD: .BLKB   1       ;FIRST PDR ADDRESS
000015  W.BNPD: .BLKB   1       ;NUMBER OF PDR'S TO MAP
000016  W.BLPD: .BLKW   1       ;CONTENTS OF LAST PDR
000020  W.BLGH:                 ;LENGTH OF WINDOW DESCRIPTOR


        ;
        ; BIT DEFINITION FOR W.BLPD
        ;
        WB.NBP=20               ;CACHE BYPASS IS NOT DESIRED FOR THIS WINDOW
        WB.BPS=40               ;ALWAYS BYPASS THE CACHE FOR THIS WINDOW

                .PSECT
```

HWDDF$

```
        HWDDF$  ,,SYSDEF

;
; MACROS FOR DEFINING MAPPING REGISTER DEFINITIONS
;
        .MACRO  CRESET  NAM,ADDR
$$$=0
        .REPT   8.
        CRENAM  NAM,ADDR+<$$$*2>,\$$$
$$$=$$$+1
        .ENDR
        .ENDM

        .MACRO  CRENAM  NAM,ADDR,N
'NAM''N'==ADDR
        .ENDM


;
; HARDWARE REGISTER ADDRESSES AND STATUS CODES
;
MPCSR=177746            ;ADDRESS OF PDP-11/70 MEMORY PARITY REGISTER
MPAR=172100             ;ADDRESS OF FIRST MEMORY PARITY REGISTER
PIRQ=177772             ;PROGRAMMED INTERRUPT REQUEST REGISTER
PR0=0                   ;PROCESSOR PRIORITY 0
PR1=40                  ;PROCESSOR PRIORITY 1
PR4=200                 ;PROCESSOR PRIORITY 4
PR5=240                 ;PROCESSOR PRIORITY 5
PR6=300                 ;PROCESSOR PRIORITY 6
PR7=340                 ;PROCESSOR PRIORITY 7
PS=177776               ;PROCESSOR STATUS WORD
SWR=177570              ;CONSOLE SWITCH AND DISPLAY REGISTER
TPS=177564              ;CONSOLE TERMINAL PRINTER STATUS REGISTER


;
; EXTENDED ARITHMETIC ELEMENT REGISTERS
;
        .IF DF  E$$EAE

AC=177302               ;ACCUMULATOR
MQ=177304               ;MULTIPLIER-QUOTIENT
SC=177310               ;SHIFT COUNT

        .ENDC


;
; MEMORY MANAGEMENT HARDWARE REGISTERS AND STATUS CODES
;
        .IF NB  B

        CRESET  KINAR,172340    ;KERNEL I PAR'S
        CRESET  KINDR,172300    ;KERNEL I PDR'S
        CRESET  KDSAR,172360    ;KERNEL D PAR'S
        CRESET  KDSDR,172320    ;KERNEL D PDR'S
        CRESET  SISAR,172240    ;SUPERVISOR I PAR'S
        CRESET  SISDR,172200    ;SUPERVISOR I PDR'S
```

HWDDF$ (Cont.)

```
        CRESET  SDSAR,172260    ;SUPERVISOR D PAR'S
        CRESET  SDSDR,172220    ;SUPERVISOR D PDR'S
        CRESET  UINAR,177640    ;USER I PAR'S
        CRESET  UINDR,177600    ;USER I PDR'S
        CRESET  UDSAR,177660    ;USER D PAR'S
        CRESET  UDSDR,177620    ;USER D PDR'S

        .ENDC

        .IF NB  SYSDEF

        .IF DF  K$$DAS

        CRESET  KISAR,172360    ;KERNEL D PAR'S
        CRESET  KISDR,172320    ;KERNEL D PDR'S

        .IFF

        CRESET  KISAR,172340    ;KERNEL I PAR'S
        CRESET  KISDR,172300    ;KERNEL I PDR'S

        .ENDC

        .IF DF  U$$DAS

        CRESET  UISAR,177660    ;USER D PAR'S
        CRESET  UISDR,177620    ;USER D PDR'S

        .IFF    ; DF U$$DAS

        CRESET  UISAR,177640    ;USER I PAR'S
        CRESET  UISDR,177600    ;USER I PDR'S

        .ENDC   ; DF U$$DAS

        .ENDC

UBMPR=170200            ;UNIBUS MAPPING REGISTER 0
CMODE=140000            ;CURRENT MODE FIELD OF PS WORD
PMODE=30000             ;PREVIOUS MODE FIELD OF PS WORD
CSMODE=40000            ;CURRENT MODE = SUPERVISOR PS WORD BITS
PSMODE=10000            ;PREVIOUS MODE = SUPERVISOR PS WORD BITS
SR0=177572              ;SEGMENT STATUS REGISTER 0
SR3=172516              ;SEGMENT STATUS REGISTER 3
CPUERR=177766           ;CPU ERROR REGISTER
MEMERR=177744           ;MEMORY SYSTEM ERROR REGISTER
MEMCTL=177746           ;MEMORY CONTROL REGISTER


;
; FEATURE SYMBOL DEFINITIONS
;
FE.EXT=1                ;22-BIT EXTENDED MEMORY SUPPORT
FE.MUP=2                ;MULTI-USER PROTECTION SUPPORT
FE.EXV=4                ;EXECUTIVE IS SUPPORTED TO 20K
FE.DRV=10               ;LOADABLE DRIVER SUPPORT
FE.PLA=20               ;PLAS SUPPORT
```

HWDDF$ (Cont.)

```
FE.CAL=40               ;DYNAMIC CHECKPOINT SPACE ALLOCATION
FE.PKT=100              ;PREALLOCATION OF I/O PACKETS
FE.EXP=200              ;EXTEND TASK DIRECTIVE SUPPORTED
FE.LSI=400              ;PROCESSOR IS AN LSI-11
FE.OFF=1000             ;PARENT/OFFSPRING TASKING SUPPORTED
FE.FDT=2000             ;FULL DUPLEX TERMINAL DRIVER SUPPORTED
FE.X25=4000             ;X.25 CEX IS LOADED
FE.DYM=10000            ;DYNAMIC MEMORY ALLOCATION SUPPORTED
FE.CEX=20000            ;COM EXEC IS LOADED
FE.MXT=40000            ;MCR EXIT AFTER EACH COMMAND MODE
FE.NLG=100000           ;LOGINS DISABLED - MULTI-USER SUPPORT


;
; FEATURE MASK DEFINITIONS (SECOND WORD)
;
F2.DAS=1                ;KERNEL DATA SPACE SUPPORTED
F2.LIB=2                ;SUPERVISOR MODE LIBRARIES SUPPORTED
F2.MP=4                 ;SYSTEM SUPPORTS MULTIPROCESSING
F2.EVT=10               ;SYSTEM SUPPORTS EVENT TRACE FEATURE
F2.ACN=20               ;SYSTEM SUPPORTS CPU ACCOUNTING
F2.SDW=40               ;SYSTEM SUPPORTS SHADOW RECORDING
F2.POL=100              ;SYSTEM SUPPORTS SECONDARY POOLS
F2.WND=200              ;SYSTEM SUPPORTS SECONDARY POOL FILE WINDOWS
F2.DPR=400              ;SYSTEM HAS A SEPARATE DIRECTIVE PARTITION
F2.IRR=1000             ;INSTALL, RUN, AND REMOVE SUPPORT
F2.GGF=2000             ;GROUP GLOBAL EVENT FLAG SUPPORT
F2.RAS=4000             ;RECEIVE/SEND DATA PACKET SUPPORT
F2.AHR=10000            ;ALT. HEADER REFRESH AREA SUPPORT
F2.RBN=20000            ;ROUND ROBIN SCHEDULING SUPPORT
F2.SWP=40000            ;EXECUTIVE LEVEL DISK SWAPPING SUPPORT
F2.STP=100000           ;EVENT FLAG MASK IS IN THE TCB(1=YES)


;
; THIRD FEATURE MASK SYMBOL DEFINITIONS
;
F3.CRA=1                ;SYSTEM SPONTANEOUSLY CRASHED (1=YES)
F3.XCR=2                ;SYSTEM CRASHED FROM XDT (1=YES)
F3.EIS=4                ;SYSTEM REQUIRES EXTENDED INSTRUCTION SET
F3.STM=10               ;SYSTEM HAS SET SYSTEM TIME DIRECTIVE
F3.UDS=20               ;SYSTEM SUPPORTS USER DATA SPACE
F3.PRO=40               ;SYSTEM SUPPORTS SEC. POOL PROTO TCBS
F3.XHR=100              ;SYSTEM SUPPORTS EXTERNAL TASK HEADERS
F3.AST=200              ;SYSTEM HAS AST SUPPORT
F3.11S=400              ;RSX-11S SYSTEM
F3.CLI=1000             ;MULTIPLE CLI SUPPORT
F3.TCM=2000             ;SYSTEM HAS SEPARATE TERMINAL DRIVER POOL
F3.PMN=4000             ;SYSTEM SUPPORTS POOL MONITORING
F3.WAT=10000            ;SYSTEM HAS WATCHDOG TIMER SUPPORT
F3.RLK=20000            ;SYSTEM SUPPORTS RMS RECORD LOCKING
F3.SHF=40000            ;SYSTEM SUPPORTS SHUFFLER TASK


;
; FOURTH FEATURE MASK BITS
;
F4.CXD=1                ;COMM EXEC IS DEALLOCATED (NON-I/D ONLY)
```

HWDDF$ (Cont.)

```
;
; HARDWARE FEATURE MASK BIT DEFINITIONS
;
;       HF.CIS,HF.FPP DEFINED AS SIGN BITS FOR RUN TIME SPEED
;
HF.UBM=1                ;PROCESSOR HAS A UNIBUS MAP (1=YES)
HF.EIS=2                ;PROCESSOR HAS EXTENDED INSTRUCION SET
HF.CIS=200              ;PROCESSOR SUPPORTS COMMERCIAL INST SET
HF.FPP=100000           ;(1=PROC. HAS NO FLOATING POINT UNIT)


;
; SYSGEN FEATURE SELECTIONS MASK.  THIS IS INTENDED TO RECORD IN A
; BIT MASK THE CHOICES THE USER HAS MADE AT SYSGEN TIME.  FEATURES
; WILL BE LISTED HERE WHEN THEY ARE BEING RECORDED FOR OUR
; INFORMATIONAL PURPOSES ONLY.  THEY CANNOT BE TESTED LIKE BITS IN
; THE FEATURE MASK SINCE THIS ONLY EXISTS IN THE RSX11M.STB FILE.
; NO BITS IN MEMORY ARE USED.  THEY ARE ONLY INTENDED TO BE PRINTED
; FROM THE STB FILE BY CDA.
;
SF.STD=1                ;STANDARD EXEC SELECTED
SF.RL2-2                ;SYSTEM IS FROM RL02 KIT


;
; MULTIPROCESSOR STATUS TABLE DEFINITIONS (TEMPORARY)
;
MP.CRH=100000           ;CRASH PROCESSOR IMMEDIATELY
MP.PWF=40000            ;POWERFAIL ON ONE CPU
MP.RSM=20000            ;RESET INTERRUPT MASKS
MP.NOP=10000            ;NOP FUNCTION FOR TRANSMISSION CHECK
MP.STP=4                ;STOP PROCESSOR IN ORDERLY FASHION
MP.INT=7777             ;BIC MASK FOR INTERRUPT LVL FUNCTIONS
```

ITBDF$

```
                ITBDF$  ,,SYSDEF

        ;
        ; INTERRUPT TRANSFER BLOCK (ITB) OFFSET DEFINITIONS
        ;

                .MCALL  PKTDF$
                PKTDF$                  ; DEFINE AST BLOCK OFFSETS


                .ASECT
        .=0
000000  X.LNK:  .BLKW    1             ; LINK WORD FOR ITB LIST STARTING IN TCB
000002  X.JSR:  JSR     R5,@#0          ; CALL $INTSC
000006  X.PSW:  .BLKB    1             ; LOW BYTE OF PSW FOR ISR
000007          .BLKB    1             ; UNUSED
000010  X.ISR:  .BLKW    1             ; ISR ENTRY POINT (APR5 MAPPING)
000012  X.FORK:                        ; FORK BLOCK
000012          .BLKW    1             ; THREAD WORD
000014          .BLKW    1             ; FORK PC
000016          .BLKW    1             ; SAVED R5
000020          .BLKW    1             ; SAVED R4
000022  X.REL:  .BLKW    1             ; RELOCATION BASE FOR APR5
000024  X.DSI:  .BLKW    1             ; ADDRESS OF DIS.INT. ROUTINE
000026  X.TCB:  .BLKW    1             ; TCB ADDRESS OF OWNING TASK

                .IF NB  SYSDEF

000030          .BLKW    1             ; A.DQSR FOR AST BLOCK
000032  X.AST:  .BLKB    A.PRM         ; AST BLOCK
000044  X.VEC:  .BLKW    1             ; VECTOR ADDRESS (IF AST SUPPORT,
                                       ; THIS IS FIRST AND ONLY AST PARAMETER)
000046  X.VPC:  .BLKW    1             ; SAVED VECTOR PC
000050  X.LEN:                         ; LENGTH IN BYTES OF ITB

                .ENDC

                .PSECT
```

KRBDF$

```
                KRBDF$

        ;
        ; CONTROLLER REQUEST BLOCK (KRB)
        ;
        ; THE CONTROLLER REQUEST BLOCK DEFINES THE ENVIRONMENT OF A DEVICE
        ; CONTROLLER.  EXACTLY ONE KRB EXISTS FOR EVERY DEVICE CONTROLLER
        ; IN AN RSX-11M+ SYSTEM.  THE KRB CONTAINS CERTAIN DEVICE STATUS
        ; INCLUDING THE CSR AND VECTOR ADDRESS FOR THE CONTROLLER.
        ;
                .ASECT
        .=177770
177770  K.PRM:  .BLKW   1       ;DEVICE DEPENDANT PARAMETER WORD
177772  K.PRI:  .BLKB   1       ;CONTROLLER PRIORITY
177773  K.VCT:  .BLKB   1       ;INTERRUPT VECTOR ADDRESS
177774  K.CON:  .BLKB   1       ;CONTROLLER INDEX WITHIN THE SYSTEM
177775  K.IOC:  .BLKB   1       ;CONTROLLER I/O COUNT
177776  K.STS:  .BLKW   1       ;CONTROLLER STATUS
000000  K.CSR:  .BLKW   1       ;ADDRESS OF CONTROL STATUS REGISTER
        ;
        ; NOTE: K.CSR MUST BE THE ZERO OFFSET!
        ;
000002  K.OFF:  .BLKW   1       ;OFFSET TO UCB/UMR/RHBAE TABLE
000004  K.HPU:  .BLKB   1       ;HIGHEST PHYSICAL UNIT NUMBER
000005          .BLKB   1       ;UNUSED BYTE
000006  K.OWN:  .BLKW   1       ;OWNER OF CONTROLLER
000010  K.CRQ:  .BLKW   2       ;CONTROLLER REQUEST QUEUE
000014  K.URM:  .BLKW   1       ;CONTROLLER UNIBUS RUN MASK
000016  K.FRK:  .BLKW   1       ;POSSIBLE KRB FORK BLOCK

        ;
        ; OFFSETS FOR THE KRB EXTENSION REACHED BY ADDING (K.OFF) TO
        ; THE STARTING ADDRESS OF THE KRB.
        ;


        ;
        ; DEFINE OFFSETS IN SCB/KRB FOR DISK MSCP CONTROLLERS
        ;
        .=-20.
177754  KE.UMH: .BLKW   2       ;LIST HEAD FOR UMR WAITING ASSIGNMENT BLK(S)
177760  KE.UMC: .BLKW   1       ;COUNT OF AVAILABLE UMR WAITING ASSIGNMENT
                                ;BLOCK(S)


        .=177776
177776  KE.RHB: .BLKW   1       ;OFFSET TO RHBAE REGISTER (IF ANY)
        ;
        ; WHEN ONE ADDS (K.OFF) TO THE KRB ADDRESS, IT YIELDS AN ADDRESS
        ; WHICH POINTS TO HERE.
        ;
000000  KE.UCB: .BLKW   1       ;OFFSET TO UCB TABLE (IF KS.UCB SET)

                .PSECT
```

KRBDF$ (Cont.)

```
                ;
                ; CONTROLLER REQUEST BLOCK (KRB) STATUS BIT DEFINITIONS
                ;
                KS.OFL=1                ;CONTROLLER OFFLINE (1=YES)
                KS.MOF=2                ;CONTROLLER MARKED FOR OFFLINE (1=YES)
                KS.UOP=4                ;SUPPORTS OVERLAPPED OPERATION (1=YES)
                KS.MBC=10               ;DEVICE IS MASSBUS CONTROLLER (1=YES)
                KS.SDX=20               ;SEEKS ALLOWED DURING DATA XFERS (1=YES)
                KS.POE=40               ;PARALLEL OPERATION ENABLED (1=YES)
                KS.UCB=100              ;UCB TABLE PRESENT (1=YES)
                KS.DIP=200              ;DATA TRANSFER IN PROGRESS (1=YES)
                KS.PDF=400              ;PRIVILEGED DIAGNOSTIC FUNCTIONS ONLY(1=YES)
                KS.EXT=1000             ;EXTENDED 22-BIT UNIBUS CONTROLLER (1=YES)
                KS.SLO=2000             ;CONTROLLER IS SLOW COMING ONLINE (1=YES)


                ;
                ; DEFINE THE CONTIGUOUS SCB OFFSETS
                ;
                        .ASECT
                .=177762
177762  S.PRI:  .BLKB    1       ;CONTROLLER PRIORITY
177763  S.VCT:  .BLKB    1       ;INTERRUPT VECTOR ADDRESS
177764  S.CON:  .BLKB    1       ;CONTROLLER INDEX
177765          .BLKB    1
177766          .BLKW    1
177770  S.CSR:  .BLKW    1       ;CONTROL AND STATUS REGISTER
177772          .BLKW    1
177774          .BLKB    1
177775          .BLKB    1
177776  S.OWN:  .BLKW    1       ;DISTRIBUTED CNTBL


                ;
                ; SUBCONTROLLER REQUEST BLOCK (KRB1)
                ;
                ; THE SUBCONTROLLER REQUEST BLOCK DEFINES THE ENVIRONMENT OF A
                ; DEVICE SUBCONTROLLER.  EXACTLY ONE KRB1 EXISTS FOR EVERY DEVICE
                ; SUBCONTROLLER IN AN RSX-11M+ SYSTEM.
                ;
                        .ASECT
                .=-4
177774  K1.CON: .BLKB    1       ;SUBCONTROLLER INDEX WITHIN THE SYSTEM
177775          .BLKB    1       ;UNUSED BYTE
177776  K1.STS: .BLKW    1       ;SUBCONTROLLER STATUS
000000  K1.MAS: .BLKW    1       ;UCB ADDRESS OF THE MASTER UNIT
                ;
                ; NOTE: K1.MAS MUST BE THE ZERO OFFSET
                ;
000002  K1.OWN: .BLKW    1       ;OWNER OF SUBCONTROLLER
000004  K1.CRQ: .BLKW    2       ;SUBCONTROLLER REQUEST QUEUE
000010  K1.UCB:                  ;START OF THE UCB TABLE (IF ANY)

                        .PSECT
```

LCBDF$

```
                LCBDF$

        ;
        ; LOGICAL ASSIGNMENT CONTROL BLOCK
        ;
        ; THE LOGICAL ASSIGNMENT CONTROL BLOCK (LCB) IS USED TO ASSOCIATE A
        ; LOGICAL NAME WITH A PHYSICAL DEVICE UNIT.  LCB'S ARE LINKED
        ; TOGETHER TO FORM THE LOGICAL ASSIGNMENTS OF A SYSTEM.  ASSIGNMENTS
        ; MAY BE ON A SYSTEM WIDE OR LOCAL (TERMINAL) BASIS.
        ;
                .ASECT
        .=0
000000  L.LNK:  .BLKW   1       ;LINK TO NEXT LCB
000002  L.NAM:  .BLKW   1       ;LOGICAL NAME OF DEVICE
000004  L.UNIT: .BLKB   1       ;LOGICAL UNIT NUMBER
000005  L.TYPE: .BLKB   1       ;TYPE OF ENTRY (0=SYSTEM WIDE)
000006  L.UCB:  .BLKW   1       ;TI UCB ADDRESS
000010  L.ASG:  .BLKW   1       ;ASSIGNMENT UCB ADDRESS
000012  L.LGTH=.-L.LNK          ;LENGTH OF LCB

                .PSECT
```

MTADF$

```
                MTADF$

        ;
        ; ANSI MAGTAPE SPECIFIC DATA STRUCTURES
        ;
        ; VOLUME SET CONTROL BLOCK OFFSET DEFININTIONS (VSCB)
        ;
        ; VOLUME SET AND PROCESS CONTROL SECTION
        ;
                .ASECT
        .=0
000000  V.TCNT: .BLKW   1       ;TRANSACTION COUNT
000002  V.TYPE: .BLKB   1       ;VOLUME TYPE DESCRIPTOR
000003  V.VCHA: .BLKB   1       ;VOLUME CHARACTERISTICS
000004  V.LABL: .BLKB   12.     ;FILE SET ID (FIRST SIX BYTES)
000020  V.NXT:  .BLKW   1       ;PTR TO NEXT VSCB NODE
000022  V.MVL:  .BLKW   1       ;PTR TO MOUNTED VOL LIST
000024  V.UVL:  .BLKW   1       ;PTR TO UNMOUNTED VOL LIST
000026  V.ATL:  .BLKW   1       ;ATL ADDR OF ACCESSING TASK TCB IN RSX11M
000030  V.UCB:  .BLKW   1       ;ADDR OF CURRENT UCB OR PUD
000032  V.RVOL: .BLKB   1       ;CURRENT RELATIVE VOL #
000033  V.MOU:  .BLKB   1       ;MOUNT MODE BYTE
000034  V.TCHR: .BLKW   1       ;UINT CHAR. FOR ALL UNITS USED FOR VOL SET
000036  V.SEQN: .BLKW   1       ;CURRENT FILE SEQUENCE #
000040  V.SECN: .BLKW   1       ;CURRENT FILE SECTION #
000042  V.TPOS: .BLKB   1       ;POSITION OF TAPE IN TM'S TO NXT HDR1
000043  V.PSTA: .BLKB   1       ;PROCESS STATUS BYTE
000044  V.TIMO: .BLKW   1       ;BLOCKED PROCESS TIMEOUT COUNTER
000046  V.STAT: .BLKW   3       ;STATUS WORDS USED BY COMMAND EXECUTION MODS
000054  V.TRTB: .BLKB   1       ;TRANSLATION CONTROL BYTE
000055  V.EFTV: .BLKB   1       ;FOR MAG TO RETURN IE.EOF, EOT, EOV


        ;
        ; LABEL DATA SECTION
        ;
000056  V.BLKL: .BLKW   1       ;BLOCK LENGTH
000060  V.RECL: .BLKW   1       ;RECORD LENGTH
000062  V.FNAM: .BLKW   3       ;FILE NAME
000070  V.FTYP: .BLKW   1       ;FILE TYPE
000072  V.FVER: .BLKW   1       ;FILE VERSION #
000074  V.CDAT: .BLKW   2       ;CREATION DATE
000100  V.EDAT: .BLKW   2       ;EXPRIATION DATE
000104  V.BLKC: .BLKW   2       ;BLOCK COUNT FOR FILE SECTION
000110  V.RTYP: .BLKB   1       ;RECORD TYPE
000111  V.FATT: .BLKB   1       ;FILE ATTRIBUTES FOR CARRIAGE CONTROL
000112          .BLKB   30.     ;REMAINDER OF FILE ATTRIBUTES


        ;
        ; NULL WINDOW SECTION
        ;
000150  V.WIND: .BLKW   4.      ;NULL WINDOW
000160  V.MST2: .BLKW   1       ;MAGTAPE STATUS BITS
000162  V.FABY: .BLKB   1       ;FILE ACCESSIBILITY BYTE (HDR1)
000163          .BLKB   1       ;SPARE
000164  V.ANSN: .BLKB   17.     ;ANSI 17 CHARACTER FILE NAME
```

MTADF$ (Cont.)

```
000205  V.BOFF: .BLKB   1.      ;BUFFER OFFSET
000206  V.DENS: .BLKB   1.      ;REQUESTED UNIT DENSITY
000207  V.DRAT: .BLKB   1.      ;DEFAULT RECORD ATTRIBUTES
000210  V.DBLK: .BLKW   1.      ;DEFAULT BLOCK SIZE
000212  V.DREC: .BLKW   1.      ;DEFAULT RECORD SIZE

000214  S.VSCB=.                ;SIZE OF VSCB

                .PSECT

        ;
        ; DEFINE OFFSETS INTO NULL WINDOW SECTION
        ;
                .ASECT
        .=0
000000  W.CTL:  .BLKW   1       ;CONTROL WORD IN WINDOW
        V.WINC=V.WIND+W.CTL     ;CNTRL WORD IN NULL WINDOW
                                ;RELATIVE TO THE VSCB

                .PSECT

        ;
        ; MOUNTED VOLUME LIST OFFSET DEFININTIONS (MVL)
        ;
                .ASECT
        .=0
000000  M.NXT:  .BLKW   1       ;PTR TO NXT MVL NODE (11M)
000002  M.UIC:  .BLKW   1       ;OWNER UIC FROM RVOL #1
000004  M.CH:   .BLKW   1       ;U.CH/U.VP (11D)
000006  M.PROT: .BLKW   1       ;PROTECTION U.AR IN 11D
000010  M.RVOL: .BLKB   1       ;RELATIVE VOL # OF MOUNTED VOLUME
000011  M.STAT: .BLKB   1       ;VOLUME STATUS
000012  M.VIDP: .BLKW   1       ;VOLUME ID POINTER
000014  M.UCB:  .BLKW   1       ;ADDR OF ASSOC UCB OR PUD

000016  S.MVL=.                 ;SIZE OF MVL NODE

                .PSECT

        ;
        ; UNMOUNTED VOLUME AND VOLUME  LIST OFFSET DEFINITIONS (UVL)
        ;
                .ASECT
        .=0
000000  L.NXT:  .BLKW   1       ;PTR TO NXT UVL NODE
000002  L.VOL1: .BLKB   1       ;REL VOL # OF 1'ST VOL IN NODE
000003  L.VOL2: .BLKB   1       ;REL VOL # OF 2'ND VOL IN NODE
000004  L.VID1: .BLKB   6       ;VOL ID OF 1'ST VOL IN NODE
000012  L.VID2: .BLKB   6       ;VOL ID OF 2'ND VOL IN NODE

000020  S.UVL=.                 ;SIZE OF UVL NODE
```

MTADF$ (Cont.)

```
        .PSECT

;
; SYSTEM DATA STRUCTURE CONTENT VALUES
;

;
; VSCB VALUES
;
; V.MOU VALUES
;
VM.OLD  =       200     ;OLD .FL300 VOLUME - VM.BYP WILL ALSO BE SET
VM.BYP  =       100     ;BYPASS LABEL PROCESSING
VM.ULB  =       40      ;UNLABELED TAPE
VM.FSC  =       20      ;OVERRIDE FILE SET ID CHECK
VM.EXC  =       10      ;OVERRIDE EXPRIATION DATE CHECK


;
; V.MST2 VALUES
;
V2.INI  =       1       ;MAG WANTS US TO INITIALIZE NEXT OUTPUT
V2.XH2  =       2       ;THIS FILE HAS NO HDR2, DON'T WRITE EOF2
V2.XH3  =       4       ;THIS FILE HAS NO HDR3, DON'T WRITE EOF3
V2.NH3  =       10      ;DON'T WRITE HDR3/EOX3 LABELS
V2.OAC  =       20      ;OVERRIDE FILE/VOLUME ACCESSIBILITY


;
; V.PSTA VALUES - UNBLOCKED TRANSITION STATE
;
VP.RM   =       2       ;READ DATA MODE
VP.WM   =       4       ;WRITE DATA MODE
VP.UCM  =       6       ;UNLABELLED CREATE POSITIONING MODE
VP.SM   =       10      ;SEARCH MODE
VP.MOU  =       20      ;MOUNT MODE
VP.RWD  =       40      ;REWIND OR VOL VERIFICATION WAIT
VP.VFY  =       VP.RWD
VP.POS  =       100     ;PROCESS IN POSITIONING MODE
                        ;(MULTI-SECTION FILE)


;
; BLOCKED STATE = -(UNBLOCKED TRANSITION STATE VALUES)
;
; PROCESS TIMED OUT BIT 0 = 1
;
VP.TO=1


;
; NULL WINDOW CONTROL BIT DEFINITIONS
;
WI.RDV  =       400     ;ACCESSED FOR READ
WI.WRV  =       1000    ;ACCESSED FOR WRITE
WI.EXT  =       2000    ;ACCESSED FOR EXTEND
WI.LCK  =       4000    ;LOCKED
```

MTADF$ (Cont.)

```
;
; MVL VALUES IN THE M.STAT FIELD
;
MS.VER  =       200     ;VOL ID NOT VERIFIED
MS.RID  =       1       ;VOL ID TO BE READ NOT CHECKED
MS.NMO  =       2       ;MOUNT MESSAGE NOT GIVEN YET
MS.TMO  =       4       ;ONE TIMEOUT ALREADY EXPRIED
MS.EXP  =       10      ;EXPIRATION DATE MESSAGE GIVEN


;
; MISC BITS USED IN MOUNT (STORED IN V.STS)
;
MO.OVR  =       1       ;OVER RIDE VOL NAME SWITCH
MO.UIC  =       2       ;EXPLICIT UIC GIVEN
MO.PRO  =       4       ;EXPLICIT PROTECTION GIVEN
MO.160  =       10      ;1600 BPI SPECIFIED
```

OLRDF$

```
        OLRDF$  $$$GBL

;
; THIS MODULE DEFINES THE ONLINE RECONFIGURATION INTERFACE
; AS IMPLEMENTED BETWEEN THE RSX-11M-PLUS TASKS CON, HRC, AND
; THE RDDRV.
;

;
; DEFINE THE I/O FUNCTION CODES FOR ONLINE RECONFIGURATION CONTROL.
;
        .MCALL  .WORD.,DEFIN$

        .IF IDN <$$$GBL>,<DEF$G>
...GBL=1
        .IFF
...GBL=0
        .ENDC

;
; THE FOLLOWING MACRO DEFINES THE SUB-FUNCTION CODES FOR EACH OF THE
; OPERATIONS PERFORMED BY THE HRC TASK AND A PARAMETER DESCRIBING
; THE ARGUMENTS REQUIRED FOR EACH FUNCTION.  IN A MACRO CALL THE
; FOLLOWING ARE THE LEGAL COMBINATIONS FOR THE 'MASK'
; PARAMETER:
;               <>      SIGNIFYING NO PARAMETERS
;               <D>     SIGNIFYING ONE BUFFER DESCRIPTOR
;               <D,D>   SIGNIFYING TWO BUFFER DESCRIPTORS
;               <D,CT>  SIGNIFYING ONE DESCRIPTOR AND 'CT' BYTES OF
;                       PARAMETERS
;               <CT>    SIGNIFYING 'CT' BYTES OF PARAMETERS
;

        .MACRO  FUNC NAME,SUBF,FUN,MASK
        .WORD.  IO.'NAME,SUBF,FUN
        FUNCA   NAME,<MASK>
        .ENDM

        .MACRO  FUNCA NAME,MSK
        PARCT=0
        DESCT=0
        .IRP X,<MSK>
        .IIF IDN <X>,<P> PARCT=PARCT+1
        .IIF IDN <X>,<D> DESCT=DESCT+1
        .IIF GT <PARCT-17> .ERROR INVALID PARAMETER COUNT
        .IIF GT <DESCT-17> .ERROR INVALID DESCRIPTOR COUNT
        .ENDR

        TEMP=<DESCT*4>+<PARCT*2>
        .WORD.  IO$'NAME,<<DESCT*20+PARCT>>,TEMP
        .ENDM

;
; DEFINE ONLINE RECONFIGURATION I/O FUNCTIONS
;

        .WORD.  IO.MFC,000,001  ; MULTI-FUNCTION MODIFY CONFIGURATN
        .WORD.  IO.RSC,000,002  ; READ SYSTEM CONFIGURATION
        .WORD.  IO.WSC,000,006  ; MODIFY DEVICE CONFIGURATION
```

OLRDF$ (Cont.)

```
;
; DEFINE SUBFUNCTIONS TO MODIFY DEVICE CONFIGURATION
;
        FUNC    ONL,001,006,<D,D>       ; SET DEVICE ONLINE
        FUNC    OFL,002,006,<D,D>       ; SET DEVICE OFFLINE
        FUNC    MAI,003,006,<D,D>       ; SET DEVICE IN MAINT MODE
        FUNC    CAC,004,006,<>          ; CACHE CONTROL
        FUNC    MEM,005,006,<>          ; MIND CONTROL
        FUNC    STN,006,006,<P,P>       ; RECONFIGURATION CONTROL,
                                        ; SPECIFY TASK NAME
        FUNC    HRC,007,006,<P,P>       ; RECONFIGURATION CONTROL,
                                        ; HRC OPERATING MODE
        FUNC    ONE,010,006,<P,P>       ; ON <CONDITION> <COMMAND>
        FUNC    STA,011,006,<D>         ; RETURN DEVICE STATE
        FUNC    IF ,012,006,<P,P>       ; IF <CONDITION> <COMMAND>
        FUNC    RLI,013,006,<D,D,D,D>   ; LINK UNIBUS RUN
        FUNC    RUL,014,006,<D,D,D,D>   ; UNLINK UNIBUS RUN
        FUNC    MBO,015,006,<P,P,D,D,D,D,D,D,D,D> ; MEM BOX ONLINE
        FUNC    RSW,016,006,<D,D,D,D>   ; SWITCH BUS
        FUNC    WAT,017,006,<D>         ; WRITE ATTRIBUTES
        FUNC    RAT,020,006,<D,D>       ; READ ATTRIBUTES
        FUNC    MBF,021,006,<P,P,D,D,D,D,D,D,D,D> ; MEM BOX OFFLINE

        IO$MAX=21               ; DEFINE MAXIMUM SUBFUNCTION


        DEFIN$  IS.HRG,6.       ; STOP PROCESSING COND ENCOUNTERED
                                ; SECOND STATUS WORD IS ARGUMENT


;
; DEFINE A MACRO, WHICH WHEN EXPANDED WITH THE APPROPRIATE
; DEFINITION FOR .IOER. WILL DEFINE THE PRIVATE ERROR CODES USED BY
; HRC AND CON.
;

.MACRO  OLREM$

$$$VAL=-256.                    ; DEFINE INITIAL ERROR NUMBER VALUE

.IOER.  IE$DAL,<DEVICE already linked>
.IOER.  IE$DNL,<DEVICE not linked>
.IOER.  IE$PRM,<Parameter error>
.IOER.  IE$SYN,<Syntax error>
.IOER.  IE$AFE,<Attribute format error>
.IOER.  IE$TMU,<HRC... Internal tables insufficient for this system>
.IOER.  IE$CAB,<Unable to access busrun>
.IOER.  IE$TRP,<HRC... internal addressing error>
.IOER.  IE$ALG,<Memory box parameter error>
.IOER.  IE$TQU,<Timeout on unit quieting operation>
.IOER.  IE$EPO,<ONLINE CPU failure>
.IOER.  IE$EUO,<ONLINE UNIT failure>
.IOER.  IE$ECO,<ONLINE CONTROLLER failure>
.IOER.  IE$EPF,<OFFLINE CPU failure>
.IOER.  IE$EUF,<OFFLINE UNIT failure>
.IOER.  IE$ECF,<OFFLINE CONTROLLER failure>
.IOER.  IE$CFU,<Attempt to quiet unit for controller failed>
```

OLRDF$ (Cont.)

```
.IOER.  IE$CSR,<CSR for controller not present in I/O page>
.IOER.  IE$SWF,<Unable to switch unit away from current controller>
.IOER.  IE$ICE,<HRC... detected I/O database consistancy error>
.IOER.  IE$SCE,<Executive or Driver status change error>
.IOER.  IE$MDE,<HRC... Memory descriptor format error>
.IOER.  IE$NFW,<No path to target device is available>
.IOER.  IE$CXT,<Unable to take unit with context offline.>
.IOER.  IE$IDU,<Invalid device descriptor>
.IOER.  IE$UNK,<Device is unknown in this configuration>
.IOER.  IE$SZE,<HRC... Unable to access device to size drive>
.IOER.  IE$POB,<HRC... Can't take box offline. Partition overmaps box>
.IOER.  IE$NLB,<HRC... Can't take box offline. Not last box in memory>
.IOER.  IE$OMP,<HRC... Can't modify partition size. Overmap exists>
.IOER.  IE$POC,<HRC... Can't modify partition size. Occupied>
.IOER.  IE$DFE,<HRC... Request format error.>
.IOER.  IE$IDS,<HRC... Invalid device specification.>
.IOER.  IE$UOE,<HRC... Unkown error from online/offline call>
.ENDM


;
; CONDITION CODES FOR CONDITIONS TESTED BY IO.ONE AND IO.IF FUNCTS
;
        CO$ONL = 1      ; IF DEVICE NOW ONLINE
        CO$OFL = 2      ; IF DEVICE NOW OFFLINE
        CO$UNK = 3      ; UNKNOWN DEVICE
        CO$ACC = 4      ; ACCESSABLE (ACCESS PATH EXISTS)
        CO$ANY = 5      ; ANY ERROR CONDITION
        CO$MAI = 6      ; MAINTENANCE MODE

        CO$MAX = 6      ; MAXIMUM CODE


;
; CONDITION COMMAND CODES FOR IO.ONE AND IO.IF FUNCTIONS
;
        CD$STO = 2      ; 'STOP' COMMAND
        CD$GOT = 4      ; 'GOTO'
        CD$CON = 6      ; 'CONTINUE'

        CD$MAX = 6      ; MAXIMUM CONDITION DEFINED


;
; ARGUMENT DEFINITION FOR IO.HRC FUNCTION
;
        M$LOG = 1       ; SUPRESS CONFIG TRANSMISSION TO ERRLOG
        M$INIT = 2      ; INITALIZE HRC
        M$DEBG = 4      ; SET HRC INTO DEBUG MODE (DEVELOPMENT ONLY)
        M$EXIT = 10     ; EXIT REQUEST (FROM ABORT AST REQUEST)


;
; DEFINE TABLE OFFSETS AND STATUS BITS RETURNED IN RESPONSE TO
; A 'READ CONFIGURATION' QIO
;
        .ASECT
.=0
```

OLRDF$ (Cont.)

```
000000  C$DTYP: .BLKB   1       ; ENTRY TYPE FIELD


        ;
        ; ENTRY TYPE CODES ARE AS FOLLOWS
        ;
                ET$HDR = 1      ; CONFIGURATION HEADER ENTRY
                ET$END = 2      ; END OF CONFIGURATION DATA

                ET$DEV = 'A     ; MIN VALUE FOR DEVICE SPECIFICATION ENTRY


000001  C$DECT: .BLKB   1       ; COUNT OF TABLE ENTRIES (CPUS+SWITCHED
                                ; BUS RUNS+CONTROLLERS+UNITS)
000002  C$DVER: .BLKB   1       ; VERSION OF RECONFIGURATION TASK PROTOCAL
000003  C$DSTD: .BLKB   1       ; SIZE OF HEADER
000004  C$DMUB: .BLKB   1       ; MAXIMUM UNIBUS RUNS SUPPORTED
000005  C$DMCT: .BLKB   1       ; MAX CONTROLLERS OF A GIVEN TYPE SUPPORTED
                .EVEN
000006  C$DFAC: .BLKW   2       ; FACILITES SUPPORTED IN HOST SYSTEM
000012  C$DIDN: .BLKW   9.      ; HRC VERSION AND BUILD TIMESTAMP

000034  C$STD:                  ; SIZE OF THE TABLE HEADER


        ;
        ; OFFSETS WITHIN THE FIXED PORTION OF A GIVEN ENTRY
        ;
        .=0
000000  C$DTYP:                 ; ENTRY TYPE CODE
000000  C$DNAM: .BLKW   1       ; TWO ASCII CHARACTER UNIT OR CONTR NAME
000002  C$DPUN: .BLKB   1       ; CONTROLLER NUMBER (0-255.)
000003  C$DLUN: .BLKB   1       ; LOGICAL UNIT NUM IF THIS DEVICE IS A UNIT
000004  C$DSCT: .BLKB   1       ; SUB-CONTROLLER NUMBER
000005  C$DEVT: .BLKB   1       ; DEVICE TYPE CODE
000006  C$DSTS: .BLKW   1       ; DEVICE STATUS MASK


        ;
        ; FLAG VALUES FOR C$DSTS
        ;
                CS$ATR=1        ; VARIABLE LENGTH ATTRIBUTE INFO IS APPENDED
                CS$EXF=76       ; FIELD IN C$DSTS CONTAINING COUNT OF
                                ; ADDITIONAL BYTES IN THIS DEVICE ENTRY
                CS$SUB=100      ; THIS IS A SUB-CONTROLLER DEVICE
                ;CS$XXX=200     ; UNUSED
                CS$OFL=400      ; 1=>DEVICE IS OFFLINE, 0=>DEVICE IS ONLINE
                CS$PDF=1000     ; DEV IS RESTRICTED TO PRIVILEGED DIAG FNS
                CS$POR=2000     ; THIS IS A MULTIPORT DEVICE
                CS$MBD=4000     ; DEVICE IS A MASS BUS DEVICE
                CS$UNK=10000    ; DEVICE IS UNKNOWN
                CS$ACC=20000    ; AN ONLINE ACCESS PATH EXISTS TO THIS DEV
                CS$MTD=40000    ; DEV IS MOUNTED(DISK) OR LOGGED IN (TERM)
                CS$DRV=100000   ; A DRIVER IS LOADED FOR THIS DEVICE
```

OLRDF$ (Cont.)

```
000010  C$DST2: .BLKW   1       ; STATUS EXTENSION

                CS$PUN=20       ; 1=> THIS DEVICE SPECIFIED WITH PHYSICAL
                                ;     UNIT NUMBER
                CS$CRD=40       ; 1=> THIS IS A CONTROLLER RELATIVE DEVICE
                                ;     SPEC
                CS$PRC=100      ; 1=> THIS IS A PORT RELATIVE CONTROLLER
                                ;     SPEC
                CS$CTL=200      ; DEVICE IS A CONTROLLER (MUST BE SIGN BIT)
                CS$DCL=3400     ; DEVICE CLASS CODE FIELD. MUST BE LOW ORDER
                                ; BITS OF HIGH BYTE.


        ;
        ; DEVICE CLASS VALUES
        ;
                DC$UNI = 0      ; UNIT
                DC$CTL = 1      ; CONTROLLER
                DC$MKU = 2      ; MEMORY BOX UNIT
                DC$MKC = 3      ; MEMORY BOX CONTROLLER
                DC$SBU = 4      ; SWITCHED BUS UNIT
                DC$SBC = 5      ; SWITCHED BUS CONTROLLER
                DC$CPU = 6      ; CPU
                ;DC$XXX = 7     ; UNUSED

000012  C$DDAT: .BLKW   2       ; DEVICE DEPENDANT DATA

000016  C$SME:                  ; SIZE IF A MINIMUM ENTRY


        ;
        ; VARIABLE PORTION OF A GIVEN ENTRY
        ;

        ;
        ; FOR CONTROLLERS
        ;
        .=C$SME
000016  C$DKPO: .BLKW   1       ; PORT-STATUS-WORD. THIS DESCRIBES THE BUS
                                ; RUN, CPU OR SWITCHED BUS, TO WHICH THIS
                                ; CONTROLLER IS CONNECTED.
000020  C$SCT:                  ; MIMIMUM SIZE OF A CONTROLLER ENTRY


        ;
        ; FOR UNIT ENTRIES
        ;
        .=C$SME
000016  C$DCTN: .BLKW   1       ; CONTROLLER NAME. TWO CHARACTER ASCII CODE
                                ; OF THE CONTROLLER TO WHICH THIS UNIT IS
                                ; ATTACHED.
000020  C$DUPO: .BLKW   1       ; PORT-STATUS-WORD. THIS IS THE
                                ; FIRST OF THE PSWS DESCRIBING THE CONTR(S)
                                ; TO WHICH THIS UNIT IS CONNECTED.
000022  C$SUN:                  ; MIMIMUM SIZE OF A UNIT ENTRY
```

OLRDF$ (Cont.)

```
        ;
        ; FOR CPU-S
        ;
        .=C$SME
000016  C$DCPO: .BLKW   1        ; PORT-STATUS-WORD. THIS IS THE BUS
                                 ; NUMBER FOR THIS CPU.
000020  C$SCP:                   ; MINIMUM SIZE OF A CPU ENTRY


        ;
        ; FOR MEMORY BOXES
        ;
        .=C$SME
000016  C$DCTN: .BLKW   1        ; CONTROLLER NAME.
000020          .BLKW   4        ; MAXIMUM OF 4 PORTS FOR MEMORY CONTROLLERS

000030  C$SMB:                   ; MAXIMUM SIZE OF A MEMORY BOX ENTRY


        ;
        ; STATUS BIT DEFINITIONS FOR THE PORT STATUS WORD
        ;
                CP$OFL=400       ; 1=> PORT IS OFFLINE
                CP$XXX=1000      ; UNUSED
                CP$CUR=2000      ; THIS PORT IS THE CURRENT PORT (S.KRB
                                 ; REFERENCES THIS PORT
                CP$XXX=4000      ; UNUSED
                CP$XXX=10000     ; UNUSED
                CP$ACC=20000     ; THIS PORT HAS AN ACCESS PATH
                CP$MTD=40000     ; PORT HAS CONTEXT OR SERVICES A DEVICE
                                 ; HAVING CONTEXT
                CP$XXX=100000    ; UNUSED


        ;
        ; DEVICE ATTRIBUTES CODES
        ;
                .MACRO ATT NAME,SIZ
                $$$TMP=$$$TMP+1
                DEFIN$ DA$'NAME,$$$TMP!<400*SIZ>
                .ENDM

                $$$TMP=0

                ATT     CSR,2    ; CSR ADDRESS
                ATT     VEC,2    ; VECTOR ADDRESS
                ATT     UBR,2    ; UNIBUS RUN
                ATT     TYP,2    ; DEVICE TYPE, READ ONLY
                ATT     VOL,12.  ; MOUNTED VOLUME NAME, READ ONLY
                ATT     ERR,10   ; DEVICE ERROR COUNTERS, READ/WRITE
                ATT     PRI,2    ; DEVICE INTERRUPT PRIORITY
                ATT     MBP,6    ; MEMORY BOX PARAMETER
                ATT     STE,2    ; SANITY TIMER ENABLE/DISABLE
                ATT     SAL,2    ; ALARM ENABLE/DISABLE
                ATT     DSN,2    ; DEVICE SERIAL NUMBER
                ATT     CSN,10   ; CPU SERIAL NUMBERS
```

OLRDF$ (Cont.)

```
        ;
        ; MEMORY BOX ATTRIBUTE BUFFER
        ;
                .ASECT
        .=0
000000  C$MBAS: .BLKW   1        ; BASE ADDRESS OF BOX
000002  C$MINT: .BLKB   1        ; INTERLEAVE FACTOR
000003          .BLKB   1        ; FREE BYTE
000004  C$MSIZ: .BLKW   1        ; SIZE OF BOX IN 32 WORD BLOCKS
000006  C$MGRN: .BLKW   1        ; BOX GRANULARITY. "BYTES-PER-UNIT"

000010  C$MDSC:                  ; SIZE OF BOX ATTRIBUTE BUFFER

                .PSECT


        ;
        ; MACRO FOR THE DEFINITION OF DEVICE TYPE CODES
        ;
                .MACRO DEVCD$ $$$GBL

                .MCALL DEFIN$

                .IF IDN <$$$GBL>,<DEF$G>
        ...GBL=1
                .IFF
        ...GBL=0
                .ENDC

                .MACRO DEV X
                DEFIN$ D$'X,$$$TMP
                $$$TMP=$$$TMP+1
                .ENDM

                $$$TMP = 0

                DEV UDET         ; UNDETERMINED DEVICE TYPE
                DEV UKNO         ; UNKNOWN DEVICE TYPE

                DEV RK03         ; RK03
                DEV RK05         ; RK05
                DEV RK5F         ; RK05-F (DUAL DENSITY FIXED CARTRIDGE)

                DEV RX01         ; RX01
                DEV RX02         ; RX02 (DUAL DENSITY RX01)

                DEV RL01         ; RL01
                DEV RL02         ; RL02

                DEV RP02         ; RP02
                DEV RP03         ; RP03
                DEV RP04         ; RP04
                DEV RP05         ; RP05
                DEV RP06         ; RP06
                DEV RP07         ; RP07
```

OLRDF$ (Cont.)

```
DEV RK06        ; RK06
DEV RK07        ; RK07

DEV RM02        ; RM02
DEV RM03        ; RM03
DEV RM05        ; RM05
DEV RM80        ; RM80

DEV RS03        ; RS03
DEV RS04        ; RS04 (DUAL DENSITY RS03)

DEV RF11        ; RF11/RS08

DEV TU10        ; TU10
DEV TU16        ; TU16
DEV TU45        ; TU45
DEV TU77        ; TU77
DEV TU78        ; TU78
DEV TS11        ; TS11

DEV TM02        ; TM02
DEV TM03        ; TM03
DEV TM78        ; TM78

DEV TU56        ; TU56
DEV TU58        ; TU58
DEV TU60        ; TU60

DEV MSCP        ; UDA50
DEV RA60        ; RA60
DEV RA80        ; RA80
DEV RA81        ; RA81

DEV ML11        ; ML11

DEV TERM        ; TERMINAL

$$$TMP=370
DEV USR0        ; USER TYPE 0
DEV USR1        ; USER TYPE 1
DEV USR2        ; USER TYPE 2
DEV USR3        ; USER TYPE 3
DEV USR4        ; USER TYPE 4
DEV USR5        ; USER TYPE 5
DEV USR6        ; USER TYPE 6
DEV USR7        ; USER TYPE 7
```

PCBDF$

```
                PCBDF$  ,,SYSDEF

        ;
        ; MAIN PARTITION PCB
        ;
                .ASECT
        .=0
000000  P.LNK:  .BLKW   1       ;LINK TO NEXT MAIN PARTITION PCB
000002          .BLKW   1       ;(UNUSED)
000004  P.NAM:  .BLKW   2       ;PARTITION NAME IN RAD50
000010  P.SUB:  .BLKW   1       ;POINTER TO FIRST SUBPARTITION
000012  P.MAIN: .BLKW   1       ;POINTER TO SELF
000014  P.REL:  .BLKW   1       ;STARTING PHYSICAL ADDRESS IN 32W BLOCKS
000016  P.BLKS:
000016  P.SIZE: .BLKW   1       ;SIZE OF PARTITION IN 32W BLOCKS
000020  P.WAIT: .BLKW   2       ;PARTITION WAIT QUEUE LISTHEAD
000024          .BLKW   2       ;(UNUSED)
000030  P.STAT: .BLKW   1       ;PARTITION STATUS FLAGS
000032  P.ST2:  .BLKW   1       ;STATUS EXTENSION FOR COMMON AND MAIN PCB'S
000034          .BLKW   3       ;(UNUSED)
000042  P.HDLN: .BLKB   1       ;SIZE OF EXTERNAL HEADER IN 32W BLOCKS
000043  P.IOC:  .BLKB   1       ;PARTITION I/O COUNT

        $$$=.
        P.RRM:  .BLKW   1       ;REQUIRED RUN MASK

                .IF NDF M$$PRO
        .=$$$
                .ENDC


                .IF NB  SYSDEF

000044  P.LGTH=.                ;PARTITION CONTROL BLOCK LENGTH

                .ENDC


        ;
        ; TASK REGION PCB
        ;
        .=0
000000  P.LNK:  .BLKW   1       ;UTILITY LINK WORD
000002  P.PRI:  .BLKB   1       ;PRIORITY OF PARTITION
000003  P.RMCT: .BLKB   1       ;RESIDENT MAPPED TASKS COUNT
000004  P.NAM:  .BLKW   2       ;PARTITION NAME IN RAD50
000010  P.SUB:  .BLKW   1       ;POINTER TO NEXT SUBPARTITION
000012  P.MAIN: .BLKW   1       ;POINTER TO MAIN PARTITION
000014  P.REL:  .BLKW   1       ;STARTING PHYSICAL ADDRESS IN 32W BLOCKS
000016  P.BLKS:
000016  P.SIZE: .BLKW   1       ;SIZE OF PARTITION IN 32W BLOCKS
000020          .BLKW   1       ;(UNUSED)
000022  P.SWSZ: .BLKW   1       ;PARTITION SWAP SIZE
000024  P.DPCB: .BLKW   1       ;CHECKPOINT ALLOCATION PCB
000026  P.TCB:  .BLKW   1       ;TCB ADDRESS OF OWNER TASK
000030  P.STAT: .BLKW   1       ;PARTITION STATUS FLAGS
000032  P.HDR:  .BLKW   1       ;POINTER TO HEADER CONTROL BLOCK
```

PCBDF$ (Cont.)

```
000034                  .BLKW   1       ;(UNUSED)
000036  P.ATT:  .BLKW   2       ;ATTACHMENT DESCRIPTOR LISTHEAD
000042  P.HDLN: .BLKB   1       ;SIZE OF EXTERNAL HEADER IN 32W BLOCKS
000043  P.IOC:  .BLKB   1       ;PARTITION I/O COUNT

        $$$=.
        P.RRM:  .BLKW   1       ;REQUIRED RUN MASK

                .IF NDF M$$PRO
        .=$$$
                .ENDC


        ;
        ; COMMON REGION PCB
        ;
        .=0
000000  P.LNK:  .BLKW   1       ;UTILITY LINK WORD
000002  P.PRI:  .BLKB   1       ;PRIORITY OF PARTITION
000003  P.RMCT: .BLKB   1       ;RESIDENT MAPPED TASKS COUNT
000004  P.NAM:  .BLKW   2       ;PARTITION NAME IN RAD50
000010  P.SUB:  .BLKW   1       ;POINTER TO NEXT SUBPARTITION
000012  P.MAIN: .BLKW   1       ;POINTER TO MAIN PARTITION
000014  P.REL:  .BLKW   1       ;STARTING PHYSICAL ADDRESS IN 32W BLOCKS
000016  P.BLKS:
000016  P.SIZE: .BLKW   1       ;SIZE OF PARTITION IN 32W BLOCKS
000020  P.CBDL: .BLKW   1       ;COMMON BLOCK DIRECTORY LINK
000022  P.SWSZ: .BLKW   1       ;PARTITION SWAP SIZE
000024  P.DPCB: .BLKW   1       ;POINTER TO DISK PCB
000026  P.OWN:  .BLKW   1       ;OWNING UIC OF REGION
000030  P.STAT: .BLKW   1       ;PARTITION STATUS FLAGS
000032  P.ST2:  .BLKW   1       ;STATUS EXTENSION FOR COMMON AND MAIN PCB'S
000034  P.PRO:  .BLKW   1       ;PROTECTION WORD [DEWR,DEWR,DEWR,DEWR]
000036  P.ATT:  .BLKW   2       ;ATTACHMENT DESCRIPTOR LISTHEAD
000042  P.HDLN: .BLKB   1       ;SIZE OF EXTERNAL HEADER IN 32W BLOCKS
000043  P.IOC:  .BLKB   1       ;PARTITION I/O COUNT

        $$$=.
        P.RRM:  .BLKW   1       ;REQUIRED RUN MASK

                .IF NDF M$$PRO
        .=$$$
                .ENDC


                .PSECT

        ;
        ; PARTITION STATUS WORD BIT DEFINITIONS
        ;
        PS.OUT=100000           ;PARTITION IS OUT OF MEMORY(1=YES)
        PS.CKP=40000            ;PARTITION CHECKPOINT IN PROGRESS (1=YES)
        PS.CKR=20000            ;PARTITION CHECKPOINT IS REQUESTED (1=YES)
        PS.CHK=10000            ;PARTITION IS NOT CHECKPOINTABLE (1=YES)
        PS.FXD=4000             ;PARTITION IS FIXED (1=YES)
        PS.CAF=2000             ;CHECKPOINT SPACE ALLOCATION FAILURE (1=YES)
        PS.LIO=1000             ;MARKED BY SHUFFLER FOR LONG I/O (1=YES)
        PS.NSF=400              ;PARTITION IS NOT SHUFFLEABLE (1=YES)
```

PCBDF$ (Cont.)

```
PS.COM=200              ;LIBRARY OR COMMON BLOCK (1=YES)
PS.LFR=100              ;LAST LOAD OF REGION FAILED (1=YES)
PS.PER=40               ;PARTIY ERROR OCCURED IN THIS REGION (1=YES)
PS.DEL=10               ;PARTITION SHOULD BE DELETED WHEN NOT
                        ;ATTACHED (1=YES)
PS.AST=4                ;PARTITION HAS REGION LOAD AST PENDING


;
; REQUIRED RUN MASK
;
PR.UBT=100000           ;UNIBUS RUN T
PR.UBS=40000            ;UNIBUS RUN S
PR.UBR=20000            ;UNIBUS RUN R
PR.UBP=10000            ;UNIBUS RUN P
PR.UBN=4000             ;UNIBUS RUN N
PR.UBM=2000             ;UNIBUS RUN M
PR.UBL=1000             ;UNIBUS RUN L
PR.UBK=400              ;UNIBUS RUN K
PR.UBJ=200              ;UNIBUS RUN J
PR.UBH=100              ;UNIBUS RUN H
PR.UBF=40               ;UNIBUS RUN F
PR.UBE=20               ;UNIBUS RUN E
PR.CPD=10               ;PROCESSOR D
PR.CPC=4                ;PROCESSOR C
PR.CPB=2                ;PROCESSOR B
PR.CPA=1                ;PROCESSOR A


;
; STATUS EXTENSION WORD BIT DEFINITIONS
;       (THESE BITS CAN ONLY BE EXAMINED IN COMMON OR MAIN PCB'S)
;
P2.LMA=40000            ;DON'T SHUFFLE,DELETE SPINDLE OR MUTILATE
                        ;THIS PARTITION
P2.CPC=20000            ;CPCR INITIATED CHECKPOINT PENDING
P2.SEC=4000             ;THIS IS RO SECTION OF MU TASK
                        ;WITH TCB IN SEC. POOL
P2.PAR=2000             ;THE FIXER TASK HAS HANDLED A PARITY ERROR
P2.POL=1000             ;SECONDARY POOL PARTITION
P2.CPU=400              ;MULTIPROCESSOR CPU PARTITION
P2.PIC=200              ;POSITION INDEPENDENT LIBRARY OR COMMON
                        ;(1=YES)
P2.RON=100              ;READ-ONLY COMMON (1=YES)
P2.DRV=40               ;DRIVER COMMON PARTITION (1=YES)
P2.APR=7                ;STARTING APR NUMBER MASK FOR NON-PIC COMMON


;
; CHECKPOINT FILE PCB
;
        .ASECT
.=0
000000  P.LNK:  .BLKW   1       ;LINK WORD OF CHECKPOINT FILE PCB'S
000002  P.UCB:  .BLKW   1       ;UCB ADDRESS OF CHECKPOINT FILE DEVICE
000004  P.LBN:  .BLKW   1       ;HIGH PART OF STARTING LBN
000006          .BLKW   1       ;LOW PART OF STARTING LBN
000010  P.SUB:  .BLKW   1       ;POINTER TO FIRST CHECKPOINT ALLOCATION PCB
```

PCBDF$ (Cont.)

```
000012  P.MAIN: .BLKW   1       ;MUST BE 0 (FOR $RLPR1)
000014  P.REL:  .BLKW   1       ;CONTAINS 0 IF FILE IN USE, 1 IF NOT IN USE
000016  P.SIZE: .BLKW   1       ;SIZE OF CHECKPOINT FILE IN 256W BLOCKS
000020  P.DLGH=.                ;LENGTH OF ALL DISK PCB'S


        ;
        ; CHECKPOINT ALLOCATION PCB
        ;
        .=0
000000          .BLKW   4       ;(UNUSED)
000010  P.SUB:  .BLKW   1       ;LINK TO NEXT CHECKPOINT ALLOCATION PCB
000012  P.MAIN: .BLKW   1       ;ADDRESS OF CHECKPOINT FILE PCB
000014  P.REL:  .BLKW   1       ;RELATIVE POSITION IN FILE IN 256W BLOCKS
000016  P.SIZE: .BLKW   1       ;SIZE ALLOCATED IN 256W BLOCKS


        ;
        ; COMMON TASK IMAGE FILE PCB
        ;
        .=0
000000  P.FID1: .BLKW   1       ;FILE ID WORD FOR SAVE
000002  P.UCB:  .BLKW   1       ;UCB ADDR OF DEVICE ON WHICH COMMON RESIDES
000004  P.LBN:  .BLKW   1       ;HIGH PART OF STARTING LBN
000006          .BLKW   1       ;LOW PART OF STARTING LBN
000010  P.FID2: .BLKW   1       ;FILE ID WORD FOR SAVE
000012  P.MAIN: .BLKW   1       ;POINTER TO SELF
000014  P.REL:  .BLKW   1       ;ALWAYS CONTAINS A 0
000016  P.FID3: .BLKW   1       ;FILE ID WORD FOR SAVE


        ;
        ; ATTACHMENT DESCRIPTOR OFFSETS
        ;
                .ASECT
        .=0
000000  A.PCBL: .BLKW   1       ;PCB ATTACHMENT QUEUE THREAD WORD
000002  A.PRI:  .BLKB   1       ;PRIORITY OF ATTACHED TASK
000003  A.IOC:  .BLKB   1       ;I/O COUNT THROUGH THIS DESCRIPTOR
000004  A.TCB:  .BLKW   1       ;TCB ADDRESS OF ATTACHED TASK
000006  A.TCBL: .BLKW   1       ;TCB ATTACHMENT QUEUE THREAD WORD
000010  A.STAT: .BLKB   1       ;STATUS BYTE
000011  A.MPCT: .BLKB   1       ;MAPPING COUNT OF TASK THRU THIS DESCRIPTOR
000012  A.PCB:  .BLKW   1       ;PCB ADDRESS OF ATTACHED TASK
000014  A.LGTH=.                ;LENGTH OF ATTACHMENT DESCRIPTOR


        ;
        ; ATTACHMENT DESCRIPTOR STATUS BYTE BIT DEFINITIONS
        ;
                .PSECT
        AS.PRO=100              ;A.TCB IS SEC POOL TCB BIAS (1=YES)
        AS.SBP=20               ;CACHE BYPASS REQUESTED
        AS.RBP=40               ;REQUEST TO NOT BYPASS CACHE
        AS.DEL=10               ;TASK HAS DELETE ACCESS (1=YES)
        AS.EXT=4                ;TASK HAS EXTEND ACCESS (1=YES)
        AS.WRT=2                ;TASK HAS WRITE ACCESS (1=YES)
        AS.RED=1                ;TASK HAS READ ACCESS (1=YES)
```

PKTDF$

```
                PKTDF$

        ;
        ; ASYNCHRONOUS SYSTEM TRAP CONTROL BLOCK OFFSET DEFINITIONS
        ;
        ; SOME POSITIONAL DEPENDENCIES BETWEEN THE OCB AND THE AST CONTROL
        ; BLOCK ARE RELIED UPON IN THE ROUTINE $FINXT IN THE MODULE SYSXT.
        ;
                .ASECT
        .=177774
177774  A.KSR5: .BLKW   1       ;SUBROUTINE KISAR5 BIAS (A.CBL=0)
177776  A.DQSR: .BLKW   1       ;DEQUEUE SUBROUTINE ADDRESS (A.CBL=0)
000000          .BLKW   1       ;AST QUEUE THREAD WORD
000002  A.CBL:  .BLKW   1       ;LENGTH OF CONTROL BLOCK IN BYTES
                                ;IF A.CBL = 0, THE AST CONTROL BLOCK IS
                                ;TO BE DEALLOCATED BY THE DEQUEUE SUBROUTINE
                                ;POINTED TO BY A.DQSR MAPPED VIA APR 5
                                ;VALUE A.KSR5.  THIS IS CURRENTLY USED ONLY
                                ;BY THE FULL DUPLEX TERMINAL DRIVER FOR
                                ;UNSOLICITED CHARACTER ASTS.
                                ;IF THE LOW BYTE OF A.CBL = 0, AND THE
                                ;HIGH BYTE IS NOT = 0, THE AST CONTROL BLOCK
                                ;IS A SPECIFIED AST, WITH LENGTH, C.LGTH.
                                ;IF THE HIGH BYTE OF A.CBL=0
                                ;AND THE LOW BYTE > 0, THEN
                                ;THE LOW BYTE IS THE LENGTH OF THE
                                ;AST CONTROL BLOCK.
                                ;IF HIGH BYTE = 0 AND LOW BYTE IS NEGATIVE,
                                ;THEN THE BLOCK IS A KERNEL AST
                                ;BIT 6 IS SET IF $SGFIN SHOULD
                                ;NOT BE CALLED PRIOR TO DISPATCHING
                                ;THE AST, AND THE LOW SIX BITS (5-0)
                                ;REPRESENT THE INDEX/2 INTO THE
                                ;KERNEL AST DISPATCH TABLE ($KATBL)
000004  A.BYT:  .BLKW   1       ;NUMBER OF BYTES TO ALLOCATE ON TASK STACK
000006  A.AST:  .BLKW   1       ;AST TRAP ADDRESS
000010  A.NPR:  .BLKW   1       ;NUMBER OF AST PARAMETERS
000012  A.PRM:  .BLKW   1       ;FIRST AST PARAMETER


        AS.FPA=1                ;CODE FOR FLOATING POINT AST
        AS.RCA=2                ;CODE FOR RECEIVE DATA AST
        AS.RRA=3                ;CODE FOR RECEIVE BY REFERENCE AST
        AS.PEA=4                ;CODE FOR PARITY ERROR AST
        AS.REA=5                ;CODE FOR REQUESTED EXIT AST
        AS.PFA=6                ;CODE FOR POWER FAIL AST
        AS.CAA=7                ;CODE FOR CLI COMMAND ARRIVAL AST


        ;
        ; ABORTER SUBCODES FOR ABORT AST (AS.REA) TO BE RETURNED ON USER'S
        ; STACK
        ;
        AB.NPV=1                ;ABORTER IS NONPRIVILEGED (1=YES)
        AB.TYP=2                ;ABORT FROM DIRECTIVE (0=YES)
                                ;ABORT FROM CLI COMMAND (1=YES)
        A.PLGH=70               ;SIZE OF PARITY ERROR AST CONTROL BLOCK
        A.DUCB=10               ;UCB OF TERM ISSUING DEBUG COMMAND
        A.DLGH=10.              ;LENGTH OF DEBUG (AK.TBT) AST BLOCK
```

PKTDF$ (Cont.)

```
        ;
        ; KERNEL AST CONTROL CODES (A.CBL)
        ;
        AK.BUF=200              ;BUFFERED I/O COMPLETION
                                ;THIS CODE MUST BE 200 UNTIL ALL
                                ;REFERENCES IN TTDRV ARE FIXED
        AK.OCB=201              ;OFFSPRING TASK EXIT
        AK.GBI=202              ;SEGMENTED BUFFERED I/O COMPLETION
        AK.TBT=203              ;TASK FORCE T-BIT TRAP (DEBUG CMD)
        AK.DIO=204              ;DELAYED I/O COMPLETION
        AK.GGF=205              ;GRP. GBL. RUNDWN


        ;
        ; BIT DEFINITIONS FOR THE GET/SET INFORMATION DIRECTIVE.
        ;
        SF.PRV=100000           ;FUNCTION IS PRIVILEGED
        SF.IN= 40000            ;FUNCTION IS AN INPUT FUNCTION


        ;
        ; GROUP GLOBAL EVENT FLAG BLOCK OFFSETS
        ;
        .=0
000000  G.LNK:  .BLKW   1       ;LINK WORD
000002  G.GRP:  .BLKB   1       ;GROUP NUMBER
000003  G.STAT: .BLKB   1       ;STATUS BYTE
000004  G.CNT:  .BLKW   1       ;ACCESS COUNT
000006  G.EFLG: .BLKW   2       ;EVENT FLAGS

000012  G.LGTH=.                ;LENGTH OF GROUP GLOBAL EVENT FLAG BLOCK


        GS.DEL=1                ;STATUS BIT -- MARKED FOR DELETE


        ;
        ; EXECUTIVE POOL MONITOR CONTROL FLAGS
        ;

        ;
        ; $POLST IS THE SYNCHRONIZATION WORD BETWEEN THE EXEC AND POOL
        ; MONITOR
        ;
        PC.HIH=1                ;HIGH POOL LIMIT CROSSED (1=YES)
        PC.LOW=2                ;LOW POOL LIMIT CROSSED (1=YES)
        PC.ALF=4                ;POOL ALLOCATION FAILURE (1=YES)
        PC.XIT=200              ;FORCE POOL MONITOR TASK TO EXIT (MUST
                                ;BE COUPLED WITH SETTING FE.MXT IN THE
                                ;FEATURE MASK)
        PC.NRM=PC.HIH*400       ;POOL TASK INHIBIT BIT FOR HIGH POOL
        PC.ALM=PC.LOW*400       ;POOL TASK INHIBIT BIT FOR LOW POOL

        ;
        ; $POLFL IS THE POOL USAGE CONTROL WORD
        ;
        PF.INS=40               ;REJECT NONPRIVILEGED INS/RUN/REM
        PF.LOG=100              ;NONPRIVILEGED LOGINS ARE DISABLED
```

PKTDF$ (Cont.)

```
        PF.REQ=200              ;STALL REQUEST OF NONPRIV. TASKS
        PF.ALL=177777           ;TAKE ALL POSSIBLE ACTIONS TO SAVE POOL


        ;
        ; OFFSPRING CONTROL BLOCK DEFINITIONS
        ;
        ; SOME POSITIONAL DEPENDENCIES ARE DEPENDED ON BETWEEN THE OCB AND
        ; THE AST BLOCK IN THE ROUTINE $FINXT IN THE MODULE SYSXT.
        ;
        .=0
000000  O.LNK:  .BLKW   1       ;OCB LINK WORD
000002  O.MCRL: .BLKW   1       ;ADDRESS OF MCR COMMAND LINE
000004  O.PTCB: .BLKW   1       ;PARENT TCB ADDRESS
000006  O.AST:  .BLKW   1       ;EXIT AST ADDRESS
000010  O.EFN:  .BLKW   1       ;EXIT EVENT FLAG
000012  O.ESB:  .BLKW   1       ;EXIT STATUS BLOCK VIRTUAL ADDRESS
000014  O.STAT: .BLKW   8.      ;EXIT STATUS BUFFER

000034  O.LGTH=.                ;LENGTH OF OCB


        ;
        ; I/O PACKET OFFSET DEFINITIONS
        ;
                .ASECT
        .=0
000000  I.LNK:  .BLKW   1       ;I/O QUEUE THREAD WORD
000002  I.PRI:  .BLKB   1       ;REQUEST PRIORITY
000003  I.EFN:  .BLKB   1       ;EVENT FLAG NUMBER
000004  I.TCB:  .BLKW   1       ;TCB ADDRESS OF REQUESTOR
000006  I.LN2:  .BLKW   1       ;POINTER TO SECOND LUN WORD
000010  I.UCB:  .BLKW   1       ;POINTER TO UNIT CONTROL BLOCK
000012  I.FCN:  .BLKW   1       ;I/O FUNCTION CODE
000014  I.IOSB: .BLKW   1       ;VIRTUAL ADDRESS OF I/O STATUS BLOCK
000016          .BLKW   1       ;I/O STATUS BLOCK RELOCATON BIAS
000020          .BLKW   1       ;I/O STATUS BLOCK ADDRESS
000022  I.AST:  .BLKW   1       ;AST SERVICE ROUTINE ADDRESS
000024  I.PRM:  .BLKW   1       ;RESERVED FOR MAPPING PARAMETER #1
000026          .BLKW   6       ;PARAMETERS 1 TO 6
000042          .BLKW   1       ;USER MODE DIAGNOSTIC PARAMETER WORD

000044  I.ATTL=.                ;MINIMUM LENGTH OF I/O PACKET (USED BY
                                ;FILE SYSTEM TO CALCULATE MAXIMUM
                                ;NUMBER OF ATTRIBUTES)
000044  I.AADA: .BLKW   2       ;STORAGE FOR ATT DESCR PTRS WITH I/O

000050  I.LGTH=.                ;LENGTH OF I/O REQUEST CONTROL BLOCK
        I.ATRL=6*8.             ;LENGTH OF FILE SYSTEM ATTRIBUTE BLOCK


        ;
        ; CLI PARSER BLOCK (CPB) DEFINITIONS
        ;
        .=0
```

PKTDF$ (Cont.)

```
000000  C.PTCB: .BLKW   1       ;ADDRESS OF CLI'S TCB
000002  C.PNAM: .BLKW   2       ;CLI NAME
000006  C.PSTS: .BLKW   1       ;STATUS MASK
000010  C.PDPL: .BLKB   1       ;LENGTH OF DEFAULT PROMPT
000011  C.PCPL: .BLKB   1       ;LENGTH O CNTRL/C PROMPT
000012  C.PRMT:                 ;START OF PROMPT STRINGS. DEFAULT
                                ;IS CONCATENATED WITH CONTROL C PROMPT


        ;
        ; STATUS BIT DEFINITIONS
        ;
        CP.NUL=1                ;PASS EMPTY COMMANDS TO CLI
        CP.MSG=2                ;CLI DESIRES SYSTEM MESSAGES
        CP.LGO=4                ;CLI WANTS COMMANDS FROM LOGGED OFF TTYS
        CP.DSB=10               ;CLI IS DISABLED
        CP.PRV=20               ;USER MUST BE PRIV TO SET TTY TO THIS CLI
        CP.SGL=40               ;DON'T HANDLE CONTINUATIONS (M-PLUS ONLY)
        CP.NIO=100              ;MCR..., HEL, BYE DO NO I/O TO TTY
                                ;HEL, BYE DO NOT SET CLI ETC.
        CP.RST=200              ;ABILITY TO SET TO THIS CLI IS RESTRICTED
                                ;TO THE CLI ITSELF
        CP.EXT=400              ;PASS TASK EXIT PROMPT REQUESTS TO CLI
        CP.POL=1000             ;CLI TCB IS IN SECONDARY POOL


        ;
        ; SECONDARY POOL COMMAND BUFFER BLOCKS
        ;
        .=0
000000  C.CLK:  .BLKW   1       ;LINK WORD
000002  C.CTCB: .BLKW   1       ;TCB ADDRESS OF TASK TO RECEIVE COMMAND
000004  C.CUCB: .BLKW   1       ;UCB ADDRESS OF RESPONSIBLE TERMINAL
000006  C.CCT:  .BLKW   1       ;CHARACTER COUNT, EXCLUDING TRAILING CR
000010  C.CSTS: .BLKW   1       ;STATUS MASK
000012  C.CMCD:                 ;SYSTEM MESSAGE CODE
000012  C.CSO:  .BLKW   1       ;STARTING OFFSET OF VALID COMMAND TEXT
000014  C.CTR:  .BLKB   1       ;TERMINATOR CHARACTER
000015  C.CBLK: .BLKB   1       ;SIZE OF PACKET IN SEC POOL (32 WD.) BLOCKS
000016  C.CTXT:                 ;COMMAND TEXT, FOLLOWED BY CR


        ;
        ; STATUS BITS FOR COMMAND BLOCKS
        ;
        CC.MCR=1                ;FORCE COMMAND TO MCR
        CC.PRM=2                ;ISSUE DEFAULT PROMPT
        CC.EXT=4                ;TASK EXIT PROMPT REQUEST
        CC.KIL=10               ;DELETE ALL CONTINUATION PIECES FROM THIS TT
        CC.CLI=20               ;COMMAND TO BE RETREIVED BY GCCI$ ONLY
        CC.MSG=40               ;PACKET CONTAINS SYSTEM MESSAGE TO CLI
        CC.TTD=100              ;COMMAND CAME FROM TTDRV


        ;
        ; IDENTIFIER CODES FOR SYSTEM TO CLI MESSAGES
        ;
        ; CODES 0-127. ARE RESERVED FOR USE BY DIGITAL
        ; CODES 128.-255. ARE RESERVED FOR USE BY CUSTOMERS
        ;
```

PKTDF$ (Cont.)

```
                CM.INE=1                ;CLI INITIALIZED ENABLED
                CM.IND=2                ;CLI INITIALIZED DISABLED
                CM.CEN=3                ;CLI ENABLED
                CM.CDS=4                ;CLI DISABLED
                CM.ELM=5                ;CLI BEING ELIMINATED
                CM.EXT=6                ;CLI MUST EXIT IMMEDIATELY
                CM.LKT=7                ;NEW TERMINAL LINKED TO CLI
                CM.RMT=8.               ;TERMINAL REMOVED FROM CLI
                CM.MSG=9.               ;GENERAL MESSAGE TO CLI


                ;
                ; ANCILLARY CONTROL BLOCK (ACB) DEFINITIONS
                ;
                .=0
000000  A.REL:   .BLKW   1        ;ACD RELOCATION BIAS
000002  A.DIS:   .BLKW   1        ;ACD DISPATCH TABLE POINTER
000004  A.MAS:   .BLKW   1        ;ACD FUNCTION MASK
000006  A.NUM:   .BLKB   1        ;ACD IDENTIFICATION NUMBER
000007           .BLKB   1        ;RESERVED
000010  A.LIN:   .BLKW   1        ;ACD LINK WORD
000012  A.ACC:   .BLKB   1        ;ACD ACCESS COUNT
000013  A.STA:   .BLKB   1        ;ACD STATUS BYTE

000014  A.LEN1=.                  ;LENGTH OF PROTOTYPE ACB


                .=A.LIN           ;FULL ACB OVERLAPS PROTOTYPE ACB
000010  A.IMAP: .BLKW   1        ;ACD INTERRUPT BUFFER RELOCATION BIAS
000012  A.IBUF: .BLKW   1        ;ACD INTERRUPT BUFFER ADDRESS
000014  A.ILEN: .BLKW   1        ;ACD INTERRUPT BUFFER LENGTH
000016  A.SMAP: .BLKW   1        ;ACD SYSTEM STATE BUFFER RELOCATION BIAS
000020  A.SBUF: .BLKW   1        ;ACD SYSTEM STATE BUFFER ADDRESS
000022  A.SLEN: .BLKW   1        ;ACD SYSTEM STATE BUFFER LENGTH
000024  A.IOS:   .BLKW   2        ;ACD I/O STATUS
000030  A.RES:   .BLKW   1        ;RESERVED FOR USE BY THE ACD

000032  A.LEN2=.                  ;LENGTH OF FULL ACB


                ;
                ; DEFINE THE FLAG VALUES IN THE OFFSET U.AFLG
                ;
                UA.ACC=1                ;ACCEPT THIS CHARACTER
                UA.PRO=2                ;PROCESS THIS CHARACTER
                UA.ECH=4                ;ECHO THIS CHARACTER
                UA.TYP=10               ;FORCE THIS CHARACTER INTO TYPEAHEAD
                UA.SPE=20               ;THIS CHARACTER HAS A SPECIAL ECHO
                UA.PUT=40               ;PUT THIS CHARACTER IN THE INPUT BUFFER
                UA.CAL=100              ;CALL THE ACD BACK AFTER THE TRANSFER
                UA.COM=200              ;COMPLETE THE INPUT REQUEST
                UA.ALL=400              ;ALLOW PROCESSING OF THIS I/O REQUEST
                UA.TRA=1000             ;TRANSFER CHARS. WHEN I/O COMPLETES


                ;
                ; DEFINE THE ACD ENTRY POINTS (OFFSETS INTO THE DISPATCH TABLE)
                ;
                .=0
```

PKTDF$ (Cont.)

```
000000  A.ACCE: .BLKW   1       ;I/O REQUEST ACCEPTANCE ENTRY POINT
000002  A.DEQU: .BLKW   1       ;I/O REQUEST DEQUEUE ENTRY POINT
000004  A.POWE: .BLKW   1       ;POWER FAILURE ENTRY POINT
000006  A.INPU: .BLKW   1       ;INPUT COMPLETION ENTRY POINT
000010  A.OUTP: .BLKW   1       ;OUTPUT COMPLETION ENTRY POINT
000012  A.CONN: .BLKW   1       ;CONNECTION ENTRY POINT
000014  A.DISC: .BLKW   1       ;DISCONNECTION ENTRY POINT
000016  A.RECE: .BLKW   1       ;INPUT CHARACTER RECEPTION ENTRY POINT
000020  A.PROC: .BLKW   1       ;INPUT CHARACTER PROCESSING ENTRY POINT
000022  A.CALL: .BLKW   1       ;CALL ACD BACK AFTER TRANSFER ENTRY POINT


        ;
        ; DEFINE THE STATUS BITS IN A.STA OF THE PROTOTYPE ACB
        ;
        AS.DEL=1                ;ACD IS MARKED FOR DELETE
        AS.DIS=2                ;ACD IS DISABLED

                .PSECT
```

SCBDF$

```
                SCBDF$  ,,SYSDEF

        ;
        ; STATUS CONTROL BLOCK
        ;
        ; THE STATUS CONTROL BLOCK (SCB) DEFINES THE STATUS OF A DEVICE
        ; CONTROLLER.  THERE IS ONE SCB FOR EACH CONTROLLER IN A SYSTEM.
        ; THE SCB IS POINTED TO BY UNIT CONTROL BLOCKS.  TO EXPAND ON THE
        ; TELETYPE EXAMPLE ABOVE, EACH TELETYPE INTERFACED VIA A DL11-A
        ; WOULD HAVE A SCB SINCE EACH DL11-A IS AN INDEPENDENT INTERFACE
        ; UNIT.  THE TELETYPES INTERFACED VIA THE DH11 WOULD ALSO EACH HAVE
        ; AN SCB SINCE THE DH11 IS A SINGLE CONTROLLER BUT MULTIPLEXES MANY
        ; UNITS IN PARALLEL.
        ;
                .IF NB  SYSDEF

                .ASECT
        .=0
000000  S.LHD:  .BLKW   2       ;CONTROLLER I/O QUEUE LISTHEAD
000004  S.URM:                  ;REFERENCE LABEL

                .IF DF  M$$PRO

                .BLKW   1       ;UNIBUS RUN MASK FOR THE FORK BLOCK

                .ENDC

000004  S.FRK:  .BLKW   1       ;FORK BLOCK LINK WORD
000006          .BLKW   1       ;FORK-PC
000010          .BLKW   1       ;FORK-R5
000012          .BLKW   1       ;FORK-R4
000014  S.KS5:  .BLKW   1       ;FORK KISAR5
000016  S.PKT:  .BLKW   1       ;ADDRESS OF CURRENT I/O PACKET
000020  S.CTM:  .BLKB   1       ;CURRENT TIMEOUT COUNT
000021  S.ITM:  .BLKB   1       ;INITIAL TIMEOUT COUNT
000022  S.STS:  .BLKB   1       ;STATUS (0=FREE, NE 0=BUSY)
000023  S.ST3:  .BLKB   1       ;STATUS EXTENSION BYTE
000024  S.ST2:  .BLKW   1       ;STATUS EXTENSION
000026  S.KRB:  .BLKW   1       ;ADDRESS OF KRB
000030  S.RCNT: .BLKB   1       ;NUMBER OF REGISTERS TO COPY
000031  S.ROFF: .BLKB   1       ;OFFSET TO FIRST DEV REG TO COPY
000032  S.EMB:  .BLKW   1       ;ERROR MESSAGE BLOCK POINTER
000034  S.KTB:  .BLKW   1       ;START OF MULTI-ACCESS KRBS

                .PSECT

                .IFF

        ;
        ; STATUS CONTROL BLOCK  STATUS EXTENSION BIT DEFINITIONS
        ;
        S2.EIP=1                ;ERROR IN PROGRESS (1=YES)
        S2.ENB=2                ;ERROR LOGGING ENABLED (0=YES)
        S2.LOG=4                ;ERROR LOGGING SUPPORTED (1=YES)
        S2.MAD=10               ;MULTIACCESS DEVICE (1=YES)
        S2.LDS=40               ;LOAD SHARING ENABLED (1=YES)
        S2.OPT=100              ;SUPPORTS SEEK OPTIMIZATION (1=YES)
```

SCBDF$ (Cont.)

```
                S2.CON=200              ;SCB AND KRB ARE CONTIGUOUS (1=YES)
                S2.OP1=400              ;THESE TWO BITS DEFINE THE OPTIMIZATION
                S2.OP2=1000             ;METHOD.
                                        ;OP2,OP1=0,0 INDICATES NEAREST CYLINDER
                                        ;OP2,OP1=0,1 INDICATES ELEVATOR
                                        ;OP2,OP1=1,0 INDICATES C-SCAN
                                        ;OP2,OP1=1,1 RESERVED
                S2.ACT=2000             ;DRIVER HAS OPERATION OUTSTANDING (1=YES)
                S2.XHR=4000             ;EXTERNAL HEADER AND NEW I.LN2 SUPPORT


                ;
                ; STATUS CONTROL BLOCK STATUS EXTENSION (S.ST3) DEFINITIONS
                ;
                S3.DRL=1                ;MULTI-ACCESS DRIVE IN RELEASED STATE(1=YES)
                S3.NRL=2                ;DRIVER SHOULDN'T RLS MULTI-ACCESS DRIVE
                                        ;(1=YES)
                S3.SIP=4                ;SEEK IN PROGRESS (1=YES)
                S3.ATN=10               ;DRIVER MUST CLEAR ATTENTION BIT (1=YES)
                S3.SLV=20               ;DEVICE USES SLAVE UNITS (1=YES)
                S3.SPA=40               ;PORT 'A' SPINNING UP
                S3.SPB=100              ;PORT 'B' SPINNING UP
                S3.OPT=200              ;SEEK OPTIMIZATION ENABLED (1=YES)
                S3.SPU=S3.SPA!S3.SPB    ;.OR. OF PORT SPINUP BITS


                ;
                ; KRB ADDRESS TABLE (S.KTB) PORT OFFLINE FROM THIS SCB FLAG.
                ;
                KP.OFL=1                ;KRB ADDRESS POINTS TO OFFLINE PORT (1=YES)


                ;
                ; MAPPING ASSIGNMENT BLOCK (FOR UNIBUS MAPPING REGISTER ASSIGNMENT)
                ;
                        .ASECT
                .=0
000000  M.LNK:  .BLKW   1            ;LINK WORD
000002  M.UMRA: .BLKW   1            ;ADDRESS OF FIRST ASSIGNED UMR
000004  M.UMRN: .BLKW   1            ;NUMBER OF UMR'S ASSIGNED * 4
000006  M.UMVL: .BLKW   1            ;LOW 16 BITS MAPPED BY 1ST ASSIGNED UMR
000010  M.UMVH: .BLKB   1            ;HIGH 2 BITS MAPPED IN BITS 4 AND 5
000011  M.BFVH: .BLKB   1            ;HIGH 6 BITS OF PHYSICAL BUFFER ADDRESS
000012  M.BFVL: .BLKW   1            ;LOW 16 BITS OF PHYSICAL BUFFER ADDRESS
000014  M.LGTH=.                     ;LENGTH OF MAPPING ASSIGNMENT BLOCK

                        .ENDC

                        .PSECT
```

SHDDF$

```
                SHDDF$

        ;
        ; FIRST, WE MUST DEFINE THE I/O PACKET DEFINITIONS, SINCE WE
        ; USE THEM IN OUR DEFINITIONS.
        ;
                PKTDF$          ;DEFINE I/O PACKET DEFINITIONS


        ;
        ; SHADOW RECORDING LINKAGE BLOCK (UMB)
        ;
        ; THE UMB LINKS TOGETHER TWO UCB'S AS A SHADOW SET.  ONE IS THE
        ; PRIMARY UCB, THE OTHER THE SECONDARY UCB.  THE EXISTANCE OF A
        ; UMB SIGNALS THAT SHADOW RECORDING IS ENABLED ON A PARTICULAR
        ; UCB.
        ;
                .ASECT
        .=0
000000  M.LNK:  .BLKW   1       ;LINKAGE OF ALL UMB'S IN THE SYSTEM
000002  M.LHD:  .BLKW   1       ;LISTHEAD OF ALL ML NODES FOR THIS SET
000004  M.UCB:  .BLKW   2       ;PRIMARY AND SECONDARY UCB ADDRESSES
000010  M.STS:  .BLKW   1       ;STATUS WORD
000012  M.LBN:  .BLKB   1       ;HIGH ORDER BYTE OF FENCE
000013          .BLKB   1       ;UNUSED BYTE (MAYBE STATUS?)
000014          .BLKW   1       ;LOW ORDER WORD OF FENCE

000016  M.LGH=.


        ;
        ; UMB STATUS BIT DEFINITIONS
        ;
                .PSECT
        MS.MDA=1                ;UMB MARKED FOR DEALLOCATION (1=YES)
        MS.CHP=2                ;CATCHUP IN PROGRESS (1=YES)


        ;
        ; DEFINE THE OFFSETS FOR THE ML NODE, LINKED OFF OF THE UMB
        ; THROUGH CELL M.LHD.  THIS NODE CONTAINS THE SECONDARY I/O
        ; PACKET, AND DOUBLES AS THE ERROR PACKET TO THE ERROR MESSAGE
        ; TASK.
        ;
                .ASECT
        .=0
000000  ML.LNK: .BLKW   1       ;LINKAGE OF ALL ML NODES ON UMB
000002  ML.LEN: .BLKB   1       ;LENGTH OF ML NODE FOR DEALLOCATION
000003  ML.TYP: .BLKB   1       ;TYPE OF ML NODE FOR ERROR TASK
000004  ML.DNC: .BLKB   1       ;DONE COUNT OF PACKETS
000005          .BLKB   1       ;UNUSED
000006  ML.PRI: .BLKW   1       ;PRIMARY I/O PACKET ADDRESS
000010  ML.PKT: .BLKB   I.LGTH  ;SECONDARY I/O PACKET

000060  ML.LGH=.
```

SHDDF$ (Cont.)

```
;
; ML NODE TYPE CODES
;
        .PSECT
MT.PKT=1                ;ML NODE IS I/O PACKET TYPE


;
; I/O PACKET OFFSET DEFNS FOR USE BY SHADOW RECORDING
;
I.R0=I.PRM              ;STATUS STORAGE FOR R0 STATUS
I.R1=I.PRM+2            ;STATUS STORAGE FOR R1 STATUS


;
; DEFINE THE ERROR MESSAGE POINTERS THAT RESIDE IN THE I/O PACKET.
;
        .PSECT
ML.FID=ML.PKT+I.IOSB    ;FILE ID WHICH CONTAINS ERROR
ML.FSEQ=ML.PKT+I.IOSB+2 ;FILE SEQUENCE NUMBER OF FILE IN ERROR
ML.LBN=ML.PKT+I.PRM+10  ;HIGH ORDER LBN OF BLOCK(S) IN ERROR
ML.CNT=ML.PKT+I.PRM+4   ;NUMBER OF BLOCKS IN BAD XFER
ML.TCB=ML.PKT+I.TCB     ;TCB OF TASK WITH BAD REQUEST
ML.SR0=ML.PKT+I.R0      ;R0 OF SECONDARY I/O PACKET
ML.SR1=ML.PKT+I.R1      ;R1 OF SECONDARY I/O PACKET
ML.PR0=ML.PKT+I.PRM+14  ;R0 OF PRIMARY I/O PACKET
ML.PR1=ML.PKT+I.PRM+16  ;R1 OF PRIMARY I/O PACKET
```

TCBDF$

```
                TCBDF$  ,,SYSDEF

        ;
        ; TASK CONTROL BLOCK OFFSET AND STATUS DEFINITIONS
        ;
        ; TASK CONTROL BLOCK
        ;
                .ASECT
        .=0
000000  T.LNK:   .BLKW   1       ;UTILITY LINK WORD
000002  T.PRI:   .BLKB   1       ;TASK PRIORITY
000003  T.IOC:   .BLKB   1       ;I/O PENDING COUNT
000004  T.PCBV:  .BLKW   1       ;POINTER TO COMMON PCB VECTOR
000006  T.NAM:   .BLKW   2       ;TASK NAME IN RAD50
000012  T.RCVL:  .BLKW   2       ;RECEIVE QUEUE LISTHEAD
000016  T.ASTL:  .BLKW   2       ;AST QUEUE LISTHEAD
000022  T.EFLG:  .BLKW   2       ;TASK LOCAL EVENT FLAGS 1-32
000026  T.UCB:   .BLKW   1       ;UCB ADDRESS FOR PSEUDO DEVICE 'TI'
000030  T.TCBL:  .BLKW   1       ;TASK LIST THREAD WORD
000032  T.STAT:  .BLKW   1       ;FIRST STATUS WORD (BLOCKING BITS)
000034  T.ST2:   .BLKW   1       ;SECOND STATUS WORD (STATE BITS)
000036  T.ST3:   .BLKW   1       ;THIRD STATUS WORD (ATTRIBUTE BITS)
000040  T.DPRI:  .BLKB   1       ;TASK'S DEFAULT PRIORITY
000041  T.LBN:   .BLKB   3       ;LBN OF TASK LOAD IMAGE
000044  T.LDV:   .BLKW   1       ;UCB ADDRESS OF LOAD DEVICE
000046  T.PCB:   .BLKW   1       ;PCB ADDRESS OF TASK PARTITION
000050  T.MXSZ:  .BLKW   1       ;MAXIMUM SIZE OF TASK IMAGE (MAPPED ONLY)
000052  T.ACTL:  .BLKW   1       ;ADDRESS OF NEXT TASK IN ACTIVE LIST
000054  T.ATT:   .BLKW   2       ;ATTACHMENT DESCRIPTOR LISTHEAD
000060  T.ST4:   .BLKW   1       ;FOURTH TASK STATUS WORD
000062  T.HDLN:  .BLKB   1       ;LENGTH OF HEADER (0 IF HDR IN POOL)
000063           .BLKB   1       ;UNUSED
000064  T.GGF:   .BLKB   1       ;GROUP GLOBAL USE COUNT FOR TASK
000065  T.TIO:   .BLKB   1       ;BUFFERED I/O IN PROGRESS COUNT
000066  T.EFLM:  .BLKW   2       ;TASK WAITFOR MASK/ADDRESS
000072  T.TKSZ:  .BLKW   1       ;TASK LOAD SIZE IN 32 WD BLOCKS


        $$$=.                   ;MARK START OF PLAS AREA
000074  T.OFF:   .BLKW   1       ;OFFSET TO TASK IMAGE IN PARTITION
000076           .BLKB   1       ;RESERVED
000077  T.SRCT:  .BLKB   1       ;SREF WITH EFN COUNT IN ALL RECEIVE QUEUES
000100  T.RRFL:  .BLKW   2       ;RECEIVE BY REFERENCE LISTHEAD

                .IF NDF P$$LAS
        .=$$$                   ;MOVE LC BACK TO START OF PLAS AREA
                .ENDC


                .IF NB  SYSDEF


        $$$=.                   ;MARK START OF PARENT/OFFSPRING AREA
000104  T.OCBH:  .BLKW   2       ;OFFSPRING CONTROL BLOCK LISTHEAD
000110  T.RDCT:  .BLKW   1       ;OUTSTANDING OFFSPRING AND VT: COUNT

                .IF NDF P$$OFF
        .=$$$
                .ENDC
```

TCBDF$ (Cont.)

```
000112  T.SAST: .BLKW   1       ;SPECIFY AST LIST HEAD


        $$$=.
        T.RRM:  .BLKW   1       ;REQUIRED RUN MASK
        T.IRM:  .BLKW   1       ;INITIAL RUN MASK SET UP BY INSTALL
        T.CPU:  .BLKB   1       ;PROCESSOR NUMBER ON WHICH TASK LAST EXECUTD
                .BLKB   1       ;(UNUSED)

                .IF NDF M$$PRO
        .=$$$
                .ENDC


        $$$=.
        T.ACN:  .BLKW   1       ;POINTER TO ACCOUNTING BLOCK

                .IF NDF A$$CNT
        .=$$$
                .ENDC


        $$$=.
        T.ISIZ: .BLKW   1       ;SIZE OF ROOT I SPACE

                .IF NDF U$$DAS
        .=$$$
                .ENDC


        T.LGTH=.                ;LENGTH OF TASK CONTROL BLOCK
        T.EXT=0                 ;LENGTH OF TCB EXTENSION

                .IFF

        ;
        ; TASK STATUS DEFINITIONS
        ;
        ; FIRST STATUS WORD (BLOCKING BITS)
        ;
        TS.EXE=100000           ;TASK NOT IN EXECUTION (1=YES)
        TS.RDN=40000            ;I/O RUN DOWN IN PROGRESS (1=YES)
        TS.MSG=20000            ;ABORT MESSAGE BEING OUTPUT (1=YES)
        TS.CIP=10000            ;TASK BLOCKED FOR CHECKPOINT IN PROGRESS
                                ;(1=YES)
        TS.RUN=4000             ;TASK IS RUNNING ON ANOTHER PROCESSOR(1=YES)
        TS.STP=1000             ;TASK BLOCKED BY CLI COMMAND
        TS.CKR=100              ;TASK HAS CKP REQUEST (MP SYSTEM ONLY)
                                ;(1=YES)
        TS.BLC=37               ;INCREMENT BLOCKING COUNT MASK


        ;
        ; TASK BLOCKING STATUS MASK
        ;
        TS.BLK=177777
```

TCBDF$ (Cont.)

```
;
; SECOND STATUS WORD (STATE BITS)
;
T2.AST=100000           ;AST IN PROGRESS (1=YES)
T2.DST=40000            ;AST RECOGNITION DISABLED (1=YES)
T2.CHK=20000            ;TASK NOT CHECKPOINTABLE (1=YES)
T2.REX=10000            ;REQUESTED EXIT AST SPECIFIED
T2.SEF=4000             ;TASK STOPPED FOR EVENT FLAG(S) (1=YES)
T2.SIO=1000             ;TASK STOPPED FOR BUFFERED I/O
T2.AFF=400              ;TASK IS INSTALLED WITH AFFINITY
T2.HLT=200              ;TASK IS BEING HALTED (1=YES)
T2.ABO=100              ;TASK MARKED FOR ABORT (1=YES)
T2.STP=40               ;SAVED T2.SPN ON AST IN PROGRESS
T2.STP=20               ;TASK STOPPED (1=YES)
T2.SPN=10               ;SAVED T2.SPN ON AST IN PROGRESS
T2.SPN=4                ;TASK SUSPENDED (1=YES)
T2.WFR=2                ;SAVED T2.WFR ON AST IN PROGRESS
T2.WFR=1                ;TASK IN WAITFOR STATE (1=YES)


;
; THIRD STATUS WORD (ATTRIBUTE BITS)
;
T3.ACP=100000           ;ANCILLARY CONTROL PROCESSOR (1=YES)
T3.PMD=40000            ;DUMP TASK ON SYNCHRONOUS ABORT (0=YES)
T3.REM=20000            ;REMOVE TASK ON EXIT (1=YES)
T3.PRV=10000            ;TASK IS PRIVILEGED (1=YES)
T3.MCR=4000             ;TASK REQUESTED AS EXTERNAL MCR FUNCT(1=YES)
T3.SLV=2000             ;TASK IS A SLAVE TASK (1=YES)
T3.CLI=1000             ;TASK IS A COMMAND LINE INTERPRETER (1=YES)
T3.RST=400              ;TASK IS RESTRICTED (1=YES)
T3.NSD=200              ;TASK DOES NOT ALLOW SEND DATA
T3.CAL=100              ;TASK HAS CHECKPOINT SPACE IN TASK IMAGE
T3.ROV=40               ;TASK HAS RESIDENT OVERLAYS
T3.NET=20               ;NETWORK PROTOCOL LEVEL
T3.MPC=10               ;MAPPING CHANGE WITH OUTSTANDING I/O (1=YES)
T3.CMD=4                ;TASK IS EXECUTING A CLI COMMAND
T3.SWS=2                ;RESERVED FOR SOFTWARE SERVICES USE
T3.GFL=1                ;GROUP GLOBAL EVENT FLAG LOCK


;
; STATUS BIT DEFINITIONS FOR FOURTH STATUS WORD (T.ST4)
;
T4.MUT=40               ;TASK IS A MULTI-USER TASK
T4.LDD=20               ;TASK'S LOAD DEVICE HAS BEEN DISMOUNTED
T4.PRO=10               ;TCB IS (OR SHOULD BE) A PROTOTYPE
T4.PRV=4                ;TASK WAS PRIV, BUT HAS CLEARED T3.PRV
                        ;WITH GIN (MAY RESET WITH GIN IF T4.PRV SET)
T4.DSP=2                ;TASK WAS BUILT FOR USER I/D SPACE
T4.SNC=1                ;TASK USES COMMONS FOR SYNCHRONIZATION
```

TCBDF$ (Cont.)

```
;
; REQUIRED RUN MASK
;
TR.UBT=100000           ;UNIBUS RUN T
TR.UBS=40000            ;UNIBUS RUN S
TR.UBR=20000            ;UNIBUS RUN R
TR.UBP=10000            ;UNIBUS RUN P
TR.UBN=4000             ;UNIBUS RUN N
TR.UBM=2000             ;UNIBUS RUN M
TR.UBL=1000             ;UNIBUS RUN L
TR.UBK=400              ;UNIBUS RUN K
TR.UBJ=200              ;UNIBUS RUN J
TR.UBH=100              ;UNIBUS RUN H
TR.UBF=40               ;UNIBUS RUN F
TR.UBE=20               ;UNIBUS RUN E
TR.CPD=10               ;PROCESSOR D
TR.CPC=4                ;PROCESSOR C
TR.CPB=2                ;PROCESSOR B
TR.CPA=1                ;PROCESSOR A

        .ENDC

        .PSECT
```

UCBDF$

```
        UCBDF$  ,,TTDEF,SYSDEF

;
; UNIT CONTROL BLOCK
;
; THE UNIT CONTROL BLOCK (UCB) DEFINES THE STATUS OF AN INDIVIDUAL
; DEVICE UNIT AND IS THE CONTROL BLOCK THAT IS POINTED TO BY THE
; FIRST WORD OF AN ASSIGNED LUN.  THERE IS ONE UCB FOR EACH DEVICE
; UNIT OF EACH DCB.  THE UCB'S ASSOCIATED WITH A PARTICULAR DCB ARE
; CONTIGUOUS IN MEMORY AND ARE POINTED TO BY THE DCB.  UCB'S ARE
; VARIABLE LENGTH BETWEEN DCB'S BUT ARE OF THE SAME LENGTH FOR A
; SPECIFIC DCB.  TO FINISH THE TELETYPE EXAMPLE ABOVE, EACH UNIT ON
; BOTH INTERFACES WOULD HAVE A UCB.
;
        .ASECT
.=177772

        .IF NB  SYSDEF

        .IF DF  A$$CNT

.=177770
U.UAB:  .BLKW   1       ;POINTER TO USER ACCOUNT BLOCK

        .IFF

U.UAB:
        .ENDC

        .ENDC

177772  U.MUP:  .BLKW   1       ;MULTI-USER PROTECTION WORD
177774  U.LUIC: .BLKW   1       ;LOGIN UIC - MULTI USER SYSTEMS ONLY
177776  U.OWN:  .BLKW   1       ;OWNING TERMINAL - MULTI USER SYSTEMS ONLY
000000  U.DCB:  .BLKW   1       ;BACK POINTER TO DCB
000002  U.RED:  .BLKW   1       ;POINTER TO REDIRECT UNIT UCB
000004  U.CTL:  .BLKB   1       ;CONTROL PROCESSING FLAGS
000005  U.STS:  .BLKB   1       ;UNIT STATUS
000006  U.UNIT: .BLKB   1       ;PHYSICAL UNIT NUMBER
000007  U.ST2:  .BLKB   1       ;UNIT STATUS EXTENSION
000010  U.CW1:  .BLKW   1       ;FIRST DEVICE CHARACTERISTICS WORD
000012  U.CW2:  .BLKW   1       ;SECOND DEVICE CHARACTERISTICS WORD
000014  U.CW3:  .BLKW   1       ;THIRD DEVICE CHARACTERISTICS WORD
000016  U.CW4:  .BLKW   1       ;FOURTH DEVICE CHARACTERISTICS WORD
000020  U.SCB:  .BLKW   1       ;POINTER TO SCB
000022  U.ATT:  .BLKW   1       ;TCB ADDRESS OF ATTACHED TASK
000024  U.BUF:  .BLKW   1       ;RELOCATION BIAS OF CURRENT I/O REQUEST
000026          .BLKW   1       ;BUFFER ADDRESS OF CURRENT I/O REQUEST
000030  U.CNT:  .BLKW   1       ;BYTE COUNT OF CURRENT I/O REQUEST

000032  U.UCBX=U.CNT+2          ;POINTER TO UCB EXTENSION IN SECONDARY POOL
000034  U.ACP=U.CNT+4           ;ADDRESS OF TCB OF MOUNTED ACP
000036  U.VCB=U.CNT+6           ;ADDRESS OF VOLUME CONTROL BLOCK
000034  U.CBF=U.CNT+4           ;CONTROL BUFFER RELOCATION AND ADDRESS
000040  U.UMB=U.CNT+10          ;ADDRESS OF UMB FOR SHADOW RECORDING
000042  U.PRM=U.CNT+12          ;DISK SIZE PARAMETER WORDS
000046  U.UTMO=U.CNT+16         ;UNIT COMMAND TIME OUT
000050  U.LHD=U.CNT+20          ;UNIT OUTSTANDING I/O PACKET LISTHEAD
```

UCBDF$ (Cont.)

```
000054  U.BPKT=U.CNT+24          ;UNIT BAD BLOCK PACKET WAITING LIST
000060  U.UC2X=U.CNT+30          ;POINTER TO 2ND EXTENSION IN SECONDARY POOL
000062  U.OTRF=U.CNT+32          ;OUTSTANDING COMMAND STATUS REQUEST REGISTER
000064  U.CMST=U.CNT+34          ;COMMAND STATUS PROGRESS REGISTER


        ;
        ; MAGTAPE DEVICE DEPENDANT UCB OFFSETS
        ;
000040  U.SNUM=U.CNT+10          ;SLAVE UNIT NUMBER
000042  U.FCDE=U.CNT+12          ;FUNCTION CODE
000044  U.KRB1=U.CNT+14          ;SUBCONTROLLER KRB1 POINTER


        ;
        ; DEFINE SECONDARY POOL UCB EXTENSION OFFSETS
        ; (ERROR LOGGING DEVICES ONLY)
        ;
        .=0
000000          .BLKW   9.      ;FIXED ACCOUNTING TRANSACTION HEADER
000022  X.NAME: .BLKW   2       ;DRIVE NAME IN RAD50
000026  X.IOC:  .BLKW   2       ;I/O COUNT
000032  X.ERHL: .BLKB   1       ;HARD ERROR LIMIT
000033  X.ERSL: .BLKB   1       ;SOFT ERROR LIMIT
000034  X.ERSC: .BLKB   1       ;SOFT ERROR COUNT
000035  X.ERHC: .BLKB   1       ;HARD ERROR COUNT
000036  X.WCNT: .BLKW   2       ;WORDS TRANSFERED COUNT


        ;
        ; DEFINE OFFSETS FOR SEEK OPTIMIZATION DEVICES
        ;
000042  X.CYLC: .BLKW   2       ;CYLINDERS CROSSED COUNT
000046  X.CCYL: .BLKW   1       ;CURRENT CYLINDER
000050  X.FCUR: .BLKB   1       ;CURRENT FAIRNESS COUNT
000051  X.FLIM:                 ;FAIRNESS COUNT LIMIT
000051  X.DSKD: .BLKB   1       ;DISK DIRECTION (HIGH BIT 1=OUT)
000052  X.DNAM: .BLKW   1       ;DEVICE NAME FOR ACCOUNTING
000054  X.UNIT: .BLKB   1       ;UNIT NUMBER FOR ACCOUNTING
000055          .BLKB   1       ;UNUSED FOR NOW

000056  X.LGTH=.                ;LENGTH OF THE UCB EXTENSION

        X.DFFL=10.              ;DEFAULT FAIRNESS COUNT LIMIT
        X.DFSL=8.               ;DEFAULT SOFT ERROR LIMIT
        X.DFHL=5.               ;DEFAULT HARD ERROR LIMIT


        ;
        ; DEFINE OFFSETS FOR DISK MSCP CONTROLLERS (SECOND UCB EXTENSION)
        ;

        ;
        ; CHARACTERISTICS OBTAINED FROM "GET UNIT STATUS" END PACKETS
        ;
        .=0
```

UCBDF$ (Cont.)

```
000000  X.MLUN: .BLKW   1       ;MULTI-UNIT CODE
000002  X.UNFL: .BLKW   1       ;UNIT FLAGS
000004  X.HSTI: .BLKW   2       ;HOST IDENTIFIER
000010  X.UNTI: .BLKW   4       ;UNIT IDENTIFIER
000020  X.MEDI: .BLKW   2       ;MEDIA IDENTIFIER
000024  X.SHUN: .BLKW   1       ;SHADOW UNIT
000026  X.SHST: .BLKW   1       ;SHADOW UNIT STATUS
000030  X.TRCK: .BLKW   1       ;UNIT TRACK SIZE
000032  X.GRP:  .BLKW   1       ;UNIT GROUP SIZE
000034  X.CYL:  .BLKW   2       ;UNIT CYLINDER SIZE
000040  X.RCTS: .BLKW   1       ;UNIT RCT TABLE SIZE
000042  X.RBNS: .BLKB   1       ;UNIT RBN 'S / TRACK
000043  X.RCTC: .BLKB   1       ;UNIT RCT COPIES


        ;
        ; CHARACTERISTICS OBTAINED FROM "ONLINE" OR "SET UNIT
        ; CHARACTERISTICS" END PACKETS
        ;
000044  X.UNSZ: .BLKW   2       ;UNIT SIZE
000050  X.VSER: .BLKW   2       ;VOLUME SERIAL NUMBER

000054  X.DUSZ=.                ;SIZE OF DISK MSCP CONTROLLER UCB EXTENTION


                .IF NB  TTDEF

        ;
        ; TERMINAL DRIVER DEFINITIONS
        ;
        .=U.BUF
000024  U.TUX:  .BLKW   1       ;POINTER TO UCB EXTENSION (UCBX)
000026  U.TSTA: .BLKW   3       ;STATUS TRIPLE-WORD
000034  U.TTAB: .BLKW   1       ;IF 0: U.TTAB+1 IS SINGLE-CHARACTER TYPE-
                                ;       AHEAD BUFFER, CURRENTLY EMPTY
                                ;IF ODD: U.TTAB+1 IS SINGLE-CHARACTER TYPE-
                                ;       AHEAD BUFFER AND HOLDS A CHARACTER
                                ;IF NON-0 AND EVEN: POINTER TO MULTI-
                                ;       CHARACTER TYPE-AHEAD BUFFER
        .=.-2                   ;THE NEXT TWO OFFSETS OVERLAP U.TTAB WHEN
                                ;THE TYPEAHEAD BUFFER IS IN SECONDARY POOL
000034  U.TECO: .BLKB   1       ;ECHO BUFFER FOR DMA OPERATIONS WHEN UCBX IS
                                ;IN SECONDARY POOL AND THUS NOT MAPPED BY A
                                ;UMR
000035  U.TBSZ: .BLKB   1       ;TYPEAHEAD BUFFER SIZE
000036  U.UIC:  .BLKW   1       ;DEFAULT UIC
000040  U.TLPP: .BLKB   1       ;LINES PER PAGE
000041  U.TFRQ: .BLKB   1       ;FORK REQUEST BYTE
000042  U.TFLK: .BLKW   1       ;FORK LIST LINK WORD
000044  U.TCHP: .BLKB   1       ;CURRENT HORIZONTAL POSITION
000045  U.TCVP: .BLKB   1       ;CURRENT VERTICAL POSITION
000046  U.TTYP: .BLKB   1       ;TERMINAL TYPE
000047  U.TMTI: .BLKB   1       ;MODEM TIMER
000050  U.ACB:  .BLKW   1       ;ANCILLARY CONTROL DRIVER BLOCK ADDR
000052  U.AFLG: .BLKW   1       ;ANCILLARY CONTROL DRIVER FLAGS WORD
000054  U.ADMA: .BLKW   1       ;ANCILLARY CONTROL DRIVER DMA BUFFER
```

UCBDF$ (Cont.)

```
;
; DEFINE BITS IN STATUS WORD 1 (U.TSTA)
;
S1.RST=1                ;READ WITH SPECIAL TERMINATORS IN PROGRESS
S1.RUB=2                ;RUBOUT SEQUENCE IN PROGRESS (NON-SCOPE)
S1.ESC=4                ;ESCAPE SEQUENCE IN PROGRESS
S1.RAL=10               ;READ ALL IN PROGRESS
S1.RNE=20               ;ECHO SUPPRESSED
S1.CTO=40               ;OUTPUT STOPPED BY CTRL-O
S1.OBY=100              ;OUTPUT BUSY
S1.IBY=200              ;INPUT BUSY
S1.BEL=400              ;BELL PENDING
S1.DPR=1000             ;DEFER PROCESSING OF CHAR. IN U.TECB
S1.DEC=2000             ;DEFER ECHO OF CHAR. IN U.TECB
S1.DSI=4000             ;INPUT PROCESSING DISABLED
S1.CTS=10000            ;OUTPUT STOPPED BY CTRL-S
S1.USI=20000            ;UNSOLICITED INPUT IN PROGRESS
S1.OBF=40000            ;BUFFERED OUTPUT IN PROGRESS
S1.IBF=100000           ;BUFFERED INPUT IN PROGRESS


;
; DEFINE BITS IN STATUS WORD 2 (U.TSTA+2)
;
S2.ACR=1                ;WRAP-AROUND (AUTOMATIC CR-LF) REQUIRED
S2.WRA=6                ;CONTEXT FOR WRAP-AROUND
S2.WRB=2                ;LOW BIT IN S2.WRA BIT PATTERN
S2.CR=10                ;TRAILING CR REQUIRED ON OUTPUT
S2.BRQ=20               ;BREAK-THROUGH-WRITE REQUEST IN QUEUE
S2.SRQ=40               ;SPECIAL REQUEST IN QUEUE
                        ;(IO.ATT, IO.DET, SF.SMC)
S2.ORQ=100              ;OUTPUT REQUEST IN QUEUE (MUST = S1.OBY)
S2.IRQ=200              ;INPUT REQUEST IN QUEUE (MUST = S1.IBY)
S2.HFL=3400             ;HORIZONTAL FILL REQUIREMENT
S2.VFL=4000             ;VERTICAL FILL REQUIREMENT
S2.HHT=10000            ;HARDWARE HORIZONTAL TAB PRESENT
S2.HFF=20000            ;HARDWARE FORM-FEED PRESENT
S2.FLF=40000            ;FORCE LINE FEED BEFORE NEXT ECHO
S2.FDX=100000           ;LINE IS IN FULL DUPLEX MODE


;
; DEFINE BITS IN STATUS WORD 3 (U.TSTA+4)
;
S3.RAL=10               ;TERMINAL IS IN READ-PASS-ALL MODE
                        ;(S3.RAL MUST = S1.RAL)
S3.RPO=20               ;READ W/PROMPT OUTPUT IN PROGRESS
S3.WES=40               ;TASK WANTS ESCAPE SEQUENCES
S3.TAB=100              ;TYPE-AHEAD BUFFER ALLOCATION REQUESTED
S3.8BC=200              ;PASS 8 BITS ON INPUT
S3.RCU=400              ;RESTORE CURSOR (MUST = TF.RCU*400)
S3.ABD=1000             ;AUTO-BAUD SPEED DETECTION ENABLED
S3.ABP=2000             ;AUTO-BAUD SPEED DETECTION IN PROGRESS
S3.WAL=4000             ;WRITE-PASS-ALL (MUST = TF.WAL*400)
S3.VER=10000            ;LAST CHAR. IN TYPE-AHEAD BUFFER
                        ;HAS PARITY ERROR
S3.BCC=20000            ;LAST CHAR. IN TYPE-AHEAD BUFFER
                        ;HAS FRAMING ERROR
```

UCBDF$ (Cont.)

```
        S3.DAO=40000            ;LAST CHAR. IN TYPE-AHEAD BUFFER
                                ;HAS DATA OVERRUN ERROR
                                ;NOTE - THE 3 BITS ABOVE MUST CORRESPOND
                                ;TO THE RESPECTIVE ERROR FLAGS IN THE
                                ;HARDWARE RECEIVE BUFFER
        S3.PCU=100000           ;POSITION CURSOR BEFORE WRITE

                .ENDC


        ;
        ; VIRTUAL TERMINAL UCB DEFINITIONS
        ;
        .=U.UNIT
000006  U.OCNT: .BLKB   1       ;OFFSPRING WITH THIS AS TI:

        .=U.BUF
000024  U.RPKT: .BLKW   1       ;CURRENT OFFSPRING READ I/O PACKET
000026  U.WPKT: .BLKW   1       ;CURRENT OFFSPRING WRITE I/O PACKET
000030  U.IAST: .BLKW   1       ;INPUT AST ROUTINE ADDRESS
000032  U.OAST: .BLKW   1       ;OUTPUT AST ROUTINE ADDRESS
000034  U.AAST: .BLKW   1       ;ATTACH AST ROUTINE ADDRESS

                .IF NB  TTDEF

        .IIF NE U.AAST+2-U.UIC  .ERROR  ;ADJACENCY ASSUMED

                .ENDC

        .=U.AAST+4
000040  U.PTCB: .BLKW   1       ;PARENT TCB ADDRESS


        ;
        ; CONSOLE DRIVER DEFINITIONS
        ;
        .=U.BUF+2
000026  U.CTCB: .BLKW   1       ;ADDRESS OF CONSOLE LOGGER TCB
000030  U.COTQ: .BLKW   2       ;I/O PACKET LIST QUEUE
000034  U.RED2: .BLKW   1       ;REDIRECT UCB ADDRESS

                .PSECT


        ;
        ; DEVICE TABLE STATUS DEFINITIONS
        ;
        ; DEVICE CHARACTERISTICS WORD 1 (U.CW1) DEVICE TYPE DEFINITION BITS.
        ;
        DV.REC=1                ;RECORD ORIENTED DEVICE (1=YES)
        DV.CCL=2                ;CARRIAGE CONTROL DEVICE (1=YES)
        DV.TTY=4                ;TERMINAL DEVICE (1=YES)
        DV.DIR=10               ;FILE STRUCTURED DEVICE (1=YES)
        DV.SDI=20               ;SINGLE DIRECTORY DEVICE (1=YES)
        DV.SQD=40               ;SEQUENTIAL DEVICE (1=YES)
        DV.MSD=100              ;MASS STORAGE DEVICE (1=YES)
        DV.UMD=200              ;USER MODE DIAGNOSTICS SUPPORTED (1=YES)
```

UCBDF$ (Cont.)

```
DV.MBC=400              ;MASSBUS CONTROLLER (11M COMPATIBILITY ONLY)
DV.EXT=400              ;UNIT ON EXTENDED 22-BIT UNIBUS CNTROLER
                        ;(1=YES)
DV.SWL=1000             ;UNIT SOFTWARE WRITE LOCKED (1=YES)
DV.ISP=2000             ;INPUT SPOOLED DEVICE (1=YES)
DV.OSP=4000             ;OUTPUT SPOOLED DEVICE (1=YES)
DV.PSE=10000            ;PSEUDO DEVICE (1=YES)
DV.COM=20000            ;DEVICE IS MOUNTABLE AS COM CHANNEL (1=YES)
DV.F11=40000            ;DEVICE IS MOUNTABLE AS F11 DEVICE (1=YES)
DV.MNT=100000           ;DEVICE IS MOUNTABLE (1=YES)


;
; TERMINAL DEPENDENT CHARACTERISTICS WORD 2 (U.CW2) BIT DEFINITIONS
;
U2.DH1=100000           ;UNIT IS A MULTIPLEXER (1=YES)
U2.DJ1=40000            ;UNIT IS A DJ11 (1=YES)
U2.RMT=20000            ;UNIT IS REMOTE (1=YES)
U2.HFF=10000            ;UNIT HANDLES HARDWARE FORM FEEDS (1=YES)
U2.L8S=10000            ;OLD NAME FOR U2.HFF
U2.NEC=4000             ;DON'T ECHO SOLICITED INPUT (1=YES)
U2.CRT=2000             ;UNIT IS A CRT (1=YES)
U2.ESC=1000             ;UNIT GENERATES ESCAPE SEQUENCES (1=YES)
U2.LOG=400              ;USER LOGGED ON TERMINAL (0=YES)
U2.SLV=200              ;UNIT IS A SLAVE TERMINAL (1=YES)
U2.DZ1=100              ;UNIT IS A DZ11 (1=YES)
U2.HLD=40               ;TERMINAL IS IN HOLD SCREEN MODE (1=YES)
U2.AT.=20               ;MCR COMMAND AT. BEING PROCESSED (1=YES)
U2.PRV=10               ;UNIT IS A PRIVILEGED TERMINAL (1=YES)
U2.L3S=4                ;UNIT IS A LA30S TERMINAL (1=YES)
U2.VT5=2                ;UNIT IS A VT05B TERMINAL (1=YES)
U2.LWC=1                ;LOWER CASE TO UPPER CASE CONVERSION (0=YES)


;
; BIT DEFINITIONS FOR U.MUP
;
UM.OVR=1                ;OVERRIDE CLI INDICATOR
UM.CLI=36               ;CLI INDICATOR BITS
UM.DSB=200              ;TERMINAL DISABLED SINCE CLI ELIMINATED
UM.NBR=400              ;NO BROADCAST
UM.CNT=1000             ;CONTINUATION LINE IN PROGRESS
UM.CMD=2000             ;COMMAND IN PROGRESS
UM.SER=4000             ;SERIAL COMMAND RECOGNITION ENABLED
UM.KIL=10000            ;TTDRV SHOULD SEND KILL PKT ON CNTRL/C


;
; TERMINAL SECONDARY POOL OFFSETS FOR THE UCB EXTENSION AND TYPE-
; AHEAD BUFFER
;
U.TAPR=24               ;OFFSET WITHIN UCB WHICH POINTS TO UCB EXT
U.TTBF=46               ;OFFSET WITHIN UCB EXTENSION WHICH POINTS TO
                        ;TYPEAHEAD BUFFER
```

UCBDF$ (Cont.)

```
;
; RH11-RS03/RS04 CHARACTERISTICS WORD 2 (U.CW2) BIT DEFINITIONS
;
U2.R04=100000           ;UNIT IS A RS04 (1=YES)


;
; RH11-TU16 CHARACTERISTICS WORD 2 (U.CW2) BIT DEFINITIONS
;
U2.7CH=10000            ;UNIT IS A 7 CHANNEL DRIVE (1=YES)


;
; TERMINAL DEPENDENT CHARACTERISTICS WORD 3 (U.CW3) BIT DEFINITIONS
;
U3.UPC=20000            ;UPCASE OUTPUT FLAG


;
; VIRTUAL TERMINAL 3RD CHARACTERISTICS WORD DEFINITIONS
;
U3.FDX=1                ;FULL DUPLEX MODE (1=YES)
U3.DBF=2                ;INTERMEDIATE BUFFERING DISABLED (1=YES)
U3.RPR=4                ;READ W/PROMPT IN PROGRESS (1=YES)


;
; TERMINAL DEPENDENT CHARACTERISTICS WORD 4 (U.CW4) BIT DEFINITIONS
;
U4.CR=100               ;LOOK FOR CARRIAGE RETURN


;
; UNIT CONTROL PROCESSING FLAG DEFINITIONS
;
UC.ALG=200              ;BYTE ALIGNMENT ALLOWED (1=NO)
UC.NPR=100              ;DEVICE IS AN NPR DEVICE (1=YES)
UC.QUE=40               ;CALL DRIVER BEFORE QUEUING (1=YES)
UC.PWF=20               ;CALL DRIVER AT POWERFAIL ALWAYS (1=YES)
UC.ATT=10               ;CALL DRIVER ON ATTACH/DETACH (1=YES)
UC.KIL=4                ;CALL DRIVER AT I/O KILL ALWAYS (1=YES)
UC.LGH=3                ;TRANSFER LENGTH MASK BITS


;
; UNIT STATUS BIT DEFINTIONS
;
US.BSY=200              ;UNIT IS BUSY (1=YES)
US.MNT=100              ;UNIT IS MOUNTED (0=YES)
US.FOR=40               ;UNIT IS MOUNTED AS FOREIGN VOLUME (1=YES)
US.MDM=20               ;UNIT IS MARKED FOR DISMOUNT (1=YES)


;
; CARD READER DEPENDENT UNIT STATUS BIT DEFINITIONS
;
US.ABO=1                ;UNIT IS MARKED FOR ABORT IF NOT READY
                        ;(1=YES)
US.MDE=2                ;UNIT IS IN 029 TRANSLATION NODE (1=YES)
```

UCBDF$ (Cont.)

```
;
; FILES-11 DEPENDENT UNIT STATUS BITS
;
US.WCK=10               ;WRITE CHECK ENABLED (1=YES)
US.SPU=2                ;UNIT IS SPINNING UP (1=YES)
US.VV=1                 ;VOLUME VALID IS SET (1=YES)


;
; TERMINAL DEPENDENT UNIT STATUS BIT DEFINITIONS
;
US.CRW=4                ;UNIT IS WAITING FOR CARRIER (1=YES)
US.DSB=2                ;UNIT IS DISABLED (1=YES)
US.OIU=1                ;OUTPUT INTERRUPT IS UNEXPECTED ON UNIT
                        ;(1=YES)


;
; LPS11 DEPENDENT UNIT STATUS BIT DEFINITIONS
;
US.FRK=2                ;FORK IN PROGRESS (1=YES)
US.SHR=1                ;SHAREABLE FUNCTION IN PROGRESS (0=YES)


;
; ANSI MAGTAPE DEPENDANT UNIT STATUS BITS
;
US.LAB=4                ;UNIT HAS LABELED TAPE ON IT (1=YES)


;
; UNIT STATUS EXTENSION (U.ST2) BIT DEFINITIONS
;
US.OFL=1                ;UNIT OFFLINE (1=YES)
US.RED=2                ;UNIT REDIRECTABLE (0=YES)
US.PUB=4                ;UNIT IS PUBLIC DEVICE (1=YES)
US.UMD=10               ;UNIT ATTACHED FOR DIAGNOSTICS (1=YES)
US.PDF=20               ;PRIVILEGED DIAGNOSTIC FUNCTIONS ONLY(1=YES)


;
; MAGTAPE DENSITY SUPPORT DEFINITION IN U.CW3
;
UD.UNS=0                ;UNSUPPORTED
UD.200=1                ; 200BPI, 7 TRACK
UD.556=2                ; 556BPI, 7 TRACK
UD.800=3                ; 800BPI, 7 OR 9 TRACK
UD.160=4                ;1600BPI, 9 TRACK
UD.625=5                ;6250BPI, 9 TRACK
```

INDEX

ABODF$, B-3, C-3
ACNDF$, C-4
/ACT, 2-1
Active task
  AST queue, 3-23
  attribute bits, 3-22
  blocking bits, 3-21
  MCR, 3-26
  offspring control block, 3-24
  receive by reference queue, 3-24
  receive queue, 3-23
  state bits, 3-22
Active task dump, 3-21
  AST queue, 3-21
  offspring control block, 3-21
  receive by reference queue, 3-21
  receive queue, 3-21
/ADV, 2-1
/ALL, 2-1
Analysis routines switch, 2-3
Assign table dump, 3-1, 3-17
/ATL, 2-1

Binary output file size switch, 2-8
/BL, 2-6
Block number switch, 2-7

CDA
  installed, 1-3
  invoking from indirect command file, 1-5
  running, 1-3
  uninstalled, 1-3
CDA command line, 1-3
  binary file, 1-3
  crash input file, 1-4
  default, 1-4
  list file, 1-3
  symbol file, 1-4
CDA Message
  analysis
    example of, A-1
  fatal
    example of, A-1
/CLI, 2-1
CLI parser block dump, 3-2, 3-31
CLKDF$, B-4, C-10
Clock queue dump, 3-50
Clock queue switch, 2-3
/CLQ, 2-1
Command line interpreter switch, 2-3
Common block directory dump, 3-36
/CPB, 2-1
Crash causes
  halt instruction, 1-2
  infinite loop, 1-2
  processor trap, 1-2
  restart procedure, 1-2
Crash dump device, 1-1
Crash Dump Routine, 1-1
Crash notification device, 1-1
$CRAVL, 3-15
CTBDF$, C-12
/CTL, 2-2
Current task
  priority, 3-20

/DCB, 2-2
DCBDF$, B-6, C-13
/DENS, 2-6
Density switch, 2-7
/DEV, 2-2
Device controller dump, 3-52
  common interrupt address, 3-52
  controller request block, 3-52
  controller status words, 3-52
  controller table, 3-52
Device controller switch, 2-4
Device information dump
  control processing flags, 3-39
  device characteristics word, 3-39
  I/O request packet, 3-38, 3-42
  terminal status word, 3-38
  UCB extension, 3-38
/DMP, 2-2
/DUMP, 2-2

EPKDF$, B-7, C-14
Error log packet dump, 1-6, 3-2, 3-19
Executive Crash Dump Routine, 1-1
Executive Debugging Tool
  See XDT
Executive Symbol Table, 1-1
EXEMC.MLB, B-1
/EXIT, 2-6
Exit switch, 2-7

F11DF$, B-15, C-21
FORK, 4-2

Group global event flag dump, 1-6, 3-2, 3-18

Hardware feature mask definitions, C-27
/HDR, 2-2
HDRDF$, B-20, C-25
HWDDF$, B-22, C-27

Interpreting crash dumps
  interrupt save, 4-2
  mapping information, 4-1
  stack depth, 4-1
    Kernel stack, 4-2
    SST, 4-2
    $STKDP, 4-2
INTSV, 4-2
ITBDF$, B-25, C-31

/KDS, 2-2
Kernel data space dump, 3-54
Kernel data space switch, 2-4
Kernel instruction space dump, 3-54
Kernel instruction space switch, 2-4
Kernel Mapping Register switch, 2-8
Kernel stack dump, 3-1, 3-5
/KIS, 2-2
/KMR, 2-6
KRBDF$, C-32

LCBDF$, B-26, C-34
/LIMIT, 2-6
/LINES, 2-6
Lines switch, 2-7
Logical device name, 3-17
Low core memory dump, 1-6, 3-2, 3-20

Mark time request, 3-50
MCR unit control block, 3-26
/MEMSIZ, 2-6
MTADF$, B-27, C-35

No spool switch, 2-8

Offset mode, 3-1
OLRDF$, C-39
Output listing limit switch, 2-7

/PAR, 2-2
Partition
  base address, 3-21
  name, 3-21
  PCB address, 3-21
Partition control block switch, 2-5
Partition information
  attachment descriptor, 3-34
  wait queue, 3-34
Partition information dump
  attachment descriptor, 3-31
  individual, 3-33
  system, 3-31
  wait queue, 3-31
Partition status flags, 3-33
/PCB, 2-2
PCBDF$, B-31, C-47
Physical device name, 3-17
Physical memory dump switch, 2-4
PKTDF$, B-33, C-51
/POOL, 2-2
Pool
  free, 3-15
  largest fragment, 3-15
  smallest possible block, 3-15
  total free bytes, 3-15
Pool dump, 3-45
Pool statistics dump, 3-1, 3-15
Processor Status Word, 3-2

Register
  cache control, 3-2
  CPU error, 3-2
  memory management, 3-2
  memory system error, 3-2
  page address, 3-2
  page descriptor, 3-2
  Unibus mapping, 3-2
RSX11M.STB, 1-1, 2-9

Saved stack pointer, 3-20
/SCB, 2-2
SCBDF$, B-38, C-57
Secondary pool dump, 3-45
Secondary pool switch, 2-5
SHDDF$, C-59
Show devices switch, 2-3
/-SP, 2-6
SST, 4-2
Stack pointer
  kernel, 3-2
  user, 3-2
/STB, 2-6
/STD, 2-2
$STKDP, 4-2
Switches
  analysis, 2-1
  function, 2-1
Symbol table switch, 2-8
Symbolic offset, B-1
/-SYS, 2-2
System common, 3-6
  active task, 3-6
  alphabetized, 3-9
  boot device, 3-6
  labels, 3-9
  network UIC, 3-6
  partition address, 3-6

System common (Cont.)
  stack depth, 3-6
  system size, 3-6
  TCB address, 3-6
  UIC, 3-6
System common dump, 3-1
  alphabetized, 3-1
System data structure macro
  accounting block offset, C-4
  AST control block, B-33, C-51
  clock queue control block, B-4, C-10
  controller request block, C-32
  controller table, C-12
  device control block, B-6, C-13
  driver dispatch table, B-6
  error message block, B-7, C-14
  EXELIB.OLB, C-1
  EXEMC.MLB, C-1
  hardware register addresses, B-22, C-27
  interrupt transfer block, B-25, C-31
  logical assignment control block, B-26, C-34
  magtape volume set control block, B-27, C-35
  online reconfiguration interface, C-39
  partition control block, B-31, C-47
  shadow recording linkage block, C-59
  status control block, B-38, C-57
  summary of, C-2
  symbolic offsets in, C-1
  task abort codes, B-3, C-3
  task control block, B-40, C-61
  task header, B-20, C-25
  TKTN message codes, B-3, C-3
  unit control block, B-43, C-65
  volume control block, B-15, C-21
System device switch, 2-4
System Generation
  CDA and, 1-1
System information dump, 1-5
System information switch, 2-5
System pool switch, 2-5
System task directory dump, 3-44
System task directory switch, 2-5

/TAL, 2-2
/TAS, 2-2
/TASK, 2-2
Task Control Block switch, 2-3
Task data space dump, 3-54
Task data space switch, 2-5
Task dump, 3-48
  window blocks, 3-48
Task header dump, 3-28
  directive status word, 3-28
  file control block, 3-29
  logical unit table, 3-28
  page descriptor register, 3-29
  swapping priority, 3-28
  window blocks, 3-29
Task header switch, 2-4
Task instruction space dump, 3-54
Task instruction space switch, 2-6
Task virtual address space switch, 2-5
/TCB, 2-2
TCB
  pointer to, 3-20
TCBDF$, B-40, C-61
/TDS, 2-2
/TIS, 2-2
/TSK, 2-2

/UCB, 2-2
UCBDF$, B-43, C-65

Volatile register dump, 3-1 to 3-2
Volume set control block, C-35

XDT, 1-2

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