RSX-11M/M-PLUS
and Micro/RSX
Crash Dump Analyzer
Reference Manual
Order No. AA-FD11A-TC
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PREFACE

MANUAL OBJECTIVES

This manual describes the operation of the Crash Dump Analyzer (CDA). It does not attempt to describe the operation of the RSX-1IM-PLUS Executive or the significance of the individual data structures. The RSX-1IM/M-PLUS Executive Reference Manual and the RSX-1IM and RSX-1IM-PLUS Guide to Writing an I/O Driver describe these data structures.

INTENDED AUDIENCE

This manual is intended for system managers who are responsible for interpreting system failures and for 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 MANUAL

Chapter 1 explains the function of the Crash Dump Analyzer. It describes the system resources necessary and the procedure for obtaining a crash dump. The chapter continues with an overview of loadable crash dump drivers, and explains how to run CDA. The chapter also describes indirect command files as they pertain to CDA.

Chapter 2 describes the two ways that you can use CDA: by issuing the CDA command line or the DCL ANALYZE/CRASH_DUMP command. The chapter begins by describing the CDA command line format, including command line specifications and switches. Two summary tables provide quick reference on switch operation. Finally, the chapter concludes with a description of the DCL ANALYZE/CRASH_DUMP command.

Chapter 3 consists of examples and descriptions of CDA output listings.

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-1IM.

Appendix C lists system macros that supply symbolic offsets for system data structures for RSX-1IM-PLUS.

Appendix D lists error code definitions for Micro/RSX operating systems.
ASSOCIATED MANUALS

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 MANUAL

This symbol indicates that you press the RETURN key.

Square brackets show elements in a command line format that are optional. For example, [/switch] indicates that you can include a switch if you want to, but you do not have to.

Square brackets around a comma and an ellipsis mark indicate that you can use a series of optional elements separated by commas. For example, (argument[, ...]) means that you can specify a series of optional arguments by enclosing the arguments in parentheses and separating them with commas.

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

Pink shading in this manual indicates features that are specific to RSX-11M operating systems only.

Gray shading indicates features that are specific to RSX-11M-PLUS operating systems only.
SUMMARY OF TECHNICAL CHANGES

TECHNICAL CHANGES

• The system Assign Table, which is one of the report listings that CDA generates, has been changed. The table now lists logical assignments in two categories: system logical assignments, and user logical assignments. The entry in the table for each assignment includes its size in blocks, its type, and its status.

• Some of the system data structures that are shown in Appendix B and Appendix C have changed as a result of new system features such as support for logical names and networking. Refer to the specific data structures in Appendix B (RSX-llM) or Appendix C (RSX-llM-PLUS) to see the changes.

NEW DEVICE SUPPORT

You can specify any of the following new devices as the crash dump device for your system:

For RSX-llM/M-PLUS Systems

<table>
<thead>
<tr>
<th>Device Type</th>
<th>Mnemonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA60/RX50 disk packs</td>
<td>DU:</td>
</tr>
<tr>
<td>RC25 removable disk packs</td>
<td>DU:</td>
</tr>
<tr>
<td>TK25/TU80 magnetic tapes</td>
<td>MS:</td>
</tr>
<tr>
<td>TK50 magnetic tapes</td>
<td>MU:</td>
</tr>
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</table>

For Micro/RSX or Pregenerated RSX-llM-PLUS Systems

<table>
<thead>
<tr>
<th>Device Type</th>
<th>Mnemonic</th>
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<tbody>
<tr>
<td>RD52 disks</td>
<td>DU:</td>
</tr>
<tr>
<td>TK25 magnetic tapes</td>
<td>MS:</td>
</tr>
<tr>
<td>TK50 magnetic tapes</td>
<td>MU:</td>
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</table>

ADDITIONS TO THE CRASH DUMP ANALYZER REFERENCE MANUAL

The following documentation has been added to this manual:

• Chapter 1 now includes a description of loadable crash dump support for Micro/RSX and pregenerated RSX-llM-PLUS systems. You load a crash dump driver by specifying a crash dump device. If the system crashes when the driver is loaded, the driver dumps the contents of memory at the time of the crash.
SUMMARY OF TECHNICAL CHANGES

onto the specified crash dump device. When you do not want a crash driver resident in memory, you can unload it to the system disk. Thus, loadable crash drivers allow you to choose when you want crash dump support.

- Chapter 2 now includes a description of the DCL ANALYZE/CRASH_DUMP command. If your terminal supports the DIGITAL Command Language (DCL) command line interpreter, you can use the ANALYZE/CRASH_DUMP command to run CDA. Command qualifiers let you choose which report listings you want CDA to generate. You can also use qualifiers to specify the format of the CDA report listings.

- A new appendix, Appendix D, lists error code definitions for Micro/RSX operating systems, including facility-independent definitions and Bugcheck standard format definitions.
CHAPTER 1
INTRODUCTION

This chapter introduces the Crash Dump Analyzer (CDA). It describes the function of CDA, details the system features that CDA requires, and explains how to obtain a crash dump. The procedures for generating a crash dump vary from system to system. This chapter explains how to obtain a crash dump on different types of systems. Then this chapter describes how to run CDA, and how to use CDA with indirect command files. Finally, the last section of the chapter lists the six basic analysis listings that the Crash Dump Analyzer generates.

1.1 CRASH DUMP ANALYZER FUNCTION

CDA is a specialized utility that helps you establish the cause of system crashes. It is installed in a system as a nonprivileged task that any user can run. CDA reads the contents of a memory dump created by the crash dump routine of the Executive. CDA then uses the data in the Executive symbol table file (RSXIIM.STB) to format the binary input of the memory dump into readable analysis listings. Finally, CDA prints the analysis listings on a line printer. Examining the CDA listings can help you to determine the cause of a system crash.

CDA is a nonprivileged task that any user can run.

1.2 SYSTEM REQUIREMENTS

Micro/RSX operating systems with the Advanced Programmer's Kit and pregenerated RSX-11M-PLUS operating systems support loadable crash dump drivers. Refer to Section 1.4 for a description of loadable crash dump support.

On RSX-11M operating systems, and on non-pregenerated RSX-11M-PLUS operating systems, you can select support for crash dump analysis during system generation. Refer to the RSX-11M System Generation and Installation Guide or the RSX-11M-PLUS System Generation and Installation Guide for instructions on how to include CDA in your system. If you select support for crash dump analysis during system generation, you specify a crash notification device and a crash dump device. The system then builds a crash dump routine into the Executive. Thereafter, when the system crashes, the crash dump routine displays a message on the crash notification device and writes the contents of memory onto the specified crash dump device. The contents of memory are the input to CDA. If you decide to change the crash dump or crash notification devices, you must perform another system generation in order to specify the new devices.
INTRODUCTION

Since CDA overwrites the contents of the crash dump device, you should not specify the system device as the crash dump device. Also, the following fixed disks cannot serve as CDA crash dump devices:

RA80
RA81
RD51
RC25

However, you may use any of the following mass storage devices as the crash dump device for your system.

For RSX-11M/M-PLUS Operating Systems

<table>
<thead>
<tr>
<th>Device</th>
<th>Mnemonic</th>
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<tbody>
<tr>
<td>RP04/RP05/RP06 disk packs</td>
<td>DB:</td>
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<tr>
<td>DECtape II (TU58)</td>
<td>DD:</td>
</tr>
<tr>
<td>RK05/J/F disk cartridge</td>
<td>DK:</td>
</tr>
<tr>
<td>RL01/RL02 disks</td>
<td>DL:</td>
</tr>
<tr>
<td>RK06/RK07 disk cartridges</td>
<td>DM:</td>
</tr>
<tr>
<td>RM02/RM03/RM05 disk packs</td>
<td>DR:</td>
</tr>
<tr>
<td>DECtape (TU56)</td>
<td>DT:</td>
</tr>
<tr>
<td>RC25 removable disk pack</td>
<td>DU:</td>
</tr>
<tr>
<td>RA60/RX50 disk packs</td>
<td>DU:</td>
</tr>
<tr>
<td>RX01 diskette (RSX-11M only)</td>
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</tr>
<tr>
<td>RX02 diskette</td>
<td>DY:</td>
</tr>
<tr>
<td>TU45/TU16/TE16/TU77 magnetic tapes</td>
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</tr>
<tr>
<td>TS11/TU80/TSV05/TK25 magnetic tapes</td>
<td>MS:</td>
</tr>
<tr>
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<td>MT:</td>
</tr>
<tr>
<td>TK50 magnetic tapes</td>
<td>MU:</td>
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For Micro/RSX and Pregenerated RSX-11M-PLUS Operating Systems

<table>
<thead>
<tr>
<th>Device</th>
<th>Mnemonic</th>
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<tr>
<td>RL01/RL02 disks</td>
<td>DL:</td>
</tr>
<tr>
<td>RD51/RD52/RX50 disks</td>
<td>DU:</td>
</tr>
<tr>
<td>TSV05/TK25 magnetic tape</td>
<td>MS:</td>
</tr>
<tr>
<td>TK50 magnetic tapes</td>
<td>MU:</td>
</tr>
</tbody>
</table>

1.3 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. The transfer of processor control depends on how the crash occurred and whether you built the Executive Debugging Tool (XDT) into your system during system generation.

System crashes can result from any of the following causes:

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).
INTRODUCTION

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. For example:

XDT>X

Refer to the RSX-11M/M-PLUS and Micro/RSX Debugging Reference Manual for a description of XDT.

If your system does not include XDT, a processor trap causes control to be transferred directly to the crash dump routine of the Executive.

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 ddnn

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, restart the processor by depressing the Continue switch on the processor console. The crash dump routine then dumps memory on the crash dump device and halts the processor when the dump finishes. The volume in the crash dump device now contains a binary representation of the contents of memory at the time of the crash. These contents are the 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 dump routine displays the following message on the crash notification device:

CRASH -- ILLEGAL CRASH DEVICE

After displaying the message, the crash dump routine halts. The illegal crash device error occurs if you specify a fixed media device as the crash dump device. If you have a removable media device on the same controller, you can switch the physical unit number plugs on the devices to assign the removable media device to the crash device. Then press the Continue key on the operator's console and the crash dump routine will attempt the dump again.

1.4 LOADABLE CRASH DUMP DRIVERS

The pregenerated RSX-11M-PLUS operating system and the Privileged Development option of the Micro/RSX Advanced Programmer's Kit include loadable crash dump drivers. Loadable drivers reside on an external storage device when they are not in use. Using loadable drivers for crash dump support reduces the size of the Executive and frees memory space for other purposes.

1.4.1 Crash Devices

Loadable crash dump support is provided by four loadable crash dump drivers, each of which dumps the contents of memory to a specific type of device. The following list shows the crash dump drivers and their corresponding device types.
INTRODUCTION

Crash Dump Driver

Crash Dump Device

DLCRSH.TSK
RL02 cartridge disk

DUCRSH.TSK
RX50 diskette

MSCRSH.TSK
TSV05/TK25 magnetic tape

MUCRSH.TSK
TK50 magnetic tape (Micro/RSX)

If the crash dump driver is loaded and the system crashes, the contents of memory are dumped to the designated crash device. You can then use the Crash Dump Analyzer to investigate the cause of the crash. If there is not a crash driver resident in the system when the system crashes, the Bugcheck facility displays the following message:

SYSTEM FAULT DETECTED AT PC=xxxxxx FACILITY=xxxxxx ERROR CODE=xxxxxx

If a crash driver is already loaded and you specify a different device with the SET SYSTEM/CRASH DEVICE command, the system unloads the resident crash driver, loads the new driver for the device that you specified, and updates the crash data base. If a crash driver is loaded and you specify the same device but a different unit number, the resident driver remains loaded and the system changes the device unit number in the crash data base.

If you specify the system disk as a crash device, you receive the following warning message:

SET -- WARNING, System disk chosen as crash device

SET -- Crash device ddn: has been successfully loaded

A loadable crash driver resides on the system disk until you specify a crash device. To specify a crash device, use the following command:

SET SYSTEM /CRASH DEVICE: ddn:  

This command loads a specific crash driver into a main memory partition and updates the crash data base. Also, you may use this command to change the crash dump device or to change the unit number of the crash device while the system is running.

When the crash driver is successfully loaded, you receive the following message:

SET -- Crash device ddn: has been successfully loaded

If the device that you specified as the crash device is not in the current system, the following error message is displayed:

SET -- Device not in system

If you specify the system disk as a crash device, you receive the following warning message:

SET -- WARNING, System disk chosen as crash device
SET -- Crash device ddn: has been successfully loaded

1-4
Note that if your system disk is a removable disk, it is a valid crash dump device. The system warns you that you have specified the system disk, but it loads the crash dump driver for the disk despite the warning message. You should avoid using the system disk as the crash dump device, because the memory dump will overwrite the contents of the disk, unless you remove the system disk and replace it with a scratch disk when the system crashes.

It is not possible to crash to a fixed media device such as the RD51 fixed disk. If you indicate the RD51 or any other fixed disk as a crash device, you receive the following message:

CRASH -- ILLEGAL CRASH DEVICE
CRASH -- CONT WITH SCRATCH MEDIA ON ddn

At this point, you cannot obtain a crash dump of memory.

NOTE
You cannot select a crash device and unit number once the crash has occurred.

However, you may choose a crash device unit that is not in the current system. To do this, specify the address of the control and status register (CSR) of the device that you want as the crash device. Use the /REGISTER switch to specify the address of the CSR of the desired device:

SET SYSTEM /CRASH_DEVICE:ddn:REGISTER:csraddr

To display the current crash dump device unit, use the following command:

$ SHOW SYSTEM /CRASH_DEVICE

In response to this command, the system displays the current device unit, as follows:

CRASHDEV=ddn:

1.4.3 Unloading a Crash Dump Driver

You use the following command to unload a crash dump driver when crash dump support is unnecessary:

$ SET SYSTEM /NOCRASH_DEVICE

In response to this command, the system displays the following message:

SET -- Crash device ddn: is being unloaded
SET -- WARNING, Crash dump support is inactive

The system then unloads the crash dump driver and updates the crash data base. When there is no crash dump driver resident in memory, the Bugcheck facility services system crashes (refer to Appendix D for a list of error code definitions used by Bugcheck). Unloading the crash dump driver frees the memory space in the crash driver partition until you decide to reactivate crash dump support. You can reactivate crash dump support at any time simply by specifying a new crash device unit.
INTRODUCTION

1.4.4 When the System Crashes

When a Micro/RSX or pregenerated RSX-11M-PLUS operating system crashes, the reaction of the system depends on the type of crash support that is loaded when the crash occurs. There are three types of crash support:

1. The Bugcheck facility, which is a standard part of the operating system, and is therefore resident in memory
2. Loadable crash dump drivers
3. XDT, which is also loadable

Thus, when a system crashes, any of the following conditions may exist:

- A crash dump driver is loaded but XDT is not loaded
- Both a crash dump driver and XDT are loaded
- XDT is loaded but a crash dump driver is not

1.4.4.1 A System Crash with a Driver Loaded and XDT Unloaded

If a system crashes when a crash driver is loaded but XDT is not loaded, the crash dump routine notifies you of the crash with the following message:

CRASH -- CONT WITH SCRATCH MEDIA ON ddn

After displaying this message, the crash routine halts the hardware processor so that you can make sure there is a scratch media in the crash device. When you have the crash device ready, press the P key followed by a carriage return to proceed.

In response to your command to proceed, the crash dump routine dumps memory to the designated crash dump device. When the dump is completed, the processor is again halted. During the memory dump, the processor Run light is on; when the dump is completed, the processor Run light goes off.

At this point, the medium in the crash dump device contains a binary representation of the contents of memory at the time the system crash occurred. This memory dump is the input to CDA. Now you can use the ANALYZE/CRASH DUMP command, which is described in Section 2.2 of this manual, to control how CDA processes the crash dump. Then you can analyze the output listings that CDA generates to determine why your system crashed.

1.4.4.2 A System Crash with a Driver Loaded and XDT Loaded

If a system crashes when a crash driver and XDT are loaded, control is transferred to XDT. After you use XDT to debug the system, if you want to obtain a crash dump, press the X key followed by a carriage return. The following message is then displayed:

CRASH -- CONT WITH SCRATCH MEDIA ON ddn

Now you can follow the procedure in Section 1.4.4.1 to obtain the crash dump.

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1.4.4.3 A System Crash with only XDT Loaded - If a system crashes when XDT is loaded but a crash driver is not loaded, control is transferred to XDT. However, when you enter the X command, the following is displayed:

SYSTEM FAULT DETECTED AT PC=xxxxxx FACILITY=xxxxxx ERROR CODE=xxxxxx
CRASH -- CRASH DRIVER NOT LOADED

1.4.4.4 Inducing a System Crash - In some situations, you may want to purposely induce a system crash. Then, if you have a crash driver loaded, you can dump the contents of memory and examine them. For example, suppose that you want to stop the processor from executing in an infinite loop. You can induce a system crash by performing the following procedure:

1. Push the Halt button on the processor. On processors with console ODT, the following is displayed:

nnnnnn
@

2. Release the Halt button.

3. At the terminal, type 40G. The following is displayed:

CRASH -- CONT WITH SCRATCH MEDIA ON ddn
nnnnnn
@

If you have a crash driver loaded, you can obtain a crash dump now by pressing the P key followed by RETURN.

1.5 RUNNING CDA

There are several ways to run CDA, and you can run it as either an installed or an uninstalled task. Also, you can run CDA from either the DCL or MCR command line interpreter (CLI). This section describes the alternative ways of running CDA.

If CDA is an installed task on your system, you can enter the CDA command line at the CLI prompt. After CDA processes your command, the CLI prompt returns. In the following example, MCR is the CLI:

> CDA CRASH_DUMP.LST,COPY.CDA=[1,54]/STB,DR5: ~
>

If CDA is installed and you want to enter commands directly to CDA, you can invoke the command level of the CDA utility by typing CDA and a carriage return. When you are finished using CDA, you exit from CDA by pressing CTRL/Z, which returns control to the CLI. In the following example, DCL is the CLI:

$ CDA ~
CDA> command line ~
CDA> command line ~
CDA> "Z
$
INTRODUCTION

If CDA is an uninstall task, the system has to find and install the CDA task image file before it can run CDA. Therefore, the command you use depends upon the location of the CDA task image file (CDA.TSK). If CDA.TSK is in the system UFD or the system library, type:

```
RUN $CDA
CDA> command line
CDA>
```

On RSX-11M operating systems, you can use the RUN $CDA command only if CDA.TSK is present in the UFD that corresponds to the system UIC on device LB. On RSX-11M-PLUS operating systems, CDA.TSK must be present in the UFD that corresponds to the library UIC.

If CDA.TSK is present in the UFD that corresponds to the current UIC on the default system device (the current UFD for the terminal from which the command is entered), you can run CDA by typing the following command:

```
RUN CDA
CDA> command line
```

Finally, you can run CDA by using the DCL ANALYZE/CRASH_DUMP command:

```
$ ANALYZE/CRASH_DUMP
```

If your CLI is MCR, but your terminal also supports DCL, you can run the ANALYZE/CRASH_DUMP command by typing DCL and a space before the command. For example:

```
>DCL ANALYZE/CRASH_DUMP
```

Chapter 2 shows you how to use CDA command lines and the ANALYZE/CRASH_DUMP command.

1.6 INDIRECT COMMAND FILES

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

1.7 BASIC CRASH DUMP ANALYZER OUTPUT LISTING

While the Crash Dump Analyzer provides many output listing options, fundamental system information appears on the first six pages of output listing (you can suppress this information by using the /-SYS switch, which is described in Chapter 2). The first six pages of output listings 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 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
COMMAND LINES

CDA commands control how the Crash Dump Analyzer processes a memory dump and how it formats the output listings that it generates. You can use CDA command lines to enter commands directly to the CDA utility or, if your terminal supports the DIGITAL Command Language (DCL), you can use the DCL ANALYZE/CRASH DUMP command to run CDA. This chapter describes CDA command lines and the ANALYZE/CRASH DUMP command by showing the format of the command lines, the command specifications and qualifiers, and examples of how the commands work.

2.1 CDA COMMAND LINES

This section shows the CDA command line format, lists and describes command line switches, and provides some examples of CDA command lines.

The CDA command line has the following format:

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

The CDA command line specifies the input to CDA and the output from CDA. The specifications to the left of the equal sign in the command line are output specifications, and those on the right side of the equal sign are input specifications.

You must include at least one output specification and one input specification in the command line. For output from CDA, you can specify a list file only, a binary file only, or both a list file and a binary file. For input to CDA, you must specify the crash-input, but the symbol file specification is optional.

Output file specifications are position dependent. Position dependent means that when you include both output specifications, you must place them in the positions shown in the command line. 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.

The remainder of this section describes CDA command line specifications.

Output Specifications:

listfile

The output specification of the formatted CDA analysis listings. You can use either a device or a file as the list file specification. If you specify a file, CDA creates the file and writes the output listings to the file. By default, CDA then
spools the file to the system line printer queue, unless you specify otherwise. If you specify a device for the list file, CDA displays or prints its output listings on that specific device. For example, if you specify your terminal (TTnn: or TI:) as the list file, CDA displays the output listings on your terminal. Chapter 3 describes the analysis listings that CDA generates.

**binaryfile**

The file specification for the 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 an 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 successive dump, this feature allows you to use a single volume for all crash dumps.

If the crash dump device on your system is a secondary storage or sequential device, you can reduce CDA analysis time by copying the crash input to a binary file on another device. Then you can use the binary file as input to CDA for analysis.

**Input Specifications:**

**symbolfile/STB**

The file specification of the symbol table file for the crashed system. The /STB switch is an integral part of this file specification, because CDA uses the data in the symbol table file to format the binary memory dump into readable formats. If you omit this file specification and switch, CDA uses the default symbol table file, which is the file named RSX11M.STB in the UFD that corresponds to 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. However, if the crash-input specification is a binary file, you cannot also include a binary file output specification in the command line.

**Switches:**

/sw

An optional CDA switch. The list file, binary file, and crash-input file specifications can include optional switches that modify CDA action. Each specification in the command line has its own switches. Section 2.1.1 describes the CDA switches and lists which specification they apply to.

File specifications in the CDA command line can appear in complete Files-II format, with device name, UFD, file name, file type, and version number. When you omit any of these elements, CDA uses the defaults shown in Table 2-1. However, not all of the elements in file specifications have defaults.
2.1.1 CDA Command Line Switches

Two kinds of command line switches, analysis switches and function switches, allow you to control CDA operation.

Analysis switches determine which analysis routines CDA applies to the crash input. Thus, you can select the types of data that you want CDA to output. For example, analysis switches can list information about all of the devices in the system, or they can list information about active devices only.

Function switches provide a number of options for controlling CDA output. For example, function switches can terminate an analysis after CDA encounters a specified number of errors, or they can limit the number of pages of output listings.

Both types of switches are file specific. That is, each switch applies to a particular file and may not be used without that file or with any other file.

2.1.1.1 Analysis Switches - Table 2-2 summarizes the analysis switches and gives brief descriptions of their effects. Some of the switches in Table 2-2 have synonyms or alternate mnemonics. These are shown under each switch. Expanded descriptions of each switch follow the table.
## Table 2-2 (Cont.)
### Summary of CDA Analysis Switches

<table>
<thead>
<tr>
<th>Switch</th>
<th>Function</th>
<th>Applies to File</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ALL</td>
<td>Lists the output of all analysis routines</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/CLI</td>
<td>Lists the contents of the CLI Parser Blocks in the system</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/CPB</td>
<td>Lists the contents of the clock queue</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/CLQ</td>
<td>Lists information for each device controller</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/CTL</td>
<td>Lists information for all active devices in the system</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/DEV</td>
<td>Lists the contents of physical memory between address a and address b; (c is an optional virtual starting address)</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/DCB</td>
<td>Lists the contents of the task headers for each task resident in memory</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/SCB</td>
<td>Lists the contents of the system's pool</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/UCB</td>
<td>Suppresses listing of the system information</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/KDS:a:b</td>
<td>Lists the contents of the kernel data space from virtual address a to virtual address b (RSX-11M-PLUS systems only)</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/KIS:a:b</td>
<td>Lists the contents of kernel instruction space from virtual address a to virtual address b (RSX-11M-PLUS systems only)</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/PCB</td>
<td>Lists the contents of each Partition Control Block</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/PAR</td>
<td>Lists the contents of the system's pool</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/SECPOL</td>
<td>Lists the contents of system secondary pool (RSX-11M-PLUS systems only)</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/SYS</td>
<td>Suppresses listing of the system information</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/TASK:name:a:b</td>
<td>Lists the contents of task &quot;name&quot; between virtual address a and virtual address b; lists the contents of task data space (if task includes data space) on RSX-11M-PLUS</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/TAS:name:a:b</td>
<td>Lists the contents of task &quot;name&quot; between virtual address a and virtual address b; lists the contents of task data space (if task includes data space) on RSX-11M-PLUS</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/TSK:name:a:b</td>
<td>Lists the contents of task &quot;name&quot; between virtual address a and virtual address b; lists the contents of task data space (if task includes data space) on RSX-11M-PLUS</td>
<td>Crash-input</td>
</tr>
</tbody>
</table>

(Continued on next page)
## COMMAND LINES

### Table 2-2 (Cont.)

#### Summary of CDA Analysis Switches

<table>
<thead>
<tr>
<th>Switch</th>
<th>Function</th>
<th>Applies to File</th>
</tr>
</thead>
<tbody>
<tr>
<td>/TCB</td>
<td>Lists the contents of the TCB for every task in the System</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/TAL</td>
<td>Task Directory</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/STD</td>
<td>Lists the contents of task data space (RSX-11M-PLUS only)</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/TIS:name</td>
<td>Lists the contents of task instruction space (RSX-11M-PLUS systems only)</td>
<td>Crash-input</td>
</tr>
</tbody>
</table>

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

File: Crash-input

**Effect:** CDA lists the contents of the Task Control Block (TCB) for each active task.

/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.

/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 information
3. Task headers information
4. Partition information
5. Common Block Directory entries
6. Device information
7. Clock queue contents
8. Device controller information
9. Pool contents

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COMMAND LINES

/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.

/CLQ (Clock Queue)

File: Crash-input

Effect: CDA lists the contents of the clock queue.

/CTL (Device Controllers)

File: Crash-input

Effect: CDA lists the contents of the controller table and Controller Request Block (KRB) for each device controller in the system.

/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.

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

File: Crash-input

Effect: If only a and b are specified, CDA dumps the contents of physical addresses a through b inclusive and labels them with their physical addresses. If a, b, and c are specified, CDA dumps the contents of physical addresses a through b, but labels them with dummy virtual addresses, starting at the address specified by c.

CDA allows you to specify a virtual starting address because RSX-1LM and RSX-1LM-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 addresses to virtual addresses as you read the dump.

/HDR (Headers for Memory-Resident Tasks)

File: Crash-input

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

/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.

/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.
### COMMAND LINES

**/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 (PCB).

**/POOL:a:b (System Pool)**

File: Crash-input

Effect: CDA lists the system pool in octal, Radix-50, and ASCII.

**/SECPPOOL[:a:b] (Secondary Pool)**

File: Crash-input

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

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

File: Crash-input

Effect: CDA lists the contents of all of the Task Control Blocks in the System Task Directory (STD) at the time of the crash.

**/-SYS (System Information)**

File: Crash-input

Effect: CDA suppresses the system information listing.

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

File: Crash-input

Effect: CDA lists the virtual address space from the 16-bit virtual address a through b for the task specified by "name." If you do not specify addresses, CDA lists the task's entire virtual address space.

**/TDS:name[:a:b] (Task Data Space)**

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.

**/TIS:name:a:b (Task Instruction Space)**

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.

---

2.1.1.2 Function Switches - Table 2-3 summarizes the function switches and gives brief descriptions of their effects. Expanded descriptions of each switch follow the table.
## Table 2-3
### Summary of CDA Function Switches

<table>
<thead>
<tr>
<th>Switch</th>
<th>Function Description</th>
<th>Applies to File</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>/BL:n</td>
<td>Identifies the starting block number of the crash-input device; the value of n must be less than 65535.</td>
<td>Crash-input</td>
<td>n=1</td>
</tr>
<tr>
<td>/DENS:n</td>
<td>Sets density of crash input tape to 800 or 1600 bits per inch (bpi)</td>
<td>Crash-input</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>:HIGH</td>
<td></td>
<td>n=800</td>
</tr>
<tr>
<td></td>
<td>:LOW</td>
<td></td>
<td>--</td>
</tr>
<tr>
<td>/EXIT:n</td>
<td>Terminates analysis after encountering n analysis errors</td>
<td>List file</td>
<td>--</td>
</tr>
<tr>
<td>/LIMIT:n</td>
<td>Limits output listing to n pages</td>
<td>List file</td>
<td>n=300.</td>
</tr>
<tr>
<td>/LINES:n</td>
<td>Limits page length to n lines</td>
<td>List file</td>
<td>n=60.</td>
</tr>
<tr>
<td>/MEMSIZ:n</td>
<td>Saves nKb memory from crash in a binary file</td>
<td>Binary file</td>
<td>n=124.</td>
</tr>
<tr>
<td>/KMR</td>
<td>Forces the assignment of kernel address register values for the crashed system</td>
<td>Crash-input</td>
<td>/-KMR</td>
</tr>
<tr>
<td>/-SP</td>
<td>Does not print analysis output listing</td>
<td>List file</td>
<td>/SP</td>
</tr>
<tr>
<td>/STB</td>
<td>Identifies the file specification that contains the Executive symbol table</td>
<td>Symbol file</td>
<td>--</td>
</tr>
</tbody>
</table>

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

### /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 a DECtape, CDA ignores this switch.
- **Default:** n = 1

### /DENS:n (Sets Tape Density)
- **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
/EXIT:n (Exit After n Errors)

File: List file

Effect: CDA maintains an error count. As it encounters inconsistencies in the system data structures, 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.

/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.

/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.

/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 nKb 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 magnetic tape, the binary output file is filled with zeroes if the EOF is read before nKb words are transferred.

Default: n = 124.

/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. If 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.
COMMAND LINES

/-SP (Do Not Spool)

File: List file

Effect: CDA does not spool the analysis output listing to the system line printer queue. Instead, it creates an output list file on the device indicated in the output file specification. If you do not specify a device in the output file specification when you use the /-SP qualifier, CDA creates the output list file on SY0:.

Default: /SP

/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 symbol file and extracts the necessary symbol values. If it fails to find any required symbol values, CDA aborts the analysis and returns an error message.

Default: [current UIC]RSX11M.STB

2.1.2 CDA Command Line Examples

The following examples illustrate CDA command lines. Assume that the user in these examples is logged in under UIC [301,356], that the crash dump device is DR5:, and that CDA is running as an installed task. Also, note how CDA uses default file types.

Example 1

> CDA
CDA>DUMP,DUMP=RSX11M.STB/STB,DR5: 

This command line creates:

• A list file, DUMP.LST, in UFD [301,356], which is printed automatically
• A binary file, DUMP.CDA, in UFD [301,356]

CDA reads the binary crash dump input from the crash dump device (DR5:), makes a binary copy of the crash dump input named DUMP.CDA, analyzes the crash dump input according to the information in the Executive symbol table file named RSX11M.STB in UFD [301,356], and writes a formatted output listing to a file named DUMP.LST. CDA then spools DUMP.LST to the system line printer queue.

Example 2

> CDA
CDA>DUMP=[1,54]/STB,DR5: 

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

CDA reads the binary crash dump input from DR5: and analyzes it according to the information in the Executive symbol table file, which is named RSX11M.STB in UFD [1,54].
Example 3

> CDA LP:= [1,54]/STB,DUMP

This command line creates an output listing on device LP:

CDA reads the binary input from a previously created binary file named DUMP.CDA, and analyzes it in accordance with the information contained in the Executive symbol table file named RSX11M.STB in UFD [1,54]. The CDA output listings are then printed on LP:

This command line is also an example of a CDA command that is issued from the CLI prompt. Thus, the CLI prompt returns after the command is issued.

Example 4

> CDA TI:= DUMP

This command line creates an output listing that is displayed on the terminal from which the command was issued.

CDA reads the binary input from a previously created binary file named DUMP.CDA and analyzes it according to the information in the default symbol table file, (the file named RSX11M.STB in the UFD that currently corresponds to UIC [301,356]). The CDA output listings are then displayed on TI:

2.2 THE DCL ANALYZE/CRASH_DUMP COMMAND

If your terminal supports the DIGITAL Command Language (DCL) command line interpreter, you can run the CDA utility by using the DCL ANALYZE/CRASH_DUMP command as an alternative to the CDA command line. This section describes the ANALYZE/CRASH_DUMP command line format and qualifiers. The section concludes with some examples of ANALYZE/CRASH_DUMP command lines.

The ANALYZE/CRASH_DUMP command line has the following format:

ANALYZE/CRASH_DUMP [/qualifiers] crash-input [/qualifiers]

You use the ANALYZE/CRASH_DUMP command to specify CDA input and output. The command qualifiers that you place immediately after the command name specify the CDA output files and, optionally, the symbol table file that CDA uses to process the crash dump input. The crash-input specification is mandatory because it directs CDA to the source of the binary crash dump input.

Output Specifications:

You must specify at least one of the following command qualifiers as an output specification in the command line:

- /LIST: Specifies the output list file
- /BINARY: Specifies a binary copy of the crash-input file
- /SYMBOLS: Specifies the symbol definition file
You can specify /LIST: only, /BINARY: only, or /LIST: and /BINARY: together. You can optionally specify /SYMBOLS: with any combination of the /LIST: and /BINARY: qualifiers. However, if you do specify /SYMBOLS, you must include at least one of the other command qualifiers (because the symbol definition file is not an output file; it is used by CDA to generate an output file). Section 2.2.1.1. provides complete descriptions of the functions of each of the command qualifiers.

If you omit the crash-input specification from the command line, CDA prompts you for it, as shown in the following example:

```
$ ANALYZE/CRASH_DUMP/LIST:LP: \(\text{\textcopyright}\)
Crash input? DR5: \(\text{\textcopyright}\)
```

If you enter the command name only, CDA prompts you for input and output, as shown in the following example:

```
$ ANALYZE/CRASH_DUMP \(\text{\textcopyright}\)
Crash output? /LIST:SY:[301,356]CRASH.LST:/BINARY:COPY.CDA \(\text{\textcopyright}\)
Crash input? DUMP.CDA \(\text{\textcopyright}\)
```

Note that if you enter an output file in this way, you must include the /LIST: or /BINARY: qualifiers as part of the output file specification.

Input Specification:

```
crash-input
```

Specifies the location of the binary input to the ANALYZE/CRASH_DUMP command. The crash-input specification can be the name of the crash dump device, or it can be a binary file that was created during a previous crash dump analysis.

When you enter an ANALYZE/CRASH_DUMP command line, you can include command qualifiers, qualifiers for the crash-input parameter, or both. Section 2.2.1 describes qualifiers.

2.2.1 ANALYZE/CRASH_DUMP Command Qualifiers

You can control the way CDA processes the crash input and how it formats the output listings by using command qualifiers in the command line. You can select the information that you want in the CDA output listings by using qualifiers for the crash-input specification. Section 2.2.1.1 describes command qualifiers. Section 2.2.1.2 describes the qualifiers that you can use when you specify the crash input.

2.2.1.1 Command Qualifiers - You can use command qualifiers with the ANALYZE/CRASH_DUMP command to control how CDA processes the binary crash-input, and how it formats the output analysis listings. You place command qualifiers immediately after the command name in the command line. Table 2-4 summarizes the command qualifiers and gives brief descriptions of their effects. Expanded descriptions of each qualifier follow the table.
### Table 2-4
Summary of ANALYZE/CRASH_DUMP Command Qualifiers

<table>
<thead>
<tr>
<th>Command Qualifier</th>
<th>Function</th>
<th>Applies to File</th>
</tr>
</thead>
<tbody>
<tr>
<td>/LIST:listfile[/qualifiers]</td>
<td>Specifies the output list file or device</td>
<td>List file</td>
</tr>
<tr>
<td>listfile qualifiers:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>/ERROR_LIMIT</td>
<td>Specifies an error limit at which CDA analysis terminates</td>
<td>List file</td>
</tr>
<tr>
<td>/PAGE_COUNT:n</td>
<td>Specifies the number of output pages</td>
<td>List file</td>
</tr>
<tr>
<td>/PAGE_LENGTH:n</td>
<td>Specifies the number of output lines per page</td>
<td>List file</td>
</tr>
<tr>
<td>/[NO]PRINTER</td>
<td>Specifies whether the output should be printed on the system line printer</td>
<td>List file</td>
</tr>
<tr>
<td>/BINARY:binaryfile[/qual]</td>
<td>Specifies an optional copy of the binary input file</td>
<td>Crash-input file</td>
</tr>
<tr>
<td>binaryfile qualifier:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>/MEMORY_SIZE:n</td>
<td>Copies nKb words of memory from a crashed system</td>
<td>Crash-input file</td>
</tr>
<tr>
<td>/SYMBOLS:symbolfile</td>
<td>Specifies the symbol definition file</td>
<td>Crash-input file</td>
</tr>
</tbody>
</table>

### Command Qualifier Descriptions:

- **/LIST:listfile[/qualifiers]**
  - /ERROR_LIMIT:n
  - /PAGE_COUNT:n
  - /PAGE_LENGTH:n
  - /[NO]PRINTER

**File**: List file

**Effect**: Specifies the optional formatted CDA output list file. This list file consists of the analysis report listings that are described in Chapter 3. You can also specify a device for the list file, in which case CDA displays or prints its output listings on the specified device. You can control the list file output by using the following file qualifiers.
List File Qualifiers:

/ERROR_LIMIT[:n]

Effect:  CDA maintains an error count. As it encounters inconsistencies in the system data structures, it increments the error count. CDA terminates the crash dump analysis when it finds the number of errors that you specify with this qualifier. If you use the /ERROR_LIMIT qualifier without specifying a number, the crash dump analysis terminates after one error.

Default:  CDA runs the analysis until it is completed.

/PAGE_COUNT:n

Effect:  This qualifier limits the number of pages of analysis output. When CDA has generated n pages, it terminates the analysis and prints a message on the terminal indicating that the analysis has terminated.

Default:  Analysis terminates after 300 pages.

/PAGE_LENGTH:n

Effect:  This qualifier lets you specify the number of lines that you want CDA to print per output page. After the specified number of lines are printed, CDA breaks to a new page.

Default:  CDA prints 60 lines per page.

/[NO]PRINTER

Effect:  This qualifier prevents the printing of the analysis output on the system line printer. Instead, CDA creates the output list file on the device in the list file specification. If a device is not specified in the list file specification, CDA creates the output file on the default user disk (SY0:).

Default:  CDA prints all output on the system line printer.

/BINARY:binaryfile[/qualifier]

File:  Crash-input

Effect:  Specifies that an optional binary file should be created. This file is a copy of the binary data that the crash dump routine wrote on the crash dump device. If you create the file during an initial analysis, you can use it as input to the ANALYZE/CRASH DUMP command at a later time. Also, because the crash dump routine overwrites the contents of the crash dump volume with each crash dump, this qualifier allows you to save the results of crash dumps. You can then reuse the same volume for successive crash dumps while maintaining a record of previous crash dumps.
2.2.1.2 Crash-input File Qualifiers - You can select the analysis listings that you want CDA to output by using qualifiers for the crash-input file specification in the ANALYZE/CRASH_DUMP command line. Table 2-5 summarizes the crash-input qualifiers and gives brief descriptions of their effects. Expanded descriptions of each qualifier follow the table.

Table 2-5
Summary of ANALYZE/CRASH_DUMP Crash-input Qualifiers

<table>
<thead>
<tr>
<th>Qualifier or Argument</th>
<th>Function</th>
<th>Applies to File</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ACTIVE: (arg[,...])</td>
<td>Lists data on active tasks and/or devices</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/ACTIVE arguments:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEVICES</td>
<td>Lists data about active devices</td>
<td>Crash-input</td>
</tr>
<tr>
<td>TASKS</td>
<td>Lists contents of the Task Control Blocks for active tasks</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/ALL</td>
<td>Lists all available crash dump data</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/BLOCK:n</td>
<td>Specifies the block number where crash dump begins on the crash dump device</td>
<td>Crash-input</td>
</tr>
</tbody>
</table>

(Continued on next page)
### Table 2-5 (Cont.)
Summary of ANALYZE/CRASH_DUMP Crash-input Qualifiers

<table>
<thead>
<tr>
<th>Qualifier or Argument</th>
<th>Function</th>
<th>Applies to File</th>
</tr>
</thead>
<tbody>
<tr>
<td>/CLOCK_QUEUE</td>
<td>Lists the contents of the clock queue</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/CONTROLLERS</td>
<td>Lists device controller data</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/DATA_STRUCTURES:(arg[,...])</td>
<td>Specifies which data structures are to be formatted and listed</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/DATA_STRUCTURES arguments:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMMAND_PARSER</td>
<td>Lists contents of CLI Parser Blocks</td>
<td>Crash-input</td>
</tr>
<tr>
<td>DEVICE STATUS UNIT</td>
<td>List contents of the control blocks for active devices</td>
<td>Crash-input</td>
</tr>
<tr>
<td>PARTITION</td>
<td>Lists contents of Partition Control Blocks</td>
<td>Crash-input</td>
</tr>
<tr>
<td>TASK</td>
<td>Lists contents of the Task Control Blocks for tasks in the STD</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/DENSITY:n</td>
<td>Specifies bits per inch for input device</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/DEVICES</td>
<td>Lists contents of all Device Control Blocks</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/DUMP[: (START:n,END:n,ADDRESS:n)]</td>
<td>Lists contents of physical addresses</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/HEADERS</td>
<td>Lists contents of resident task headers</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/KERNEL:(arg[,...])</td>
<td>Lists kernel contents</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/KERNEL arguments:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DATA: (START:n,END:n)</td>
<td>Lists contents of kernel data space</td>
<td>Crash-input</td>
</tr>
<tr>
<td>INSTRUCTION: (START:n,END:n)</td>
<td>Lists contents of kernel instruction space</td>
<td>Crash-input</td>
</tr>
<tr>
<td>REGISTERS</td>
<td>Forces assignment of values for the kernel address registers</td>
<td>Crash-input</td>
</tr>
</tbody>
</table>

(Continued on next page)
### Table 2-5 (Cont.)
Summary of ANALYZE/CRASH_DUMP Crash-input Qualifiers

<table>
<thead>
<tr>
<th>Qualifier or Argument</th>
<th>Function</th>
<th>Applies to File</th>
</tr>
</thead>
<tbody>
<tr>
<td>/PARTITION</td>
<td>Lists contents of Crash-input Partition Control Blocks</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/POOL:(START:n,END:n)</td>
<td>Lists pool contents of Crash-input</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/SECONDARY_POOL[: (START:n,END:n)]</td>
<td>Lists contents of secondary pool from START to END</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/[NO]SYSTEM</td>
<td>Suppresses listing of Crash-input system information</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/TASKS: (arg[,...])</td>
<td>Lists task data</td>
<td>Crash-input</td>
</tr>
<tr>
<td>/TASKS arguments:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIRECTORY</td>
<td>Lists contents of the Task Control Blocks for tasks in the STD</td>
<td>Crash-input</td>
</tr>
<tr>
<td>ADDRESS: (NAME:name[,START:n,END:n])</td>
<td>Lists contents of task addresses from START to END</td>
<td>Crash-input</td>
</tr>
<tr>
<td>DATA: (NAME:name[,START:n,END:n])</td>
<td>Lists contents of task data space</td>
<td>Crash-input</td>
</tr>
<tr>
<td>INSTRUCTION: (NAME:[,START:n,END:n])</td>
<td>Lists contents of task instruction space</td>
<td>Crash-input</td>
</tr>
</tbody>
</table>

**File Qualifier Descriptions:**

/ACTIVE: (arg[,...])

- **DEVICES**
- **TASKS**

**File:** Crash-input

**Effect:** Lists data on active tasks and devices.

**/ACTIVE arguments:**

**DEVICES**

**Effect:** Lists data on the devices active in the system at the time of the crash. If you want CDA to list data on all of the devices known to the system at the time of the crash, use the /DEVICES qualifier.

**TASKS**

**Effect:** Lists the contents of the Task Control Blocks of active tasks. If you want CDA to list the contents of the Task Control Blocks of all installed tasks, both active and dormant, use the /TASKS:(DIRECTORY) qualifier.
COMMAND LINES

/ALL

File: Crash-input

Effect: Analyzes all information available in the crash dump file (except the information associated with memory and task dumps). CDA lists the output in the following order:

1. System information
2. Active tasks information
3. Task headers information
4. Partition information
5. Common Block Directory entries
6. Device information
7. Clock queue contents
8. Device controller information
9. Pool contents

/BLOCK:n

File: Crash-input

Effect: Identifies the starting block number of the crash dump file on the crash input device. The value of n must be less than 65535(decimal).

/CLOCK_QUEUE

File: Crash-input

Effect: Lists the contents of the system clock queue.

/CONTROLLERS

File: Crash-input

Effect: Lists the contents of the controller table and Controller Request Block (KRB) for each device controller in the system.

/DATA_STRUCTURES: (arg[,...])

  COMMANDPARSER
  DEVICE
  PARTITION
  STATUS
  TASK
  UNIT

File: Crash-input

Effect: Selects which system data structures CDA will format and list.
COMMAND LINES

/DATA_STRUCTURES arguments:

COMMAND_PARSER

Effect: Lists the contents of the Command Line Interpreter (CLI) Parser Blocks.

PARTITION

Effect: Lists the contents of the Partition Control Blocks.

TASK

Effect: Lists the contents of the Task Control Block for every task in the System Task Directory (all installed tasks) at the time of the system crash.

DEVICE

Effect: Lists the contents of the Device Control Blocks for active devices.

STATUS

Effect: Lists the contents of the Status Control Blocks for active devices.

UNIT

Effect: Lists the contents of the Unit Control Blocks for active devices.

/DENSITY:n

File: Crash-input

Effect: Causes a crash input tape to be read at the density specified, 800 or 1600 bpi. The default is 800 bpi.

/DEVICES

File: Crash-input

Effect: Lists the contents of the control blocks for all devices in the system. To list only active devices, use the /ACTIVE:(DEVICES) qualifier.

/DUMP[:(START:a,END:b[,ADDRESS:c])]}

File: Crash-input

Effect: Lists the contents of physical addresses a through b inclusive and labels them with their physical addresses. If you include address c, the /DUMP qualifier dumps the contents of physical addresses a through b, but labels them with dummy virtual addresses, starting at c.

/HEADERS

File: Crash-input

Effect: Lists the contents of the task headers for each task resident in memory.
COMMAND LINES

/KERNEL:(arg[,...])

DATA:(START:n,END:n)
INSTRUCTION:(START:n,END:n)
REGISTERS

File: Crash-input

Effect: Lists kernel data.

/KERNEL arguments:

DATA:(START:n,END:n)

Effect: Lists the contents of kernel data space from virtual addresses START:n to END:n.

INSTRUCTION:(START:n,END:n)

Effect: Lists the contents of kernel instruction space from virtual address START:n to END:n.

REGISTERS

Effect: Forces the assignment of the kernel address register values for the crashed system.

/PARTITION

File: Crash-input

Effect: Lists the contents of the Partition Control Blocks.

/POOL:(START:n,END:n)

File: Crash-input

Effect: Lists the contents of system pool between the addresses specified in octal, Radix-50, and ASCII.

/SECONDARY_POOL:(START:n,END:n)]

File: Crash-input

Effect: Lists the contents of system secondary pool between the addresses specified by START and END.

/[NO]SYSTEM

File: Crash-input

Effect: The /NOSYSTEM qualifier suppresses the system information listing. The default action of CDA is /SYSTEM; that is, it lists the system information.

/TASKS:(arg[,...])

DIRECTORY
ADDRESS:(NAME:name,START:n,END:n)
DATA:(NAME:name[,START:n,END:n])
INSTRUCTION:(NAME:name[,START:n,END:n])

File: Crash-input

Effect: Lists task data.
COMMAND LINES

/TASKS arguments:

DIRECTORY

Effect: Lists the contents of the Task Control Block for every task in the System Task Directory (all installed tasks) at the time of the system crash.

ADDRESS: (NAME:name, START:n, END:n)

Effect: Lists the contents of the task specified by NAME between the virtual addresses specified by START and END. Includes the contents of task data space if a task includes data space.

DATA: (NAME:name[, START:n, END:n])

Effect: RSX-11M-PLUS operating systems only. Lists the contents of task data space for the task specified by NAME.

INSTRUCTION: (NAME:name[, START:n, END:n])

Effect: RSX-11M-PLUS operating systems only. Lists the contents of task instruction space for the task specified by NAME.

2.2.2 ANALYZE/CRASH_DUMP Command Examples

The following examples illustrate the ANALYZE/CRASH_DUMP command. Assume that the user in these examples is logged in under UIC [301,356], and that the crash dump device is DR5:. In this way, you can note how CDA uses default file types. Also, assume that CDA is running as an installed task.

Example 1

$ ANALYZE/CRASH_DUMP/LIST:CRASH/BINARY:COPY/MEMORYSIZE:250 DR5:

This command creates:

- An output list file named CRASH.LST in the current UFO for UIC [301,356].
- A binary copy of 250kb words of the crash dump from DR5: (the crash dump device). The copy is named COPY.CDA and is placed in the current UFO for UIC [301,56].

CDA reads the binary crash dump input from the crash dump device and analyzes it according to the default symbol definition file, since a symbol definition file is not specified in the command line. CDA uses the file named RSX1LM.STB in the current UIC as the symbol definition file. CDA then generates a list file named CRASH.LST and spools it to the default system line printer queue. CDA also copies the specified amount of memory from the crash dump device to a binary file named COPY.CDA.

Example 2

$ ANALYZE/CRASH_DUMP/LIST:LP5:/PAGE_COUNT:5 DR5:/BL:100

This command creates a list file that is printed on LP5:

CDA reads the crash input from DR5:, beginning at block 100, and analyzes it according to the default symbol definition file. CDA then prints the first five pages of its output listing on LP5:.
Example 3

$ ANALYZE/CRASH_DUMP/LIST:TI:/SYMBOLS:[1,54] COPY.CDA

This command creates a list file that is displayed on TI: (the terminal at which the command was issued).

CDA reads the previously generated binary file named COPY.CDA, analyzes it according to the file named RSX11M.STB in UPD [1,54], and displays its output listings on TI:.
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 neither physical nor virtual addresses of the data.

NOTE

These listings came from several different crash dumps. Therefore, values that would usually 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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Contents of Processor Status Word (PSW) and kernel and user stack pointers after crash</td>
</tr>
<tr>
<td>2.</td>
<td>Program counter and PSW (that the system pushed onto the kernel stack) just prior to system crash (These values are valid only if the system trapped.)</td>
</tr>
<tr>
<td>3.</td>
<td>Contents of general registers</td>
</tr>
<tr>
<td>4.</td>
<td>Contents of memory management registers</td>
</tr>
<tr>
<td>5.</td>
<td>Contents of Page Address and Page Description Registers (See Section 4.1.1 for information on how to interpret this information.)</td>
</tr>
<tr>
<td>6.</td>
<td>Contents of UNIBUS map registers (This field is suppressed if the processor does not have a UNIBUS map.)</td>
</tr>
<tr>
<td>7.</td>
<td>Contents of CPU error register that 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.)</td>
</tr>
<tr>
<td>8.</td>
<td>Contents of memory system error register (On RSX-11M-PLUS systems, this field is suppressed if the processor does not have a UNIBUS map.)</td>
</tr>
<tr>
<td>9.</td>
<td>Contents of cache control register (On RSX-11M-PLUS systems, this field is suppressed if the processor does not have a UNIBUS map.)</td>
</tr>
</tbody>
</table>
ANALYSIS LISTINGS

VOLATILE REGISTERS

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

**BEFORE CRASH:**
PC = 000000  PS = 120476

R0 = 00776a  R1 = 007377  R2 = 007530  R3 = 00000d  R4 = 000001  R5 = 000000

MMR0 = 000000  MMR1 = 000000  MMR2 = 002256  MMR3 = 000000

---

**USER**

<table>
<thead>
<tr>
<th>USER SPACE</th>
<th>D SPACE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDR</td>
<td>PAR</td>
</tr>
<tr>
<td>0775a6</td>
<td>000000</td>
</tr>
<tr>
<td>0774b6</td>
<td>000200</td>
</tr>
<tr>
<td>0775b6</td>
<td>000400</td>
</tr>
<tr>
<td>0774c6</td>
<td>000600</td>
</tr>
<tr>
<td>0375a6</td>
<td>001600</td>
</tr>
<tr>
<td>0940a4</td>
<td>003123</td>
</tr>
<tr>
<td>0774b6</td>
<td>177600</td>
</tr>
</tbody>
</table>

**UNIBUS MAP**

- 1: 00000000
- 2: 00020000
- 3: 00040000
- 4: 00060000
- 5: 00100000
- 6: 00120000
- 7: 00140000
- 8: 00327024
- 9: 0132134
- 10: 01152134
- 11: 01157134
- 12: 01200134
- 13: 01674220
- 14: 00487770
- 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

---

**SUPERVISOR**

<table>
<thead>
<tr>
<th>SUPERVISOR SPACE</th>
<th>D SPACE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDR</td>
<td>PAR</td>
</tr>
<tr>
<td>000000</td>
<td>000000</td>
</tr>
<tr>
<td>000000</td>
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**KERNEL**

<table>
<thead>
<tr>
<th>KERNEL SPACE</th>
<th>D SPACE</th>
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<tbody>
<tr>
<td>PDR</td>
<td>PAR</td>
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<tr>
<td>0775a6</td>
<td>000000</td>
</tr>
<tr>
<td>0775b6</td>
<td>000200</td>
</tr>
<tr>
<td>0775c6</td>
<td>000400</td>
</tr>
<tr>
<td>0775d6</td>
<td>000600</td>
</tr>
<tr>
<td>0774a6</td>
<td>001000</td>
</tr>
<tr>
<td>0774b6</td>
<td>003123</td>
</tr>
<tr>
<td>0775c6</td>
<td>177600</td>
</tr>
</tbody>
</table>

---

Figure 3-1 Volatile Registers
## ANALYSIS LISTINGS

**VOLATILE REGISTERS**

### AFTER CRASH
- PS=000344
- SP(K)=000604
- SP(S)=001212
- SP(U)=120362
- CPU ERR = 00100
- MEM SYS ERR = 00000
- CACHE CTL REG = 00001

### BEFORE CRASH
- PC=045210
- PS=030005
- R0=000000
- R1=053558
- R2=000000
- R3=000010
- R4=000102
- R5=120526
- MMR0=000001
- MMR1=000000
- MMR2=011710
- MMR3=000066

### USER UNIBUS MAP

<table>
<thead>
<tr>
<th>USER</th>
<th>UNIBUS MAP</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image-url" alt="User UNIBUS Map" /></td>
<td></td>
</tr>
</tbody>
</table>

### SUPERVISOR

<table>
<thead>
<tr>
<th>SUPERVISOR</th>
<th>UNIBUS MAP</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image-url" alt="Supervisor UNIBUS Map" /></td>
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</tr>
</tbody>
</table>

### KERNEL

<table>
<thead>
<tr>
<th>KERNEL</th>
<th>UNIBUS MAP</th>
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</thead>
<tbody>
<tr>
<td><img src="image-url" alt="Kernel UNIBUS Map" /></td>
<td></td>
</tr>
</tbody>
</table>

---

**Figure 3-1 (Cont.) Volatile Registers**

---

3-4
3.1.2 Kernel Stack

Figure 3-2 shows the contents of the kernel stack area beginning at V$SCTR and ending at SSTACK. 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.

<table>
<thead>
<tr>
<th>Address 1</th>
<th>Address 2</th>
<th>Address 3</th>
<th>Address 4</th>
<th>Address 5</th>
<th>Address 6</th>
<th>Address 7</th>
<th>Address 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>000400</td>
<td>000000</td>
<td>000000</td>
<td>000000</td>
<td>000000</td>
<td>000000</td>
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<tr>
<td>000420</td>
<td>000000</td>
<td>000000</td>
<td>000000</td>
<td>000000</td>
<td>000000</td>
<td>000000</td>
<td>000000</td>
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<tr>
<td>000440</td>
<td>000000</td>
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<td>000460</td>
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</tr>
<tr>
<td>000500</td>
<td>000000</td>
<td>000000</td>
<td>000000</td>
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<tr>
<td>000520</td>
<td>000000</td>
<td>000000</td>
<td>000000</td>
<td>000000</td>
<td>000000</td>
<td>000000</td>
<td>000000</td>
</tr>
<tr>
<td>000540</td>
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<td>000000</td>
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<td>000000</td>
<td>000000</td>
<td>000000</td>
</tr>
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<td>000560</td>
<td>000000</td>
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<td>000000</td>
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<td>177613</td>
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<td>000600</td>
<td>123224</td>
<td>116506</td>
<td>000000</td>
<td>122710</td>
<td>000014</td>
<td>120344</td>
<td>123064</td>
</tr>
<tr>
<td>000620</td>
<td>120204</td>
<td>123064</td>
<td>123064</td>
<td>001446</td>
<td>120204</td>
<td>161121</td>
<td>006066</td>
</tr>
<tr>
<td>000640</td>
<td>114514</td>
<td>025160</td>
<td>000000</td>
<td>023540</td>
<td>066066</td>
<td>133362</td>
<td>126570</td>
</tr>
<tr>
<td>000660</td>
<td>140672</td>
<td>130054</td>
<td>160020</td>
<td>136744</td>
<td>122026</td>
<td>000000</td>
<td>137062</td>
</tr>
<tr>
<td>000700</td>
<td>130110</td>
<td>130054</td>
<td>006066</td>
<td>105664</td>
<td>000000</td>
<td>120644</td>
<td>022402</td>
</tr>
<tr>
<td>000720</td>
<td>030011</td>
<td>000700</td>
<td>007736</td>
<td>121000</td>
<td>003306</td>
<td>120212</td>
<td>025616</td>
</tr>
<tr>
<td>000740</td>
<td>106036</td>
<td>000000</td>
<td>106004</td>
<td>120204</td>
<td>170000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 following describes the corresponding 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 further information.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Time and date of crash, as set in the system</td>
</tr>
<tr>
<td>2.</td>
<td>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.)</td>
</tr>
<tr>
<td>3.</td>
<td>The address of the Task Control Block (TCB) of the current task</td>
</tr>
<tr>
<td>4.</td>
<td>The contents of the 4-byte system ID indicating system base level</td>
</tr>
<tr>
<td>5.</td>
<td>The first address available for partitions (the last address of the Executive plus 1)</td>
</tr>
<tr>
<td>6.</td>
<td>The system size in 32-word blocks and in total words</td>
</tr>
<tr>
<td>7.</td>
<td>System UIC</td>
</tr>
<tr>
<td>8.</td>
<td>Stack depth count</td>
</tr>
<tr>
<td>9.</td>
<td>Contents of the global event flag words</td>
</tr>
<tr>
<td>10.</td>
<td>Name of the system for which dump is generated</td>
</tr>
<tr>
<td>11.</td>
<td>Network UIC</td>
</tr>
<tr>
<td>12.</td>
<td>Device from which the system was booted</td>
</tr>
<tr>
<td>13.</td>
<td>Logical block number (LBN) of the beginning of the system image</td>
</tr>
<tr>
<td>14.</td>
<td>Size of system image file in blocks</td>
</tr>
<tr>
<td>15.</td>
<td>The octal value of the system feature masks and the meaning of each set bit</td>
</tr>
<tr>
<td>16.</td>
<td>Octal dump of system common in offset mode in numerical order by address</td>
</tr>
</tbody>
</table>
ANALYSIS LISTINGS

CRASH OCCURRED AT 09:53:51 21-MAY-81

CURRENT TASK = LDR... TCB ADDRESS = 112050
$SYSID = 30E $EXSIZ = 115000 $SYSIZE = 16384/512K $SYUIC = [2,54]
$STKDP = 00000 $COMEFL <3=48> 000000 <49=64> 000000
SYSTEM NAME = QUASAR $NTUIC = [102,54]
LOAD DEVICE = DB0 LBN = 00124461 FILE SIZE = 496.

SYSTEM FEATURE MASK (FIRST WORD) = 033377

<table>
<thead>
<tr>
<th>BIT SET</th>
<th>MEANING</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXT</td>
<td>22-BIT EXTENDED MEMORY SUPPORT</td>
</tr>
<tr>
<td>MUP</td>
<td>MULTI-USER PROTECTION SUPPORT</td>
</tr>
<tr>
<td>EXV</td>
<td>28K EXEC SUPPORTED</td>
</tr>
<tr>
<td>DRV</td>
<td>LOADABLE DRIVER SUPPORT</td>
</tr>
<tr>
<td>PLA</td>
<td>PLAS SUPPORT</td>
</tr>
<tr>
<td>CAL</td>
<td>DYNAMIC CHECKPOINT SPACE ALLOCATION</td>
</tr>
<tr>
<td>PKT</td>
<td>PREALLOCATION OF I/O PACKETS</td>
</tr>
<tr>
<td>EXP</td>
<td>EXTEND TASK DIRECTIVE SUPPORTED</td>
</tr>
<tr>
<td>OFF</td>
<td>PARENT/OFFSPRING TASKING SUPPORTED</td>
</tr>
<tr>
<td>FDT</td>
<td>FULL DUPLEX TERMINAL DRIVER</td>
</tr>
<tr>
<td>DYM</td>
<td>DYNAMIC MEMORY ALLOCATION SUPPORTED</td>
</tr>
<tr>
<td>CEX</td>
<td>COMMUNICATIONS EXEC IS LOADED</td>
</tr>
</tbody>
</table>

SYSTEM FEATURE MASK (SECOND WORD) = 167400

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

SYSTEM FEATURE MASK (THIRD WORD) = 025215

<table>
<thead>
<tr>
<th>BIT SET</th>
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<tbody>
<tr>
<td>CLI</td>
<td>MULTIPLE CLI SUPPORT</td>
</tr>
<tr>
<td>EIS</td>
<td>SYSTEM REQUIRES THE EXTENDED INSTRUCTION SET</td>
</tr>
<tr>
<td>CRA</td>
<td>SYSTEM SPONTANEOUSLY CRASHED (1=YES)</td>
</tr>
<tr>
<td>STM</td>
<td>SYSTEM HAS SET SYSTEM TIME DIRECTIVE</td>
</tr>
<tr>
<td>AST</td>
<td>SYSTEM HAS AST SUPPORT</td>
</tr>
</tbody>
</table>

Figure 3-3 System Common
<table>
<thead>
<tr>
<th>ADDR</th>
<th>LABEL</th>
<th>VALUE</th>
<th>ADDR</th>
<th>LABEL</th>
<th>VALUE</th>
<th>ADDR</th>
<th>LABEL</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>007660</td>
<td>000760</td>
<td>010020</td>
<td>010160</td>
<td>000000</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SHEADR</td>
<td>111700</td>
<td>010316</td>
<td>SPRIL</td>
<td>000000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SHEADR</td>
<td>000760</td>
<td>174000</td>
<td>SPRIL</td>
<td>000000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SHEADR</td>
<td>000000</td>
<td>010020</td>
<td>SPRIL</td>
<td>000000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SHEADR</td>
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<td>010020</td>
<td>SPRIL</td>
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<tr>
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<td>010400</td>
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<td>010200</td>
<td>010400</td>
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<td></td>
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<tr>
<td>SHEADR</td>
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<td>010200</td>
<td>010400</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SHEADR</td>
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<td>010200</td>
<td>010400</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>020105</td>
<td>010200</td>
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<td>020105</td>
<td>010200</td>
<td>010400</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 that additional labels may appear, depending upon the options you selected at system generation.

$ABTIM Absolute time counter
$ACTHD Active task listhead
$CACTPS Clock rate for accounting
$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 User Account Block (UAB) for task run from clock queue
$CKURM UNIBUS Run Mask (URM) of processor that keeps the clock
$CLICQ Command queue listhead
$CLKHD Clock queue listhead
$COPT Pointer to Console Output (COO:) Unit Control Block (UCB)
$CPMSK Processor bit clear mask
$CPPAR Pointer to partition for CPU local memory
$CPTRBL Pointer to Command Line Interpreter Parser Block (CPB) Table
$CRAVL Free system pool listhead
$CRCCSR Crash device CSR address with no Controller Request Block (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 Controller Table (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
$ERRSQ Universal error sequence number
$EVBSQ Buffer sequence number
$EVDIS Buffer position for next event
$EVKS6 KISR6 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 cyclic redundancy check (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
$GNIList General use pool packet listhead
### ANALYSIS LISTINGS

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$HEADR</td>
<td>Pointer to current task header</td>
</tr>
<tr>
<td>$HFMSK</td>
<td>Hardware system feature mask</td>
</tr>
<tr>
<td>$HRCPT</td>
<td>Pointer to HRC... task (privileged task for reconfiguration services)</td>
</tr>
<tr>
<td>$ICAVAL</td>
<td>ICB pool; same as core pool if no data space on system</td>
</tr>
<tr>
<td>$IDLCT</td>
<td>Idle pattern count byte</td>
</tr>
<tr>
<td>$IDLFL</td>
<td>Idle pattern flag in bytes</td>
</tr>
<tr>
<td>$IDLPT</td>
<td>Idle pattern word</td>
</tr>
<tr>
<td>$IICPU</td>
<td>Mask of interrupted URMs</td>
</tr>
<tr>
<td>$IIFNL</td>
<td>Serialize access to $MPTAB lock</td>
</tr>
<tr>
<td>$IMSK</td>
<td>I1st interrupt mask word</td>
</tr>
<tr>
<td>$INXT</td>
<td>Round robin word for $ISVC</td>
</tr>
<tr>
<td>$IPND</td>
<td>Pending URM work word</td>
</tr>
<tr>
<td>$INTCT</td>
<td>Clock interrupt ticks count</td>
</tr>
<tr>
<td>$LBUIIC</td>
<td>Library UIC</td>
</tr>
<tr>
<td>$LDPCB</td>
<td>Current loader PCB pointer</td>
</tr>
<tr>
<td>$LDRPT</td>
<td>Pointer to loader TCB</td>
</tr>
<tr>
<td>$LOGHD</td>
<td>Logical device assignment listhead</td>
</tr>
<tr>
<td>$LSTLK</td>
<td>Lock word; TCB address of owner</td>
</tr>
<tr>
<td>$MCRPT</td>
<td>Pointer to MCR TCB</td>
</tr>
<tr>
<td>$MOULS</td>
<td>Mount listhead</td>
</tr>
<tr>
<td>$MXEXT</td>
<td>Last address in system common</td>
</tr>
<tr>
<td>$NCP</td>
<td>Number of processors in system</td>
</tr>
<tr>
<td>$NTUIC</td>
<td>Network UIC</td>
</tr>
<tr>
<td>$PARHD</td>
<td>Pointer to partition list</td>
</tr>
<tr>
<td>$PASTH</td>
<td>Partition AST listhead</td>
</tr>
<tr>
<td>$PFRSZ</td>
<td>Minimum size of largest fragment in pool</td>
</tr>
<tr>
<td>$PFURM</td>
<td>URM to powerfail</td>
</tr>
<tr>
<td>$PKAVL</td>
<td>Pointer to first preallocated I/O packet</td>
</tr>
<tr>
<td>$PKMAX</td>
<td>Maximum number of preallocated I/O packets</td>
</tr>
<tr>
<td>$PKNUM</td>
<td>Number of preallocated I/O packets currently in list</td>
</tr>
<tr>
<td>$PLPAR</td>
<td>Pointer to secondary pool PCB</td>
</tr>
<tr>
<td>$POLBP</td>
<td>Minimum priority for nonprivileged task to execute at low pool</td>
</tr>
</tbody>
</table>
## ANALYSIS LISTINGS

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$POLFL</td>
<td>Executive pool usage control flags</td>
</tr>
<tr>
<td>$POLHD</td>
<td>Listhead for secondary pool free list</td>
</tr>
<tr>
<td>$POLST</td>
<td>Executive pool communications word</td>
</tr>
<tr>
<td>$PRIFR</td>
<td>Current amount of free pool</td>
</tr>
<tr>
<td>$PRIHL</td>
<td>Upper limit for pool monitoring</td>
</tr>
<tr>
<td>$PRILL</td>
<td>Lower limit for pool monitoring</td>
</tr>
<tr>
<td>$PRISZ</td>
<td>Minimum size of largest pool fragment</td>
</tr>
<tr>
<td>$PRMOD</td>
<td>Processor model number</td>
</tr>
<tr>
<td>$PRTAB</td>
<td>Processor current task priority table</td>
</tr>
<tr>
<td>$PTCBL</td>
<td>Prototype TCB listhead</td>
</tr>
<tr>
<td>$PTCPT</td>
<td>KISR6 bias of prototype TCB</td>
</tr>
<tr>
<td>$PTTCB</td>
<td>TCB address of pool recovery task</td>
</tr>
<tr>
<td>$PWRFL</td>
<td>Power-fail recovery request flag</td>
</tr>
<tr>
<td>$PWRLK</td>
<td>Serialize access to $PWRMK lock</td>
</tr>
<tr>
<td>$PWRMK</td>
<td>Mask of CPU in power-fail code</td>
</tr>
<tr>
<td>$RNDC</td>
<td>Clock ticks for each scheduling interval</td>
</tr>
<tr>
<td>$RNDC</td>
<td>Number of clock ticks until next scheduled interval</td>
</tr>
<tr>
<td>$RNDH</td>
<td>Highest priority class to consider</td>
</tr>
<tr>
<td>$RNDL</td>
<td>Lowest priority class to consider</td>
</tr>
<tr>
<td>$ROEND</td>
<td>End of read-only part of the Executive</td>
</tr>
<tr>
<td>$RQSCH</td>
<td>Schedule request TCB address</td>
</tr>
<tr>
<td>$RQTAB</td>
<td>Reschedule pointer to TCB table</td>
</tr>
<tr>
<td>$SABPT</td>
<td>Pointer to System Account Block</td>
</tr>
<tr>
<td>$SAHDB</td>
<td>Bias of current task header</td>
</tr>
<tr>
<td>$SAHPT</td>
<td>Virtual address of current task header</td>
</tr>
<tr>
<td>$SAVSP</td>
<td>Saved stack pointer</td>
</tr>
<tr>
<td>$SCCTB</td>
<td>CTB if $SCDEV contains KRB</td>
</tr>
<tr>
<td>$SCDEV</td>
<td>UCB or KRB for status change</td>
</tr>
<tr>
<td>$SCERR</td>
<td>Error return from driver</td>
</tr>
<tr>
<td>$SCMOF</td>
<td>Offset to data space</td>
</tr>
<tr>
<td>$SCOFL</td>
<td>On-line or off-line parameter</td>
</tr>
<tr>
<td>$SECFR</td>
<td>Number of free blocks in secondary pool</td>
</tr>
<tr>
<td>$SGFRR</td>
<td>Pointer into stack for $SGFIN</td>
</tr>
<tr>
<td>Symbol</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>$SHERR</td>
<td>Points to TCB of shadow error task</td>
</tr>
<tr>
<td>$SHFCT</td>
<td>Minimum ticks between shuffler requests</td>
</tr>
<tr>
<td>$SHFPT</td>
<td>Pointer to Shuffler Task Control Block</td>
</tr>
<tr>
<td>$SHFTM</td>
<td>Time remaining before next possible request to Shuffler</td>
</tr>
<tr>
<td>$SHLIM</td>
<td>Error packet limit</td>
</tr>
<tr>
<td>$SHLOS</td>
<td>Number of packets lost from saturation</td>
</tr>
<tr>
<td>$SHPCT</td>
<td>Current shadow error count</td>
</tr>
<tr>
<td>$SHUMB</td>
<td>Root for UMB list</td>
</tr>
<tr>
<td>$SIGFL</td>
<td>Task waiting for significant event</td>
</tr>
<tr>
<td>$STALR</td>
<td>Sanity timer alarm enabled on CPU</td>
</tr>
<tr>
<td>$STENB</td>
<td>Sanity timer enabled</td>
</tr>
<tr>
<td>$STKDP</td>
<td>Stack depth indicator</td>
</tr>
<tr>
<td>$SWPC</td>
<td>Clock ticks for each swapping interval</td>
</tr>
<tr>
<td>$SWPCT</td>
<td>Number of clock ticks to next swapping interval</td>
</tr>
<tr>
<td>$SWPR</td>
<td>Swapping priority</td>
</tr>
<tr>
<td>$SWR</td>
<td>Multiprocessor console switch register</td>
</tr>
<tr>
<td>$SYLHD</td>
<td>Listhead for System log input queue</td>
</tr>
<tr>
<td>$SYSIZ</td>
<td>Size of memory in 32Kb-word blocks</td>
</tr>
<tr>
<td>$SYUAB</td>
<td>Address of UAB for system tasks</td>
</tr>
<tr>
<td>$SYUIC</td>
<td>System User Identification Code (UIC)</td>
</tr>
<tr>
<td>$TKNPT</td>
<td>Pointer to Task Termination Notification Program (TKTN)</td>
</tr>
<tr>
<td>$TKPS</td>
<td>Ticks per second</td>
</tr>
<tr>
<td>$TNAME</td>
<td>Multiuser task name</td>
</tr>
<tr>
<td>$TSKHD</td>
<td>Pointer to System Task Directory (STD)</td>
</tr>
<tr>
<td>$TTNS</td>
<td>Tick of second</td>
</tr>
<tr>
<td>$ULDPT</td>
<td>Microcode loader task TCB address</td>
</tr>
<tr>
<td>$UMRST</td>
<td>Unibus Run Mask (URM) status table</td>
</tr>
<tr>
<td>$VECTR</td>
<td>Highest vector address</td>
</tr>
<tr>
<td>$XDTFL</td>
<td>Executive Debugging Tool (XDT) initialization table</td>
</tr>
<tr>
<td>$XDTPR</td>
<td>Flag for prompts from XDT</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>$ABTIM 007572</td>
<td>$SERRPT 000000</td>
</tr>
<tr>
<td>$ACTHD 112050</td>
<td>$SERRSQ 000000</td>
</tr>
<tr>
<td>$AVRHD 000000</td>
<td>$SEXSIZ 115000</td>
</tr>
<tr>
<td>$CFLPT 046444</td>
<td>$SFMASK 033377</td>
</tr>
<tr>
<td>$CKCNT 177546</td>
<td>$SFRKHD 000000</td>
</tr>
<tr>
<td>$CKCSR 177546</td>
<td>$SGEFDM 000356</td>
</tr>
<tr>
<td>$CKLDC 000000</td>
<td>$SGEFPT 010064</td>
</tr>
<tr>
<td>$CLICQ 000000</td>
<td>$SGFCTB 010064</td>
</tr>
<tr>
<td>$CLKHD 044414</td>
<td>$SGGEF 000000</td>
</tr>
<tr>
<td>$COPT 037356</td>
<td>$SHEADR 111700</td>
</tr>
<tr>
<td>$CPBL 010472</td>
<td>$SHFMSK 000003</td>
</tr>
<tr>
<td>$CRAVL 045074</td>
<td>$SIDLCT 0000</td>
</tr>
<tr>
<td>$CURPR 370</td>
<td>$SIDLFL 0000</td>
</tr>
<tr>
<td>$CXDBL 000</td>
<td>$SIDLPT 103741</td>
</tr>
<tr>
<td>$DEVHD 063460</td>
<td>$SINTCT 177777</td>
</tr>
<tr>
<td>$DCSV 001051</td>
<td>$SLBUIC 000454</td>
</tr>
<tr>
<td>$DPM 000040</td>
<td>$SLDRPT 112950</td>
</tr>
<tr>
<td>$ENTSQ 000001</td>
<td>$SLOGH 052254</td>
</tr>
<tr>
<td>$ERBAF 023</td>
<td>$SLSTLK 103640</td>
</tr>
<tr>
<td>$ERFID 000000</td>
<td>$SMCRCL 104360</td>
</tr>
<tr>
<td>$ERFLE 000</td>
<td>$SMCRPT 110160</td>
</tr>
<tr>
<td>$ERMEA 000000</td>
<td>$SMOULS 046614</td>
</tr>
<tr>
<td>$ERLOF 000</td>
<td>$SWEXT 177777</td>
</tr>
</tbody>
</table>

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 (that is, pool granularity) in Item 5 comes from the contents of $CRAVL-2$. Each item in the following list describes a correspondingly numbered item in Figure 3-5.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Pool size in decimal bytes</td>
</tr>
<tr>
<td>2.</td>
<td>The largest fragment of pool space</td>
</tr>
<tr>
<td>3.</td>
<td>Total number of free bytes in pool</td>
</tr>
<tr>
<td>4.</td>
<td>Number of fragments not allocated</td>
</tr>
<tr>
<td>5.</td>
<td>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.)</td>
</tr>
<tr>
<td>6.</td>
<td>Bit map in octal</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Bit Number</th>
<th>15</th>
<th>14</th>
<th>13</th>
<th>12</th>
<th>11</th>
<th>10</th>
<th>9</th>
<th>8</th>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Binary</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>11</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Octal</td>
<td>0</td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

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

POOL SIZE (BYTES) = 16532, (1)
LARGEST FREE BLOCK (BYTES) = 12416, (2)
TOTAL FREE BYTES = 12676, (3)
NUMBER OF FRAGMENTS = 14, (4)
MINIMUM BLOCK SIZE (BYTES) = 4, (5)

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

```
000000 100434 000000 007000 000040 140000 002001 000000
000000 000000 000000 000000 000000 000000 000000 000000
177777 177777 177777 177777 177777 177777 177777 177777
177777 177777 177777 177777 177777 177777 177777 177777
177777 177777 177777 177777 177777 177777 177777 177777
177777 177777 177777 177777 177777 177777 177777 177777
177777 177777 177777 177777 177777 177777 177777 177777
177777 177777 177777 177777 177777 177777 177777 177777
177777 177777 177777 177777 177777 177777 177777 177777
177777 177777 177777 177777 177777 177777 177777 177777
177777 177777 177777 177777 177777 177777 177777 177777
177777 177777 177777 177777 177777 177777 177777 177777
177777 177777 177777 177777 177777 177777 177777 177777
177777 177777 177777 177777 177777 177777 177777 177777
177777 177777 177777 177777 177777 177777 177777 177777
177777 177777 177777 177777 177777 177777 177777 177777
177777 177777 177777 177777 177777 177777 177777 177777
177777 177777 177777 177777 177777 177777 177777 177777
177777 177777 177777 177777 177777 177777 177777 177777
177777 177777 177777 177777 177777 177777 177777 177777
177777 177777 177777 177777 177777 177777 177777 177777
```

Figure 3-5 Pool Statistics
3.1.6 Assign Table

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

**RSX-11M-PLUS CRASH DUMP ANALYZER V3.0  16-APR-85  09:15**

**ASSIGN TABLE**

**System Logicals:**

```
SY = DR5:
Block: 1   Status: (Final)
EDTINI = SYS$LOGIN:EDTINI
Block: 1
```

**User Logicals:**

```
Terminal: TT5:
SYS$LOGIN = DR5:[COVERT]
Block: 2   Status: (Final, Privileged)

Terminal: TT24:
IN = DR5:
Block: 1   Status: (Final)
SYS$LOGIN = DR5:[007,325]
Block: 2   Status: (Final, Privileged)

Terminal: TT75:
HOME = DR5:[7,40]
Block: 1
DEFCOR = DB3:[61,40]
Block: 1
DUMPS = LB:[4,54]
Block: 1
SYS$LOGIN = DR5:[7,40]
Block: 2   Status: (Final, Privileged)
```

Figure 3-6  Logical Assignment Table

The Assign Table lists logical assignment table entries in two categories: system logicals and user logicals. The system logicals listing shows the logical name, the equivalence name, the number of blocks, and the status of an assignment. The user logicals listing also shows the terminal from which an assignment was made.
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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Group number</td>
</tr>
<tr>
<td>2.</td>
<td>Access count</td>
</tr>
</tbody>
</table>
| 3.   | Group-global Event Flag Block dump  
(The last two words are the group-global event flags.)

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 resided 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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Address of error log buffer</td>
</tr>
<tr>
<td>2.</td>
<td>Error log packet entry type code</td>
</tr>
<tr>
<td>3.</td>
<td>Error log packet entry type subcode</td>
</tr>
<tr>
<td>4.</td>
<td>Time the packet was logged</td>
</tr>
<tr>
<td>5.</td>
<td>Dump of error log packet in octal</td>
</tr>
</tbody>
</table>

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:

- **$SCRBF**: Internal crash stack
- **$CRUPC**: Scratch user program counter (PC)
- **$CRUST**: Scratch user Processor Status Word (PSW)
- **$CURPR**: Pointer to current task priority
- **$CDBL**: Context switch disable flag
- **$DICSV**: Temporary storage for directive service
- **$DXDEP**: Entry point to dynamic Executive debugger interface
- **$DXDK5**: Saved KINAR5 for dynamic Executive debugger interface
- **$DXDL**: Relocation bias for dynamic Executive debugger interface
- **$HEADR**: Pointer to current task header
- **$PARLV**: Interrupt recursion level counter
- **$RQSC**: 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
- **$STKCB**: Pointer to current task TCB

```plaintext
<table>
<thead>
<tr>
<th>Label</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$SCRBF</td>
<td>000000</td>
</tr>
<tr>
<td></td>
<td>000000</td>
</tr>
<tr>
<td></td>
<td>000000</td>
</tr>
<tr>
<td></td>
<td>000000</td>
</tr>
<tr>
<td>$CRUPC</td>
<td>000000</td>
</tr>
<tr>
<td></td>
<td>000000</td>
</tr>
<tr>
<td></td>
<td>000000</td>
</tr>
<tr>
<td></td>
<td>000000</td>
</tr>
<tr>
<td>$CRUST</td>
<td>000000</td>
</tr>
<tr>
<td></td>
<td>000000</td>
</tr>
<tr>
<td></td>
<td>000000</td>
</tr>
<tr>
<td></td>
<td>000000</td>
</tr>
<tr>
<td>$CURPR</td>
<td>021722</td>
</tr>
<tr>
<td></td>
<td>000000</td>
</tr>
<tr>
<td></td>
<td>000000</td>
</tr>
<tr>
<td></td>
<td>000000</td>
</tr>
<tr>
<td>$CDBL</td>
<td>000000</td>
</tr>
<tr>
<td></td>
<td>000000</td>
</tr>
<tr>
<td></td>
<td>000000</td>
</tr>
<tr>
<td></td>
<td>000000</td>
</tr>
<tr>
<td>$DICSV</td>
<td>000000</td>
</tr>
<tr>
<td></td>
<td>000000</td>
</tr>
<tr>
<td></td>
<td>000000</td>
</tr>
<tr>
<td></td>
<td>000000</td>
</tr>
</tbody>
</table>
```

![Figure 3-9 Low Core Memory](image-url)

---

3-20
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 that 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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Task name</td>
</tr>
<tr>
<td>2.</td>
<td>Address of Task Control Block (TCB) for the task</td>
</tr>
<tr>
<td>3.</td>
<td>Name of the partition in which the task runs</td>
</tr>
<tr>
<td>4.</td>
<td>Address of Partition Control Block (PCB)</td>
</tr>
<tr>
<td>5.</td>
<td>Base address for the partition in which the task runs</td>
</tr>
<tr>
<td>6.</td>
<td>Device that contains task image</td>
</tr>
<tr>
<td>7.</td>
<td>Beginning logical block number (LBN) of the task on the device</td>
</tr>
<tr>
<td>8.</td>
<td>Running priority</td>
</tr>
<tr>
<td>9.</td>
<td>Number of outstanding QIO requests</td>
</tr>
<tr>
<td>10.</td>
<td>Current UIC (either the login UIC or the UIC specified with a SET command)</td>
</tr>
<tr>
<td>11.</td>
<td>Physical name of task's pseudo device</td>
</tr>
<tr>
<td>12.</td>
<td>Maximum size of task image in 32(decimal)-word blocks</td>
</tr>
<tr>
<td>13.</td>
<td>State of local event flags for task</td>
</tr>
<tr>
<td>14.</td>
<td>First status word (blocking bits), using the following three-letter codes:</td>
</tr>
<tr>
<td></td>
<td>-EXE - Task not executing</td>
</tr>
<tr>
<td></td>
<td>RDN - I/O rundown in progress</td>
</tr>
<tr>
<td></td>
<td>CIP - Task blocked for checkpoint in progress</td>
</tr>
<tr>
<td></td>
<td>MSG - Abort message being output</td>
</tr>
<tr>
<td></td>
<td>CKR - Task has checkpoint request (RSX-11M-PLUS only)</td>
</tr>
<tr>
<td></td>
<td>BLC - Increment blocking count</td>
</tr>
<tr>
<td></td>
<td>STP - Task stopped by CLI command</td>
</tr>
</tbody>
</table>
### ANALYSIS LISTINGS

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>15.</strong></td>
<td>Second status word (state bits), using the following three-letter codes:</td>
</tr>
<tr>
<td>AST</td>
<td>Asynchronous system trap (AST) in progress</td>
</tr>
<tr>
<td>SIO</td>
<td>Task stopped for buffered I/O</td>
</tr>
<tr>
<td>DST</td>
<td>AST recognition disabled</td>
</tr>
<tr>
<td>AFF</td>
<td>Task installed with affinity</td>
</tr>
<tr>
<td>-CHK</td>
<td>Task not checkpointable</td>
</tr>
<tr>
<td>SEF</td>
<td>Stopped for event flag</td>
</tr>
<tr>
<td>REX</td>
<td>Exit AST specified</td>
</tr>
<tr>
<td>HLT</td>
<td>Task being halted</td>
</tr>
<tr>
<td>ABO</td>
<td>Task marked for abort</td>
</tr>
<tr>
<td>STP</td>
<td>Task stopped</td>
</tr>
<tr>
<td>SPN</td>
<td>Task suspended</td>
</tr>
<tr>
<td>WFR</td>
<td>Task in wait-for state</td>
</tr>
<tr>
<td><strong>16.</strong></td>
<td>Third status word (attribute bits), using the following three-letter codes:</td>
</tr>
<tr>
<td>ACP</td>
<td>Task is an Ancillary Control Processor (ACP)</td>
</tr>
<tr>
<td>PMD</td>
<td>Task not dumped on synchronous abort</td>
</tr>
<tr>
<td>CMD</td>
<td>Task is executing a CLI command</td>
</tr>
<tr>
<td>REM</td>
<td>Remove task on exit</td>
</tr>
<tr>
<td>PRV</td>
<td>Task is privileged</td>
</tr>
<tr>
<td>MCR</td>
<td>Task requested as an external MCR function</td>
</tr>
<tr>
<td>SLV</td>
<td>Task is a slave task</td>
</tr>
<tr>
<td>CLI</td>
<td>Task is a command line interpreter</td>
</tr>
<tr>
<td>RST</td>
<td>Task is restricted</td>
</tr>
<tr>
<td>NSD</td>
<td>Task does not allow send data</td>
</tr>
<tr>
<td>CAL</td>
<td>Task has checkpoint space in task image</td>
</tr>
<tr>
<td>ROV</td>
<td>Task has resident overlays</td>
</tr>
<tr>
<td>NET</td>
<td>Network protocol level</td>
</tr>
<tr>
<td>GFL</td>
<td>Group-global event flags are locked</td>
</tr>
<tr>
<td>SWS</td>
<td>Reserved for Software Services</td>
</tr>
<tr>
<td>MPC</td>
<td>Mapping change with outstanding I/O</td>
</tr>
</tbody>
</table>
### ANALYSIS LISTINGS

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.</td>
<td>Fourth status word, using the following three-letter codes:</td>
</tr>
<tr>
<td></td>
<td>MUT - Task is a multiuser task</td>
</tr>
<tr>
<td></td>
<td>LDD - Task load device is dismounted</td>
</tr>
<tr>
<td></td>
<td>PRO - TCB is a prototype</td>
</tr>
<tr>
<td></td>
<td>PRV - Task was privileged but has cleared TB.PRV with the GIN directive</td>
</tr>
<tr>
<td></td>
<td>DSP - Task was built for user data space</td>
</tr>
<tr>
<td></td>
<td>SNC - Task uses common synchronization</td>
</tr>
<tr>
<td>18.</td>
<td>Octal dump of TCB in offset mode</td>
</tr>
<tr>
<td></td>
<td>RECEIVE QUEUE (if the task has one)</td>
</tr>
<tr>
<td>19.</td>
<td>Starting address of receive block</td>
</tr>
<tr>
<td>20.</td>
<td>Name of task</td>
</tr>
<tr>
<td>21.</td>
<td>Octal dump of receive block in offset mode</td>
</tr>
<tr>
<td></td>
<td>OFFSPRING CONTROL BLOCK (OCB) LIST (if the task has one)</td>
</tr>
<tr>
<td>22.</td>
<td>Exit event flag number of offspring task</td>
</tr>
<tr>
<td>23.</td>
<td>Name of parent task</td>
</tr>
<tr>
<td>24.</td>
<td>Octal dump of offspring control block in offset mode</td>
</tr>
<tr>
<td></td>
<td>ASYNCHRONOUS SYSTEM TRAP (AST) QUEUE (if the task has one)</td>
</tr>
</tbody>
</table>

If a task has an AST Queue, CDA lists its contents. If the task also has a Receive Queue, the AST Queue appears immediately after the Receive Queue on the output listing. If the task does not have a Receive Queue, the AST Queue is listed after the fourth status word information (the example in Figure 3-10 does not include an AST Queue).

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

- Unsolicited AST
- Floating point AST
- Receive data AST
- Receive-by-reference AST
- Parity error AST
- Requested exit AST
- Power fail
- CLI command arrival AST
- Buffered I/O AST
ANALYSIS LISTINGS

- Offspring task AST
- Segmented buffered I/O completion AST
- Task force trace bit trap AST
- Delayed I/O completion AST
- Group-global rundown AST
- 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 the task has one)

If a task has a Receive-by-Reference Queue, CDA lists its contents. If the task also has an Offspring Control Block list, the Receive-by-Reference Queue appears immediately before the OCB list on the output listing. If the task does not have an OCB list, the Receive-by-Reference Queue is the last list on the Active Tasks listing (the example in Figure 3-10 does not include a Receive-by-Reference Queue).

- 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
ANALYSIS LISTINGS

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ACTIVE TASKS

...LDR 1

TCB ADDRESS = 111650  PAR = SYSPAR  PCB ADDRESS = 111434

LOAD ADDRESS = 00461600  LOAD DEVICE = LR01  LBN = 00076636

PRI = 248  I/O COUNT = 0  UIC = [1,24]  TI = 0001

MAX SIZE = 000035  EVENT FLAGS = <1-16> 000001  <17-32> 000000

T,STAT1  000000 (14)

T,STAT2  020020  =CHK STP (15)

T,STAT3  050200  =PMO PRV NSD (16)

T,STAT4  000000 (17)

TCB DUMP:

000000  000000  000000  000000  111574  045662  000000  111662  000000
000020  111666  000001  000000  022370  111500  000000  030020  050200
000040  000370  076636  031420  111434  000035  013350  111426  111426
000060  000000  000000  000000  000001  111672  000035  000000  000000
000080  000000  111755  000000  111754  000000  000000  000000  000000

....

RECEIVE QUEUE

RECEIVE BLOCK ADDRESS = 062000  TASK NAME = TUSKRD

000000  000000  190143  043624  016266  050210  061600  121502  024172
000020  140002  133460  000000  000000  000000  000000  000000  000000
000040  046522  000000

....

OCB LIST:

EXIT EVENT FLAG (0,EFLN) = 000000 (22)

PARENT TASK NAME = QMG... (23)

OCB DUMP:

000000  000000  000000  196424  121352  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 the MCR task (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 MCR... is the active task.

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

3-26
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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Task name</td>
</tr>
<tr>
<td>2.</td>
<td>Pointer to the first word in the task header</td>
</tr>
<tr>
<td>3.</td>
<td>Pointer to the first word in the Task Control Block (TCB)</td>
</tr>
<tr>
<td>4.</td>
<td>Contents of Processor Status Word (PSW) and Program Counter (PC)</td>
</tr>
<tr>
<td>5.</td>
<td>Contents of the general registers</td>
</tr>
<tr>
<td>6.</td>
<td>Initial contents of the PSW, the PC, and the stack pointer (SP)</td>
</tr>
<tr>
<td>7.</td>
<td>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</td>
</tr>
<tr>
<td>8.</td>
<td>Current and default UIC</td>
</tr>
<tr>
<td>9.</td>
<td>Pointer to number of window blocks</td>
</tr>
<tr>
<td>10.</td>
<td>Pointer to header guard word</td>
</tr>
<tr>
<td>11.</td>
<td>Work area extension vector pointer</td>
</tr>
<tr>
<td>12.</td>
<td>Priority difference for swapping</td>
</tr>
<tr>
<td>14.</td>
<td>Address of File Control Services (FCS) impure area</td>
</tr>
<tr>
<td>15.</td>
<td>Address of FORTRAN impure area</td>
</tr>
<tr>
<td>16.</td>
<td>Address of overlay impure storage</td>
</tr>
</tbody>
</table>

LOGICAL UNIT TABLE

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.</td>
<td>Logical unit number (LUN)</td>
</tr>
<tr>
<td>18.</td>
<td>Physical device name before redirect</td>
</tr>
<tr>
<td>19.</td>
<td>Window pointer in header</td>
</tr>
</tbody>
</table>
### ANALYSIS LISTINGS

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
</table>
| 20.  | 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

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>27.</td>
<td>The name of the partition in which the task runs</td>
</tr>
<tr>
<td>28.</td>
<td>The virtual limits of the task</td>
</tr>
<tr>
<td>29.</td>
<td>Address of attachment descriptor</td>
</tr>
<tr>
<td>30.</td>
<td>Window size in 32-word blocks</td>
</tr>
<tr>
<td>31.</td>
<td>Offset into partition</td>
</tr>
<tr>
<td>32.</td>
<td>Address of the first Page Description Register (PDR) used to map the window</td>
</tr>
<tr>
<td>33.</td>
<td>Number of PDRs used</td>
</tr>
<tr>
<td>34.</td>
<td>The contents of the last PDR used</td>
</tr>
<tr>
<td>35.</td>
<td>Octal dump of task header in offset mode</td>
</tr>
</tbody>
</table>
## ANALYSIS LISTINGS

**RSX-11M CRASH DUMP ANALYZER**  
**TASK HEADERS**  

**TKTN**  

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| **HEADER ADDRESS** | 076060 | **TCB ADDRESS** | 107134 |
| **PS** | 170000 | **PC** | 122630 |
| **R0** | 120254 | **R1** | 000065 | **R2** | 000060 | **R3** | 140354 | **R4** | 120702 | **R5** | 051024 | **SP** | 120226 |
| **INITIAL PS** | 170017 | **INITIAL PC** | 120764 | **INITIAL SP** | 120230 |
| **HEADER SIZE** | 102 | **NO. OF WINDOWS** | 1 | **NO. OF LUNS** | 1 |
| **CURRENT UIC** | [1, 24] | **DEFAULT UIC** | [1, 24] |
| **H.WND** | 076162 | **H.GARD** | 076224 | **H.VEXT** | 000000 | **H.SPRI** | 5 |
| **DSW** | 000001 | **H.FCS** | 000000 | **H.FORT** | 000000 | **H.OVLY** | 000000 |

### LOGICAL UNIT TABLE:

<table>
<thead>
<tr>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
<th>21</th>
<th>22</th>
<th>23</th>
<th>24</th>
<th>25</th>
<th>26</th>
</tr>
</thead>
<tbody>
<tr>
<td># DEV</td>
<td>WINDOW</td>
<td>W.CTL</td>
<td>W.FCB</td>
<td>F.FNUM</td>
<td>F.FSEQ</td>
<td>F.SHT</td>
<td>NAC</td>
<td>NLCK</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>TIO1</td>
<td>000000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### WINDOW BLOCKS:

<table>
<thead>
<tr>
<th>27</th>
<th>28</th>
<th>29</th>
<th>30</th>
<th>31</th>
<th>32</th>
<th>33</th>
<th>34</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAR</td>
<td>VIRT LIMITS</td>
<td>ATT DESC</td>
<td>WND SIZE</td>
<td>OFFSET</td>
<td>1ST PDR</td>
<td>NO.</td>
<td>LAST PDR</td>
</tr>
<tr>
<td>TKNPAR</td>
<td>120000</td>
<td>127777</td>
<td>045220</td>
<td>000100</td>
<td>000000</td>
<td>177612</td>
<td>1</td>
</tr>
</tbody>
</table>

### HEADER:

| 000000 | 122226 | 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 |
| 000060 | 000005 | 000000 | 000000 | 000000 | 000000 | 076224 | 000001 | 04570 |
| 000100 | 000000 | 000001 | 114450 | 120000 | 127777 | 045220 | 000100 | 000000 |
| 000120 | 000612 | 037406 | 170000 | 122630 | 051024 | 120702 | 140354 | 000000 |
| 000140 | 000065 | 120254 | 000000 |

Figure 3-12 Task Headers (Truncated)
3.2.4 Command Line Interpreter Parser Block (CPB)

The listing shown in Figure 3-13 contains the Command Line Interpreter Parser Block for MCR. The listing corresponds to the following items:

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Task name of the CLI</td>
</tr>
<tr>
<td>2.</td>
<td>Starting address of the CPB</td>
</tr>
<tr>
<td>3.</td>
<td>C.PSTS, which is the CPB status word</td>
</tr>
<tr>
<td>4.</td>
<td>Dump of the CPB in octal</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Partition names</td>
</tr>
<tr>
<td>2.</td>
<td>Partition Control Block (PCB) address</td>
</tr>
<tr>
<td>3.</td>
<td>Base address of partition in memory</td>
</tr>
<tr>
<td>4.</td>
<td>Size of the partition</td>
</tr>
<tr>
<td>5.</td>
<td>Type of partition</td>
</tr>
<tr>
<td>6.</td>
<td>Task or tasks occupying the partition</td>
</tr>
</tbody>
</table>
## ANALYSIS LISTINGS

### RSX-11M CRASH DUMP ANALYZER

**PARTITION INFORMATION**

### Memory Map

<table>
<thead>
<tr>
<th>PARTITION</th>
<th>PCBADR</th>
<th>BASE</th>
<th>SIZE</th>
<th>TYPE</th>
<th>OCCUPIED BY</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;EXEC&gt;</td>
<td>0000000</td>
<td>00000000</td>
<td>0004470</td>
<td>MAIN COMMON</td>
<td></td>
</tr>
<tr>
<td>&lt;POOL&gt;</td>
<td>0004470</td>
<td>00050100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CEXPAR</td>
<td>114734</td>
<td>00115000</td>
<td>00003000</td>
<td>MAIN DRIVER</td>
<td>TTI</td>
</tr>
<tr>
<td>TPPAR</td>
<td>114670</td>
<td>00120000</td>
<td>00040000</td>
<td>MAIN COMMON</td>
<td></td>
</tr>
<tr>
<td>EXCOM1</td>
<td>114624</td>
<td>00160000</td>
<td>00014600</td>
<td>MAIN COMMON</td>
<td></td>
</tr>
<tr>
<td>EXCOM2</td>
<td>114560</td>
<td>00174600</td>
<td>00006100</td>
<td>MAIN COMMON</td>
<td></td>
</tr>
<tr>
<td>SYSPAR</td>
<td>114514</td>
<td>00202700</td>
<td>00010000</td>
<td>MAIN TASK</td>
<td>MCR...</td>
</tr>
<tr>
<td>TKNPAR</td>
<td>114450</td>
<td>00212700</td>
<td>00010000</td>
<td>MAIN TASK</td>
<td>TKTN</td>
</tr>
<tr>
<td>DRVPAR</td>
<td>114404</td>
<td>00222700</td>
<td>00003200</td>
<td>MAIN SYS</td>
<td></td>
</tr>
<tr>
<td>114340</td>
<td>00222700</td>
<td>00002100</td>
<td>SUB DRIVER</td>
<td>DB1</td>
<td></td>
</tr>
<tr>
<td>114140</td>
<td>00226200</td>
<td>00003000</td>
<td>SUB DRIVER</td>
<td>DM1</td>
<td></td>
</tr>
<tr>
<td>114040</td>
<td>00231200</td>
<td>00003000</td>
<td>SUB DRIVER</td>
<td>DR1</td>
<td></td>
</tr>
<tr>
<td>113740</td>
<td>00234200</td>
<td>00001000</td>
<td>SUB DRIVER</td>
<td>EM1</td>
<td></td>
</tr>
<tr>
<td>113640</td>
<td>00235200</td>
<td>00000100</td>
<td>&lt;HOLE&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>113540</td>
<td>00236400</td>
<td>00001100</td>
<td>SUB DRIVER</td>
<td>DT1</td>
<td></td>
</tr>
<tr>
<td>113440</td>
<td>00243900</td>
<td>00001400</td>
<td>SUB DRIVER</td>
<td>DX1</td>
<td></td>
</tr>
<tr>
<td>113340</td>
<td>00242200</td>
<td>00002200</td>
<td>SUB DRIVER</td>
<td>DL1</td>
<td></td>
</tr>
<tr>
<td>113240</td>
<td>00245000</td>
<td>00001300</td>
<td>SUB DRIVER</td>
<td>DM1</td>
<td></td>
</tr>
<tr>
<td>113140</td>
<td>00246300</td>
<td>00001300</td>
<td>SUB DRIVER</td>
<td>LM1</td>
<td></td>
</tr>
<tr>
<td>112450</td>
<td>00252600</td>
<td>00000300</td>
<td>SUB DRIVER</td>
<td>COI</td>
<td></td>
</tr>
<tr>
<td>LDRPAR</td>
<td>112404</td>
<td>00253100</td>
<td>00002500</td>
<td>MAIN TASK</td>
<td>LDR...</td>
</tr>
<tr>
<td>BASIC2</td>
<td>112340</td>
<td>00255600</td>
<td>00040000</td>
<td>MAIN COMMON</td>
<td></td>
</tr>
<tr>
<td>FCSRES</td>
<td>112274</td>
<td>00315600</td>
<td>00040000</td>
<td>MAIN COMMON</td>
<td></td>
</tr>
<tr>
<td>TSTOPAR</td>
<td>112239</td>
<td>00355600</td>
<td>00100000</td>
<td>MAIN TASK</td>
<td></td>
</tr>
<tr>
<td>GEN</td>
<td>112164</td>
<td>00455600</td>
<td>00322000</td>
<td>MAIN SYS</td>
<td></td>
</tr>
<tr>
<td>045620</td>
<td>00455600</td>
<td>00024000</td>
<td>SUB TASK</td>
<td>D32FCP</td>
<td></td>
</tr>
<tr>
<td>057144</td>
<td>00501600</td>
<td>00025500</td>
<td>SUB TASK</td>
<td>NETACP</td>
<td></td>
</tr>
<tr>
<td>064610</td>
<td>00534500</td>
<td>00023300</td>
<td>SUB TASK</td>
<td>RMHACP</td>
<td></td>
</tr>
<tr>
<td>053004</td>
<td>00560000</td>
<td>00052000</td>
<td>SUB TASK</td>
<td>CA,T6</td>
<td></td>
</tr>
<tr>
<td>073553</td>
<td>00565200</td>
<td>00052000</td>
<td>SUB TASK</td>
<td>CA,T30</td>
<td></td>
</tr>
<tr>
<td>045910</td>
<td>00603500</td>
<td>00005700</td>
<td>SUB TASK</td>
<td>PMT...</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 3-14** Partition Information
ANALYSIS LISTINGS

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

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Partition name</td>
</tr>
<tr>
<td>2.</td>
<td>Pointer to the first word of the PCB</td>
</tr>
<tr>
<td>3.</td>
<td>Type of partition</td>
</tr>
<tr>
<td>4.</td>
<td>Name of main partition</td>
</tr>
<tr>
<td>5.</td>
<td>Physical base address of partition in 32-word blocks</td>
</tr>
<tr>
<td>6.</td>
<td>Partition size in 32-word blocks</td>
</tr>
<tr>
<td>7.</td>
<td>Pointer to the first word of the TCB of attached task</td>
</tr>
<tr>
<td>8.</td>
<td>Partition protection word (mapped system only)</td>
</tr>
<tr>
<td>9.</td>
<td>Priority of attached task or partition</td>
</tr>
<tr>
<td>10.</td>
<td>I/O count of attached task or partition</td>
</tr>
<tr>
<td>11.</td>
<td>Partition status flags, using the following three-letter codes:</td>
</tr>
<tr>
<td></td>
<td>OUT - Partition is out of memory</td>
</tr>
<tr>
<td></td>
<td>CKP - Partition checkpoint in progress</td>
</tr>
<tr>
<td></td>
<td>CKR - Partition checkpoint is requested</td>
</tr>
<tr>
<td></td>
<td>CAF - Checkpoint space allocation failure</td>
</tr>
<tr>
<td></td>
<td>-CHK - Partition is not checkpointable</td>
</tr>
<tr>
<td></td>
<td>FXD - Partition is fixed</td>
</tr>
<tr>
<td></td>
<td>LFR - Last head of region failure</td>
</tr>
<tr>
<td></td>
<td>PER - Parity error in partition</td>
</tr>
<tr>
<td></td>
<td>LIO - Marked by Shuffler for long I/O</td>
</tr>
<tr>
<td></td>
<td>NSF - Partition cannot be shuffled</td>
</tr>
<tr>
<td></td>
<td>COM - Library or common block</td>
</tr>
<tr>
<td></td>
<td>DEL - Partition should be deleted when not attached</td>
</tr>
<tr>
<td>12.</td>
<td>Octal dump of PCB in offset mode</td>
</tr>
</tbody>
</table>
### ANALYSIS LISTINGS

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ATTACHMENT DESCRIPTOR</strong></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Address of attachment descriptor</td>
</tr>
<tr>
<td>14.</td>
<td>Partition to which attachment occurs</td>
</tr>
<tr>
<td>15.</td>
<td>Name of attaching task</td>
</tr>
<tr>
<td>16.</td>
<td>PCB attachment queue thread word</td>
</tr>
<tr>
<td>17.</td>
<td>TCB attachment queue thread word</td>
</tr>
<tr>
<td>18.</td>
<td>Priority of highest priority task attached to this partition</td>
</tr>
<tr>
<td>19.</td>
<td>I/O count of attached task on RSX-11M systems; I/O count of attached partition on RSX-11M-PLUS systems</td>
</tr>
<tr>
<td>20.</td>
<td>Number of times task is mapped through this attachment descriptor</td>
</tr>
<tr>
<td>21.</td>
<td>Attachment descriptor status byte, using the following three-letter codes:</td>
</tr>
<tr>
<td></td>
<td><strong>DEL</strong> - Task has delete access</td>
</tr>
<tr>
<td></td>
<td><strong>EXT</strong> - Task has extend access</td>
</tr>
<tr>
<td></td>
<td><strong>WRT</strong> - Task has write access</td>
</tr>
<tr>
<td></td>
<td><strong>RED</strong> - Task has read access</td>
</tr>
<tr>
<td></td>
<td><strong>PRO</strong> - TCB is secondary pool TCB bias</td>
</tr>
<tr>
<td></td>
<td><strong>SPB</strong> - Cache bypass request</td>
</tr>
<tr>
<td></td>
<td><strong>RBP</strong> - Request to not bypass cache</td>
</tr>
<tr>
<td>22.</td>
<td>Octal dump of attachment descriptors in offset mode</td>
</tr>
<tr>
<td><strong>PARTITION WAIT QUEUE</strong></td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>Name of the task awaiting access to the partition</td>
</tr>
<tr>
<td>24.</td>
<td>Address of TCB for the task</td>
</tr>
<tr>
<td>25.</td>
<td>TI: device for the task</td>
</tr>
<tr>
<td>26.</td>
<td>Task's priority</td>
</tr>
<tr>
<td>27.</td>
<td>Second status word (state bits)—same as item 15 of the active task dump (Section 3.2.1)</td>
</tr>
</tbody>
</table>

---

**RSX-11M-PLUS SYSTEMS ONLY ADDITIONAL ITEM DESCRIPTION**

| 28. | Resident mapped task count |
| 29. | Wait queue contains partition description rather than task description |

---

3-34
<table>
<thead>
<tr>
<th>PARTITION PCB ADR</th>
<th>TYPE</th>
<th>MAIN BASE</th>
<th>SIZE</th>
<th>P,TCB</th>
<th>PRO PRI IOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRVPAR</td>
<td>SUB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P,STAT: SYS DRV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PARTITION PCB ADR</th>
<th>TYPE</th>
<th>MAIN BASE</th>
<th>SIZE</th>
<th>P,TCB</th>
<th>PRO PRI IOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYSPAR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P,STAT:</td>
<td>(1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PARTITION PCB ADR</th>
<th>TYPE</th>
<th>MAIN BASE</th>
<th>SIZE</th>
<th>P,TCB</th>
<th>PRO PRI IOC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WAIT QUEUE: TASK TCB ADR</th>
<th>TI T,PRI STATE BITS (T,ST2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F11ACP</td>
<td>C00 149, CAF STP</td>
</tr>
</tbody>
</table>

| ATTACHMENT DESCRIPTORS: ADDRESS PARTITION ATT TASK A,PCBL A,TCBL PRI IOC MAP COUNT |
|-----------------------------|------------|----------|-----------|-------------|
| 042060 041764 040244 115264 | SYSPAR 041764 | 000000 160, 0, 0. |
| A,STAT: WRT RED            |             |          |

Figure 3-15 Partition Control Blocks and Attachment Descriptors
### 3.2.6 Common Block Directory

CDA lists partition information, status words, and Partition Control Blocks 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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Name of the installed common region partition</td>
</tr>
<tr>
<td>2.</td>
<td>Address of Partition Control Block (PCB)</td>
</tr>
<tr>
<td>3.</td>
<td>Type of partition</td>
</tr>
<tr>
<td>4.</td>
<td>Name of the main partition</td>
</tr>
<tr>
<td>5.</td>
<td>Physical base address of partition</td>
</tr>
<tr>
<td>6.</td>
<td>Size of partition in 32(decimal)-word blocks</td>
</tr>
<tr>
<td>7.</td>
<td>Owning UIC of the common region</td>
</tr>
<tr>
<td>8.</td>
<td>Partition protection word</td>
</tr>
</tbody>
</table>

---

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

Item Description

9. Resident mapped task count
10. Partition status words (refer to Section 3.2.4)
11. Octal dump of PCB
12. Address of PCB of the common task image file
13. Address of Unit Control Block (UCB) of the device on which the common resides
14. Starting logical block number (LBN) of the common task image file
15. Word that always contains a 0
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 for these items 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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Device name</td>
</tr>
<tr>
<td>2</td>
<td>Address of offset 0 in Unit Control Block (UCB)</td>
</tr>
<tr>
<td>3</td>
<td>Address of offset 0 in Device Control Block (DCB)</td>
</tr>
<tr>
<td>4</td>
<td>Address of offset 0 in Status Control Block (SCB)</td>
</tr>
<tr>
<td>5</td>
<td>Device to which unit is redirected</td>
</tr>
<tr>
<td>6</td>
<td>Name of Ancillary Control Processor (ACP)</td>
</tr>
<tr>
<td>7</td>
<td>Name of attached task</td>
</tr>
<tr>
<td>8</td>
<td>Pointer to the UCB name of the owning terminal</td>
</tr>
<tr>
<td>9</td>
<td>UIC used to log into the system</td>
</tr>
<tr>
<td>10</td>
<td>Unit status byte, using the following three-letter codes:</td>
</tr>
<tr>
<td></td>
<td>BSY - Unit is busy</td>
</tr>
<tr>
<td></td>
<td>-MNT - Unit is not mounted</td>
</tr>
<tr>
<td></td>
<td>FOR - Unit is mounted as a foreign volume</td>
</tr>
<tr>
<td></td>
<td>MDM - Unit is marked for dismount</td>
</tr>
<tr>
<td></td>
<td>PWF - Power fail occurred</td>
</tr>
<tr>
<td></td>
<td>WCK - Write check enabled</td>
</tr>
<tr>
<td></td>
<td>SPU - Unit is spinning up</td>
</tr>
<tr>
<td></td>
<td>VV - Volume is valid</td>
</tr>
<tr>
<td>11</td>
<td>Unit status extension byte, using the following three-letter codes:</td>
</tr>
<tr>
<td></td>
<td>OFL - Unit off line</td>
</tr>
<tr>
<td></td>
<td>-RED - Unit is not redirectable</td>
</tr>
<tr>
<td></td>
<td>PUB - Unit is public device</td>
</tr>
<tr>
<td></td>
<td>UMD - Unit attached for diagnostics</td>
</tr>
<tr>
<td></td>
<td>PDF - Privileged diagnostic functions only</td>
</tr>
</tbody>
</table>
ANALYSIS LISTINGS

Item Description

12. Control Processing flags, using the following three-letter codes:

- 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, using the following three-letter codes:

- 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, using the following three-letter codes:

- 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
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRT</td>
<td>Unit is a CRT</td>
</tr>
<tr>
<td>ESC</td>
<td>Unit generates escape sequences</td>
</tr>
<tr>
<td>LOG</td>
<td>User not logged in on terminal</td>
</tr>
<tr>
<td>SLV</td>
<td>Unit is a slave terminal</td>
</tr>
<tr>
<td>DZ1</td>
<td>Unit is a DZ11</td>
</tr>
<tr>
<td>HLD</td>
<td>Terminal is in hold screen mode</td>
</tr>
<tr>
<td>AT.</td>
<td>MCR command AT. is being processed</td>
</tr>
<tr>
<td>PRV</td>
<td>Unit is a privileged terminal</td>
</tr>
<tr>
<td>L3S</td>
<td>Unit is a LA30S terminal</td>
</tr>
<tr>
<td>VT5</td>
<td>Unit is a VT05B terminal</td>
</tr>
<tr>
<td>LWC</td>
<td>Lowercase to uppercase conversion</td>
</tr>
</tbody>
</table>

15. Terminal status word, using the following three-letter codes:

- 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
### ANALYSIS LISTINGS

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.</td>
<td>Second terminal status word using the following three-letter codes:</td>
</tr>
<tr>
<td></td>
<td>ACR - Wrap-around required</td>
</tr>
<tr>
<td></td>
<td>CR - Trailing carriage return required on output</td>
</tr>
<tr>
<td></td>
<td>BRQ - Break-through write is queued</td>
</tr>
<tr>
<td></td>
<td>WRA - Control for wraparound</td>
</tr>
<tr>
<td></td>
<td>SRQ - Special request is queued</td>
</tr>
<tr>
<td></td>
<td>WRB - Low bit in 52-WRA bit pattern</td>
</tr>
<tr>
<td></td>
<td>ORQ - Output request is queued</td>
</tr>
<tr>
<td></td>
<td>IRQ - Input request is queued</td>
</tr>
<tr>
<td></td>
<td>HFL - Horizontal fill required</td>
</tr>
<tr>
<td></td>
<td>VFL - Vertical fill required</td>
</tr>
<tr>
<td></td>
<td>HHT - Hardware horizontal tab is present</td>
</tr>
<tr>
<td></td>
<td>HFF - Hardware form-feed is present</td>
</tr>
<tr>
<td></td>
<td>FLF - Force line feed before next echo</td>
</tr>
<tr>
<td></td>
<td>FOX - Line is full duplex mode</td>
</tr>
<tr>
<td>17.</td>
<td>Fourth terminal status word, using the following three-letter codes:</td>
</tr>
<tr>
<td></td>
<td>RAL - Terminal is in read-pass-all mode</td>
</tr>
<tr>
<td></td>
<td>WES - Task waiting for escape sequence</td>
</tr>
<tr>
<td></td>
<td>RPO - Read with prompt output in progress</td>
</tr>
<tr>
<td></td>
<td>TAB - Type-ahead buffer allocation requested</td>
</tr>
<tr>
<td></td>
<td>8BC - Pass eight bits on input</td>
</tr>
<tr>
<td></td>
<td>ABD - Autobaud speed detection enabled</td>
</tr>
<tr>
<td></td>
<td>RCU - Restore cursor</td>
</tr>
<tr>
<td></td>
<td>ABP - Autobaud speed detection in progress</td>
</tr>
<tr>
<td></td>
<td>WAL - Terminal is in write-pass-all mode</td>
</tr>
<tr>
<td></td>
<td>VER - Last character in type-ahead buffer has a parity error</td>
</tr>
</tbody>
</table>
# Analysis Listings

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCC</td>
<td>Last character in type-ahead buffer has a framing error</td>
</tr>
<tr>
<td>DAO</td>
<td>Last character in type-ahead buffer has a data overrun error</td>
</tr>
<tr>
<td>PCU</td>
<td>Position cursor</td>
</tr>
</tbody>
</table>

**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 (UCB), including negative offsets, and octal dump of UCB 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. Name of the task requesting I/O
23. 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-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
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.

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, Radix-50, 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.
**ANALYSIS LISTINGS**

**POOL DUMP**

* = NEXT WORD ALLOCATED
FIRST FREE BLOCK (SCRAVL) = 041760
+ = NEXT WORD IS IN SPKAVL LIST
= NEXT WORD IS IN SPKAVL AND ALSO IN SCRAVL

```
041674  * 000000  * 042710  * 042154  * 042164  1  KFX JBD JBDII HEDII
041704  * 000400  * 000002  * 003204  * 000407  1  FP B AA, FMI1 1
041714  * 000007  * 002400  * 002112  * 000401  1  G 2 9 9 QG 1 J 1
041724  * 000000  * 000240  * 160000  * 000000  1  X 53X 1
041734  * 087400  * 002347  * 051522  * 0305s0  1  Z 010 XMM 5021 J RSX1
041744  * 046461  * 046102  * 032462  * 000000  1LNA LHB HTR 1115L525
041754  * 000000  * 045064  * 042014  * 000004  1  K8 JST DII 11 I D1
041764  * 000000  * 000225  * 115764  * 000020  1  C/ XBD 11 1
041784  * 000300  * 117714  * 041764  * 040240  1  YL JAB D < 1 C
042004  * 115264  * 000000  * 000003  * 117704  1X0D 1 C YL114 <
042014  * 042604  * 000000  * 000044  * 042624  1J6T D J9s 6114D 4D51
042024  * 000000  * 000000  * 040212  * 001010  1P 1MT MII 1
042034  * 121200  * 002111  * 140000  * 000000  1Z 00 0,2 11 "1 1
042044  * 000000  * 012054  * 001356  * 000000  1P CID RX 11 1
042054  * 000553  * 011016  * 000000  * 000000  1IC MF 11 I
042064  * 042400  * 000034  * 115264  * 007422  1J9H 1 0x0 05R1 D 1
042074  * 000000  * 010000  * 115346  * 000016  1TSH X0VII JI F1
042104  * 042400  * 000014  * 000000  * 000000  1J9H L 1 D1 I
042114  * 000003  * 000114  * 042020  * 000044  1C 1 J5X 611 85 I
042124  * 000000  * 000000  * 041016  * 000400  1P 1V0 1PP1 B
042134  * 120426  * 001376  * 140026  * 000000  1Y08 SF 0/N 11 1
042144  * 201412  * 140047  * 000003  * 000000  1SR 0/1 1
042154  * 000000  * 000000  * 000000  * 041260  1JZ211 081
043164  * 000000  * 000000  * 000000  * 000000  1A 4 A 1
042174  * 000041  * 000000  * 000000  * 000000  1FQ 11 1
042184  * 000003  * 000000  * 000000  * 000000  1C 1 1
042194  * 002112  * 000401  * 000000  * 000000  1SR FQ 111 J
042204  * 000000  * 000000  * 000000  * 000111  1A1 1
042234  * 000000  * 122022  * 042330  * 000242  1ZJB KX T11 $KD 1
042244  * 115264  * 005374  * 000000  * 000000  1X0D AOL 114 I
042254  * 100000  * 115306  * 042760  * 000000  13TM X0V KGX D11 03E 1
042264  * 042500  * 002114  * 140054  * 000000  1KCL ST 0/A 1IDEL, 1
042274  * 004212  * 001000  * 120636  * 000000  1JMB L2 YIN 81I 1
042304  * 140436  * 000000  * 000000  * 141750  1B/15 1MII 1 MCI
042314  * 010000  * 000000  * 000000  * 000025  1L2 2 U11 1
042324  * 000000  * 000020  * 042550  * 000154  1P KDH BII IE3 I
042334  * 050061  * 020105  * 030466  * 000154  1L31 EFU G,Y 0/111PE 60 1
042344  * 170017  * 120374  * 120252  * 000000  16PO Y0L Y, J 1l PI
042354  * 000000  * 120712  * 00016  * 000000  1Y5R N 11 J1 1
042364  * 000000  * 000003  * 000000  * 000000  1 I
042374  * 042436  * 000011  * 000000  * 000000  1X0N A 11 E 1
042444  * 123558  * 000000  * 000375  * 000060  1Z1P FM 11 ME 1
042454  * 000000  * 000000  * 000000  * 042500  1XCI 11 H1
042464  * 002412  * 002000  * 000000  * 041540  1H JMB JLI1 1311
042474  * 000000  * 000000  * 117074  * 120000  1A YL X1 13 1
042484  * 130477  * 041764  * 000055  * 000000  1NO J46 A/1117tCE 1
```

Figure 3-19 Pool Dump (Truncated)
ANALYSIS LISTINGS

SECONDARY POOL DUMP

NUMBER OF FREE BYTES = 0037500
LENGTH = 00120000 BYTES
START ADDRESS = 00625000
ENDING ADDRESS = 00627500

00625000 000000 000101 000000 131574
00625010 003273 000000 140012 000000
00625020 140016 002044 000000 000000
00625030 006314 100000 020000 050000
00625040 001101 041972 042334 113634
00625050 001101 080000 000000 000000
00625060 000000 000000 000000 000000
00625070 000000 000143 000000 000000
00625080 000000 140190 000000 140194
00625090 000000 000000 000000 000000
00625100 000000 000000 000000 000000
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
00625180 000000 000000 000000 000000
00625190 000000 000000 000000 000000
00625200 000000 000000 000000 131574
00625210 003313 000000 140012 000000
00625220 140016 001660 000000 000000
00625230 006651 100000 020000 050000
00625240 005006 022346 023344 113634
00625250 000168 000000 000000 140054
00625260 000000 000000 000000 000000
00625270 000000 000162 000000 000000
00625280 000000 140190 000000 140194
00625290 000000 000000 000000 000000
00625300 000000 000000 000000 000000
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
00625380 000000 000000 000000 000000
00625390 000000 000000 000000 000000
00625400 000000 000000 000000 000000
00625410 000000 000000 000000 000000
00625420 000000 000000 000000 000000
00625430 000000 000000 000000 000000
00625440 000000 000000 000000 000000
00625450 000000 000000 000000 000000
00625460 000000 000000 000000 000000
00625470 000000 000000 000000 000000
00625480 000000 000000 000000 000000
00625490 000000 000000 000000 000000
00625500 000000 000000 000000 000000
00625510 000000 000000 000000 000000
00625520 000000 000000 000000 000000
00625530 000000 000000 000000 000000

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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Task name</td>
</tr>
<tr>
<td>2.</td>
<td>Address of the first word of the Task Control Block for the task</td>
</tr>
<tr>
<td>3.</td>
<td>Address of the first word of the task's header</td>
</tr>
</tbody>
</table>

**WINDOW BLOCKS**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Name of the partition to which the task is mapped</td>
</tr>
<tr>
<td>5.</td>
<td>Task virtual address limits</td>
</tr>
<tr>
<td>6.</td>
<td>Address of the attachment descriptor</td>
</tr>
<tr>
<td>7.</td>
<td>Size of window in 32-word blocks</td>
</tr>
<tr>
<td>8.</td>
<td>Offset to memory region within partition in 32-word blocks</td>
</tr>
<tr>
<td>9.</td>
<td>First Page Description Register (PDR) used to map the task</td>
</tr>
<tr>
<td>10.</td>
<td>Number of PDRs used to map task</td>
</tr>
<tr>
<td>11.</td>
<td>Contents of the last PDR used to map the task</td>
</tr>
<tr>
<td>12.</td>
<td>Task virtual address limits</td>
</tr>
<tr>
<td>13.</td>
<td>Physical starting address of the memory region being dumped</td>
</tr>
<tr>
<td>14.</td>
<td>Dump of the data within the window, formatted in octal, Radix-50, and ASCII</td>
</tr>
</tbody>
</table>
### TASK DUMP OF ***MCR (1)

**TCB ADDRESS = 115264**  
**HEADER ADDRESS = 042760**

<table>
<thead>
<tr>
<th>WINDOW BLOCKS</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PAR</td>
<td>VIRT LIMITS</td>
<td>ATT DESC</td>
<td>WND SIZE</td>
<td>OFFSET</td>
<td>1ST PDR</td>
<td>NO.</td>
<td>LAST PDR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSPAR</td>
<td>120400</td>
<td>130477</td>
<td>042000</td>
<td>001001</td>
<td>000000</td>
<td>177172</td>
<td>1</td>
<td>042006</td>
<td></td>
</tr>
</tbody>
</table>

### WINDOW #1 -- TASK VIRTUAL LIMITS 120000-130477 (2)

**PHYSICAL STARTING ADDRESS = 00137200 (3)**

| 120000 | 124362 | 000162 | 040000 | 115310 | 1Y08 B4 J1X X0X11< % ?M ! |  |  |  |
| 120010 | 000424 | 000424 | 170017 | 120636 | 1F6 F6 890 Y00111 | D ! |  |  |
| 120020 | 120636 | 000000 | 000000 | 000000 | 1Y08 | II |  |  |
| 120030 | 000000 | 000000 | 000000 | 000000 | 1D |  |  |  |
| 120040 | 000000 | 000000 | 043076 | 000001 | 1KIV A11 >1 |  |  |  |
| 120050 | 000000 | 000000 | 121176 | 000000 | 1Y08 | 11 |  |  |
| 120060 | 000000 | 000000 | 000000 | 000000 | 1D |  |  |  |
| 120070 | 000000 | 000000 | 041100 | 000004 | 041260 | 1KJP D J12111 >1 0B1 |  |  |
| 120080 | 000000 | 041400 | 000000 | 041600 | 1J 2 J 1211 C C1 |  |  |  |
| 120090 | 000000 | 041354 | 000000 | 000000 | 1J L A11 1B |  |  |  |
| 120100 | 117074 | 120000 | 130477 | 042000 | 1Y08 Y 1X NO J5H11< 71 D1 |  |  |  |
| 120110 | 000105 | 000105 | 000120 | 042006 | 1A/ 14 J5111E D1 |  |  |  |
| 120120 | 170070 | 122360 | 000000 | 000000 | 1B0 ZOX 11 PPS |  |  |  |
| 120130 | 120420 | 000070 | 120472 | 000000 | 1Y08 AP Y14 | 1B | 11 |  |
| 120140 | 000000 | 000000 | 000000 | 000000 | 1 | 1 |  |  |

(ABOVE LINE REPEATED 10 TIMES)

| 120310 | 000000 | 000000 | 006001 | 001010 | 1A 63 M 11 |  |  |
| 120320 | 000004 | 000004 | 121202 | 000000 | 1D 1ZB 11 | " |  |
| 120330 | 121634 | 004130 | 121202 | 000000 | 1ZGD AMP A11 #1 |  |  |
| 120340 | 125512 | 060100 | 120515 | 000000 | 13PJ OP Y2M 1J11*1 |  |  |
| 120350 | 121232 | 001453 | 001047 | 125040 | 1Z Z TK 1SH211 "* 1 |  |  |

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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Address of the clock queue entry</td>
</tr>
</tbody>
</table>
| 2.   | Types of time schedule requests  
One of the following 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 labels are:

- C.AST - AST address
- C.SRC - Event flag mask word
- C.DST - Event flag mask address
- Event Flag Number

For a periodic rescheduling request, the labels are:

- C.RSI - Reschedule internal
- C.UIC - Scheduling UIC

The field for a single-shot task request contains only one label:

- C.UIC - Scheduling UIC

The field for a single-shot internal subroutine (both with and without system subroutine identification) contains:

- C.SUB - Subroutine address
- C.AR5 - Relocation base address (for loadable drivers)

7. Octal dump of clock queue in offset mode
ANALYSIS LISTINGS

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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Name of the device controller</td>
</tr>
<tr>
<td>2.</td>
<td>Address of the Controller Table (CTB)</td>
</tr>
<tr>
<td>3.</td>
<td>Address of the Device Controller Block (DCB) for this device</td>
</tr>
</tbody>
</table>
| 4.   | CTB status byte, which may contain any of the following three-letter status codes:  
  CLK - Clock block appears at the top of the CTB  
  MDC - Multidriver CTB  
  CBL - Clock block is linked into the clock queue  
  CIN - Controller uses the common interrupt dispatch table  
  NET - DECnet device |
<p>| 5.   | Octal dump of the CTB |
| 6.   | Common Interrupt Address |</p>
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td>DCB for each device interfaced by this controller</td>
</tr>
<tr>
<td>8.</td>
<td>Name of each device interfaced by this controller</td>
</tr>
<tr>
<td>9.</td>
<td>Address of the Controller Request Block (KRB)</td>
</tr>
</tbody>
</table>
| 10.  | Controller status. The following is a list of possible status values and their meanings:  
|      | OPL - 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 KRB in one or two parts |

**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.
### ANALYSIS LISTINGS

**RSX-11M-PLUS CRASH DUMP ANALYZER V3.0 2-MAY-85 12:51 PAGE 6**

**KERNEL DATA SPACE DUMP**

<table>
<thead>
<tr>
<th>VIRTUAL ADDRESS</th>
<th>PHYSICAL ADDRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>001000</td>
<td>000000</td>
</tr>
</tbody>
</table>

[ABOVE LINE REPEATED 28 TIMES]

<table>
<thead>
<tr>
<th>001350</th>
<th>000000</th>
<th>000000</th>
<th>020422</th>
<th>000000</th>
<th>1</th>
<th>EKZ</th>
<th>1</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>001360</td>
<td>177400</td>
<td>000000</td>
<td>000000</td>
<td>020416</td>
<td>1</td>
<td>XE</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>001370</td>
<td>005015</td>
<td>025052</td>
<td>042425</td>
<td>02530</td>
<td>1</td>
<td>AXM F/4 KBZ KC21</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>001400</td>
<td>020103</td>
<td>040520</td>
<td>045422</td>
<td>054524</td>
<td>1</td>
<td>EFS JR K/J NK KL</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>001410</td>
<td>021403</td>
<td>045122</td>
<td>051117</td>
<td>041440</td>
<td>1</td>
<td>KBP MF4 MF1 ML</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>001420</td>
<td>027524</td>
<td>025122</td>
<td>025052</td>
<td>085015</td>
<td>1</td>
<td>LS3 F32 F/4 AXM</td>
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<td></td>
</tr>
<tr>
<td>001430</td>
<td>000012</td>
<td>177777</td>
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<td>031190</td>
<td>1</td>
<td>J 80 90 A HII</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>001440</td>
<td>160377</td>
<td>177781</td>
<td>003660</td>
<td>000000</td>
<td>1599 2A FF</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>001450</td>
<td>000001</td>
<td>001450</td>
<td>001450</td>
<td>001450</td>
<td>1</td>
<td>TH TH TH</td>
<td>1</td>
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</tr>
<tr>
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<td>001450</td>
<td>001450</td>
<td>001450</td>
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<td>1</td>
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</tr>
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<td>001480</td>
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<td>001450</td>
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<td>2</td>
<td>TH TH TH</td>
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</tr>
<tr>
<td>001520</td>
<td>177746</td>
<td>177755</td>
<td>177752</td>
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<td>1</td>
<td>70 72 74 6F11</td>
<td>h</td>
<td></td>
</tr>
<tr>
<td>001530</td>
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<td>L26</td>
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</tr>
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<td>001540</td>
<td>000000</td>
<td>000000</td>
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<td>1</td>
<td></td>
</tr>
<tr>
<td>001550</td>
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<td>000000</td>
<td>000001</td>
<td>1</td>
<td>YXX</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>001560</td>
<td>000001</td>
<td>024220</td>
<td>000000</td>
<td>000001</td>
<td>1</td>
<td>A J82 AXM J/A1 K</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>001570</td>
<td>040522</td>
<td>044123</td>
<td>026440</td>
<td>020005</td>
<td>1</td>
<td>JRB KV5 GH2 EE7</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>001600</td>
<td>047503</td>
<td>052116</td>
<td>054340</td>
<td>052111</td>
<td>1</td>
<td>LSK MSV M7X MS01</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>001610</td>
<td>021010</td>
<td>024152</td>
<td>040522</td>
<td>041524</td>
<td>1</td>
<td>EFX J05 JRB J06</td>
<td>H CRATC1</td>
<td></td>
</tr>
<tr>
<td>001620</td>
<td>020110</td>
<td>024251</td>
<td>044504</td>
<td>024101</td>
<td>1</td>
<td>EFX KCU K 6</td>
<td>EPQ11H MEDIA</td>
<td></td>
</tr>
<tr>
<td>001630</td>
<td>047117</td>
<td>042040</td>
<td>033113</td>
<td>050115</td>
<td>1</td>
<td>LUG J6 G/C AXM</td>
<td>110 DK0</td>
<td></td>
</tr>
<tr>
<td>001640</td>
<td>000012</td>
<td>005110</td>
<td>051110</td>
<td>051501</td>
<td>1</td>
<td>J AXM MF5 ML311</td>
<td>CRAS1</td>
<td></td>
</tr>
<tr>
<td>001650</td>
<td>020110</td>
<td>026055</td>
<td>044400</td>
<td>020117</td>
<td>1</td>
<td>EFX GIE K K, EP11H</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>001660</td>
<td>051105</td>
<td>047522</td>
<td>020112</td>
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<td>1</td>
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<td>ERROR ON1</td>
<td></td>
</tr>
<tr>
<td>001670</td>
<td>041400</td>
<td>040522</td>
<td>044123</td>
<td>042091</td>
<td>1</td>
<td>J/R JRB KV5 J6</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>001700</td>
<td>040525</td>
<td>028122</td>
<td>042501</td>
<td>045226</td>
<td>1</td>
<td>LN7 EF2 KCL K/NJUMP DEV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>001710</td>
<td>042303</td>
<td>025040</td>
<td>041420</td>
<td>045022</td>
<td>1</td>
<td>KCK BHC J8B JRB1</td>
<td>ICE CRA1</td>
<td></td>
</tr>
<tr>
<td>001720</td>
<td>041423</td>
<td>026440</td>
<td>029055</td>
<td>045023</td>
<td>1</td>
<td>KV5 GH2 EE7 JRC11SH</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>001730</td>
<td>045116</td>
<td>054520</td>
<td>052042</td>
<td>045101</td>
<td>1</td>
<td>K/F NK MRP LNY</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>001740</td>
<td>051105</td>
<td>042442</td>
<td>051013</td>
<td>051111</td>
<td>1</td>
<td>MFU KBP L40 MFY1</td>
<td>ERROR</td>
<td>EXPIR1</td>
</tr>
<tr>
<td>001750</td>
<td>042105</td>
<td>047440</td>
<td>020116</td>
<td>051012</td>
<td>1</td>
<td>J67 L2P EP0 MF211</td>
<td>ED ON PR1</td>
<td></td>
</tr>
<tr>
<td>001760</td>
<td>045117</td>
<td>051505</td>
<td>047523</td>
<td>020121</td>
<td>1</td>
<td>J80 ML7 LS84F 111CE</td>
<td>CRFSOR1</td>
<td></td>
</tr>
<tr>
<td>001770</td>
<td>050103</td>
<td>026420</td>
<td>014112</td>
<td>045022</td>
<td>1</td>
<td>L33 BHC J8B JRB1</td>
<td>CCR1</td>
<td></td>
</tr>
<tr>
<td>002000</td>
<td>041233</td>
<td>026440</td>
<td>000003</td>
<td>116301</td>
<td>1</td>
<td>KV5 GH2 C YC111SH</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

[END OF ANALYSIS OUTPUT]

---

Figure 3-23 Kernel Data Space
**ANALYSIS LISTINGS**

**RSX-11M-PLUS CRASH DUMP ANALYZER V3.0  2-MAY-85  12151  PAGE 5**

**KERNEL INSTRUCTION SPACE DUMP**

<table>
<thead>
<tr>
<th>VIRTUAL ADDRESS</th>
<th>PHYSICAL ADDRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>001000 000000 000000 000000 000000 000000</td>
<td>0001000 000000 000000 000000 000000 000000</td>
</tr>
</tbody>
</table>

**[ABOVE LINE REPEATED 28 TIMES]**

<table>
<thead>
<tr>
<th>Address</th>
<th>Code</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>001350</td>
<td>A83019</td>
<td>080000 023422 000000</td>
</tr>
<tr>
<td>001360</td>
<td>174400</td>
<td>000000 000000 02416</td>
</tr>
<tr>
<td>001370</td>
<td>A05915</td>
<td>025452 042452 042537</td>
</tr>
<tr>
<td>001400</td>
<td>021034</td>
<td>044520 044522 054524</td>
</tr>
<tr>
<td>001410</td>
<td>042440</td>
<td>051122 051127 051400</td>
</tr>
<tr>
<td>001420</td>
<td>075242</td>
<td>025122 025052 000515</td>
</tr>
<tr>
<td>001430</td>
<td>000120</td>
<td>177777 172227 000310</td>
</tr>
<tr>
<td>001440</td>
<td>163377</td>
<td>177021 003366 000000</td>
</tr>
<tr>
<td>001450</td>
<td>000101</td>
<td>014540 014545 014540</td>
</tr>
<tr>
<td>001460</td>
<td>014540</td>
<td>014545 014540 014540</td>
</tr>
<tr>
<td>001470</td>
<td>014540</td>
<td>014545 014540 014540</td>
</tr>
<tr>
<td>001500</td>
<td>014540</td>
<td>014545 014540 014540</td>
</tr>
<tr>
<td>001520</td>
<td>177777</td>
<td>177777 177777 177777</td>
</tr>
<tr>
<td>001530</td>
<td>024000</td>
<td>000000 023004 000000</td>
</tr>
<tr>
<td>001540</td>
<td>000000</td>
<td>000000 053044 000000</td>
</tr>
<tr>
<td>001550</td>
<td>120133</td>
<td>000000 000000 000001</td>
</tr>
<tr>
<td>001560</td>
<td>001000</td>
<td>042220 05015 041412</td>
</tr>
<tr>
<td>001570</td>
<td>045022</td>
<td>044123 026406 020506</td>
</tr>
<tr>
<td>001600</td>
<td>047553</td>
<td>052116 053440 052111</td>
</tr>
<tr>
<td>001610</td>
<td>021014</td>
<td>041523 040522 041524</td>
</tr>
<tr>
<td>001620</td>
<td>021014</td>
<td>042515 044504 028191</td>
</tr>
<tr>
<td>001630</td>
<td>047117</td>
<td>042404 038113 038505</td>
</tr>
<tr>
<td>001640</td>
<td>020142</td>
<td>051519 051123 051511</td>
</tr>
<tr>
<td>001650</td>
<td>021110</td>
<td>026655 044404 028117</td>
</tr>
<tr>
<td>001660</td>
<td>051195</td>
<td>047522 029122 047117</td>
</tr>
<tr>
<td>001670</td>
<td>041440</td>
<td>040522 044123 042048</td>
</tr>
<tr>
<td>001700</td>
<td>045625</td>
<td>020120 042504 044526</td>
</tr>
<tr>
<td>001710</td>
<td>042503</td>
<td>006400 041412 049522</td>
</tr>
<tr>
<td>001720</td>
<td>044123</td>
<td>026440 020855 040523</td>
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<td>001730</td>
<td>044516</td>
<td>054524 052040 046516</td>
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<td>001740</td>
<td>051185</td>
<td>042240 050130 051111</td>
</tr>
<tr>
<td>001750</td>
<td>042195</td>
<td>027740 020116 051210</td>
</tr>
<tr>
<td>001760</td>
<td>041517</td>
<td>051505 047523 028122</td>
</tr>
<tr>
<td>001770</td>
<td>052124</td>
<td>026600 041412 045522</td>
</tr>
<tr>
<td>002000</td>
<td>044123</td>
<td>026440 000003 115301</td>
</tr>
</tbody>
</table>

**Figure 3-24 Kernel Instruction Space**

3-55
### TASK DUMP OF LITT27

---

**DATA SPACE**

TCB ADDRESS = 042204  HEADER ADDRESS = 011323

**WINDOW BLOCKS:**

<table>
<thead>
<tr>
<th>PAR</th>
<th>VIRT LIMITS</th>
<th>ATT DESC</th>
<th>KND SIZE</th>
<th>OFFSET</th>
<th>1ST PDR</th>
<th>NO.</th>
<th>LAST PDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEN</td>
<td>000000 002077</td>
<td>040300</td>
<td>000002</td>
<td>000015</td>
<td>177620</td>
<td>1</td>
<td>010006</td>
</tr>
<tr>
<td></td>
<td>160000 160177</td>
<td>041040</td>
<td>000002</td>
<td>00010</td>
<td>177636</td>
<td>1</td>
<td>000402</td>
</tr>
</tbody>
</table>

**WINDOW #2 -- TASK VIRTUAL LIMITS 008000-002077**

---

**PHYSICAL STARTING ADDRESS = 01134000**

```
| 400000 | 400000 | 400252 | 400313 | 160400 | 1 | DJ 035 b | 11 | * K0 e1  |
| 400020 | 400134 | 000000 | 000000 | 000000 | 000000 | 1 | AFI AFI 8PD 53X119 9 p *1  |
| 400030 | 000000 | 000000 | 000000 | 000000 | 000000 | 1 | RL    | 11 | 1  |
| 400040 | 000000 | 140252 | 140126 | 000000 | 1    | 038 006 A1 | 1 | *EVE  |
| 400050 | 000000 | 000000 | 000000 | 000000 | 000000 | 1    | 0  |
| 400060 | 000000 | 000000 | 000000 | 000000 | 000000 | 1    | 1  |
| 400070 | 000000 | 140250 | 000000 | 025200 | 1    | 03 F 8211 (e PX1  |
| 400080 | 000000 | 025200 | 000000 | 025200 | 1    | IX 8211 PX PX1  |
| 400090 | 025200 | 025200 | 000000 | 037460 | 1    | 8211 PX 27 |
| 4000a0 | 000000 | 037506 | 000000 | 000000 | 1    | JDB    | 01 | F0  |
| 4000b0 | 147540 | 000000 | 000000 | 011877 | 000000 | 1    | LV7, NO | 11d | 7  |
| 4000c0 | 000011 | 000004 | 000000 | 040004 | 1    | 1 | D IX AKN11  |
| 4000d0 | 107544 | 000000 | 020777 | 000000 | 1    | LV7, SG | 11d | 7  |
| 4000e0 | 000021 | 000000 | 000000 | 010006 | 1    | Q G  | J BV71  |
| 4000f0 | 401044 | 160000 | 160177 | 000000 | 1    | 1JLD 53X 6CG | 11d0 | a 1 |
| 400100 | 000000 | 000000 | 000000 | 001616 | 02402 | 1    | F  | 11  |
| 400110 | 401044 | 160000 | 160177 | 000000 | 1    | 1JLD 53X 56 | 11d0 | * 1 |
| 400120 | 000000 | 000000 | 000000 | 001616 | 02402 | 1    | B H  | JN F111  |
| 400130 | 177470 | 000000 | 000000 | 010400 | 1    | LEDD 0 D | JG  |
| 400140 | 140313 | 046174 | 131574 | 000000 | 1    | 1055 LIT... | 11K01L13 |
| 400150 | 000000 | 000000 | 000000 | 000000 | 1    | 1  |

(ABOVE LINE REPEATED 63 TIMES)
```

---

Figure 3-25 Task Data Space
### Instruction Space

**TCB Address = 117300**
**Header Address = 117130**

#### Window Blocks:

<table>
<thead>
<tr>
<th>PAR</th>
<th>VIRT LIMITS</th>
<th>ATT DESC</th>
<th>MND SIZE</th>
<th>OFFSET</th>
<th>1ST PDR</th>
<th>NO.</th>
<th>LAST PDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYSVAR</td>
<td>120000</td>
<td>123777</td>
<td>117114</td>
<td>000040</td>
<td>200020</td>
<td>177612</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Window #1 -- Task Virtual Limits 120000-123777

**Physical Starting Address = 00530100**

```
128000 000000 000146 140664 140630 1 BV 09 09 11 4 4A A1
128010 000424 00424 177017 128226 1 F6 F6 BPO YS011 0 1
128020 124166 000003 000000 000000 1 LYS0 1 1V 1
128030 000000 000000 000000 000000 1       1 1
128040 000000 000000 00102 000000 1 1 1 1
128050 000000 000000 000000 000000 1       1 1
128060 000000 000000 000000 000000 1       1 1
128070 000000 000144 000001 037602 1 JFR11 2 9 1
128080 000000 000001 117610 128000 1 YU YX 11 1
128100 123777 000000 000400 000000 1 125G 2 1 1
128120 000612 017406 000143 000283 1 D8V BS C1 1
128130 000000 140636 140066 045662 1 09 09 LDR11 A4A2K1
128140 131574 000000 000000 000000 1   113 1
128150 000000 000000 000000 140630 1 09 1 A1
128160 000802 123666 102707 006003 1 BYZ8 UP A6511 1 V 1
128170 001080 000001 000001 120214 1 L2 A A YST11 1
128200 000000 140000 101700 000000 1 0,2 UCH 11 10 1
128210 000000 047662 000000 000000 1 10 L0 11 80 1
128220 000000 000000 031401 104376 1 10 YIT AYO T.X DOP11,17 X 1
128230 120454 005067 106570 016700 105, PKH J AWH11 106 1
128240 061024 062700 000012 004767 103, PKH J AWH11 106 1
```

Figure 3-26 Task Instruction Space
CHAPTER 4
INTERPRETING A CRASH DUMP LISTING

This chapter introduces basic concepts that can help you to use CDA output listings to analyze the cause of a system crash. However, this 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 (instruction space registers on RSX-llM systems, both instruction and data space registers on RSX-11M-PLUS systems). This listing, titled Volatile Registers, is shown in Figure 3-1.

Figure 4-1 is an example of the listing of the contents of the sixth and seventh words from a Kernel Page Address Registers dump. The contents of the sixth and seventh words are the block numbers of the task or driver that was mapped at the time of the crash. You can determine what occupied that portion of memory from the memory map on the first page of partition information in the CDA output listing. Look under the BASE heading (for the base address of the mapped partition).

You can use this information, along with data from the kernel stack and system common listings, to analyze the state of the system at the time of the crash.
4.1.2 Interpreting the Kernel Stack

$STKDP$, which appears on the first page of the system common listing, is the system stack depth indicator. The value of the stack depth indicator shows which state the system was in when it crashed. The following lists shows the possible values of the stack depth indicator and the corresponding system states.

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

Note that when the system is in Interrupt state, the stack depth value is negative. Two types of interrupt conditions can decrement stack depth:

1. A synchronous system trap (SST), which can be caused by any of the following:
   - A directive
   - A TRAP instruction
   - An illegal instruction
   - Another SST

2. The interrupt save routine ($INTSV$)

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

- The Processor Status Word (PSW)
- The Program Counter (PC)
- The address of return to DIRSV
- SST specific information
- R5 (Mapped systems only)
- R4 (Mapped systems only)
- R3
- R2
- R1
- R0

Figure 4-1 Kernel Page Address Registers
When an interrupt occurs, the following are pushed onto the stack:

PSW
PC

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

Address of return to $INTSV
R5
R4

The stack depth is then decremented. If the value of $STKDP is 0 and the currently mapped driver issues a call to the $FORK routine, the following items are pushed onto the stack:

Return to $FORK
R3 (Which replaces the return to $INTSV)
R2
R1
R0

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 Executive, 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 contents of the PC and the PSW before the crash appear on the first page of the CDA listing. You can compare this information to the contents of the PC and the PSW on the stack to help locate the cause of the crash.

Refer to the RSX-llM Guide to Writing an I/O Driver or to the RSX-llM-PLUS Guide to Writing an I/O Driver for a 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.

Not all of the messages listed below terminate CDA analysis. Some are simply informational messages, and others warn you of nonfatal errors. Also, this list includes some ANALYZE/CRASH_DUMP command error messages.

ANALYZE -- Illegal crash input specification

Type: Fatal

Explanation: You must include a crash-input device or file in the command line. Also, you must use the correct command line syntax when you specify the crash input.

ANALYZE -- Illegal crash output specification

Type: Fatal

Explanation: You must specify at least one output file or device specification. Also, you must use the correct command line syntax when you specify the crash output.

ANALYZE -- Illegal, contradictory, or ambiguous qualifiers

Type: Fatal

Explanation: You must use qualifiers with the correct file or device specification. Refer to the qualifier tables in Chapter 2 if you are unsure which file or device specification a qualifier modifies. Also, when you specify qualifier arguments, be sure to enclose them in parentheses. If you specify more than one argument for the same qualifier, separate the arguments with commas.

ANALYZE -- Sorry, task not installed

Type: Fatal

Explanation: CDA is not presently installed in the system. If you are a nonprivileged user, refer to Chapter 1 for an explanation of how you can run CDA as an uninstalled task, or ask a privileged user (such as your system manager) to install CDA.
CDA MESSAGES

If you are a privileged user, you can install CDA and then reenter your command line.

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:
- A device failure
- A bad block on the volume
- The crashed system had a corrupted data base
- 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(decimal) 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 MESSAGES

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 Page Address Registers are invalid. To restart the analysis, you must specify the /KRM 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:

- A device failure
- A bad block on the volume
- 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:

- A device failure
- 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:

- A device failure
- A bad block on the volume
- 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:

- A full volume
- A problem with the device
- 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:

- A full volume
- A problem with the device
- 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 Postmortem Dump (PMD) is installed in the system, the system will generate a snapshot dump. This is an indication of a software problem. If you send a Software Performance Report (SPR) to DIGITAL for this type of failure, you should include any available dumps.
CDA MESSAGES

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 (ALUN$) directive failed when CDA attempted to use it to attach the specified input device before reading the crash dump from the device. ALUN$ 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 (EXTK$) 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:
   - The specified device does not exist.
   - The volume is not mounted.
   - A problem exists with the device.
CDA MESSAGES

- The specified UFO does not exist.
- The specified file does not exist.
- You do not have read access privileges.

CDA -- Failed to open output file filename

Type: Fatal

Explanation: One of the following conditions exists:

- The specified device does not exist.
- The volume is not mounted.
- A problem exists with the device.
- The specified UFO does not exist.
- The volume is full or the device is write-protected.
- You do not have write access privilege to UFO.

CDA -- Illegal switch

Type: Fatal

Explanation: You specified an unknown switch or used a legal switch with 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 MESSAGES

CDA -- Invalid address range

Type: Fatal

Explanation: You specified an address that was not consistent with Active Page Register (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 exceeded the maximum allowable number of nested indirect command files. (CDA only permits one indirect command level.)

CDA -- No input file specified

Type: Fatal

Explanation: You did not specify a crash dump input file.

CDA -- No output file specified

Type: Fatal

Explanation: You did not specify an output file.

CDA -- Output dump filename must be explicit

Type: Fatal

Explanation: You did not specify a valid 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 the end-of-file mark on a magnetic tape) 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 MESSAGES

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 Unit Control Block (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: This 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
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 MESSAGES

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:

- Unsolicited character AST
- Buffered I/O AST
- Emit status AST
- Completion AST from:
  
  QIOS
  MRKT$  
  SPWN$  
  CNCT$  
  CINT$

1. 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 DCBDFS
DCBDFS $ ;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.

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

Table B-1
Summary of System Data Structure Macros

<table>
<thead>
<tr>
<th>Macro</th>
<th>Arguments</th>
<th>Data Structures</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABODFS$</td>
<td>&lt;&gt;,&lt;=&gt;</td>
<td>Task abort and termination notification message codes</td>
</tr>
<tr>
<td>CLKDFS$</td>
<td>&lt;&gt;,&lt;=&gt;</td>
<td>Clock queue control block</td>
</tr>
<tr>
<td>DCBDFS$</td>
<td>&lt;&gt;,&lt;=&gt;</td>
<td>Device Control Block</td>
</tr>
<tr>
<td>EPKDFS$</td>
<td>&lt;&gt;,&lt;=&gt;</td>
<td>Error message block</td>
</tr>
<tr>
<td>EVNDFS$</td>
<td>&lt;&gt;,&lt;=&gt;</td>
<td>Terminal Software Architecture (TSA) event packet definitions</td>
</tr>
</tbody>
</table>

(Continued on next page)
### RSX-11M System Data Structures and Symbolic Definitions

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

<table>
<thead>
<tr>
<th>Macro</th>
<th>Arguments</th>
<th>Data Structures</th>
</tr>
</thead>
<tbody>
<tr>
<td>FllDF$</td>
<td>&lt;&gt;,&lt;&gt;</td>
<td>Files-ll data structures (volume control block, mount list entry, file Control Block, file window block, locked block list node)</td>
</tr>
<tr>
<td>HDRDF$</td>
<td>&lt;&gt;,&lt;&gt;</td>
<td>Task header and window block</td>
</tr>
<tr>
<td>HWDDF$</td>
<td>&lt;&gt;,&lt;&gt;</td>
<td>Hardware register addresses and feature mask definitions</td>
</tr>
<tr>
<td>ITBDF$</td>
<td>&lt;&gt;,&lt;&gt;</td>
<td>Interrupt transfer block</td>
</tr>
<tr>
<td>LCBDF$</td>
<td>&lt;&gt;,&lt;&gt;</td>
<td>Logical assignment control block</td>
</tr>
<tr>
<td>MTADF$</td>
<td>&lt;&gt;,&lt;&gt;</td>
<td>ANSI magtape data structures (volume set control block)</td>
</tr>
<tr>
<td>PCBDF$</td>
<td>&lt;&gt;,&lt;&gt;</td>
<td>Partition Control Block and attachment descriptor</td>
</tr>
<tr>
<td>PKTDF$</td>
<td>&lt;&gt;,&lt;&gt;</td>
<td>I/O packet, AST control block, offspring control block, group global event flag control block, and CLI parser block</td>
</tr>
<tr>
<td>SCBDF$</td>
<td>&lt;&gt;,&lt;&gt;</td>
<td>Status Control Block and UMR assignment block</td>
</tr>
<tr>
<td>TCBDF$</td>
<td>&lt;&gt;,&lt;&gt;</td>
<td>Task Control Block</td>
</tr>
<tr>
<td>UCBDF$</td>
<td>&lt;&gt;,&lt;=&gt;,TTDEF</td>
<td>Unit Control Block</td>
</tr>
</tbody>
</table>
RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

ABODFS$  

.MACRO ABODFS$,L,B  
;
; TASK ABORT CODES  
;  
; NOTE: S.COAD-S.CFLT ARE ALSO SST VECTOR OFFSETS  
;  
S.CACT='B'-4. ;TASK STILL ACTIVE  
S.CEXT='B'-2. ;TASK EXITTED NORMALLY  
S.COAD='B'0. ;ODD ADDRESS AND TRAPS TO 4  
S.CSGF='B'2. ;SEGMENT FAULT  
S.CBPT='B'4. ;BREAK POINT OR TRACE TRAP  
S.CIOT='B'6. ;IOT INSTRUCTION  
S.CILI='B'8. ;ILLEGAL OR RESERVED INSTRUCTION  
S.CEMT='B'10. ;NON RSX EMT INSTRUCTION  
S.CTRP='B'12. ;TRAP INSTRUCTION  
S.CFLT='B'14. ;11/40 FLOATING POINT EXCEPTION  
S.CSST='B'16. ;SST ABORT-BAD STACK  
S.CAST='B'18. ;SST ABORT-BAD STACK  
S.CABO='B'20. ;ABORT VIA DIRECTIVE  
S.CCLR='B'22. ;TASK LOAD REQUEST FAILURE  
S.CCRF='B'24. ;TASK CHECKPOINT READ FAILURE  
S.IOIM='B'26. ;TASK EXIT WITH OUTSTANDING I/O  
S.PRTY='B'28. ;TASK MEMORY PARITY ERROR  
S.CPM='B'30. ;TASK ABORTED WITH PMD REQUEST  
S.CINS='B'32. ;TASK INSTALLED IN TWO SYSTEMS  
;  
; TASK TERMINATION NOTIFICATION MESSAGE CODES  
;  
T.NDNR='B'0 ;DEVICE NOT READY  
.NDSE='B'2 ;DEVICE SELECT ERROR  
T.NCWF='B'4 ;CHECKPOINT WRITE FAILURE  
T.NCRE='B'6 ;CARD READER HARDWARE ERROR  
T.NDMO='B'8 ;DISMOUNT COMPLETE  
T.NEUR='B'10 ;UNRECOVERABLE ERROR  
T.NLDN='B'12 ;LINK DOWN (NETWORKS)  
T.NLUP='B'14 ;LINK UP (NETWORKS)  
T.NCFL='B'16 ;CHECKPOINT FILE INACTIVE  
T.NUDE='B'18 ;UNRECOVERABLE DEVICE ERROR  
T.NMPE='B'20 ;MEMORY PARITY ERROR  
T.NKLF='B'22 ;UCODE LOADER NOT INSTALLED  
T.NDEB='B'24 ;TASK HAS NO DEBUGGING AID  
T.NRCTL='B'26 ;CONTROL TASK NOT INSTALLED  
T.NWSB='B'28 ;WRITE BACK CACHING DATA LOST. UNIT  
;WRITE LOCKED  
T.NPNT='B'30 ;REQUIRED PARTITION NOT IN SYSTEM  
T.NIOP='B'32 ;I/O STALLED  
T.NIOR='B'34 ;I/O RESUMING  
.MACRO ABODFS$ X,Y  
.ENDM  
.ENDM  

B-3
CLKDF$.

.MACRO CLKDF$,L,B

; 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='B'0 ;MARK TIME REQUEST
C.SCHD='B'2 ;TASK REQUEST WITH PERIODIC RESCHEDULING
C.SSHT='B'4 ;SINGLE SHOT TASK REQUEST
C.SYST='B'6 ;SINGLE SHOT INTERNAL SYSTEM SUBROUTINE
; (IDENT)
C.SYTK='B'8 ;SINGLE SHOT INTERNAL SYSTEM SUBROUTINE
; (TASK)
C.CSTP='B'10 ;CLEAR STOP BIT (CONDITIONALIZED ON
; SHUFFLING)
;
; CLOCK QUEUE CONTROL BLOCK TYPE INDEPENDENT OFFSET DEFINITIONS
;
.ASECT
.

C.LNK: 'L' .BLKW 1 ;CLOCK QUEUE THREAD WORD
C.RQT: 'L' .BLKB 1 ;REQUEST TYPE
C.EFN: 'L' .BLKB 1 ;EVENT FLAG NUMBER (MARK TIME ONLY)
C.TCB: 'L' .BLKW 1 ;TCB ADDRESS OR SYSTEM SUBROUTINE
; IDENTIFICATION
C.TIM: 'L' .BLKW 2 ;ABSOLUTE TIME WHEN REQUEST COMES DUE
;
; CLOCK QUEUE CONTROL BLOCK—MARK TIME DEPENDENT OFFSET DEFINITIONS
;

.C.TIM+4 ;START OF DEPENDENT AREA
C.AST: 'L' .BLKW 1 ;AST ADDRESS
C.SRC: 'L' .BLKW 1 ;FLAG MASK WORD FOR 'BIS' SOURCE
C.DST: 'L' .BLKW 1 ;ADDRESS OF 'BIS' DESTINATION
;
; CLOCK QUEUE CONTROL BLOCK—PERIODIC RESCHEDULING DEPENDENT OFFSET
; DEFINITIONS
;

.C.TIM+4 ;START OF DEPENDENT AREA
C.RSI: 'L' .BLKW 2 ;RESCHEDULE INTERVAL IN CLOCK TICKS
C.UIC: 'L' .BLKW 1 ;SCHEDULING UIC
; CLOCK QUEUE CONTROL BLOCK—SINGLE SHOT DEPENDENT OFFSET DEFINITIONS

.;=C.TIM+4 ;START OF DEPENDENT AREA
.BLKW 2 ;TWO UNUSED WORDS
.BLKW 1 ;SCHEDULING UIC

; CLOCK QUEUE CONTROL BLOCK—SINGLE SHOT INTERNAL SUBROUTINE OFFSET DEFINITIONS

; THERE ARE TWO TYPE CODES FOR THIS TYPE OF REQUEST: 'L'

; 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
C.SUB: 'L' .BLKW 1 ;SUBROUTINE ADDRESS
C.AR5: 'L' .BLKW 1 ;RELOCATION BASE (FOR LOADABLE DRIVERS)
.BLKW 1 ;ONE UNUSED WORD
C.LGTH='B' ;LENGTH OF CLOCK QUEUE CONTROL BLOCK
.PSECT

.MACRO CLKDFS X,Y
.ENDM
.ENDM
DCBDF$  

DCBDF

.MACRO  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 TTY'S IN A SYSTEM, THEN THERE IS AT LEAST ONE
  ; DCB WITH THE DEVICE NAME 'TT'. IF PART OF THE
  ; TTY'S 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 TTY'S, AND ONE FOR ALL DH11
  ; INTERFACED TTY'S.
  
  .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 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 TTDV)
  D.VINI=0 ; DEVICE INITIATOR
  D.VCAN=2 ; CANCEL CURRENT I/O FUNCTION
  D.VOUT=4 ; DEVICE TIMEOUT
  D.VPWF=6 ; POWERFAIL RECOVERY
RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

EPKDF$

.MACRO EPKDF$,L,B
; Error Message Block Definitions
- .ASECT

; Header Subpacket

<table>
<thead>
<tr>
<th>Subpacket Length in Bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subpacket Flags</td>
</tr>
<tr>
<td>Format Identification</td>
</tr>
<tr>
<td>Operating System Code</td>
</tr>
<tr>
<td>Operating System Identification</td>
</tr>
<tr>
<td>Flags</td>
</tr>
<tr>
<td>Context Code</td>
</tr>
<tr>
<td>Entry Sequence</td>
</tr>
<tr>
<td>Error Sequence</td>
</tr>
<tr>
<td>Entry Type Subcode</td>
</tr>
<tr>
<td>Entry Type Code</td>
</tr>
<tr>
<td>Time Stamp</td>
</tr>
<tr>
<td>Reserved</td>
</tr>
<tr>
<td>Processor Type</td>
</tr>
<tr>
<td>Processor Identification (URM)</td>
</tr>
</tbody>
</table>

; =0

E$HLGH: 'L' .BLK 1 ; Subpacket length in bytes
E$HSBF: 'L' .BLK 1 ; Subpacket Flags
E$SYS: 'L' .BLK 1 ; Operating System Code
E$IDN: 'L' .BLK 1 ; Format Identification
E$HSID: 'L' .BLK 4 ; Operating System Identification
E$CTX: 'L' .BLK 1 ; Context Code
E$FLG: 'L' .BLK 1 ; Flags
E$ENS: 'L' .BLK 1 ; Entry Sequence Number
E$ERS: 'L' .BLK 1 ; Error Sequence Number
E$ENC: 'L' ; Entry Code
E$TYC: 'L' .BLK 1 ; Entry Type Code
E$TYS: 'L' .BLK 1 ; Entry Type Subcode
E$TIM: 'L' .BLK 6 ; Time Stamp
E$PTY: 'L' .BLK 1 ; Processor Type
E$URM: 'L' .BLK 1 ; Processor Identification (URM)

.EVEN

E$LEN: 'L' ; Length
RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

EPKDF$ (Cont.)

; Subpacket Flags for E$HSBF
; SM.ERR='B' 1; Error Packet
SM.HDR='B' 1; Header Subpacket
SM.TSK='B' 2; Task Subpacket
SM.DID='B' 4; Device Identification Subpacket
SM.DOP='B' 10; Device Operation Subpacket
SM.DAC='B' 20; Device Activity Subpacket
SM.DAT='B' 40; Data Subpacket
SM.MBC='B' 20000; 22-bit massbus controller present
SM.CMD='B' 40000; Error Log Command Packet
SM.ZER='B' 100000; Zero I/O Counts
; Codes for field E$HIDN
EH$FOR='B' 1; Current packet format

; Flags for the error log flags byte ($ERFLA) in the exec.
ES.INI='B' 1; Error log initialized
ES.DAT='B' 2; Error log receiving data packets
ES.LIM='B' 4; Error limiting enabled
ES.LOG='B' 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$CCMD='B' 1; Error Log Control
E$SSTA='B' 1; Error Log Status Change
E$SWI='B' 2; Switch Logging Files
E$APP='B' 3; Append File
E$SBC='B' 4; Declare Backup File
E$SNO='B' 5; Show
E$SCHL='B' 6; Change Limits
E$SERR='B' 2; Device Errors
E$SHV='B' 1; Device Hard Error
E$SVS='B' 2; Device Soft Error
E$STMO='B' 3; Device Interrupt Timeout (HARD)
E$UNS='B' 4; Device Unsolicited Interrupt
E$STMS='B' 5; Device Interrupt Timeout (SOFT)
E$CDVI='B' 3; Device Information
E$SDVI='B' 1; Device Information Message
E$CDCI='B' 4; Device Control Information
E$SMOU='B' 1; Device Mount
E$SDMO='B' 2; Device Dismount
E$RES='B' 3; Device Count Reset
E$RC='B' 4; Block Replacement
E$CMEM='B' 5; Memory Detected Errors
E$SMMEM='B' 1; Memory Error
E$SYS='B' 6; System Control Information
E$SPWR='B' 1; Power Recovery
RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

EPKDF$ (Cont.)

E$CCCTL='B' 7 ; Control Information
E$STIM='B' 1 ; Time Change
E$SCR$='B' 2 ; System Crash
E$SLOA='B' 3 ; Device Driver Load
E$SUNL='B' 4 ; Device Driver Unload
E$SHRC='B' 5 ; Reconfiguration Status Change
E$SMEN='B' 6 ; Message
E$CPUR='B' 10 ; CPU Detected Errors
E$SINT='B' 1 ; Unexpected Interrupt
E$CSSDE='B' 11 ; Software Detected Events
E$SABO='B' 1 ; Task Abort

; Codes for Context Code entry E$HCTX
; E$SNOR='B' 1 ; Normal Entry
E$STT='B' 2 ; Start Entry
E$STCR='B' 3 ; Crash Entry

; Codes for Flags entry E$HFLG
; E$SVIR='B' 1 ; Addresses are virtual
E$SEX='B' 2 ; Addresses are extended
E$SCOU='B' 4 ; Error counts supplied
E$SBS='B' 10 ; Q-BUS CPU
E$SLR='B' 20 ; Limit reached

; Task Subpacket
;
; +-----------------------------------------------+
| Task Subpacket Length                        |
; +-----------------------------------------------+
| Task Name in RAD50                           |
; +-----------------------------------------------+
| Task UIC                                     |
; +-----------------------------------------------+
| Task TI: Device Name                         |
| +-----------------------------------------------+
| Flags                     | Task TI: Unit Number |
; +-----------------------------------------------+

.E0

E$TLCN:'L'.BLKW 1 ; Task Subpacket Length
E$TNSK:'L'.BLKW 2 ; Task Name in RAD50
E$TUIC:'L'.BLKW 1 ; Task UIC
E$TTID:'L'.BLKB 2 ; Task TI: Device Name
E$TTIU:'L'.BLKB 1 ; Task TI: Unit
E$TTLG:'L'.BLKB 1 ; Flags
.EVEN
E$TLEN:'L'

; Flags for entry E$TFLG
; ET$PRV='B' 1 ; Task is Privileged
ET$PRI='B' 2 ; Terminal is Privileged

B-9
### RSX-11M System Data Structures and Symbolic Definitions

#### EPKDFS (Cont.)

Device Identification Subpacket

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device Identification Subpacket Length</td>
<td></td>
</tr>
<tr>
<td>Device Mnemonic Name</td>
<td></td>
</tr>
<tr>
<td>Controller Number</td>
<td>Device Unit Number</td>
</tr>
<tr>
<td>Physical Subunit #</td>
<td>Physical Unit #</td>
</tr>
<tr>
<td>Physical Device Mnemonic</td>
<td></td>
</tr>
<tr>
<td>Reserved Mnemonic (RSX-11M-Plus only)</td>
<td></td>
</tr>
<tr>
<td>Flags</td>
<td></td>
</tr>
<tr>
<td>Volume Name of Mounted Volume</td>
<td></td>
</tr>
</tbody>
</table>

Pack Identification

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device Type Class</td>
<td></td>
</tr>
<tr>
<td>Device Type</td>
<td></td>
</tr>
<tr>
<td>I/O Operation Count Longword</td>
<td></td>
</tr>
<tr>
<td>Hard Error Count</td>
<td>Soft Error Count</td>
</tr>
<tr>
<td>Blocks Transferred Count (RSX-11M-Plus only)</td>
<td></td>
</tr>
<tr>
<td>Cylinders Crossed Count (RSX-11M-Plus only)</td>
<td></td>
</tr>
</tbody>
</table>

```
; 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
E$ILGH:'L' .BLKW 1 ; Device Identification Subpacket Length
E$ILDV:'L' .BLKW 1 ; Device Mnemonic Name
E$ILUN:'L' .BLKB 1 ; Device Unit Number
E$IPCO:'L' .BLKB 1 ; Controller Number
E$IPUN:'L' .BLKB 1 ; Physical Unit Number
E$IPSU:'L' .BLKB 1 ; Physical Subunit Number

;IF DF R$$MPL
E$IPDV:'L' .BLKW 1 ; Physical Device Mnemonic

;ENDC ; R$$MPL
```
RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

EPKDFS (Cont.)

E$IPLG:'L'.BLKB 1 ; Flags
.BLKB 1 ; Reserved
E$IVOL:'L'.BLKB 12. ; Volume Name
E$IPAK:'L'.BLKB 4 ; Pack Identification
E$IDEV:'L' ; Device Type
E$IDCL:'L'.BLKW 1 ; Device Type Class
E$IDTY:'L'.BLKW 2 ; Device Type
E$OPR:'L'.BLKW 2 ; I/O Operation Count Longword
E$ERS:'L'.BLKB 1 ; Soft Error Count
E$IERH:'L'.BLKB 1 ; Hard Error Count

.IF DF R$$MPL
E$IBLK:'L'.BLKW 2 ; Blocks transferred count
E$ICYL:'L'.BLKW 2 ; Cylinders crossed count

.ENDC ; R$$MPL

.EVEN
E$ILEN:'L' ; Subpacket Length
; Flags for field E$IPLG
; EI$SUB='B' 1 ; Subcontroller device
 .IF DF R$$MPL
EI$NUX='B' 2 ; No UCB extension, data invalid
 .ENDC ; R$$MPL

; 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

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RSX-IIM SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

EPKDF$ (Cont.)

E$OLGN:'L' .BLKW 1 ; Subpacket Length
E$OTSK:'L' .BLKW 2 ; Task Name in RAD50
E$OUIC:'L' .BLKW 1 ; Task UIC
E$OTID:'L' .BLKB 2 ; Task TI: Logical Device Mnemonic
E$OTIU:'L' .BLKB 1 ; Task TI: Logical Device Unit
 .BLKB 1 ; Reserved
E$OFNC:'L' .BLKW 1 ; I/O Function Code
E$OFLG:'L' .BLKW 1 ; Operation Flags
 .BLKB 1 ; Reserved
E$OADD:'L' .BLKW 2 ; Transfer Operation Address
E$OSIZ:'L' .BLKW 1 ; Transfer Operation Byte Count
E$ORTY:'L' .BLKW 1 ; Current Operation Retry Count
E$OLEN:'L' ; Device Operation Subpacket Length
 ; Flags for field E$OFLG
 ;
EO$TRA='B' 1 ; Transfer Operation
EO$DMA='B' 2 ; DMA Device
EO$EXT='B' 4 ; Extended Addressing Device
EO$PIP='B' 10 ; Device is positioning

; I/O Activity Subpacket
;
+-----------------------------------------------+
| I/O Activity Subpacket Length                 |
+-----------------------------------------------+

=0

E$ALGH:'L' .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-1lm-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                              |
+-----------------------------------------------+

(Continued on next page)
RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

EPKDF$ (Cont.)

+-----------------------+-----------------------+
| Reserved              | Flags                 |
| +-----------------------+-----------------------+
| Transfer Operation Address |                        |
| +-----------------------+-----------------------+
| Transfer Operation Byte Count |
+-----------------------+-----------------------+

=E=0

E$ALDV:'L' .BLKW 1 ; Logical Device Name Mnemonic
E$ALUN:'L' .BLKB 1 ; Logical Device Unit
E$APCO:'L' .BLKB 1 ; Controller Number
E$APUN:'L' .BLKB 1 ; Physical Unit Number
E$APSU:'L' .BLKB 1 ; Physical Subunit Number

."IF DF R$$MPL

E$APDV:'L' .BLKW 1 ; Physical Device Mnemonic

."ENDC

E$ADFG:'L' .BLKB 1 ; Device flags
E$ATIU:'L' .BLKB 1 ; Task TI: Logical Unit
E$ATSK:'L' .BLKW 2 ; Requesting Task Name in RAD50
E$AUIC:'L' .BLKW 1 ; Requesting Task UIC
E$ATID:'L' .BLKW 1 ; Task TI: Logical Device Name
E$AFNC:'L' .BLKW 1 ; I/O Function Code
E$APLG:'L' .BLKB 1 ; Flags
E$AADD:'L' .BLKW 1 ; Reserved
E$ASIZ:'L' .BLKW 2 ; Transfer Operation Address
E$ALEN:'L' EVEN ; Subpacket Entry Length

."IF DF R$$MPL

E$SUB='B' 1 ; Subcontroller device

."ENDC ; R$$MPL

E$NUX='B' 2 ; No UCB extension, data invalid

."ENDC ; R$$MPL

E$TRA='B' 1 ; Transfer Operation
E$DMA='B' 2 ; DMA Device
E$EXT='B' 4 ; Device has Extended Addressing
E$PIP='B' 10 ; Device is positioning

.PSECT

.MACRO EPKDF$ X,Y
 .ENDM

 .ENDM
EVNDF$.

.MACRO EVNDF$,L,B,LST

; EVNDF$ -- Event Packet Definitions
;
; This module contains a macro which defines the offsets and field values for TSA Event Packets (TEP's). These packets are used to pass data and status information between system components that provide Digital's Terminal Software Architecture support on RSX.
;
; Explicit Inputs:
; L ":" for global offset definitions
; B "=" for global bit/value definitions
; LST "LIST" for macro expansion listing
;
; Implicit Inputs:
; NONE
;
; Outputs:
; Symbols defined as described above.
; Listing as described above.
;
; General packet header format
;
; .ASECT .=0 ; Define offsets absolutely
;
E.VLNK: 'L'
E.VSIZ: 'L'
E.VTYP: 'L'
E.VUCB: 'L'

; E.VTYP Values
;
ET.LOW='B'0 ; Lowest valid type code
ET.QIO='B'0 ; QIO (distinguishes QIO packet from TEP)
ET.BND='B'2 ; Bind Request
ET.UNB='B'4 ; Unbind Request
ET.BCP='B'6 ; Bind Complete
ET.REJ='B'10 ; Bind Reject
ET.DIS='B'12 ; Disconnect Notification
ET.DCP='B'14 ; Disconnect Complete
ET.ICS='B'16 ; Input Count State Change
ET.OOB='B'20 ; Out-of-Band (OOB)
ET.ONO='B'22 ; Abnormal Termination Request
ET.PHO='B'24 ; Physical Terminal Disconnected
ET.HI='B'24 ; Highest valid type code

};
The following definitions are for packet types that require passing additional information in the packets. All other packet types use the general packet format described above.

Bind Request packet (Terminal Management Mode --> Network)

\[ = \text{E.VUCB+2} \]

- E.VBCT: 'L'
- E.VBNL: 'L'
- E.VBLN: 'L'

\[ .BLKW 1; \text{Count of nodes (One for now)} \]

Input Count State Change, Out-Of-Band packets (TTDRV --> Network)

And Modem Hang-up packets (TSA... --> Network)

\[ = \text{E.VUCB+2} \]

- E.VAPR: 'L'
- E.VADR: 'L'
- E.VFLG: 'L'

\[ .BLKW 1; \text{Doubleword address of packet...} \]

Input Count State Change

\[ = \text{E.VFLG+2} \]

- E.VSLN: 'L'

\[ ; \text{Length of Input state message} \]

- OOB

\[ = \text{E.VFLG+2} \]

- E.VOBF: 'L'
- E.VHDR: 'L'
- E.VTAB: 'L'
- E.VOLN: 'L'

\[ .BLKW 6; \text{Out-of-Band bitmasks} \]
\[ .BLKW 2; \text{Type-ahead buffer header} \]
\[ .BLKB 10.; \text{Type-ahead buffer} \]
\[ ; \text{Length of OOB packet} \]

Terminal Management Switch Characters

\[ = \text{E.VFLG+2} \]

- E.VSWC: 'L'
- E.VTNL: 'L'

\[ .BLKW 1; \text{Terminal management switch characters} \]
\[ ; \text{Length of Switch Character packet} \]

Bit values in flag word (E.VFLG). For convenience some bits have corresponding bits in the AST Control Block flag word (A.PRM+5).

- EF.NCO='B'1
- EF.NOI='B'2
- EF.AST='B'10
- EF.LCK='B'40
- EF.QUE='B'100
- EF.MDE='B'200

All non-control characters are out-of-band
All non-control OOB are include-OOB
Reserved bit synonymous with TF.AST
Reserved bit synonymous with AF.LCK
TEP is queued
TEP is marked for delete
; Unbind Request packet (TMM --> Network)
; 
.E.VUCB+2
.E.VULN: 'L' ; Length of Unbind message

; Connect Reject notification packet (Network --> TMM)
; 
.E.VUCB+2
.E.VRR: 'L'.BLKW .BLKW 1 ; Reason for Rejection
E.VRLN: 'L' ; Length of Reject message

; Disconnect Notification packet (Network --> TMM)
; 
.E.VUCB+2
.E.VRD: 'L'.BLKW .BLKW 1 ; Reason for Disconnect
E.VDLN: 'L' ; Length of Disconnect message

; Disconnect Complete packet (TMM --> Network)
; 
.E.VUCB+2
.E.VDCL: 'L' ; Length of Disconnect Complete message

.PSECT

.IF NB LST
.NLIST ; Turn listing back off
.IFF
.MACRO EVNDF$ ; If not listing, redefine
. ENDM ; macro to nothing
.RNDC .ENDM

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RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

.F11DF$

.Macro F11DF$,L,B
;
; VOLUME CONTROL BLOCK
;
 =0

V.TRCT:'L'.BLKW 1 ; TRANSACTION COUNT
V.TYPE:'L'.BLKW 1 ; VOLUME TYPE DESCRIPTOR
VT.FOR='B' 0 ; Foreign volume structure
VT.SL1='B' 1 ; Files-11 Structure level 1
VT.SL2='B' 2 ; Files-11 Structure level 2
VT.ANS='B' 10 ; ANSI labeled tape
VT.UNL='B' 11 ; Unlabeled tape
V.VCHA:'L'.BLKB 1 ; Volume characteristics
VC.SLK='B' 1 ; Clear volume valid on dismount
VC.HLK='B' 2 ; Unload the volume on dismount
VC.DEA='B' 4 ; Deallocate the volume on dismount
VC.PUB='B' 10 ; Set (clear) US.PUB on dismount
VC.DUP='B' 20 ; Duplicate volume name; don't delete
; logicals
V.LABL:'L'.BLKW 14 ; Volume label (ASCII)
V.PKSR:'L'.BLKW 2 ; Pack serial number for error logging
V.SLEN:'L' ; Length of short VCB
V.IFWI:'L'.BLKW 1 ; INDEX FILE WINDOW
V.FCB:'L'.BLKW 2 ; FILE CONTROL BLOCK LIST HEAD
V.IBLB:'L'.BLKB 1 ; INDEX BIT MAP 1ST LBN HIGH BYTE
V.IBSZ:'L'.BLKB 1 ; INDEX BIT MAP SIZE IN BLOCKS
; .BLKW
V.FMAX:'L'.BLKW 1 ; INDEX BITMAP 1ST LBN LOW BITS
V.WISZ:'L'.BLKW 1 ; DEFAULT NO. OF FILES ON VOLUME
V.SBCL:'L'.BLKB 1 ; INDEX BIT MAP CLUSTER FACTOR
V.SBSS:'L'.BLKB 1 ; STORAGE BIT MAP SIZE IN BLOCKS
V.SLBL:'L'.BLKB 1 ; STORAGE BIT MAP 1ST LBN HIGH BYTE
V.FLEX:'L'.BLKB 1 ; DEFAULT FILE EXTEND SIZE
; .BLKW
V.VOWN:'L'.BLKW 1 ; STORAGE BIT MAP 1ST LBN LOW BITS
V.VOWN:'L'.BLKW 1 ; VOLUME OWNER'S UIC
V.VPR0:'L'.BLKW 1 ; VOLUME PROTECTION
V.VPRO:'L'.BLKB 1 ; VOLUME DEFAULT FILE PROTECTION
V.VFBK:'L'.BLKB 1 ; NUMBER OF FREE BLOCKS ON VOLUME HIGH BYTE
V.VLRS:'L'.BLKB 1 ; COUNT OF AVAILABLE LRU SLOTS IN FCB LIST
; .BLK
V.STS:'L'.BLKB 1 ; NUMBER OF FREE BLOCKS ON VOLUME LOW BITS
; .BLK
V.VOWN:'L'.BLKB 1 ; VOLUME STATUS BYTE, CONTAINING THE
; FOLLOWING
VS.IFW='B' 1 ; INDEX FILE IS WRITE ACCESSED
VS.BMW='B' 2 ; STORAGE BITMAP FILE IS WRITE ACCESSED
V.FFNU:'L'.BLKB 1 ; FIRST FREE INDEX FILE BITMAP BLOCK
V.EXT:'L'.BLKB 1 ; POINTER TO VCB EXTENSION
V.HBLB:'L'.BLKW 2 ; LBN of home block
V.HBDC:'L'.BLKB 2 ; Home block checksums
V.LGTH:'L' ; SIZE IN BYTES OF VCB

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RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

F11DF$ (Cont.)

; 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 "I" FOR
; DEVICE ACCESS BLOCKS

; ASEC
.=0

M.LNK: 'L' .BLKW 1 ; LINK WORD
M.TYPE: 'L' .BLKB 1 ; TYPE OF ENTRY
MT.MLS='B' 1 ; Mounted volume user access list
M.ACC: 'L' .BLKB 1 ; NUMBER OF ACCESSES
M.DEV: 'L' .BLKW 1 ; DEVICE UCB
M.TI: 'L' .BLKW 1 ; ACCESSOR TI: UCB
M.LEN: 'L' ; LENGTH OF ENTRY

; FILE CONTROL BLOCK

; ASEC
.=0

F.LNK: 'L'.BLKW 1 ; FCB CHAIN POINTER
F.FNUM: 'L'.BLKW 1 ; FILE NUMBER
F.FSEQ: 'L'.BLKB 1 ; FILE SEQUENCE NUMBER
F.FSQN: 'L'.BLKB 1 ; NOT USED
F.FOWN: 'L'.BLKW 1 ; FILE OWNER'S UIC
F.FPRO: 'L'.BLKB 1 ; FILE PROTECTION CODE
F.UCHA: 'L'.BLKB 1 ; USER CONTROLLED CHARACTERISTICS
F.SCHA: 'L'.BLKB 1 ; SYSTEM CONTROLLED CHARACTERISTICS
F.HDLB: 'L'.BLKW 2 ; FILE HEADER LOGICAL BLOCK NUMBER
F.LBN: 'L'.BLKW 2 ; BEGINNING OF STATISTICS BLOCK
F.FSEQ: 'L'.BLKB 1 ; LBN OF VIRTUAL BLOCK 1 IF CONTIGUOUS
F.FSQN: 'L'.BLKB 1 ; 0 IF NON CONTIGUOUS
F.SIZE: 'L'.BLKW 1 ; SIZE OF FILE IN BLOCKS
F.NACS: 'L'.BLKB 1 ; NO. OF ACCESSES
F.NLCK: 'L'.BLKB 1 ; NO. OF LOCKS
S.STBK='B'-F.LBN ; SIZE OF STATISTICS BLOCK
F.STAT: 'L' ; FCB STATUS WORD
F.NWAC: 'L'.BLKB 1 ; NUMBER OF WRITE ACCESSORS
F.WAC='B' 100000 ; STATUS BITS FOR FCB CONSISTING OF
F.DIR='B' 40000 ; SET IF FILE ACCESSED FOR WRITE
F.CEF='B' 20000 ; SET IF FCB IS IN DIRECTORY LRU
F.PCO='B' 10000 ; SET IF DIRECTORY EOF NEEDS UPDATING
F.DREF: 'L'.BLKW 1 ; DIRECTORY EOF BLOCK NUMBER
F.DRNM: 'L'.BLKW 1 ; 1ST WORD OF DIRECTORY NAME
F.FEXT: 'L'.BLKW 1 ; POINTER TO EXTENSION FCB
F.FVBN: 'L'.BLKW 1 ; STARTING VBN OF THIS FILE SEGMENT
F.LKL: 'L'.BLKW 1 ; POINTER TO LOCKED BLOCK LIST FOR FILE
F.WIN: 'L'.BLKW 1 ; WINDOW BLOCK LIST FOR THIS FILE
F.LGTH: 'L' ; SIZE IN BYTES OF FCB

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RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

F11DF$ (Cont.)

; WINDOW

.ASECT

.W.ACT:'L' ; NUMBER OF ACTIVE MAPPING POINTERS
; WHEN NO SECONDARY POOL
.W.BLKS:'L' ; BLOCK SIZE OF SECONDARY POOL SEGMENT
; WHEN SECONDARY POOL
.W.CTL:'L'.BLKW 1 ; LOW BYTE = # OF MAP ENTRIES ACTIVE
; HIGH BYTE CONSISTS OF CONTROL BITS
WI.RDV='B' 400 ; READ VIRTUAL BLOCK ALLOWED IF SET
WI.WRV='B' 1000 ; WRITE VIRTUAL BLOCK ALLOWED IF SET
WI.EXT='B' 2000 ; EXTEND ALLOWED IF SET
WI.LCK='B' 4000 ; SET IF LOCKED AGAINST SHARED ACCESS
WI.DLK='B' 10000 ; SET IF DEACCESS LOCK ENABLED
WI.EXL='B' 20000 ; WINDOW TURN PENDING BIT
WI.WCK='B' 40000 ; SET IF MANUAL UNLOCK DESIRED
.W.IOC:'L'.BLKB 1 ; COUNT OF I/O THROUGH THIS WINDOW
; Reserved
.W.FCB:'L'.BLKW 1 ; FILE CONTROL BLOCK ADDRESS
.W.TCB:'L'.BLKW 1 ; TCB address of accessor
.W.UCB:'L'.BLKW 1 ; Original UCB address of device
.W.LKL:'L'.BLKW 1 ; POINTER TO LIST OF USERS LOCKED BLOCKS
.W.WIN:'L'.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:'L'.BLKB 1 ; HIGH BYTE OF 1ST VBN MAPPED BY WINDOW
.W.MAP:'L' ; DEFINE LABEL WITH ODD ADDRESS TO CATCH BAD
; REFERENCES
.W.WISZ:'L'.BLKB 1 ; SIZE IN RTRV PTRS OF WINDOW (7 BITS)
.W.RTRV:'L'.BLKW 1 ; LOW ORDER WORD OF 1ST VBN MAPPED
.W.SLEN='B'-4 ; Dummy definition to prevent incorrect
; reference
; (-4 when rounded "up" is a VERY large block)

.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.

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RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

F11DF$ (Cont.)

W.MAP:'L' .BLKW 1 ; ADDR TO THE MAPPING PTRS IN SECONDARY POOL
W.SLEN:'L' ; Length of primary pool stub

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

.=0

ASSUME W.CTL,0

.W.USE:'L' .BLKB 1 ; NUMBER OF ACTIVE MAPPING POINTERS
.W.VBN:'L' .BLKB 1 ; STATUS OF BLOCK
.W.WISZ:'L'.BLKB 1 ; SIZE IN RTRV PTRS OF WINDOW (7 BITS)
.W.RTRV:'L' ; OFFSET TO 1ST RETRIEVAL POINTER IN WINDOW

.ENDC ; END SECONDARY POOL WINDOW CONDITIONAL
. ENDC ; END SYSDEF CONDITIONAL

; LOCKED BLOCK LIST NODE
;

.ASECT

.=0

L.LNK:'L' .BLKW 1 ; LINK TO NEXT NODE IN LIST
L.WIB:'L' .BLKW 1 ; POINTER TO WINDOW FOR FIRST ENTRY
L.VBI:'L' .BLKB 1 ; HIGH ORDER VBN BYTE
L.CNT:'L' .BLKB 1 ; COUNT FOR ENTRY
L.LKSZ:'L'

; END OF DEFINITIONS
;

.PSECT

.MACRO F11DF$ X,Y,Z
.ENDM F11DF$
.ENDM F11DF$
RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

HDRDF$.

.Macro HDRDF$,L,B

; TASK HEADER OFFSET DEFINITIONS

.Asect

  =0
  H.CSP: 'L' .BLKW 1 ; CURRENT STACK POINTER
  H.HDLN: 'L' .BLKW 1 ; HEADER LENGTH IN BYTES
  H.EFLM: 'L' .BLKW 2 ; EVENT FLAG MASK WORD AND ADDRESS
  H.CUIC: 'L' .BLKW 1 ; CURRENT TASK UIC
  H.DUIC: 'L' .BLKW 1 ; DEFAULT TASK UIC
  H.IPS: 'L' .BLKW 1 ; INITIAL PROCESSOR STATUS WORD (PS)
  H.IPC: 'L' .BLKW 1 ; INITIAL PROGRAM COUNTER (PC)
  H.ISP: 'L' .BLKW 1 ; INITIAL STACK POINTER (SP)
  H.OVLY: 'L' .BLKW 1 ; OVERLAY IMPURE POINTER
  H.FORT: 'L' .BLKW 1 ; FORTRAN IMPURE POINTER
  H.FPSL='B'25.*2 ; FOR USE BY X.25 SOFTWARE
  H.BLKB 1 ; FIVE RESERVED BYTES
  H.BLKB 2 ;
  H.GARD: 'L' .BLKW 1 ; POINTER TO HEADER GUARD WORD
  H.NLUN: 'L' .BLKW 1 ; NUMBER OF LUN'S
  H.LUN: 'L' .BLKW 2 ; START OF LOGICAL UNIT TABLE

; WINDOW BLOCK OFFSETS

  =0
  W.BPCB: 'L' .BLKW 1 ; PARTITION CONTROL BLOCK ADDRESS
  W.BLVR: 'L' .BLKW 1 ; LOW VIRTUAL ADDRESS LIMIT
  W.BHVR: 'L' .BLKW 1 ; HIGH VIRTUAL ADDRESS LIMIT
  W.BATT: 'L' .BLKW 1 ; ADDRESS OF ATTACHMENT DESCRIPTOR
  W.BSIZ: 'L' .BLKW 1 ; SIZE OF WINDOW IN 32W BLOCKS

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HDRDF$ (Cont.)

W.BOFF:'L'.BLKW 1 ; PHYSICAL MEMORY OFFSET IN 32W BLOCKS
W.BFPD:'L'.BLKB 1 ; FIRST PDR ADDRESS
W.BNPD:'L'.BLKB 1 ; NUMBER OF PDR'S TO MAP
W.BLPD:'L'.BLKW 1 ; CONTENTS OF LAST PDR
W.BLGH:'L' ; LENGTH OF WINDOW DESCRIPTOR

.PSECT
.MACRO HDRDF$ X, Y
.ENDM
.ENDM
RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

HWDDF$

.MACRO HWDDF$,L,B

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

;+    EXTENDED ARITHMETIC ELEMENT REGISTERS
;-

.REGION

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

.REGION

KDSAR0='B' 172360 ;KERNEL D PAR 0
KDSAR1='B' 172340 ;KERNEL D PAR 1
KISAR0='B' 172352 ;KERNEL I PAR 0
KISAR1='B' 172354 ;KERNEL I PAR 1
KISAR5='B' 172356 ;KERNEL I PAR 5
KISAR6='B' 172300 ;KERNEL I PAR 6
KISDR0='B' 172314 ;KERNEL I PDR 0

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RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

HWDDDF$ (Cont.)

KISDR7='B' 172316 ;KERNEL I PAR 7
SISDR0='B' 172200 ;SUPERVISOR I PDR 0
UDSAR0='B' 177660 ;USER D PAR 0
UDSAR0='B' 177620 ;USER D PDR 0
UISAR0='B' 177640 ;USER I PAR 0
UISAR4='B' 177650 ;USER I PAR 4
UISAR5='B' 177652 ;USER I PAR 5
UISAR6='B' 177654 ;USER I PAR 6
UISAR7='B' 177656 ;USER I PAR 7
UISDR0='B' 177600 ;USER I PDR 0
UISDR4='B' 177610 ;USER I PDR 4
UISDR5='B' 177612 ;USER I PDR 5
UISDR6='B' 177614 ;USER I PDR 6
UISDR7='B' 177616 ;USER I PDR 7
UBMPR='B' 170200 ;UNIBUS MAPPING REGISTER 0
CMODE='B' 140000 ;CURRENT MODE FIELD OF PS WORD

.PM0  ;M$MGE
PMODE='B' 30000 ;PREVIOUS MODE FIELD OF PS WORD

.SR0='B' 177572 ;SEGMENT STATUS REGISTER 0
SR3='B' 172516 ;SEGMENT STATUS REGISTER 3

.EF
; FEATURE SYMBOL DEFINITIONS
.-

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

.EF
; SECOND FEATURE MASK SYMBOL DEFINITIONS
.-

F2.DAS='B' 1 ;KERNEL DATA SPACE (M-PLUS ONLY)
F2.LIB='B' 2 ;SUPERVISOR MODE LIBRARIES
F2.MP='B' 4 ;MULTIPROCESSING SUPPORT

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RSX-11M system data structures and symbolic definitions

HWDDFS (Cont.)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F2.EVT</td>
<td>'B'</td>
<td>Event trace support</td>
</tr>
<tr>
<td>F2.ACN</td>
<td>'B'</td>
<td>CPU accounting</td>
</tr>
<tr>
<td>F2.SDW</td>
<td>'B'</td>
<td>Shadow recording</td>
</tr>
<tr>
<td>F2.POL</td>
<td>'B'</td>
<td>Secondary pools</td>
</tr>
<tr>
<td>F2.WND</td>
<td>'B'</td>
<td>Secondary pool file windows</td>
</tr>
<tr>
<td>F2.IRR</td>
<td>'B'</td>
<td>Install, request and remove support</td>
</tr>
<tr>
<td>F2.GGF</td>
<td>'B'</td>
<td>Group global event flag support</td>
</tr>
<tr>
<td>F2.DPR</td>
<td>'B'</td>
<td>Directive partition support</td>
</tr>
<tr>
<td>F2.AHR</td>
<td>'B'</td>
<td>Alt. header refresh areas supported</td>
</tr>
<tr>
<td>F2.RBN</td>
<td>'B'</td>
<td>Round robin scheduling support</td>
</tr>
<tr>
<td>F2.SWP</td>
<td>'B'</td>
<td>Executive level disk swapping support</td>
</tr>
<tr>
<td>F2.STP</td>
<td>'B'</td>
<td>Event flag mask is in the TCB (l=YES)</td>
</tr>
</tbody>
</table>

;+  THIRD FEATURE MASK SYMBOL DEFINITIONS ;-

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F3.CRA</td>
<td>'B'</td>
<td>Spontaneous crash (l=YES)</td>
</tr>
<tr>
<td>F3.NWK</td>
<td>'B'</td>
<td>System has network support</td>
</tr>
<tr>
<td>F3.EIS</td>
<td>'B'</td>
<td>System requires the extended instruction set</td>
</tr>
<tr>
<td>F3.STM</td>
<td>'B'</td>
<td>System has set system time directive</td>
</tr>
<tr>
<td>F3.UDS</td>
<td>'B'</td>
<td>User data space (M-PLUS only)</td>
</tr>
<tr>
<td>F3.PRO</td>
<td>'B'</td>
<td>Proto TCBS out of pool &quot;</td>
</tr>
<tr>
<td>F3.XHR</td>
<td>'B'</td>
<td>External header support &quot;</td>
</tr>
<tr>
<td>F3.AST</td>
<td>'B'</td>
<td>System has AST support</td>
</tr>
<tr>
<td>F3.11S</td>
<td>'B'</td>
<td>System IS RSX-11S</td>
</tr>
<tr>
<td>F3.CLI</td>
<td>'B'</td>
<td>System has multiple CLI support</td>
</tr>
<tr>
<td>F3.TCM</td>
<td>'B'</td>
<td>Terminal common (M-PLUS only)</td>
</tr>
<tr>
<td>F3.PMN</td>
<td>'B'</td>
<td>Pool monitoring support</td>
</tr>
<tr>
<td>F3.WAT</td>
<td>'B'</td>
<td>Watchdog timer support</td>
</tr>
<tr>
<td>F3.RLK</td>
<td>'B'</td>
<td>'RMS' record locking support</td>
</tr>
<tr>
<td>F3.SHF</td>
<td>'B'</td>
<td>Memory shuffler supported</td>
</tr>
<tr>
<td>F3.RES</td>
<td>'B'</td>
<td>Reserved for future expansion of 11M</td>
</tr>
</tbody>
</table>

; HARDWARE FEATURE MASK SYMBOL DEFINITIONS ;-

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HF.UBM</td>
<td>'B'</td>
<td>System has a Unibus map (l=YES)</td>
</tr>
<tr>
<td>HF.EIS</td>
<td>'B'</td>
<td>System has extended instruction set</td>
</tr>
<tr>
<td>HF.QB</td>
<td>'B'</td>
<td>System has a Qbus backplane (l=YES)</td>
</tr>
<tr>
<td>HF.CIS</td>
<td>'B'</td>
<td>System has commercial instruction set</td>
</tr>
<tr>
<td>HF.FPP</td>
<td>'B'</td>
<td>System supports floating point (l=NO)</td>
</tr>
</tbody>
</table>

.MACRO HWDFFS X,Y
 .ENDM
 .ENDM

B-25
RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

ITBDF$

; .MACRO ITBDF$ L,B
;
;+ INTERRUPT TRANSFER BLOCK (ITB) OFFSET DEFINITIONS
;-

.IF DF A$STRP

.MCALL PKTDF$ PKTDF$ ; DEFINE AST BLOCK OFFSETS

.ENDC

.ASECT .=0

.X.LNK:'L' .BLKW 1 ; LINK WORD FOR ITB LIST STARTING IN TCB
.X.JSR:'L' JSR R5,@#0 ; CALL $INTSC
.X.PSW:'L' .BLKB 1 ; LOW BYTE OF PSW FOR ISR
    ; UNUSED
.X.ISR:'L' .BLKW 1 ; ISR ENTRY POINT (APR5 MAPPING)
.X.FORK:'L'
      .BLKW 1 ; FORK BLOCK
      .BLKW 1 ; THREAD WORD
      .BLKW 1 ; FORK PC
      .BLKW 1 ; SAVED R5
      .BLKW 1 ; SAVED R4

.IF DF M$SMGE

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

.ENDC

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

.IF NB SYSDEF

.IF DF A$STRP

.X.AST:'L' .BLKB A.PRM ; A.DQSR FOR AST BLOCK

.ENDC

.X.VEC:'L' .BLKW 1 ; VECTOR ADDRESS (IF AST SUPPORT,
                      ; THIS IS FIRST AND ONLY AST
                      ; PARAMETER)
.X.VPC:'L' .BLKW 1 ; SAVED VECTOR PC
.X.LEN:'L'

.ENDC

.PSECT

.MACRO ITBDF$ X,Y,Z

.ENDM ITBDF$

.ENDM ITBDF$

B-26
RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

LCBDF$  

;  
.MACRO  LCBDF$,L,B  
;+  
; LOGICAL ASSIGNMENT CONTROL BLOCK  
;  
; THE LOGICAL ASSIGNMENT CONTROL BLOCK (LCB) IS USED TO ASSOCIATE A  
; LOGICAL NAME WITH A PHYSICAL DEVICE UNIT. LCB'S ARE LINKED TOGETHER  
; TO FORM THE LOGICAL ASSIGNMENTS OF A SYSTEM. ASSIGNMENTS MAY BE ON  
; A SYSTEM WIDE OR LOCAL (TERMINAL) BASIS.  
;  
; .ASECT  
.=0  
L.LNK: 'L' .BLKW 1 ;LINK TO NEXT LCB  
L.NAM: 'L' .BLKW 1 ;LOGICAL NAME OF DEVICE  
L.UNIT: 'L' .BLKB 1 ;LOGICAL UNIT NUMBER  
L.TYPE: 'L' .BLKB 1 ;TYPE OF ENTRY (O=SYSTEM WIDE)  
L.UCB: 'L' .BLKW 1 ;TI UCB ADDRESS  
L.ASG: 'L' .BLKW 1 ;ASSIGNMENT UCB ADDRESS  
L.LGTH='B' .-L.LNK ;LENGTH OF LCB  
.PSECT  
;  
; .MACRO  LCBDF$,X,Y  
;  
; .ENDM  
;  
; .ENDM
RSX-IIM SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

MTADFS

.MACRO   MTADFS$!,B
.ASECTION

; ANSI MAGTAPE SPECIFIC DATA STRUCTURES
; VOLUME SET CONTROL BLOCK OFFSET DEFINITIONS (VSCB)
; VOLUME SET AND PROCESS CONTROL SECTION

;=0
V.TCNT: 'L'.BLKW 1 ; TRANSACTION COUNT
V.TYPE: 'L'.BLKB 1 ; VOLUME TYPE DESCRIPTOR
V.VCHA: 'L'.BLKB 1 ; VOLUME CHARACTERISTICS
V.LABL: 'L'.BLKB 12. ; FILE SET ID (FIRST SIX BYTES)
V.NXT: 'L'.BLKW 1 ; PTR TO NEXT VSCB NODE
V.MVL: 'L'.BLKW 1 ; PTR TO MOUNTED VOL LIST
V.UVL: 'L'.BLKW 1 ; PTR TO UNMOUNTED VOL LIST
V.ATL: 'L'.BLKW 1 ; ATL ADDR OF ACCESSING TASK
                      ; TCB IN RSX1M
V.UBC: 'L'.BLKW 1 ; ADDR OF CURRENT UCB OR PUD
V.RVOL: 'L'.BLKB 1 ; CURRENT RELATIVE VOL #
V.MOU: 'L'.BLKB 1 ; MOUNT MODE BYTE
V.TCHR: 'L'.BLKW 1 ; UINT CHAR. FOR ALL UNITS USED FOR VOL SET
V.SEQN: 'L'.BLKW 1 ; CURRENT FILE SEQUENCE #
V.SECN: 'L'.BLKW 1 ; CURRENT FILE SECTION #
V.TPOS: 'L'.BLKB 1 ; POSITION OF TAPE IN TM'S TO NXT HDR1
V.PSTA: 'L'.BLKB 1 ; PROCESS STATUS BYTE
V.TIMO: 'L'.BLKW 1 ; BLOCKED PROCESS TIMEOUT COUNTER
V.STAT: 'L'.BLKW 3 ; STATUS WORDS USED BY COMMAND
                   ; EXECUTION MODULES
V.TRRTB: 'L'.BLKB 1 ; TRANSLATION CONTROL BYTE
V.EFTV: 'L'.BLKB 1 ; FOR MAG TO RETURN IE.EOF, EOT, EOV

; LABEL DATA SECTION

; V.BLKL: 'B'.BLKW 1 ; BLOCK LENGTH
V.RECL: 'B'.BLKW 1 ; RECORD LENGTH
V.FNAM: 'L'.BLKW 3 ; FILE NAME
V.FTP: 'L'.BLKW 1 ; FILE TYPE
V.FVER: 'L'.BLKW 1 ; FILE VERSION #
V.CDAT: 'L'.BLKW 2 ; CREATION DATE
V.EDAT: 'L'.BLKW 2 ; EXPIRATION DATE
V.BLKC: 'L'.BLKW 2 ; BLOCK COUNT FOR FILE SECTION
V.RTP: 'L'.BLKB 1 ; RECORD TYPE
V.FATT: 'L'.BLKB 1 ; FILE ATTRIBUTES FOR CARRIAGE CONTROL
                   ; REMAINDER OF FILE ATTRIBUTES

; NULL WINDOW SECTION

V.WIND: 'L'.BLKW 4. ; NULL WINDOW

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

MTADFS$ (Cont.)

V.MST2: 'L' .BLKW 1 ; MAGTAPE STATUS BITS
V.FABY: 'L' .BLKB 1 ; FILE ACCESSIBILITY BYTE (HDR1)
   .BLKB 1 ; SPARE
V.ANSN: 'L' .BLKB 17 ; ANSI 17 CHARACTER FILE NAME
V.BOFF: 'L' .BLKB 1 ; BUFFER OFFSET
V.DENS: 'L' .BLKB 1 ; REQUESTED UNIT DENSITY
V.DRAT: 'L' .BLKB 1 ; DEFAULT RECORD ATTRIBUTES
V.DBLK: 'L' .BLKW 1 ; DEFAULT BLOCK SIZE
V.DREC: 'L' .BLKW 1 ; DEFAULT RECORD SIZE

;*****
S.VSCB=.

; DEFINE OFFSETS INTO NULL WINDOW SECTION

.;ASECT
=0

W.CTL: .BLKW 1 ;CONTROL WORD IN WINDOW
V.WINC=V.WIND+W.CTL ; CNTRL WORD IN NULL WINDOW

; MOUNTED VOLUME LIST OFFSET DEFINITIONS (MVL)

.;ASECT
=0

.M.NXT: 'L' .BLKW 1 ;PTR TO NXT MVL NODE (11M)
.M.UIC: 'L' .BLKW 1 ;OWNER UIC FROM RVOL #1
.M.CH: 'L' .BLKB 1 ; U.CH/U.VP (11D)
.M.PROT: 'L' .BLKB 1 ; PROTECTION U.AR IN 11D
   .IF NDF R$$11M
   .BLKW 2 ;ACP WORDS 11D
  M.NXT: 'L' .BLKW 1 ;PTR TO NEXT MVL NODE (11D)
  ;ENDC
  M.RVOL: 'L' .BLKB 1 ;RELATIVE VOL # OF MOUNTED VOLUME
  M.STATUS: 'L' .BLKB 1 ; VOLUME STATUS
  M.VIDP: 'L' .BLKB 1 ; VOLUME ID POINTER
  M.UCB: 'L' .BLKW 1 ; ADDR OF ASSOC UCB OR PUD
S.MVL=.

; UNMOUNTED VOLUME AND VOLUME LIST OFFSET DEFINITIONS (UVL)

.;ASECT
=0

.L.NXT: 'L' .BLKW 1 ;PTR TO NXT UVL NODE
L.VOL1: 'L' .BLKB 1 ; REL VOL # OF 1'ST VOL IN NODE
L.VOL2: 'L' .BLKB 1 ; REL VOL # OF 2'ND VOL IN NODE
L.VID1: 'L' .BLKB 6 ; VOL ID OF 1'ST VOL IN NODE
L.VID2: 'L' .BLKB 6 ; VOL ID OF 2'ND VOL IN NODE
S.UVL=.

; SYSTEM DATA STRUCTURE CONTENT VALUES

; VSCB VALUES

B-29
RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

MTADFS$ (Cont.)

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

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

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

; BLOCKED STATE = -(UNBLOCKED TRANSITION STATE VALUES)

; PROCESS TIMED OUT BIT 0 = 1
VP.TO=1

; NULL WINDOW CONTROL BIT DEFINITIONS

WI.RDV='B' 400 ; ACCESSED FOR READ
WI.WRV='B' 1000 ; ACCESSED FOR WRITE
WI.EXT='B' 2000 ; ACCESSED FOR EXTEND
WI.LCK='B' 4000 ; LOCKED

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

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

.ENDM

B-30
RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

PCBDF$

.MACRO PCBDF$ L,B

;+ 
; PARTITION CONTROL BLOCK OFFSET DEFINITIONS
;-

.ASECT

.=0

P.LNK:'L' .BLKW 1 ;LINK TO NEXT PARTITION PCB
P.PRI:'L' .BLKB 1 ;PRIORITY OF PARTITION
P.IOC:'L' .BLKB 1 ;I/O + I/O STATUS BLOCK COUNT
P.NAM:'L' .BLKW 2 ;PARTITION NAME IN RAD50
P.SUB:'L' .BLKW 1 ;POINTER TO NEXT SUBPARTITION
P.MAIN:'L' .BLKW 1 ;POINTER TO MAIN PARTITION

.IF NB SYSDEF

.IF NDF M$$MGE

P.HDR:'L' ;POINTER TO HEADER CONTROL BLOCK

.ENDC

.IFTF

P.REL:'L' .BLKW 1 ;STARTING PHYSICAL ADDRESS OF PARTITION
P.BLKS:'L'
P.SIZE:'L' .BLKW 1 ;SIZE OF PARTITION IN:

; UNMAPPED SYSTEMS – BYTES
; MAPPED SYSTEMS – 32 WORD BLOCKS
P.WAIT:'L' .BLKW 1 ;PARTITION WAIT QUEUE LISTHEAD (2 WORDS)
P.SWSZ:'L' .BLKW 1 ;PARTITION SWAP SIZE (SYSTEM ONLY)
P.BUSY:'L' .BLKB 2 ;PARTITION BUSY FLAGS
P.OWN:'L'
P.TCB:'L' .BLKW 1 ;TCB ADDRESS OF OWNER TASK
P.STAT:'L' .BLKW 1 ;PARTITION STATUS FLAGS

.IFT

.IF DF M$$MGE

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

.ENDC

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

.IF NDF P$$LAS

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

.IFF

B-31
RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

PCBDF$ (Cont.)

P.LGTH='B'. ;LENGTH OF PARTITION CONTROL BLOCK

. ENDC
. IFF
. PSECT

;+ ; PARTITION STATUS WORD BIT DEFINITIONS ;-

PS.OUT='B' 100000 ;PARTITION IS OUT OF MEMORY (l=YES)
PS.CKP='B' 400000 ;PARTITION CHECKPOINT IN PROGRESS (l=YES)
PS.CKR='B' 200000 ;PARTITION CHECKPOINT IS REQUESTED (l=YES)
PS.CK='B' 100000 ;PARTITION IS NOT CHECKPOINTABLE (l=YES)
PS.EYD='B' 40000 ;PARTITION IS FIXED (l=YES)
PS.PER='B' 20000 ;PARITY ERROR IN PARTITION (l=YES)
PS.LIO='B' 10000 ;MARKED BY SHUFFLER FOR LONG I/O (l=YES)
PS.NSF='B' 4000 ;PARTITION IS NOT SHUFFLEABLE (l=YES)
PS.COM='B' 200 ;LIBRARY OR COMMON BLOCK (l=YES)
PS.PIC='B' 100 ;POSITION INDEPENDENT LIBRARY OR COMMON

; (l=YES)
PS.SYS='B' 40 ;SYSTEM CONTROLLED PARTITION (l=YES)
PS.DRV='B' 20 ;DRIVER IS LOADED IN PARTITION (l=YES)
PS.DEL='B' 10 ;PARTITION SHOULD BE DELETED WHEN NOT

ATTACHED (l=YES)

PS.APR='B' 7 ;STARTING APR NUMBER MASK

;+ ; ATTACHMENT DESCRIPTOR OFFSETS ;-

. ASEC T

. =0
A.PCBL: 'L' . BLKW 1 ;PCB ATTACHMENT QUEUE THREAD WORD
A.PRI: 'L' . BLKB 1 ;PRIORITY OF ATTACHED TASK
A.IOC: 'L' . BLKB 1 ;I/O COUNT THROUGH THIS DESCRIPTOR
A.TCB: 'L' . BLKB 1 ;TCB ADDRESS OF ATTACHED TASK
A.TCBL: 'L' . BLKB 1 ;TCB ATTACHMENT QUEUE THREAD WORD
A_STAT: 'L' . BLKB 1 ;STATUS BYTE
A.MPCT: 'L' . BLKB 1 ;MAPPING COUNT OF TASK THRU THIS DESCRIPTOR
A.PCB: 'L' . BLKW 1 ;PCB ADDRESS OF ATTACHED TASK
A.LGTH='B' . ;LENGTH OF ATTACHMENT DESCRIPTOR

;+ ; ATTACHMENT DESCRIPTOR STATUS BYTE BIT DEFINITIONS ;-

. PSECT

AS.DEL='B' 10 ;TASK HAS DELETE ACCESS (l=YES)
AS.EXT='B' 4 ;TASK HAS EXTEND ACCESS (l=YES)
AS.WRT='B' 2 ;TASK HAS WRITE ACCESS (l=YES)
AS.RED='B' 1 ;TASK HAS READ ACCESS (l=YES)

. ENDC

. MACRO
PCBDF$ X,Y,Z
. ENDM
. ENDM
RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

PKTDFS

.MACRO PKTDFS,L,B

; 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
A.KSR5:'L' .BLKW 1 ;SUBROUTINE KISAR5 BIAS (A.CBL=0)
A.DQSR:'L' .BLKW 1 ;DEQUEUE SUBROUTINE ADDRESS (A.CBL=0)
A.CBL:'L' .BLKW 1 ;LENGTH OF CONTROL BLOCK IN BYTES
;IF A.CBL = 0, THE AST CONTROL BLOCK IS
;TO BE DEALLOCATED BY THE DEQUEUE SUBROUTINE
;POINTEED 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.

A.BYT:'L' .BLKW 1 ;NUMBER OF BYTES TO ALLOCATE ON TASK STACK
A.AST:'L' .BLKW 1 ;AST TRAP ADDRESS
A.NPR:'L' .BLKW 1 ;NUMBER OF AST PARAMETERS
A.PRM:'L' .BLKW 1 ;FIRST AST PARAMETER

; THE SPECIFIABLE AST CODES MUST NOT BE 0.

AS.FPA='B' 1 ;CODE FOR FLOATING POINT AST
AS.BCA='B' 2 ;CODE FOR RECEIVE DATA AST
AS.RRA='B' 3 ;CODE FOR RECEIVE BY REFERENCE AST
AS.PFA='B' 4 ;CODE FOR POWERFAIL AST
AS.REA='B' 5 ;CODE FOR REQUESTED EXIT (ABORT) AST
AS.CAA='B' 6 ;CODE FOR COMMAND ARRIVAL AST FOR CLIS

; BIT VALUES IN A.PRM+5

AF.XCC='B' 1 ;ATTACHED FOR ALL BUT CONTROL-C (TF.XCC)
AF.NOT='B' 2 ;ATTACHED FOR ALL NOTIFICATION (TF.NOT)
AF.OOB='B' 4 ;ACB IS FOR OUT-OF-BAND AST
AF.AST='B' 10 ;ACB HANDLES UNSOL. INPUT CHAR AST'S (TF.AST)
AF.ESQ='B' 20 ;ATTACHED FOR ESCAPE SEQUENCES (TF.ESQ)
AF.LCK='B' 40 ;ACB IS LOCKED
AF.QUE='B' 100 ;ACB IS QUEUED
AF.MDE='B' 200 ;ACB IS MARKED FOR DELETE


B-33
ABORTER SUBCODES FOR ABORT AST (AS.REA) TO BE RETURNED ON USER'S STACK

AB.NPV='B' 1 ;ABORTER IS NONPRIVILEGED (1=YES)
AB.TYP='B' 2 ;ABORT FROM DIRECTIVE (0=YES)
               ;ABORT FROM CLI COMMAND (1=YES)

;+ 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.
;
; BUFFERED I/O COMPLETION AST
AK.OCB='B' 201 ;OFFSPRING EXIT
AK.GBI='B' 202 ;GENERAL BUFFERED I/O AST
AK.GGF='B' 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
;
; OCB LINK WORD
O.LNK: 'L' .BLKW 1 ;ADDRESS OF MCR COMMAND LINE
O.MCRL: 'L' .BLKW 1 ;PARENT TCB ADDRESS
O.PTCB: 'L' .BLKW 1 ;EXIT AST ADDRESS
O.EFN: 'L' .BLKW 1 ;EXIT EVENT FLAG
O.ESB: 'L' .BLKW 1 ;EXIT STATUS BLOCK VIRTUAL ADDRESS
O.LGTH='B' .BLKW 8 ;EXIT STATUS BUFFER

; I/O PACKET OFFSET DEFINITIONS
;
;I/O QUEUE THREAD WORD
.I.LNK: 'L' .BLKW 1 ;REQUEST PRIORITY
.I.PRI: 'L' .BLKB 1 ;EVENT FLAG NUMBER
.I.EFN: 'L' .BLKB 1 ;TCB ADDRESS OF REQUESTOR
.I.TCB: 'L' .BLKW 1 ;POINTER TO SECOND LUN WORD
.I.N2: 'L' .BLKW 1 ;POINTER TO UNIT CONTROL BLOCK
.I.FCN: 'L' .BLKW 1 ;I/O FUNCTION CODE
PKTDF$ (Cont.)

I.IO$B='L'.BLK W 1 ;VIRTUAL ADDRESS OF I/O STATUS BLOCK
   BLK W 1 ;I/O STATUS BLOCK RELOCATON BIAS
   BLK W 1 ;I/O STATUS BLOCK ADDRESS
I.A$:T='L'.BLK W 1 ;AST SERVICE ROUTINE ADDRESS
I.PRM: 'L'.BLK W 1 ;RESERVED FOR MAPPING PARAMETER #1
   BLKW 6 ;PARAMETERS 1 TO 6
   BLK W 1 ;USER MODE DIAGNOSTIC PARAMETER WORD

; FOLLOWING ARE DEFINITIONS FOR FLAG BITS IN I.PRM+11
; (DSA DRIVERS INTERNAL USE ONLY)

IP.FAK='B' 20 ;IOP IS PSEUDO IOP
IP.ABO='B' 40 ;(MUDRV)ABORT COMMAND MUST BE ISSUED FOR IOP
IP.PND='B' 100 ;(MUDRV)ABORT COMMAND WAS ISSUED FOR IOP
IP.UMR='B' 200 ;A UMR WAIT BLOCK IS IN USE FOR THIS I/O

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

; DEFINE OFFSETS IN I/O PACKET EXTENSION (IOPX)
; .ASECT
   .=0
I.XLNK:'L'.BLKW 1 ;LINK WORD
I.XIO$:P='L'.BLKW 1 ;I/O PACKET ADDRESS
I.XTCB:'L'.BLKW 1 ;TCB ADDRESS OF REQUESTING TASK
I.XMOD:'L'.BLKW 2 ;MODIFIER WORDS (NOTE: 2ND WORD MUST BE
                      ;SPECIFIED AND MUST BE ZERO.)
I.XRBF:'L'.BLKW 2 ;READ DATA BUFFER ADDRESS APR BIAS
                      ;READ DATA BUFFER VIRTUAL ADDRESS
I.XRBL:'L'.BLKW 1 ;READ DATA BUFFER LENGTH
I.XTMO:'L'.BLKW 1 ;READ TIME-OUT INTERVAL
I.XPBF:'L'.BLKW 2 ;PROMPT BUFFER ADDRESS APR BIAS
                      ;PROMPT BUFFER VIRTUAL ADDRESS
I.XPBL:'L'.BLKW 1 ;PROMPT BUFFER LENGTH
I.XPBV:'L'.BLKW 1 ;PROMPT BUFFER VERTICAL FORMS CONTROL
I.XTBT:'L'.BLKW 2 ;TERMINATOR TABLE ADDRESS APR BIAS
                  ;TERMINATOR TABLE VIRTUAL ADDRESS
I.XTBL:'L'.BLKW 1 ;TERMINATOR TABLE LENGTH
I.XDBF:'L'.BLKW 2 ;DEFAULT INPUT BUFFER ADDRESS APR BIAS
                  ;DEFAULT INPUT BUFFER VIRTUAL ADDRESS
I.XDBL:'L'.BLKW 1 ;DEFAULT INPUT BUFFER LENGTH

;+ ; GROUP GLOBAL EVENT FLAG CONTROL BLOCK OFFSETS
;-
   .=0
G.LNK:'L'.BLKW 1 ;LINK WORD
G.GRP:'L'.BLKB 1 ;GROUP NUMBER
G.STAT:'L'.BLKB 1 ;STATUS BYTE
G.CNT:'L'.BLKW 1 ;ACCESS COUNT
G.EFLG:'L'.BLKW 2 ;EVENT FLAGS
G.LGTH='B'. ;LENGTH OF GROUP GLOBAL CONTROL BLOCK
PKTDF$ (Cont.)

; STATUS BYTE DEFINITIONS

GS.DEL='B'l ;GROUP MARKED FOR DELETE

; EXECUTIVE POOL MONITOR CONTROL FLAGS

; $POLST IS THE SYNCHRONIZATION WORD BETWEEN THE EXEC AND POOL MONITOR

PC.HIH='B' 1 ;HIGH POOL LIMIT CROSSED (1=YES)
PC.LOW='B' 2 ;LOW POOL LIMIT CROSSED (1=YES)
PC.ALF='B' 4 ;FAILED TO ALLOCATE LARGE BLOCK (1=YES)
PC.XAF='B' 10 ;FAILED TO ALLOCATE SMALL BLOCK (1=YES)
PC.XIT='B' 200 ;FORCE POOL MONITOR TASK TO EXIT
PC.NRM='B' PC.HIH*400 ;POOL TASK INHIBIT BIT FOR HIGH POOL
PC.ALM='B' PC.LOW*400 ;POOL TASK INHIBIT BIT FOR LOW POOL

; $POLFL IS THE POOL USAGE CONTROL WORD

PF.INS='B' 40 ;REJECT NONPRIVILEGED INS/RUN/REM
PF.LOG='B' 100 ;LOGINS ARE DISABLED
PF.REQ='B' 200 ;STALL REQUEST OF NONPRIV. TASKS
PF.ALL='B' 177777 ;TAKE ALL POSSIBLE ACTIONS TO SAVE POOL

; CLI PARSER BLOCK (CPB) DEFINITIONS

; =0

C.PTCB:'L' .BLK 1 ;ADDRESS OF CLI'S TCB
C.PNAM:'L' .BLKW 2 ;CLI NAME
C.PSTS:'L' .BLK 1 ;STATUS MASK
C.PDPL:'L' .BLKW 1 ;LENGTH OF DEFAULT PROMPT
C.PCPL:'L' .BLKB 1 ;LENGTH OF CNTRL/C PROMPT
C.PRMT:'L' ;START OF ASCII PROMPT STRINGS
;THE DEFAULT STRING IS CONCATENATED
;WITH THE "C STRING

; STATUS BIT DEFINITIONS

CP.NUL='B' 1 ;PASS EMPTY COMMAND LINES TO CLI
CP.MSG='B' 2 ;CLI DESIRES SYSTEM MESSAGES
CP.LGO='B' 4 ;CLI WANTS COMMANDS FROM LOGGED OFF TTYS
CP.DSB='B' 10 ;CLI IS DISABLED
CP.FRV='B' 20 ;USER MUST BE PRIV TO SET TTY TO THIS CLI
CP.SGL='B' 40 ;DON'T HANDLE CONTINUATIONS (M-PLUS ONLY)
CP.NIO='B' 100 ;MCR..., HEL, BYE DO NO I/O TO TTY
;HEL, BYE ALSO DO NOT SET CLI ETC.
CP.RST='B' 200 ;ABILITY TO SET TO THIS CLI IS RESTRICTED
;TO THE CLI ITSELF
CP.EXT='B' 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
RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

PKTDF$ (Cont.)

; CM.INE='B' 1 ; CLI INITIALIZED ENABLED
; CM.IND='B' 2 ; CLI INITIALIZED DISABLED
; CM.CEN='B' 3 ; CLI ENABLED
; CM.CDS='B' 4 ; CLI DISABLED
; CM.ELM='B' 5 ; CLI BEING ELIMINATED
; CM.EXT='B' 6 ; CLI MUST EXIT IMMEDIATELY
; CM.LKT='B' 7 ; NEW TERMINAL LINKED TO CLI
; CM.RMT='B' 8 ; TERMINAL REMOVED FROM CLI
; CM.MSG='B' 9 ; GENERAL MESSAGE TO CLI

; +
; ; ANCILLARY CONTROL BLOCK (ACB) DEFINITIONS
; -

; =0
A.REL: 'L' .BLK 1 ; ACD RELOCATION BIAS
A.DIS: 'L' .BLK 1 ; ACD DISPATCH TABLE POINTER
A.MAS: 'L' .BLK 2 ; ACD FUNCTION MASK
A.NUM: 'L' .BLKB 1 ; ACD IDENTIFICATION NUMBER
A.PLEN: 'L' .BLKB 1 ; LENGTH IN BYTES OF FULL ACB
A.LIN: 'L' .BLK 1 ; ACD LINK WORD
A.ACC: 'L' .BLKB 1 ; ACD ACCESS COUNT
A.STA: 'L' .BLKB 1 ; ACD STATUS BYTE
A.PLEN='B'. ; LENGTH IN BYTES OF PROTOTYPE ACB

; =A.LIN ; FULL ACB OVERLAPS PROTOTYPE ACB
A.IMAP: 'L' .BLK 1 ; ACD INTERRUPT BUFFER RELOCATION BIAS
A.IBUF: 'L' .BLK 1 ; ACD INTERRUPT BUFFER ADDRESS
A.ILEN: 'L' .BLK 1 ; ACD INTERRUPT BUFFER LENGTH
A.SMAP: 'L' .BLK 1 ; ACD SYSTEM STATE BUFFER RELOCATION BIAS
A.SBUF: 'L' .BLK 1 ; ACD SYSTEM STATE BUFFER ADDRESS
A.SLEN: 'L' .BLK 1 ; ACD SYSTEM STATE BUFFER LENGTH
A.IOS: 'L' .BLK 1 ; ACD I/O STATUS
A.RES='B'. ; START OF ACB RESERVED FOR USE BY THE ACD

; DEFINE THE FLAG VALUES IN THE OFFSET U.AFLG
;
UA.ACC='B' 1 ; ACCEPT THIS CHARACTER
UA.PRO='B' 2 ; PROCESS THIS CHARACTER
UA.ECH='B' 4 ; ECHO THIS CHARACTER
UA.TYP='B' 10 ; FORCE THIS CHARACTER INTO TYPEAHEAD
UA.SPE='B' 20 ; THIS CHARACTER HAS A SPECIAL ECHO
UA.PUT='B' 40 ; PUT THIS CHARACTER IN THE INPUT BUFFER
UA.CAL='B' 100 ; CALL THE ACD BACK AFTER THE TRANSFER
UA.COM='B' 200 ; COMPLETE THE INPUT REQUEST
;
UA.ALL='B' 400 ; ALLOW PROCESSING OF THIS I/O REQUEST
UA.TRN='B' 1000 ; TRANSLATE CHARACTERS FROM OUTPUT QIO
UA.TRA='B' 2000 ; TRANSFER CHARACTERS WHEN I/O COMPLETES
;
; DEFINE THE ACD ENTRY POINTS (OFFSETS INTO THE DISPATCH TABLE)
;
; =0
A.ACCE: 'L' .BLK 1 ; I/O REQUEST ACCEPTANCE ENTRY POINT
A.DEQU: 'L' .BLK 1 ; I/O REQUEST DEQUEUE ENTRY POINT
A.Powe: 'L' .BLK 1 ; POWER FAILURE ENTRY POINT
A.INPU: 'L' .BLK 1 ; INPUT COMPLETION ENTRY POINT
RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

PKTDF$ (Cont.)

A.OUTP:'L' .BLKW 1 ;OUTPUT COMPLETION ENTRY POINT
A.CONN:'L' .BLKW 1 ;CONNECTION ENTRY POINT
A.DISC:'L' .BLKW 1 ;DISCONNECTION ENTRY POINT
A.RECE:'L' .BLKW 1 ;INPUT CHARACTER RECEPTION ENTRY POINT
A.PROC:'L' .BLKW 1 ;INPUT CHARACTER PROCESSING ENTRY POINT
A.TRAN:'L' .BLKW 1 ;OUTPUT QIO CHARACTER TRANSLATION ENTRY POINT
A.CALL:'L' .BLKW 1 ;CALL ACD BACK AFTER TRANSFER ENTRY POINT

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

.PSECT

.MACRO PKTDF$ X,Y,Z
.ENDM
.ENDM
SCBDF$

; 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 TELETYPewriter TYPE INTERFACED VIA
; A DLII-A WOULD HAVE A SCB SINCE EACH DLII-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
S.RCNT:'L' .BLKB 1 ;NUMBER OF REGISTERS TO COPY ON ERROR
S.ROFF:'L' .BLKB 1 ;OFFSET TO FIRST DEVICE REGISTER
S.BNSV:'L' .BLKW 1 ;SAVED I/O ACTIVE BITMAP AND POINTER TO EMB
S.BNSK:'L' .BLKW 1 ;DEVICE I/O ACTIVE BIT MASK
S.LHD:'L' .BLKW 2 ;CONTROLLER I/O QUEUE LISTHEAD
S.PRI:'L' .BLKB 1 ;DEVICE PRIORITY
S.VCT:'L' .BLKW 1 ;INTERRUPT VECTOR ADDRESS /4
S.CTM:'L' .BLKW 1 ;CURRENT TIMEOUT COUNT
S.ITT:'L' .BLKB 1 ;INITIAL TIMEOUT COUNT
S.CON:'L' .BLKB 1 ;CONTROLLER INDEX
S.STS:'L' .BLKB 1 ;CONTROLLER STATUS (0=IDLE,1=BUSY)
S.CSR:'L' .BLKW 1 ;ADDRESS OF CONTROL STATUS REGISTER
S.PKT:'L' .BLKW 1 ;ADDRESS OF CURRENT I/O PACKET
S.FRK:'L' .BLKW 1 ;FORK BLOCK LINK WORD
S.DMCS:'L' .BLKW 1 ;DMII-BB CSR FOR FDX TTDRV
.BLKW 1 ;FORK-PC
.BLKW 1 ;FORK-R5
.BLKW 1 ;FORK-R4

.IF NB SYSDEF

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

.BLKW 1 ;FORK-DRIVER RELOCATION BASE

.ENDIF

S.PORT:'L'
S.PBIA='B' S.PORT+2 ;FIRST THREE CHAR. OF PORT NAME (RAD50)
S.QST='B' S.PORT+4 ;BIAS OF PORT COMMON
S.BSYU='B' S.PORT+6 ;ADDRESS OF QST, CONTROLLER STATE TABLE
S.BSYU='B' S.PORT+6 ;ADDRESS OF UNIT CORRESPONDING TO OLDEST CMD.
; ZERO IF THERE ARE NO OUTSTANDING CMDS.
S.CCB:'L'
S.MPR:'L' .BLKW 6 ;11/70 EXTENDED MEMORY UNIBUS DEVICE C-BLOCK
.BLKW 1 ;BUFFER WORD
S.UMHD:'L' .BLKW 2 ;LIST HEAD FOR UMR ASSIGNMENT BLOCK(S)
S.UMCT:'L' .BLKW 1 ;COUNT OF AVAILABLE UMR ASSIGNMENT BLOCK(S)

.IFF

.PSECT

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;+ 
; STATUS CONTROL BLOCK PRIORITY BYTE CONDITION CODE STATUS BIT 
; DEFINITIONS 
;-

SP.EIP='B' 1 ;ERROR IN PROGRESS (1=YES)
SP.ENB='B' 2 ;ERROR LOGGING ENABLED (0=YES)
SP.LOG='B' 4 ;ERROR LOGGING AVAILABLE (1=YES)
SPARE=10 ;SPARE BIT

;+ 
; MAPPING ASSIGNMENT BLOCK (FOR UNIBUS MAPPING REGISTER ASSIGNMENT) 
;-

.ASECT

.M.LNK:'L' .BLKW 1 ;LINK WORD
.M.UMRA:'L' .BLKW 1 ;ADDRESS OF FIRST ASSIGNED UMR
.M.UMRN:'L' .BLKW 1 ;NUMBER OF UMR'S ASSIGNED * 4
.M.UMVL:'L' .BLKW 1 ;LOW 16 BITS MAPPED BY 1ST ASSIGNED UMR
.M.UMRNL: 'L' .BLKB 1 ;HIGH 2 BITS MAPPED IN BITS 4 AND 5
.M.BFVH:'L' .BLKB 1 ;HIGH 6 BITS OF PHYSICAL BUFFER ADDRESS
.M.BFVL:'L' .BLKW 1 ;LOW 16 BITS OF PHYSICAL BUFFER ADDRESS
.M.LGTH='B'. ;LENGTH OF MAPPING ASSIGNMENT BLOCK

.ENDC

.PSECT

.MACRO SCBDFS,X,Y,Z
.ENDM
. ENDM
. ENDM

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RSX-I1M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

TCBDF$.

.MACRO TCBDF$,L,B

; TASK CONTROL BLOCK OFFSET AND STATUS DEFINITIONS
;
; TASK CONTROL BLOCK
;
;
; SEVERAL PIECES OF PRIVILEGED CODE EXIST THAT CREATE TCBS FROM
; OTHER TCBS. SINCE THESE PIECES OF CODE ARE GENERALLY OPTIMIZED
; FOR SPEED AND DO NOT USE THE SYMBOLIC OFFSETS PROVIDED BELOW,
; ANY CHANGE IN THE TCB MUST ALSO BE MADE TO EACH OF THESE PIECES
; OF CODE. THE KNOWN LIST OF SUCH PIECES OF CODE IS AS FOLLOWS:
;
; LIBRARY MODULE COMMENT
; ------- ------- -------
; --------- ---------
; RSX11M DRSPW TCB CREATED FOR RPOI$ DIRECTIVE
; MCR MCROV,MCRDIS MULTIUSER TASK DISPATCHING
;
; .ASECT

.LNK:'L' .BLKB 1 ;UTILITY LINK WORD
.TPRI:'L' .BLKB 1 ;TASK PRIORITY
.TIOC:'L' .BLKB 1 ;I/O PENDING COUNT
.TCPB:'L' .BLKW 1 ;POINTER TO CHECKPOINT PCB
.TAM:'L' .BLKW 2 ;TASK NAME IN RAD50
.TRCVL:'L' .BLKW 2 ;RECEIVE QUEUE LISTHEAD
.TASTL:'L' .BLKW 2 ;AST QUEUE LISTHEAD
.T.EFLG:'L' .BLKW 2 ;TASK LOCAL EVENT FLAGS 1-32
.TUCB:'L' .BLKW 1 ;UCB ADDRESS FOR PSEUDO DEVICE 'TI'
.TTCB:'L' .BLKW 1 ;TASK LIST THREAD WORD
.TSTAT:'L' .BLKW 1 ;FIRST STATUS WORD (BLOCKING BITS)
.T.ST2:'L' .BLKW 1 ;SECOND STATUS WORD (STATE BITS)
.T.ST3:'L' .BLKW 1 ;THIRD STATUS WORD (ATTRIBUTE BITS)
.T.DPRI:'L' .BLKB 1 ;TASK'S DEFAULT PRIORITY
.T.LBN:'L' .BLKB 3 ;LBN OF TASK LOAD IMAGE
.T.LDV:'L' .BLKW 1 ;UCB ADDRESS OF LOAD DEVICE
.T.PCB:'L' .BLKW 1 ;PCB ADDRESS OF TASK PARTITION
.T.MXXZ:'L' .BLKW 1 ;MAXIMUM SIZE OF TASK IMAGE (MAPPED ONLY)
.T.ACTL:'L' .BLKW 1 ;ADDRESS OF NEXT TASK IN ACTIVE LIST
.T.SAST:'L' .BLKW 1 ;SPECIFIED AST LISTHEAD
.T.TIO:'L' .BLKB 1 ;BUFFERED I/O COUNT
.T.TKSS:'L' .BLKW 1 ;TASK SIZE (FROM L$BLDZ IN LABEL BLK) IN:

$$. =.

.T.ATT:'L' .BLKW 2 ;ATTACHMENT DESCRIPTOR LISTHEAD
.T.OFF:'L' .BLKW 1 ;OFFSET TO TASK IMAGE IN PARTITION

.BLBK 1

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RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

TCBDFS (Cont.)

T.SRCT:'L' .BLKB 1 ;SREF WITH EFN COUNT IN ALL RECEIVE QUEUES
T.RRFL:'L' .BLKW 2 ;RECEIVE BY REFERENCE LISTHEAD

    .IF NDF P$$LAS
    .$$=.
    .ENDIF

    ;POINT TO START OF PLAS AREA

T.OCBH:'L' .BLKW 2 ;OFFSPRING CONTROL BLOCK LISTHEAD
T.RDCT:'L' .BLKW 1 ;OUTSTANDING OFFSPRING COUNT

    .IF NDF P$$OFF
    .$$=.
    .ENDIF

    ;POINT TO START OF PARENT OFFSPRING AREA

T.EFLM:'L' .BLKW 2 ;EVENT FLAG MASK WORD
            ;EVENT FLAG MASK ADDRESS

    .IF NDF S$$TOP&T$$BUF
    .$$=.
    .ENDIF

    ;POINT TO START OF EVENT FLAG MASK AREA

T.HDLN:'L' .BLKB 1 ;TASK HEADER LENGTH IN 32-WORD BLOCKS

    .IF NDF A$$HDR
    .$$=.
    .ENDIF

    ;NOT SUPPORTED IF NDF

T.GGF:'L' .BLKB 1 ;GROUP GLOBAL USE COUNT FOR TASK

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

    ;LENGTH OF TASK CONTROL BLOCK

T.LGTH='B' . ;LENGTH OF TCB EXTENSION
T.EXT='B'0

    .IFF

B-42
RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

TCBDF$ (Cont.)

; TASK STATUS DEFINITIONS
;
; FIRST STATUS WORD (BLOCKING BITS)
-
TS.EXE='B' 100000 ; TASK NOT IN EXECUTION (1=YES)
TS.RDN='B' 40000 ; I/O RUN DOWN IN PROGRESS (1=YES)
TS.MSG='B' 20000 ; ABORT MESSAGE BEING OUTPUT (1=YES)
TS.NRP='B' 10000 ; TASK MAPPED TO NONRESIDENT PARTITION (1=YES)
TS.RUN='B' 4000 ; TASK IS RUNNING ON ANOTHER PROCESSOR (1=YES)
TS.HLD='B' 2000 ; TASK HALF-LOADED BY TASK LOADER
TS.OUT='B' 1000 ; TASK EXTERNALLY BLOCKED VIA CLI COMMAND
TS.CKP='B' 200 ; TASK IS BEING CHECKPOINTED (1=YES)
TS.CKR='B' 100 ; TASK CHECKPOINT REQUESTED (1=YES)
+
; TASK BLOCKING STATUS MASK
-
TS.BLK='B'TS.CKP!TS.CKR!TS.EXE!TS.MSG!TS.NRP!TS.OUT!TS.RDN!TS.STP
+
; SECOND STATUS WORD (STATE BITS)
-
T2.AST='B' 100000 ; AST IN PROGRESS (1=YES)
T2.DST='B' 40000 ; AST RECOGNITION DISABLED (1=YES)
T2.CKD='B' 20000 ; TASK NOT CHECKPOINTABLE (1=YES)
T2.CHK='B' 10000 ; CHECKPOINTING DISABLED (1=YES)
T2.SEF='B' 4000 ; TASK STOPPED FOR EVENT FLAGS (1=YES)
T2.FXD='B' 2000 ; TASK FIXED IN MEMORY (1=YES)
T2.REX='B' 1000 ; ABORT AST EFFECTED OR IN PROGRESS (1=YES)
T2.CAF='B' 400 ; DYN CHECKPOINT SPACE ALLOCATION FAILURE
T2.HLT='B' 200 ; TASK IS BEING Halted (1=YES)
T2.ABO='B' 100 ; TASK MARKED FOR ABORT (1=YES)
T2.STP='B' 40 ; SAVED T2.STP ON AST IN PROGRESS
T2.STP='B' 20 ; TASK STOPPED (1=YES)
T2.SPW='B' 10 ; SAVED T2.SPW ON AST IN PROGRESS
T2.SPW='B' 4 ; TASK SUSPENDED (1=YES)
T2.WFR='B' 2 ; SAVED T2.WFR ON AST IN PROGRESS
T2.WFR='B' 1 ; TASK IN WAITFOR STATE (1=YES)
+
; THIRD STATUS WORD (ATTRIBUTE BITS)
-
T3.ACP='B' 100000 ; ANCILLARY CONTROL PROCESSOR (1=YES)
T3.PMD='B' 40000 ; DUMP TASK ON SYNCHRONOUS ABORT (0=YES)
T3.REM='B' 20000 ; REMOVE TASK ON EXIT (1=YES)
T3.PRV='B' 10000 ; TASK IS PRIVILEGED (1=YES)
T3.MCR='B' 4000 ; TASK REQUESTED AS EXTERNAL MCR FUNCTION (1=YES)
T3.SLV='B' 2000 ; TASK IS A SLAVE TASK (1=YES)
T3.CLI='B' 1000 ; TASK IS A COMMAND LINE INTERPRETER (1=YES)
T3.RST='B' 400 ; TASK IS RESTRICTED (1=YES)
T3.NSD='B' 200 ; TASK DOES NOT ALLOW SEND DATA

B-43
TCBDF$ (Cont.)

```assembly
T3.CAL = 'B' 100 ; TASK HAS CHECKPOINT SPACE IN TASK IMAGE
T3.ROV = 'B' 40 ; TASK HAS RESIDENT OVERLAYS
T3.NET = 'B' 20 ; NETWORK PROTOCOL LEVEL
T3.GFL = 'B' 10 ; TASK HAS ITS GRP GBL EVENT FLAGS LOCKED
;    = 'B' 4 ; RESERVED FOR FUTURE USE
T3.SWS = 'B' 2 ; RESERVED FOR USE BY SOFTWARE SERVICES
;    = 'B' 1 ; RESERVED FOR FUTURE USE

.ENDC

.PSECT
.MACRO TCBDF$ X,Y,Z
.ENDM
.ENDM
.ENDM
```
.MACRO UCBDF$,L,B,TTypeDef,SYSDF

;+ 
;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.
;-

.ASEC

.IF NB SYSDF

.IF DF E$$DVC

.IF DF M$$MUP ;IS U.OWN THERE?

=177766

.IF

=177770

.ENDC

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

.ENDC

.ENDC

=177772

U.MUP:'L' ;MULTIUSER PROTECTION FLAG WORD
U.CLI:'L' .BLKW 1 ;TCB OF COMMAND LINE INTERPRETER
U.LUIC:'L' .BLKW 1 ;LOGIN UIC - MULTI USER SYSTEMS ONLY
U.OWN:'L' .BLKW 1 ;OWNING TERMINAL - MULTI USER SYSTEMS
;ONLY
U.DCB:'L' .BLKW 1 ;BACK POINTER TO DCB
U.RED:'L' .BLKW 1 ;POINTER TO REDIRECT UNIT UCB
U.CTL:'L' .BLKB 1 ;CONTROL PROCESSING FLAGS
U.STS:'L' .BLKB 1 ;UNIT STATUS
U.UNIT:'L' .BLKB 1 ;PHYSICAL UNIT NUMBER
U.ST2:'L' .BLKB 1 ;UNIT STATUS EXTENSION
U.CW1:'L' .BLKB 1 ;FIRST DEVICE CHARACTERISTICS WORD
U.CW2:'L' .BLKB 1 ;SECOND DEVICE CHARACTERISTICS WORD
U.CW3:'L' .BLKB 1 ;THIRD DEVICE CHARACTERISTICS WORD
U.CW4:'L' .BLKB 1 ;FOURTH DEVICE CHARACTERISTICS WORD
U.SCB:'L' .BLKB 1 ;POINTER TO SCB
U.ATT:'L' .BLKW 1 ;TCB ADDRESS OF ATTACHED TASK
U.BUF:'L' .BLKW 1 ;RELOCATION BIAS OF CURRENT I/O REQUEST
.BLK W 1 ;BUFFER ADDRESS OF CURRENT I/O REQUEST
RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

UCBDFS (Cont.)

U.CNT= 'L' .BLKW 1 ;BYTE COUNT OF CURRENT I/O REQUEST
U.ACP= 'B' U.CNT+2 ;ADDRESS OF TCB OF MOUNTED ACP
U.VCB= 'B' U.CNT+4 ;ADDRESS OF VOLUME CONTROL BLOCK
U.CBF= 'B' U.CNT+2 ;CONTROL BUFFER RELOCATION AND ADDRESS
U.KCSR= 'B' U.CNT+2 ;CSR ADDRESS OF KMC-11
U.KCS6= 'B' U.KCSR+2 ;CSR+6 OF KMC-11

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

; MSCP/TMSCP DRIVER UCB OFFSETS
;
U.UTIL= 'B' U.VCB+2 ;UNIT STATE WORD
;
; DEFINITIONS FOR U.UTIL BITS
;
UU.SER= 'B' 1 ;SERIAL MODE
UU.RCT= 'B' 2 ;(DUDRV) RCT IN PROGRESS
UU.AVN= 'B' 4 ;UNIT IS WAITING FOR OTHER UNITS TO SPIN;
UU.DOWN= 'B' 5 ;DOWN
UU.GUS= 'B' 10 ;UNIT MUST HAVE A GUS COMMAND ISSUED
UU.ONL= 'B' 20 ;UNIT MUST HAVE A ONL COMMAND ISSUED
UU.SPC= 'B' 40 ;SPECIAL ONLINE TRANSITION
UU.ATN= 'B' 100 ;UNIT HAS SENT ATTENTION MESSAGE
UU.RDY= 'B' 200 ;UNIT IS READY
UU.ABO= 'B' 400 ;IF SET, XXCAN SET UU.SER FLAG FOR UNIT
UU.STO= 'B' 1000 ;THIS UNIT CAN STALL I/O
UU.IOS= 'B' 2000 ;THIS UNIT HAS I/O STALLED
UU.MEDI= 'B' U.VCB+4 ;MEDIA IDENTIFIER (2 WORDS)
;
; ALL THE FOLLOWING MSCP FIELDS APPLY ONLY TO DISK
;
U.BPKT= 'B' U.VCB+10 ;UNIT BAD BLOCK PACKET WAITING LIST
;
; CHARACTERISTICS OBTAINED FROM "GET UNIT STATUS" END PACKETS
;
U.MLUN= 'B' U.VCB+14 ;MULTI-UNIT CODE
U.UNFL= 'B' U.VCB+16 ;UNIT FLAGS
U.UNI= 'B' U.VCB+24 ;UNIT IDENTIFIER
U.2MED= 'B' U.VCB+34 ;ORIGINAL COPY OF MEDIA IDENTIFIER
U.SHUN= 'B' U.VCB+40 ;SHADOW UNIT
U.SHT= 'B' U.VCB+42 ;SHADOW UNIT STATUS
U.TRCK= 'B' U.VCB+44 ;UNIT TRACK SIZE
U.GRP= 'B' U.VCB+46 ;UNIT GROUP SIZE
U.CYL= 'B' U.VCB+50 ;UNIT CYLINDER SIZE
U.USVR= 'B' U.VCB+52 ;UNIT SOFTWARE VERSION
U.UHVR= 'B' U.VCB+53 ;UNIT HARDWARE VERSION
U.RCTS= 'B' U.VCB+54 ;UNIT RCT TABLE SIZE
U.RBNS= 'B' U.VCB+56 ;UNIT RBN 'S / TRACK
U.RCTC= 'B' U.VCB+57 ;UNIT RCT COPIES

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UCBDF$ (Cont.)

; CHARACTERISTICS OBTAINED FROM "ONLINE" OR "SET UNIT CHARACTERISTICS"
; END PACKETS
;
U.UNSZ='B'U.VCB+60 ;UNIT SIZE
U.VSER='B'U.VCB+64 ;VOLUME SERIAL NUMBER
;
; TERMINAL DRIVER DEFINITIONS
;
.=U.BUF
U.TUX: 'L' .BLKW 1 ;POINTER TO UCB EXTENSION (UCBX)
U.TSTA: 'L' .BLKW 4 ;STATUS QUADRUPLE-WORD
U.TFRQ: 'L' .BLKW 1 ;FORK REQUEST WORD
U.TFLK: 'L' .BLKW 1 ;FORK LIST LINK WORD
U.TCHP: 'L' .BLKB 1 ;CURRENT HORIZONTAL POSITION
U.TCYP: 'L' .BLKB 1 ;CURRENT VERTICAL POSITION
U.UIC: 'L' .BLKW 1 ;TERMINAL UIC
U.TTYP: 'L' .BLKB 1 ;TERMINAL TYPE
U.TMTI: 'L' .BLKB 1 ;MODEM TIMER
U.TTAB: 'L' .BLKB 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
U.CTYP: 'L' .BLKB 1 ;CONTROLLER TYPE
U.TLPP: 'L' .BLKB 1 ;LINES PER PAGE
U.TST5: 'L' .BLKW 1 ;ADDITIONAL STATUS BITS
U.TST6: 'L' .BLKW 1 ;EXTENDED I/O STATUS BITS
U.TIXL: 'L' .BLKW 1 ;I/O PACKET EXTENSION LISTHEAD
U.ACB: 'L' .BLKW 1 ;ANCILLARY CONTROL DRIVER BLOCK ADDR
U.APLG: 'L' .BLKB 1 ;ANCILLARY CONTROL DRIVER FLAGS WORD
U.ADMA: 'L' .BLKB 1 ;ANCILLARY CONTROL DRIVER DMA BUFFER
;
; CONSOLE DRIVER DEFINITIONS
;
.=U.BUF+2
U.CTCB: 'L' .BLKW 1 ;ADDRESS OF CONSOLE LOGGER TCB
U.COTQ: 'L' .BLKB 2 ;I/O PACKET LIST QUEUE
U.RED2: 'L' .BLKB 1 ;REDIRECT UCB ADDRESS
;
; DEFINE BITS IN STATUS WORD 1 (U.TSTA)
;
; INPUT STATUS
;
S1.RST='B' 1 ;READ WITH SPECIAL TERMINATORS IN
 ;PROGRESS
S1.ESC='B' 2 ;ESCAPE SEQUENCE IN PROGRESS
S1.RSP='B' 4 ;READ WITH SPECIAL PROCESSING
S1.PTH='B' 10 ;PASS THRU IS CURRENTLY ACTIVE
S1.RNE='B' 20 ;ECHO Suppressed
S1.TSY='B' 40 ;TERMINAL OUTPUT SYNc IS CURRENTLY
 ;ENABLED
UCBDF$ (Cont.)

S1.OBY='B' 100 ; OUTPUT BUSY
S1.IBY='B' 200 ; INPUT BUSY
S1.DPR='B' 400 ; DEFER PROCESSING OF CHAR. IN U.TECB
S1.DEC='B' 1000 ; DEFER ECHO OF CHAR. IN U.TECB
S1.IBF='B' 2000 ; BUFFERED INPUT IN PROGRESS
S1.DSI='B' 4000 ; INPUT PROCESSING DISABLED
S1.RES='B' 10000 ; ESC. SEQ PROCESSING IS ENABLED FOR THE CURRENT READ
S1.RNF='B' 20000 ; READ NO FILTER IS ACTIVE (EDIT CHARBS. ARE DISPLAYED)
S1.TNE='B' 40000 ; TERMINATOR NO ECHO
S1.USI='B' 100000 ; UNSOLICITED INPUT IN PROGRESS

; DEFINE BITS IN STATUS WORD 2 (U.TSTA+2)
; OUTPUT STATUS

S2.RCU='B' 1 ; RESTORE CURSOR (MUST = TF.RCU)
S2.WRA='B' 6 ; CONTEXT FOR WRAP-AROUND
S2.WRB='B' 2 ; LOW BIT IN S2.WRA BIT PATTERN
S2.WAL='B' 10 ; WRITE PASS ALL (MUST = TF.WAL)
S2.BRQ='B' 20 ; BREAK-THROUGH-WRITE REQUEST IN QUEUE
S2.SRQ='B' 40 ; SPECIAL REQUEST IN QUEUE
; (IO.ATT, IO.DET, SF.SMC)
S2.ORQ='B' 100 ; OUTPUT REQUEST IN QUEUE (MUST = S1.OBY)
S2.IRQ='B' 200 ; INPUT REQUEST IN QUEUE (MUST = S1.IBY)
S2.FLF='B' 400 ; FORCE LINEFEED BEFORE NEXT ECHO
S2.ELF='B' 1000 ; EAT A LINEFEED (IGNORE A LEADING LF ON OUTPUT)
S2.CR='B' 2000 ; TRAILING CR REQUIRED ON OUTPUT
S2.OBF='B' 4000 ; BUFFERED OUTPUT IN PROGRESS
S2.PCU='B' 10000 ; POSITION CURSOR BEFORE WRITE
S2.BEL='B' 20000 ; BELL PENDING
S2.CTO='B' 40000 ; OUTPUT STOPPED BY CTRL-O 266.
S2.CTS='B' 100000 ; OUTPUT STOPPED BY CTRL-S

; DEFINE BITS IN STATUS WORD 3 (U.TSTA+4)
; TERMINAL OPERATION CHARACTERISTICS

S3.ACR='B' 1 ; WRAP-AROUND (AUTOMATIC CR-LF) REQUIRED
S3.TAB='B' 2 ; TYPE-AHEAD BUFFER ALLOCATION REQUESTED
S3.CTC='B' 4 ; TERMINAL WANTS CLI TO HAVE °C NOTIFICATION
S3.RAL='B' 10 ; TERMINAL IS IN READ-PASS-ALL MODE
S3.NEC='B' 20 ; NO ECHO
S3.TSY='B' 40 ; TERMINAL SYNC
S3.8BC='B' 100 ; PASS 8 BITS ON INPUT
S3.PDX='B' 200 ; LINE IS IN FULL DUPLEX MODE
S3.MHE='B' 400 ; NOTIFY ATTACHED TASK OF MODEM HANG-UP
S3.ICE='B' 1000 ; INPUT COUNT STATE ENABLED
S3.TME='B' 2000 ; TERMINAL MANAGEMENT MODE ENABLED
S3.PTH='B' 4000 ; PASS THROUGH REQUESTED
S3.RUB='B' 10000 ; TASK WANTS ESCAPE SEQUENCES
S3.PPT='B' 20000 ; TERMINAL HAS PRINTER PORT
S3.RUB='B' 40000 ; RUBOUT SEQUENCE IN PROGRESS (NON-SCOPE)
RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

UCBDFS$ (Cont.)

; DEFINE BITS IN STATUS WORD 4 (U.TSTA+6)
;
; TERMINAL ATTRIBUTE CHARACTERISTICS
;
S4.HFL='B' 7 ;HORIZONTAL FILL REQUIREMENT
S4.VFL='B' 10 ;VERTICAL FILL REQUIREMENT
S4.HFF='B' 20 ;HARDWARE FORM- FEED PRESENT
S4.HHT='B' 40 ;HARDWARE HORIZONTAL TAB PRESENT
S4.DLO='B' 100 ;DIAL-OUT LINE (IMPLES U2.RMT)
S4.HSY='B' 200 ;HOST/Terminal SYNCHRONIZATION ENABLED
S4.ANI='B' 400 ;ANSI CRT TERMINAL
S4.AVO='B' 1000 ;VT100-FAMILY TERMINAL DISPLAY
S4.BLK='B' 2000 ;BLOCK MODE TERMINAL
S4.DEC='B' 4000 ;DIGITAL CRT TERMINAL
S4.EDT='B' 10000 ;TERMINAL HAS LOCAL EDITING FUNCTIONS
S4.RGS='B' 20000 ;TERMINAL SUPPORTS REGIS GRAPHICS
S4.ABD='B' 100000 ;AUTO-BAUD SPEED DETECTION ENABLED

; DEFINE BITS IN STATUS WORD U.TST5
;
; ADDITIONAL STATUS CHARACTERISTICS
;
S5.SW1='B' 1 ;FIRST TERMINAL MANAGEMENT SWITCH
S5.TMM='B' 2 ;CHARACTER HAS BEEN SEEN
S5.XOF='B' 4 ;SEND AN XOFF AT FIRST OPPORTUNITY
S5.XON='B' 10 ;SEND AN XON AT FIRST OPPORTUNITY
S5.HPC='B' 14 ;OUTPUT OF HIGH PRIORITY CHARACTERS
S5.HPO='B' 20 ;REQUESTED
S5.OCR='B' 20 ;HIGH PRIORITY OUTPUT IN PROGRESS
S5.ODF='B' 40 ;XOFF HAS BEEN OUTPUT
S5.ITU='B' 100 ;IMMEDIATE TIMEOUT ON INPUT
S5.RPO='B' 2000 ;READ W/PROMPT OUTPUT IN PROGRESS
S5.VER='B' 10000 ;LAST CHAR. IN TYPE-AHEAD BUFFER
S5.BCC='B' 20000 ;HAS PARITY ERROR
S5.BCD='B' 40000 ;LAST CHAR. IN TYPE-AHEAD BUFFER
S5.DAO='B' 40000 ;HAS FRAMING ERROR
S5.DAO='B' 40000 ;LAST CHAR. IN TYPE-AHEAD BUFFER
S5.ABP='B' 100000 ;HAS DATA OVERRUN ERROR
S5.ABP='B' 100000 ;NOTE - THE 3 BITS ABOVE MUST CORRESPOND
S6.EIO='B' 400 ;TO THE RESPECTIVE ERROR FLAGS IN THE
S6.RLU='B' 1000 ;HARDWARE RECEIVE BUFFER
S6.RDI='B' 100000 ;READ WAS AN EXTENDED I/O
S6.RDI='B' 100000 ;READ WITH LOWER CASE TO UPPER CASE
S6.RDI='B' 100000 ;READ WITH DEFAULT INPUT

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UCBDF$ (Cont.)

;+ 
; DEVICE TABLE STATUS DEFINITIONS 
; 
; DEVICE CHARACTERISTICS WORD 1 (U.CW1) DEVICE TYPE DEFINITION BITS.
;-

DV.REC='B' 1 ;RECORD ORIENTED DEVICE (1=YES)
DV.CCL='B' 2 ;CARRIAGE CONTROL DEVICE (1=YES)
DV.TTY='B' 4 ;TERMINAL DEVICE (1=YES)
DV.DIR='B' 10 ;FILE STRUCTURED DEVICE (1=YES)
DV.SDI='B' 20 ;SINGLE DIRECTORY DEVICE (1=YES)
DV.SQD='B' 40 ;SEQUENTIAL DEVICE (1=YES)
DV.MSD='B' 100 ;MASS STORAGE DEVICE (1=YES)
DV.UMD='B' 200 ;USER MODE DIAGNOSTICS SUPPORTED (1=YES)
DV.MBC='B' 400 ;DEVICE IS ON MASSBUS CONTROLLER (1=YES)
DV.EXT='B' 400 ;DEVICE ON EXTENDED ADDRESSING CONTROLLER
DV.SWL='B' 1000 ;UNIT SOFTWARE WRITE LOCKED (1=YES)
DV.ISP='B' 2000 ;INPUT SPOOLED DEVICE (1=YES)
DV.OSP='B' 4000 ;OUTPUT SPOOLED DEVICE (1=YES)
DV.PSE='B' 10000 ;PSEUDO DEVICE (1=YES)
DV.COM='B' 20000 ;DEVICE IS MOUNTABLE AS COM CHANNEL 
; (1=YES)
DV.F1L='B' 40000 ;DEVICE IS MOUNTABLE AS F1L DEVICE (1=YES)
DV.MNT='B' 100000 ;DEVICE IS MOUNTABLE (1=YES)

;+ 
; TERMINAL DEPENDENT CHARACTERISTICS WORD 2 (U.CW2) BIT DEFINITIONS 
;-

U2.DH1='B' 100000 ;UNIT IS A MULTIPLEXER (1=YES)
U2.DJ1='B' 40000 ;UNIT IS A DJ11 (1=YES)
U2.RMT='B' 20000 ;UNIT IS REMOTE (1=YES)
U2.HFF='B' 10000 ;UNIT HANDLES HARDWARE FORM FEEDS (1=YES)
U2.NEC='B' 10000 ;OLD NAME FOR U2.HFF
U2.CRT='B' 4000 ;UNIT IS A CRT (1=YES)
U2.ESCE='B' 2000 ;UNIT GENERATES ESCAPE SEQUENCES (1=YES)
U2.LOG='B' 1000 ;USER LOGGED ON TERMINAL (0=YES)
U2.SLV='B' 2000 ;UNIT IS A SLAVE TERMINAL (1=YES)
U2.DZ1='B' 1000 ;UNIT IS A DZ11 (1=YES)
U2.HLD='B' 40 ;TERMINAL IS IN HOLD SCREEN MODE (1=YES)
U2.AT='B' 20 ;MCR COMMAND AT. BEING PROCESSED (1=YES)
U2.PRV='B' 10 ;UNIT IS A PRIVILEGED TERMINAL (1=YES)
U2.LAS='B' 4 ;UNIT IS A LA30S TERMINAL (1=YES)
U2.SCS='B' 4 ;SCS-11 COMMAND TERMINAL (1=YES)
U2.VT5='B' 2 ;UNIT IS A VT05B TERMINAL (1=YES)
U2.LWC='B' 1 ;LOWER CASE TO UPPER CASE CONVERSION ;(0=YES)

;+ 
; BIT DEFINITIONS FOR U.MUP (SYSTEMS WITH ALTERNATE CLI SUPPORT ONLY) 
;-

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RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

UCBDFS (Cont.)

UM.OVR='B' 1 ;OVERRIDE CLI INDICATOR
UM.CLI='B' 36 ;CLI INDICATOR BITS
UM.DSB='B' 200 ;TERMINAL DISABLED SINCE CLI ELIMINATED
UM.NBR='B' 400 ;NO BROADCAST

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

; RH11-TU16 CHARACTERISTICS WORD 2 (U.CW2) BIT DEFINITIONS
-
U2.7CH='B' 100000 ;UNIT IS A 7 CHANNEL DRIVE (1=Yes)

; TERMINAL DEPENDENT CHARACTERISTICS WORD 3 (U.CW3) BIT DEFINITIONS
-
U3.UPC='B' 200000 ;UPCASE OUTPUT FLAG
U3.PAR='B' 400000 ;PARITY GENERATION AND CHECKING
U3.0PA='B' 1000000 ;PARITY SENSE (1=ODD PARITY)

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

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

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

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

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

;+ KMC-11-LP DEPENDENT UNIT STATUS BITS
;-
US.KPF='B' 1 ; KMC-11 POWERFAIL INTERLOCK

;+ TERMINAL DEPENDENT UNIT STATUS BIT DEFINITIONS
;-
IFI NB TTDEF
IFI DF TS$CPW

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

IFF ; TS$CPW

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

ENDC
ENDC ; TTDEF

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

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

;+ UNIT STATUS EXTENSION (U.ST2) BIT DEFINITIONS
;-

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RSX-11M SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

UCBDF$ (Cont.)

US.OFL='B' 1 ;UNIT OFFLINE (1=YES)
US.RED='B' 2 ;UNIT REDIRECTABLE (0=YES)
US.PUB='B' 4 ;UNIT IS PUBLIC DEVICE (1=YES)
US.UMD='B' 10 ;UNIT ATTACHED FOR DIAGNOSTICS (1=YES)

;+ MAg TAPE DENs SUPPORT IDENT IN CHAR WORD 3 (U.CW3) DEFINITION
; ASSIGNMENTS PER NUMERICAL SEQUENCE 0 - 255.
;-
UD.UNS='B' 0 ;UNSUPPORTED
UD.200='B' 1 ;200BPI, 7 TRACK
UD.556='B' 2 ;556BPI, 7 TRACK
UD.800='B' 3 ;800BPI, 7 OR 9 TRACK
UD.160='B' 4 ;1600BPI, 9 TRACK
UD.625='B' 5 ;6250BPI, 9 TRACK
UD.8K='B' 6 ;8K BPI - SERIAL, SERPENTINE RECORDING

.MACRO UCBDF$,X,Y,Z,ZZ
.ENDM
.ENDM
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.

All of these macros are in the Executive macro library LB:[1,1]EXEMC.MLB. All except FLDF$, ITBDF$, 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

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<th>Macro Arguments</th>
<th>Data Structures</th>
</tr>
</thead>
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<td>Task abort and termination notification message codes</td>
</tr>
<tr>
<td>ACNDF$ &lt;:)&lt;=&gt;</td>
<td>Accounting data structures (user account block, task account block, system account block)</td>
</tr>
<tr>
<td>CLKDF$ &lt;:)&lt;=&gt;</td>
<td>Clock queue control block</td>
</tr>
<tr>
<td>CTBDF$ &lt;:)&lt;=&gt;</td>
<td>Controller table</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Macro Arguments</th>
<th>Data Structures</th>
</tr>
</thead>
<tbody>
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<td>DCBDF§ &lt;:&gt;,&lt;=&gt;</td>
<td>Device Control Block</td>
</tr>
<tr>
<td>EPKDF§ &lt;:&gt;,&lt;=&gt;</td>
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</tr>
<tr>
<td>EVNDF§ &lt;:&gt;,&lt;=&gt;</td>
<td>Terminal Software Architecture (TSA) event packet definitions</td>
</tr>
<tr>
<td>F11DF§ &lt;:&gt;,&lt;=&gt;</td>
<td>FILES-11 data structures (Volume Control Block, mount list entry, File Control Block, file window block, locked block list node)</td>
</tr>
<tr>
<td>HDRDF§ &lt;:&gt;,&lt;=&gt;</td>
<td>Task header and window block</td>
</tr>
<tr>
<td>HWDDF§ &lt;:&gt;,&lt;=&gt;</td>
<td>Hardware register addresses and feature mask definitions</td>
</tr>
<tr>
<td>ITBDF§ &lt;:&gt;,&lt;=&gt;</td>
<td>Interrupt transfer block</td>
</tr>
<tr>
<td>KRBDF§ &lt;:&gt;,&lt;=&gt;</td>
<td>Controller request block</td>
</tr>
<tr>
<td>LCBDF§ &lt;:&gt;,&lt;=&gt;</td>
<td>Logical assignment control block</td>
</tr>
<tr>
<td>MTADF§ &lt;:&gt;,&lt;=&gt;</td>
<td>ANSI magtape data structures (volume set control block)</td>
</tr>
<tr>
<td>OLRDF§</td>
<td>On-line reconfiguration interface</td>
</tr>
<tr>
<td>PCBDF§ &lt;:&gt;,&lt;=&gt;</td>
<td>Partition Control Block and attachment descriptor</td>
</tr>
<tr>
<td>PKTDF§ &lt;:&gt;,&lt;=&gt;</td>
<td>I/O packet, AST control block, offspring control block, group global event flag control block, and CLI parser block</td>
</tr>
<tr>
<td>SCBDF§ &lt;:&gt;,&lt;=&gt;</td>
<td>Status Control Block and UMR assignment block</td>
</tr>
<tr>
<td>SHDDF§ &lt;:&gt;,&lt;=&gt;</td>
<td>Shadow recording linkage block</td>
</tr>
<tr>
<td>TCBDF§ &lt;:&gt;,&lt;=&gt;</td>
<td>Task Control Block</td>
</tr>
<tr>
<td>UCBDF§ &lt;:&gt;,&lt;=&gt;,TTDEF</td>
<td>Unit Control Block</td>
</tr>
</tbody>
</table>
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

ABODFS

.MACRO ABODFS,$L,$B

; TASK ABORT CODES
;
; NOTE: S.COAD-S.CFLT ARE ALSO SST VECTOR OFFSETS
;

S.CACT='B'-4. ;TASK STILL ACTIVE
S.CEXT='B'-2. ;TASK EXITED NORMALLY
S.COAD='B'0. ;ODD ADDRESS AND TRAPS TO 4
S.CBPT='B'2. ;SEGMENT FAULT
S.CILI='B'4. ;BREAK POINT OR TRACE TRAP
S.CIOT='B'6. ;IOT INSTRUCTION
S.CEMT='B'8. ;ILLEGAL OR RESERVED INSTRUCTION
S.CEXT='B'10. ;NON RSX EMT INSTRUCTION
S.CTRP='B'12. ;TRAP INSTRUCTION
S.CFLT='B'14. ;11/40 FLOATING POINT EXCEPTION
S.CSST='B'16. ;SST ABORT-BAD STACK
S.CAST='B'18. ;AST ABORT-BAD STACK
S.CABO='B'20. ;ABORT VIA DIRECTIVE
S.CCRF='B'22. ;TASK LOAD REQUEST FAILURE
S.CCRF='B'24. ;TASK CHECKPOINT READ FAILURE
S.IOMG='B'26. ;TASK EXIT WITH OUTSTANDING I/O
S.PRTY='B'28. ;TASK MEMORY PARITY ERROR
S.CPMD='B'30. ;TASK ABORTED WITH PMD REQUEST
S.CELV='B'32. ;TI: VIRTUAL TERMINAL WAS ELIMINATED
S.CINS='B'34. ;TASK INSTALLED IN 2 DIFFERENT SYSTEMS
S.CAFF='B'36. ;TASK ABORTED DUE TO BAD AFFINITY (REQUIRED
;BUS RUNS ARE OFFLINE OR NOT PRESENT)
S.CCSM='B'38. ;BAD CSM PARAMETERS OR BAD STACK
S.COTL='B'40. ;TASK HAS RUN OVER ITS TIME LIMIT
S.CTKN='B'42. ;ABORT VIA DIRECTIVE WITH NO TKTN MESSAGE

; TERMINATION CODES FOR BOM$
;
; NOTE:
;
; THE NORMAL TKTN ERROR CODES SPAN -4 THROUGH 42. THE BOM CODES,
; ALTHOUGH DEFINED FOR THE TASK, ETC, AS 0 THROUGH N, ARE PASSED TO
; TKTN AS -127 THROUGH -127+N. AN UNRECOGNIZED CODE IS PASSED AS -128,
; UNKNOWN ERROR.
;
S.BUNK='B'-128. ;UNKNOWN BOM$ ERROR
S.BFEI='B'0. ;ERROR IN HIGH LEVEL LANGUAGE INTERFACE
S.BOVL='B'1. ;LOAD OVERLAY FAILURE

; KEEP THE FOLLOWING DEFINED AS THE HIGHEST CODE IN USE
;
S.BHI='B'1. ;HIGHEST ACCEPTABLE BOM$ CODE

; BIT DEFINITIONS FOR BOM$ FLAGS WORD
;
S.BBIF='B'1. ;ENABLE CONDITIONAL BREAKPOINT

C-3
ABODFS$ (Cont.)

; TASK TERMINATION NOTIFICATION MESSAGE CODES

T.NDNR='B'0 ; DEVICE NOT READY
T.NDSE='B'2 ; DEVICE SELECT ERROR
T.NCWF='B'4 ; CHECKPOINT WRITE FAILURE
T.NCRE='B'6 ; CARD READER HARDWARE ERROR
T.NDMO='B'8 ; DISMOUNT COMPLETE
T.NUER='B'10 ; UNRECOVERABLE ERROR
T.NLDN='B'12 ; LINK DOWN (NETWORKS)
T.NLUP='B'14 ; LINK UP (NETWORKS)
T.NCFI='B'16 ; CHECKPOINT FILE INACTIVE
T.NUDE='B'18 ; UNRECOVERABLE DEVICE ERROR
T.NMPE='B'20 ; MEMORY PARITY ERROR
T.NKLF='B'22 ; UCODE LOADER NOT INSTALLED
T.NAAL='B'24 ; ACCOUNTING ALLOCATION FAILURE
T.NTAF='B'26 ; ACCOUNTING TAB ALLOCATION FAILURE
T.NDEB='B'28 ; TASK HAS NO DEBUGGING AID
T.NRCT='B'30 ; REPLACEMENT CONTROL TASK NOT INSTALLED
T.NWBL='B'32 ; WRITE BACK CACHING DATA LOST
; UNIT WRITE LOCKED
T.NVER='B'34 ; MOUNT VERIFICATION TASK NOT INSTALLED
T.NIOS='B'36 ; I/O STALLED TO DEVICE
T.NIOR='B'38 ; I/O RESUMING ON DEVICE

; MACRO ABODFS$ X,Y
.ENDM
.ENDM
.ENDM
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

ACNDF$ 

.MACRO ACNDF$,L,B

;+ ; ACCOUNTING BLOCK OFFSET AND STATUS DEFINITIONS ; FOR EACH TRANSACTION TYPE. ; ; HEADER COMMON TO ALL TRANSACTIONS ;-

.ASEC

.;=0
B.LNK:'L' .BLKW 1 ;LINK TO NEXT IN SYSLOG QUEUE B.TYP:'L' .BLKB 1 ;TRANSACTION TYPE B.LEN:'L' .BLKB 1 ;TRANSACTION LENGTH B.TIM:'L' .BLKW 3 ;ENDING TIME OF TRANSACTION B.HID='B' ;START OF HEADER IDENTIFICATION AREA B.UID:'L' .BLKW 2 ;UNIQUE SESSION IDENT B.ACN:'L' .BLKW 1 ;FIRST WORD-RAD50, SECOND-BINARY ACCOUNT NUMBER B.TID:'L' .BLKB 1 ;ASCII TERMINAL TYPE (V,T,B OR C) B.UHEND='B' ;(VIRTUAL,REAL,BATCH, OR CONSOLE) ;UNIT NUMBER B.HEND='B'. ;END OF HEADER ID AREA $$$HLN=. ;HEADER LENGTH ;

;+ ; ACCUMULATION FIELDS FOR TAB, UAB, AND SAB ;-

B.CPU:'L' .BLKW 2 ;TOTAL CPU TIME USED B.DIR:'L' .BLKW 2 ;TOTAL DIRECTIVE COUNT B.QIO:'L' .BLKW 2 ;TOTAL QIO$ COUNT B.TAS:'L' .BLKB 2 ;TOTAL TASK COUNT B.MEM:'L' .BLKW 3 ;RESERVED B.BEG:'L' .BLKW 3 ;BEGINNING/LOGIN TIME B.CPUL:'L' .BLKB 2 ;CPU LIMIT B.PNT:'L' .BLKW 1 ;POINTER TO HIGHER LEVEL TOTALS B.STM:'L' .BLKW 1 ;STATUS MASK $$$TLN=. ;TOTAL'S LENGTH

;+ ; USER ACCOUNT BLOCK (UAB) ; NOTE: UAB'S MUST END ON A WORD BOUNDARY ;-

.;=$$$$TLN
B.USE:'L' .BLKB 1 ;START AFTER TOTALS ;USE COUNT B.ACT:'L' .BLKW 1 ;NUMBER OF CURRENTLY ACTIVE TASKS B.UUIC:'L' .BLKB 1 ;LOGIN UIC B.UCB:'L' .BLKW 1 ;POINTER TO UCB B.LGO:'L' .BLKW 3 ;LOGOFF TIME B.ULNK:'L' .BLKW 1 ;LINK TO NEXT UAB B.RNA:'L' .BLKW 3 ;LOC IN SYSTEM ACCNT FILE ;(OFFSET,VBN-HI,VBN-LO)
ACNDF$ (Cont.)

B.NAM: 'L'.BLKB 14. ; LAST NAME OF USER
 .BLKB 1 ; FIRST INITIAL OF USER
 .BLKB 1 ; FLAG BYTE FOR UAB (bs.sil) etc.
B.LDS: 'L'.BLKB 10. ; LOGIN DIRECTORY STRING
B.ULEN='B'. ; UAB LENGTH
$$=$$ <.77>/100 ; UAB LENGTH (ROUNDED UP TO 32 WORD BOUND)

;+ ; TASK ACCOUNT BLOCK (TAB)
; NOTE: THE TAB MUST END ON A WORD BOUNDARY
;-

.=$$$TLN ; STARTS AFTER TOTALS
B.PRI: 'L'.BLKB 1 ; HIGHEST RUNNING PRIORITY
B.TNAM: 'L'.BLKW 2 ; TASK NAME
B.TCB: 'L'.BLKW 1 ;_tcb address
B.TST3: 'L'.BLKW 1 ; T.ST3 FROM TASK'S TCB
 .BLKW 1 ; RESERVED FOR FUTURE STATUS BITS
B.CUIC: 'L'.BLKW 1 ; CURRENT UIC OF TASK
B.PUIC: 'L'.BLKW 1 ; PROTECTION UIC OF TASK
B.CTXT: 'L'.BLKW 2 ; NUMBER OF CONTEXT LOADS
B.TCKP: 'L'.BLKW 2 ; TIMES TASK HAS BEEN CHECKPOINTED
B.OVLY: 'L'.BLKW 2 ; NUMBER OF DISK OVERLAY LOADS
B.EXST: 'L'.BLKW 2 ; EXIT STATUS AND ABORT CODE
B.TLEN='B'. ; TAB LENGTH
B.TBLK='B'<.77>/100 ; NUMBER OF SEC POOL BLOCKS IN TAB

;+ ; SYSTEM ACCOUNT BLOCK (SAB)
;-

.=$$$TLN ; STARTS AFTER TOTALS
B.SHDN: 'L'.BLKB 1 ; ACCOUNTING SHUTDOWN REASON CODE
B.UHD: 'L'.BLKW 1 ; UAB LISTHEAD
B.ULO: 'L'.BLKW 1 ; NUMBER OF USERS CURRENTLY LOGGED ON
B.ULT: 'L'.BLKW 2 ; TOTAL NUMBER OF LOGONS
B.CKP: 'L'.BLKW 2 ; TOTAL NUMBER OF CHECKPOINTS
B.SHP: 'L'.BLKW 2 ; TOTAL NUMBER OF SHUFFLER RUNS
B.RND: 'L'.BLKW 2 ; NUMBER OF CPU INTERVALS ROUNDED UP TO 1
B.FID: 'L'.BLKW 3 ; FILE-ID OF TRANSACTION FILE
B.DVNM: 'L'.BLKB 2 ; DEVICE OF TRANSACTION FILE
B.UNIT: 'L'.BLKW 1 ; UNIT OF TRANSACTION FILE
B.EXTS: 'L'.BLKW 1 ; EXTEND SIZE FOR TRANSACTION FILE
B.LSCN: 'L'.BLKW 3 ; TIME OF LAST SCAN
B.SCNR: 'L'.BLKW 1 ; SCAN RATE IN SECONDS
B.DSCN: 'L'.BLKW 1 ; STATISTICAL SCAN RATE (IN SEC)
B.STSP: 'L'.BLKW 2 ; RESERVED
B.SYSM: 'L'.BLKW 1 ; RESERVED
B.CKUS: 'L'.BLKW 3 ; RESERVED
B.CKSP: 'L'.BLKW 2 ; RESERVED
B.CKAL: 'L'.BLKW 1 ; RESERVED
B.SLEN='B'. ; SAB LENGTH

; NEW FIELDS FOR EXTENDED ACCOUNTING
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

ACNDF$ (Cont.)

B.CPUT: 'L'.BLKW 8. ;CPU time used per processor
B.CTXP: 'L'.BLKW 8. ;Number of context switches (per proc)
B.IDCT: 'L'.BLKW 8. ;Number of idle loop entries (per proc)
B.QIOC: 'L'.BLKW 8. ;Number of I/O initiations (per proc)
B.MIOC: 'L'.BLKW 8. ;Mass store I/O completions (per proc)
B.AIOC: 'L'.BLKW 8. ;All I/O completions (per proc)
B.IPSN: 'L'.BLKW 8. ;IP interrupts sent (per proc)
B.IPRC: 'L'.BLKW 8. ;IP interrupts rcvd (per proc)
B.CKEX: 'L'.BLKW 2 ;Checkpoint due to extend tasks
B.CFCL: 'L'.BLKW 2 ;Calls to cfork
B.CFRK: 'L'.BLKW 2 ;Cfork forks
B.TLOD: 'L'.BLKW 2 ;Task loads
B.RLOD: 'L'.BLKW 2 ;Region loads
.BLBK 82.;Bump size to next 32 word block
B.SSBL=.-B.SLEN ;Extra length of system statistics block
$$$= <.+.77>/100 ;SAS length (rounded up to 32 word bound)

;+ ;Syslog startup transaction
;-

.+ = $$HNL ;Start after header
B.SSLN='B' ;Transaction length

;+ ;Crash recovery transaction
;-

.+ = $$HNL ;Start after standard header
B.CTLS: 'L'.BLKW 3 ;Time of last scan before crash
B.CSRT: 'L'.BLKW 1 ;Scan rate before crash
B.CRSN: 'L'.BLKB 60. ;ASCII text explaining crash
B.CLEN='B'. ;Transaction length

;+ ;Invalid login transaction
;-

.+ = $$HNL ;Name from login line
B.INAM: 'L'.BLKB 14. ;Name from login line
B.IUIC: 'L'.BLKB 6. ;UIC from login line
B.IPSW: 'L'.BLKB 6. ;Password from login line
B.ILEN='B'. ;Transaction length

;+ ;Device transactions (allocation, deallocation, mount, and dismount)
;-

.+ = $$HNL ;ASCII device name
B.DNAM: 'L'.BLKW 1 ;ASCII device name
B.DUNT: 'L'.BLKB 1 ;Octal device unit number
B.DLEN='B'. ;Transaction length for all, DEA, and DMO
.BLKB 1 ;Unused byte
ACNDF$ (Cont.)

B.DLBL:'L'.BLKW 6 ; VOLUME LABEL
B.DMST:'L'.BLKW 1 ; MOUNT STATUS BITS
B.DUIC:'L'.BLKW 1 ; OWNER UIC
B.DVRP:'L'.BLKW 1 ; VOLUME PROTECTION CODE
B.DACP:'L'.BLKW 2 ; NAME OFACP FOR DEVICE
B.MLEN='B'. ; LENGTH OF MOUNT TRANSACTION

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

;+ ; SYSTEM TIME CHANGE TRANSACTION
;-
B.TOLD:'L'.BLKB 6 ; OLD TIME (YR, MON, DAY, HR, MIN, SEC)
B.TNEW:'L'.BLKB 6 ; NEW TIME (YR, MON, DAY, HR, MIN, SEC)
B.TMLN='B'. ; TRANSACTION LENGTH

;+ ; PRINT DESPOOLER TRANSACTION
;-
B.PNAM:'L'.BLKW 3 ; PRINT JOB NAME (RAD50)
B.PPGS:'L'.BLKW 1 ; PAGE COUNT
B.PNFI:'L'.BLKB 1 ; NUMBER OF FILES PRINTED
B.PFRM:'L'.BLKB 1 ; FORM NUMBER
B.PPFI:'L'.BLKB 1 ; PRINT PRIORITY
B.PDEV:'L'.BLKW 1 ; PRINT DEVICE NAME (ASCII)
B.PPUN:'L'.BLKW 1 ; UNIT NUMBER OF PRINT DEVICE
B.PLEN='B'. ; TRANSACTION LENGTH

;+ ; CARD READER SPOOLING TRANSACTION
;-
B.RNAM:'L'.BLKW 3 ; BATCH OR PRINT JOB NAME
B.RCDs:'L'.BLKW 1 ; NUMBER OF CARDS READ
B.RDEV:'L'.BLKW 1 ; READER DEVICE NAME (ASCII)
B.RUNT:'L'.BLKB 1 ; UNIT NUMBER OF READER DEVICE
B.RSOP:'L'.BLKB 1 ; SUBMIT OR PRINT (0=SUBMIT, 1=PRINT)
B.RLEN='B'. ; TRANSACTION LENGTH

;+ ; LOGIN TRANSACTION
;-

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ACNDF$ (Cont.)

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

; START AFTER HEADER
; LOGIN UIC
; USER'S LAST NAME
; AND FIRST INITIAL
; TRANSACTION LENGTH

+ ; RESET TRANSACTION PARAMETERS

; AFTER HEADER
; FILE-ID OF OLD TRN. FILE
; DEVICE OF OLD TRN. FILE
; UNIT OF OLD TRN. FILE
; FILE-ID OF NEW TRN. FILE
; DEVICE OF NEW TRN. FILE
; UNIT OF NEW TRN. FILE
; EXT. SIZE FOR OLD TRN. FILE
; EXT. SIZE FOR NEW TRN. FILE
; OLD SCAN RATE IN SECONDS
; NEW SCAN RATE IN SECONDS
; OLD STATISTICAL SCAN RATE
; NEW STATISTICAL SCAN RATE

; TRANSACTION TYPES

; 000 THRU 127 RESERVED FOR DEC USE
; 128 THRU 255 RESERVED FOR CUSTOMER USE

; SYSTEM ACCOUNT BLOCK (SAB)
; USER ACCOUNT BLOCK (UAB)
; TASK ACCOUNT BLOCK (TAB)
; SYSLOG STARTUP TRANSACTION
; INVALID LOGIN TRANSACTION
; SYSTEM TIME CHANGE TRANSACTION
; ALLOCATE DEVICE TRANSACTION
; DEALLOCATE DEVICE TRANSACTION
; MOUNT DEVICE TRANSACTION
; DISMOUNT DEVICE TRANSACTION
; PRINT DESPOOLER TRANSACTION
; DISK ACCOUNTING BY DIRECTORY
; (UNSUPPORTED)
; DISK ACCOUNTING BY VOLUME
; (UNSUPPORTED)
; LOGIN TRANSACTION
; CRASH RECOVERY TRANSACTION
; DEVICE STATISTICS (UCB EXTENSION)
; RESET TRANSACTION PARAMETERS
; CARD READER SPOOLING TRANSACTION

; STATUS MASK BIT DEFINITIONS (B.STM)

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

ACNDF$ (Cont.)

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

;+ ; ACCOUNTING FEATURE MASK ($ACNFE)
;-
BF.DST='B'40000 ;STATISTICAL SCAN RATE
BF.WRT='B'200 ;FORCE SYSLOG TO WRITE ITS BUFFER
BF.SCN='B'1000 ;SCAN REQUESTED
BF.SLR='B'400 ;SYSLOG IS RUNNING (NOT STOPPED)
BF.ERR='B'200 ;ACCOUNTING STOPPED DUE TO FATAL ERROR
BF.STR='B'100 ;ACCOUNTING IS STARTING UP / SHUTTING DOWN
BF.LSS='B'40 ;ACCUMULATE SYSTEM STATISTICS
BF.TRN='B'10 ;(POINT UAB TO SAB)
BF.XTK='B'4 ;OUTPUT TO TRANSACTION FILE
BF.TSK='B'2 ;CHECKPOINT REQUEST IS DUE TO EXTK$
BF.XAC='B'1 ;TASK ACCOUNTING TURNED ON

;+ ; SHUTDOWN CODES (B.SHDN)
;-
; 1 MAINTENANCE
; 2 REBOOT
; 3 SCHEDULED_SHUTDOWN
; 4 ACCOUNTING_SHUTDOWN BY TASK "SHUTUP"
; 5 OTHER

;***********************************************************************
B.MAXL='B'128. ;MAXIMUM TRANSACTION LENGTH
B.MINL='B'$SSHLN ;MINIMUM TRANSACTION LENGTH
;***********************************************************************

.PSECT
.MACRO ACNDF$ X,Y
.ENDM
.ENDM

.MACRO ACTDF$,L,B
.ASECT =0
A.GRP: 'L' .BLKB 3 ; GROUP CODE (ASCII)
A.MBR: 'L' .BLKB 3 ; MEMBER CODE
A.PSWD: 'L' .BLKB 6 ; PASSWORD
A.LNM: 'L' .BLKB 14. ; LAST NAME
A.FNM: 'L' .BLKB 12. ; FIRST NAME
A.LDAT: 'L' .BLKB 6 ; DATE OF LAST LOGON
; FORMAT = (DD/MM/YY HH:MM:SS)
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

ACNDF$ (Cont.)

A.NLOG: 'L' .BLKB 2 ; TOTAL NUMBER OF LOGONS
A.SYDV: 'L' .BLKB 4 ; DEFAULT SYSTEM DEVICE
A.ACN: 'L' .BLKW 1 ; ACCOUNT NUMBER (BINARY)
A.CLI: 'L' .BLKW 2 ; RAD50 USER CLI
A.LPRV: 'L' .BLKW 2 ; UNUSED
A.SID: 'L' .BLKW 1 ; LOGIN PRIVILEGE WORD
A.DDS: 'L' .BLKB 11 ; SESSION IDENTIFIER
A.FPRO: 'L' .BLKB 1 ; DEFAULT DIRECTORY STRING
A.RLVL: 'L' .BLKB 1 ; UNUSED BYTE
A.LEN='B'401 ; ACCOUNT RECORD REV. LEVEL
A.SALT: 'L' .BLKW 1 ; 16-BIT ENCRYPTION SALT VALUE
A.ENCT: 'L' .BLKW 1 ; ENCRYPTION TYPE
A.HPW: 'L' .BLKW 1 ; HASHED PASSWORD

A.TTY: 'L' .BLKB 5 ; TERMINAL TTNNN FOR AUTO LOGIN
A.PRID: 'L' .BLKB 1 ; PRIMARY DAYS MASK
A.SECD: 'L' .BLKB 1 ; SECONDARY DAYS MASK
A.PRIT: 'L' .BLKB 1 ; PRIMARY DAYS TIME
A.SECT: 'L' .BLKB 1 ; SECONDARY DAYS TIME
A.RLEN='B' .

A.LEN='B' 128 ; LENGTH OF CONTROL BLOCK

AL.SLV='B' 1 ; SLAVE TERMINAL ON LOGIN
AL.DDS='B' 2 ; INDICATOR FOR PROLOGUE 2 FORMAT
AL.SIL='B' 4 ; SILENT LOGIN/LOGOUT

AL.AUT='B' 10 ; AUTO LOGIN ENABLED ('*')
AL.BND='B' 20 ; BINDING ENABLED ('Y')
AL.RMT='B' 40 ; REMOTE DIALUP 1=NO
AL.NET='B' 100 ; NETWORK LOGIN 1=NO
AL.DIS='B' 200 ; DISABLE THIS ACCOUNT FROM LOGIN
AL.PRI='B' 400 ; PRIMARY DAYS LIMIT SET
AL.SEC='B' 1000 ; SECONDARY DAYS LIMIT SET

.; PSECT
. ENDM
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

CLKDF$.

.MACRO CLKDF$,L,B

; 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='B'0 ;MARK TIME REQUEST
C.SCHD='B'2 ;TASK REQUEST WITH PERIODIC RESCHEDULING
C.SSHT='B'4 ;SINGLE SHOT TASK REQUEST
C.SYST='B'6 ;SINGLE SHOT INTERNAL SYSTEM SUBROUTINE
; (IDENT)
C.SYTK='B'8. ;SINGLE SHOT INTERNAL SYSTEM SUBROUTINE
; (TASK)
C.CSTP='B'10. ;CLEAR STOP BIT (CONDITIONALIZED ON
; SUFFLING)

; CLOCK QUEUE CONTROL BLOCK TYPE INDEPENDENT OFFSET DEFINITIONS

; .ASECTION
.AEXIT

.=0
C.LNK:'L' .BLKW 1 ;CLOCK QUEUE THREAD WORD
C.RQT:'L' .BLKB 1 ;REQUEST TYPE
C.EFN:'L' .BLKB 1 ;EVENT FLAG NUMBER (MARK TIME ONLY)
C.TCB:'L' .BLKW 1 ;TCB ADDRESS OR SYSTEM SUBROUTINE
; IDENTIFICATION
C.TIM:'L' .BLKW 2 ;ABSOLUTE TIME WHEN REQUEST COMES DUE

; CLOCK QUEUE CONTROL BLOCK-MARK TIME DEPENDENT OFFSET DEFINITIONS

; .AEXIT

.=C.TIM+4
C.AST:'L' .BLKW 1 ;START OF DEPENDENT AREA
C.RQT:'L' .BLKB 1 ;AST ADDRESS
C.SRC:'L' .BLKW 1 ;FLAG MASK WORD FOR 'BIS' SOURCE
C.DST:'L' .BLKW 1 ;ADDRESS OF 'BIS' DESTINATION
; UNUSED

; CLOCK QUEUE CONTROL BLOCK-PERIODIC RESCHEDULING DEPENDENT OFFSET DEFINITIONS

; .AEXIT

.=C.TIM+4
C.RSI:'L' .BLKW 2 ;START OF DEPENDENT AREA
C.RSI:'L' .BLKW 2 ;RESCHEDULE INTERVAL IN CLOCK TICKS
C.UIC:'L' .BLKW 1 ;SCHEDULING UIC
C.UAB:'L' .BLKW 1 ;POINTER TO ASSOCIATED UAB

; CLOCK QUEUE CONTROL BLOCK-SINGLE SHOT DEPENDENT OFFSET DEFINITIONS

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

CLKDFS$ (Cont.)

.=C.TIM+4
.BLKW 2
.BLKW 1
.BLKW 1

; START OF DEPENDENT AREA
; TWO UNUSED WORDS
; SCHEDULING UIC
; C.UAB

; CLOCK QUEUE CONTROL BLOCK—SINGLE SHOT INTERNAL SUBROUTINE OFFSET
; DEFINITIONS
; THERE ARE TWO TYPE CODES FOR THIS TYPE OF REQUEST: 'L'
; 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
C.SUB: 'L'. BLKW 1
C.AR5: 'L'. BLKW 1
C.URM: 'L'. BLKW 1
.BLKW 1
C.LGTH='B'.

; LENGTH OF CLOCK QUEUE CONTROL BLOCK

; NAMED DIRECTORY SUPPORT
; OFFSET C.EFN WILL BE REUSED IN SCHEDULING REQUESTS TO INDICATE IF C.UIC
; HAS A VALID UIC (C.NAM=0) OR IF C.UIC POINTS TO A CONTEXT BLOCK WITH A
; DDS. IN SCHEDULE REQUESTS, C.EFN WILL BE REFERRED TO AS C.NAM.

C.NAM='B'. C.EFN
; FLAG WORD FOR USE WITH NAME DIRECTORIES
; DEPENDING ON THE VALUE IN C.NAM, C.UIC WILL CONTAIN A UIC OR A POINTER
; TO A CONTEXT BLOCK. C.UIC WILL BE REFERRED TO AS C.CTX WHEN IT CONTAINS
; A POINTER TO A CONTEXT BLOCK.

C.CTX='B'. C.UIC
; POINTER TO CONTEXT BLOCK

.PSECT
.MACRO CLKDFS$ X,Y
.ENDM
.ENDM
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

CTBDF$

.MACRO 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.
;
.ASEC
=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:.BLKW 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 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)

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

DCBDF$

.MACRO DCBDF$,L,B

;+ 
;
; 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
D.LNK:'L' .BLKW 1 ;LINK TO NEXT DCB
D.UCB:'L' .BLKW 1 ;POINTER TO FIRST UNIT CONTROL BLOCK
D.NAM:'L' .BLKW 1 ;GENERIC DEVICE NAME
D.UNIT:'L' .BLKB 1 ;LOWEST UNIT NUMBER COVERED BY THIS DCB
D.UNITB:'L' .BLKB 1 ;HIGHEST UNIT NUMBER COVERED BY THIS DCB
D.DSP:'L' .BLKW 1 ;LENGTH OF EACH UNIT CONTROL BLOCK IN BYTES
D.MSK:'L' .BLKW 1 ;POINTER TO DRIVER DISPATCH TABLE
D.MSK:O' ' .BLKW 1 ;LEGAL FUNCTION MASK CODES 0-15.
D.MSK:1' .BLKW 1 ;CONTROL FUNCTION MASK CODES 0-15.
D.MSK:2' .BLKW 1 ;NOP'ED FUNCTION MASK CODES 0-15.
D.MSK:3' .BLKW 1 ;ACP FUNCTION MASK CODES 0-15.
D.MSK:4' .BLKW 1 ;LEGAL FUNCTION MASK CODES 16.-31.
D.MSK:5' .BLKW 1 ;CONTROL FUNCTION MASK CODES 16.-31.
D.MSK:6' .BLKW 1 ;NOP'ED FUNCTION MASK CODES 16.-31.
D.MSK:7' .BLKW 1 ;ACP FUNCTION MASK CODES 16.-31.
D.PCB:'L' .BLKW 1 ;LOADABLE DRIVER PCB ADDRESS

.PSECT

;+ 
;
; DRIVER DISPATCH TABLE OFFSET DEFINITIONS 
;-

D.VDEB='B'-2 ;DEALLOCATE BUFFER(S)
D.VCHK='B'-4 ;ADDRESS OF ROUTINE CALLED TO VALIDATE 
;AND CONVERT THE LBN. USED BY DRIVERS 
;THAT SUPPORT SEEK OPTIMIZATION.
D.VNXC='B'-4 ;ADDRESS OF ROUTINE IN TTDRV CALLED TO 
;HAVE IT SEND THE NEXT COMMAND IN THE 
;TYPEAHEAD BUFFER TO MCR...
D.VTOU='B'-10 ;ADDRESS OF ROUTINE IN TTDRV CALLED 
;FOR OUTPUT COMPLETION
D.VTOU='B'-6 ;ADDRESS OF ROUTINE IN TTDRV CALLED 
;FOR INPUT FROM THE CT FIRMWARE TASK
D.VINI='B'0 ;DEVICE INITIATOR
D.VCAN='B'2 ;CANCEL CURRENT I/O FUNCTION
D.VOUT='B'4 ;DEVICE TIMEOUT
D.VPWF='B'6 ;POWERFAIL RECOVERY
D.VKRB='B'10 ;CONTROLLER STATUS CHANGE ENTRY
D.VUCB='B'12 ;UNIT STATUS CHANGE ENTRY
DCBDF$ (Cont.)

.IP NB SYSDEF

D.VINT='B'14 ;BEGINNING OF INTERRUPT DATA

.ENDC

.MACRO DCBDF$,X,Y,Z
.MACRO DCBDF$,X,Y,Z
-ENDM
-ENDM

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

EPKDFS

.MACRO EPKDFS,L,B

;* 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

E$HLGH:'L' .BLKW 1 ; Subpacket length in bytes
E$HSBF:'L' .BLKW 1 ; Subpacket Flags
E$HSYS:'L' .BLKB 1 ; Operating System Code
E$HIDN:'L' .BLKB 1 ; Format Identification
E$HSID:'L' .BLKB 4 ; Operating System Identification
E$HCTX:'L' .BLKB 1 ; Context Code
E$HFLG:'L' .BLKB 1 ; Flags
E$HENS:'L' .BLKW 1 ; Entry Sequence Number
E$HERS:'L' .BLKW 1 ; Error Sequence Number
E$HENC:'L' ; Entry Code
E$HTYC:'L' .BLKB 1 ; Entry Type Code
E$HTYS:'L' .BLKB 1 ; Entry Type Subcode
E$HTIM:'L' .BLKB 6 ; Time Stamp
E$HPTY:'L' .BLKB 1 ; Processor Type
 E$LHURL : .BLKW 1 ; Processor Identification (URM)

E$HLEN:'L' .EVEN ; Length
EPKDFS (Cont.)

; Subpacket Flags for E$HSBF

; SM.ERR = 'B' 1 ; Error Packet
SM.HDR = 'B' 1 ; Header Subpacket
SM.TSK = 'B' 2 ; Task Subpacket
SM.DID = 'B' 4 ; Device Identification Subpacket
SM.DOP = 'B' 10 ; Device Operation Subpacket
SM.DAC = 'B' 20 ; Device Activity Subpacket
SM.DAT = 'B' 40 ; Data Subpacket
SM.MBC = 'B' 20000 ; 22-bit massbus controller present
SM.CMD = 'B' 40000 ; Error Log Command Packet
SM.ZER = 'B' 100000 ; Zero I/O Counts

; Codes for field E$HIDN

; EH$FOR = 'B' 2 ; Current packet format

; Flags for the error log flags byte ($ERFLA) in the Executive

; ES.INI = 'B' 1 ; Error log initialized
ES.DAT = 'B' 2 ; Error log receiving data packets
ES.LIM = 'B' 4 ; Error limiting enabled
ES.LOG = 'B' 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$CCMD = 'B' 1 ; Error Log Control
E$SSTA = 'B' 1 ; Error Log Status Change
E$SWI = 'B' 2 ; Switch Logging Files
E$SAPP = 'B' 3 ; Append File
E$SBAC = 'B' 4 ; Declare Backup File
E$SSHO = 'B' 5 ; Show
E$SCLL = 'B' 6 ; Change Limits
E$CERR = 'B' 2 ; Device Errors
E$SDVH = 'B' 1 ; Device Hard Error
E$SDYS = 'B' 2 ; Device Soft Error
E$STM0 = 'B' 3 ; Device Interrupt Timeout (HARD)
E$UNS = 'B' 4 ; Device Unsolicited Interrupt
E$STS = 'B' 5 ; Device Interrupt Timeout (SOFT)
E$CDVI = 'B' 3 ; Device Information
E$SDVI = 'B' 1 ; Device Information Message
E$CDCI = 'B' 4 ; Device Control Information
E$SMOU = 'B' 1 ; Device Mount
E$SMDO = 'B' 2 ; Device Dismount
E$SRSE = 'B' 3 ; Device Count Reset
E$SRCT = 'B' 4 ; Block Replacement
E$CMEM = 'B' 5 ; Memory Detected Errors
E$SMEM = 'B' 1 ; Memory Error
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

EPKDFS$ (Cont.)

E$CSYS = 'B' 6 ; System Control Information
E$SPWR = 'B' 1 ; Power Recovery
E$CCCTL = 'B' 7 ; Control Information
E$STIM = 'B' 1 ; Time Change
E$SCR = 'B' 2 ; System Crash
E$SLOA = 'B' 3 ; Device Driver Load
E$SUNL = 'B' 4 ; Device Driver Unload
E$SHRC = 'B' 5 ; Reconfiguration Status Change
E$SMES = 'B' 6 ; Message
E$CCPU = 'B' 10 ; CPU Detected Errors
E$SINT = 'B' 1 ; Unexpected Interrupt
E$SINT = 'B' 2 ; Unexpected Interrupt

; Subtype code 2 is reserved. Use 3 for the next following Subtype code
E$CSDE = 'B' 11 ; Software Detected Events
E$SABO = 'B' 1 ; Task Abort

; Codes for Context Code entry E$HCTX
EH$SNR = 'B' 1 ; Normal Entry
EH$STA = 'B' 2 ; Start Entry
EH$CRS = 'B' 3 ; Crash Entry

; Codes for Flags entry E$HFLG
EH$VIR = 'B' 1 ; Addresses are virtual
EH$EXT = 'B' 2 ; Addresses are extended
EH$COU = 'B' 4 ; Error counts supplied
EH$QBS = 'B' 10 ; Q-BUS CPU
EH$LMR = 'B' 20 ; Limit reached

; Task Subpacket
+-----------------------------------------------+
| Task Subpacket Length                        |
+-----------------------------------------------+
| Task Name in RAD50                          |
+-----------------------------------------------+
| Task UIC                                    |
+-----------------------------------------------+
| Task TI: Device Name                         |
+-----------------------------------------------+
| Flags                                      |
| Task TI: Unit Number                       |
+-----------------------------------------------+

=0

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EPKDFS (Cont.)

E$TGH: 'L' .BLKW 1 ; Task Subpacket Length
E$TSK: 'L' .BLKW 2 ; Task Name in RAD50
E$TUIC: 'L' .BLKW 1 ; Task UIC
E$TTID: 'L' .BLKB 2 ; Task TI: Device Name
E$TTIU: 'L' .BLKB 1 ; Task TI: Unit
E$TFLG: 'L' .BLKB 1 ; Flags

.EVEN
E$TLEN: 'L'

; Flags for entry E$TFLG
; ET$PRV = 'B' 1 ; Task is Privileged
; ET$PRI = 'B' 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)
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

EPKDFS (Cont.)

.. = 0

E$ILGH:'L' .BLKW 1 ; Device Identification Subpacket Length
E$ILDV:'L' .BLKW 1 ; Device Mnemonic Name
E$ILUN:'L' .BLKB 1 ; Device Unit Number
E$IPCO:'L' .BLKB 1 ; Controller Number
E$IPUN:'L' .BLKB 1 ; Physical Unit Number
E$IPSU:'L' .BLKB 1 ; Physical Subunit Number
.

IFDEF R$SMPL

E$IPDV:'L' .BLKW 1 ; Physical Device Mnemonic
.

ENDIF R$SMPL

E$IFLG:'L' .BLKB 1 ; Flags
    .BLKB 1 ; Reserved
E$IVOL:'L' .BLKB 12. ; Volume Name
E$IPAK:'L' .BLKB 4 ; Pack Identification
E$IDEV:'L' .BLKB 1 ; Device Type
E$IDCL:'L' .BLKB 4 ; Device Type Class
E$IDTY:'L' .BLKW 1 ; Device Type
E$IOPR:'L' .BLKB 2 ; I/O Operation Count Longword
E$IERS:'L' .BLKB 1 ; Soft Error Count
E$IERH:'L' .BLKB 1 ; Hard Error Count
.

IFDEF R$SMPL

E$IBLK:'L' .BLKW 2 ; Blocks transferred count
E$ICYL:'L' .BLKW 2 ; Cylinders crossed count
.

ENDIF R$SMPL

.EVEN

E$ILEN:'L' ; Subpacket Length
;
Flags for field E$IFLG
;
E$ISUB = 'B' 1 ; Subcontroller device
.

IFDEF R$SMPL

E$INUX = 'B' 2 ; No UCB extension, data invalid
.

ENDIF R$SMPL

;
Device Operation Subpacket
;
;

(Continued on next page)
RSX-IIM-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

EPKDF$ (Cont.)

; ; Reserved + Task TI: Device Unit +
; + I/O Function Code + Operation Flags +
; Transfer Operation Address +
; Transfer Operation Byte Count +
; Maximum Retries | Retries Left +

.END

.EVEN

E$OFLG:'L' .BLKW 1 ; Subpacket Length
E$OFLG:'L' .BLKW 2 ; Task Name in RAD50
E$OFLG:'L' .BLKW 1 ; Task UIC
E$OFLG:'L' .BLKW 2 ; Task TI: Logical Device Mnemonic
E$OFLG:'L' .BLKB 1 ; Task TI: Logical Device Unit
E$OFLG:'L' .BLKB 1 ; Reserved
E$OFLG:'L' .BLKW 1 ; I/O Function Code
E$OFLG:'L' .BLKB 1 ; Operation Flags
E$OFLG:'L' .BLKB 1 ; Reserved
E$OFLG:'L' .BLWK 2 ; Transfer Operation Address
E$OFLG:'L' .BLKB 1 ; Transfer Operation Byte Count
E$OFLG:'L' .BLKB 1 ; Retries Left
E$OFLG:'L' .BLKB 1 ; Maximum Retries

.EVEN

E$OFLG:'L' ; Device Operation Subpacket Length

; Flags for field E$OFLG
;
EO$TRA ='B' 1 ; Transfer Operation
EO$DMA ='B' 2 ; DMA Device
EO$EXT ='B' 4 ; Extended Addressing Device
EO$SPIF ='B' 10 ; Device is positioning
EO$SIO = 'B' 20 ; Internal I/O operation
;
; I/O Activity Subpacket
;
; ; I/O Activity Subpacket Length
;
; =0

E$ALGH:'L' .BLKW 1 ; Subpacket Length
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

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
E$ALDV:'L' .BLKW 1 ; Logical Device Name Mnemonic
E$ALUN:'L' .BLKB 1 ; Logical Device Unit
E$APCO:'L' .BLKB 1 ; Controller Number
E$APUN:'L' .BLKB 1 ; Physical Unit Number
E$APSU:'L' .BLKB 1 ; Physical Subunit Number

IFDEF R$SMPL
E$APDV:'L' .BLKW 1 ; Physical Device Mnemonic
ENDIF
E$ADFG:'L' .BLKB 1 ; Device flags
E$ATIU:'L' .BLKB 1 ; Task TI: Logical Unit
E$ATS$TK:'L' .BLKW 2 ; Requesting Task Name in RAD50
E$AUIC:'L' .BLKW 2 ; Requesting Task UIC
E$ATID:'L' .BLKW 1 ; Task TI: Logical Device Name
E$AFNC:'L' .BLKW 1 ; I/O Function Code
E$AFLG:'L' .BLKB 1 ; Flags
E$AADD:'L' .BLKW 2 ; Transfer Operation Address
E$ASIZ:'L' .BLKW 1 ; Transfer Operation Byte Count

.EVEN
EPKDF$ (Cont.)

ESALEN:'L' ; Subpacket Entry Length

; Flags for field ESADFG

EASSUB = 'B' 1 ; Subcontroller device

.IFDEF R$S$MP$L

EASNUX = 'B' 2 ; No UCB extension, data invalid

.ENDIF ; R$S$MP$L

; Flags for field E$AFLG

EASTRA = 'B' 1 ; Transfer Operation

EASDMA = 'B' 2 ; DMA Device

EASEXT = 'B' 4 ; Device has Extended Addressing

EASPIP = 'B' 10 ; Device is positioning

EASIIO = 'B' 20 ; Internal I/O operation

.PSECT

; FLAG DEFINITIONS FOR ERROR LOG FEATURE MASK

EL.ICM = 'B' 1 ; SET - Inhibit Operator Console Messages

EL.SEF = 'B' 2 ; SET - Special File Formats Enabled

EL.MOU = 'B' 4 ; SET - Process MOU/DMO In Special Files

.MACRO EPKDF$ X,Y

.ENDM

.ENDM
This module contains a macro which defines the offsets and field values for TSA Event Packets (TEP's). These packets are used to pass data and status information between system components that provide Digital's Terminal Software Architecture support on RSX.

Explicit Inputs:
L "::" for global offset definitions
B "=" for global bit/value definitions
LST "LIST" for macro expansion listing

Implicit Inputs:
NONE

Outputs:
Symbols defined as described above.
Listing as described above.

General packet header format
.ASECT .=0
E.VLNK: 'L' .BLKW 1
E.VSIZ: 'L' .BLKB 1
E.VTYP: 'L' .BLKB 1
E.VUCB: 'L' .BLKW 1

E.VTYP Values
ET.LOW='B'0
ET.QIO='B'0
ET.BND='B'2
ET.UNB='B'4
ET.BCP='B'6
ET.REJ='B'10
ET.DIS='B'12
ET.DCP='B'14
ET.ICS='B'16
ET.OOB='B'20
ET.ONO='B'22
ET.PHO='B'24
ET.HI='B'24

Define offsets absolutely
Link word
Packet size
Packet type
Terminal UCB address
Lowest valid type code
QIO (distinguishes QIO packet from TEP)
Bind Request
Unbind Request
Bind Complete
Bind Reject
Disconnect Notification
Disconnect Complete
Input Count State Change
Out-of-Band (OOB)
Abnormal Termination Request
Physical Terminal Disconnected

Highest valid type code
The following definitions are for packet types that require passing additional information in the packets. All other packet types use the general packet format described above.

Bind Request packet (Terminal Management Mode --> Network)

- E.VBCT: 'L' .BLKW 1; Count of nodes (One for now)
- E.VBND: 'L' .BLKB 6; Node name
- E.VBLN: 'L'; Length of bind request

Input Count State Change, Out-Of-Band packets (TTDRV --> Network) And Modem Hang-up packets (TSA... --> Network)

- E.VAPR: 'L' .BLKW 1; Doubleword address of packet...
- E.VADR: 'L' .BLKW 1; ...queueing routine
- E.VFLG: 'L'
- E.VSLN: 'L' ; Length of Input state message
- OOB
- E.VOBM: 'L' .BLKW 6; Out-of-Band bitmasks
- E.VHDR: 'L' .BLKW 2; Type-ahead buffer header
- E.VTAB: 'L' .BLKB 10.; Type-ahead buffer
- E.VOLN: 'L'; Length of OOB packet

Terminal Management Switch Characters

- E.VSWC: 'L' .BLKW 1; Terminal management switch characters
- E.VTLN: 'L'; Length of Switch Character packet

Bit values in flag word (E.VFLG). For convenience some bits have corresponding bits in the AST Control Block flag word (A.PRM+5).
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

EVNDF$ (Cont.)

; All non-control characters are out-of band
EF.NCO='B'1
; All non-control OOB are include-OOB
EF.NOI='B'2
; Reserved bit synonymous with TF.AST
EF.AST='B'10
; Reserved bit synonymous with AF.LCK
EF.LCK='B'40
EF.QUE='B'100
; TEP is queued
EF.MDE='B'200

; Unbind Request packet (TMM --> Network)
.E=VUCB+2
E.VULN:'L'
; Length of Unbind message

; Connect Reject notification packet (Network --> TMM)
.E=VUCB+2
E.VRR:'L' .BLKW 1 ; Reason for Rejection
E.VRLN:'L' ; Length of Reject message

; Disconnect Notification packet (Network --> TMM)
.E=VUCB+2
E.VRD:'L' .BLKW 1 ; Reason for Disconnect
E.VDLN:'L' ; Length of Disconnect message

; Disconnect Complete packet (TMM --> Network)
.E=VUCB+2
E.VDCL:'L'

.PSECT

.IF NB LST
.NLIST
.IFF .MACRO EVNDF$
.ENDM
; If not listing, redefine
.ENDM EVNDF$

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

F11DF$

.MACRO F11DF$,L,B

; VOLUME CONTROL BLOCK

.ASECT

=0

V.TRCT:'L',BLW 1 ; TRANSACTION COUNT
V.TYPE:'L',BLK 1 ; VOLUME TYPE DESCRIPTOR
   VT.FOR='B' 0 ; FOREIGN VOLUME STRUCTURE
   VT.SL1='B' 1 ; FILES-11 STRUCTURE LEVEL 1
   VT.SL2='B' 2 ; FILES-11 STRUCTURE LEVEL 2
   VT.ANS='B' 10 ; ANSI LABELED TAPE
   VT.UNL='B' 11 ; UNLABELED TAPE
V.VCHA:'L',BLKB 1 ; VOLUME CHARACTERISTICS
   VC.SLK='B' 1 ; CLEAR VOLUME VALID ON DISMOUNT
   VC.HLK='B' 2 ; UNLOAD THE VOLUME ON DISMOUNT
   VC.DEA='B' 4 ; DEALLOCATE THE VOLUME ON DISMOUNT
   VC.PUB='B' 10 ; SET (CLEAR) US.PUB ON DISMOUNT
   VC.DUP='B' 20 ; DUPLICATE VOLUME NAME; DON'T DELETE LOGICALS
   VC.SIL='B' 40 ; SILENT MODE; SUPPRESS DISMOUNT COMPLETE MESSAGE
V.LABL:'L',BLKB 14 ; VOLUME LABEL (ASCII)
V.PKSR:'L',BLK 2 ; PACK SERIAL NUMBER FOR ERROR LOGGING
V.SLEN:'L' ; LENGTH OF SHORT VCB
V.IFWI:'L',BLKW 1 ; INDEX FILE WINDOW
V.FCB:'L',BLK 2 ; FILE CONTROL BLOCK LIST HEAD
V.IBLB:'L',BLKB 1 ; INDEX BIT MAP 1ST LBN HIGH BYTE
V.IBSZ:'L',BLKB 1 ; INDEX BIT MAP SIZE IN BLOCKS
   .BLKW 1 ; INDEX BITMAP 1ST LBN LOW BITS
V.FMAX:'L',BLKW 1 ; MAX NO. OF FILES ON VOLUME
V.WISZ:'L',BLKB 1 ; DEFAULT SIZE OF WINDOW IN RTRV PTRS
   ; VALUE IS < 128.
V.SBCL:'L',BLKB 1 ; STORAGE BIT MAP CLUSTER FACTOR
V.SBSZ:'L',BLKB 1 ; STORAGE BIT MAP SIZE IN BLOCKS
V.SBLB:'L',BLKB 1 ; STORAGE BIT MAP 1ST LBN HIGH BYTE
V.FIEL:'L',BLKB 1 ; DEFAULT FILE EXTEND SIZE
   .BLKW 1 ; STORAGE BIT MAP 1ST LBN LOW BITS

; WARNING

; THE FOLLOWING CELLS OF THE VCB ARE ORDER DEPENDENT.
; THEY ARE RETURNED BY A READ ATTRIBUTES FUNCTION AND
; MUST BE KEPT CONTIGUOUS. IF THE ORDER OF THE CELLS
; IS BROKEN, THE CODE MAY BREAK AS WELL.

V.VOWN:'L',BLK 1 ; VOLUME OWNER'S UIC
V.VPRO:'L',BLK 1 ; VOLUME PROTECTION
V.FPRO:'L',BLK 1 ; VOLUME DEFAULT FILE PROTECTION
V.FRBK:'L',BLKB 1 ; NUMBER OF FREE BLOCKS ON VOLUME HIGH BYTE
V.LRUC:'L',BLKB 1 ; COUNT OF AVAILABLE LRU SLOTS IN FCB LIST
   .BLKW 1 ; NUMBER OF FREE BLOCKS ON VOLUME LOW BITS
WARNING

THE ABOVE CELLS OF THE VCB ARE ORDER DEPENDENT.
THEY ARE RETURNED BY A READ ATTRIBUTES FUNCTION AND
MUST BE KEPT CONTIGUOUS. IF THE ORDER OF THE CELLS
IS BROKEN, THE CODE MAY BREAK AS WELL.

V.STS: 'L'.BLKB 1 ; VOLUME STATUS BYTE, CONTAINING THE FOLLOWING
  VS.IFW='B' 1 ; INDEX FILE IS WRITE ACCESSED
  VS.BMW='B' 2 ; STORAGE BITMAP FILE IS WRITE ACCESSED
V.FFNU: 'L'.BLKB 1 ; FIRST FREE INDEX FILE BITMAP BLOCK
V.EXT: 'L'.BLKW 1 ; POINTER TO VCB EXTENSION
V.HBLB: 'L'.BLKB 2 ; LBN OF HOME BLOCK
V.HBCS: 'L'.BLKW 2 ; HOME BLOCK CHECKSUMS
V.LGTH: 'L' ; 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

M.LNK: 'L'.BLKW 1 ; LINK WORD
M.TYPE: 'L'.BLKW 1 ; TYPE OF ENTRY
  MT.MLS='B' 1 ; MOUNTED VOLUME USER ACCESS LIST
M.ACC: 'L'.BLKB 1 ; NUMBER OF ACCESSSES
M.DEV: 'L'.BLKW 1 ; DEVICE UCB
M.TI: 'L'.BLKW 1 ; ACCESSOR TI: UCB
M.LEN: 'L' ; LENGTH OF ENTRY

FILE CONTROL BLOCK

.ASECT

F.LINK: 'L'.BLKW 1 ; FCB CHAIN POINTER
F.FNUM: 'L'.BLKW 1 ; FILE NUMBER
F.FSEQ: 'L'.BLKW 1 ; FILE SEQUENCE NUMBER
  .BLKB 1 ; NOT USED
F.FSQN: 'L'.BLKB 1 ; FILE SEGMENT NUMBER
F.FOWN: 'L'.BLKW 1 ; FILE OWNER'S UIC
F.FPRO: 'L'.BLKW 1 ; FILE PROTECTION CODE
F.UCHA: 'L'.BLKB 1 ; USER CONTROLLED CHARACTERISTICS
F.SCHA: 'L'.BLKB 1 ; SYSTEM CONTROLLED CHARACTERISTICS
F.HDLB: 'L'.BLKW 2 ; FILE HEADER LOGICAL BLOCK NUMBER
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

F11DF$ (Cont.)

F.LBN:'L'.BLKW 2 ; BEGINNING OF STATISTICS BLOCK
F.SIZE:'L'.BLKW 2 ; LBN OF VIRTUAL BLOCK 1 IF CONTIGUOUS
F.NACS:'L'.BLKB 1 ; 0 IF NON CONTIGUOUS
F.NLCK:'L'.BLKB 1 ; SIZE OF FILE IN BLOCKS
S.STBK='B'.-F.LBN ; NO. OF LOCKS
S.STAT:'L' ; SIZE OF STATISTICS BLOCK
F.NWAC:'L'.BLKB 1 ; BEGINNING OF STATISTICS BLOCK
F.SIZE:'L'.BLKW 2 ; LBN OF VIRTUAL BLOCK 1 IF CONTIGUOUS
F.NACS:'L'.BLKB 1 ; 0 IF NON CONTIGUOUS
F.NLCK:'L'.BLKB 1 ; SIZE OF FILE IN BLOCKS
F.TBLK:'L'.BLKB 1 ; NO. OF LOCKS
S.STBK='B'.-F.LBN ; SIZE OF STATISTICS BLOCK
F.STAT:'L' ; FCB STATUS WORD
F.NWAC:'L'.BLKB 1 ; NUMBER OF WRITE ACCESSORS
F.NWAC+'L'.BLKB 1 ; STATUS BITS FOR FCB CONSISTING OF
FC.WAC='B' 100000 ; SET IF FILE ACCESSED FOR WRITE
FC.DIR='B' 400000 ; SET IF FCB IS IN DIRECTORY LRU
FC.CEF='B' 200000 ; SET IF DIRECTORY EOF NEEDS UPDATING
FC.FCO='B' 100000 ; SET IF TRYING TO FORCE DIRECTORY CONTIG
F.DREF:'L'.BLKB 1 ; DIRECTORY EOF BLOCK NUMBER
F.DRNM:'L'.BLKB 1 ; 1ST WORD OF DIRECTORY NAME
F.DREC:'L'.BLKB 1 ; POINTER TO EXTENSION FCB
F.EEXT:'L'.BLKB 1 ; STARTING VBN OF THIS FILE SEGMENT
F.FVBN:'L'.BLKB 1 ; POINTER TO LOCKED BLOCK LIST FOR FILE
F.FLBK:'L'.BLKB 1 ; WINDOW BLOCK LIST FOR THIS FILE
F.FLKB:'L'.BLKB 1 ; SIZE IN BLOCKS OF FCB
W.ACT:'L' ; NUMBER OF ACTIVE MAPPING POINTERS
W.BLKS:'L' ; WHEN NO SECONDARY POOL
W.CTL:'L'.BLKB 1 ; BLOCK SIZE OF SECONDARY POOL SEGMENT
W.CTL+'L’.BLKB 1 ; WHEN SECONDARY POOL
WI.RDV='B' 400 ; READ VIRTUAL BLOCK ALLOWED IF SET
WI.WRV='B' 1000 ; WRITE VIRTUAL BLOCK ALLOWED IF SET
WI.EXT='B' 2000 ; EXTEND ALLOWED IF SET
WI.LCK='B' 4000 ; SET IF LOCKED AGAINST SHARED ACCESS
WI.DLK='B' 10000 ; SET IF DEACCESS LOCK ENABLED
WI.PND='B' 20000 ; WINDOW TURN PENDING BIT
WI.EXL='B' 40000 ; SET IF MANUAL UNLOCK DESIRED
WI.WCK='B' 100000 ; DATA CHECK ALL WRITES TO FILE
W.IOC:'L’.BLKB 1 ; COUNT OF I/O THROUGH THIS WINDOW
W.FCB:'L’.BLKB 1 ; FILE CONTROL BLOCK ADDRESS
W.TCB:'L’.BLKB 1 ; TCB ADDRESS OF ACCESSOR
W.UCB':'L’.BLKB 1 ; ORIGINAL UCB ADDRESS OF DEVICE
W.LKL:'L’.BLKB 1 ; POINTER TO LIST OF USERS LOCKED BLOCKS
W.WIN:'L’.BLKB 1 ; WINDOW BLOCK LIST LINK WORD

C-30
; NON-SECONDARY POOL WINDOW BLOCK
;
; IF SECONDARY POOL WINDOWS ARE NOT ENABLED, THE WINDOW BLOCK
; CONTAINS THE CONTROL INFORMATION AND RETRIEVAL POINTERS.
;
W.VBN: 'L'.BLKB 1 ; HIGH BYTE OF 1ST VBN MAPPED BY WINDOW
W.MAP: 'L' ; DEFINE LABEL WITH ODD ADDRESS TO CATCH BAD REF
W.WISZ: 'L'.BLKB 1 ; SIZE IN RTRV PTRS OF WINDOW (7 BITS)
.W.RTRV: 'L' ; OFFSET TO 1ST RETRIEVAL POINTER IN WINDOW
W.SLEN='B'-4 ; DUMMY DEFINITION TO PREVENT INCORRECT REFERENCE
; (-4 WHEN ROUNDED "UP" IS A VERY LARGE BLOCK)
.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: 'L'.BLKW 1 ; ADDR TO THE MAPPING PTRS IN SECONDARY POOL
W.SLEN: 'L' ; LENGTH OF PRIMARY POOL STUB

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

ASSUME W.CTL,0

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

.ENDC ; END SECONDARY POOL WINDOW CONDITIONAL

.ENDC ; END SYSDEF CONDITIONAL

; LOCKED BLOCK LIST NODE
;
.=0

.ASECT

C-31
F11DF$ (Cont.)

L.LNK:'L'.BLKW 1 ; LINK TO NEXT NODE IN LIST
L.WI1:'L'.BLKW 1 ; POINTER TO WINDOW FOR FIRST ENTRY
L.VBI:'L'.BLKB 1 ; HIGH ORDER VBN BYTE
L.CNT:'L'.BLKB 1 ; COUNT FOR ENTRY
          .BLKW 1 ; LOW ORDER VBN
L.LKSZ:'L'

; END OF DEFINITIONS

    .PSECT
    .MACRO  F11DF$  X,Y,Z
    .ENDM  F11DF$
    .ENDM  F11DF$
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

HDRDFS$

.MACRO HDRDFS$,L,B

;+ TASK HEADER OFFSET DEFINITIONS
;-

.ASEC

=0
H.CSP: 'L'.BLKW 1 ; CURRENT STACK POINTER
H.HDLN: 'L'.BLKW 1 ; HEADER LENGTH IN BYTES
H.SMAP: 'L'.BLKB 1 ; SUPERVISOR D SPACE OVERMAP MASK
H.DMAP: 'L'.BLKB 1 ; USER D SPACE OVERMAP MASK
H.FMAP: 'L'.BLKW 1 ; POINTER TO FAST MAP SECTION OF HDR
H.CUIC: 'L'.BLKW 1 ; CURRENT TASK UIC
H.DUIC: 'L'.BLKW 1 ; DEFAULT TASK UIC
H.IPS: 'L'.BLKW 1 ; INITIAL PROCESSOR STATUS WORD (PS)
H.IPC: 'L'.BLKW 1 ; INITIAL PROGRAM COUNTER (PC)
H.ISP: 'L'.BLKW 1 ; INITIAL STACK POINTER (SP)
H.ODVA: 'L'.BLKW 1 ; ODT SST VECTOR ADDRESS
H.ODVL: 'L'.BLKW 1 ; ODT SST VECTOR LENGTH
H.TKVA: 'L'.BLKW 1 ; TASK SST VECTOR ADDRESS
H.TKVL: 'L'.BLKW 1 ; TASK SST VECTOR LENGTH
H.PFVA: 'L'.BLKW 1 ; POWER FAIL AST CONTROL BLOCK ADDRESS
H.FPVA: 'L'.BLKW 1 ; FLOATING POINT AST CONTROL BLOCK ADDRESS
H.RCVA: 'L'.BLKW 1 ; RECEIVE AST CONTROL BLOCK ADDRESS
H.EFSV: 'L'.BLKW 1 ; EVENT FLAG ADDRESS SAVE ADDRESS
H.FPSA: 'L'.BLKW 1 ; POINTER TO FLOATING POINT/EE SAVE AREA
H.WND: 'L'.BLKW 1 ; POINTER TO NUMBER OF WINDOW BLOCKS
H.DSW: 'L'.BLKW 1 ; TASK DIRECTIVE STATUS WORD
H.FCIS: 'L'.BLKW 1 ; FCS IMPURE POINTER
H.FORT: 'L'.BLKW 1 ; FORTRAN IMPURE POINTER
H.OVLY: 'L'.BLKW 1 ; OVERLAY IMPURE POINTER
H.VEXT: 'L'.BLKW 1 ; WORK AREA EXTENSION VECTOR POINTER
H.SPRI: 'L'.BLKB 1 ; PRIORITY DIFFERENCE FOR SWAPPING
H.NML: 'L'.BLKB 1 ; NETWORK MAILBOX LUN
H.RRVA: 'L'.BLKW 1 ; RECEIVE BY REFERENCE AST CONTROL BLOCK
; ADDRESS
H.X25: 'L'.BLKB 1 ; FOR USE BY X25 SOFTWARE
; .BLKW 1 ; 5 RESERVED BYTES
; .BLKW 2 ;
H.GARD: 'L'.BLKW 1 ; POINTER TO HEADER GUARD WORD
H.LUN: 'L'.BLKW 1 ; NUMBER OF LUN'S
H.LUN: 'L'.BLKW 2 ; START OF LOGICAL UNIT TABLE

;+ LENGTH OF FLOATING POINT SAVE AREA
;-
H.FPSL='B'25.*2

;+ WINDOW BLOCK OFFSETS
;-
=0
W.BPCB: 'L'.BLKW 1 ; PARTITION CONTROL BLOCK ADDRESS
W.BLVR: 'L'.BLKW 1 ; LOW VIRTUAL ADDRESS LIMIT
W.BHVR: 'L'.BLKW 1 ; HIGH VIRTUAL ADDRESS LIMIT
W.BATT: 'L'.BLKW 1 ; ADDRESS OF ATTACHMENT DESCRIPTOR
W.BSIZ: 'L'.BLKW 1 ; SIZE OF WINDOW IN 32W BLOCKS

C-33
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

HDRDF$ (Cont.)

W.BOFF: 'L'.BLKW 1 ; PHYSICAL MEMORY OFFSET IN 32W BLOCKS
W.BFPD: 'L'.BLKB 1 ; FIRST PDR ADDRESS
W.BNPD: 'L'.BLKB 1 ; NUMBER OF PDR'S TO MAP
W.BLPD: 'L'.BLKW 1 ; CONTENTS OF LAST PDR
W.BLGH: 'L' ; LENGTH OF WINDOW DESCRIPTOR

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

.PSECT

.MACRO HDRDF$ X,Y
. ENDM
. ENDM
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

HWDDF$

.MACRO HWDDF$,L,B
    ; MACROS FOR DEFINING MAPPING REGISTER DEFINITIONS
    
    $$$$=0
    .REPT 8,
    CRENAM NAM,ADDR+<$$$2>,$$$
    $$$$=$$$$+1
    .ENDR
    .ENDM

.MACRO CRENAM NAM,ADDR,N
    'NAM' 'N' ==ADDR
    .ENDM

; HARDWARE REGISTER ADDRESSES AND STATUS CODES

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

; EXTENDED ARITHMETIC ELEMENT REGISTERS

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

; MEMORY MANAGEMENT HARDWARE REGISTERS AND STATUS CODES

.KERNEL I PAR'S
.KERNEL I PDR'S
.KERNEL D PAR'S
.KERNEL D PDR'S

C-35
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

HWDDFS (Cont.)

CRESET SISAR,172240 ;SUPERVISOR I PAR'S
CRESET SISDR,172200 ;SUPERVISOR I PDR'S
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='B'170200 ;UNIBUS MAPPING REGISTER 0
CMODE='B'140000 ;CURRENT MODE FIELD OF PS WORD
PMODE='B'300000 ;PREVIOUS MODE FIELD OF PS WORD
CSMODE='B'400000 ;CURRENT MODE = SUPERVISOR PS WORD BITS
PSMODE='B'100000 ;PREVIOUS MODE = SUPERVISOR PS WORD BITS
SR0='B'177572 ;SEGMENT STATUS REGISTER 0
SR3='B'172516 ;SEGMENT STATUS REGISTER 3
CPUBERR='B'177766 ;CPU ERROR REGISTER
MEMERR='B'177744 ;MEMORY SYSTEM ERROR REGISTER
MEMCTL='B'177746 ;MEMORY CONTROL REGISTER

; DEFINE THE LOCATIONS USED IN THE NON-VOLATILE RAM (NVR)
; FOR XT SYSTEMS
;
N.KEY='B'173054 ;NUMBER OF KEYS Pressed
N.UPT='B'173064 ;UPTIME IN MINUTES
N.DZA='B'173074 ;NUMBER OF I/OS DONE ON THE DZ
N.DWA='B'173104 ;NUMBER OF I/OS DONE ON THE DW
N.DAY='B'173114 ;DATE THAT THE NVR WAS LAST INITIALIZED
N.MON='B'173116 ;...
N.YEA='B'173120 ;...

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

HWDDFS$ (Cont.)

++; FEATURE SYMBOL DEFINITIONS
;-

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

++; FEATURE MASK DEFINITIONS (SECOND WORD)
;-

F2.DAS='B'1  ;KERNEL DATA SPACE SUPPORTED
F2.LIB='B'2  ;SUPERVISOR MODE LIBRARIES SUPPORTED
F2.MP='B'4  ;SYSTEM SUPPORTS MULTIPROCESSING
F2.EVT='B'10 ;SYSTEM SUPPORTS EVENT TRACE FEATURE
F2.ACN='B'20 ;SYSTEM SUPPORTS CPU ACCOUNTING
F2.SDW='B'40 ;SYSTEM SUPPORTS SHADOW RECORDING
F2.POL='B'100 ;SYSTEM SUPPORTS SECONDARY POOLS
F2.WND='B'200 ;SYSTEM SUPPORTS SECONDARY POOL FILE WINDOWS
F2.DPR='B'400 ;SYSTEM HAS A SEPARATE DIRECTIVE PARTITION
F2.IRR='B'1000 ;INSTALL, RUN, AND REMOVE SUPPORT
F2.GGF='B'2000 ;GROUP GLOBAL EVENT FLAG SUPPORT
F2.RAS='B'4000 ;RECEIVE/SEND DATA PACKET SUPPORT
F2.UDS='B'10000 ;ALT. HEADER REFRESH AREA SUPPORT
F2.RHN='B'20000 ;ROUND ROBIN SCHEDULING SUPPORT
F2.SWP='B'40000 ;EXECUTIVE LEVEL DISK SWAPPING SUPPORT
F2.STP='B'1000000 ;EVENT FLAG MASK IS IN THE TCB (L=YES)

++; THIRD FEATURE MASK SYMBOL DEFINITIONS
;-

F3.CRA='B'1  ;SYSTEM SPONTANEOUSLY CRASHED (L=YES)
F3.XR= 'B'2  ;SYSTEM CRASHED FROM XDT (L=YES)
F3.EIS='B'4  ;SYSTEM REQUIRES EXTENDED INSTRUCTION SET
F3.STM='B'10 ;SYSTEM HAS SET SYSTEM TIME DIRECTIVE
F3.UDS='B'20 ;SYSTEM SUPPORTS USER DATA SPACE
F3.PRO='B'40 ;SYSTEM SUPPORTS SEC. POOL PROTO TCBS
F3.XHR='B'100 ;SYSTEM SUPPORTS EXTERNAL TASK HEADERS
F3.AST='B'200 ;SYSTEM HAS AST SUPPORT
F3.11S='B'400 ;RSX-11S SYSTEM
F3.CLI='B'1000 ;MULTIPLE CLI SUPPORT
F3.TCM='B'2000 ;SYSTEM HAS SEPARATE TERMINAL DRIVER POOL
F3.PMN='B'4000 ;SYSTEM SUPPORTS POOL MONITORING
F3.WAT='B'10000 ;SYSTEM HAS WATCHDOG TIMER SUPPORT
F3.RLK='B'20000 ;SYSTEM SUPPORTS RMS RECORD LOCKING
F3.SHF='B'40000 ;SYSTEM SUPPORTS SHUFFLER TASK
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

HWDDFS (Cont.)

; FOURTH FEATURE MASK BITS

F4.CXD='B'1 ;COMM EXEC IS DEALLOCATED (NON-I/D ONLY)
F4.XT='B'2 ;SYSTEM IS AN XT SYSTEM (l=YES)
F4.BRL='B'4 ;SYSTEM SUPPORTS ERROR LOGGING (l=YES)
F4.PTY='B'10 ;SYSTEM SUPPORTS DECIMAL VERSIONS (l=YES)
F4.DVN='B'20 ;SYSTEM SUPPORTS DECIMAL VERSIONS (l=YES)
F4.LCD='B'40 ;SYSTEM SUPPORTS DECIMAL VERSIONS (l=YES)
F4.NIM='B'100 ;SYSTEM SUPPORTS DELETED TASK IMAGES (l=YES)
F4.CHE='B'200 ;SYSTEM SUPPORTS DISK DATA CACHING (l=YES)
F4.LOC='B'400 ;SYSTEM SUPPORTS LOGICAL NAMES (l=YES)
F4.NAM='B'1000 ;SYSTEM SUPPORTS NAMED DIRECTORIES (l=YES)
F4.FMP='B'2000 ;SYSTEM SUPPORTS FAST MAP DIRECTIVE
F4.DCL='B'4000 ;DCL IS DEFAULT CLI (l=YES)
F4.DDS='B'10000 ;NAMED DIRECTORY MODE IS THE DEFAULT (l=YES)
F4.ACD='B'20000 ;SYSTEM SUPPORTS ACD'S

; HARDWARE FEATURE MASK BIT DEFINITIONS

; HF.CIS,HF.FPP DEFINED AS SIGN BITS FOR RUN TIME SPEED

HF.UBM='B'1 ;PROCESSOR HAS A UNIBUS MAP (l=YES)
HF.EIS='B'2 ;PROCESSOR HAS EXTENDED INSTRUCTION SET
HF.QB='B'4 ;SYSTEM HAS A QBUS (l=YES)
HF.DSE='B'10 ;HARDWARE SUPPORTS DATA SPACE
HF.CIS='B'200 ;PROCESSOR SUPPORTS COMMERCIAL INSTRUCTION SET
HF.FPP='B'100000 ;(l=PROC. HAS NO FLOATING POINT UNIT)

; SECOND HARDWARE FEATURE MASK BIT DEFINITIONS

; THIS WORD IS RESERVED FOR XT HARDWARE FEATURES

H2.NVR='B'1 ;XT NON-VOLATILE RAM PRESENT (l=YES)
H2.INV='B'2 ;NON-VOLATILE RAM IS INVALID (l=YES)
H2.CLK='B'4 ;XT CLOCK IS PRESENT (l=YES)
H2.ITF='B'10 ;INVALID TIME FORMAT IN NON-VOLATILE RAM
H2.PRO='B'20 ;RUNNING ON PRO/3XX HARDWARE
H2.BRG='B'100000 ;XT BRIDGE MODULE PRESENT (l=YES)

; SYSGEN FEATURE SELECTIONS MASK. THIS IS INTENDED TO RECORD IN A
; BIT MASK THE CHOICES MADE AT SYSGEN TIME. FEATURES ARE LISTED HERE 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='B'1 ;STANDARD EXEC SELECTED
SF.PGN='B'2 ;SYSTEM WAS PRE-GENERATED

C-38
;+ MULTIPROCESSOR STATUS TABLE DEFINITIONS (TEMPORARY)

;-

MP.CRHT='B'100000 ; CRASH PROCESSOR IMMEDIATELY
MP.PWF='B'40000 ; POWERFAIL ON ONE CPU
MP.RSM='B'20000 ; RESET INTERRUPT MASKS
MP.NOP='B'10000 ; NOP FUNCTION FOR TRANSMISSION CHECK
MP.STP='B'4 ; STOP PROCESSOR IN ORDERLY FASHION
MP.INT='B'7777 ; BIC MASK FOR INTERRUPT LVL FUNCTIONS

.MACRO HWDDFS X,Y,Z
.ENDM
.ENDM

C-39
ITBDF$

.MACRO ITBDF$ L,B

; INTERRUPT TRANSFER BLOCK (ITB) OFFSET DEFINITIONS

; IF DF A$$STRP
.MCALL PKTDF$
PKTDF$ ; DEFINE AST BLOCK OFFSETS
.ENDC

.ASECT .A$$STRP
X.LNK:'L' .BLKW 1 ; LINK WORD FOR ITB LIST STARTING IN TCB
X.JSR:'L' JSR R5,@ 0 ; CALL SINTSC
X.PSW:'L' .BLKW 1 ; LOW BYTE OF PSW FOR ISR
.X.ISR:'L' .BLKW 1 ; ISR ENTRY POINT (APR5 MAPPING)
X.FORK:'L' ; FORK BLOCK
.BLKW 1 ; THREAD WORD
.BLKW 1 ; FORK PC
.BLKW 1 ; SAVED R5
.BLKW 1 ; SAVED R4

; IF DF M$$MGE
X.REL:'L' .BLKW 1 ; RELOCATION BASE FOR APR5
.ENDC

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

; IF NB SYSDEF

; IF DF A$$STRP
.BLKW 1 ; A.DQSR FOR AST BLOCK
X.AST:'L' .BLKB A.PRM ; AST BLOCK

.ENDC

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

.ENDC

.PSECT

.MACRO ITBDF$ X,Y,Z

.ENDM ITBDF$
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

KRBDF$

; MACRO 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.

.ASECTION

=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
177760 KE.UMC: .BLKW 1 ; COUNT OF AVAILABLE UMR WAITING
177776 .BLKW 1 ; 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)

.PSECTION

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

KRBD($ (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 ;DATA TRANSFER IN PROGRESS (1=YES)
KS.UCB=100 ;UCB TABLE PRESENT (1=YES)
KS.DIP=200 ;DATA TRANSFER OPERATION ENABLED (1=YES)
KS.PDF=400 ;PRIVILEGED DIAGNOSTIC FUNCTIONS ONLY
KS.EXT=1000 ;BIST(2) 22-BIT UNIBUS CONTROLLER
KS.SLO=2000 ;CONTROLLER IS SLOW COMING ONLINE

; 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 .BLKB 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.CIQ: .BLKW 2 ;SUBCONTROLLER REQUEST QUEUE
000010 K1.UCB: ;START OF THE UCB TABLE (IF ANY)

.PSECT
; MACRO LCBDF$

; LOGICAL ASSIGNMENT CONTROL BLOCK
;
; THE LOGICAL ASSIGNMENT CONTROL BLOCK (LCB) IS USED TO
; ASSOCIATE A LOGICAL NAME WITH A PHYSICAL DEVICE UNIT.
; LOGICAL CONTROL BLOCKS ARE LINKED TO FORM THE LOGICAL
; ASSIGNMENTS OF A SYSTEM. LOGICAL ASSIGNMENTS CAN BE MADE
; ON A SYSTEM-WIDE OR LOCAL (TERMINAL) BASIS.
;
; .ASECT

 ASECT

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$.

.MACRO MTADF$,L,B
.ASECT

; ANSI MAGTAPE SPECIFIC DATA STRUCTURES
;
; VOLUME SET CONTROL BLOCK OFFSET DEFINITIONS (VSCB)
;
; VOLUME SET AND PROCESS CONTROL SECTION
;
."=0
V.TCNT: 'L' .BLKW 1 ; TRANSACTION COUNT
V.TYPE: 'L' .BLKB 1 ; VOLUME TYPE DESCRIPTOR
V.VCHA: 'L' .BLKB 1 ; VOLUME CHARACTERISTICS
V.LABL: 'L' .BLKB 12. ; FILE SET ID (FIRST SIX BYTES)
V.NXT: 'L' .BLKW 1 ; PTR TO NEXT VSCB NODE
V.MVL: 'L' .BLKW 1 ; PTR TO MOUNTED VOL LIST
V.UVL: 'L' .BLKW 1 ; PTR TO UNMOUNTED VOL LIST
V.ATL: 'L' .BLKW 1 ; ATL ADDR OF ACCESSING TASK
V.RVOL: 'L' .BLKW 1 ; TCB IN RSIIMS
V.UBLK: 'L' .BLKW 1 ; ADDR OF CURRENT UCB OR PUD
V.MOU: 'L' .BLKB 1 ; CURRENT RELATIVE VOL #
V.TCHR: 'L' .BLKB 1 ; MOUNT MODE BYTE
V.SEQN: 'L' .BLKW 1 ; CURRENT FILE SEQUENCE #
V.SECN: 'L' .BLKW 1 ; CURRENT FILE SECTION #
V.TPOS: 'L' .BLKB 1 ; POSITION OF TAPE IN TM'S TO NXT HDR1
V.PSTA: 'L' .BLKW 1 ; PROCESS STATUS BYTE
V.TIMO: 'L' .BLKW 1 ; BLOCKED PROCESS TIMEOUT COUNTER
V.STAT: 'L' .BLKW 1 ; STATUS WORDS USED BY COMMAND
V.TRTB: 'L' .BLKB 1 ; EXECUTION MODULES
V.EFTV: 'L' .BLKW 1 ; TRANSLATION CONTROL BYTE
V.BLKL: 'L' .BLKW 1 ; FOR MAG TO RETURN IE.EOF, EOT, EOF
;
; LABEL DATA SECTION
;
V.RECL: 'L' .BLKW 1 ; BLOCK LENGTH
V.PNAM: 'L' .BLKB 1 ; RECORD LENGTH
V.VCH: 'L' .BLKW 3 ; FILE NAME
V.PTY: 'L' .BLKW 1 ; FILE TYPE
V.EVER: 'L' .BLKW 1 ; FILE VERSION #
V.FNAME: 'L' .BLKW 1 ; CREATION DATE
V.FDATE: 'L' .BLKW 1 ; EXPRIATION DATE
V.BLKC: 'L' .BLKW 2 ; BLOCK COUNT FOR FILE SECTION
V.RTY: 'L' .BLKB 1 ; RECORD TYPE
V.ANSN: 'L' .BLKB 1 ; FILE ATTRIBUTES FOR CARRIAGE CONTROL
V.REM: 'L' .BLKB 30. ; REMAINDER OF FILE ATTRIBUTES
;
; NULL WINDOW SECTION
;
V.WIND: 'L' .BLKW 4. ; NULL WINDOW
V.MST2: 'L' .BLKW 1 ; MAGTAPE STATUS BITS
V.FABY: 'L' .BLKB 1 ; FILE ACCESSIBILITY BYTE (HDR1)
V.UBLK: 'L' .BLKW 1 ; SPARE
V.ANSN: 'L' .BLKB 17. ; ANSI 17 CHARACTER FILE NAME
V.BOFF: 'L' .BLKB 1. ; BUFFER OFFSET
V.DENS: 'L' .BLKB 1. ; REQUESTED UNIT DENSITY
V.DRAT: 'L' .BLKB 1. ; DEFAULT RECORD ATTRIBUTES
V.BLKL: 'L' .BLKW 1. ; DEFAULT BLOCK SIZE
V.DREC: 'L' .BLKW 1. ; DEFAULT RECORD SIZE
S.VSCB="B". ; SIZE OF VSCB

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

MTADFS$ (Cont.)

.PSELECT
;
; DEFINE OFFSETS INTO NULL WINDOW SECTION;
;
.ASELECT
.
=W.CTL:'L'.BLKW 1 ;CONTROL WORD IN WINDOW
V.WINC='B'.V.WIND+W.CTL ;CNTRL WORD IN NULL WINDOW
.
.PSELECT
;
; RELATIVE TO THE VSCB
;
; MOUNTED VOLUME LIST OFFSET DEFINITIONS (MVL)
;
.ASELECT
.
=M.NXT:'L'.BLKW 1 ;PTR TO NXT MVL NODE (11M)
.M.UIC:'L'.BLKW 1 ;OWNER UIC FROM RVOL #1
.M.CH:'L'.BLKW 1 ;U.CH/U.VP (1ID)
.M.PROT:'L'.BLKW 1 ;PROTECTION U.AR IN 1ID

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

.M.RVOL:'L'.BLKB 1 ;RELATIVE VOL # OF MOUNTED VOLUME
.M.STAT:'L'.BLKB 1 ;VOLUME STATUS
.M.VIDP:'L'.BLKW 1 ;VOLUME ID POINTER
.M.UCB:'L'.BLKW 1 ;ADDR OF ASSOC UCB OR PUD
.
S.MVL='B'. ;SIZE OF MVL NODE

.PSELECT
;
; UNMOUNTED VOLUME AND VOLUME LIST OFFSET DEFINITIONS (UVL)
;
.ASELECT
.
=L.NXT:'L'.BLKW 1 ;PTR TO NXT UVL NODE
L.VOL1:'L'.BLKB 1 ;REL VOL # OF 1'ST VOL IN NODE
L.VOL2:'L'.BLKB 1 ;REL VOL # OF 2'ND VOL IN NODE
L.VID1:'L'.BLKB 6 ;VOL ID OF 1'ST VOL IN NODE
L.VID2:'L'.BLKB 6 ;VOL ID OF 2'ND VOL IN NODE
S.UVL='B'. ;SIZE OF UVL NODE

.PSELECT
;
; SYSTEM DATA STRUCTURE CONTENT VALUES
;
; VSCB VALUES

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MTADFS (Cont.)

; V.MOU VALUES
VM.OLD = 'B' 200 ; OLD .PL300 VOLUME -- VM.BYP WILL ALSO BE SET
VM.BYP = 'B' 100 ; BYPASS LABEL PROCESSING
VM.ULB = 'B' 40 ; UNLABELED TAPE
VM.FSC = 'B' 20 ; OVERRIDE FILE SET ID CHECK
VM.EXC = 'B' 10 ; OVERRIDE EXPIRATION DATE CHECK

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

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

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

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

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

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

. ENDM

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OLRDF$ 

.MACRO 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'
; <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 CONFIGURATION
.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 MAINTAINENCE MODE
FUNC CAC,004,006,<D> ; 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 RL1,013,006,<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> ; MEMORY 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,D,D,D,D,D,D,D,D> ; MEMORY BOX OFFLINE

IO$MAX=21 ; DEFINE MAXIMUM SUBFUNCTION

DEFIN$ ISI.HRG,6. ; STOP PROCESSING CONDITION 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. IESDAL,<DEVICE already linked>
.IOER. IESNLC,<DEVICE not linked>
.IOER. IESPRM,<Parameter error>
.IOER. IESYN,<Syntax error>
.IOER. IESAFE,<Attribute format error>
.IOER. IESTMU,<HRC... Internal tables insufficient for this system>
.IOER. IESCAB,<Unable to access busrun>
.IOER. IESTRP,<HRC... internal addressing error>
.IOER. IESALG,<Memory box parameter error>
.IOER. IESTQU,<Timeout on unit quieting operation>
.IOER. IESETO,<ONLINE CPU failure>
.IOER. IESDOU,<ONLINE UNIT failure>
.IOER. IESECO,<ONLINE CONTROLLER failure>
.IOER. IESAP,<OFFLINE CPU failure>
.IOER. IESUEU,<OFFLINE UNIT failure>
.IOER. ISECEF,<OFFLINE CONTROLLER failure>
.IOER. IESCPU,<Attempt to quiet unit for controller failed>
.IOER. IESSCR,<CSR for controller not present in I/O page>
.IOER. IESSWF,<Unable to switch unit away from current controller>
.IOER. IESSICE,<HRC... detected I/O database consistancy error>
.IOER. IESSCE,<Executive or Driver status change error>
.IOER. IESSMDE,<HRC... Memory descriptor format error>
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OLRDF$ (Cont.)

.IOER. IE$NPW,<No path to target device is available>
.IOER. IE$CTX,<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$NLB,<HRC... Can't take box offline. Not last box in memory>
.IOER. IE$FORM,<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... Unknown error from online/offline call>
. ENDM

; CONDITION CODES FOR CONDITIONS TESTED BY IO.ONE AND IO.IF FUNCTIONS

CO$ONL = 1 ; IF DEVICE NOW ONLINE
CO$OFI = 2 ; IF DEVICE NOW OFFLINE
CO$UNK = 3 ; UNKNOWN DEVICE
CO$ACC = 4 ; ACCESSABLE (ACCESS PATH EXISTS)
CO$AKY = 5 ; ANY ERROR CONDITION
CO$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$LOG = 1 ; SUPRESS CONFIGURATION TRANSMISSION TO ERRLOG
M$INIT = 2 ; INITIALIZE 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 .ASECT
:0
CS$DTYP: .BLKB 1 ; ENTRY TYPE FIELD

ENTRY TYPE CODES ARE AS FOLLOWS

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OLRDFS$ (Cont.)

ET$HDR = 1 ; CONFIGURATION HEADER ENTRY
ET$END = 2 ; END OF CONFIGURATION DATA
ET$DEV = 'A ; MINIMUM VALUE FOR DEVICE SPECIFICATION ; ENTRY

C$DECT: .BLKB 1 ; COUNT OF TABLE ENTRIES (CPUS+SWITCHED ; BUS RUNS+CONTROLLERS+UNITS)
C$DVER: .BLKB 1 ; VERSION OF RECONFIGURATION TASK PROTOCOL
C$DSTD: .BLKB 1 ; SIZE OF HEADER
C$DMUB: .BLKB 1 ; MAXIMUM UNIBUS RUNS SUPPORTED
C$DMCT: .BLKB 1 ; MAXIMUM CONTROLLERS OF A GIVEN TYPE ; SUPPORTED

.EVEN
C$DFAC: .BLKW 2 ; FACILITES SUPPORTED IN HOST SYSTEM
C$DIDN: .BLKW 9. ; HRC VERSION AND BUILD TIMESTAMP
C$STD: ; SIZE OF THE TABLE HEADER

; OFFSETS WITHIN THE FIXED PORTION OF A GIVEN ENTRY
; .=0

C$DTYP: ; ENTRY TYPE CODE
C$DNAM: .BLKW 1 ; TWO ASCII CHARACTER UNIT OR CONTROLLER NAME
C$DPUN: .BLKB 1 ; CONTROLLER NUMBER (0-255.)
C$DLUN: .BLKB 1 ; LOGICAL UNIT NUMBER IF THIS DEVICE IS A UNIT
C$DSCT: .BLKB 1 ; SUB-CONTROLLER NUMBER
C$DEVT: .BLKB 1 ; DEVICE TYPE CODE
C$DSTS: .BLKW 1 ; DEVICE STATUS MASK

; FLAG VALUES FOR C$DSTS
;
CS$ATR=1 ; VARIABLE LENGTH ATTRIBUTE INFO IS APPENDED
CS$EXP=76 ; FIELD IN C$DSTS CONTAINING COUNT OF ADDITIONAL
; BYTES IN THIS DEVICE ENTRY
CS$SUB=100 ; THIS IS A SUB-CONTROLLER DEVICE
; CS$XXX=200 ; UNUSED
CS$OLF=400 ; 1=>DEVICE IS OFFLINE, 0=>DEVICE IS ONLINE
CS$DIRP=1000 ; DEVICE 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 DEVICE
CS$MDT=40000 ; DEVICE IS MOUNTED(DISK) OR LOGGED IN (TERM)
CS$DV=100000 ; A DRIVER IS LOADED FOR THIS DEVICE

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
; BIT OF HIGH BYTE.
OLRDFS$ (Cont.)

; 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

C$DDAT: .BLKW 2 ; DEVICE DEPENDANT DATA
C$SME: ; SIZE IF A MINIMUM ENTRY

; VARIABLE PORTION OF A GIVEN ENTRY
;
; FOR CONTROLLERS
; .=C$SME

C$DKPO: .BLKW 1 ; PORT-STATUS-WORD. THIS DESCRIBES THE BUS RUN
                   ; CPU OR SWITCHED BUS, TO WHICH THIS
                   ; CONTROLLER IS CONNECTED.
C$SCT:
                   ; MINIMUM SIZE OF A CONTROLLER ENTRY
;
; FOR UNIT ENTRIES
; .=C$SME

C$DCTN: .BLKW 1 ; CONTROLLER NAME. TWO CHARACTER ASCII CODE
                   ; OF THE CONTROLLER TO WHICH THIS UNIT IS
                   ; ATTACHED.
C$DUPO: .BLKW 1 ; PORT-STATUS-WORD. THIS IS THE
                   ; FIRST OF THE PSWS DESCRIBING THE CONTROLLER(S)
                   ; TO WHICH THIS UNIT IS CONNECTED.
C$SUN:
                   ; MINIMUM SIZE OF A UNIT ENTRY
;
; FOR CPU-S
; .=C$SME

C$DCPO: .BLKW 1 ; PORT-STATUS-WORD. THIS IS THE BUS
                   ; NUMBER FOR THIS CPU.
C$SCP:
                   ; MINIMUM SIZE OF A CPU ENTRY
;
; FOR MEMORY BOXES
;
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OLRDFS$ (Cont.)

.; C$SME

C$DCTN: .BLKW 1 ; CONTROLLER NAME.
          .BLKW 4 ; MAXIMUM OF 4 PORTS FOR MEMORY CONTROLLERS

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$XXX=10000 ; UNUSED
CP$SACC=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
$$$TMP=8$$TMP+1
DEFINS 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

; MEMORY BOX ATTRIBUTE BUFFER

; ASEC
=-0

C$MBAS: .BLKW 1 ; BASE ADDRESS OF BOX
C$MINT: .BLKB 1 ; INTERLAVE FACTOR
           .BLKB 1 ; FREE BYTE
C$MSIZ: .BLKW 1 ; SIZE OF BOX IN 32 WORD BLOCKS
C$MGRN: .BLKW 1 ; BOX GRANULARITY. "BYTES-PER-UNIT"
C$MDSC: ; SIZE OF BOX ATTRIBUTE BUFFER

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

OLRDF$ (Cont.)

.PSECT

; REDEFINE MACRO TO NULL

; .MACRO OLRDF$ X
; .ENDM
; .MACRO ATT X
; .ENDM
; .ENDM

; 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$ DS'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
DEV RK06 ; RK06
DEV RK07 ; RK07
OLRDFS (Cont.)

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 TK25 ; TK25
DEV TK50 ; TK50
DEV TU10 ; TU10
DEV TU16 ; TU16
DEV TU45 ; TU45
DEV TU77 ; TU77
DEV TU78 ; TU78
DEV TS11 ; TS11
DEV TSU0 ; TSU0
DEV TSV0 ; TSV0
DEV TU80 ; TU80
DEV TU81 ; TU81

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 RC25 ; RC25 (AZTEC)

DEV RD50 ; RD50
DEV RD51 ; RD51
DEV RX50 ; RX50

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

.MACRO DEVCD$ .ENDM
.MACRO DEV X .ENDM

.ENDM

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

PCBDF$ PROC

.MACRO PCBDF$ L,B

; MAIN PARTITION PCB

.ASECT

.$=0
P.LNK:'L'.BLKW 1 ;LINK TO NEXT MAIN PARTITION PCB
.BLKW 1 ;(UNUSED)
P.NAM:'L'.BLKW 2 ;PARTITION NAME IN RAD50
P.SUB:'L'.BLKW 1 ;POINTER TO FIRST SUBPARTITION
P.MAIN:'L'.BLKW 1 ;POINTER TO SELF
P.REL:'L'.BLKW 1 ;STARTING PHYSICAL ADDRESS IN 32W BLOCKS
P.BLKS:'L'
P.SIZE:'L'.BLKW 1 ;SIZE OF PARTITION IN 32W BLOCKS
P.WAIT:'L'.BLKW 2 ;PARTITION WAIT QUEUE LISTHEAD
.BLKW 2 ;(UNUSED)
P.STAT:'L'.BLKW 1 ;PARTITION STATUS FLAGS
P.ST2:'L'.BLKW 1 ;STATUS EXTENSION FOR COMMON AND MAIN PCB'S
.BLKW 3 ;(UNUSED)
P.HDLN:'L'.BLKB 1 ;SIZE OF EXTERNAL HEADER IN 32W BLOCKS
P.IOC:'L'.BLKB 1 ;PARTITION I/O COUNT
$$=.
P.RRM:'L'.BLKW 1 ;REQUIRED RUN MASK

..IF NDF M$$PRO
.$$= $$
.ENDC

..IF NB SYSDEF
P.LGTH='B'. ;PARTITION CONTROL BLOCK LENGTH
.ENDC

; TASK REGION PCB

..=0
P.LNK:'L'.BLKW 1 ;UTILITY LINK WORD
P.PRI:'L'.BLKB 1 ;PRIORITY OF PARTITION
P.RMCT:'L'.BLKW 1 ;RESIDENT MAPPED TASKS COUNT
P.NAM:'L'.BLKW 2 ;PARTITION NAME IN RAD50
P.SUB:'L'.BLKW 1 ;POINTER TO NEXT SUBPARTITION
P.MAIN:'L'.BLKW 1 ;POINTER TO MAIN PARTITION
P.REL:'L'.BLKW 1 ;STARTING PHYSICAL ADDRESS IN 32W BLOCKS
P.BLKS:'L'

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PCBDF$ (Cont.)

P.SIZE:'L'.BLKW 1 ;SIZE OF PARTITION IN 32W BLOCKS
.BLKW 1 ;(UNUSED)
P.SWSZ:'L'.BLKW 1 ;PARTITION SWAP SIZE
.BLKW 1 ;(UNUSED)
P.DPCB:'L'.BLKW 1 ;CHECKPOINT ALLOCATION PCB
P.TCB:'L'.BLKW 1 ;TCB ADDRESS OF OWNER TASK
P.HDR:'L'.BLKW 1 ;POINTER TO HEADER CONTROL BLOCK
.BLKW 1 ;(UNUSED)
P.ATT:'L'.BLKW 2 ;ATTACHMENT DESCRIPTOR LISTHEAD
P.HDLN:'L'.BLKB 1 ;SIZE OF EXTERNAL HEADER IN 32W BLOCKS
P.IOC:'L'.BLKB 1 ;PARTITION I/O COUNT

$.=.$$
P.RRM:'L'.BLKW 1 ;REQUIRED RUN MASK

.IF NDF M$$PRO
.==$$$
.ENDC

++; COMMON REGION PCB ;-
.
0P.LNK:'L'.BLKW 1 ;UTILITY LINK WORD
P.PRI:'L'.BLKB 1 ;PRIORITY OF PARTITION
P.RMCT:'L'.BLKB 1 ;RESIDENT MAPPED TASKS COUNT
P.NAM:'L'.BLKW 2 ;PARTITION NAME IN RAD50
P.SUB:'L'.BLKW 1 ;POINTER TO NEXT SUBPARTITION
P.MAIN:'L'.BLKW 1 ;POINTER TO MAIN PARTITION
P.REL:'L'.BLKW 1 ;STARTING PHYSICAL ADDRESS IN 32W BLOCKS
P.BLKS:'L'
P.SIZE:'L'.BLKW 1 ;SIZE OF PARTITION IN 32W BLOCKS
P.CBDL:'L'.BLKW 1 ;COMMON BLOCK DIRECTORY LINK
P.CSBA:'L'
; CACHE STATISTICS BLOCK LISTHEAD
; ...(IF P2.CHE IS SET, PARTITION WON'T SWAP)
P.SWSZ:'L'.BLKW 1 ;PARTITION SWAP SIZE
P.DPCB:'L'.BLKW 1 ;POINTER TO DISK PCB
P.OWN:'L'.BLKW 1 ;OWNING UIC OF REGION
P.STAT:'L'.BLKW 1 ;PARTITION STATUS FLAGS
P.ST2:'L'.BLKW 1 ;STATUS EXTENSION FOR COMMON AND MAIN PCB'S
P.PRO:'L'.BLKW 1 ;PROTECTION WORD [DEWR,DEWR,DEWR,DEWR]
P.ATT:'L'.BLKW 2 ;ATTACHMENT DESCRIPTOR LISTHEAD
P.HDLN:'L'.BLKB 1 ;SIZE OF EXTERNAL HEADER IN 32W BLOCKS
P.IOC:'L'.BLKB 1 ;PARTITION I/O COUNT

$.=.$$
P.RRM:'L'.BLKW 1 ;REQUIRED RUN MASK
.IF NDF M$$PRO

.=$$

.ENDC

.PSECT

;+ PARTITION STATUS WORD BIT DEFINITIONS

;-

PS.OUT='B'100000 ;PARTITION IS OUT OF MEMORY (l=YES)
PS.CKP='B'40000  ;PARTITION CHECKPOINT IN PROGRESS (l=YES)
PS.CKR='B'10000  ;PARTITION CHECKPOINT IS REQUESTED (l=YES)
PS.FXD='B'10000  ;PARTITION IS NOT CHECKPOINTABLE (l=YES)
PS.CAF='B'4000   ;CHECKPOINT SPACE ALLOCATION FAILURE (l=YES)
PS.NSF='B'2000   ;MARKED BY SHUFFLER FOR LONG I/O (l=YES)
PS.COM='B'200    ;PARTITION IS NOT SHUFFLEABLE (l=YES)
PS.LFR='B'100    ;LIBRARY OR COMMON BLOCK (l=YES)
PS.PER='B'1000   ;LAST LOAD OF REGION FAILED (l=YES)
PS.PER='B'40     ;PARTITION ERROR OCCURED IN THIS REGION (l=YES)
PS.NWB='B'20     ;COMMON SHOULDN'T BE WRITTEN BACK
PS.DEL='B'10     ;PARTITION SHOULD BE DELETED WHEN NOT ATTACHED
     ;(l=YES)
PS.AST='B'4      ;PARTITION HAS REGION LOAD AST PENDING

;+ REQUIRED RUN MASK

;-

PR.UBT='B'100000 ;UNIBUS RUN T
PR.URS='B'40000  ;UNIBUS RUN S
PR.URR='B'20000  ;UNIBUS RUN R
PR.UBP='B'10000  ;UNIBUS RUN P
PR.UBN='B'4000   ;UNIBUS RUN N
PR.UBM='B'2000   ;UNIBUS RUN M
PR.UBL='B'1000   ;UNIBUS RUN L
PR.UBK='B'100    ;UNIBUS RUN K
PR.UBJ='B'200    ;UNIBUS RUN J
PR.URH='B'100    ;UNIBUS RUN H
PR.UBF='B'40     ;UNIBUS RUN F
PR.UBE='B'20     ;UNIBUS RUN E
PR.CPD='B'10     ;PROCESSOR D
PR.CPC='B'4      ;PROCESSOR C
PR.CPB='B'2      ;PROCESSOR B
PR.CPA='B'1      ;PROCESSOR A

;+ STATUS EXTENSION WORD BIT DEFINITIONS

; (THESE BITS CAN ONLY BE EXAMINED IN COMMON OR MAIN PCB'S)

; -
**PCBDFS$ (Cont.)**

P2.LMA='B'40000 ;DON'T SHUFFLE, DELETE SPINDLE OR MUTILATE
P2.CPC='B'20000 ;CPCR INITIATED CHECKPOINT PENDING
P2.CHE='B'10000 ;CACHE PARTITION
P2.SEC='B'40000 ;THIS IS NO SECTION OF MU TASK
P2.PAR='B'20000 ;WITH TCB IN SEC. POOL
P2.POL='B'400 ;THE FIXER TASK HAS HANDLED A PARITY ERROR
P2.CPU='B'4000 ;SECONDARY POOL PARTITION
P2.PIC='B'2000 ;MULTIPROCESSOR CPU PARTITION
P2.RON='B'100 ;POSITION INDEPENDENT LIBRARY OR COMMON (1=YES)
P2.DRV='B'40 ;READ-ONLY COMMON (1=YES)
P2.APR='B'7 ;DRIVER COMMON PARTITION (1=YES)
P2.APR='B'7 ;STARTING APR NUMBER MASK FOR NON-PIC COMMON

;+ ; CHECKPOINT FILE PCB
;-

;ASELECT
; .ASELECT

;ASELECT
; .ASELECT

;ASELECT
; .ASELECT

;ASELECT
; .ASELECT

+ ; CHECKPOINT ALLOCATION PCB
;-

;ASELECT
; .ASELECT

+ ; COMMON TASK IMAGE FILE PCB
;-

;ASELECT
; .ASELECT

+ ; ATTACHMENT DESCRIPTOR OFFSETS
;-

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

PCBDF$ (Cont.)

.ASECT
=0
A.PCBL: 'L'.BLKW 1 ; PCB ATTACHMENT QUEUE THREAD WORD
A.PRI: 'L'.BLKB 1 ; PRIORITY OF ATTACHED TASK
A.IOC: 'L'.BLKB 1 ; I/O COUNT THROUGH THIS DESCRIPTOR
A.TCB: 'L'.BLKW 1 ; TCB ADDRESS OF ATTACHED TASK
A.TCBL: 'L'.BLKW 1 ; TCB ATTACHMENT QUEUE THREAD WORD
A.STAT: 'L'.BLKB 1 ; STATUS BYTE
A.MPCT: 'L'.BLKB 1 ; MAPPING COUNT OF TASK THRU THIS DESCRIPTOR
A.PCB: 'L'.BLKW 1 ; PCB ADDRESS OF ATTACHED TASK
A.LGTH= 'B'.; LENGTH OF ATTACHMENT DESCRIPTOR

; ATTACHMENT DESCRIPTOR STATUS BYTE BIT DEFINITIONS

.PSECT
AS.PRO= 'B'100 ; A.TCB IS SEC POOL TCB BIAS (1=YES)
AS.SBP= 'B'20 ; CACHE BYPASS REQUESTED
AS.RBP= 'B'40 ; REQUEST TO NOT BYPASS CACHE
AS.DEL= 'B'10 ; TASK HAS DELETE ACCESS (1=YES)
AS.EXT= 'B'4 ; TASK HAS EXTEND ACCESS (1=YES)
AS.WRT= 'B'2 ; TASK HAS WRITE ACCESS (1=YES)
AS.RED= 'B'1 ; TASK HAS READ ACCESS (1=YES)

.MACRO PCBDF$ X,Y,Z
.ENDM
.ENDM
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

PKTDF$.

.MACRO PKTDF$,L,B
;
; 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
A.KSR5: 'L' .BLKW 1
A.DQSR: 'L' .BLKW 1
.A.CBL: 'L' .BLKW 1

; SUBROUTINE KISAR5 BIAS (A.CBL=0)
; DEQUEUE SUBROUTINE ADDRESS (A.CBL=0)
; AST QUEUE THREAD WORD
; 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)
; NUMBER OF BYTES TO ALLOCATE ON TASK STACK
; AST TRAP ADDRESS
; NUMBER OF AST PARAMETERS
; FIRST AST PARAMETER
; CODE FOR FLOATING POINT AST
; CODE FOR RECEIVE DATA AST
; CODE FOR RECEIVE BY REFERENCE AST
; CODE FOR PARITY ERROR AST
; CODE FOR REQUESTED EXIT AST
; CODE FOR POWER FAIL AST
; CODE FOR CLI COMMAND ARRIVAL AST

A.BYT: 'L' .BLKW 1
A.AST: 'L' .BLKW 1
A.NPR: 'L' .BLKW 1
A.PRM: 'L' .BLKW 1
AS.FPA='B'1
AS.RCA='B'2
AS.RRA='B'3
AS.PEA='B'4
AS.REA='B'5
AS.PFA='B'6
AS.CAA='B'7

; BIT VALUES IN A.PRM+5
;
AF.XCC='B'1
AF.NOT='B'2
AF.OOB='B'4
AF.AST='B'10
AF.ESQ='B'20
AF.LCR='B'40
AF.QUE='B'100
AF.MDE='B'200

; ATTACHED FOR ALL BUT CONTROL-C (TF.XCC)
; ATTACHED FOR ALL NOTIFICATION (TF.NOT)
; ACB IS FOR OUT-OF-BAND AST
; ACB HANDLES UNSOL. INPUT CHAR AST'S (TF.AST)
; ATTACHED FOR ESCAPE SEQUENCES (TF.ESQ)
; ACB IS LOCKED
; ACB IS QUEUED
; ACB IS MARKED FOR DELETE

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

PKTDF$ (Cont.)

; ABORTER SUBCODES FOR ABORT AST (AS.REA) TO BE RETURNED ON USER'S STACK
; AB.NPV='B'1 ; ABORTER IS NONPRIVILEGED (1=YES)
AB.TYP='B'2 ; ABORT FROM DIRECTIVE (0=YES)
A.PLGH='B'70 ; ABORT FROM CLI COMMAND (1=YES)
A.DUCB='B'10 ; SIZE OF PARITY ERROR AST CONTROL BLOCK
A.DLGH='B'10 ; UCB OF TERM ISSUING DEBUG COMMAND

; KERNEL AST CONTROL CODES (A.CBL)
AK.BUF='B'200 ; BUFFERED I/O COMPLETION
AK.OCB='B'201 ; THIS CODE MUST BE 200 UNTIL ALL
AK.GBI='B'202 ; REFERENCES IN TTDVR ARE FIXED
AK.TBT='B'203 ; OFFSPRING TASK EXIT
AK.DIO='B'204 ; SEGMENTED BUFFERED I/O COMPLETION
AK.GGF='B'205 ; TASK FORCE T-BIT TRAP (DEBUG CMD)

; BIT DEFINITIONS FOR THE GET/SET INFORMATION DIRECTIVE.
SF.PRV='B'100000 ; FUNCTION IS PRIVILEGED
SF.IN='B'40000 ; FUNCTION IS AN INPUT FUNCTION

; GROUP GLOBAL EVENT FLAG BLOCK OFFSETS
G.LNK:'L'.BLKW 1 ; LINK WORD
G.GRP:'L'.BLKB 1 ; GROUP NUMBER
G.STAT:'L'.BLKB1 ; STATUS BYTE
G.CNT:'L'.BLKW 1 ; ACCESS COUNT
G.EF LG:'L'.BLKW 2 ; EVENT FLAGS
G.LG TH='B'. ; LENGTH OF GROUP GLOBAL EVENT FLAG
GS.DEL='B'1 ; STATUS BIT -- MARKED FOR DELETE

; EXECUTIVE POOL MONITOR CONTROL FLAGS
PC.HIH='B'1 ; HIGH POOL LIMIT CROSSED (1=YES)
PC.LOW='B'2 ; LOW POOL LIMIT CROSSED (1=YES)
PC.ALF='B'4 ; POOL ALLOCATION FAILURE (1=YES)
PC.XIT='B'200 ; FORCE POOL MONITOR TASK TO EXIT (MUST
PC.NRM='B'PC.HIH*400 ; BE COUPLED WITH SETTING FE.MXT IN THE
PC.ALM='B'PC.LOW*400 ; FEATURE MASK)

C-61
PKTDF$ (Cont.)

; $POLFL IS THE POOL USAGE CONTROL WORD
PF.INS='B'40 ; REJECT NONPRIVILEGED INS/RUN/REM
PF.LOG='B'100 ; NONPRIVILEGED LOGINS ARE DISABLED
PF.REQ='B'200 ; STALL REQUEST OF NONPRIV. TASKS
PF.ALL='B'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
O.LNK:'L'.BLKW 1 ; OCB LINK WORD
O.MCRL:'L'.BLKW 1 ; ADDRESS OF MCR COMMAND LINE
O.PTCB:'L'.BLKW 1 ; PARENT TCB ADDRESS
O.AST:'L'.BLKW 1 ; EXIT AST ADDRESS
O.EFN:'L'.BLKW 1 ; EXIT EVENT FLAG
O.ESB:'L'.BLKW 1 ; EXIT STATUS BLOCK VIRTUAL ADDRESS
O.STAT:'L'.BLKW 8. ; EXIT STATUS BUFFER
O.LGTH='B'. ; LENGTH OF OCB

+ ; I/O PACKET OFFSET DEFINITIONS
;
. =0
.I.LNK:'L'.BLKW 1 ; I/O QUEUE THREAD WORD
I.PRI:'L'.BLKB 1 ; REQUEST PRIORITY
I.EFN:'L'.BLKB 1 ; EVENT FLAG NUMBER
I.TCB:'L'.BLKW 1 ; TCB ADDRESS OF REQUESTOR
I.LN2:'L'.BLKW 1 ; POINTER TO SECOND LUN WORD
I.UEB:'L'.BLKW 1 ; POINTER TO UNIT CONTROL BLOCK
I.FCN:'L'.BLKW 1 ; I/O FUNCTION CODE
I.IOSB:'L'.BLKW 1 ; VIRTUAL ADDRESS OF I/O STATUS BLOCK
.IOSB.BLK 1 ; I/O STATUS BLOCK RELOCATION BIAS
.IOSB.BLK 1 ; I/O STATUS BLOCK ADDRESS
.IOSB.BLK 1 ; AST SERVICE ROUTINE ADDRESS
I.AST:'L'.BLKW 1 ; AST SERVICE ROUTINE ADDRESS
I.PRM:'L'.BLKW 1 ; RESERVED FOR MAPPING PARAMETER #1
.I.PrM.BLK 6 ; PARAMETERS 1 TO 6
.I.PrM.BLK 1 ; USER MODE DIAGNOSTIC PARAMETER WORD

; FOLLOWING ARE DEFINITIONS FOR FLAG BITS IN I.PRM+11
; (DSA DRIVERS INTERNAL USE ONLY)
;
IP.FAK = 'B' 20 ; IOP IS PSEUDO IOP
IP.ABO = 'B' 40 ; (MUDRV) ABORT COMMAND MUST BE ISSUED FOR IOP
IP.PND = 'B' 100 ; (MUDRV) ABORT COMMAND WAS ISSUED FOR IOP
IP.UMR = 'B'200 ; A UMR WAIT BLOCK IS IN USE FOR THIS I/O
PKTDF$ (Cont.)

I.ATTL='B' .

;MINIMUM LENGTH OF I/O PACKET (USED BY
;FILE SYSTEM TO CALCULATE MAXIMUM
;NUMBER OF ATTRIBUTES)

I.AADA:='L' .BLKW 2

;STORAGE FOR ATT DESCR PTRS WITH I/O

I.LGTH='B' .

;LENGTH OF I/O REQUEST CONTROL BLOCK

I.ATRL='B'6*8.

;LENGTH OF FILE SYSTEM ATTRIBUTE BLOCK

;

; DEFINE OFFSETS IN I/O PACKET EXTENSION (IOPX)

;

.ASECT 

.= 0

I.XLNK:'L' .BLKW 1

;LINK WORD

I.XIOP:'L' .BLKW 1

;I/O PACKET ADDRESS

I.XTCB:'L' .BLKW 1

;TCB ADDRESS OF REQUESTING TASK

I.XMOD:'L' .BLKW 2

;MODIFIER WORDS (NOTE: 2ND WORD MUST BE
;SPECIFIED AND MUST BE ZERO.)

I.XRBF:'L' .BLKW 2

;READ DATA BUFFER ADDRESS APR BIAS

I.XRBL:'L' .BLKW 2

;READ DATA BUFFER LENGTH

I.XMTO:'L' .BLKW 1

;READ TIME-OUT INTERVAL

I.XPBF:'L' .BLKW 2

;PROMPT BUFFER ADDRESS APR BIAS

I.XPBV:'L' .BLKW 1

;PROMPT BUFFER VIRTUAL ADDRESS

I.XRBL:'L' .BLKW 2

;PROMPT BUFFER LENGTH

I.XPBV:'L' .BLKW 1

;PROMPT BUFFER VERTICAL FORMS CONTROL

I.XTTL:'L' .BLKW 2

;TERMINATOR TABLE ADDRESS APR BIAS

I.XDBF:'L' .BLKW 1

;TERMINATOR TABLE VIRTUAL ADDRESS

I.XDBL:'L' .BLKW 1

;TERMINATOR TABLE LENGTH

I.XPBF:'L' .BLKW 2

;DEFAULT INPUT BUFFER ADDRESS APR BIAS

I.XPBV:'L' .BLKW 1

;DEFAULT INPUT BUFFER VIRTUAL ADDRESS

I.XPBL:'L' .BLKW 1

;DEFAULT INPUT BUFFER LENGTH

;+ 

; CLI PARSER BLOCK (CPB) DEFINITIONS

;-

 .= 0

C.PTCB:'L' .BLKW 1

;ADDRESS OF CLI'S TCB

C.PNAM:'L' .BLKW 2

;CLI NAME

C.PSTS:'L' .BLKW 1

;STATUS MASK

C.PDPL:'L' .BLKB 1

;LENGTH OF DEFAULT PROMPT

C.PCPL:'L' .BLKB 1

;LENGTH O CNTRL/C PROMPT

C.PRMT:'L'

;START OF PROMPT STRINGS. DEFAULT

;IS CONCATENATED WITH CONTROL C PROMPT

;

; STATUS BIT DEFINITIONS

;

CP.NUL='B'1

;PASS EMPTY COMMANDS TO CLI

CP.MSG='B'2

;CLI DESIRES SYSTEM MESSAGES

CP.LGO='B'4

;CLI WANTS COMMANDS FROM LOGGED OFF TTYS

CP.DSB='B'10

;CLI IS DISABLED

CP.PRV='B'20

;USER MUST BE PRIV TO SET TTY TO THIS CLI

CP.SGL='B'40

;DON'T HANDLE CONTINuations (M-PLUS ONLY)

CP.NIO='B'100

;MCR..., HEL, BYE DO NO I/O TO TTY

;HEL, BYE DO NOT SET CLI ETC.
PKTDF$ (Cont.)

CP.RST='B'200 ;ABILITY TO SET TO THIS CLI IS RESTRICTED TO THE CLI ITSELF
CP.EXT='B'400 ;PASS TASK EXIT PROMPT REQUESTS TO CLI
CP.POL='B'1000 ;CLI TCB IS IN SECONDARY POOL
CP.CTC='B'2000 ;"C NOTIFICATION PACKETS ARE WANTED

;+ ; SECONDARY POOL COMMAND BUFFER BLOCKS ;-

.=0
C.CLK: 'L' .BLKW 1 ;LINK WORD
C.CTCB: 'L' .BLKW 1 ;TCB ADDRESS OF TASK TO RECEIVE COMMAND
C.CUCB: 'L' .BLKW 1 ;UCB ADDRESS OF RESPONSIBLE TERMINAL
C.CCT: 'L' .BLKW 1 ;CHARACTER COUNT, EXCLUDING TRAILING CR
C.CSTS: 'L' .BLKW 1 ;STATUS MASK
C.CMCD: 'L' ;SYSTEM MESSAGE CODE
C.CSO: 'L' .BLKW 1 ;STARTING OFFSET OF VALID COMMAND TEXT
C.CTR: 'L' .BLKB 1 ;TERMINATOR CHARACTER
C.CBLK: 'L' .BLKB 1 ;SIZE OF PACKET IN SEC POOL (32 WD.) BLOCKS
C.CTXT: 'L' ;COMMAND TEXT, FOLLOWED BY CR

;+ ; STATUS BITS FOR COMMAND BLOCKS ;-

CC.MCR='B'1 ;FORCE COMMAND TO MCR
CC.PRM='B'2 ;ISSUE DEFAULT PROMPT
CC.EXT='B'4 ;TASK EXIT PROMPT REQUEST
CC.KIL='B'10 ;DELETE ALL CONTINUATION PIECES FROM THIS TTY
CC.CLI='B'20 ;COMMAND TO BE RETRIEVED BY GCCI$ ONLY
CC.MSG='B'40 ;PACKET CONTAINS SYSTEM MESSAGE TO CLI
CC.TTD='B'100 ;COMMAND CAME FROM TTDV
CC.CTC='B'200 ;"C NOTIFICATION PACKET

; 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='B'1 ;CLI INITIALIZED ENABLED
CM.IND='B'2 ;CLI INITIALIZED DISABLED
CM.CEN='B'3 ;CLI ENABLED
CM.CDS='B'4 ;CLI DISABLED
CM.ELM='B'5 ;CLI BEING ELIMINATED
CM.EXT='B'6 ;CLI MUST EXIT IMMEDIATELY
CM.LRT='B'7 ;NEW TERMINAL LINKED TO CLI
CM.RMT='B'8 ;TERMINAL REMOVED FROM CLI
CM.MSG='B'9 ;GENERAL MESSAGE TO CLI

;+ ; ANCILLARY CONTROL BLOCK (ACB) DEFINITIONS ;-

.=0
A.REL: 'L' .BLKW 1 ;ACD RELOCATION BIAS
A.DIS: 'L' .BLKW 1 ;ACD DISPATCH TABLE POINTER
A.MAS: 'L' .BLKW 2 ;ACD FUNCTION MASK WORDS
A.NUM: 'L' .BLKB 1 ;ACD IDENTIFICATION NUMBER
A.FLEN: 'L' .BLKB 1 ;LENGTH IN BYTES OF FULL ACB
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

PKTDFS (Cont.)

A.LIN: 'L', BLKW 1  ; ACD LINK WORD
A.ACC: 'L', BLKB 1  ; ACD ACCESS COUNT
A.STA: 'L', BLKB 1  ; ACD STATUS BYTE
A.PLEN = 'B', =A.LIN
A.IMAP: 'L', BLKW 1  ; FULL ACB OVERLAPS PROTOTYPE ACB
A.IBUF: 'L', BLKW 1  ; ACD INTERRUPT BUFFER RELLOCATION BIAS
A.ILEN: 'L', BLKW 1  ; ACD INTERRUPT BUFFER LENGTH
A.SMAP: 'L', BLKW 1  ; ACD SYSTEM STATE BUFFER ADDRESS
A.SBUF: 'L', BLKW 1  ; ACD SYSTEM STATE BUFFER ADDRESS
A.SLEN: 'L', BLKW 1  ; ACD SYSTEM STATE BUFFER LENGTH
A.IOS: 'L', BLKW 2  ; ACD I/O STATUS
A.RES = 'B', ; START OF ACB RESERVED FOR USE BY THE ACD

; DEFINE THE FLAG VALUES IN THE OFFSET U.AFLG

UA.ACC = 'B'1  ; ACCEPT THIS CHARACTER
UA.PRO = 'B'2  ; PROCESS THIS CHARACTER
UA.ECH = 'B'4  ; ECHO THIS CHARACTER
UA.TYP = 'B'10 ; FORCE THIS CHARACTER INTO TYPEAHEAD
UA.SPE = 'B'20 ; THIS CHARACTER HAS A SPECIAL ECHO
UA.PUT = 'B'40 ; PUT THIS CHARACTER IN THE INPUT BUFFER
UA.CAL = 'B'100; CALL THE ACD BACK AFTER THE TRANSFER
UA.COM = 'B'200; COMPLETE THE INPUT REQUEST

UA.ALL = 'B'400; ALLOW PROCESSING OF THIS I/O REQUEST
UA.TRN = 'B'1000; TRANSLATE CHARACTERS FROM OUTPUT QIO
UA.TRA = 'B'2000; TRANSFER CHARACTERS WHEN I/O COMPLETES

; DEFINE THE ACD ENTRY POINTS (OFFSETS INTO THE DISPATCH TABLE)

A.ACCE: 'L', BLKW 1  ; I/O REQUEST ACCEPTANCE ENTRY POINT
A.DEQU: 'L', BLKW 1  ; I/O REQUEST DEQUEUE ENTRY POINT
A.POWE: 'L', BLKW 1  ; POWER FAILURE ENTRY POINT
A.INPU: 'L', BLKW 1  ; INPUT COMPLETION ENTRY POINT
A.OUTP: 'L', BLKW 1  ; OUTPUT COMPLETION ENTRY POINT
A.CONNECT: 'L', BLKW 1  ; CONNECTION ENTRY POINT
A.DISCON: 'L', BLKW 1  ; DISCONNECTION ENTRY POINT
A.REC: 'L', BLKW 1  ; INPUT CHARACTER RECEPTION ENTRY POINT
A.PROC: 'L', BLKW 1  ; INPUT CHARACTER PROCESSING ENTRY POINT
A.TRAN: 'L', BLKW 1  ; OUTPUT QIO CHARACTER TRANSLATION ENTRY POINT
A.CALL: 'L', BLKW 1  ; CALL ACD BACK AFTER TRANSFER ENTRY POINT

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

.PSect
 .MACRO PKTDFS X,Y,Z
 .ENDM
 .ENDM
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

SCBDF$

.MACRO SCBDF$,L,B

;+ 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 TELE-
; TYPE INTERFACED VIA A DL11-A WOULD HAVE A SCB SINCE EACH DL11-A IS AN IN-
; DEPENDENT 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
S.LHD:'L' .BLKW 2 ;CONTROLLER I/O QUEUE LISTHEAD
S.URM:'L' ;REFERENCE LABEL

.;IF DF M$$$PRO
.BLKW 1 ;UNIBUS RUN MASK FOR THE FORK BLOCK
.ENDC

S.FRK:'L' .BLKW 1 ;FORK BLOCK LINK WORD
.BLKW 1 ;FORK-PC
.BLKW 1 ;FORK-R5
.BLKW 1 ;FORK-R4

.;IF DF L$$$DRV
S.KS5:'L' .BLKW 1 ;FORK KISAR5
.ENDC

S.PKT:'L' .BLKW 1 ;ADDRESS OF CURRENT I/O PACKET
S.CTM:'L' .BLKB 1 ;CURRENT TIMEOUT COUNT
S.ITM:'L' .BLKB 1 ;INITIAL TIMEOUT COUNT
S.STS:'L' .BLKB 1 ;STATUS (O=FREE, NE O=BUSY)
S.ST3:'L' .BLKB 1 ;STATUS EXTENSION BYTE
S.ST2:'L' .BLKW 1 ;STATUS EXTENSION
S.KRB:'L' .BLKW 1 ;ADDRESS OF KRB
S.RCNT:'L' .BLKB 1 ;NUMBER OF REGISTERS TO COPY
S.ROFF:'L' .BLKB 1 ;OFFSET TO FIRST DEV REG TO COPY
S.EMB:'L' .BLKW 1 ;ERROR MESSAGE BLOCK POINTER
S.KTB:'L' .BLKW 1 ;START OF MULTI-ACCESS KRBS

.PSECT
SCBDF$ (Cont.)

;+ OFFSETS FOR MSCP/TMSCP DRIVER DATA BASES (MUDRV, DUDRV)
;-
S.PORT='B'S.EMB+2 ;FIRST 3 CHAR. OF PORT NAME IN RAD50
S.PBA='B'S.EMB+4 ;BIAS OF PORT
S.QST='B'S.EMB+6 ;ADDRESS OF QST (MU,DU CONTR. TABLE)
S.BSYU='B'S.EMB+10 ;UNIT ASSOCIATED WITH OLDEST CMD TO CONTR.

;+ STATUS CONTROL BLOCK STATUS EXTENSION BIT DEFINITIONS
;-
S2.EIP='B'1 ;ERROR IN PROGRESS (1=YES)
S2.EMB='B'2 ;ERROR LOGGING ENABLED (0=YES)
S2.LGO='B'4 ;ERROR LOGGING SUPPORTED (1=YES)
S2.MAD='B'10 ;MULTIACCESS DEVICE (1=YES)
S2.LDS='B'40 ;LOAD SHARING ENABLED (1=YES)
S2.OPT='B'100 ;SUPPORTS SEEK OPTIMIZATION (1=YES)
S2.0PL='B'200 ;SCB AND KRB ARE CONTIGUOUS (1=YES)
S2.0P1='B'400 ;THESE TWO BITS DEFINE THE OPTIMIZATION
S2.ACT='B'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='B'2000 ;DRIVER HAS OPERATION OUTSTANDING (1=YES)
S2.XHR='B'4000 ;EXTERNAL HEADER AND NEW I.LN2 SUPPORT
S2.KRB='B'10000 ;SCB IS QUEUED IN CONTROLLER REQUEST QUEUE

;+ STATUS CONTROL BLOCK STATUS EXTENSION (S.ST3) DEFINITIONS
;-
S3.DRL='B'1 ;MULTI-ACCESS DRIVE IN RELEASED STATE (1=YES)
S3.NRL='B'2 ;DRIVER SHOULDN'T RLS MULTI-ACCESS DRIVE (1=YES)
S3.SIP='B'4 ;SEEK IN PROGRESS (1=YES)
S3.AIN='B'10 ;DRIVER MUST CLEAR ATTENTION BIT (1=YES)
S3.SLV='B'20 ;DEVICE USES SLAVE UNITS (1=YES)
S3.SPA='B'40 ;PORT 'A' SPINNING UP
S3.SPB='B'100 ;PORT 'B' SPINNING UP
S3.OPT='B'200 ;SEEK OPTIMIZATION ENABLED (1=YES)
S3.SPU='B'3.SPA'S3.SPB ;OR. OF PORT SPINUP BITS

;+ KRB ADDRESS TABLE (S.KTB) PORT OFFLINE FROM THIS SCB FLAG.
;-
KP.OFL='B'1 ;KRB ADDRESS POINTS TO OFFLINE PORT (1=YES)

;+ MAPPING ASSIGNMENT BLOCK (FOR UNIBUS MAPPING REGISTER ASSIGNMENT)
;-

C-67
SCBDF$ (Cont.)

.ASECT

M.LNK: 'L', .BLKW 1 ; LINK WORD
M.UMRA: 'L', .BLKW 1 ; ADDRESS OF FIRST ASSIGNED UMR
M.UMRN: 'L', .BLKW 1 ; NUMBER OF UMR'S ASSIGNED * 4
M.UMVL: 'L', .BLKW 1 ; LOW 16 BITS MAPPED BY 1ST ASSIGNED UMR
M.UMVH: 'L', .BLKB 1 ; HIGH 2 BITS MAPPED IN BITS 4 AND 5
M.BFVH: 'L', .BLKB 1 ; HIGH 6 BITS OF PHYSICAL BUFFER ADDRESS
M.BFVL: 'L', .BLKW 1 ; LOW 16 BITS OF PHYSICAL BUFFER ADDRESS
M.LGTH= 'B', ; LENGTH OF MAPPING ASSIGNMENT BLOCK

.ENDC

.MACRO SCBDF$,X,Y,Z

.ENDM

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

SHDDFS

.MACRO SHDDFS,L,B
; FIRST, WE MUST DEFINE THE I/O PACKET DEFINITIONS, SINCE WE
; USE THEM IN OUR DEFINITIONS.
;
PKTDFS ;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
M.LNK:'L' .BLKW 1 ;LINKAGE OF ALL UMB'S IN THE SYSTEM
M.LHD:'L' .BLKW 1 ;LISTHEAD OF ALL ML NODES FOR THIS SET
M.UCBS:'L' .BLKW 2 ;PRIMARY AND SECONDARY UCB ADDRESSES
M.STS:'L' .BLKW 1 ;STATUS WORD
M.LBN:'L' .BLKB 1 ;HIGH ORDER BYTE OF FENCE
 .BLKB 1 ;UNUSED BYTE (MAYBE STATUS?)
 .BLKW 1 ;LOW ORDER WORD OF FENCE
M.LGH=.
;
; UMB STATUS BIT DEFINITIONS
;

.PSECT
MS.MDA'B'=1 ;UMB MARKED FOR DEALLOCATION (1=YES)
MS.CHP'B'=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
ML.LNK:'L' .BLKW 1 ;LINKAGE OF ALL ML NODES ON UMB
ML.LEN:'L' .BLKB 1 ;LENGTH OF ML NODE FOR DEALLOCATION
ML.TYP:'L' .BLKB 1 ;TYPE OF ML NODE FOR ERROR TASK
ML.DNC:'L' .BLKB 1 ;DONE COUNT OF PACKETS
 .BLKB 1 ;UNUSED
ML.PRI:'L' .BLKW 1 ;PRIMARY I/O PACKET ADDRESS
ML.PKT:'L' .BLKB 1.LGTH ;SECONDARY I/O PACKET
ML.LGH=.

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SHDDF$ (Cont.)

;+ ; ML NODE TYPE CODES ;-

.PSECT

MT.PKT'B'=1 ; ML NODE IS I/O PACKET TYPE

;+ ; I/O PACKET OFFSET DEFNS FOR USE BY SHADOW RECORDING ;-

I.R0'B'=I.PRM ; STATUS STORAGE FOR R0 STATUS
I.R1'B'=I.PRM+2 ; STATUS STORAGE FOR R1 STATUS

;+ ; DEFINE THE ERROR MESSAGE POINTERS THAT RESIDE IN THE I/O PACKET. ;-

.PSECT

ML.FID'B'=ML.PKT+I.IOSB ; FILE ID WHICH CONTAINS ERROR
ML.FSEQ'B'=ML.PKT+I.IOSB+2 ; FILE SEQUENCE NUMBER OF FILE IN ERROR
ML.LBN'B'=ML.PKT+I.PRM+10 ; HIGH ORDER LBN OF BLOCK(S) IN ERROR
ML.CNT'B'=ML.PKT+I.PRM+4 ; NUMBER OF BLOCKS IN BAD XFER
ML.TCB'B'=ML.PKT+I.TCB ; TCB OF TASK WITH BAD REQUEST
ML.SR0'B'=ML.PKT+I.R0 ; R0 OF SECONDARY I/O PACKET
ML.SR1'B'=ML.PKT+I.R1 ; R1 OF SECONDARY I/O PACKET
ML.PR0'B'=ML.PKT+I.PRM+14 ; R0 OF PRIMARY I/O PACKET
ML.PR1'B'=ML.PKT+I.PRM+16 ; R1 OF PRIMARY I/O PACKET

.MACRO SHDDF$,X,Y,Z
.ENDM
.ENDM
.MACRO TCBDF$,L,B

; TASK CONTROL BLOCK OFFSET AND STATUS DEFINITIONS
;
; TASK CONTROL BLOCK
;
.ASECT
.

.T.LNK: 'L' .BLKW 1 ; UTILITY LINK WORD
.T.PRI: 'L' .BLKB 1 ; TASK PRIORITY
.T.IOC: 'L' .BLKB 1 ; I/O PENDING COUNT
.T.PCBV: 'L' .BLKW 1 ; POINTER TO COMMON PCB VECTOR
.T.NAM: 'L' .BLKW 2 ; TASK NAME IN RADDR
.T.RCVL: 'L' .BLKW 2 ; RECEIVE QUEUE LISTHEAD
.T.ASTL: 'L' .BLKW 2 ; AST QUEUE LISTHEAD
.T.EFLE: 'L' .BLKW 2 ; TASK LOCAL EVENT FLAGS 1-32
.T.UCB: 'L' .BLKW 1 ; UCB ADDRESS FOR PSEUDO DEVICE 'TI'
.T.TCLB: 'L' .BLKW 1 ; TASK LIST THREAD WORD
.T.STAT: 'L' .BLKW 1 ; FIRST STATUS WORD (BLOCKING BITS)
.T.ST2: 'L' .BLKW 1 ; SECOND STATUS WORD (STATE BITS)
.T.ST3: 'L' .BLKW 1 ; THIRD STATUS WORD (ATTRIBUTE BITS)
.T.DPRI: 'L' .BLKB 1 ; TASK'S DEFAULT PRIORITY
.T.LBN: 'L' .BLKB 3 ; LBN OF TASK LOAD IMAGE
.T.LDV: 'L' .BLKW 1 ; PCB ADDRESS OF LOAD DEVICE
.T.PCBL: 'L' .BLKB 1 ; PCB ADDRESS OF TASK PARTITION
.T.MXSZ: 'L' .BLKW 1 ; MAXIMUM SIZE OF TASK IMAGE (MAPPED ONLY)
.T.ACTL: 'L' .BLKW 1 ; ADDRESS OF NEXT TASK IN ACTIVE LIST
.T.ATT: 'L' .BLKB 1 ; ATTACHMENT DESCRIPTOR LISTHEAD
.T.ST4: 'L' .BLKW 1 ; FOURTH TASK STATUS WORD
.T.HDNL: 'L' .BLKB 1 ; LENGTH OF HEADER (0 IF HDR IN POOL)
.T.GGF: 'L' .BLKB 1 ; GROUP GLOBAL USE COUNT FOR TASK
.T.TIO: 'L' .BLKB 1 ; BUFFERED I/O IN PROGRESS COUNT
.T.EFLM: 'L' .BLKW 2 ; TASK WAITFOR MASK/ADDRESS
.T.TKSL: 'L' .BLKW 1 ; TASK LOAD SIZE IN 32 WD BLOCKS

### = 0

.T.OFF: 'L' .BLKW 1 ; OFFSET TO TASK IMAGE IN PARTITION
.BLBK 1 ; RESERVED
.T.SRXT: 'L' .BLKB 1 ; SREF WITH EFN COUNT IN ALL RECEIVE QUEUES
.T.RREL: 'L' .BLKW 2 ; RECEIVE BY REFERENCE LISTHEAD

### IF NDF_PSSLAS

### = 

### IF NB SYSDEF

### =

.C-71
TCBDF$ (Cont.)

T.CTX: 'L' .BLW 1 ; POINTER TO CONTEXT BLOCK (DDS)
    .IF NDF N$DIR
    .=$$
    .ENDC ; NDF N$DIR
$$=.
T.OCBH: 'L' .BLW 2
T.RDCT: 'L' .BLW 1
    ; OFFSPRING CONTROL BLOCK LISTHEAD
    ; OUTSTANDING OFFSPRING AND VT: COUNT
    .IF NDF P$$OFF
    .=$$
. ENDC
T.SAST: 'L' .BLW 1
$$=.
T.RRM: 'L' .BLW 1
T.IRM: 'L' .BLW 1
    ; REQUIRED RUN MASK
    ; INITIAL RUN MASK SET UP BY INSTALL
    ; ***** THIS WORD IS NO LONGER NECESSARY
    ; ***** HOWEVER, INSTALL (INSLB), MCR (SPAWN),
    ; ***** AND VMR MUST BE MODIFIED
T.CPU: 'L' .BLK 1
    .BLK 1
    ; PROCESSOR NUMBER ON WHICH TASK LAST EXECUTED
    ; (UNUSED)
    .IF NDF M$$PRO
    .=$$
. ENDC
$$=.
T.ACN: 'L' .BLW 1
    ; POINTER TO ACCOUNTING BLOCK
    .IF NDF A$$CNT
    .=$$
. ENDC
$$=.
T.ISIZ: 'L' .BLK 1
    ; SIZE OF ROOT I SPACE
    .IF NDF U$$DAS
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

TCBDF$ (Cont.)

;LENGTH OF TASK CONTROL BLOCK
T.LGTH='B'.

;LENGTH OF TCB EXTENSION
T.EXT='B'0

;FIRST STATUS WORD (BLOCKING BITS)

TS.EXE='B'100000 ;TASK NOT IN EXECUTION (l=YES)
TS.RDN='B'40000 ;I/O RUN DOWN IN PROGRESS (l=YES)
TS.MSG='B'20000 ;ABORT MESSAGE BEING OUTPUT (l=YES)

TS.CIP='B'10000 ;TASK BLOCKED FOR CHECKPOINT IN PROGRESS (l=YES)
TS.RUN='B'4000 ;TASK IS RUNNING ON ANOTHER PROCESSOR (l=YES)

TS.STP='B'100 ;TASK BLOCKED BY CLI COMMAND
TS.CKR='B'100 ;TASK HAS CKP REQUEST (MP SYSTEM ONLY) (l=YES)
TS.BLC='B'37 ;INCREMENT BLOCKING COUNT MASK

;SECOND STATUS WORD (STATE BITS)

T2.AST='B'100000 ;AST IN PROGRESS (l=YES)
T2.DST='B'40000 ;AST RECOGNITION DISABLED (l=YES)
T2.CHK='B'20000 ;TASK NOT CHECKPOINTABLE (l=YES)
T2.REX='B'10000 ;REQUESTED EXIT AST SPECIFIED
T2.SEP='B'4000 ;TASK STOPPED FOR EVENT FLAG(S) (l=YES)
T2.GIL='B'1000 ;TASK STOPPED FOR BUFFERED I/O
T2.AFF='B'400 ;TASK IS INSTALLED WITH AFFINITY
T2.HLT='B'200 ;TASK IS BEING HALTED (l=YES)
T2.ABO='B'100 ;TASK MARKED FOR ABORT (l=YES)
T2.STP='B'40 ;SMAVED T2.SPN ON AST IN PROGRESS
T2.TCP='B'20 ;TASK STOPPED (l=YES)

T2.SPN='B'10 ;SMAVED T2.SPN ON AST IN PROGRESS
T2.SPN='B'4 ;SMAVED T2.WFR ON AST IN PROGRESS
T2.WFR='B'2 ;TASK IN WAITFOR STATE (l=YES)

;THIRD STATUS WORD (ATTRIBUTE BITS)

T3.ACP='B'100000 ;ANCILLARY CONTROL PROCESSOR (l=YES)
T3.PMD='B'40000 ;DUMP TASK ON SYNCHRONOUS ABORT (0=YES)
T3.REM='B'20000 ;REMOVE TASK ON EXIT (l=YES)
T3.PRV='B'10000 ;TASK IS PRIVILEGED (l=YES)

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

TCBDF$ (Cont.)

T3.MCR='B'4000 ; TASK REQUESTED AS EXTERNAL MCR FUNCTION (l=YES)
T3.SLV='B'2000 ; TASK IS A SLAVE TASK (l=YES)
T3.CLI='B'1000 ; TASK IS A COMMAND LINE INTERPRETER (l=YES)
T3.RST='B'4000 ; TASK IS RESTRICTED (l=YES)
T3.NSD='B'2000 ; TASK DOES NOT ALLOW SEND DATA
T3.CAL='B'100 ; TASK HAS CHECKPOINT SPACE IN TASK IMAGE
T3.NET='B'20 ; TASK HAS RESIDENT OVERLAYS
T3.MPC='B'10 ; NETWORK PROTOCOL LEVEL
T3.CMD='B'4 ; MAPPING CHANGE WITH OUTSTANDING I/O (l=YES)
T3.SWS='B'2 ; TASK IS EXECUTING A CLI COMMAND
T3.GFL='B'1 ; RESERVED FOR SOFTWARE SERVICES USE
T3.GPL='B'1 ; GROUP GLOBAL EVENT FLAG LOCK

;+; STATUS BIT DEFINITIONS FOR FOURTH STATUS WORD (T.ST4)
;-
T4.FMP='B'200 ; TASK HAS FAST MAP HDR EXT.
T4.CTC='B'100 ; TASK HAS BEEN PROCESSED BY GIN "C ABORT
T4.MUT='B'400 ; TASK IS A MULTI-USER TASK
T4.LDD='B'20 ; TASK'S LOAD DEVICE HAS BEEN DISMOUNTED
T4.PRO='B'10 ; TCB IS (OR SHOULD BE) A PROTOTYPE
T4.PRV='B'4 ; TASK WAS PRIV, BUT HAS CLEARED T3.PRV
T4.DSP='B'2 ; WITH GIN (MAY RESET WITH GIN IF T4.PRV SET)
T4.SNC='B'1 ; TASK WAS BUILT FOR USER I/D SPACE

;+; REQUIRED RUN MASK
;-
TR.UBT='B'100000 ; UNIBUS RUN T
TR.USB='B'40000 ; UNIBUS RUN S
TR.UBR='B'20000 ; UNIBUS RUN R
TR.UBP='B'10000 ; UNIBUS RUN P
TR.UBN='B'4000 ; UNIBUS RUN N
TR.UBM='B'2000 ; UNIBUS RUN M
TR.UBL='B'1000 ; UNIBUS RUN L
TR.UBK='B'400 ; UNIBUS RUN K
TR.UBJ='B'200 ; UNIBUS RUN J
TR.UBH='B'100 ; UNIBUS RUN H
TR.UBF='B'40 ; UNIBUS RUN F
TR.UBE='B'20 ; UNIBUS RUN E
TR.CPD='B'10 ; PROCESSOR D
TR.CPC='B'4 ; PROCESSOR C
TR.CPB='B'2 ; PROCESSOR B
TR.CPA='B'1 ; PROCESSOR A

.ENDC

.PSECT
.MACRO TCBDFS X,Y,Z
.ENDM
.ENDM
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 TELTYPE EXAMPLE
ABOVE, EACH UNIT ON BOTH INTERFACES WOULD HAVE A UCB.

.ASECT
=177772

.IF NB SYSDEF

.IF DF A$$CNT
  .=.-2
  .ENDC ;DF A$$CNT

.IF DF L$$GCL
  .=.-2
  .ENDC ;DF L$$GCL

.IF DF N$$DIR
  .=.-2
  .ENDC ;DF N$$DIR

U.UAB:'L'

.IF DF A$$CNT
  .BLKW 1 ;POINTER TO USER ACCOUNT BLOCK
  .ENDC ;DF A$$CNT

U.LOG:'L'

.IF DF L$$GCL
  .BLKW 1 ;POINTER TO USER LOGICAL HASH TABLE
  .ENDC ;DF L$$GCL

U.FPRO:'L'

.BLKW 1 ;DEFAULT FILE PROTECTION WORD
UCBDF$ (Cont.)

U.CTX='L'

  .IF DF N$$DIR
  .BLKW 1 ;POINTER TO TERMINAL CONTEXT BLOCK
  .ENDC ;DF N$$DIR
  .ENDC ;NB SYSDEF

U.MUP: 'L' .BLKW 1 ;MULTI-USER PROTECTION WORD
U.LUIC: 'L' .BLKW 1 ;LOGIN UIC - MULTI USER SYSTEMS ONLY
U.OWN: 'L' .BLKW 1 ;OWNING TERMINAL - MULTI USER SYSTEMS ONLY
U.DCB: 'L' .BLKW 1 ;BACK POINTER TO DCB
U.RED: 'L' .BLKW 1 ;POINTER TO REDIRECT UNIT UCB
U.CTL: 'L' .BLKW 1 ;CONTROL PROCESSING FLAGS
U.STS: 'L' .BLKB 1 ;UNIT STATUS
U.UNIT: 'L' .BLKB 1 ;PHYSICAL UNIT NUMBER
U.ST2: 'L' .BLKW 1 ;UNIT STATUS EXTENSION
U.CWL: 'L' .BLKW 1 ;FIRST DEVICE CHARACTERISTICS WORD
U.CW2: 'L' .BLKW 1 ;SECOND DEVICE CHARACTERISTICS WORD
U.CW3: 'L' .BLKW 1 ;THIRD DEVICE CHARACTERISTICS WORD
U.CW4: 'L' .BLKW 1 ;FOURTH DEVICE CHARACTERISTICS WORD
U.SCB: 'L' .BLKW 1 ;POINTER TO SCB
U.ATT: 'L' .BLKW 1 ;TCB ADDRESS OF ATTACHED TASK
U.BUF: 'L' .BLKW 1 ;BUFFER ADDRESS OF CURRENT I/O REQUEST
U.UCBX='B'U.CNT+2 ;POINTER TO UCB EXTENSION IN SECONDARY POOL
U.ACP='B'U.CNT+4 ;ADDRESS OF TCB OF MOUNTED ACP
U.CBF='B'U.CNT+6 ;ADDRESS OF VOLUME CONTROL BLOCK
U.UMB='B'U.CNT+10 ;ADDRESS OF UMB FOR SHADOW RECORDING
U.PRM='B'U.CNT+12 ;DISK SIZE PARAMETER WORDS
U.ICSR='B'U.CNT+16 ;CSR ADDRESS (P/OS)
U.SLT='B'U.CNT+20 ;SLOT ADDRESS (P/OS)
U.SPRM='B'U.CNT+22 ;4 WD SAVED I/O PACKET AREA (R$$AMD)
U.UTIL='B'U.CNT+16 ;STATE WORD FOR UNIT

; DEFINITIONS FOR U.UTIL BITS

UU.SER = 'B'1 ;SERIAL MODE
UU.RCT = 'B'2 ;(DUDRV)RCT IN PROGRESS
UU.AVN = 'B'4 ;IS WAITING FOR OTHER UNITS TO SPIN DOWN
UU.GUS = 'B'10 ;UNIT MUST HAVE A GUS COMMAND ISSUED
UU.ONL = 'B'20 ;UNIT MUST HAVE A ONL COMMAND ISSUED
UU.SPC = 'B'40 ;SPECIAL ONLINE TRANSITION
UU.ATN = 'B'100 ;UNIT HAS SENT ATTENTION MESSAGE
UU.RDY = 'B'200 ;UNIT IS READY
UU.ABO = 'B'400 ;IF SET, XXCAN SET UU.SER FLAG FOR UNIT
UU.SIO = 'B'1000 ;THIS UNIT CAN STALL I/O
UU.IOE = 'B'2000 ;THIS UNIT HAS I/O STALLED
UU.BLK = 'B'4000 ;THIS UNIT DOESN'T ACCEPT DENSITY SETTINGS
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

UCBDFS$ (Cont.)

U.BPKT='B'U.CNT+20 ; UNIT BAD BLOCK REPLACEMENT WAITING LIST
U.MEDI='B'U.BPKT ; MEDIA IDENTIFIER FOR MU TAPE
U.UC2X='B'U.CNT+24 ; POINTER TO SECOND EXTENSION IN SECONDARY POOL

; MAGTAPE DEVICE DEPENDENT UCB OFFSETS

U.SNUM='B'U.CNT+10 ; SLAVE UNIT NUMBER
U.FCDE='B'U.CNT+12 ; FUNCTION CODE
U.KRBl='B'U.CNT+14 ; SUBCONTROLLER KRBl POINTER

; DEFINE SECONDARY POOL UCB EXTENSION OFFSETS (ERROR LOGGING DEVICES ONLY)

=0
.BLKW 9.
; FIXED ACCOUNTING TRANSACTION HEADER
X.NAME:'L' .BLKW 2 ; DRIVE NAME IN RAD50
X.IOC:'L' .BLKW 2 ; I/O COUNT
X.ERSL:'L' .BLKB 1 ; SOFT ERROR LIMIT
X.EHRL:'L' .BLKB 1 ; HARD ERROR LIMIT
X.ERSC:'L' .BLKB 1 ; SOFT ERROR COUNT
X.EHRC:'L' .BLKB 1 ; HARD ERROR COUNT
X.WCNT:'L' .BLKW 2 ; WORDS TRANSFERED COUNT

; DEFINE OFFSETS FOR SEEK OPTIMIZATION DEVICES

X.CYLC:'L' .BLKW 2 ; CYLINDERS CROSSED COUNT
X.CCYL:'L' .BLKB 1 ; CURRENT CYLINDER
X.FCUR:'L' .BLKB 1 ; CURRENT FAIRNESS COUNT
X.FLIM: 'L' .BLKW 1 ; FAIRNESS COUNT LIMIT
X.DSKD: 'L' .BLKB 1 ; DISK DIRECTION (HIGH BIT 1=OUT)
X.DNAM: 'L' .BLKB 1 ; DEVICE NAME FOR ACCOUNTING
X.UNIT: 'L' .BLKB 1 ; UNIT NUMBER FOR ACCOUNTING
X.CSTS: 'L' .BLKB 1 ; CACHE STATUS BITS
X.CPCB: 'L' .BLKB 1 ; CACHE PARTITION PCB ADDRESS
X.CSBA: 'L' .BLKB 1 ; CACHE STATISTICS BUFFER ADDRESS (BIAS)
X.CCED: 'L' .BLKW 2 ; CACHE EXTENT DESCRIPTOR LISTHEAD
X.XDAT: 'L' .BLKB 1 ; CACHE VIRTUAL EXTENT SIZE
X.XRDA: 'L' .BLKB 1 ; CACHE READAHEAD EXTENT SIZE
X.XRDIR: 'L' .BLKB 1 ; CACHE DIRECTORY EXTENT SIZE
X.XLOG: 'L' .BLKB 1 ; CACHE LOGICAL EXTENT SIZE
X.XOVR: 'L' .BLKB 1 ; CACHE OVERLAY EXTENT SIZE
X.LGTH='B'. ; LENGTH OF THE UCB EXTENSION
X.DFPL='B'10. ; DEFAULT FAIRNESS COUNT LIMIT
X.DFSL='B'8. ; DEFAULT SOFT ERROR LIMIT
X.DFHL='B'5. ; DEFAULT HARD ERROR LIMIT

; CACHE STATUS BITS IN X.CSTS

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UCBDF$ (Cont.)

; AUTOCACHE ENABLED (1=YES)
XC.ENA='B'200

; CACHE ACTIVE FOR DEVICE (1=YES)
XC.ACT='B'100

; CACHE DIRECTORY REQUESTS (1=YES)
XC.DIR='B'020

; CACHE OVERLAY REQUESTS (1=YES)
XC.OVR='B'010

; CACHE VIRTUAL REQUESTS (1=YES)
XC.DAT='B'004

; CACHE LOGICAL REQUESTS (1=YES)
XC.LOG='B'002

; CACHE VIRTUAL READ AHEAD (1=YES)
XC.RDA='B'001

; DEFINE CACHE MAXIMUM AND DEFAULT EXTENT SIZES
;
XX.MAX='B'15.
XX.DAT='B'5.
XX.RDA='B'5.
XX.DIR='B'1.
XX.OVR='B'4.
XX.VRDA='B'0.

; DEFINE OFFSETS FOR DISK MSCP CONTROLLERS (SECOND UCB EXTENSION)
;
;
; CHARACTERISTICS OBTAINED FROM "GET UNIT STATUS" END PACKETS
;
.
X.MLUN:'L'.BLKW 1 ;MULTI-UNIT CODE
X.UNFL:'L'.BLKW 1 ;UNIT FLAGS
X.UNFL:BLKW 2 ;RESERVED
X.UNTI:'L'.BLKW 4 ;UNIT IDENTIFIER
X.MEDI:'L'.BLKW 2 ;MEDIA IDENTIFIER
X.SHUN:'L'.BLKW 1 ;SHADOW UNIT
X.SHST:'L'.BLKW 1 ;SHADOW UNIT STATUS
X.TRCK:'L'.BLKW 1 ;UNIT TRACK SIZE
X.GRP:'L'.BLKW 1 ;UNIT GROUP SIZE
X.CYL:'L'.BLKW 1 ;UNIT CYLINDER SIZE
X.USVR:'L'.BLKB 1 ;UNIT SOFTWARE VERSION
X.UHVR:'L'.BLKB 1 ;UNIT HARDWARE VERSION
X.RCTT:'L'.BLKW 1 ;UNIT RCT TABLE SIZE
X.RBNS:'L'.BLKB 1 ;UNIT RBN 'S' / TRACK
X.RCTC:'L'.BLKB 1 ;UNIT RCT COPIES
;
; CHARACTERISTICS OBTAINED FROM "ONLINE" OR "SET UNIT CHARACTERISTICS" END PACKETS
;
; UNITED SIZE
X.VSER:'L'.BLKW 2 ;UNIT SIZE
X.VSER:BLKW 2 ;VOLUME SERIAL NUMBER
X.DUSZ='B'1 ;SIZE OF DISK MSCP CONTROLLER UCB EXTENTION

. IF NB TTDEF
;
; TERMINAL DRIVER DEFINITIONS
;
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

UCBDFS (Cont.)

..=U.BUF
U.TAPR: 'L'
U.TUX: 'L' .BLKW 1  ;APR VALUE FOR START OF UCBX
U.TSTA: 'L' .BLKW 4  ;POINTER TO UCB EXTENSION (UCBX)
U.TIUC: 'L' .BLKW 1  ;STATUS QUADRUPLE-WORD
U.TFRQ: 'L' .BLKW 1  ;DEFAULT UIC
U.TFLK: 'L' .BLKW 1  ;FORK REQUEST WORD
U.TCHP: 'L' .BLKW 1  ;FORK LIST LINK WORD
U.TCVP: 'L' .BLKW 1  ;CURRENT HORIZONTAL POSITION
U.TSTA: 'L' .BLKW 4  ;CURRENT VERTICAL POSITION
U.TTYP: 'L' .BLKW 1  ;TERMINAL TYPE
U.TMTI: 'L' .BLKW 1  ;MODEM TIMER
U.TTAB: 'L' .BLKW 1  ;IF 0: U.TTAB+1 IS SINGLE-CHARACTER TYPE-AHEAD
U.TTEO: 'L' .BLKW 1  ;BUFFER, CURRENTLY EMPTY
U.TPO: 'L' .BLKW 1  ;IF ODD: U.TTAB+1 IS SINGLE-CHARACTER TYPE-AHEAD
U.TBCP: 'L' .BLKW 1  ;BUFFER AND HOLDS A CHARACTER
U.TST5: 'L' .BLKW 1  ;IF NON-0 AND EVEN: POINTER TO MULTI-CHARACTER
U.TICP: 'L' .BLKW 1  ;TYPE-AHEAD BUFFER
U.TTYP: 'L' .BLKW 1  ;THE NEXT TWO OFFSETS OVERLAP U.TTAB WHEN THE
U.TDPO: 'L' .BLKW 1  TYPEAHEAD BUFFER IS IN SECONDARY POOL
U.TIXL: 'L' .BLKW 1  ;ECHO BUFFER FOR DMA OPERATIONS WHEN UCBX IS
U.ACB: 'L' .BLKW 1  ;IN SECONDARY POOL AND THUS NOT MAPPED BY A UMR
U.AFLG: 'L' .BLKB 1  ;TYPEAHEAD BUFFER SIZE
U.TSB: 'L' .BLKB 1  ;LINES PER PAGE
U.TLP: 'L' .BLKB 1  ;IN SECONDARY POOL AND THUS NOT MAPPED BY A UMR
U.TTX: 'L' .BLKB 1  ;EXTENDED I/O STATUS WORD
U.TICP: 'L' .BLKB 1  ;I/O PACKET EXTENSION LISTHEAD
U.TTYP: 'L' .BLKB 1  ;ANCILLARY CONTROL DRIVER BLOCK ADDR
U.TIUX: 'L' .BLKB 1  ;ANCILLARY CONTROL DRIVER FLAGS WORD
U.TSTA: 'L' .BLKB 1  ;ANCILLARY CONTROL DRIVER DMA BUFFER

..=-2
U.TTEO: 'L' .BLKB 1  ;IF OP TS$LTH
U.TBSZ: 'L' .BLKB 1  ;; LAT Host Support
U.TTP: 'L' .BLKB 1  ;; STATUS/CONTROL INFORMATION
U.TST5: 'L' .BLKB 1  ;; LINK STATUS
U.TST6: 'L' .BLKB 1  ;; TRANSMIT CREDITS COUNTER
U.TIUX: 'L' .BLKB 1  ;; SERVER/CIRCUIT IDENTIFICATION
U.TIXL: 'L' .BLKB 1  ;; SERVER NUMBER
U.ACB: 'L' .BLKB 1  ;; SESSION NUMBER
U.AFLG: 'L' .BLKB 1  ;; MAXIMUM SLOT SIZE ON XMT
U.TSB: 'L' .BLKB 1  ;; PARAMETERS ON RECEIVE DATA
U.TTX: 'L' .BLKB 1  ;; RECEIVE SLOT HEADER VIRTUAL
U.TTEO: 'L' .BLKB 1  ;; RECEIVE DATA VIRTUAL
U.TTEO: 'L' .BLKB 1  ;; XMT INTERMEDIATE BUFFER CHAIN
U.TTEO: 'L' .BLKB 1  ;; XMT LISTHEAD ADDRESS
U.TTEO: 'L' .BLKB 1  ;; XMT REMAINED BYTES IN BUFFER
U.TTEO: 'L' .BLKB 1  ;; VIRTUAL CIRCUIT CCB
U.TTEO: 'L' .BLKB 1  ;; CCB ADDRESS (IN POOL)
U.TTEO: 'L' .BLKB 1  ;; LINK STATUS WORD IN U.LINS
U.LINS: 'L' .BLKB 1  ;; 1-XMT STOPPED, 0-NOT
U.CREN: 'L' .BLKB 1  ;; >255 CHAR. FOR SLOT. HOLD IT.
UCBDF$ (Cont.)

UL.TDA='B'2 ; 1-XMT DATA AVAIL, 0-NOT
UL.LST='B'4 ; DATA IN XMT QUEUE (SET BY PORT)
UL.RDA='B'10 ; 1-LINE STOPPED, 0-NOT
UL.ECH='B'20 ; LINE STOPPED BY USER (XOFF
UL.RSS='B'100 ; CAME FROM REMOTE TERMINAL)
UL.LEN='B'200 ; 1-RCV DATA AVAIL, 0-NOT

.ENDC ; .IF DF $T$LTH

; DEFINE BITS IN STATUS WORD 1 (U.TSTA)
;
; INPUT STATUS
;
S1.RST='B'1 ; READ WITH SPECIAL TERMINATORS IN PROGRESS
S1.ESC='B'2 ; ESCAPE SEQUENCE IN PROGRESS
S1.RSP='B'4 ; READ WITH SPECIAL PROCESSING
S1.PTH='B'10 ; PASS THRU IS CURRENTLY ACTIVE
S1.RNE='B'20 ; ECHO SUPPRESSED
S1.TSY='B'40 ; TERMINAL OUTPUT SYNC IS CURRENTLY ENABLED
S1.OBY='B'100 ; OUTPUT BUSY
S1.IBY='B'200 ; INPUT BUSY
S1.DPR='B'400 ; DEFER PROCESSING OF CHAR. IN U.TECB
S1.DEC='B'1000 ; DEFER ECHO OF CHAR. IN U.TECB
S1.BRQ='B'2000 ; BUFFERED INPUT IN PROGRESS
S1.SRQ='B'4000 ; INPUT PROCESSING DISABLED
S1.IBF='B'10000 ; ESC. SEQ PROCESSING IS ENABLED FOR THE CURRENT
                   ; READ
S1.RNF='B'20000 ; READ NO FILTER IS ACTIVE (EDIT CHARACTERS ARE
                   ; DISPLAYED)
S1.TNE='B'40000 ; TERMINATOR NO ECHO
S1.USI='B'100000 ; UNSOLICITED INPUT IN PROGRESS

; DEFINE BITS IN STATUS WORD 2 (U.TSTA+2)
;
; OUTPUT STATUS
;
S2.RCU='B'1 ; RESTORE CURSOR (MUST = TF.RCU)
S2.WRA='B'6 ; CONTEXT FOR WRAP-AROUND
S2.WRB='B'2 ; LOW BIT IN S2.WRA BIT PATTERN
S2.WAL='B'10 ; WRITE PASS ALL (MUST = TF.WAL)
S2.BRQ='B'20 ; BREAK-THROUGH-WRITE REQUEST IN QUEUE
S2.SRQ='B'40 ; SPECIAL REQUEST IN QUEUE
                   ; (10.ATT, 10.DET, SF.SMC)
S2.ORQ='B'100 ; OUTPUT REQUEST IN QUEUE (MUST = S1.OBY)
S2.IRQ='B'200 ; INPUT REQUEST IN QUEUE (MUST = S1.IBY)
S2.PLL='B'400 ; FORCE LINEFEED BEFORE NEXT ECHO
S2.ELF='B'1000 ; EAT A LINEFEED (IGNORE A LEADING LF ON OUTPUT)
S2.CRF='B'2000 ; TRAILING CR REQUIRED ON OUTPUT
S2.OBF='B'4000 ; BUFFERED OUTPUT IN PROGRESS
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

UCBDFS (Cont.)

S2.PCU='B'10000 ;POSITION CURSOR BEFORE WRITE
S2.BEL='B'20000 ;BELL PENDING
S2.CTO='B'40000 ;OUTPUT STOPPED BY CTRL-o 266.
S2.CTS='B'100000 ;OUTPUT STOPPED BY CTRL-s

; DEFINE BITS IN STATUS WORD 3 (U.TSTA+4)
;
; TERMINAL OPERATION CHARACTERISTICS
;
S3.ACR='B'1 ;WRAP-AROUND (AUTOMATIC CR-LF) REQUIRED
S3.TAB='B'2 ;TYPE-AHEAD BUFFER ALLOCATION REQUESTED
S3.CTC='B'4 ;TERMINAL WANTS CLI TO HAVE "C" NOTIFICATION
S3.RAL='B'10 ;TERMINAL IS IN READ-PASS-ALL MODE
S3.NEC='B'20 ;NO ECHO
S3.TSY='B'40 ;TERMINAL SYNC
S3.BBC='B'100 ;PASS 8 BITS ON INPUT
S3.FDX='B'200 ;LINE IS IN FULL DUPLEX MODE
S3.MHE='B'400 ;NOTIFY ATTACHED TASK OF MODEM HANG-UP
S3.ICE='B'1000 ;INPUT COUNT STATE ENABLED
S3.TME='B'2000 ;TERMINAL MANAGEMENT MODE ENABLED
S3.PTH='B'4000 ;PASS THROUGH REQUESTED
S3.RES='B'10000 ;TASK WANTS ESCAPE SEQUENCES
S3.PTH='B'20000 ;TERMINAL HAS PRINTER PORT
S3.RUB='B'40000 ;RUBOUT SEQUENCE IN PROGRESS (NON-SCOPE)

; DEFINE BITS IN STATUS WORD 4 (U.TSTA+6)
;
; TERMINAL ATTRIBUTE CHARACTERISTICS
;
S4.HFL='B'7 ;HORIZONTAL FILL REQUIREMENT
S4.VFL='B'10 ;VERTICAL FILL REQUIREMENT
S4.HFF='B'20 ;HARDWARE FORM-FEED PRESENT
S4.HHT='B'40 ;HARDWARE HORIZONTAL TAB PRESENT
S4.DLO='B'100 ;DIAL-OUT LINE (IMPLIED U2.RMT)
S4.HSY='B'200 ;HOST/Terminal SYNCHRONIZATION ENABLED (1=YES)
S4.ANI='B'400 ;ANSI CRT TERMINAL
S4.AVO='B'1000 ;VT100-FAMILY TERMINAL DISPLAY
S4.BLK='B'2000 ;BLOCK MODE TERMINAL
S4.DEC='B'4000 ;DIGITAL CRT TERMINAL
S4.EDT='B'10000 ;TERMINAL HAS LOCAL EDITING FUNCTIONS
S4.RGS='B'20000 ;TERMINAL SUPPORTS REGIS GRAPHICS
S4.SFC='B'40000 ;TERMINAL SUPPORTS SOFT CHARACTERS (DRCS)
S4.ABD='B'100000 ;AUTO-BAUD SPEED DETECTION ENABLED

; ADDITIONAL BITS IN STATUS WORD U.TSTS
;
S5.SW1='B'1 ;FIRST TERMINAL MANAGEMENT SWITCH
S5.TM='B'2 ;TERMINAL IN TERMINAL MANAGEMENT MODE
S5.XOF='B'4 ;SEND AN XOFF AT FIRST OPPORTUNITY
S5.XON='B'10 ;SEND AN XON AT FIRST OPPORTUNITY
S5.HPC='B'14 ;OUTPUT OF HIGH PRIORITY CHARACTERS REQUESTED
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

UCBDFS (Cont.)

S5.HPO='B'20 ;HIGH PRIORITY OUTPUT IN PROGRESS
S5.OXF='B'40 ;XOFF HAS BEEN OUTPUT
S5.ITE='B'100 ;IMMEDIATE TIMEOUT ON INPUT
S5.RPO='B'2000 ;READ W/PROMPT OUTPUT IN PROGRESS
S5.VER='B'10000 ;LAST CHAR. IN TYPE-AHEAD BUFFER
S5.BCC='B'20000 ;HAS PARITY ERROR
S5.DAO='B'40000 ;LAST CHAR. IN TYPE-AHEAD BUFFER
S5.VER='B'100000 ;HAS FRAMING ERROR
S5.BCC='B'200000 ;LAST CHAR. IN TYPE-AHEAD BUFFER
S5.DAO='B'400000 ;HAS DATA OVERRUN ERROR
S5.ABP='B'100000 ;NOTE - THE 3 BITS ABOVE MUST CORRESPOND
S5.HPO='B'20000 TO THE RESPECTIVE ERROR FLAGS IN THE
S5.ITE='B'1000000 ;HARDWARE RECEIVE BUFFER
S5.RPO='B'2000000 ;AUTO-BAUD SPEED DETECTION IN PROGRESS
S5.DAO='B'4000000
S5.VER='B'10000000
S5.BCC='B'20000000
S5.DAO='B'40000000
S5.ABP='B'10000000
S6.EIO='B'40000000 ;READ WAS AN EXTENDED I/O
S6.RLU='B'100000000 ;READ WITH LOWER CASE TO UPPER CASE CONVERSION
S6.RDI='B'1000000000 ;READ WITH DEFAULT INPUT

; VIRTUAL TERMINAL UCB DEFINITIONS

=U.UNIT
U.OCNT:'L'.BLKB 1 ;OFFSPRING WITH THIS AS TI:
=U.BUF
U.RPKT:'L'.BLKW 1 ;CURRENT OFFSPRING READ I/O PACKET
U.WPKT:'L'.BLKW 1 ;CURRENT OFFSPRING WRITE I/O PACKET
U.IAST:'L'.BLKW 1 ;INPUT AST ROUTINE ADDRESS
U.OAST:'L'.BLKW 1 ;OUTPUT AST ROUTINE ADDRESS
U.AAST:'L'.BLKW 1 ;ATTACH AST ROUTINE ADDRESS

.IF NB TTDEF
.IIF NE U.AAST+2-U.UIC .ERROR ;ADJACENCY ASSUMED
.ENDC

=U.AAST+4
U.PTCB:'L'.BLKW 1 ;PARENT TCB ADDRESS

; CONSOLE DRIVER DEFINITIONS

=U.BUF+2
U.CTCB:'L'.BLKW 1 ;ADDRESS OF CONSOLE LOGGER TCB
U.COTQ:'L'.BLKW 2 ;I/O PACKET LIST QUEUE
U.RED2:'L'.BLKW 1 ;REDIRECT UCB ADDRESS
.PSEC

**UCBDF$ (Cont.)**

;+ 
; DEVICE TABLE STATUS DEFINITIONS 
; 
; DEVICE CHARACTERISTICS WORD 1 (U.CW1) DEVICE TYPE DEFINITION BITS. 
;-

DV.REC='B'1 ; RECORD ORIENTED DEVICE (1=YES)
DV.CCL='B'2 ; CARRIAGE CONTROL DEVICE (1=YES)
DV.TTY='B'4 ; TERMINAL DEVICE (1=YES)
DV.DIR='B'10 ; FILE STRUCTURED DEVICE (1=YES)
DV.SDI='B'20 ; SINGLE DIRECTORY DEVICE (1=YES)
DV.MSD='B'40 ; SEQUENTIAL DEVICE (1=YES)
DV.UMD='B'100 ; MASS STORAGE DEVICE (1=YES)
DV.AMD='B'200 ; USER MODE DIAGNOSTICS SUPPORTED (1=YES)
DV.MBC='B'400 ; MASSBUS CONTROLLER (1M COMPATIBILITY ONLY)
DV.EXT='B'4000 ; UNIT ON EXTENDED 22-BIT UNIBUS CONTROLLER (1=YES)
DV.SWL='B'10000 ; UNIT SOFTWARE WRITE LOCKED (1=YES)
DV.ISP='B'20000 ; INPUT SPOOLED DEVICE (1=YES)
DVOSP='B'40000 ; OUTPUT SPOOLED DEVICE (1=YES)
DV.PSE='B'100000 ; PSEUDO DEVICE (1=YES)
DV.COM='B'200000 ; DEVICE IS MOUNTABLE AS COM CHANNEL (1=YES)
DV.FIL='B'400000 ; DEVICE IS MOUNTABLE AS FIL DEVICE (1=YES)
DV.MNT='B'1000000 ; DEVICE IS MOUNTABLE (1=YES)

;+ 
; TERMINAL DEPENDENT CHARACTERISTICS WORD 2 (U.CW2) BIT DEFINITIONS 
;-

U2.DH1='B'1000000 ; UNIT IS A MULTIPLEXER (1=YES)
U2.DJ1='B'4000000 ; UNIT IS A DJ1 (1=YES)
U2.RMT='B'2000000 ; UNIT IS REMOTE (1=YES)
U2.HFF='B'1000000 ; UNIT HANDLES HARDWARE FORM FEEDS (1=YES)
U2.LBS='B'1000000 ; OLD NAME FOR U2.HFF
U2.NEC='B'4000000 ; DON'T ECHO SOLICITED INPUT (1=YES)
U2.CRT='B'2000000 ; UNIT IS A CRT (1=YES)
U2.ESC='B'1000000 ; UNIT GENERATES ESCAPE SEQUENCES (1=YES)
U2.LOG='B'4000000 ; USER LOGGED ON TERMINAL (O=YES)
U2.SLV='B'2000000 ; UNIT IS A SLAVE TERMINAL (1=YES)
U2.DZ1='B'1000000 ; UNIT IS A DZ1 (1=YES)
U2.HLD='B'2000000 ; TERMINAL IS IN HOLD SCREEN MODE (1=YES)
U2.AT='B'20 ; MCR COMMAND AT. BEING PROCESSED (1=YES)
U2.PRV='B'10 ; UNIT IS A PRIVILEGED TERMINAL (1=YES)
U2.LAL='B'4 ; UNIT IS A LA30S TERMINAL (1=YES)
U2.VT5='B'2 ; UNIT IS A VT5B TERMINAL (1=YES)
U2.LWC='B'1 ; LOWER CASE TO UPPER CASE CONVERSION (0=YES)

;+ 
; BIT DEFINITIONS FOR U.MUP 
;-

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UCBDF$ (Cont.)

UM.OVR='B'1 ; OVERRIDE CLI INDICATOR
UM.CLI='B'36 ; CLI INDICATOR BITS
UM.DSB='B'200 ; TERMINAL DISABLED SINCE CLI ELIMINATED
UM.NBR='B'400 ; NO BROADCAST
UM.CNT='B'1000 ; CONTINUATION LINE IN PROGRESS
UM.CMD='B'2000 ; COMMAND IN PROGRESS
UM.SER='B'4000 ; SERIAL COMMAND RECOGNITION ENABLED
UM.KIL='B'10000 ; TTDRV SHOULD SEND KILL PKT ON CNTRL/C

; ; Rh11-RS03/RS04 CHARACTERISTICS WORD 2 (U.CW2) BIT DEFINITIONS
; -
U2.R04='B'1000000 ; UNIT IS A RS04 (1= YES)

; ; Rh11-TU16 CHARACTERISTICS WORD 2 (U.CW2) BIT DEFINITIONS
; -
U2.7CH='B'10000 ; UNIT IS A 7 CHANNEL DRIVE (1= YES)

; ; TERMINAL DEPENDENT CHARACTERISTICS WORD 3 (U.CW3) BIT DEFINITIONS
; -
U3.UPC='B'20000 ; UPPCASE OUTPUT FLAG
U3.PAR='B'40000 ; PARITY GENERATION AND CHECKING
U3.OPA='B'1000000 ; PARITY SENSE (1= ODD PARITY)

; ; VIRTUAL TERMINAL 3RD CHARACTERISTICS WORD DEFINITIONS
; -
U3.FDX='B'1 ; FULL DUPLEX MODE (1= YES)
U3.DBF='B'2 ; INTERMEDIATE BUFFERING DISABLED (1= YES)
U3.RPR='B'4 ; READ W/PROMPT IN PROGRESS (1= YES)

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

; ; UNIT CONTROL PROCESSING FLAG DEFINITIONS
; -
UC.ALG='B'200 ; BYTE ALIGNMENT ALLOWED (1= NO)
UC.NPR='B'100 ; DEVICE IS AN NPR DEVICE (1= YES)
UC.QUE='B'400 ; CALL DRIVER BEFORE QUEUING (1= YES)
UC.PWF='B'20 ; CALL DRIVER AT POWERFAIL ALWAYS (1= YES)
UC.ATT='B'100 ; CALL DRIVER ON DETACH (1= YES)
UC.KIL='B'4 ; CALL DRIVER AT I/O KILL ALWAYS (1= YES)
UC.LGH='B'3 ; TRANSFER LENGTH MASK BITS

; ; UNIT STATUS BIT DEFIITIONS
; -
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

UCBDFS (Cont.)

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

; CARD READER DEPENDENT UNIT STATUS BIT DEFINITIONS

US.ABO='B'1 ;UNIT IS MARKED FOR ABORT IF NOT READY (1=YES)
US.MDE='B'2 ;UNIT IS IN 029 TRANSLATION NODE (1=YES)

; FILES-11 DEPENDENT UNIT STATUS BITS

US.WCK='B'10 ;WRITE CHECK ENABLED (1=YES)
US.SPU='B'2 ;UNIT IS SPINNING UP (1=YES)
US.VV='B'1 ;VOLUME VALID IS SET (1=YES)

; TERMINAL DEPENDENT UNIT STATUS BIT DEFINITIONS

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

; LPS11 DEPENDENT UNIT STATUS BIT DEFINITIONS

US.FRK='B'2 ;FORK IN PROGRESS (1=YES)
US.SHR='B'1 ;SHAREABLE FUNCTION IN PROGRESS (0='B'YES)

; ANSI MAGTAPE DEPENDENT UNIT STATUS BITS

US.LAB='B'4 ;UNIT HAS LABELED TAPE ON IT (1=YES)

; UNIT STATUS EXTENSION (U.ST2) BIT DEFINITIONS

US.OFL='B'1 ;UNIT OFFLINE (1=YES)
US.RED='B'2 ;UNIT REDIRECTABLE (0=YES)
US.PUB='B'4 ;UNIT IS PUBLIC DEVICE (1=YES)
US.UMD='B'10 ;UNIT ATTACHED FOR DIAGNOSTICS (1=YES)
US.PDF='B'20 ;PRIVILEGED DIAGNOSTIC FUNCTIONS ONLY (1=YES)
US.MUN='B'40 ;MULTI-UNIT FLAG
US.TRN='B'100 ;UNIT TRANSITION HAS OCCURRED (1=YES)
US.SIO='B'200 ;STALL I/O TO UNIT (1=YES)

; MAGTAPE DENSITY SUPPORT DEFINITION IN U.CW3
RSX-11M-PLUS SYSTEM DATA STRUCTURES AND SYMBOLIC DEFINITIONS

UCBDFS$ (Cont.)

UD.UNS='B'0 ; UNSUPPORTED
UD.200='B'1 ; 200BPI, 7 TRACK
UD.556='B'2 ; 556BPI, 7 TRACK
UD.800='B'3 ; 800BPI, 7 OR 9 TRACK
UD.160='B'4 ; 1600BPI, 9 TRACK
UD.625='B'5 ; 6250BPI, 9 TRACK
UD.8K='B'6 ; 8K BPI - SERIAL, SERPENTINE RECORDING.

.MACRO UCBDFS$,X,Y,Z,A
.ENDM
.ENDM

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APPENDIX D
MICRO/RSX COMMON ERROR CODE DEFINITIONS

This appendix lists:

1. Facility-independent error code definitions
2. Standard Bugcheck formats for facility-defined error codes

;----------------------------------------------------------
; Common (Facility-Independent) Error Code Definitions
;----------------------------------------------------------

; SST-Type Errors - Error Code 1
BE.ODD = 000100 ; Odd address or other trap four
BE.SGF = 000102 ; Segment fault
BE.BPT = 000104 ; Breakpoint or T-bit trap
BE.IOT = 000106 ; IOT instruction
BE.ILI = 000110 ; Illegal instruction
BE.EMT = 000112 ; EMT instruction
BE.TRP = 000114 ; Trap instruction
BE.STK = 000116 ; Stack overflow

; Internal Inconsistency Errors - Error Code 2
BE.NPA = 000200 ; Task with no parent aborted
BE.SGN = 000201 ; Feature not included in system
BE.2FR = 000202 ; Double fork
BE.ISR = 000203 ; Interrupt service routine clobbered register
BE.FHW = 000204 ; Fatal hardware error
BE.CSR = 000205 ; Device CSR disappeared
BE.IDC = 000206 ; Internal database consistency error
BE.ACP = 000207 ; ACP task aborted
BE.HSP = 000210 ; Header subpacket problem
BE.NCT = 000211 ; No current task

; System Pool Related Errors - Error Code 3
BE.NPL = 000300 ; No pool for operation
BE.DDA = 000301 ; Double deallocation
BE.SIZ = 000302 ; Size of block invalid
BE.BAK = 000303 ; Deallocated block below pool
BE.POV = 000304 ; Deallocation overlaps end of pool

; Group-global Event Flag Errors - Error Code 4
BE.GGF = 000400 ; Task locked to non-existent flags
MICRO/RSX COMMON ERROR CODE DEFINITIONS

; Standard Bugcheck Format Facility Code Definitions
; ---------------------------------------------------------------------
; I/O Driver Subsystem - Facility Code 2
BF.TTD = 000200 ; Terminal driver
; Executive Components - Facility Code 3
BF.EXE = 000300 ; Exec - General and miscellaneous
BF.XDT = 000301 ; Exec - Executive Debugging Tool
BF.POL = 000303 ; Exec - Pool handling routines (CORAL)
BF.ERR = 000304 ; Exec - Hardware error processing subsystem
BF.INT = 000305 ; Exec - Internal consistency checking routine
BF.INI = 000306 ; Exec - INITL - initialization module
BF.DVI = 000307 ; Exec - DVINT common interrupt handler
BF.PAR = 000310 ; Exec - Parity memory support
BF.XIT = 000311 ; Exec - Task exit/abort processing
BF.QIO = 000312 ; Exec - QIO directive
BF.OPT = 000313 ; Exec - Seek optimization
BF.ACC = 000314 ; Exec - System resource accounting
BF.KAS = 000315 ; Exec - Kernel AST support
BF.DIR = 000316 ; Exec - Miscellaneous directives
BF.SAN = 000317 ; Exec - Crash with sanity timer message
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