RT-11
System Release Notes

AA-5286F-TC

December 1983

This manual summarizes the features that differentiate the RT-11 V5.0 and V5.1 operating systems from RT-11 V4.0.

This manual supersedes *RT-11 System Release Notes*, AA-5286E-TC. This manual contains Update Notice 1, AD-5286F-T1.

Operating System: RT-11 Version 5.1

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PREFACE

This manual describes the RT-11 V5.1 operating system and how it differs from RT-11 V4.0 and V5.0. The system manager and system programmers should be thoroughly familiar with the contents of this manual before performing a system generation as described in the RT-11 System Generation Guide.

Chapters 1 through 4 describe new features and corrected problems, and present a comparison between this release of RT-11 and the previous releases:

- Chapter 1 - NEW FEATURES

    This chapter describes the new processors, devices, software components, and documentation.

- Chapter 2 - CHANGES AND ADDITIONS TO EXISTING COMPONENTS

    This chapter describes software components that have been improved through changed or added capabilities.

- Chapter 3 - CORRECTED PROBLEMS AND CURRENT RESTRICTIONS

    This chapter describes current software restrictions and documentation problems, and lists software problems that have been corrected.

- Chapter 4 - INSTALLATION, BOOTSTRAP, AND HARDWARE SETUP PROCEDURES

    This chapter tells you how to access on-line information that describes customizations you can use to improve system performance. The chapter also describes installation, bootstrap, and hardware setup procedures you may need depending on your configuration.

Changes to RT-11 for Version 5.1 are highlighted in red. In software version numbers, a whole number (X) represents a major release and all its updates, and a mixed number (X.X) represents a major release or a specific update of a major release. For example, references to Version 5 apply to Version 5.1 as well, but references to Version 5.1 apply only to Version 5.1.

Appendix A provides the software kit maps for each type of RT-11 distribution kit.

NOTE

A machine-readable addendum to the RT-11 System Release Notes, V5NOTE.TXT, is provided on the distribution kit. V5NOTE.TXT describes changes that have occurred since this document was printed.

CHAPTER 1

NEW FEATURES

The primary goals of RT-11 Version 5 are to support additional processors and devices, improve and extend the functionality of existing software components, correct existing software problems, and increase the ease of RT-11 installation and maintenance.

This chapter summarizes new hardware that RT-11 supports and its new software components. Refer to the rest of the manuals in the documentation set for detailed descriptions of how to use these new features.

1.1 NEW PROCESSORS

RT-11 Version 5 runs on four new processors:

T-11 Falcon (SBC-11/21 and SBC-11/21 PLUS)

PDP-11/23 PLUS and MICRO/PDP-11

Professional 300 Series

J-11 Microprocessor (LSI-11/73 CPU board)

1.1.1 T-11 Falcon (SBC-11/21 and SBC-11/21 PLUS)

The new T-11 processor chip is supported by the RT-11 single-job (SJ) and foreground/background (FB) monitors in the SBC-11/21 PLUS, single-board computer configuration. The original SBC-11/21 is also supported by the SJ and FB monitors. In RT-11 V5.0, only the FB monitor supported the SBC-11/21, and there was no support for the SBC-11/21 PLUS.

1.1.2 PDP-11/23 PLUS and MICRO/PDP-11

The PDP-11/23 PLUS is supported by RT-11 Version 5, including full 22-bit addressing (up to 4MB) under the XM monitor. The PDP-11/23 PLUS processor is available in both the standard PDP-11/23 PLUS system configuration and in the new MICRO/PDP-11 configuration.

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1.1.3 Professional 300 Series

The Professional 325 and Professional 350 computers are supported by RT-11 Version 5.1. Although the foreground/background (FB) monitor runs on Professional computers with some restrictions (see Chapter 3 of this manual), the extended memory (XM) monitor is better suited for running RT-11 on Professional computers. The XM monitor supports full RT-11 functionality, including 22-bit addressing, on Professional computers. The SJ and BL monitors are not supported on Professional 300 series computers.

1.1.4 J-11 Microprocessor (LSI-11/73 CPU Board)

The J-11 microprocessor chip is supported by RT-11 Version 5.1, including full 22-bit addressing (up to 4MB) under the XM monitor.

1.2 NEW DEVICES

RT-11 Version 5 supports the following new mass storage devices:

        RX50 diskette
        RD50/RD51 disk
        RA80 disk
        RC25 disk
        TSV05 magtape
        TK25 magtape

1.2.1 RX50 Diskette (DU or DZ)

The RX50 is a diskette subsystem available on MICRO/PDP-11 and Professional 300 series computers. The subsystem consists of two drives, each of which holds one 5-1/4 inch diskette. Each diskette provides a storage capacity of 400KB (800 blocks).

RX50 diskettes on the MICRO/PDP-11 are MSCP (mass storage communication protocol) devices supported by the MSCP disk class handler, DU. On the Professional 325 and 350, RX50 diskette drives are supported by the DZ handler. MICRO/PDP-11 and Professional computers can read and write each other's diskettes. However, since they are supported by different device handlers, a diskette configured to bootstrap on one cannot be hardware bootstrapped on the other.

RX50 diskettes can be used as system or data storage volumes. The RT-11 V5 distribution kit is available on RX50 diskettes.

RX50 diskettes are not interchangeable with RX01 and RX02 diskettes. You can insert an RX50 diskette only in an RX50 drive.

1.2.2 RD50/RD51 Disk (DU or DW)

The RD50/RD51 disk is a fixed Winchester disk available on the MICRO/PDP-11 and Professional 350.

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The MICRO/PDP-11 includes a 10MB RD51 disk, which is an MSCP device supported by the MSCP disk class handler, DU. Professional 350 systems can include a 5MB RD50 or a 10MB RD51, both of which are supported by the DW handler.

RD50/RD51 disks can be used as system or data volumes.

1.2.3 RA80 Disk (DU)

The RA80 disk is a 124MB, fixed Winchester disk supported by the MSCP disk class handler, DU.

Because the RA80 disk contains more than 64K blocks, it is divided into multiple 64K-block partitions. When running under RT-11, each partition operates as a separate disk. Partition 0 may be used as a system volume or for data storage. All other partitions may be used for data storage only.

1.2.4 RC25 Disk (DU)

The RC25 disk is a 26MB disk supported by the MSCP handler, DU. RC25 disk drives are always paired; the even-numbered drive accepts a removable disk and the odd-numbered drive contains a fixed RC25 disk for total storage of 52MB per pair. These disks can be used as the system volume or for data storage.

1.2.5 TSV05 Magtape (MS)

The TSV05 is a TS11-compatible tape drive that operates with the PDP-11/23 PLUS. Data is recorded on nine-track 1/2-inch format magnetic tape. The TSV05 can store up to 28MB (in formatted 2K records) on a standard 10-1/2 inch, 2400 foot reel of tape. TSV05 tape drives can accept three tape reel sizes: 7 inch, 8-1/2 inch, and 10-1/2 inch.

The TSV05 is a streaming tape drive that operates in two modes, TS11 compatible mode and extended features mode. In TS11 mode, the TSV05 is a TS11 look-alike that automatically streams at 25 in/s. In extended features mode, which is turned on by setting the hardware extended features switch, the tape can stream at 100 in/s under program control.

1.2.6 TK25 Magtape (MS)

The TK25 is a streaming TS11-compatible cartridge magtape drive, operating on the Q-BUS. Data is recorded on a 600-foot, 10-track (1/4-inch format) magnetic tape. The TK25 stores up to 60MB of data in 8KB blocks, with a record size of up to 16KB. The read/write speed is 55 inches per second while streaming, for a data transfer rate of 55KB per second.

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1.3 NEW DISTRIBUTION KITS

The format of RT-11 distribution kits has changed because of the new automatic installation and verification procedure (see Section 1.4.1). Refer to Chapter 4 of this manual for procedures for RT-11 V5 distribution kits that will not be installed automatically.

1.4 NEW SOFTWARE COMPONENTS

Although RT-11 Version 5's primary goal is to extend the functionality of existing software, Version 5 also includes the following new operating features:

- Automatic installation (AI) and installation verification procedure (IVP)

- Backup utility program (BUP)

- Concise command language (CCL) and user command linkage (UCL)

- Indirect control file processor (IND)

- Logical disk subsetting (LD)

- Hardware setup utility (SETUP)

- Single-line editor (SL)

- Transparent spooling utility (SPOOL)

- Virtual KED (KEX)

- Virtual RUN utility (VBGEXE)

- Virtual terminal communication package (VTCOM)

In addition, RT-11 Version 5 includes new programmed requests, macros, SYSLIB routines, handlers and error messages, new system generation procedures and options, a new software update process, and new unsupported utilities. The following sections summarize those new components and refer you to more detailed descriptions provided in the documentation set.

1.4.1 New Automatic Installation and Verification Procedure

The RT-11 Version 5 automatic installation and verification procedure installs RT-11 by conducting an interactive dialog at the console terminal. As you answer the dialog questions, the system creates and tests a working RT-11 system.

The following hardware configuration is required for the automatic installation procedure:

- PDP-11 processor with 24K words of memory or Professional 300 series computer

- A line or Professional clock

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● One of the following mass storage configurations:

MICRO/PDP-11 (RX5Ø/RD51) - distribution kit resides on
RX5Ø diskettes

Professional 325 or 35Ø - distribution kit resides on
RX5Ø diskettes

Dual RLØ2 disks - distribution kit resides on RLØ2 disk

Dual RXØ2 diskettes - distribution kit resides on RXØ2
diskettes

If you bought an RT-11 distribution kit on any of these media, you
should have received an RT-11 Automatic Installation Booklet which
tells you how to start the automatic installation process. If your
configuration does not meet the requirements shown above, you must
have DIGITAL install your system or install your system by following
the procedures described in the RT-11 Installation Guide.

RXØ2 and RX5Ø distribution kits include two copies of the RT-11
distributed software, so you do not have to back up the distribution
kit. Although not supported for the automatic installation procedure,
RXØ1 distribution kits also include two copies of the distributed
software.

Store one copy as your master distribution kit, and bootstrap the
other copy to run the automatic installation procedure. Be careful to
keep the volumes from these two distribution kits separate. Once the
installation procedure has been run, volumes AUTO and 1 of the
distribution kit you installed will no longer be identical to volumes
AUTO and 1 of the master distribution kit you stored.

For RLØ2 distribution, the only difference between the original
distribution volume you received and the installed volume is the
bootstrap. The bootstrap on the original distribution kit bootstraps
the automatic installation monitor, RT11AI.SYS. The bootstrap on your
installed system bootstraps the RT-11 FB monitor, RT11FB.SYS.
Therefore, you can return your installed system to its original state
simply by copying the RT11AI.SYS bootstrap to the boot blocks of your
disk.

See Chapter 4 of this manual for procedures for RT-11 V5 distribution
kits that do not support automatic installation.

1.4.2 New System Utilities

This section describes the new system utilities provided with RT-11
Version 5.

1.4.2.1 Backup Utility Program (BUP) - The backup utility program provides a quick way to store a large volume or file on a set of smaller volumes. BUP lets you copy a large volume or file to several specially initialized backup volumes; the file or volume cannot be used, however, while stored on the backup volumes. BUP also lets you initialize backup volumes, obtain directory information about a set of backup volumes, and restore a volume or file to its original form from a set of backup volumes. In addition, BUP will utilize the 100 in/s streaming mode of TSV05 magnetic tape controller.

See Chapter 3 in the RT-11 System Utilities Manual for a complete description of BUP.

1.4.2.2 Concise Command Language (CCL) and User Command Linkage (UCL) - Concise command language lets you issue commands directly to utility programs or your own user-written program on a single command line. Prior to Version 5, you could issue commands on a single command line only by using DCL keyboard monitor commands or by running (R or RUN) the program and specifying a CSI command line. CCL lets you run the program and specify the input and output files and all accompanying options on a single line.. In the following example, the second command shows the CCL equivalent of the first command.

Running a Utility Program

```
.R PIP
*DL1:MYPROG.OLD=DL0:MYPROG.MAC
*
```

CCL Equivalent

```
.PIP DL1:MYPROG.OLD=DL0:MYPROG.MAC
.
```

```
or
```

```
.PIP DL0:MYPROG.MAC DL1:MYPROG.OLD
.
```

See Section 4.6 in the RT-11 System User's Guide for more information on CCL.

User command linkage (UCL) lets you write your own command parser, so you can create your own commands. UCL support is included in the distributed monitors. Refer to Section 2.2.4.2 in the RT-11 Software Support Manual for more information on UCL.

A usable example of a UCL command parser is provided on the distribution kit as an executable image (UCL.SAV). See the RT-11 System User's Guide for instructions on how to define commands using the distributed UCL.SAV.

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1.4.2.3 Indirect Control File Processor (IND) - The indirect control
file processor executes indirect control files. IND control files
contain IND directives, which control the execution of the indirect
control file, and may contain keyboard commands (DCL, CCL, and UCL).
You can use indirect control files to access other files, execute
keyboard monitor commands, define symbols, pass parameters, and
perform logical tests.

When running under the XM monitor, IND stores context information in a
region of high memory, resulting in a performance improvement.

KMON is the default command file processor in the distributed
monitors. If you want to change the default command file processor to
IND, use the monitor command SET KMON IND or apply the customization
given in Section 3.2.1 of this manual.

Chapter 5 in the RT-11 System User's Guide describes how to create and
execute indirect control files. New IND directives have been added
for Version 5.1. See Chapter 5 of the RT-11 System User's Guide for a |
description of the new IND directives.

1.4.2.4 Logical Disk Subsetting Handler (LD) - The logical disk
subsetting handler lets you define logical disks, which are subsets of
physical disks. You define logical disks by assigning a logical disk
unit number to a file on a physical disk. You can then use the
logical disk as though it were a physical disk.

Logical disk subsetting is particularly useful when you work with
large disks, which often run out of directory entry space before the
volume is full. Since each logical disk contains its own directory,
dividing a physical disk into several logical disks increases
directory entry space. Logical disk subsetting also increases the
speed of directory operations on large disks.

Chapter 9 in the RT-11 System Utilities Manual details logical disk
subsetting.

1.4.2.5 Hardware Setup Utility (SETUP) - The SETUP utility lets you
choose operating characteristics for video terminals, printers, and
some system clocks. By typing simple SETUP commands, you can control
terminal characteristics such as background and text color, scrolling,
and cursor form (block or underscore), printer characteristics such as
length of printed pages, and clock characteristics such as the 12- or
24-hour time reporting format.

SETUP's video characteristics are intended primarily for use with
Professional 300 series computers, since they have no hardware
terminal setup facility. However, most SETUP commands are also valid
for VT100 and VT200 series terminals. Some commands are valid for
only VT100 series terminals.

See the RT-11 System User's Guide for details on how to use SETUP and |
for a list of SETUP commands.

1.4.2.6 Single-Line Editor (SL) - The single-line editor lets you edit your current keyboard command line or CSI command string typed on a video terminal before you terminate the line. The single-line editor lets you position the cursor anywhere in the current line for editing by using a subset of KED (keypad editor) commands. You can also recall previous input lines for editing.

Note that the single-line editor for the XM monitor (SLX) is distributed with SYSGEN options different from the monitor itself. Therefore, SLX will not be installed when you first boot RT11XM. This is because SLX resides in high memory when installed, even when it's not being used. For compatibility with past releases, it is not desirable to have SLX use extended memory formerly available to user programs. To use SLX, issue the command SET SL SYSGEN.

See Section 4.3 in the RT-11 System User's Guide for instructions on using the single-line editor.

SLMIN.SYS, a smaller SL handler for use under the SJ/FB monitors, is now available with Version 5.1.

1.4.2.7 Transparent Spooling Package (SPOOL) - The transparent spooler (SPOOL) is a utility you can use for sending output to the line printer. SPOOL runs as a foreground or system job. Once SPOOL is running, its operations are transparent. Anytime you send output to the line printer, either explicitly by issuing commands (such as COPY and PRINT) or by using commands and options that send output to the line printer by default (such as COMPILE/LIST), SPOOL accepts the output and sends it to the printer. While SPOOL runs in the foreground, you can continue to work on other jobs in the background. SPOOL differs from the Queue Package in that you need not send output to SPOOL as a complete file. Instead, SPOOL accepts output as it becomes available ("pipeline" operation).

Although the line printer is SPOOL's default output device, you can apply a software customization to change it.

See the RT-11 System Utilities Manual for an explanation of how to use SPOOL.

1.4.2.8 Virtual KED (KEX) - The virtual KED program (KEX) is available for use under the XM monitor only. KEX editing commands are identical to KED commands. However, KEX maximizes the amount of high memory used, while minimizing the amount of low memory used. Therefore, KEX will continue to operate in many instances where there is insufficient low memory for KED to run. In addition, KEX may be run as a foreground or system job, allowing editing to continue while the background is performing some function. On systems that include multiterminal support, multiple copies of KEX may be run (by using the SRUN and FRUN commands), each with its own terminal.

1.4.2.9 Virtual RUN Utility (VBGEXE) - VBGEXE lets you run some programs under the XM monitor when there is not enough low memory to run the program by using the R or RUN command. VBGEXE is especially useful for running programs on a Professional 300 series computer under the XM monitor.

Some restrictions apply when using VBGEXE, and VBGEXE is an ▌
unsupported utility. Read the file UNSUP.TXT on your distribution kit
for details and restrictions.

1.4.2.10 **Virtual Terminal Communication Package (VTCOM)** – VTCOM lets
you use your PDP-11, PDT-11/150, or Professional computer as a
terminal when you connect it to a host computer. VTCOM.REL runs under
all monitors. VTCOM.SAV, which runs under the XM monitor, maximizes
the amount of high memory so more low memory is available for other
programs.

When running VTCOM, you can access facilities on an RT-11, RSX-11,
RTEM-11, or VAX/VMS host system and perform ASCII file transfer
between the host computer and your stand-alone system. In addition,
if the host computer is running RTEM-11 and the program TRANSF is
installed on the host, you can transfer binary files as well. Since
VTCOM can run as a foreground or system job, you can continue working
under RT-11 in the background while you maintain a connection to the
host computer.

The RT-11 System Utilities Manual lists requirements for running VTCOM ▌
and explains how to use VTCOM and TRANSF.

1.4.3 New Programmed Requests

This section describes the new programmed requests available with
RT-11 Version 5.

1.4.3.1 **.ABTIO** – The .ABTIO programmed request lets a running job
stop all outstanding I/O operations on a specified channel without
terminating the program under the FB and XM monitors. Under SJ, the
request is simulated with a .WAIT directive.

See the RT-11 Programmer's Reference Manual for details and examples ●
of the .ABTIO programmed request.

1.4.3.2 **.FPROT** – The .FPROT programmed request sets or resets the
protection status of files.

See the RT-11 Programmer's Reference Manual for details and examples ●
of the .FPROT programmed request.

1.4.3.3 **.PEEK** – The .PEEK programmed request returns in register R0
the contents of the specified low memory location (below 28KW) or the
I/O page location you specify.

See the RT-11 Programmer's Reference Manual for details and examples ●
of the .PEEK programmed request.

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1.4.3.4 **.POKE** - The .POKE programmed request deposits the value you specify into a low memory (below 28KW) or I/O page location.

● See the RT-11 Programmer's Reference Manual for details and examples of the .POKE programmed request.

1.4.3.5 **.PVAL** - The .PVAL programmed request modifies or replaces the monitor fixed offset location you specify.

● See the RT-11 Programmer's Reference Manual for details and examples of the .PVAL programmed request.

1.4.3.6 **.SFDAT** - The .SFDAT programmed request lets a program set or change the creation date in a file's directory entry.

● See the RT-11 Programmer's Reference Manual for details and examples of the .SFDAT programmed request.

1.4.4 New Macros

This section describes macros that have been added to SYSMAC.SML.

1.4.4.1 **.ADDR** - The .ADDR macro computes the address of the location you specify in a position-independent manner (independent of its link-time virtual address) and stores it in a register or on the stack.

❚ See the RT-11 Programmer's Reference Manual for more information on the .ADDR macro.

1.4.4.2 **.ASSUME** - The .ASSUME macro tests, at assembly time, the validity of a condition you specify. If the test is false, MACRO generates an assembly error and prints a message from a comment you supply as an argument to the macro.

❚ See the RT-11 Programmer's Reference Manual for more information on the .ASSUME macro.

1.4.4.3 **.BR** - The .BR macro warns you if code that belongs together is separated during assembly. When you call the .BR macro, you specify a location as an argument. .BR checks that the address of the next instruction matches the address of the location you specified as an argument to the macro. If the addresses do not match, .BR causes MACRO to print an error message.

❚ See the RT-11 Programmer's Reference Manual for more information on the .BR macro.

1.4.4.4 .DRINS - The .DRINS macro sets up the installation code area in block 0 of a device handler. .DRINS defines the addresses that contain the display CSRs used by RESORC, the CSRs checked by the INSTALL keyboard command code, and defines the system and data device installation entry points.

See the RT-11 Programmer's Reference Manual for more information on the .DRINS macro.

1.4.4.5 SOB - The SOB macro simulates the instruction "subtract one and branch if not equal" (SOB). This macro is useful for writing programs to run on any RT-11 supported processor, since the SOB instruction is invalid on some processors.

See the RT-11 Programmer's Reference Manual for more information on the SOB macro.

1.4.5 New System Subroutine Library (SYSLIB) Routines

This section describes the routines that have been added to SYSLIB.

1.4.5.1 **IABTIO** - The IABTIO routine stops all outstanding I/O operations on a specified channel without terminating the job under FB and XM. This routine is simulated under SJ with a .WAIT directive.

See Section 3.12 in the RT-11 Programmer's Reference Manual for details and examples of IABTIO.

1.4.5.2 **IFPROT** - The IFPROT routine changes a specified file's protection status.

See Section 3.27 in the RT-11 Programmer's Reference Manual for details and examples of IFPROT.

1.4.5.3 **IPUT** - The IPUT routine modifies or replaces the value of a monitor fixed offset location.

See Section 3.41 in the RT-11 Programmer's Reference Manual for details and examples of IPUT.

1.4.5.4 **ISDTTM** - The ISDTTM routine modifies the current date and time values stored in the monitor.

See Section 3.52 in the RT-11 Programmer's Reference Manual for details and examples of ISDTTM.

1.4.5.5 **ISFDAT** - The ISFDAT routine sets or changes the creation date in a file's directory entry.

See Section 3.53 in the RT-11 Programmer's Reference Manual for details and examples of ISFDAT.

1.4.6 **New Handlers**

RT-11 V5 includes the following new handlers.

1.4.6.1 **DU (MSCP Handler)** - The DU handler supports disk systems that implement the mass storage communication protocol (MSCP). Presently, RT-11 supports four MSCP storage systems: RC25 disk, RA80 disk, and RX50 diskette and RD51 disk on the MICRO/PDP-11.

The DU handler can be modified, by using SET commands, to address MSCP disks by unit number, partition number, and port number. (A port is the same as an individual controller.)

MSCP supports unit numbers 0-255. However, since RT-11 supports only unit numbers 0-7, you can map a given RT-11 unit number to any specific MSCP unit number using the SET DUn UNIT=x command. RT-11 unit n is translated to MSCP unit x.

MSCP supports disks larger than 64K blocks. Under RT-11, large disks
are divided into 64K-block partitions. The DU handler supports up to
255 partitions on a single disk, with each partition referenced as
though it were an RT-11 disk. The SET DUn PART=x command translates a
DU unit number (n) to a particular partition (x) on a disk.

The DU handler also supports up to four separate controllers or ports,
numbered 0-3.   The command SET DUn PORT=x defines which port (x) is
accessed when DU device unit n is referenced. An alternative method
of supporting multiple ports, with some potential performance
advantages, is to create a duplicate copy of the DU handler (DU.SYS)
under another file name for each additional controller.

See Section 10.11 of the RT-11 Software Support Manual for more
information on the DU handler.

1.4.6.2 **DW (Professional 350 Winchester Disk Handler)** - The   DW
handler supports 5MB RD50 and 10MB RD51 fixed Winchster disks for the
Professional 350 computer. For the Professional 350, RT-11 supports
only drive unit DW0.

1.4.6.3 **DZ (Professional 325 and 350 Diskette Handler)** - The DZ
handler supports RX50 diskette drives for the Professional 300 series
computers. RT-11 supports drive units DZ0 and DZ1. Drive unit 0 is
the top drive if your Professional sits horizontally or the left drive
if it is mounted vertically in a floor stand; drive unit 1 is the
bottom or right drive respectively.

1.4.6.4 **PI (Professional Interface Handler)** - The PI handler supports
the keyboard, video display, and system clock for Professional 300
series computers.   Although you cannot alter PI handler
characteristics or direct I/O operations to PI, PI.SYS (or PIX.SYS
under the XM monitor) must reside on your system volume if you are
running on a Professional 300 series computer.

1.4.6.5 **SP (Transparent Spooler Handler)** - The SP pseudohandler
supports the transparent spooler (SPOOL). The SP handler intercepts
output directed to the line printer and sends it to SPOOL for
temporary storage and printing.

1.4.6.6 **XC and XL (Communication Port Handler)** - The XC handler
supports the Professional 300 series computer communication port. The
XL handler supports DL(V)-11 communication ports. XC or XL (depending
on your system) is required when you use the virtual terminal
communication package, VTCOM.

1.4.6.7 VM (Memory Disk Handler) - The VM handler allows memory above 28K words to be used as though it were a disk device. Under the SJ and FB monitors, the virtual device can be used as the system volume or as a data volume. Under the XM monitor, however, the virtual device can be used only as a data volume.

The command SET VM BASE=nnnnnn lets you select the memory location that corresponds to logical block 0 of the VM device. For the distributed SJ/FB version, the base is set to 1600 which corresponds to memory location 160000 (the 28KW boundary). For the distributed XM version, the base is set to 10000 (memory location 1000000), the 18-bit/22-bit addressing boundary. Consequently, when you first boot an XM monitor, only the low 256KB of memory will be available for use with the memory management programmed requests, the same amount of memory supported under RT-11 V4. To obtain more memory, remove the VM handler or set its base to a higher value.

RT-11 does not support the use of memory above 256KB on UNIBUS machines. Therefore, DIGITAL does not recommend the removal of the VM handler or changing the base on 22-bit UNIBUS systems (11/24, 11/44, or 11/70).

Refer to Section 10.12 of the RT-11 Software Support Manual for more information on the VM handler.

1.4.7 New System Generation Procedures and Options

The system generation process is controlled by the new indirect control file processor, IND, and includes support for new options. See the RT-11 System Generation Guide for a complete description of system generation.

1.4.7.1 New System Generation Procedures - The RT-11 Version 5 system generation procedures are no longer controlled by a FORTRAN IV program (SYSGEN.SAV). Instead, system generation is now run using the IND control file processor. The system generation procedures, however, remain basically the same: system generation produces new monitors and handlers depending on your answers to SYSGEN.COM dialog questions. (SYSGEN.COM is an IND control file that replaces SYSGEN.CND and the device section of SYSTBL.CND.) The following are the major changes to the system generation procedures:

- You can create an answer file to preserve your responses during a system generation session. You can use this answer file during later system generation sessions to recreate the same system without answering the dialog questions again.

- After answering the system generation dialog questions, you now have the opportunity to change some of your answers. If you are using an answer file, you can also change some responses. The new responses are recorded in the output answer file, if you request one.

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● All work files associated with a particular system generation
session use the same name as the answer file but have a
different file type. For example, if the answer file is
NEWSYS.ANS, the work files are named NEWSYS.BLD, NEWSYS.MON,
NEWSYS.DEV, NEWSYS.CND, and so on. The default answer file is
SYSGEN.ANS.

● The system generation dialog lets you define system
conditionals for which there are no system generation
questions. For example, you can define the conditional LIGH$T
= 1 to enable support for the idle-loop light pattern. These
definitions are then included in the answer file and the .CND
(conditional) file created during system generation. This new
feature lets you define system conditionals without having to
edit the .CND file. The .ANS file will contain all system
generation information.

See the RT-11 System Generation Guide for more information on
defining system conditionals during system generation.

● You can create the .CND conditional files for the distributed
monitors by performing a system generation and using the
appropriate monitor answer file (BL.ANS, SJFB.ANS, or XM.ANS)
as input.

● Instead of choosing the long or short form of the dialog, you
can request explanatory text for individual questions by
typing <ESC><RET>.

● SYSGEN.TBL, a new file produced during the system generation
session, contains the device tables that were included in the
file SYSTBL.MAC. SYSGEN.TBL is included during the assembly
and link procedure for all monitors you generate. If you use
an answer file during the system generation session, the
resulting device tables file will have the same name as the
answer file, but with the file type .TBL. The new file
TRMTBL.MAC, which contains the multiterminal tables, is
distributed on the RT-11 Version 5 distribution kit and is
included in the assembly and link procedure only if you
request multiterminal support during system generation.

● The system generation procedure for specifying device support
has changed. Instead of asking if you want support for each
device individually, the system generation dialog now asks you
in one question to list all the devices you want to support.
If you type a question mark (?) followed by a carriage return,
the system lists the codes for all the devices you can
support, and marks each device for which you have already
included support with an asterisk (*). The system asks
appropriate questions about support for additional
controllers, and CSR and vector addresses, as you select each
device.

You can also specify your own device handlers during the
system generation procedure. They will be included in the
build command files generated.

NEW FEATURES

1.4.7.2 **New System Generation Options** - The system generaton dialog includes questions to generate support for the following new options.

- **High-speed ring buffer.** The high-speed ring buffer allows characters that are received at a very rapid rate to be processed and transmitted. This option is particularly useful for systems with intelligent terminals, such as VT100s, and for LSI systems. This option has no effect for Professional series computers.

- **Up to 9600 baud for DZ11 and DZV11 lines.** The system generation process lets you set the baud for DZ11 and DZV11 lines to 110, 150, 300, 1200, 2400, 4800, or 9600. Note that the bauds for all DZ11 and DZV11 lines are the same.

- **User command linkage.** UCL support lets you use your own command parsing program or the distributed UCL.SAV command parsing program to define your own commands.

- **Fetchable handlers under XM.** You no longer need to load device handlers when running under the XM monitor. Instead, RT-11 V5 lets you use the .FETCH programmed request in background jobs, as has been possible under the SJ and FB monitors in previous versions of RT-11. This feature is enabled in the distributed XM monitor but you can disable this feature through system generation.

  If you use any device handlers that are not distributed by DIGITAL, you may need to make some modifications to use the .FETCH programmed request under XM. See Section 2.30 of the RT-11 Programmer's Reference Manual for more information on the .FETCH programmed request.

NEW FEATURES

- **New devices.** You can generate support for the following new devices:

        TSVØ5 magtape
        MSCP disks (DU) - RC25, RA8Ø, RD51, RX5Ø
        Professional 325 and 35Ø devices: DW and DZ
        SP transparent spooler handler
        XL communication package handler (PDP-11 and PDT-11/15Ø)
        XC communication package handler (Professional 3ØØ
        series)

- Idle-loop light pattern has been removed from system generation. If you wish to include idle-loop light pattern support, you must set the conditional LIGH$T to 1 by defining the system conditional during system generation.

- The BASIC keyboard command (conditional BASI$$) has been removed. See Section 2.2.1 of this manual for more details.

- The clock for the Professional 325 and 35Ø works differently from a PDP-11 line clock. However, RT-11 supports the Professional clock in a mode similar to a 6Ø hertz line clock. Therefore, regardless of whether you choose 5Ø or 6Ø hertz during system generation, if you are running on a Professional computer, a 6Ø hertz clock rate will be used.

- Optimized PDT execution can be included by setting the conditional PDT$OP to 1. However, monitors generated with PDT$OP will not run on processors with programmable baud interfaces (DLARTS) or on the SBC-11/21.

1.4.8 New Error Messages

Error messages have been added for the following new software components:

        BUP (backup utility program)
        IND (indirect control file processor)
        LD (logical disk subsetting facility)
        SETUP (hardware setup utility)
        SL (single-line editor)
        SPOOL (transparent spooling utility)
        SYSGEN (new system generation procedure)
        VTCOM (virtual terminal communication package)
        TRANSF (VTCOM file transfer program)

In addition, KED error messages are included in a chapter of the RT-11 System Message Manual, as well as in the PDP-11 Keypad Editor User's Guide.

1.4.9 New Software Update Process

To maintain RT-11 and layered product software, you no longer need to install mandatory patches. Instead, RT-11 Version 5 provides a new update process that replaces the software modules that have been changed.

Update kits are distributed periodically after RT-11 is released.
Each update kit includes an automatic procedure for replacing software
modules and the replacement software modules. The update procedure
guides you through an interactive dialog to determine which products
you want to update and which devices you are using. Then the update
software performs the module replacement operations.

Instead of providing binary patches, the RT-11 Software Dispatch now
contains only articles describing problems corrected and functionality
added by the update kits.

Source kits are still available.

1.4.10 New Unsupported Utilities

Several unsupported utilities have been added to the RT-11
distribution kit. Read the file UNSUP.TXT on your RT-11 distribution
kit for a description of the unsupported utilities and instructions on
how to use them.

1.5 NEW DOCUMENTATION

Two Version 4 manuals, the RT-11 System User's Guide and the RT-11
Installation and System Generation Guide, have each been split into
two manuals to achieve a more modular documentation set. The RT-11
Version 5 documentation set also includes three new manuals, as well
as additions to Version 4 manuals and changes in the documentation
format. The following sections describe the new and changed Version 5
manuals.

1.5.1 RT-11 Automatic Installation Booklets

The RT-11 automatic installation booklets are new to the RT-11
documentation set. Each booklet provides instructions for starting
the software that automatically installs RT-11. Your RT-11
documentation includes the booklet appropriate for your distribution
medium: RX02, RL02, MICRO/PDP-11 RX50, or Professional 300 series
RX50.

1.5.2 RT-11 Mini-Reference Manual

This new RT-11 manual provides condensed reference information in a
small, portable looseleaf binder. The RT-11 Mini-Reference Manual
covers keyboard commands, utility programs, programmed requests,
SYSLIB routines, and monitor fixed offsets. This manual replaces the
Version 4 RT-11 Pocket Guide and contains information from the
programmed request section of the RT-11 Programmer's Reference Manual
as well as information from the RT-11 Pocket Guide.

1.5.3 RT-11 Update User's Guide

This manual, which you receive with your update kit, describes how to use the new RT-11 update process to maintain your software. You can store your RT-11 Update User's Guide in Volume 1A of your RT-11 binder set.

1.5.4 Guide to RT-11 Documentation

This manual, which replaces the Version 4 RT-11 Documentation Directory, summarizes each manual in the RT-11 documentation set and suggests appropriate reading paths for different users.

1.5.5 RT-11 System User's Guide

The Version 5 RT-11 System User's Guide describes the RT-11 operating system, system conventions, keyboard monitor commands, and the text editor EDIT. This manual contains the information in Chapters 1 through 5 of the Version 4 RT-11 System User's Guide and provides a new chapter on the indirect control file processor (IND).

1.5.6 RT-11 System Utilities Manual

This new manual, which describes the RT-11 utility programs, presents the information from Chapters 6 through 24 of the Version 4 RT-11 System User's Guide. This manual also includes chapters on the new backup utility program (BUP) and logical disk subsetting program (LD).

1.5.7 RT-11 Installation Guide

The RT-11 Installation Guide describes manual procedures for installing RT-11; this document also tells you how to customize the distributed RT-11 software. This document contains the information in Chapters 1 through 7 of the Version 4 RT-11 Installation and System Generation Guide. Two chapters have been added to describe installing RT-11 on diskettes from a hard disk distribution kit, and installing RT-11 on a MICRO/PDP-11. Information has also been added to Chapter 5 to describe installing RT-11 using RC25 disks.

1.5.8 RT-11 System Generation Guide

This manual, taken from Chapters 8 through 10 of the Version 4 RT-11 Installation and System Generation Guide, tells you how to run the system generation software to produce monitors and handlers with specialized configurations and characteristics.

1.5.9 PDP-11 TECO User's Guide

Since TECO software has been removed from the RT-11 distribution kit, the PDP-11 TECO User's Guide has been removed from the documentation set.

CHAPTER 2

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

This chapter describes features that have been added to existing RT-11 software components and features that have been changed.

2.1 MONITORS

The following features are additions or changes to the RT-11 monitors.

- **Minimum memory requirement** - The minimum memory requirement has been increased to 16KW for the SJ monitor and to 24KW for the FB monitor. The minimum memory requirement for the XM monitor (32KW) remains the same as in Version 4.

- **New default working monitor** - FB is the default monitor for a working system installed through RT-11 automatic installation procedures. If your system does not include the minimum hardware requirements for the FB monitor (24KW of memory and a line-time or Professional series clock), you cannot perform the automatic installation procedure. See Chapter 4 for information on how to install your system when your hardware configuration does not support automatic installation.

- **Distributed XM monitor** - Under RT-11 V4, use of the extended memory feature was available only through system generation. The RT-11 Version 5 distribution kit includes an XM monitor, RT11XM.SYS. The RT-11 Installation Guide provides a description of all the features included in the distributed XM monitor. The most notable features include device timeout support and system job support.

- **No SJ monitor for Professional** - RT-11 does not support running the SJ monitor on Professional 300 series systems.

- **BATCH excluded from distributed monitors** - BATCH support is excluded from the distributed monitors. BATCH support is available only through system generation.

- **FPU support included in distributed monitors** - FPU support is included in the distributed SJ, FB, and XM monitors.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

● **New monitor fixed offsets** - The following monitor fixed offsets have been added to the resident monitor data base:

SPSTAT Word offset 414; SPOOL status word (formerly reserved for DECnet)

EXTIND Byte offset 416; the stored error byte for IND

INDSTA Byte offset 417; the IND control status byte

$MEMSZ Word offset 420; contains the total amount of memory available (in 32-word blocks) to the monitor currently executing

$TCFIG Word offset 424; contains the address of the current console configuration word (SET option status); points to TTCNFG in single terminal systems and T.CNFG in the current console's terminal control block (TCB) in multiterminal systems

$INDDV Word offset 426; pointer to the ASCII device name and unit number from which IND will be run

MEMPTR Word offset 430; contains the offset to memory control block pointers

P1EXT   Word offset 432; contains the address of kernel PAR1 externalization routine for fetchable handlers under the XM monitor; contains the value 0 when running under the SJ or FB monitor

See Section 3.6.1 in the RT-11 Software Support Manual for more information on monitor fixed offsets.

● **New bit definitions** - The following new bit masks are defined for fixed offset locations:

Offset	Bit Mask	Meaning
CONFG2	LDREL$ = 20	A handler has been unloaded or released
	PROS$ = 20000	RT-11 is running on a Professional 300 series system
INDSTA	CC$IND = 4	Status of .ENABLE/.DISABLE ABORT
	CC$GBL = 10	Status of global .SCCA
	LN$IND = 40	Indicates current line from IND
	IN$RUN = 100	KMON has issued a RUN IND command
	IN$IND = 200	IND has returned control to KMON

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

SYSGEN	FPU11$ = 400	Indicates that FPU support has been chosen as a system generation option
	TSXP$ = 100000	Reserved for TSX PLUS*. This bit should never be set under RT-11.
SPSTAT	NEXT = 10	Move to start of next file
	OFF = 20	Set spooler unit off
	ON = 40	Set spooler unit on
	KILL = 100	Remove spooled output from work file
	ACTIVE = 200	Indicates spooler is active
	SHOW = 4000	Display spooler status
	PRTSCR = 10000	Print screen (Professional 300 series only)
	DATIME = 20000	Date and time request (for flag pages)
	INTEN = 40000	Fake interrupt enable
	ERROR = 100000	Error bit (set by SPOOL)

See Section 3.6 in the RT-11 Software Support Manual for more information on fixed offset bit masks.

● **Support for 22-bit addressing (on Q-bus and CTI-bus processors only)** – The XM monitor now supports 22-bit addressing to allow each job (up to eight with system job support) to have a 128KW program logical address space (PLAS) using virtual overlays and/or virtual .SETTOP. The job PLAS may be up to 4MB using explicit programmed requests.

All monitors also support up to 4MB of memory through the VM handler, which treats memory above 28KW as though it were a random access device.

When using the XM monitor on any 22-bit system, 22-bit addressing will be enabled. However, since RT-11 does not support the UNIBUS map hardware, memory above 256KB may not be used for direct memory access (DMA) I/O on UNIBUS processors. Any attempt to do so will return a hard error from the device handler. To avoid this situation, the VM handler may be installed such that its base is at the 18-bit/22-bit boundary (SET VM BASE=10000). No such restrictions apply to Q-bus systems.

See Chapter 4 of the RT-11 Software Support Manual for more information on 22-bit addressing.

● **KMON size** – The size of the keyboard monitor (KMON) for SJ has been increased to 20000(octal) bytes. In Version 4, KMON was 17000(octal) bytes.

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*TSX-PLUS is a trademark of S & H Computer Systems.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

2.2 KEYBOARD MONITOR COMMANDS

This section summarizes the changes to existing keyboard monitor
commands and describes the new keyboard monitor commands. For details
on these changes and new features, see Chapter 4 in the RT-11 System
User's Guide.

2.2.1 Changed Keyboard Monitor Commands and Options

The following keyboard monitor commands and options have changed.

2.2.1.1 Commands

BASIC   BASIC has been removed from the list of keyboard
               commands. To run BASIC, you must now type the entire
               word BASIC (rather than the abbreviation BAS), then a
               carriage return:

                   .BASIC<RET>

COMPILE   The /PASS:1 option has been eliminated.

COPY   When you use the /DELETE option with the COPY command,
               you are no longer prompted for confirmation of the
               deletion. If you want this prompt, you must now use
               the /QUERY option.

               When you copy files, the protection status of the
               output file will be the same as the protection status
               of the input file, unless you use the /PROTECTION or
               /NOPROTECTION option. (See Section 2.2.3 for a
               description of these two new options.)

               The /SETDATE option now accepts an optional date
               argument. When you specify /SETDATE[:date], the system
               puts the specified date on all files you copy.

               You no longer need to use the /SYSTEM option to copy
               .SYS files unless you use wildcards in the input file
               type.

               You can now use the /VERIFY option for files as well as
               for entire volumes. The /VERIFY option is invalid with
               the /ASCII and /BINARY options.

               You can now use the /WAIT option with the /DOS and
               /INTERCHANGE options.

DELETE   The DELETE command no longer prompts you for
               confirmation unless you use wildcards in the file
               specification.

               You no longer need to use the /SYSTEM option to delete
               .SYS files unless you use wildcards in the input file
               type.

               You can now use the /WAIT option with the /DOS and
               /INTERCHANGE options.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

DIFFERENCES   The DIFFERENCES command now accepts wildcards; this allows you to compare several files with one command. See Chapter 4 of the RT-11 System User's Guide for more details on using wildcards with the DIFFERENCES command.

The /SLP option now accepts a file specification argument. When you specify /SLP:filespec, you can later use the resulting file you specify as input to SLP. You can also use the /OUTPUT:filespec option in the same command line to produce a differences listing and an SLP command file simultaneously. If you use the /OUTPUT:filespec option without the /SLP:filespec option, a differences listing is generated and the SLP command file is printed on the console. In Version 4, it was necessary to use /OUTPUT:filepec with /SLP to specify a command file; you could not produce a differences listing and a command file simultaneously.

DIRECTORY   You can now use the /WAIT option with the /DOS and /INTERCHANGE options.

You can also now use the /VOLUMEID[:ONLY] option with /INTERCHANGE to print the volume ID of an interchange diskette.

The DIRECTORY/BADBLOCKS/VERIFY command is no longer valid. This option combination caused data to be written to the suspected bad block. Therefore, when soft errors occurred, invalid data was written to the block, destroying it.

EXECUTE   The /PASS:1 option has been eliminated.

FORMAT   You can now format volumes while a foreground job is loaded or when the volume to be formatted contains protected files. If you try such an operation, the system gives you a warning message, then asks you whether you want to continue the operation.

The table of verification patterns valid for the /PATTERN option has been increased to 16 patterns. (The last 4 of the 16 patterns are reserved for future use.)

INITIALIZE   You can now use the /VOLUMEID[:ONLY] option with the /INTERCHANGE option to write a volume identification on an interchange diskette.

The INITIALIZE/BADBLOCKS/VERIFY command is no longer valid. This option combination caused data to be written to the suspected bad block. Therefore, when soft errors occurred, invalid data was written to the block, destroying it.

LINK   You can now link privileged foreground jobs with virtual overlays. Therefore, the /FOREGROUND and /XM options are no longer mutually exclusive.

MACRO   The /PASS:1 option has been eliminated.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

PRINT   The default number of banner pages printed when you use the /FLAGPAGE:n option is determined by the default number of banner pages you set with the QUEMAN /P option. If the default set with the /P option is 0, the default for /FLAGPAGE:n is 1.

Note that the /FLAGPAGE:n option does not override the transparent spooler (SPOOL) SET SP FLAG=n command.

RENAME   The /SETDATE option now accepts an optional date argument. When you specify /SETDATE[:date], the system puts the specified date on all files you rename.

You no longer need to use the /SYSTEM option to rename .SYS files unless you use wildcards in the input file type.

RESET   The RESET command now resets the console terminal ring buffers and command buffers.

RUN   You can now execute virtual jobs from devices other than the system device. Therefore, you can use the RUN command to execute virtual jobs. However, this facility is limited to virtual programs that do not cause the keyboard monitor to write to the swap blocks (SWAP.SYS). That is, the size of the root segment of the program must not overload the keyboard monitor. If that happens, you receive the following error message:

      ?MON-F-MMU fault

In that case, copy the program's save file to the system disk and use the R command.

SET   You can now use SET TERM or SET TT to set console characteristics.

SHOW   The SHOW command now includes logical disk subsetting assignments.

The SHOW ALL command now also displays the organization of physical memory, and logical disk subsetting assignments.

The SHOW CONFIGURATION command now also displays the following system attributes:

- Total amount of memory
- Active command file processor: KMON or IND
- SL status: on or off
- Default editor for EDIT command
- Status of .SCCA support and the .SCCA flag (enabled or disabled)

The SHOW DEVICES command lets you obtain information about a specific device by using the command SHOW DEVICES:xx. The variable xx represents the two-letter permanent device name. In addition, the CSR and vectors for each device displayed are given.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

The SHOW MEMORY command shows the location of each low memory component and, under the XM monitor, each extended memory region as well.

The SHOW ERRORS command displays errors recorded by the error logger while running under the SJ monitor.

The SHOW QUEUE command shows the contents of the queue for SPOOL or QUEUE, or for both if both are running. The SPOOL status report shows whether the SPOOL output device is active or inactive, the number of blocks spooled for output, and the number of free blocks in SPOOL's work file.

The SHOW QUEUE command is now performed by the RESORC /Q option, rather than by the QUEMAN /L option. However, the QUEMAN /L option is still valid for compatibility.

SRUN   The default file type for the SRUN command is .REL. The SRUN command now defaults to the system device (SY:).

2.2.1.2 /WAIT Options

You can now abort a /WAIT operation. Refer to the following commands in the RT-11 System User's Guide for more information.

```
BOOT
COPY
DELETE
DIRECTORY
FORMAT
INITIALIZE
PRINT
PROTECT
RENAME
SQUEEZE
TYPE
UNPROTECT
```

2.2.2 New Keyboard Monitor Commands

The following keyboard monitor commands are new. Options for these commands are listed in Section 2.2.3.

ABORT   The ABORT command lets you abort, from the shared console, a foreground or system job assigned to a private console terminal with the FRUN or SRUN /TERMINAL:n option. The abort command cannot abort a job with SCCA in effect.

BACKUP   The BACKUP command provides a quick means of backing up a file or an entire volume for storage.

DISMOUNT   The DISMOUNT command is used for logical disk subsetting, to disassociate a logical disk unit from the file to which it was assigned.

MOUNT   The MOUNT command is used to associate a file with a
                logical disk unit, for logical disk subsetting.

PROTECT   The PROTECT command assigns a protection status that
                prevents deletion of a file until you remove the
                protection.

UNPROTECT   The UNPROTECT command removes protection from a file so
                you can delete it.

2.2.3 New Keyboard Monitor Command Options

This section describes new options for old and new keyboard monitor
commands.

BACKUP

   /DEVICE   Backs up or restores an entire volume.

   /RESTORE   Copies a file or volume stored on several backup
                        volumes to one volume or file.

COMPILE

   /BUFFERING   With the /DIBOL option, directs the compiler to
                        use single-buffered I/O.

   /LOG   With the /DIBOL option, creates a log file of
                        error messages generated by the compiler.

   /PAGE:n   With the /DIBOL option, specifies the number of
                        lines in a listing page. The default is 66.

   /TABLES   With the /DIBOL option, includes symbol and label
                        tables in the output listing.

COPY

   /BEFORE[:date]   Copies files created before the specified date.

   /DATE[:date]   Copies files created on the specified date.

   /INFORMATION   Causes an informational rather than fatal message
                        to print when a file in the command line is not
                        found. If used in an indirect command file, the
                        remainder of the command file is processed.

   /MULTIVOLUME   Copies files from an input volume to one or more
                        output volumes using one command.

   /PROTECTION   Assigns a protection status to the output file,
                        which prevents deletion of the output file until
                        the protection status is changed.

   /NOPROTECTION   Removes protection from the output file so you can
                        delete it.   If you use neither /PROTECTION nor
                        /NOPROTECTION in a command line, the output file
                        retains the protection status of the input file.

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CHANGES AND ADDITIONS TO EXISTING COMPONENTS

/RETAIN   With COPY/DEVICE, preserves the output volume's bad block replacement table.

/SINCE[:date]   Copies files created on or after the specified date.

DELETE

/BEFORE[:date]   Deletes files created before the specified date.

/DATE[:date]   Deletes files created on the specified date.

/INFORMATION   Causes an informational rather than fatal message to print when a file in the command line is not found. If used in an indirect command file, the remainder of the command file is processed.

/SINCE[:date]   Deletes files created on or after the specified date.

DIBOL

/BUFFERING   Directs the compiler to use single-buffered I/O.

/LOG ·   Creates a log file of error messages generated by the compiler.

/PAGE:n   Specifies the number of lines in a listing page. The default is 66.

/TABLES   Includes symbol and label tables in the output listing.

DIFFERENCES

/DEVICE   Compares two entire devices starting with block 0.

DIRECTORY

/BACKUP   Lists the directory of volumes created with the BACKUP command.

/PROTECTION   Includes in the directory listing only those files on the specified volume that are protected against deletion.

/NOPROTECTION   Includes in the directory listing only those files on the specified volume that are not protected against deletion.

EDIT

/KEX   Selects the virtual KED editor, KEX.

EXECUTE

/BUFFERING   With the /DIBOL option, directs the compiler to use single-buffered I/O.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

/DUPLICATE	Places duplicate copies of a library module in each overlay segment that references the module. This option reduces the size of your program's root segment.
/GLOBAL	With the /MAP option, includes a global symbol cross-reference section in the load map.
/LOG	With the /DIBOL option, creates a log file of error messages generated by the compiler.
/PAGE:n	With the /DIBOL option, specifies the number of lines in a listing page. The default is 66.
/TABLES	With the /DIBOL option, includes symbol and label tables in the output listing.

INITIALIZE

/BACKUP	Initializes a volume to be used as an output volume with the BACKUP command.

LINK

/DUPLICATE	Places duplicate copies of a library module in each overlay segment that references the module. This option reduces the size of your program's root segment.
/GLOBAL	With the /MAP option, includes a global symbol cross-reference section in the load map.
/LIMIT:n	Used with /XM to limit the amount of memory allocated by a .SETTOP programmed request to nKW (octal).

MOUNT

/WRITE	Write-enables the logical disk you specify.
/NOWRITE	Write-locks the logical disk you specify.

PRINT

/BEFORE[:date]	Prints files created before the specified date.
/DATE[:date]	Prints files created on the specified date.
/INFORMATION	Causes an informational rather than fatal message to print when a file in the command line is not found. If used in an indirect command file, the remainder of the command file is processed.
/SINCE[:date]	Prints files created on or after the specified date.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

PROTECT

/BEFORE[:date]	Protects files created before the specified date.
/DATE[:date]	Protects files created on the specified date.
/EXCLUDE	Protects all files on a volume except the ones you specify.
/INFORMATION	Causes an informational rather than fatal message to print when a file in the command line is not found. If used in an indirect command file, the remainder of the command file is processed.
/LOG	Lists on the terminal the names of files protected by the current command.
/NOLOG	Does not list on the terminal the names of files being protected.
/NEWFILES	Protects files created on the current system date.
/QUERY	Requests confirmation before protecting each file.
/SINCE[:date]	Protects files created on or after the specified date.
/SYSTEM	Lets you protect system (.SYS) files when you use wildcards in the file specification.
/WAIT	Initiates the PROTECT operation, then pauses and waits while you change volumes. For example, you may need to temporarily replace the system volume with a data volume.

RENAME

/BEFORE[:date]	Renames files created before the specified date.
/DATE[:date]	Renames files created on the specified date.
/INFORMATION	Causes an informational rather than fatal message to print when a file in the command line is not found. If used in an indirect command file, the remainder of the command file is processed.
/SINCE[:date]	Renames files created on or after the specified date.

SET

dd CSR=n	Modifies device handler dd to use n as the CSR address for the first controller. The following handlers are valid with this command: DD, DL, DM, DU, DX, DY, LP, LS, RK, and XL.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

dd RETRY=n	Defines the number of times (n) that a device handler tries to recover from an error while the error logger is running. This command is valid for any device the error logger supports.
dd SUCCES	Causes the error logger to log both successful and unsuccessful I/O transfers. This command is valid for any device the error logger supports.
dd NOSUCCES	Causes the error logger to log only unsuccessful I/O transfers. This command is valid for any device the error logger supports.
dd VECTOR=n	Modifies the device handler dd to use n as the vector address for the first controller. The following handlers are valid with this command: DD, DL, DM, DU, DX, DY, LP, LS, RK, and XL.
DU CSR3=n	Modifies the DU handler to use n as the CSR address for the third controller.
DU CSR4=n	Modifies the DU handler to use n as the CSR address for the fourth controller.
DU VEC3=n	Modifies the DU handler to use n as the vector for the third controller.
DU VEC4=n	Modifies the DU handler to use n as the vector for the fourth controller.
DUn PART=x	Defines the disk partition on which device unit n resides.
DUn PORT=x	Defines which port to access when device unit n is specified.
DUn UNIT=x	Defines which unit plug number to access when device unit n is specified.
DW WCHECK	Verifies output to RD50 or RD51 disks by reading data after writing it to the disk.
DW NOWCHECK	Does not verify output to RD50 and RD51 disks.
DW WRITE	Write-enables RD50/RD51 drive unit 0.
DW NOWRITE	Write-locks RD50/RD51 drive unit 0.
DXn WRITE	Write-enables RX01 drive unit n.
DXn NOWRITE	Write-locks RX01 drive unit n.
DYn WRITE	Write-enables RX02 drive unit n.
DYn NOWRITE	Write-locks RX02 drive unit n.
EDIT KEX	Selects the KEX editor (virtual KED) as the default under XM only.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

EL LOG
For error logging under the SJ monitor, turns on the error logger if the EL handler is loaded and begins logging errors in an EL handler internal buffer.

EL NOLOG
For error logging under the SJ monitor, turns off the error logger.

EL PURGE
For error logging under the SJ monitor, discards the contents of the EL handler internal buffer.

EXIT SWAP
Causes any portion of a program that resides in SWAP.SYS to be written back into memory on program termination.

EXIT NOSWAP
Prevents any portion of a program that resides in SWAP.SYS from being written back into memory on program termination.

KMON IND
Causes IND to execute the file specified with the @filespec syntax as an indirect control file. This may be overridden by using the syntax $@filespec which forces execution of the command file by KMON regardless of the current KMON/IND setting.

KMON NOIND
Causes KMON to execute the file specified with the @filespec syntax as an indirect command file.

LDn CLEAN
For logical disk subsetting, verifies and corrects logical disk assignments.

LDn WRITE
For logical disk subsetting, write-enables logical disk unit n.

LDn NOWRITE
For logical disk subsetting, write-locks logical disk unit n.

LS SPEED=n
Sets the printer to run at baud n, where n can be any of the following bauds:

50	1200
75	1800
110	2000
134	2400
150	3600
200	4800
300	9600
600	19200

This command is valid only when running on a Professional 300 series system.

You must specify a value for n in this command. If you do not use this command, the printer runs at 4800 baud.

SL ASK
Determines terminal type; if supported, terminal sets SL appropriately.

SL LEARN
Locks SL help text on a VT100 or VT102 screen.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

SL NOLEARN	Clears SL help text from VT100 or VT102 screen.
SL LET	Enables string substitution using the unsupported program LET.SAV.
SL NOLET	Disables LET.SAV string substitution.
SL OFF	Turns off the single-line editor. This must be the last option in a multiple option SET command (for example, SET SL VT100,LEARN,OFF).
SL ON	Turns on the single-line editor. This must be the last option in a multiple option SET command (for example, SET SL VT100,LEARN,ON).
SL SYSGEN	Causes SL to adapt to the booted monitor's system generation options. You cannot rename SL.SYS to SLX.SYS and issue this command to run under XM.
SL TTYIN	Causes SL to edit all line mode .TTYIN (.CSIxxx and .GTLIN) input, which lets you edit responses to prompts printed by the system utilities.
SL NOTTYIN	Causes SL to edit only lines that follow the keyboard monitor prompt (.).
SL VT52	Causes SL to support the console as a VT52.
SL VT62	Causes SL to support the console as a VT52.
SL VT100	Causes SL to support the console as a VT100.
SL VT101	Causes SL to support the console as a VT101.
SL VT102	Causes SL to support the console as a VT102. VT102 support is appropriate for all DEC VT1XX family terminals that support INSERT/OVERSTRIKE mode selection (VT102, VT131, VT132, and VT100s with certain options).
SL WIDTH=n	Sets terminal (and editing) width.
SP FLAG=n	Sets the number of flag pages to generate whenever SPOOL begins printing a file. The default for n is 0. The largest value for n is 4.
SP FORM0	Issues a form feed on the output device each time SPOOL encounters block 0 of a file to be printed. Useful if the output device is part of a multiterminal system, or if the output device handler does not support its own FORM0 option. The default mode is NOFORM0.
SP NOFORM0	Turns off FORM0 mode. This is the default mode.
SP KILL	Removes all currently spooled output from SPOOL's work file.
SP NEXT	Stops sending output from the current file, discards the remaining spooled output for that file, and begins sending output from the next listing in SPOOL's work file.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

SP WAIT

Suspends sending output from SPOOL's work file to the output device, but does not delete anything from the work file. SPOOL continues to accept input with SET SP WAIT in effect.

SP NOWAIT

Resumes sending spooled output suspended by the command SET SP WAIT.

SP WIDE

Causes SPOOL to generate 132-column flag pages.

SP NOWIDE

Causes SPOOL to generate 80-column flag pages.

VM BASE=nnnnnn

Lets you select the memory location where block 0 of the virtual device will begin.

XC SPEED=n

Sets the communcation port to run at baud n, where n can be any of the following bauds:

50	1200
75	1800
110	2000
134	2400
150	3600
200	4800
300	9600
600	19200

You must specify a value for n in this command. If you do not use this command, the communication port runs at 1200 baud.

SHOW

MEMORY

Displays the organization of physical memory: physical addresses of loaded jobs, loaded device handlers, KMON, and USR.

SUBSET

Lists logical disk assignments for physical disks that contain logical disks.

TYPE

/BEFORE[:date]

Types, on the console, files created before the date you specify.

/DATE[:date]

Types, on the console, files created on the specified date.

/INFORMATION

Causes an informational rather than fatal message to print when a file in the command line is not found. If used in an indirect command file, the remainder of the command file is processed.

/SINCE[:date]

Types, on the console, files created on or after the specified date.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

UNPROTECT

/BEFORE[:date]	Removes protection from files created before the specified date.
/DATE[:date]	Removes protection from files created on the specified date.
/EXCLUDE	Removes protection from all files on a volume except the ones you specify.
/INFORMATION	Causes an informational rather than fatal message to print when a file in the command line is not found. If used in an indirect command file, the remainder of the command file is processed.
/LOG	Lists on the terminal the names of the files affected by the current UNPROTECT command.
/NOLOG	Does not list on the console the names of the files affected by the current UNPROTECT command.
/NEWFILES	Removes protection from files created on the current system date.
/QUERY	Requests confirmation before removing protection from each file.
/SINCE[:date]	Removes protection from files created on or after the specified date.
/SYSTEM	Lets you remove protection from system (.SYS) files when you use wildcards in the file specification.
/WAIT	Initiates the UNPROTECT operation, then pauses and waits for you to change volumes. For example, you may need to temporarily replace the system volume with a data volume.

2.3 HANDLERS

The following handlers, distributed on the RT-11 V5 distribution kit, are no longer supported by RT-11 and are therefore no longer documented in the RT-11 documentation set. You can still use these handlers as documented in previous versions of RT-11.

CR	DT
CT	PC
DP	PD
DS	RF

Also, support for VT11 and VS60 graphics terminals is no longer included by default in the TT handler. You must perform system generation procedures to include this support.

XM versions of all supported handlers are now included on the RT-11 distribution kit.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

All RT-11 handlers are now linked using the /NOBITMAP option.

The following sections describe the changes made to RT-11 handlers.

2.3.1 DD

- The DD handler now operates on the SBC-11/21 and SBC-11/21 PLUS.

- The following SET commands are valid for the DD handler:

    SET DD: RETRY=n

    SET DD: SUCCES

    SET DD: NOSUCCES

    See Section 2.2.3 for a description of these commands.

2.3.2 DL

- The following SET commands are valid for the DL handler:

    SET DL: CSR=n

    SET DL: RETRY=n

    SET DL: SUCCES

    SET DL: NOSUCCES

    SET DL: VECTOR=n

    See Section 2.2.3 for a description of these commands.

- The DL handler now maintains device size information in a unit-specific table. This feature reduces the number of controller operations required in a system with multiple DL units.

- The DL handler now reports write-lock and write-gate errors to the error logger.

- The DL handler supports 22-bit DMA with the RLV12 controller.

2.3.3 DM

- The following SET commands are valid for the DM handler:

    SET DM: RETRY=n

    SET DM: SUCCES

    SET DM: NOSUCCES

    See Section 2.2.3 for a description of these commands.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

● The DM handler now reports the following errors to the error logger:

Cylinder overflow

Data late

Transfer to or from nonexistent drive

Transfer to or from memory address higher than existing memory

Write-lock

2.3.4 DU

The following SET commands are valid for the DU handler:

SET DU: CSR=n

SET DU: VECTOR=n

SET DU: CSR2=n

SET DU: VEC2=n

SET DU: CSR3=n

SET DU: VEC3=n

SET DU: CSR4=n

SET DU: VEC4=n

SET DU: RETRY=n

SET DU: SUCCES

SET DU: NOSUCCES

SET DUn: WRITE

SET DUn: NOWRITE

SET DUn: PART=x

SET DUn: PORT=x

SET DUn: UNIT=x

See Section 2.2.3 for more information on these commands.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

2.3.5 DW

The following SET commands are valid for the DW handler:

        SET DW: RETRY=n

        SET DW: SUCCES

        SET DW: NOSUCCES

        SET DW: WCHECK

        SET DW: NOWCHECK

        SET DW: WRITE

        SET DW: NOWRITE

See Section 2.2.3 for more information on these commands.

2.3.6 DX

The following SET commands are valid for the DX handler:

        SET DX: CSR=n

        SET DX: RETRY=n

        SET DX: SUCCES

        SET DX: NOSUCCES

        SET DX: VECTOR=n

        SET DXn: WRITE

        SET DXn: NOWRITE

See Section 2.2.3 for more information on these commands.

2.3.7 DY

* The following SET commands are valid for the DY handler:

            SET DY: CSR=n

            SET DY: RETRY=n

            SET DY: SUCCES

            SET DY: NOSUCCES

            SET DY: VECTOR=n

            SET DYn: WRITE

            SET DYn: NOWRITE

    See Section 2.2.3 for more information on these commands.

- The DY handler supports only ECO Revision Level F and later controllers.

2.3.8 DZ

The following SET commands are valid for the DZ handler:

    SET DZ: RETRY=n

    SET DZ: SUCCES

    SET DZ: NOSUCCES

See Section 2.2.3 for more information on these commands.

2.3.9 LS

- The default setting for the LS handler has been changed from NOCTRL to CTRL.

- The following new SET command is valid for the LS handler:

      SET LS SPEED=n

    See Section 2.2.3 for more information on this command.

2.3.10 RK

The following SET commands are now valid for the RK handler:

    SET RK: CSR=n

    SET RK: RETRY=n

    SET RK: SUCCES

    SET RK: NOSUCCESS

    SET RK: VECTOR=n

See Section 2.2.3 for more information on these commands.

2.3.11 XC

The following SET command is valid for the XC handler:

    SET XC SPEED=n

See Section 2.2.3 for more information on that command.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

2.3.12 XL

The following SET commands are valid for the XL handler:

    SET XL CSR=n

    SET XL VECTOR=n

See Section 2.2.3 for more information on these commands.

2.4 BINCOM

The following changes have been made to the binary file comparison program.

- You can now use wildcards with BINCOM to compare multiple binary files.

- The /D option, new for Version 5, compares two entire volumes starting with block 0.

See Chapter 2 of the RT-11 System Utilities Manual for more information on these changes to BINCOM.

2.5 DIR

RT-11 V5 includes the following new directory program options:

/T   Includes in the directory listing only those files that are protected against deletion.

/U   Includes in the directory listing only those files that are not protected against deletion.

See Chapter 4 of the RT-11 System Utilities Manual for more information on these DIR options.

2.6 DUP

The following changes have been made to the device utility program.

- The /H option is now invalid when combined with the /K or /B option. This option combination caused data to be written to the suspected bad block. Therefore, when soft errors occurred, invalid data was written to the block, destroying it.

  To verify whether a bad block is caused by a hard or soft error, you must perform two bad block scans and compare the results to see if any blocks reported as bad were able to recover.

- When you use the /I option to copy a larger volume to a smaller one, DUP asks for confirmation before copying the volume.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

● You can now abort a /W (WAIT) operation.

● You can now combine the /R and /I options to preserve the output volume's bad block replacement table. In Version 4, the input volume's bad block replacement table was always transferred to the output volume.

● It is no longer necessary to customize DUP in order to use variable-size volumes. Instead, a new handler attribute VARSZ$ can be set to indicate a variable size volume. Use the stat argument for the .DRDEF programmed request to set VARSZ$ (bit mask 400). Then, you can use the .DSTATUS programmed request to determine whether the handler supports variable-size volumes (and .SPFUN 373).

   See Sections 2.20 and 2.25 in the RT-11 Programmer's Reference Manual for more information.

See Chapter 6 of the RT-11 System Utilities Manual for more information on these changes to DUP.

2.7 ERROR LOGGER

The following changes have been made to the error logger subsystem.

● The SJ monitor now supports the error logger. Refer to Chapter 16 of the RT-11 System Utilities Manual for information on how to use the error logger under the SJ monitor.

● The RT-11 Version 5 error logger reports the number of retries for a single error and the final status of the operation (success or failure). The error logger provides separate entries for retries only if the registers differ.

● You can choose to log successful I/O transfers and errors, or only errors. Use the SET dd SUCCES command to log successes as well as errors, and the SET dd NOSUCCES command to log only errors.

● The error logger supports the new DW (RD50/RD51 disk) and DZ (RX50 diskette) handlers for the Professional 325 and 350.

● The error logger supports the RC25 and RA80 disks.

See Chapter 16 of the RT-11 System Utilities Manual for more information on changes to the error logger.

2.8 FILEX

The following changes have been made to the file exchange program.

● The default device for all FILEX operations is DK:.

● There are two new FILEX options:

   /V[:ONL]   Use with /Z and /U[:n] simultaneously to write a volume identification during initialization of an interchange diskette. Use the [:ONL] argument to change an

> interchange diskette's volume ID without initializing the diskette. Use with /L or /F to list the volume ID of an interchange diskette when obtaining a directory listing.

/W   Initiates the operation but pauses and waits for you to mount different volumes.

See Chapter 7 of the <u>RT-11 System Utilities Manual</u> for more information on these changes.

2.9 FORMAT

The following changes have been made to the volume formatting program.

- If you try to format a volume that contains protected files, or try to format a volume while a foreground job is loaded, FORMAT warns you and asks you to confirm the operation.

- You can now abort a /W (WAIT) operation.

- The table of verification bit patterns has been increased to 16 patterns. (The last 4 of the 16 patterns are reserved for future use.)

- Formatting of devices at nonstandard addresses is now supported. This will occur automatically, based on the CSR location specified in the device handler.

See Chapter 8 of the <u>RT-11 System Utilities Manual</u> for more information on these changes to FORMAT.

2.10 HELP

The files HELP.TXT and HELP.EXE, which together make up the program HELP.SAV, are no longer provided on the distribution kit. Therefore, if you want to change your HELP text, as described in Section 2.7.14 of the <u>RT-11 Installation Guide</u>, you must first recreate HELP.TXT and HELP.EXE from HELP.SAV using the unsupported utility SPLIT.

To recreate these files, type this command:

```
.SPLIT ddn:HELP.EXE,,ddn:HELP.TXT=ddn:HELP.SAV/B:..HLP1:..HLP2
```

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

In the command, ddn: represents the device on which to create the files HELP.TXT and HELP.EXE, or the device on which HELP.SAV exists. The variables ..HLP1 and ..HLP2 represent the boundaries along which to split HELP.SAV. Refer to the file CUSTOM.TXT on your distribution kit for the values to substitute in the command line for ..HLP1 and ..HLP2.

2.11 IND

The following changes have been made to the .ENABLE and .DISABLE directives. These changes also apply to the .IFENABLED and .IFDISABLED directives.

2.11.1 .ENABLE/.DISABLE ABORT

This new operating mode lets you enable or disable double CTRL/C aborts. When .DISABLE ABORT is in effect, CTRL/C characters are ignored until the currently executing control file exits. When .ENABLE ABORT is in effect, CTRL/C characters are recognized and processed. .DISABLE ABORT is valid only if you have included global .SCCA support in your system through system generation.

.DISABLE ABORT also disables CTRL/Z aborts.

See Chapter 5 of the RT-11 System User's Guide for more information on using .ENABLE and .DISABLE ABORT.

2.11.2 .ENABLE/.DISABLE CONTROL-Z

This new operating mode lets you enable or disable CTRL/Z aborts. Typing CTRL/Z in response to an .ASK, .ASKN, or .ASKS prompt causes the control file to abort. When .DISABLE CONTROL-Z is in effect, CTRL/Z characters are ignored until the currently executing control file exits. When .ENABLE CONTROL-Z is in effect, CTRL/Z characters are recognized and processed.

See Chapter 5 of the RT-11 System User's Guide for more information on using .ENABLE and .DISABLE CONTROL-Z.

2.11.3 .ENABLE/.DISABLE TYPEAHEAD

This new operating mode causes IND to accept or ignore type-ahead. When .ENABLE TYPEAHEAD is in effect, IND accepts and stores characters you type to answer an .ASK, .ASKS, or .ASKN prompt even before the prompt is displayed. When .DISABLE TYPEAHEAD is in effect, IND discards all characters that have been stored before processing .ASK, .ASKN, and .ASKS directives. If you have answered a prompt prematurely, your response is discarded.

See Chapter 5 of the RT-11 System User's Guide for more information on using .ENABLE and .DISABLE TYPEAHEAD.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

2.11.4 .ENABLE/.DISABLE TIMEOUT

In RT-11 V5.1, if the .ENABLE TIMEOUT directive is issued but the system does not include timer support, IND assigns special symbol <EXSTAT> the value 0, for warning, instead of printing an error message.

2.12 KED

The following changes have been made to the keypad editor (KED).

* <CTRL/R> or <CTRL/W> redisplays the screen.

* <GOLD><CTRL/U> performs the same function as <GOLD><PF4>. (GOLD is the PF1 key.)

* <GOLD><DEL> performs the same function as <GOLD><,>. (GOLD is the PF1 key.)

* <GOLD><LINEFEED> performs the same function as <GOLD><DELETE>. (GOLD is the PF1 key.)

* On terminals with AVO (advanced video option) or its equivalent, select ranges are displayed with reverse background and boldface.

* If the command EDIT/KED filespec is issued and the file you specify is not found, KED prompts you for permission to create the file. If the file is protected, KED prompts you for permission to inspect the file.

* A new version of KED, called KEX, runs as a virtual job under XM. KEX can run as a background job, a foreground job, a system job, or as all of these simultaneously.

* The version of KED you are using appears as the prefix for messages displayed (?KED-, ?K52-, or ?KEX-). Formerly, all error messages were prefixed by ?KED-.

* KED now supports default file types. When editing a file, the default input file type is .MAC; the default output file type is the same as the input file type. When inspecting a file, the default input file type is .LST. There is no default input file type when creating a file.

  To specify a file with no file type, type only the file name and the period separating the file name and type (FILNAM.).

You can modify the default file types with the following software customization:

```
.R SIPP
*aaa.SAV/A
Base?    Ø<RET>
Offset? bbbbbb<RET>

Base    Offset   Old       New?

ØØØØØØ bbbbbb   ??????    ;R<RET>
ØØØØØØ bbbbbb   <???>     ;Rccc<RET>
ØØØØØØ bbbbbb+2 <???>     <CTRL/Y><RET>

*<CTRL/C>
```

In this customization, substitute KED, K52, or KEX for aaa. Substitute the value for the symbol ..EXT (for the editing-file default) or ..IEXT (for the inspecting-file default) for bbbbbb. These values can be found in CUSTOM.TXT on your distribution kit (be sure to use the proper KED variant). Substitute the three-character file type default you want for ccc.

2.13 LIBR

The following changes have been made to the RT-11 librarian program.

● With Version 5, LIBR continues instead of exiting when an error occurs.

● The default file type for macro libraries has been changed to .MLB.

See Chapter 1Ø of the RT-11 System Utilities Manual for more information on LIBR.

2.14 LINK

The following changes have been made to the RT-11 linker program.

● A problem with LINK's CSI processing has been corrected, so that with Version 5 you can link an increased number of modules at one time.

● The /R and /V options are no longer mutually exclusive; privileged foreground jobs can be linked with virtual overlays. The root and low memory overlays are now located just below the lowest window created for virtual overlays.

● The /K:n option is no longer restricted to use for RSTS compatibility. You can now use the /K:n option with RT-11 to limit the number of words allocated by a .SETTOP programmed request.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

● RT-11 V5 includes two new LINK options:

  /D   Defines the global symbol you specify once in each
       segment that references that symbol. Such global
       symbols must be defined in a library module.

  /N   Produces in the load map a cross-reference listing
       of all global symbols defined during the linking
       process.

See Chapter 11 of the RT-11 System Utilities Manual for more
information on these changes to LINK.

2.15 MACRO

Refer to Appendix J of the PDP-11 MACRO-11 Language Reference Manual
for MACRO-11 release note information.

2.16 PAT

When PAT finishes executing a command, control returns to the CSI
(indicated by the asterisk prompt, *) rather than to the keyboard
monitor.

2.17 PIP

The following changes have been made to the peripheral interchange
program.

● If a PIP command line includes file transfers from magtape,
  PIP performs all file transfer operations requested on the
  command line in the order in which the files appear on the
  volume rather than the order in which they are specified in
  the command line.

● The /C option now accepts the [:date] argument. Use /C[:date]
  to include files of a certain date in the operation you
  specify.

● You can now abort a /E (WAIT) operation.

● In Version 5, you can use the /F (PROTECTION) and /Z
  (NOPROTECTION) options alone or for copy operations as well as
  for rename operations. It is no longer necessary to use /R
  (/RENAME) with /F or /Z.

● The /Q (QUERY) option is no longer the default when deleting
  files, except when you include wildcards in the file
  specification.

● The /T (SETDATE) option now accepts the [:date] argument, so
  you can assign files dates other than the current system date.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

●   The /Y (SYSTEM) option is now necessary only when you specify wildcards in the input file types.

●   The following PIP options are new:

/H	(VERIFY) Verifies that the output file matches the input file after a copy operation. This option is invalid with /A (ASCII) and /B (BINARY).
/I[:date]	(SINCE) Includes only those files created on or after the specified date.
/J[:date]	(BEFORE) Includes only those files created before the specified date.
/V	(MULTIVOLUME) Copies files from one input volume to two or more smaller output volumes.
/X	Prints an informational (I) message rather than a fatal (F) message when PIP cannot find a file specified in the command line.

See Chapter 13 of the RT-11 System Utilities Manual for more information on these changes to PIP.

2.18   QUEUE PACKAGE

The following changes have been made to the Queue Package.

●   When QUEUE sends a job consisting of more than one input file to an RT-11 file-structured device, QUEUE now copies each input file to a separate output file with the same file name and type. The job name is printed in the JOBNAME field of the banner page. In Version 4, all input files in the same job were concatenated into one output file with the file type .JOB.

●   Input files are now protected from deletion while QUEUE is copying them to the output device.

●   The default number of banner pages printed when you use the /H command is now determined by the number of banner pages you set as the default with the /P command.

●   When the input device for QUEUE operations is MT, to save time MT no longer rewinds between files.

●   QUEUE no longer performs a form feed after printing each file on the line printer.

●   QUEUE's work file is now SY:QUFILE.WRK. In RT-11 Version 4, the work file was DK:QUFILE.TMP.

●   The following are new QUEMAN options:

/C[:date]	(DATE) Prints only those files with the specified creation date.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

/I[:date]   (SINCE) Prints only those files created on
                or after the specified date.

/J[:date]   (BEFORE) Prints only those files created
                before the specified date.

/Q   Requests confirmation for each file to be
                included in the operation. QUEMAN prints the
                name of each file and pauses; you must
                respond Y for each file you want to include.

/W   Prints on the console a log of the files
                included in the operation.

/X   Allows QUEMAN to continue processing instead
                of halting when it cannot find a file
                specified in the command line.

See Chapter 17 of the RT-11 System Utilities Manual for more
information on these changes to the Queue Package.

- Note that the PRINT/FLAGPAGE command does not override the
  default number of flag pages set with the QUEUE command SET SP
  FLAG=n.

- The SHOW QUEUE command is now processed by the new RESORC /Q
  option rather than by the QUEMAN /L option. However, the /L
  option remains for the sake of compatibility.

2.19 RESORC

The following changes have been. made to the resource program.

- The /A (ALL) option now provides information about the total
  amount of memory on the system, logical disk subsetting
  assignments, and organization of physical memory.

- The /C (CONFIGURATION) option now provides status information
  for SET KMON [NO]IND, SET EXIT [NO]SWAP, SET EDIT, SET SL
  ON/OFF, and the global .SCCA flag.

- The /D (DEVICES) option now accepts the optional argument dd
  (dd:/D), where dd represents the two-letter permanent device
  name. You can use the argument dd to obtain information about
  a specific device.

- The /H option now includes the total amount of memory on the
  system.

- The /O option now also reports whether global .SCCA support
  was chosen during system generation.

- The RESORC utility now includes the following new options:

    /Q   Lists the contents of the queue for QUEUE or
            SPOOL, depending on which is running. The SHOW
            QUEUE keyboard command is perfomed by this option.

/S   Displays information about logical disk subsetting assignments.

/X   Displays information about the organization of physical memory: where jobs and handlers are loaded and where KMON and the USR will reside.

See Chapter 14 of the RT-11 System Utilities Manual for more information on these changes to RESORC.

2.20 SIPP

The following changes have been made to the save image patch program.

● When SIPP is used to patch a file, the creation date of the patched file is changed to the current system date. If no modifications are made, the date remains unchanged.

● When using SIPP to create an indirect command file, the command file contains the command R SIPP rather than RUN SIPP. This lets you run the command file from a volume other than the system volume.

See Chapter 22 of the RT-11 System Utilities Manual for more information on these changes to SIPP.

2.21 SL

A new function has been added to SL. When you press the PF1 (GOLD) key, then the ↑ (UPARROW) key, SL reproduces the line before the last line terminated with a carriage return. This extends the functionality of the ↑ (UPARROW) key by letting you recall an older line for editing.

In the following example, pressing <GOLD><↑> recalls the next-to-last command line for editing:

```
.RENAME FILE1.MAC FILE1.BAK<RET>

.<RET>

.ASSIGN DL0:    LOG:<RET>

.<GOLD><↑>RENAME FILE1.MAC FILE1.BAK
```

2.22 SLP

The following changes have been made to the source language patch program.

● SLP ignores any characters that precede the start-of-update character (-) in SLP command files. If SLP is unable to find the start-of-update character, SLP prints an error message and returns control to the CSI (indicated by the asterisk prompt).

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

● You can now update more than one file in a single SLP command
  file. Type a double slash (//) on a line by itself after the
  update text for each file. On the next line, type the command
  line that specifies the next input file to be updated and the
  command file name (the same command file that contains the
  update text). Then type the update text on the lines that
  follow. Type a single slash (/) on a separate line to
  indicate the end of a series of update texts.

● The SLP utility includes the following new options:

  /C[:n]   Determines or validates the contents of the
               SLP input file or the SLP command file. Use
               /C to determine the checksum of a file. Use
               /C:n to verify the contents of a file. SLP
               computes the checksum for the file and
               compares the checksum to the value you
               specify for n.

  /N   Suppresses the creation of a backup file when
               SLP updates the input file.

See Chapter 23 of the RT-11 System Utilities Manual for more
information on these changes to SLP.

2.23 SRCCOM

The following changes have been made to the source file comparison
program.

● The syntax of the SRCCOM command has changed to:

  [[out-filespec] [,SLP-filespec]=]old-filespec,new-filespec[/options]

  The new syntax element, [SLP-filespec], lets you create a
  differences file and a SLP command file in the same command
  line. With RT-11 Version 4, you could create only one or the
  other. Because you can specify both with the Version 5 syntax
  in your command line, the /P option has been eliminated.

● You can now use wildcards with SRCCOM to compare multiple
  source files.

See Chapter 15 of the RT-11 System Utilities Manual for more
information on these changes to SRCCOM.

2.24 SYSGEN

Some of the system generation procedures have been changed. See
Section 1.4.7 for a description of the new system generation
procedures.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

2.25 SYSTEM SUBROUTINE LIBRARY (SYSLIB)

The following routines have been changed in SYSLIB.

- ICSTAT - This routine can now be used under the SJ monitor.

- ISLEEP - This routine can now be used under the SJ monitor.

- IUNTIL - This routine can now be used under the SJ monitor.

- ILUN - This routine now calls a local copy of the $FCHNL routine. That copy of $FCHNL does not assign a logical unit number (LUN) to an available channel if the LUN is not already assigned and thus prevents the channel address table from filling up.

  See Section 3.33 in the RT-11 Programmer's Reference Manual for more information on ILUN.

- ISPFN/ISPFNC/ISPFNW - These routines have been modified to include support for the DW and DZ handlers, for the following special functions:

Function	DW	DZ
Read absolute sector	377	377
Write absolute sector	376	376
Return volume size	373	

2.26 SYSTEM MACRO LIBRARY (SYSMAC)

The following programmed requests have been changed:

- .CSTAT - This programmed request can now be used under the SJ monitor.

- .DRDEF - A new handler attribute, VARSZ$, is for .DRDEF's stat argument. Setting VARSZ$ (bit mask 400) indicates that the handler supports variable-size volumes and .SPFUN 373.

  See the RT-11 Programmer's Reference Manual for more information on .DRDEF and .DSTATUS.

- .ELRG - This programmed request will now concatenate contiguous areas of memory that are segmented in the allocation table when memory is restored after a region is eliminated.

  See the RT-11 Programmer's Reference Manual for more information on .ELRG.

- .FETCH - This programmed request can now be used under the XM monitor.

- .GTLIN - Now includes a terminal option (.GTLIN ,,TERM=YES) which forces input to come from the terminal rather than from the active command or control file.

CHANGES AND ADDITIONS TO EXISTING COMPONENTS

See the <u>RT-11 Programmer's Reference Manual</u> for details and ●
examples of the .GTLIN programmed request.

● .MAP - This programmed request now checks to see if the
specified window is already mapped. If it is, no unmapping
and remapping operations are performed.

● .SCCA - This programmed request has been modified to include
global .SCCA support, if that support is chosen as a special
feature during system generation. Global .SCCA support allows
you to prevent double CTRL/C aborts by causing the system to
ignore all CTRL/C characters issued from the terminal.

See the <u>RT-11 Programmer's Reference Manual</u> for more ▌
information on global .SCCA support.

● .SPFUN - This programmed request has been modified to include
support for the DW and DZ handlers, for the following special
functions:

Function	DW	DZ
Read absolute sector	377	377
Write absolute sector	376	376
Return volume size	373	

See the <u>RT-11 Programmer's Reference Manual</u> for more ▌
information on these special functions.

● .TWAIT - This programmed request can now be used under the SJ
monitor.

CHAPTER 3

CORRECTED PROBLEMS AND CURRENT RESTRICTIONS

This chapter lists software problems that have been corrected, describes corrections and additions for the RT-11 documentation set, and lists the software restrictions that remain.

3.1 CORRECTED PROBLEMS

The following problems in previous versions of RT-11 have been corrected in Version 5.

3.1.1 Monitors

The following monitor problems have been corrected.

KMON   When KMON parsed a file name longer than six characters, KMON printed the error message ?KMON-F-Command file not at end of line. In Version 5, KMON prints the more appropriate message ?KMON-F-Error in file spec.

With previous versions of RT-11, the device had to be loaded prior to chaining to another file. In Version 5, devices need not be loaded.

The command DELETE * now expands to the command DELETE *.* rather than the command *.NULL.

When you omitted an argument from an option that required one, a trap to 4 occurred. In Version 5, when you omit a required argument, the trap to 4 does not occur and KMON prints the error message ?KMON-F-Invalid value specified with option.

If you performed a chain exit when running under a monitor with system job support, vector areas 472-476 were destroyed. These vector areas are now preserved.

Typing digits in a command name caused KMON to print the error message ?KMON-F-Ambiguous command. This message is appropriate for commands that contain alphabetic characters only. In V5, using digits rather than characters in the command generates the error message ?KMON-F-Invalid command.

CORRECTED PROBLEMS AND CURRENT RESTRICTIONS

In V5, KMON prints the error message ?KMON-F-Invalid set parameter, rather than ?KMON-F-Illegal command, if the handler specified in the command rejects parameters.

USR

Under the SJ monitor, the .GTLIN programmed request didn't echo user input when TTSCP$ was set. The .GTLIN request now echoes user input when TTSCP$ is set.

When an indirect command file contained blank lines for utility version numbers, the version numbers were not always displayed. Version numbers are now displayed.

Files created on a device were not always allocated the smallest empty space for the file length requested. The smallest empty space for the file length requested is now allocated.

3.1.2 Utilities

The following problems have been corrected for utility programs.

BINCOM

When a comparison was being performed and one or both of the files or volumes being compared resided on a diskette, BINCOM generated a hard error message if it reached the end of the diskette. In V5, BINCOM returns to the keyboard monitor when it reaches the end of the diskette.

DUMP

When a diskette was being dumped, DUMP generated a hard error message when it reached the end of the diskette. In V5, DUMP returns to the keyboard monitor when it reaches the end of the diskette.

DUP

When several DUP options were specified with the /WAIT (DUP /W) option, DUP prompted to mount the input volume once for each operation requested. In Version 5, the prompt to mount a volume is printed only once.

When using the command INIT/BAD/WAIT ddn: (DUP/B/W), where ddn is the device in which the system disk resides, DUP did not prompt to mount the input volume a second time for the initialization operation. Therefore, DUP initialized the system volume instead, destroying the boot blocks. DUP now correctly prompts you to mount the input volume.

When using the BOOT/WAIT command, DUP printed the prompt ?DUP-W- Foreground loaded. Are you sure? prompt twice. In Version 5.1, the prompt is printed only once.

Error Logger

The error logger did not report the correct time of error. Time of error is now reported correctly.

LIBR

The LIBR utility failed if a forms library directory exceeded one block. LIBR now allows forms library directories to exceed one block.

PIP

When COPY/PREDELETE (PIP /O) was performed and the specified input and output volumes were the same, PIP deleted the file. In Version 5, COPY/PREDELETE performs a RENAME operation when the input and output volumes are the same.

When wildcards were used in a RENAME/NOREPLACE (PIP /N) operation, the first file was found but not renamed, and an error message appeared. RENAME/NOREPLACE now works as documented in the RT-11 System User's Guide and RT-11 System Utilities Manual.

When the /WAIT option (PIP /E) was specified, PIP attempted to read the output volume's directory before it prompted to mount the output volume. Therefore, an error occurred (if no volume was present in the output device) or the wrong volume could be read. PIP now prompts you to mount the output volume before attempting to read its directory.

QUEUE

QUEUE did not recognize and correctly print asterisk (*) and percent (%) characters used in job names on banner pages. QUEUE now correctly handles asterisk and percent characters for banner pages.

SRCCOM

When the DIFFERENCES /CHANGEBAR (SRCCOM /D) option was specified with the console as the output device, the message ?SRCCOM-I-No differences found would overwrite the end of the console output. This message is now printed on a new line.

3.1.3 MACRO-11 Assembler

The following corrections have been made to the MACRO-11 assembler. See Appendix J of the PDP-11 MACRO-11 Language Reference Manual for other MACRO release note information.

MACRO was processing some index deferred arguments as floating point numbers by default. MACRO now processes all index deferred arguments as octal by default.

Internal displaced relocatable statements were not being marked as relocatable with an apostrophe (') in the assembly listing. They are now correctly marked.

Bit 3, an unused bit, was being set in all .PSECT object records. Bit 3 is no longer set. This change causes object files created with the new version of the MACRO-11 assembler to differ from those created with previous versions, resulting in different PAT checksums. Note that differences between object files do not always cause differences in task or SAV image files, as is true in this case.

3.2 CURRENT RESTRICTIONS

When running RT-11 Version 5.1, observe the following restrictions.

- IND control files cannot include an indirect command file which, in turn, calls another IND control file. Such files also cannot call a KMON command file which, in turn, calls another IND control file.

- You cannot place CSI commands or DCL commands that require more than one line in IND control files. To execute CSI commands and multiline DCL commands from an IND control file, create an indirect command file that contains the command, and call the command file from the control file by using the $@ syntax. Alternatively, you can use CCL.

  For example, the following IND control file executes a CSI command by creating an indirect command file, then calling the indirect command file.

  ```
          .IFF PIP .GOTO 1
          .OPEN SECOND.COM
          .DATA R PIP
          .DATA A.MAC=B.MAC
          .DATA ^C
          .CLOSE
          $@SECOND
  .1:     .ASKS ...
  ```

  Instead of creating the indirect command file, you can achieve the same result by using the following CCL command example.

  ```
          .IFT PIP PIP A.MAC=B.MAC
  ```

- If you pass more than one command through a special chain exit, you can call an indirect command file only as the last command in a series of chain exits.

- If you use the RT-11 Version 5 command INIT/VOL to assign a volume ID, that volume ID will not be displayed when you issue the command DIR/VOL under RT-11 Version 4.

- TU58 DECtape II cannot be used as the system device on a 38.4K baud line. You must change your hardware to lower the baud to 19.2K.

- You cannot use BUP (or the BACKUP command) to back up a disk to magtape if the disk contains bad blocks covered with FILE.BAD files. Use PIP or the COPY command instead. This restriction does not apply during disk-to-disk backup operations, or to disks initialized using bad block replacement rather than bad block covering.

CORRECTED PROBLEMS AND CURRENT RESTRICTIONS

- The VM handler may not be used on a PDP-11/23 processor with MSV11 memory, strapped for a 2KW I/O page. The VM handler installs, but any attempt to perform I/O to it immediatly returns a hard error. This occurs because the VM handler must turn on the memory management unit to operate. However, when the MMU is enabled, the I/O page reverts to 4KW and corrupts the top 2KW of the monitor.

- The single-line editor does not support the use of control characters as input data. Before you run a program that must receive control characters as input data in line mode, you must turn off the single-line editor. Use the SET SL OFF command, or have your program set the EDIT$ bit (bit 4) in the JSW.

  This restriction does not apply to programs that use special mode input.

- When the single-line editor is enabled, the command COPY TT: filespec does not work.

- When running under the XM monitor, programs that fetch magtape handlers must place them above PAR1 space.

- Even when .ENABL MCL is in effect, you must manually .MCALL any macros whose names conflict with names in the MACRO-11 permanent symbol table (such as .PRINT).

- You cannot run the BATCH processor and IND simultaneously. You must have SET KMON NOIND in effect to run BATCH. Also, you cannot run BATCH from an IND control file.

- You can use the RUN command to run virtual programs only if the program does not require the keyboard monitor to write to the swap blocks (SWAP.SYS). That is, the size of the program's root segment must not overload the keyboard monitor. If this happens, the error message ?MON-F-MMU fault appears.

- DIGITAL recommends that you do not use the command SET LS NOHANG. When you use SET LS NOHANG, printers with very large buffers may abort before they are through printing.

- When using recursive logical disks, the outer disk must have a lower unit number than the inner disk. For example, if logical disk B is contained on logical disk A, A must have a lower unit number than B. Logical disk A can be LD0 and logical disk B can be LD1, but not vice versa.

- Privileged foreground jobs cannot presently use virtual overlays. Any attempt to do so can crash the system. (Note that this does not apply to virtual foreground jobs; they run correctly with any type of overlay.)

- There are numerous problems with program prompting with the single-line editor (SL) set ON. SL may not prompt properly when used with various combinations of .PRINT and .TTYIN, or when the prompts contain control characters such as line feeds or carriage returns. There is no correction for this problem; however, the DIGITAL-recommended work-around is to SET SL KMON (rather than SET SL ON).

CORRECTED PROBLEMS AND CURRENT RESTRICTIONS

- Some systems, such as those using MICOM lines, require more than one BREAK command to gain access to the host processor. The current version of VTCOM does not support multiple short BREAK commands.

- BUP will not give a correct EOT message under the XM monitor when backing up to multiple tape volumes. Under the XM monitor, backup is restricted to a single output tape.

- On an RT-11 file-structured device, BUP on TSV05 from an RL02 and answering YES to all prompts gives the BUP-F-Read error message; however, the transfer will have completed correctly.

- When comparing two diskettes, a bad block on one diskette will be treated as end-of-device by BINCOM. This results in the other diskette being reported as longer.

- To turn off the keyclick, you must first issue the SETUP CLICK command, followed by the SETUP NOCLICK command. SETUP NOCLICK does not work after a hard boot when issued from a start-up command file.

- Do not issue SETUP COLOR commands to monochrome monitors; it will overdrive your monitor, making the screen unreadable. Reboot the system to correct this condition. Do not include SETUP COLOR commands in command files that may be run on processors that have a monochrome monitor.

- The combination of SETUP WRAP,SMOOTH can cause only part of the first character of a wrapped line to be displayed.

- CTS SYSGEN does not produce printer source files when taking input from an answer file.

- INITIALIZE MS: issued without a tape in the drive can crash the system.

- SHOW MEMORY displays only approximate values. Memory components shown include memory tracking overhead locations, which are not part of the actual component itself. Consequently, the values shown can be as much as 32 words in error.

- Device handlers must now be linked with the /NOBITMAP option.

- The CSR and vector for the LS handler are factory set for the Professional 300 series processors. On other PDP-11 processors, you must set the CSR and vector.

- LS, in order to be used on the available SLU serial port of an SBC-11/21 or an SBC-11/21 PLUS, must be rebuilt with LS$PRI = 5.

- SL does not work with virtual jobs.

- SL and BATCH cannot be used together.

- XL, in order to be used on the available SLU serial port of an SBC-11/21 or an SBC-11/21 PLUS, must be rebuilt with XL$PRI = 5 (or XL$SBC = 1).

- DD, in order to be used on the available SLU serial port of an SBC-11/21 or an SBC-11/21 PLUS must be rebuilt with DD$PRI = 5.

- The DIBOL compiler does not work with BATCH under the XM monitor.

3.3 CURRENT RESTRICTIONS FOR PROFESSIONAL 300 SERIES PROCESSORS ONLY

When running RT-11 V5.1 on the Professional 300 series processors, observe the following restrictions.

- DIGITAL recommends that existing programs being transported to the Professional 300 series processors be relinked as virtual jobs to be run under XM. They should use both virtual overlays and virtual .SETTOP as required to minimize low memory use. A useful technique is to create a dummy root which calls the real main program linked as virtual overlay segment 1. Field testing has shown that this procedure is usually necessary when attempting to run large programs that formerly executed under the SJ or FB monitor.

  Should you be unable to relink your programs, an alternative may be to use the unsupported virtual run utility VBGEXE. It creates a simulated SJ/FB environment that is sufficient to execute many programs without relinking. For more information, refer to the file UNSUP.TXT.

- Due to possible contention with the KT-11, split-screen scrolling under the FB monitor refreshes the screen on each line scroll. DIGITAL recommends using the XM monitor on Professional 300 series processors.

- SETUP DATE,TIME should be issued after the first hard boot to correctly set the time-of-year clock. Otherwise subsequent boots will assume the clock is valid because the battery will have had time to charge. This command is included in the automatic installation procedure by default.

- On Professional series computers, bootstrapping the system always causes a terminal restart; that is, whenever you bootstrap the system, terminal status reverts to the last information saved by SETUP.

- Due to memory limitations, the 132-column mode is not available under the FB monitor.

- PRINT SCREEN can only be used under the XM monitor.

- The SJ monitor is not supported.

- 8-bit ASCII code is not supported.

- Professional 300 series and MICRO/PDP-11 processors can read and write the same RX50 diskettes. However, bootable system volumes are not interchangeable. A bootable system diskette written for the Professional 300 does not boot a MICRO/PDP-11.

CORRECTED PROBLEMS AND CURRENT RESTRICTIONS

- You cannot use ODT (on-line debugging technique) on a Professional 325 or 350. Use VDT (virtual debugging technique) instead.

- Only one RX50 controller module can be used. No additional RX50 diskette drives can be added.

- FILEX is not supported.

- The BOOT/FOREIGN command is not supported.

- No input/output (write/read) operation can be addressed to the PI (Professional interface) handler; attempts to do so cause a hard error. PI must be present on the system disk and loaded at all times.

- The Professional 300 series processors do not support split-screen smooth scrolling.

- RT-11 V5.1 does not support the following VT100 control character codes, modes, character sets, or tests, adjustments and reports:

Control Character Codes:

    ETX (end of text)

    EOT (end of transmission)

Modes:

    DECPEX (printer extent mode)

    DECPFF (printer form-feed mode)

    SRM (send-receive mode)

    MC (auto print mode)

    Interlace mode

    All VT52 modes

Character Sets:

    Alternate ROM character set

    Alternate ROM special characters set

Tests, Adjustments and Reports:

    All DECTST (device diagnostic tests)

    ECLL (load LED)

    DSR (printer)

CORRECTED PROBLEMS AND CURRENT RESTRICTIONS

177400-177477   Reserved for multiterminal support

177500-177677   Reserved

177700   Used by the .TWAIT request

177701-177766   Reserved

177767-177777   DECnet

Values in the range 177000-177677 must be cancelled
individually by the routine that issued the .TIMIO
request. This would occur, for example, in handler abort
code.

Values in the range 177700-177777 are automatically
cancelled whenever a program terminates or aborts.

In Section 2.44, the description of the argument for the .MTPS
programmed request is incorrect. The argument addr should be changed
to the argument value, which represents the value you want to load
into the processor status word.

In Section 2.90, .TTYIN/.TTINR, the third paragraph (beginning with
"If the carry bit ...") is incorrect. The second sentence should
read:

Under the FB or XM monitor and under an SJ monitor with
multiterminal support, .TTINR does not return the carry
bit set unless bit 6 of the job status word (JSW) was on
when the request was issued.

3.2.5 RT-11 Software Support Manual

In Table 10-11 of the RT-11 Software Support Manual, under the
description of First Word Code 3, and in Table 10-12, under the
description of First Word Code 4, the second paragraph should read as
follows:

The second word in the status block contains the number
of blocks requested to be spaced (wcnt), minus the number
of blocks spaced if a tape mark or BOT is detected. (A
tape mark is counted as a block.) Otherwise, its value
is not defined. The tape will be positioned after the
tape mark on forward spacing, and before the tape mark on
backward spacing.

The last paragraph of Section 7.6.1 contains the sentence:
"Start with 177000 and work up to the highest valid sequence
number, 177377." Replace this sentence with the following
sentence:

To ensure a unique number, use a value of 177000+devcod,
where devcod is the device identifier code used in the
.DRDEF macro at the beginning of the handler.

CORRECTED PROBLEMS AND CURRENT RESTRICTIONS

3.2.6 RT-11 System Message Manual

See Appendix A for a list of error messages that are not documented in
the RT-11 System Message Manual.

3.3 CURRENT RESTRICTIONS

When running RT-11 Version 5.1, observe the following restrictions.

  ● IND control files cannot include an indirect command file
    which, in turn, calls another IND control file. Such files
    also cannot call a KMON command file which, in turn, calls
    another IND control file.

  ● You cannot place CSI commands or DCL commands that require
    more than one line in IND control files. To execute CSI
    commands and multiline DCL commands from an IND control file,
    create an indirect command file that contains the command, and
    call the command file from the control file by using the $@
    syntax. Alternatively, you can use CCL.

    For example, the following IND control file executes a CSI
    command by creating an indirect command file, then calling the
    indirect command file.

                .IFF PIP .GOTO 1
                .OPEN SECOND.COM
                .DATA R PIP
                .DATA A.MAC=B.MAC
                .DATA ^C
                .CLOSE
                $@SECOND
        .1:   .ASKS ...

    Instead of creating the indirect command file, you can achieve
    the same result by using the following CCL command example.

        .IFT PIP PIP A.MAC=B.MAC

  ● If you pass more than one command through a special chain
    exit, you can call an indirect command file only as the last
    command in a series of chain exits.

  ● If you use the RT-11 Version 5 command INIT/VOL to assign a
    volume ID, that volume ID will not be displayed when you issue
    the command DIR/VOL under RT-11 Version 4.

  ● TU58 DECtape II cannot be used as the system device on a 38.4K
    baud line. You must change your hardware to lower the baud to
    19.2K.

  ● You cannot use BUP (or the BACKUP command) to back up a disk
    to magtape if the disk contains bad blocks covered with
    FILE.BAD files. Use PIP or the COPY command instead. This
    restriction does not apply during disk-to-disk backup
    operations, or to disks initialized using bad block
    replacement rather than bad block covering.

CORRECTED PROBLEMS AND CURRENT RESTRICTIONS

● The VM handler may not be used on a PDP-11/23 processor with MSV11 memory, strapped for a 2KW I/O page. The VM handler installs, but any attempt to perform I/O to it immediatly returns a hard error. This occurs because the VM handler must turn on the memory management unit to operate. However, when the MMU is enabled, the I/O page reverts to 4KW and corrupts the top 2KW of the monitor.

● The single-line editor does not support the use of control characters as input data. Before you run a program that must receive control characters as input data in line mode, you must turn off the single-line editor. Use the SET SL OFF command, or have your program set the EDIT$ bit (bit 4) in the JSW.

  This restriction does not apply to programs that use special mode input.

● When the single-line editor is enabled, the command COPY TT: filespec does not work.

● When running under the XM monitor, programs that fetch magtape handlers must place them above PAR1 space.

● Even when .ENABL MCL is in effect, you must manually .MCALL any macros whose names conflict with names in the MACRO-11 permanent symbol table (such as .PRINT).

● You cannot run the BATCH processor and IND simultaneously. You must have SET KMON NOIND in effect to run BATCH. Also, you cannot run BATCH from an IND control file.

● You can use the RUN command to run virtual programs only if the program does not require the keyboard monitor to write to the swap blocks (SWAP.SYS). That is, the size of the program's root segment must not overload the keyboard monitor. If this happens, the error message ?MON-F-MMU fault appears.

● On Professional series computers, bootstrapping the system always causes a terminal restart; that is, whenever you bootstrap the system, terminal status reverts to the last information saved by SETUP.

● DIGITAL recommends that you do not use the command SET LS NOHANG. When you use SET LS NOHANG, printers with very large buffers may abort before they are through printing. The SET LS NOHANG command will be removed in a later release of RT-11.

CHAPTER 4

INSTALLATION, BOOTSTRAP, AND HARDWARE SETUP PROCEDURES

This chapter describes procedures you may need to follow, depending on
your distribution kit and your hardware configuration. Additional
information for this chapter is contained in two files on the RT-11
distribution kit:

> V5NOTE.TXT contains procedures and software customizations that
> are not listed in the RT-11 documentation.

> CUSTOM.TXT contains a table that helps you determine the correct
> values and addresses to use when installing software
> customizations.

Chapter 2 of the RT-11 Installation Guide provides and describes
software customizations. In the customizations, symbols are used in
place of values and addresses. When you install software
customizations, use the values and addresses provided in CUSTOM.TXT in
place of each symbol shown in the software customization.

4.1 PROCEDURES FOR DISTRIBUTION KITS

All RT-11 distribution kits contain system software, and automatic
installation and verification software. However, automatic
installation and verification is supported only with certain
distribution kits: RLØ2, RXØ2, and RX5Ø. If you attempt to bootstrap
the automatic installation monitor (RT11AI.SYS for PDP-11 systems,
RT11PI.SYS for Professional 300 series systems) on a distribution kit
that does not support automatic installation, the installation
procedure informs you that automatic installation is not supported,
and you must install your system manually.

You may need to follow the procedures described below, if your
distribution kit does not support automatic installation or if your
hardware configuration does not meet automatic installation
requirements.

> ● When you bootstrap an RLØ2, RXØ2, or RX5Ø distribution kit,
> the automatic installation monitor (RT11AI.SYS for PDP-11
> systems, RT11PI.SYS for Professional 300 series systems) is
> bootstrapped. If your hardware configuration meets automatic
> installation requirements, the installation procedure tells
> you how to proceed. (See the appropriate RT-11 Automatic
> Installation Booklet for more details on automatic
> installation.) If, however, your hardware configuration does
> not meet automatic installation requirements, the automatic
> installation procedure informs you that automatic installation
> is not supported, and you must install your system by
> following the procedures in the RT-11 Installation Guide. If

your configuration does not include a line clock or 24KW of memory (FB monitor requirements), you must first copy the bootstrap for the SJ monitor from RT11SJ.SYS to your system volume while still operating under the automatic installation monitor, RT11AI.SYS or RT11PI.SYS.

● RX01 distribution kits contain two copies of the RT-11 distributed software, so you do not need to back up the distribution kit. Store one copy as your master distribution kit, and bootstrap Volume 1 of the second copy to complete system installation. Follow the instructions in the RT-11 Installation Guide. If you are following Chapter 3, you need not perform any of the operations described in Section 3.2 for preserving the distribution volumes, except for the instructions for removing protection from files beginning near the middle of page 3-6.

● Volume 10 of RX01 distribution kits includes the same software as the AUTO volume on kits that support automatic installation. This volume is also PDT-11/150 bootable. However, if you bootstrap this volume on a PDT-11/150, the installation procedure informs you that automatic installation is not supported, and you must follow the procedures in the RT-11 Installation Guide to install your system. To create a PDT-11/150-bootable RT-11 distribution kit, you should then respond to the keyboard monitor prompt (.) by using the COPY/BOOT command to copy the PD bootstrap to volume 1 of the RX01 distribution kit.

4.2 PROCEDURES FOR LINE PRINTERS AND TERMINALS

This section describes procedures you may need to follow to use your line printer or terminal.

4.2.1 Line Printer Handlers

This section describes restrictions and workaround solutions for using line printers with RT-11.

● If output to some models of line printers is terminated prematurely, the print head may not be at the left margin. When output to the printer is resumed, printing may begin in the middle of the line. To prevent this, reset the printer manually.

● Some conditions cause data sent to a printer using the LS handler to be lost without warning. Those are:

    For all terminals: The printer is powered down or placed off-line.

    For all terminals except LA34, LA38, LA120, LS120, or serial LA180: The terminal encounters an error condition while in operation.

● The LS handler cannot be used to communicate with the console terminal. Instead, you must use the TT handler.

● The SET LS NOHANG option is valid only if device timeout
  support is included in a monitor created through system
  generation. However, DIGITAL recommends that you do not use
  the command SET LS NOHANG. This command can cause printers
  with very large buffers to abort before they are through
  printing.

● If the LP or LS handler NOFORM or SKIP option is used, load
  the handler by including a LOAD command in your STARTx.COM
  files. Then, manually set the printer paper to top of page
  each time the system is bootstrapped (top of page is normally
  set so printing begins on the fourth print line down from the
  page perforation). Afterward, you should not manually move
  the paper. Instead, the handler should perform all movement
  of the paper.

  For example, to remove the last printed file from the printer,
  you must send two form feeds to the printer. Create the file
  FF.LST with an editor, and include in it only two form feed
  characters (CTRL/L). When you issue the command PRINT FF, the
  printer will perform two form feeds, so you can remove the
  last file printed. The top of page will still be set
  correctly for printing the next file.

● For the LS handler, the default CSR address is 176500 and the
  default vector address is 300. If your line printer is
  connected to a DL11/DLV11 interface with different addresses,
  use the SET LS CSR and SET LS VECTOR commands to modify the
  default values. For example, to modify the LS handler to use
  the MINC-11 printer port, SLU2, issue the following command:

        SET LS CSR=176520,VECTOR=320

4.2.2 Recommended Terminal/Line Printer SET Command Options

This section lists the nondefault SET options recommended for use with
the terminals and line printers shown.

LA30, LA35, LA36, and LS120

    SET TT WIDTH=n
    SET LP/LS CR,CTRL,NOFORM,NOFORM0,LC,WIDTH=n

LA34 and LA38

    SET TT TAB,WIDTH=n
    SET LP/LS CR,CTRL,NOFORM,NOFORM0,LC,TAB,WIDTH=n

LA120

    SET TT FORM,TAB,WIDTH=n
    SET LP/LS CR,CTRL,NOFORM0,LC,TAB,WIDTH=n

LA180

    SET LP/LS CR,CTRL,NOFORM0,LC,WIDTH=n

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VT05

    SET TT SCOPE,TAB,WIDTH=72

VT50, VT52, VT55, and VT100 Series

    SET TT NOCRLF,SCOPE,TAB

SET TT commands are not permanent and must be issued every time the monitor is bootstrapped. Therefore, DIGITAL recommends that you include the command in the appropriate STARTx.COM file(s). However, SET LP and SET LS commands modify the permanent copy of the handler, so you need to issue them only once.

When running under a multiterminal monitor, you can set the characteristics of local terminals other than the boot-time console: Include the command SET TT CONSOLE=n in an appropriate STARTx.COM file followed by the SET TT commands you want for that terminal. After all the terminal characteristics have been set, include the SET TT CONSOLE=0 command in the STARTx.COM file to return control to the boot-time console.

Of the SET TT commands listed, only the SET TT SCOPE command is valid for a single-terminal SJ monitor.

4.2.3 Recommended VT100 Series, VT105, and LA120 Setup Mode Options

This section lists recommended setup modes for VT100, VT105, and LA120 series terminals. Terminal bauds should be set to correspond to the computer interface. Setup options other than those discussed below should be set for operator preference or form requirements. To permanently save the setup options you select, type <SHIFT/S> on a VT100 series or VT105 and <SHIFT/9> on an LA120.

4.2.3.1 VT100 Series and VT105 Terminals - The following setup mode options are recommended for normal use on VT100 series and VT105 terminals:

    On line

    Autorepeat on

    Margin bell off (when preparing FORTRAN programs, it may be useful to have the margin bell set on, to notify you when column 72 is reached)

    Auto XON/XOFF on

    Wrap around on

    New line off

    Interlace off

    Parity off

    Bits per character 8

    Tabs set every 8 columns

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4.2.3.2 LA120 Series Terminals - LA120 terminals should be initialized to factory settings. Then, buffer control should be changed to small. The following factory setup options should not normally be changed:

line/local status

local echo

auto newline

parity and data bits

auto repeat

auto linefeed

XON/XOFF

printer new line character

Use the LA120 local form feed key to make sure that the paper is positioned correctly at top of form before printing a listing.

APPENDIX A

RT-11 V5.1B SOFTWARE KIT MAPS

The following sections contain kit maps for the RT-11 distribution media:

Section	Media
A.1	RX50 diskettes
A.2	RX01 diskettes
A.3	RX02 diskettes
A.4	RL01, RL02, RK05 disks
A.5	9-track, 800 bits/in magtape

NOTE

The following software kit maps are accurate for RT-11 Version 5.1B. However, future updates to RT-11 may change the software kit maps. DIGITAL recommends that you use the command DIRECTORY/PRINTER to print a listing of your distribution media if there is any question as to its contents.

A.1 RX50 DISKETTES

AUTO

```
        SWAP   .SYS     26P  07-Mar-84      RT11AI.SYS     75P  07-Mar-84
        RT11PI.SYS     89P  07-Mar-84      TT     .SYS      2P  07-Mar-84
        DL     .SYS      4P  07-Mar-84      DU     .SYS      4P  07-Mar-84
        DZ     .SYS      4P  07-Mar-84      DW     .SYS      5P  07-Mar-84
        PI     .SYS     56P  07-Mar-84      DY     .SYS      4P  07-Mar-84
        TERMID.SAV       3P  07-Mar-84      PIP    .SAV     30P  07-Mar-84
        DIR    .SAV     19P  07-Mar-84      IND    .SAV     51P  07-Mar-84
        DUP    .SAV     45P  07-Mar-84      SETUP  .SAV     29P  07-Mar-84
        QUEUE  .REL     14P  07-Mar-84      QUEMAN.SAV      15P  07-Mar-84
        STARTA.COM      54P  07-Mar-84      IVP    .MAC     25P  07-Mar-84
        IVP    .COM     16P  07-Mar-84      CONFIG.SAV.      2P  07-Mar-84
        CONFIG.COM      28P  07-Mar-84      RTBL   .MAP     20P  07-Mar-84
        RTFB   .MAP     28P  07-Mar-84      RTSJ   .MAP     20P  07-Mar-84
        RTXM   .MAP     31P  07-Mar-84      CUSTOM.TXT      11P  07-Mar-84
        V5NOTE.TXT      30P  07-Mar-84      UNSUP  .TXT     26P  07-Mar-84
         30 Files, 766 Blocks
         20 Free blocks
```

RT-11 V5.1B SOFTWARE KIT MAPS

Volume 1

SWAP	.SYS	26P	07-Mar-84	RT11XM.SYS		99P	07-Mar-84
DUX	.SYS	4P	07-Mar-84	DZX	.SYS	4P	07-Mar-84
DWX	.SYS	5P	07-Mar-84	NLX	.SYS	2P	07-Mar-84
PIX	.SYS	63P	07-Mar-84	DDX	.SYS	5P	07-Mar-84
DLX	.SYS	5P	07-Mar-84	DMX	.SYS	5P	07-Mar-84
DXX	.SYS	4P	07-Mar-84	DYX	.SYS	4P	07-Mar-84
LDX	.SYS	8P	07-Mar-84	LPX	.SYS	2P	07-Mar-84
LSX	.SYS	3P	07-Mar-84	MMX	.SYS	10P	07-Mar-84
MSX	.SYS	11P	07-Mar-84	MTX	.SYS	9P	07-Mar-84
RKX	.SYS	3P	07-Mar-84	SLX	.SYS	16P	07-Mar-84
VMX	.SYS	2P	07-Mar-84	XLX	.SYS	4P	07-Mar-84
SPX	.SYS	6P	07-Mar-84	XCX	.SYS	4P	07-Mar-84
KEX	.SAV	54P	07-Mar-84	IND	.SAV	51P	07-Mar-84
PIP	.SAV	30P	07-Mar-84	DUP	.SAV	45P	07-Mar-84
DIR	.SAV	19P	07-Mar-84	RESORC.SAV		22P	07-Mar-84
HELP	.SAV	136P	07-Mar-84	SETUP	.SAV	29P	07-Mar-84
LET	.SAV	5P	07-Mar-84	UCL	.SAV	13P	07-Mar-84
VTCOM	.SAV	23P	07-Mar-84	VERIFY.COM		3P	07-Mar-84
V5USER.TXT		3P	07-Mar-84	STARTX.COM		8P	07-Mar-84

    38 Files, 745 Blocks
    41 Free blocks

Volume 2

FORMAT.SAV		23P	07-Mar-84	KED	.SAV	59P	07-Mar-84
EDIT	.SAV	19P	07-Mar-84	ERROUT.SAV		18P	07-Mar-84
VBGEXE.SAV		16P	07-Mar-84	MACRO	.SAV	60P	07-Mar-84
CREF	.SAV	6P	07-Mar-84	LINK	.SAV	49P	07-Mar-84
SYSMAC.SML		49P	07-Mar-84	SYSLIB.OBJ		47P	07-Mar-84
SRCCOM.SAV		26P	07-Mar-84	SPOOL	.REL	11P	07-Mar-84
DATIME.SAV		4P	07-Mar-84	DATIME.COM		3P	07-Mar-84
SPLIT	.SAV	3P	07-Mar-84	TRANSF.SAV		16P	07-Mar-84
VTCOM	.REL	25P	07-Mar-84	ODT	.OBJ	8P	07-Mar-84
VDT	.OBJ	8P	07-Mar-84	QUEUE	.REL	14P	07-Mar-84
RTMON	.REL	8P	07-Mar-84	BATCH	.SAV	26P	07-Mar-84
BINCOM.SAV		24P	07-Mar-84	BUP	.SAV	37P	07-Mar-84
DUMP	.SAV	8P	07-Mar-84	FILEX	.SAV	22P	07-Mar-84
K52	.SAV	55P	07-Mar-84	LIBR	.SAV	24P	07-Mar-84
MDUP	.SAV	19P	07-Mar-84	PAT	.SAV	10P	07-Mar-84
QUEMAN.SAV		15P	07-Mar-84	SIPP ·	.SAV	21P	07-Mar-84
SLP	.SAV	13P	07-Mar-84	SPEED	.SAV	4P	07-Mar-84

    34 Files, 750 Blocks
    36 Free blocks

Volume 3

RT11SJ.SYS		73P	07-Mar-84	RT11BL.SYS		73P	07-Mar-84
RT11FB.SYS		87P	07-Mar-84	SLMIN	.SYS	12P	07-Mar-84
DY	.SYS	4P	07-Mar-84	VM	.SYS	3P	07-Mar-84
CR	.SYS	3P	07-Mar-84	CT	.SYS	6P	07-Mar-84
DD	.SYS	5P	07-Mar-84	DL	.SYS	4P	07-Mar-84
DM	.SYS	5P	07-Mar-84	DP	.SYS	3P	07-Mar-84
DS	.SYS	3P	07-Mar-84	DT	.SYS	3P	07-Mar-84
DU	.SYS	4P	07-Mar-84	DZ	.SYS	4P	07-Mar-84
DW	.SYS	5P	07-Mar-84	DX	.SYS	4P	07-Mar-84
PI	.SYS	56P	07-Mar-84	XL	.SYS	4P	07-Mar-84
XC	.SYS	4P	07-Mar-84	SP	.SYS	6P	07-Mar-84
LD	.SYS	8P	07-Mar-84	LP	.SYS	2P	07-Mar-84
LS	.SYS	3P	07-Mar-84	MM	.SYS	9P	07-Mar-84
MS	.SYS	10P	07-Mar-84	MT	.SYS	9P	07-Mar-84

```
NL     .SYS        2P  07-Mar-84      TT      .SYS        2P  07-Mar-84
PC     .SYS        2P  07-Mar-84      PD      .SYS        3P  07-Mar-84
RF     .SYS        3P  07-Mar-84      RK      .SYS        3P  07-Mar-84
SL     .SYS       14P  07-Mar-84      STARTF.COM          4P  07-Mar-84
STARTS.COM         1P  07-Mar-84
     37 Files, 446 Blocks
     340 Free blocks
```

Volume 4

```
    SYSGEN.COM       206P  07-Mar-84      BL      .ANS        8P  07-Mar-84
    SJFB  .ANS         9P  07-Mar-84      XM      .ANS        8P  07-Mar-84
    MBOOT .BOT         1P  07-Mar-84      MBOT16.BOT          1P  07-Mar-84
    MSBOOT.BOT         3P  07-Mar-84      DISMT1.COM         13P  07-Mar-84
    DISMT2.COM         8P  07-Mar-84      ERROUT.OBJ         15P  07-Mar-84
    SAMPLE.KED         4P  07-Mar-84      DEMOED.TXT          1P  07-Mar-84
    DEMOBG.MAC         2P  07-Mar-84      DEMOFG.MAC          3P  07-Mar-84
    DEMOX1.MAC         3P  07-Mar-84      DEMOF1.FOR          2P  07-Mar-84
    MDUP  .MM         56P  07-Mar-84      MDUP  .MS          56P  07-Mar-84
    MDUP  .MT         56P  07-Mar-84      VTHDLR.OBJ          8P  07-Mar-84
    PUTSTR.FOR         2P  07-Mar-84      GETSTR.FOR          2P  07-Mar-84
    CONSOL.MAC         6P  07-Mar-84
     23 Files, 473 Blocks
     313 Free blocks
```

Volume 5

```
    TRMTBL.MAC        19P  07-Mar-84      USR     .MAC       66P  07-Mar-84
    BSTRAP.MAC        66P  07-Mar-84      EDTGBL.MAC         32P  07-Mar-84
    KMON  .MAC       120P  07-Mar-84      KMOVLY.MAC        205P  07-Mar-84
    RMONFB.MAC       146P  07-Mar-84      RMONSJ.MAC         70P  07-Mar-84
    XMSUBS.MAC        34P  07-Mar-84
     9 Files, 758 Blocks
     28 Free blocks
```

Volume 6

```
    SJ     .MAC        1P  07-Mar-84      XM      .MAC        1P  07-Mar-84
    FB     .MAC        1P  07-Mar-84      TM      .MAC       26P  07-Mar-84
    TJ     .MAC       31P  07-Mar-84      XC      .MAC        1P  07-Mar-84
    TS     .MAC       33P  07-Mar-84      FSM     .MAC       32P  07-Mar-84
    BA     .MAC       20P  07-Mar-84      CR      .MAC       15P  07-Mar-84
    CT     .MAC       33P  07-Mar-84      DD      .MAC       26P  07-Mar-84
    DL     .MAC       26P  07-Mar-84      DM      .MAC       26P  07-Mar-84
    DP     .MAC       11P  07-Mar-84      DS      .MAC       10P  07-Mar-84
    DT     .MAC        9P  07-Mar-84      DZ      .MAC       17P  07-Mar-84
    DW     .MAC       26P  07-Mar-84      XL      .MAC       27P  07-Mar-84
    SP     .MAC       41P  07-Mar-84      DU      .MAC       31P  07-Mar-84
    DX     .MAC       21P  07-Mar-84      DY      .MAC       23P  07-Mar-84
    LD     .MAC       45P  07-Mar-84      LP      .MAC        9P  07-Mar-84
    LS     .MAC       19P  07-Mar-84      NL      .MAC        3P  07-Mar-84
    PC     .MAC        5P  07-Mar-84      PD      .MAC       12P  07-Mar-84
    RF     .MAC        7P  07-Mar-84      EL      .MAC       16P  07-Mar-84
    RK     .MAC       11P  07-Mar-84      TT      .MAC        7P  07-Mar-84
    VM     .MAC       17P  07-Mar-84      VTMAC .MAC          7P  07-Mar-84
    ELCOPY.MAC        15P  07-Mar-84      ELINIT.MAC         16P  07-Mar-84
    ELTASK.MAC         9P  07-Mar-84      ERRTXT.MAC          6P  07-Mar-84
    MTTEMT.MAC        18P  07-Mar-84      MTTINT.MAC         46P  07-Mar-84
     42 Files, 756 Blocks
     30 Free blocks
```

A.2 RXØ1 DISKETTES

Volume 1

```
SWAP   .SYS    26P  Ø7-Mar-84      RT11FB.SYS    87P  Ø7-Mar-84
DY     .SYS     4P  Ø7-Mar-84      DL    .SYS     4P  Ø7-Mar-84
DZ     .SYS     4P  Ø7-Mar-84      DW    .SYS     5P  Ø7-Mar-84
DU     .SYS     4P  Ø7-Mar-84      LD    .SYS     8P  Ø7-Mar-84
SL     .SYS    14P  Ø7-Mar-84      VM    .SYS     3P  Ø7-Mar-84
RK     .SYS     3P  Ø7-Mar-84      DM    .SYS     5P  Ø7-Mar-84
DD     .SYS     5P  Ø7-Mar-84      TT    .SYS     2P  Ø7-Mar-84
LP     .SYS     2P  Ø7-Mar-84      LS    .SYS     3P  Ø7-Mar-84
NL     .SYS     2P  Ø7-Mar-84      MT    .SYS     9P  Ø7-Mar-84
MM     .SYS     9P  Ø7-Mar-84      MS    .SYS    1ØP  Ø7-Mar-84
DS     .SYS     3P  Ø7-Mar-84      DT    .SYS     3P  Ø7-Mar-84
DP     .SYS     3P  Ø7-Mar-84      DX    .SYS     4P  Ø7-Mar-84
RF     .SYS     3P  Ø7-Mar-84      PC    .SYS     2P  Ø7-Mar-84
PD     .SYS     3P  Ø7-Mar-84      CT    .SYS     6P  Ø7-Mar-84
CR     .SYS     3P  Ø7-Mar-84      SP    .SYS     6P  Ø7-Mar-84
XL     .SYS     4P  Ø7-Mar-84      XC    .SYS     4P  Ø7-Mar-84
IND    .SAV    51P  Ø7-Mar-84      PIP   .SAV    30P  Ø7-Mar-84
DUP    .SAV    45P  Ø7-Mar-84      DIR   .SAV    19P  Ø7-Mar-84
KED    .SAV    59P  Ø7-Mar-84      RESORC.SAV    22P  Ø7-Mar-84
STARTF.COM      4P  Ø7-Mar-84      V5USER.TXT     3P  Ø7-Mar-84
   40 Files, 486 Blocks
   Ø Free blocks
```

Volume 2

```
RT11BL.SYS    73P  Ø7-Mar-84      RT11SJ.SYS    73P  Ø7-Mar-84
RT11XM.SYS    99P  Ø7-Mar-84      SLMIN .SYS    12P  Ø7-Mar-84
DYX    .SYS     4P  Ø7-Mar-84      DLX   .SYS     5P  Ø7-Mar-84
DZX    .SYS     4P  Ø7-Mar-84      DWX   .SYS     5P  Ø7-Mar-84
XLX    .SYS     4P  Ø7-Mar-84      SPX   .SYS     6P  Ø7-Mar-84
XCX    .SYS     4P  Ø7-Mar-84      PIX   .SYS    63P  Ø7-Mar-84
DUX    .SYS     4P  Ø7-Mar-84      LDX   .SYS     8P  Ø7-Mar-84
VMX    .SYS     2P  Ø7-Mar-84      DMX   .SYS     5P  Ø7-Mar-84
DDX    .SYS     5P  Ø7-Mar-84      LPX   .SYS     2P  Ø7-Mar-84
LSX    .SYS     3P  Ø7-Mar-84      DXX   .SYS     4P  Ø7-Mar-84
RKX    .SYS     3P  Ø7-Mar-84      SLX   .SYS    16P  Ø7-Mar-84
NLX    .SYS     2P  Ø7-Mar-84      MSX   .SYS    11P  Ø7-Mar-84
MTX    .SYS     9P  Ø7-Mar-84      MMX   .SYS    1ØP  Ø7-Mar-84
STARTS.COM      1P  Ø7-Mar-84      STARTX.COM     8P  Ø7-Mar-84
   28 Files, 445 Blocks
   41 Free blocks
```

Volume 3

```
PI     .SYS    56P  Ø7-Mar-84      EDIT  .SAV    19P  Ø7-Mar-84
K52    .SAV    55P  Ø7-Mar-84      MACRO .SAV    6ØP  Ø7-Mar-84
CREF   .SAV     6P  Ø7-Mar-84      LINK  .SAV    49P  Ø7-Mar-84
LIBR   .SAV    24P  Ø7-Mar-84      SYSMAC.SML    49P  Ø7-Mar-84
SYSLIB.OBJ     47P  Ø7-Mar-84      ODT   .OBJ     8P  Ø7-Mar-84
VDT    .OBJ     8P  Ø7-Mar-84      PAT   .SAV    1ØP  Ø7-Mar-84
BINCOM.SAV     24P  Ø7-Mar-84      SRCCOM.SAV    26P  Ø7-Mar-84
DUMP   .SAV     8P  Ø7-Mar-84
   15 Files, 449 Blocks
   37 Free blocks
```

Volume 4

```
    FORMAT.SAV      23P 07-Mar-84        BUP   .SAV     37P 07-Mar-84
    FILEX .SAV      22P 07-Mar-84        SIPP  .SAV     21P 07-Mar-84
    SLP   .SAV      13P 07-Mar-84        HELP  .SAV    136P 07-Mar-84
    SYSGEN.COM     206P 07-Mar-84        BL    .ANS      8P 07-Mar-84
    SJFB  .ANS       9P 07-Mar-84        XM    .ANS      8P 07-Mar-84
      10 Files, 483 Blocks
      3 Free blocks
```

Volume 5

```
    SJ    .MAC       1P 07-Mar-84        FB    .MAC      1P 07-Mar-84
    XM    .MAC       1P 07-Mar-84        XL    .MAC     27P 07-Mar-84
    EDTGBL.MAC      32P 07-Mar-84        BSTRAP.MAC     66P 07-Mar-84
    KMON  .MAC     120P 07-Mar-84        KMOVLY.MAC    205P 07-Mar-84
      8 Files, 453 Blocks
      33 Free blocks
```

Volume 6

```
    SP    .MAC      41P 07-Mar-84        USR   .MAC     66P 07-Mar-84
    RMONSJ.MAC      70P 07-Mar-84        RMONFB.MAC    146P 07-Mar-84
    XMSUBS.MAC      34P 07-Mar-84        MTTEMT.MAC     18P 07-Mar-84
    MTTINT.MAC      46P 07-Mar-84        CR    .MAC     15P 07-Mar-84
    CT    .MAC      33P 07-Mar-84        DT    .MAC      9P 07-Mar-84
    PC    .MAC       5P 07-Mar-84
      11 Files, 483 Blocks
      3 Free blocks
```

Volume 7

```
    TRMTBL.MAC      19P 07-Mar-84        BA    .MAC     20P 07-Mar-84
    DD    .MAC      26P 07-Mar-84        DL    .MAC     26P 07-Mar-84
    DM    .MAC      26P 07-Mar-84        DP    .MAC     11P 07-Mar-84
    DS    .MAC      10P 07-Mar-84        DZ    .MAC     17P 07-Mar-84
    DW    .MAC      26P 07-Mar-84        DU    .MAC     31P 07-Mar-84
    DX    .MAC      21P 07-Mar-84        DY    .MAC     23P 07-Mar-84
    EL    .MAC      16P 07-Mar-84        ELCOPY.MAC     15P 07-Mar-84
    ELINIT.MAC      16P 07-Mar-84        ELTASK.MAC      9P 07-Mar-84
    FSM   .MAC      32P 07-Mar-84        LD    .MAC     45P 07-Mar-84
    LP    .MAC       9P 07-Mar-84        LS    .MAC     19P 07-Mar-84
    NL    .MAC       3P 07-Mar-84        PD    .MAC     12P 07-Mar-84
    RK    .MAC      11P 07-Mar-84        TJ    .MAC     31P 07-Mar-84
    XC    .MAC       1P 07-Mar-84        TT    .MAC      7P 07-Mar-84
      26 Files, 482 Blocks
      4 Free blocks
```

Volume 8

RF	.MAC	7P	07-Mar-84	ERROUT.SAV	18P	07-Mar-84
ERROUT.OBJ		15P	07-Mar-84	ERRTXT.MAC	6P	07-Mar-84
MDUP	.SAV	19P	07-Mar-84	MDUP .MM	56P	07-Mar-84
MDUP	.MT	56P	07-Mar-84	MDUP .MS	56P	07-Mar-84
MBOT16.BOT		1P	07-Mar-84	MBOOT .BOT	1P	07-Mar-84
MSBOOT.BOT		3P	07-Mar-84	DISMT1.COM	13P	07-Mar-84
DISMT2.COM		8P	07-Mar-84	V5NOTE.TXT	30P	07-Mar-84
RTBL	.MAP	20P	07-Mar-84	RTFB .MAP	28P	07-Mar-84
RTSJ	.MAP	20P	07-Mar-84	RTXM .MAP	31P	07-Mar-84

18 Files, 388 Blocks
98 Free blocks

Volume 9

BATCH	.SAV	26P	07-Mar-84	QUEMAN.SAV	15P	07-Mar-84
TS	.MAC	33P	07-Mar-84	TM .MAC	26P	07-Mar-84
VM	.MAC	17P	07-Mar-84	SPEED .SAV	4P	07-Mar-84
SETUP	.SAV	29P	07-Mar-84	SPLIT .SAV	3P	07-Mar-84
UCL	.SAV	13P	07-Mar-84	VBGEXE.SAV	16P	07-Mar-84
KEX	.SAV	54P	07-Mar-84	LET .SAV	5P	07-Mar-84
UNSUP	.TXT	26P	07-Mar-84	QUEUE .REL	14P	07-Mar-84
RTMON	.REL	8P	07-Mar-84	CONSOL.MAC	6P	07-Mar-84
SAMPLE.KED		4P	07-Mar-84	DATIME.SAV	4P	07-Mar-84
DATIME.COM		3P	07-Mar-84	VTCOM .SAV	23P	07-Mar-84
VTCOM	.REL	25P	07-Mar-84	TRANSF.SAV	16P	07-Mar-84
SPOOL	.REL	11P	07-Mar-84	VTMAC .MAC	7P	07-Mar-84
VTHDLR.OBJ		8P	07-Mar-84	DEMOBG.MAC	2P	07-Mar-84
DEMOFG.MAC		3P	07-Mar-84	DEMOX1.MAC	3P	07-Mar-84
DEMOF1.FOR		2P	07-Mar-84	DEMOED.TXT	1P	07-Mar-84
PUTSTR.FOR		2P	07-Mar-84	GETSTR.FOR	2P	07-Mar-84

32 Files, 411 Blocks
75 Free blocks

Volume 10

SWAP	.SYS	26P	07-Mar-84	RT11AI.SYS	75P	07-Mar-84
RT11PI.SYS		89P	07-Mar-84	TT .SYS	2P	07-Mar-84
PD	.SYS	3P	07-Mar-84	TERMID.SAV	3P	07-Mar-84
PIP	.SAV	30P	07-Mar-84	DIR .SAV	19P	07-Mar-84
IND	.SAV	51P	07-Mar-84	DUP .SAV	45P	07-Mar-84
STARTA.COM		54P	07-Mar-84	VERIFY.COM	3P	07-Mar-84
IVP	.MAC	25P	07-Mar-84	IVP .COM	16P	07-Mar-84
CONFIG.SAV		2P	07-Mar-84	CONFIG.COM	28P	07-Mar-84
CUSTOM.TXT		11P	07-Mar-84			

17 Files, 482 Blocks
4 Free blocks

A.3 RX02 DISKETTES

AUTO

SWAP	.SYS	26P	07-Mar-84	RT11AI.SYS	75P	07-Mar-84
RT11PI.SYS	89P	07-Mar-84	TT .SYS	2P	07-Mar-84
DL	.SYS	4P	07-Mar-84	DU .SYS	4P	07-Mar-84
DZ	.SYS	4P	07-Mar-84	DW .SYS	5P	07-Mar-84
PI	.SYS	56P	07-Mar-84	DY .SYS	4P	07-Mar-84
TERMID.SAV	3P	07-Mar-84	PIP .SAV	30P	07-Mar-84
DIR	.SAV	19P	07-Mar-84	IND .SAV	51P	07-Mar-84
DUP	.SAV	45P	07-Mar-84	QUEUE .REL	14P	07-Mar-84
QUEMAN.SAV	15P	07-Mar-84	STARTA.COM	54P	07-Mar-84
IVP	.MAC	25P	07-Mar-84	CONFIG.SAV	2P	07-Mar-84
CONFIG.COM	28P	07-Mar-84	IVP .COM	16P	07-Mar-84
RTBL	.MAP	20P	07-Mar-84	RTFB .MAP	28P	07-Mar-84
RTSJ	.MAP	20P	07-Mar-84	RTXM .MAP	31P	07-Mar-84
CUSTOM.TXT	11P	07-Mar-84	V5NOTE.TXT	30P	07-Mar-84

    28 Files, 711 Blocks
    263 Free blocks

Volume 1

SWAP	.SYS	26P	07-Mar-84	RT11FB.SYS	87P	07-Mar-84
DY	.SYS	4P	07-Mar-84	VM .SYS	3P	07-Mar-84
CR	.SYS	3P	07-Mar-84	CT .SYS	6P	07-Mar-84
DD	.SYS	5P	07-Mar-84	DL .SYS	4P	07-Mar-84
DM	.SYS	5P	07-Mar-84	DP .SYS	3P	07-Mar-84
DS	.SYS	3P	07-Mar-84	DT .SYS	3P	07-Mar-84
DU	.SYS	4P	07-Mar-84	DZ .SYS	4P	07-Mar-84
DW	.SYS	5P	07-Mar-84	DX .SYS	4P	07-Mar-84
PI	.SYS	56P	07-Mar-84	XL .SYS	4P	07-Mar-84
XC	.SYS	4P	07-Mar-84	SP .SYS	6P	07-Mar-84
SLMIN	.SYS	12P	07-Mar-84	LD .SYS	8P	07-Mar-84
LP	.SYS	2P	07-Mar-84	LS .SYS	3P	07-Mar-84
MM	.SYS	9P	07-Mar-84	MS .SYS	10P	07-Mar-84
MT	.SYS	9P	07-Mar-84	NL .SYS	2P	07-Mar-84
TT	.SYS	2P	07-Mar-84	PC .SYS	2P	07-Mar-84
PD	.SYS	3P	07-Mar-84	RF .SYS	3P	07-Mar-84
RK	.SYS	3P	07-Mar-84	SL .SYS	14P	07-Mar-84
IND	.SAV	51P	07-Mar-84	PIP .SAV	30P	07-Mar-84
DUP	.SAV	45P	07-Mar-84	DIR .SAV	19P	07-Mar-84
RESORC.SAV	22P	07-Mar-84	KED .SAV	59P	07-Mar-84
EDIT	.SAV	19P	07-Mar-84	MACRO .SAV	60P	07-Mar-84
CREF	.SAV	6P	07-Mar-84	LINK .SAV	49P	07-Mar-84
SYSMAC.SML	49P	07-Mar-84	SYSLIB.OBJ	47P	07-Mar-84
SPOOL .REL	11P	07-Mar-84	SRCCOM.SAV	26P	07-Mar-84
DATIME.SAV	4P	07-Mar-84	DATIME.COM	3P	07-Mar-84
SAMPLE.KED	4P	07-Mar-84	DEMOED.TXT	1P	07-Mar-84
DEMOBG.MAC	2P	07-Mar-84	DEMOFG.MAC	3P	07-Mar-84
DEMOX1.MAC	3P	07-Mar-84	DEMOF1.FOR	2P	07-Mar-84
VERIFY.COM	3P	07-Mar-84	V5USER.TXT	3P	07-Mar-84
STARTF.COM	4P	07-Mar-84			

    59 Files, 846 Blocks
    128 Free blocks

Volume 2

RT11XM.SYS	99P	07-Mar-84	RT11BL.SYS	73P	07-Mar-84
RT11SJ.SYS	73P	07-Mar-84	DDX .SYS	5P	07-Mar-84
DLX .SYS	5P	07-Mar-84	DMX .SYS	5P	07-Mar-84
DUX .SYS	4P	07-Mar-84	DZX .SYS	4P	07-Mar-84
DWX .SYS	5P	07-Mar-84	DXX .SYS	4P	07-Mar-84
DYX .SYS	4P	07-Mar-84	LDX .SYS	8P	07-Mar-84
LPX .SYS	2P	07-Mar-84	LSX .SYS	3P	07-Mar-84
MMX .SYS	10P	07-Mar-84	MSX .SYS	11P	07-Mar-84
MTX .SYS	9P	07-Mar-84	NLX .SYS	2P	07-Mar-84
RKX .SYS	3P	07-Mar-84	SLX .SYS	16P	07-Mar-84
VMX .SYS	2P	07-Mar-84	XLX .SYS	4P	07-Mar-84
SPX .SYS	6P	07-Mar-84	XCX .SYS	4P	07-Mar-84
PIX .SYS	63P	07-Mar-84	KEX .SAV	54P	07-Mar-84
STARTX.COM	8P	07-Mar-84	STARTS.COM	1P	07-Mar-84
ODT .OBJ	8P	07-Mar-84	VDT .OBJ	8P	07-Mar-84
QUEUE .REL	14P	07-Mar-84	RTMON .REL	8P	07-Mar-84
BATCH .SAV	26P	07-Mar-84	BINCOM.SAV	24P	07-Mar-84
BUP .SAV	37P	07-Mar-84	DUMP .SAV	8P	07-Mar-84
FILEX .SAV	22P	07-Mar-84	K52 .SAV	55P	07-Mar-84
LIBR .SAV	24P	07-Mar-84	MDUP .SAV	19P	07-Mar-84
UCL .SAV	13P	07-Mar-84	VBGEXE.SAV	16P	07-Mar-84
LET .SAV	5P	07-Mar-84	PAT .SAV	10P	07-Mar-84
QUEMAN.SAV	15P	07-Mar-84	SIPP .SAV	21P	07-Mar-84
SLP .SAV	13P	07-Mar-84	SPEED .SAV	4P	07-Mar-84
SETUP .SAV	29P	07-Mar-84	SPLIT .SAV	3P	07-Mar-84
TRANSF.SAV	16P	07-Mar-84	VTCOM .SAV	23P	07-Mar-84
VTCOM .REL	25P	07-Mar-84			

  53 Files, 933 Blocks
  41 Free blocks

Volume 3

HELP .SAV	136P	07-Mar-84	FORMAT.SAV	23P	07-Mar-84
MTTEMT.MAC	18P	07-Mar-84	MTTINT.MAC	46P	07-Mar-84
TRMTBL.MAC	19P	07-Mar-84	SYSGEN.COM	206P	07-Mar-84
BL .ANS	8P	07-Mar-84	SJFB .ANS	9P	07-Mar-84
XM .ANS	8P	07-Mar-84	MBOOT .BOT	1P	07-Mar-84
MBOT16.BOT	1P	07-Mar-84	MSBOOT.BOT	3P	07-Mar-84
DISMT1.COM	13P	07-Mar-84	DISMT2.COM	8P	07-Mar-84
MDUP .MM	56P	07-Mar-84	MDUP .MS	56P	07-Mar-84
MDUP .MT	56P	07-Mar-84	EL .MAC	16P	07-Mar-84
ELCOPY.MAC	15P	07-Mar-84	ELINIT.MAC	16P	07-Mar-84
ELTASK.MAC	9P	07-Mar-84	ERRTXT.MAC	6P	07-Mar-84
ERROUT.SAV	18P	07-Mar-84	ERROUT.OBJ	15P	07-Mar-84

  24 Files, 762 Blocks
  212 Free blocks

Volume 4

SJ	.MAC	1P	07-Mar-84	XM	.MAC	1P	07-Mar-84
FB	.MAC	1P	07-Mar-84	BSTRAP	.MAC	66P	07-Mar-84
EDTGBL	.MAC	32P	07-Mar-84	KMON	.MAC	120P	07-Mar-84
KMOVLY	.MAC	205P	07-Mar-84	RMONFB	.MAC	146P	07-Mar-84
RMONSJ	.MAC	70P	07-Mar-84	XMSUBS	.MAC	34P	07-Mar-84

    10 Files, 676 Blocks
    298 Free blocks

Volume 5

USR	.MAC	66P	07-Mar-84	FSM	.MAC	32P	07-Mar-84
TM	.MAC	26P	07-Mar-84	TJ	.MAC	31P	07-Mar-84
XC	.MAC	1P	07-Mar-84	TS	.MAC	33P	07-Mar-84
BA	.MAC	20P	07-Mar-84	CR	.MAC	15P	07-Mar-84
CT	.MAC	33P	07-Mar-84	DD	.MAC	26P	07-Mar-84
DL	.MAC	26P	07-Mar-84	DM	.MAC	26P	07-Mar-84
DP	.MAC	11P	07-Mar-84	DS	.MAC	10P	07-Mar-84
DT	.MAC	9P	07-Mar-84	DZ	.MAC	17P	07-Mar-84
DW	.MAC	26P	07-Mar-84	XL	.MAC	27P	07-Mar-84
SP	.MAC	41P	07-Mar-84	DU	.MAC	31P	07-Mar-84
DX	.MAC	21P	07-Mar-84	DY	.MAC	23P	07-Mar-84
LD	.MAC	45P	07-Mar-84	LP	.MAC	9P	07-Mar-84
LS	.MAC	19P	07-Mar-84	NL	.MAC	3P	07-Mar-84
PC	.MAC	5P	07-Mar-84	PD	.MAC	12P	07-Mar-84
RF	.MAC	7P	07-Mar-84	RK	.MAC	11P	07-Mar-84
TT	.MAC	7P	07-Mar-84	VM	.MAC	17P	07-Mar-84
VTMAC	.MAC	7P	07-Mar-84	VTHDLR	.OBJ	8P	07-Mar-84
PUTSTR	.FOR	2P	07-Mar-84	GETSTR	.FOR	2P	07-Mar-84
CONSOL	.MAC	6P	07-Mar-84	UNSUP	.TXT	26P	07-Mar-84

    38 Files, 737 Blocks
    237 Free blocks

A.4 RL01, RL02, RK05 DISKS

SWAP	.SYS	26P	07-Mar-84	RT11XM	.SYS	99P	07-Mar-84
RT11FB	.SYS	87P	07-Mar-84	RT11SJ	.SYS	73P	07-Mar-84
RT11BL	.SYS	73P	07-Mar-84	RT11PI	.SYS	89P	07-Mar-84
RT11AI	.SYS	75P	07-Mar-84	DYX	.SYS	4P	07-Mar-84
DDX	.SYS	5P	07-Mar-84	DLX	.SYS	5P	07-Mar-84
DXX	.SYS	4P	07-Mar-84	LSX	.SYS	3P	07-Mar-84
LPX	.SYS	2P	07-Mar-84	MSX	.SYS	11P	07-Mar-84
DUX	.SYS	4P	07-Mar-84	DZX	.SYS	4P	07-Mar-84
DWX	.SYS	5P	07-Mar-84	XLX	.SYS	4P	07-Mar-84
SPX	.SYS	6P	07-Mar-84	XCX	.SYS	4P	07-Mar-84
PIX	.SYS	63P	07-Mar-84	NLX	.SYS	2P	07-Mar-84
LDX	.SYS	8P	07-Mar-84	DMX	.SYS	5P	07-Mar-84
VMX	.SYS	2P	07-Mar-84	RKX	.SYS	3P	07-Mar-84
SLX	.SYS	16P	07-Mar-84	MTX	.SYS	9P	07-Mar-84
MMX	.SYS	10P	07-Mar-84	TT	.SYS	2P	07-Mar-84
DT	.SYS	3P	07-Mar-84	DP	.SYS	3P	07-Mar-84
DX	.SYS	4P	07-Mar-84	DY	.SYS	4P	07-Mar-84
RF	.SYS	3P	07-Mar-84	RK	.SYS	3P	07-Mar-84
DL	.SYS	4P	07-Mar-84	DZ	.SYS	4P	07-Mar-84
DW	.SYS	5P	07-Mar-84	PI	.SYS	56P	07-Mar-84
XL	.SYS	4P	07-Mar-84	XC	.SYS	4P	07-Mar-84
SP	.SYS	6P	07-Mar-84	SLMIN	.SYS	12P	07-Mar-84
DU	.SYS	4P	07-Mar-84	DM	.SYS	5P	07-Mar-84
DS	.SYS	3P	07-Mar-84	DD	.SYS	5P	07-Mar-84

LP	.SYS	2P	07-Mar-84	LS	.SYS	3P	07-Mar-84
CR	.SYS	3P	07-Mar-84	MT	.SYS	9P	07-Mar-84
MM	.SYS	9P	07-Mar-84	MS	.SYS	10P	07-Mar-84
NL	.SYS	2P	07-Mar-84	PC	.SYS	2P	07-Mar-84
PD	.SYS	3P	07-Mar-84	CT	.SYS	6P	07-Mar-84
LD	.SYS	8P	07-Mar-84	SL	.SYS	14P	07-Mar-84
VM	.SYS	3P	07-Mar-84	PIP	.SAV	30P	07-Mar-84
DUP	.SAV	45P	07-Mar-84	DIR	.SAV	19P	07-Mar-84
IND	.SAV	51P	07-Mar-84	RESORC	.SAV	22P	07-Mar-84
SYSMAC	.SML	49P	07-Mar-84	EDIT	.SAV	19P	07-Mar-84
KED	.SAV	59P	07-Mar-84	K52	.SAV	55P	07-Mar-84
KEX	.SAV	54P	07-Mar-84	SAMPLE	.KED	4P	07-Mar-84
MACRO	.SAV	60P	07-Mar-84	CREF	.SAV	6P	07-Mar-84
LINK	.SAV	49P	07-Mar-84	LIBR	.SAV	24P	07-Mar-84
FILEX	.SAV	22P	07-Mar-84	SRCCOM	.SAV	26P	07-Mar-84
BINCOM	.SAV	24P	07-Mar-84	SLP	.SAV	13P	07-Mar-84
DUMP	.SAV	8P	07-Mar-84	SIPP	.SAV	21P	07-Mar-84
BUP	.SAV	37P	07-Mar-84	PAT	.SAV	10P	07-Mar-84
HELP	.SAV	136P	07-Mar-84	SPOOL	.REL	11P	07-Mar-84
BATCH	.SAV	26P	07-Mar-84	ERROUT	.SAV	18P	07-Mar-84
QUEMAN	.SAV	15P	07-Mar-84	FORMAT	.SAV	23P	07-Mar-84
SPEED	.SAV	4P	07-Mar-84	VTCOM	.SAV	23P	07-Mar-84
VTCOM	.REL	25P	07-Mar-84	TRANSF	.SAV	16P	07-Mar-84
SETUP	.SAV	29P	07-Mar-84	SPLIT	.SAV	3P	07-Mar-84
DATIME	.SAV	4P	07-Mar-84	DATIME	.COM	3P	07-Mar-84
CONFIG	.SAV	2P	07-Mar-84	CONFIG	.COM	28P	07-Mar-84
LET	.SAV	5P	07-Mar-84	UNSUP	.TXT	26P	07-Mar-84
UCL	.SAV	13P	07-Mar-84	VBGEXE	.SAV	16P	07-Mar-84
RTMON	.REL	8P	07-Mar-84	QUEUE	.REL	14P	07-Mar-84
ODT	.OBJ	8P	07-Mar-84	VDT	.OBJ	8P	07-Mar-84
VTMAC	.MAC	7P	07-Mar-84	VTHDLR	.OBJ	8P	07-Mar-84
SYSLIB	.OBJ	47P	07-Mar-84	PUTSTR	.FOR	2P	07-Mar-84
GETSTR	.FOR	2P	07-Mar-84	MDUP	.SAV	19P	07-Mar-84
MBOOT	.BOT	1P	07-Mar-84	MBOT16	.BOT	1P	07-Mar-84
MSBOOT	.BOT	3P	07-Mar-84	DEMOBG	.MAC	2P	07-Mar-84
DEMOFG	.MAC	3P	07-Mar-84	DEMOX1	.MAC	3P	07-Mar-84
DEMOF1	.FOR	2P	07-Mar-84	DEMOED	.TXT	1P	07-Mar-84
STARTS	.COM	1P	07-Mar-84	STARTA	.COM	54P	07-Mar-84
STARTF	.COM	4P	07-Mar-84	STARTX	.COM	8P	07-Mar-84
VERIFY	.COM	3P	07-Mar-84	IVP	.COM	16P	07-Mar-84
IVP	.MAC	25P	07-Mar-84	V5USER	.TXT	3P	07-Mar-84
DISMT1	.COM	13P	07-Mar-84	DISMT2	.COM	8P	07-Mar-84
SJ	.MAC	1P	07-Mar-84	FB	.MAC	1P	07-Mar-84
XM	.MAC	1P	07-Mar-84	XL	.MAC	27P	07-Mar-84
XC	.MAC	1P	07-Mar-84	SP	.MAC	41P	07-Mar-84
KMON	.MAC	120P	07-Mar-84	USR	.MAC	66P	07-Mar-84
RMONSJ	.MAC	70P	07-Mar-84	RMONFB	.MAC	146P	07-Mar-84
XMSUBS	.MAC	34P	07-Mar-84	KMOVLY	.MAC	205P	07-Mar-84
EDTGBL	.MAC	32P	07-Mar-84	BSTRAP	.MAC	66P	07-Mar-84
MTTEMT	.MAC	18P	07-Mar-84	MTTINT	.MAC	46P	07-Mar-84
TRMTBL	.MAC	19P	07-Mar-84	TT	.MAC	7P	07-Mar-84
BA	.MAC	20P	07-Mar-84	LP	.MAC	9P	07-Mar-84
LS	.MAC	19P	07-Mar-84	DD	.MAC	26P	07-Mar-84
DL	.MAC	26P	07-Mar-84	DU	.MAC	31P	07-Mar-84
DZ	.MAC	17P	07-Mar-84	DW	.MAC	26P	07-Mar-84
RK	.MAC	11P	07-Mar-84	DT	.MAC	9P	07-Mar-84
DS	.MAC	10P	07-Mar-84	PC	.MAC	5P	07-Mar-84

PD	.MAC	12P	07-Mar-84	RF	.MAC	7P	07-Mar-84
DM	.MAC	26P	07-Mar-84	DX	.MAC	21P	07-Mar-84
DY	.MAC	23P	07-Mar-84	CR	.MAC	15P	07-Mar-84
DP	.MAC	11P	07-Mar-84	CT	.MAC	33P	07-Mar-84
TM	.MAC	26P	07-Mar-84	TJ	.MAC	31P	07-Mar-84
TS	.MAC	33P	07-Mar-84	NL	.MAC	3P	07-Mar-84
VM	.MAC	17P	07-Mar-84	EL	.MAC	16P	07-Mar-84
FSM	.MAC	32P	07-Mar-84	ELCOPY	.MAC	15P	07-Mar-84
ELINIT	.MAC	16P	07-Mar-84	ELTASK	.MAC	9P	07-Mar-84
ERROUT	.OBJ	15P	07-Mar-84	ERRTXT	.MAC	6P	07-Mar-84
LD	.MAC	45P	07-Mar-84	CONSOL	.MAC	6P	07-Mar-84
RTBL	.MAP	20P	07-Mar-84	RTSJ	.MAP	20P	07-Mar-84
RTFB	.MAP	28P	07-Mar-84	RTXM	.MAP	31P	07-Mar-84
MDUP	.MT	56P	07-Mar-84	MDUP	.MM	56P	07-Mar-84
MDUP	.MS	56P	07-Mar-84	SYSGEN	.COM	206P	07-Mar-84
XM	.ANS	8P	07-Mar-84	SJFB	.ANS	9P	07-Mar-84
BL	.ANS	8P	07-Mar-84	V5NOTE	.TXT	30P	07-Mar-84
CUSTOM	.TXT	11P	07-Mar-84	TERMID	.SAV	3P	07-Mar-84

198 Files, 4386 Blocks
15996 Free blocks

A.5 9-TRACK, 800 BITS/IN MAGTAPE

Volume 1

MSBOOT	.BOT	3	10-Apr-84	MDUP	.MM	56	10-Apr-84
MDUP	.MT	56	10-Apr-84	MDUP	.MS	56	10-Apr-84
SWAP	.SYS	26	10-Apr-84	RT11BL	.SYS	73	10-Apr-84
RT11SJ	.SYS	73	10-Apr-84	RT11FB	.SYS	87	10-Apr-84
RT11XM	.SYS	99	10-Apr-84	RT11AI	.SYS	75	10-Apr-84
RT11PI	.SYS	89	10-Apr-84	TT	.SYS	2	10-Apr-84
RK	.SYS	3	10-Apr-84	DL	.SYS	4	10-Apr-84
DM	.SYS	5	10-Apr-84	DP	.SYS	3	10-Apr-84
DS	.SYS	3	10-Apr-84	DX	.SYS	4	10-Apr-84
DY	.SYS	4	10-Apr-84	DD	.SYS	5	10-Apr-84
DT	.SYS	3	10-Apr-84	RF	.SYS	3	10-Apr-84
PD	.SYS	3	10-Apr-84	DU	.SYS	4	10-Apr-84
DZ	.SYS	4	10-Apr-84	DW	.SYS	5	10-Apr-84
PI	.SYS	56	10-Apr-84	SP	.SYS	6	10-Apr-84
XC	.SYS	4	10-Apr-84	XL	.SYS	4	10-Apr-84
SLMIN	.SYS	12	10-Apr-84	PIX	.SYS	63	10-Apr-84
SPX	.SYS	6	10-Apr-84	XCX	.SYS	4	10-Apr-84
XLX	.SYS	4	10-Apr-84	RKX	.SYS	3	10-Apr-84
DLX	.SYS	5	10-Apr-84	DMX	.SYS	5	10-Apr-84
DXX	.SYS	4	10-Apr-84	DYX	.SYS	4	10-Apr-84
DDX	.SYS	5	10-Apr-84	DUX	.SYS	4	10-Apr-84
DZX	.SYS	4	10-Apr-84	DWX	.SYS	5	10-Apr-84
MM	.SYS	9	10-Apr-84	MMX	.SYS	10	10-Apr-84
MT	.SYS	9	10-Apr-84	MTX	.SYS	9	10-Apr-84
MS	.SYS	10	10-Apr-84	MSX	.SYS	11	10-Apr-84
LD	.SYS	8	10-Apr-84	SL	.SYS	14	10-Apr-84
VM	.SYS	3	10-Apr-84	LP	.SYS	2	10-Apr-84
LS	.SYS	3	10-Apr-84	NL	.SYS	2	10-Apr-84
CR	.SYS	3	10-Apr-84	PC	.SYS	2	10-Apr-84
CT	.SYS	6	10-Apr-84	LSX	.SYS	3	10-Apr-84
LPX	.SYS	2	10-Apr-84	NLX	.SYS	2	10-Apr-84

LDX	.SYS	8	10-Apr-84	VMX	.SYS	2	10-Apr-84
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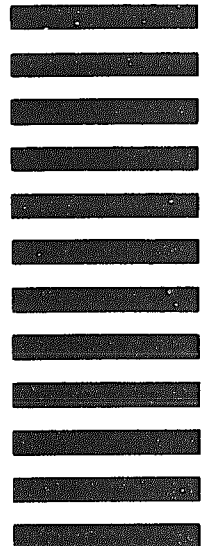
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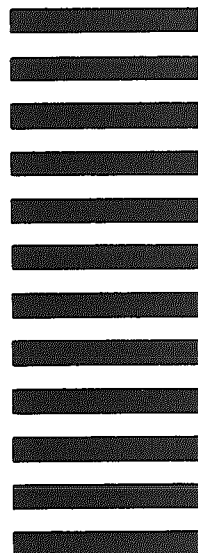   or Country

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