RSTS/E

RSTS/E V7.2
Maintenance Notebook

Order No. AA–L997B–TC

digital software

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June 1982

This notebook describes optional feature patches for RSTS/E. It is a working document that system maintainers should keep current by adding published articles on software problems, programming notes, and documentation corrections. These articles are published in the RSTS/E Software Dispatch.

OPERATING SYSTEM AND VERSION:	RSTS/E	V7.2
SOFTWARE VERSION:	RSTS/E	V7.2

digital equipment corporation, maynard, massachusetts

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Preface

The RSTS/E Maintenance Notebook is a maintenance notebook for documentation corrections, published software problems and solutions, and programming notes. Subordinate software information is also included. The RSTS/E Software Dispatch Review and the RSTS/E Software Dispatch are designed so that their articles may be merged into the Maintenance Notebook.

The RSTS/E Software Dispatch Review contains articles published for optional layered software supported on RSTS/E V7.2. In general, this is a composite of all optional layered software articles previously published for RSTS/E V7.1, which still apply to the product when run on RSTS/E V7.2.

The RSTS/E Software Dispatch is provided for 90 days after each software installation of a RSTS/E system by DIGITAL, and is addressed to the software contract established by the DIGITAL field office. After 90 days, the customer may purchase the Self Maintenance Service to continue receiving the RSTS/E Software Dispatch. Contact your local Digital office for more information. The RSTS/E Software Dispatch is published monthly, and contains articles for RSTS/E and its layered software. Each month, you should take apart the RSTS/E Software Dispatch and merge the new articles by sequence number in your notebook.

Anyone who is about to generate RSTS/E V7.2 must incorporate all "Mandatory" patches as part of the system generation and BUILD procedures. All articles published are summarized in the Cumulative Index. There is also an index of the version and edit levels for all the Commonly Used System Programs (CUSPs). These indices are updated each month in the RSTS/E Software Dispatch.

1.Ø Notebook Maintenance

Each month you should take apart the RSTS/E Software Dispatch and merge the new articles by sequence number in your notebook. If an article is a replacement, discard the superseded article. Each article addresses a single topic and its title gives the symptom or a one-line problem description. This information appears at the top of each page. For example:

RSTS/E Software Dispatch, Month year

RSTS/E V7.2 Seq 4.1.4 F
BASIC-PLUS
BASIC-PLUS Patches 1 of 2

DEFAULT TO EXTEND MODE - BASIC-PLUS FEATURE PATCH

The system components and subcomponents are listed in Section 2.Ø. That list will be updated periodically as products become available or obsolete. Articles for each subcomponent are assigned a sequencing number which uniquely identifies the article within that component.subcomponent category. As each new article is published for a subcomponent, it is assigned the next higher sequence number. The entire number is defined as the COMPONENT.SUBCOMPONENT.ISSUE number, an example being the "4.1.4" shown in the upper right corner of the sample heading. Replacement articles are identified as such.

A flag will appear after the sequencing number:

M = MANDATORY: These patches correct errors in the software product. All users are required to apply these patches unless the accompanying article specifies otherwise.

F = FEATURE: These patches extend or configure non-standard capabilities into the product. These functions will be treated as a supported part of the product for the duration of the current release.

R = RESTRICTION: These articles discuss areas that will not be patched in the current release because they require major modifications or because they are not consistent with the design of the product. Restrictions, except those described as permanent, are reviewed and modified when possible as part of the normal release cycle.

N = NOTE: These articles provide explanatory information that supplements the documentation set and provides more detailed information about a program or package. They also provide procedural information to make it easier to use a program or package.

2.Ø RSTS/E Component.Subcomponent Assignments

The component.subcomponent numbers outlined below appear on articles to be filed following Section 5.4 of this notebook.

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Ø.Ø RSTS/E V7.2 General Notes
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1.Ø Initialization
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- 1.2 INIT.SYS Program Notes

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- 4.6 PRINT-USING
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- 4.8 Virtual Core
- 4.9 String Arithmetic
- 4.1Ø Non-Standard BASIC-PLUS Features

5.Ø RSTS/E 278Ø Device Driver
- 5.1 278Ø Device Driver Patches
- 5.2 278Ø Device Driver Notes

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7.Ø DECnet/E Package V2.Ø
- 7.1 NSP/TRN/SES

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- 9.2 TECO.RTS
- 9.3 TECO.TEC
- 9.4 VTEDIT.TEC
- 9.5 TECO.INI
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- 9.9 TECKBM.TEC
- 9.10 SEARCH.TEC

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- 1Ø.3 DIRECT
- 1Ø.4 DISPLY
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- 1Ø.6 VT5Ø (VT5ØPY)
- 1Ø.7 (Reserved)
- 1Ø.8 DSKINT
- 1Ø.9 GRIPE
- 1Ø.1Ø INIT
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- 1Ø.14 MONEY
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11.11	BPCRF1
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16.Ø System Management Guidelines

17.Ø Automated Patching Facility Package
- 17.1 Package Notes
- 17.2 PATCPY
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18.Ø	**Device Test Package**
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19.Ø	Documentation	
19.1	RSTS/E Documentation Directory	AA-2642E-TC
19.2	RSTS/E System Generation Manual	AA-2669F-TC
19.3	RSTS/E System Manager's Guide	AA-2762D-TC
19.4	RSTS/E System User's Guide	AA-5133C-TC
19.5	BASIC-PLUS Language Manual	AA-2623D-TC
19.6	RSTS/E Programming Manual	AA-2726D-TC
19.7	RSTS/E RUNOFF User's Guide	DEC-11-URUNA-B-D
19.8	RSTS/E DCL User's Guide	AA-L426A-TC
19.9	RSTS/E V7.2 Release Notes	AA-5246D-TC
19.1Ø	RSTS/E Pocket Guide	DEC-11-ORFCA-A-D
19.11	RSTS/E Primer	AA-5408A-TC
19.12	Introduction to BASIC	AA-Ø155A-TK
19.13	RSTS/E Task Builder Reference Manual	AA-5Ø72B-TC
	RSTS/E Task Builder Manual Update	ad-5Ø72B-T1
19.14	RSTS/E V7.2 Maintenance Notebook	AA-L997A-TC
19.15	RMS-11 MACRO Programmer's Reference Manual	AA-H683A-TC
19.16	(Reserved)	
19.17	(Reserved)	
19.18	PDP-11 MACRO-11 Language Reference Manual	AA-5Ø75B-TC
19.19	EDT Editor Manual	AA-J726A-TC
19.2Ø	EDT Editor Reference Card	AV-J756A-TC
19.21	Introduction to the EDT Editor	AA-K443A-TC
19.22	(Reserved)	
19.23	IAS/RSX ODT Reference Manual	AA-M5Ø7A-TC
19.24	RSTS/E System Directives Manual	AA-D748B-TC
19.25	RSTS/E Programmer's Utilities Manual	AA-D749A-TC
	RSTS/E Programmer's Utilities Manual Update1	AD-D749A-T1
	RSTS/E Programmer's Utilities Manual Update2	AD-D749A-T2
19.26	RSTS/E RT11 Utilities Manual	AA-M213A-TC
19.27	PDP-11 SORT Reference Manual	AA-3341C-TC
	PDP-11 SORT Reference Manual Update	AA-3341C-T1
19.28	PDP-11 TECO User's Guide	DEC-11-UTECA-B-D
19.29	RMS-11 Installation Guide	AA-H235A-TC
19.3Ø	RMS-11 User's Guide	AA-D538A-TC
	RMS-11 User's Guide Update	AA-D538A-T1
19.31	RSTS/E Documentation Notes	AA-M5Ø7A-TC

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20.0	**DCL**
20.1	Package Notes
20.2	DCL.RTS
20.3	DCL.DCL
20.4	PRELIN
20.5	SHOTER
21.0	**RSX Emulator and Utilities Package**
21.1	Package Notes
21.2	(Reserved)
21.3	RSX.RTS
21.4	TKB.TSK
21.5	MAC.TSK
21.6	LBR.TSK
21.7	SYSLIB.OLB
21.8	RSXMAC.SML
21.9	PAT.TSK
21.10	(Reserved)
21.11	CSPCOM.TSK
21.12	CSPCOM.OLB
21.13	CRF.TSK
21.14	RNO.TSK
21.15	SLOTKB.TSK
22.0	**RT-11 Emulator and Utilities Package**
22.1	Package Notes
22.2	RT11.RTS
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- 24.22 DSORTX
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- 24.26 DMS-5ØØ User's Guide (DEC-11-ORDUA-B-D)

25.Ø RSTS/E 278Ø PACKAGE V3.Ø
- 25.1 Package Notes
- 25.2 RJ278Ø
- 25.3 RSTS/E 278Ø User's Guide (DEC-11-ORJEA-B-D)

26.Ø DIBOL-11/DECFORM V4.5
- 26.1 Release Notes
- 26.2 Installation Guide
- 26.3 CTS-5ØØ DIBOL-11 Language Reference Manual
- 26.4 CTS-5ØØ DIBOL-11 User's Guide
- 26.5 DECFORM User's Manual

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- 26.7 DBLLIB.OLB
- 26.8 FOCOMP.RTS (and .TSK)
- 26.9 FOCOMP.MLB
- 26.1Ø DECFØ
- 26.11 DECF1
- 26.12 ISMUTL
- 26.13 SORTG
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- 26.15 DBUILD
- 26.16 DMSDBL.CTL
- 26.17 DMSDMO.CTL
- 26.18 DECSM.OBJ
- 26.19-26.39 Reserved

These are the RMS DIBOL components

- 26.4Ø DBRRES.LIB (and .TSK and .STB)
- 26.41 DBRLIB.OLB
- 26.42 FOCOMR.RTS (and FOCOMR.TSK)
- 26.43 FOCRMS
- 26.44 DECFØR
- 26.45 DECF1R
- 26.46 DBRRMS.ODL
- 26.47 DBROPN.ODL
- 26.48 DBRALL.ODL
- 26.49 DBRSR.ODL
- 26.5Ø DBRRAN.ODL
- 26.51 DBRISM.ODL
- 26.52 DBRRES.ODL
- 26.53 DBRSEQ.ODL
- 26.54 FOCOMR.ODL
- 26.55 RMSDBL.CTL
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- 26.57 RMSDMR.CTL
- 26.58 FOCOMR.MLB
- 26.59 DECSMR.OBJ
- 26.6Ø-26.69 Reserved

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26.70 DICOMP.TSK
26.71 RSDDT

27.0 FMS-11 V1.5
27.1 Package Notes

28.0 INDENT V1.1
28.1 Package Notes
28.2 INDENT.SAV
28.3 INDENT.RTS
28.4 INDENT Drivers

29.0 DX/RSTS V3.1
29.1 Package Notes

30.0 (Reserved)

31.0 DECnet/E Utilities V2.0
31.1 Package notes
31.1 Package notes
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31.4 reserved (NML Object patches)
31.5 reserved (NML.TSK)
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31.44 DECnet/E V2.0 Release Notes
31.45 DECnet/E V2.0 System Manager's Guide
31.46 DECnet/E V2.0 Network Pgmg in Basic-Plus and Basic-Plus-2
31.47 DECnet/E V2.0 Network Pgmg in Macro
31.48 DECnet/E V2.0 Network Pgmg in FORTRAN
31.49 DECnet/E V2.0 Network Pgmg in COBOL
31.50 DECnet/E V2.0 System User's Manual
31.51 DECnet/E V2.0 Installation Manual

32.0 (Reserved)

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34.0 (Reserved)

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44.Ø SORT-11 VØ2 (as part of RSTS/E V7.2)
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- 44.2 SORT Object Library Patches

45.Ø BASIC-PLUS-2 V1.6
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- 45.3 BASIC2 Run-Time System Patches
- 45.4 BP2COM Run-Time System Patches
- 45.5 BASIC2 Object Library Patches
- 45.6 BP2COM Object Library Patches
- 45.7 BASRMS Object Library Patches
- 45.8 TRANSLATOR Utility Patches
- 45.9 PDP-11 BASIC-PLUS-2 Language Reference Manual (AA-H774A-TC)
  PDP-11 BASIC-PLUS-2 Language Reference Manual Update (AD-H774A-T1)
- 45.1Ø BASIC-PLUS-2 RSTS/E User's Guide (AA-H772A-TC)
  BASIC-PLUS-2 RSTS/E User's Guide Update (AD-H772A-T1)
- 45.11 BASIC-PLUS-2 RSTS/E Installation Guide (AA-Ø156B-TC)
- 45.12 BASICS Resident Library Patches
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- 45.15 BASIC-PLUS-2 V1.6 Pocket Reference Card (AV-KØ14A-TC)

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48.0 RMS-11 V1.8
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- 50.2 IBM Interconnect (II) Driver
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- 51.4 3271 Microcode (RAM)
- 51.5 MTO
- 51.6 RSTS/E 3271 Protocol Emulator V2.1 Release Notes (AA-H474C-TC)
- 51.7 RSTS/E 3271 Protocol Emulator User's Guide (AA-D365A-TC)
- 51.8 DIBOL Interface

52.0 RSTS/E High Performance 2780/3780 Emulator V1.1
- 52.1 Package Notes
- 52.2 2780 Microcode (CRAM)
- 52.3 2780 Microcode (RAM)
- 52.4 3780 Microcode (CRAM)
- 52.5 3780 Microcode (RAM)
- 52.6 RJESPL
- 52.7 RSTS/E 2780/3780 High Performance Emulator V1.1 Release Notes (AA-J458B-TC)
- 52.8 RSTS/E High Performance 2780/3780 Emulator User's Guide (AA-J177A-TC)

53.0 (Reserved)

54.0 (Reserved)

55.Ø (Reserved)

56.Ø (Reserved)

57.Ø (Reserved)

58.Ø (Reserved)

59.Ø (Reserved)

60.Ø DECWORD/DP V1.1
- 60.1 Package Notes

61.Ø COBOL-11 V4.1
- 61.1 Package Notes
- 61.2 COBOL Compiler - NON-CIS
- 61.3 COBOL Compiler - CIS
- 61.4 COBOL Object Library - NON-CIS
- 61.5 COBOL Object Library - CIS
- 61.6 COBOL ODL
- 61.7 COBOL Utilities
- 61.8 COBOL Interactive Debugger - CIS
- 61.9 COBOL Interactive Debugger - NON- CIS
- 61.1Ø PDP-11 COBOL Language Reference Manual (AA-1749E-TC)
  PDP-11 COBOL Language reference Manual Update (AD-1749E-T1)
- 61.11 PDP-11 COBOL User's Guide (AA-1757E-TC)
- 61.12 PDP-11 COBOL Installation Guide (AA-1745E-TC)

62.Ø (Reserved)

63.Ø FORTRAN IV V2.5
- 63.1 Package Notes
- 63.2 COMPILER
- 63.3 OTS
- 63.4 RSTS/E FORTRAN IV Installation Guide/Release Notes (AA-C762C-TC)

64.Ø FORTRAN IV-PLUS V3.Ø
- 64.1 Package Notes
- 64.2 COMPILER
- 64.3 OTS

65.Ø DECWORD/DP V1.Ø
- 65.1 Package Notes
- 65.2 DECWORD/DP Release Information
- 65.3 DECWORD/DP Directory
- 65.4 How to Install DECWORD/DP
- 65.5 How to Manage DECWORD/DP
- 65.6 Beginner's Guide to DECWORD
- 65.7 How to Use DECWORD
- 65.8 DECWORD Quick Reference Guide
- 65.9 Glossary of DECWORD Terms
- 65.1Ø How to Use DECWORD List Processing
- 65.11 How to Use DECWORD Options
- 65.12 DECWORD for WPS-8 Users
- 65.13 DECWORD Basic User Course
- 65.14 Editing and Handling Documents
- 65.15 User Defined Keys
- 65.16 Document Conversion
- 65.17 List Processing
- 65.18 Spelling Error Detection
- 65.19 Communications
- 65.2Ø Spoolers and Printer Utilities
- 65.21 Training Utility

66.Ø COBOL-81 V1.Ø
- 66.1 Package Notes

67.Ø PDP-11 FORTRAN-77/RSTS/E V4.Ø
- 67.1 Package Notes

68.Ø DATATRIEVE V2.4
- 68.1 Package Notes

69.Ø (Reserved)

7Ø.Ø COBOL-11 V4.4
- 7Ø.1 Package Notes

71.Ø DMS-5ØØ V2.1
- 71.1 Release Notes
- 71.2 DMS-5ØØ User's Guide

These are the component numbers for the ISAM and RAM package

- 71.3 DMSFSS.BAS
- 71.4 DMSISO.BAS
- 71.5 DMSRAO.BAS
- 71.6 DMSISR.BAS
- 71.7 DMSISC.BAS
- 71.8 DMSRAR.BAS
- 71.9 DMSISA.BAS
- 71.1Ø DMSRAA.BAS

71.11 DMSFSU.BAS
71.12 DMSFSX.BAS
71.13 DMSUTL.BAS
71.14 IAMGEN.BAS
71.15 IAMCRI.BAS
71.16 IAMDMP.BAS
71.17 IAMVFY.BAS
71.18 IAMFNS.BAS

These are the component numbers for the DSORT package

71.19 DSORT.BAS
71.20 DSORTD.BAS
71.21 DSORTF.BAS
71.22 DSORTX.BAS
71.23 DSORTS.BAS
71.24 DSORTM.BAS
71.25 DSORTO.BAS

90.0 User Assigned Components - For Development Use
90.1 Package Notes

91.0 - 99.0 User Assigned Components - For User Use

3.0 Software Performance Reports

Each new installation is provided with Software Performance Report (SPR) forms. The SPR form enables the user to suggest enhancements to, or report problems, with DIGITAL software or documentation. When a problem is encountered, an SPR should be completed and mailed to the local SPR Center (see the inside back cover of the SPR form).

Responses will be sent to the name and address appearing on the form. Additional SPR forms may be obtained by writing to the local SPR Center. SPR response is provided at no charge for one year after installation and may be continued by subscription thereafter.

3.1 Software Performance Report Guidelines

These guidelines for RSTS/E SPR completion ensure that adequate information is included to prevent delays in processing.

For all types of actual or suspected software problems, the following should be included with the SPR:

1. A complete description of the problem.
2. The CPU type.
3. The system disk type.
4. The amount and type of memory.
5. If possible, a simple program or procedure which can be used to reproduce the problem.
6. Any additional information which you may think is relevant.

For problems associated with the RSTS/E Monitor or crash analysis package (ANALYS), also include:

1. The crash dump printed by ANALYS (which includes annotations, a listing of the symbol table, and a list of all installed patches).
2. If possible, a machine readable copy (preferrably 9-track magnetic tape) of your monitor and CRASH.SYS file. Your media will be returned with your SPR answer.

3. Listings of your maps, CONFIG.MAC, and SYSGEN.CTL files created during SYSGEN. Note that the .MAP files are necessary, even though ANALYS prints some of the same information.

When submitting an SPR concerning a DIGITAL supplied BASIC-PLUS program (CUSP), also include:

1. The name of the CUSP.

2. A "RUN" of the CUSP which displays the header line, version number, and the problem which is occurring, if possible.

3. A list of any optional feature patches installed.

4. Whether the program was compiled under BASIC-PLUS, BASIC-PLUS-2, or CSPCOM. In the latter two cases, also include the name of the run-time system under which the program was running.

5. Under what account(s) the problem occurs, distinguishing between privileged and non-privileged behavior.

6. A complete listing of the CUSP (preferably on magnetic tape) if your installation has made any non-standard changes.

7. Listings of all relevant input and output files.

NOTE

No SPR, monitor or CUSP, will be considered unless ALL relevant Mandatory patches published to date have been applied. Before submitting an SPR, the user should review the relevant section(s) of the Maintenance Notebook, to insure that ALL Mandatory patches to the program or package have been applied.

SPR turnaround time for CUSPs running under the BASIC-PLUS run-time system can be reduced by including a "DUMP" of the CUSP. See articles Seq 4.10.2 N, Seq 4.10.4 F, and Seq 4.10.6 F.

4.Ø Patching Procedure

This section briefly describes the patching procedures to be used for maintenance of RSTS/E V7.2. Programs included in the patching package are ONLPAT for the monitor, INIT, BASIC PLUS, RT-11 run-time system, RSX-11M run-time system, and ATPK, BUILD, PBUILD, PATCPY, CPATCH, and AUTOED for the CUSPs. The procedures to be followed for patching the monitor and CUSPs when generating a new RSTS/E system are described in the RSTS/E System Generation Manual.

NOTE

The RSTS/E Software Dispatch will contain announcement articles as new RSTS/E V7.2 autopatch kits become available. These articles, to be published as Seq 17.1.n N, will contain general procedures to be followed when applying patch kits, and indicate components which have patches that did not appear on the previous kit. The articles may also contain special instructions which might be necessary to install and/or patch various products on RSTS/E V7.2. Each announcement/instruction article is also included on the corresponding patch kit in account [1,2]; the name of the file is in the form "PATCHz.DOC", where "z" reflects the version of the patch kit, e.g., "PATCHA.DOC".

Note that if instructions included in patch kit announcement/instruction articles conflict with procedures described in the standard RSTS/E documentation kit, the article takes precedence for the specified patch kit. The announcement article should always be read prior to trying to apply the patch kit or generating a system.

Be sure to read article Seq 17.1.1 N before generating your system if you received Patch Kit "A" with your distribution kit.

Some patches to the monitor or INIT code must be applied manually with the INIT PATCH option before the system can be started for autopatching. Any patches requiring such special attention will be clearly marked in their accompanying article.

The programs used for automated patching can also be used for manual patching. The procedures for manual patching with these programs can be found in the RSTS/E System Manager's Guide.

Two types of patching will be used for RSTS/E software: 1) Monitor patching and 2) CUSP patching. Other optional software supplied may require different patching procedures. In all cases, however, the patching procedure will be described in the accompanying patch article.

Unless otherwise stated, all patches published in the RSTS/E Software Dispatch are MANDATORY patches which must be made to the affected component as soon as possible. Since not all components will be included at each installation, patches to unused components will fail when the attempt is made to apply them. The system manager should file all articles, however, even for unused components, since the installation might choose at some future time to install additional components and these components will then have to be brought up to the latest support level.

Some articles will detail the procedure to patch a component in order for the installation to use an optional feature of that component. These optional "Feature" patches are not required to keep a component at its current support level. If problems occur with a component containing optional features, however, the installation must report which optional feature patches are in use when filing the Software Performance Report (SPR).

Next, some discussion of documentation conventions needs to be presented. The following list of syntactic elements provides a description of certain terminal keys which have non-printing functions:

^C	up-arrow/C or Control-C

NOTE

The syntactic element "^C" refers only to "up-arrow/C" (i.e., typing upper-shift 6 followed by the character "C") when used in patches using the program ONLPAT.

CTRL/C	Control-C
<tab>	Horizontal tab
<lf>	Line feed
<ff>	Form feed
<cr>	Carriage return
^Z or CTRL/Z	Control-Z
<esc>	Escape (Alt Mode or SEL)

When one of these syntactic elements appears in the documentation, it signifies that the associated key(s) is (are) pressed if input is desired or the appropriate terminal action occurs if an output operation is being described.

An optional item will be indicated by enclosing it in square brackets (this does not apply to project-programmer numbers). For example, a line of the following form appears in most CUSP patch articles:

#[logfile=]KB:/CS:64049

Replacing "[logfile=]" with an actual file specification will allow you to produce a patch command file when applying a patch. For example,

#PA1012.003=KB:/CS:64049

4.1 Monitor Patching

Changes to the RSTS/E monitor will be made via the PATCH option of INIT.SYS and/or the program ONLPAT, as described in the RSTS/E System Generation Manual.

Articles discussing various monitor options and problem corrections will contain the exact operator action required when using the PATCH option. The expected dialogue will be shown in the article as it should appear when the patch is made. If any deviation occurs, the process should be halted, any changes already made returned to their former values via the PATCH option, and a determination made as to where the discrepancy occurred.

4.2 Commonly Used System Program (CUSP) Patching

The RSTS/E CPATCH program will serve as the CUSP program patching tool for maintenance purposes.

Refer to the RSTS/E System Manager's Guide for complete information on the commands and capabilities of CPATCH and PBUILD.

Each patch notice will be self-contained as a convenience to the person who will be making the change. It is recommended that the date of the change and the name of the person making the patch be written on the article at the time the program modification is performed in order to keep an accurate record of the status of the system library software.

4.3 Patch Kits

RSTS/E patch kits contain machine readable patches for software supported under RSTS/E V7.2. RSTS/E Patch Kit "A" contains all patches published in the RSTS/E V7.2 Maintenance Notebook and in the RSTS/E V7.2 Software Dispatch Review. Subsequent patch kits will contain these same patches plus new patches published in the RSTS/E Software Dispatch. The cumulative index published in the Software Dispatch contains a column indicating which is the first patch kit that a new patch will appear in.

Procedures for using the patch kit to patch standard RSTS/E software can be found in the RSTS/E System Generation Manual. Procedures for patching optional layered software are usually found in the appropriate installation manual for the product.

The sections which follow provide general guidelines for using patch kits. Information for using specific patch kits will be published as articles with sequence numbers 17.1.n N. Please refer to those articles before attempting to apply any patch kit.

4.3.1 OFF-LINE PATCHING

Off-line patching is done as part of the SYSGEN procedure. Patches for the following areas may be applied off-line:

- o Initialization code
- o the RSTS/E Monitor
- o the BASIC-PLUS run-time system
- o the RSX Emulator (Both Monitor emulation and the run-time system)
- o DECnet/E V2.Ø

Patch command files exist on the patch kit for all of these components. Those that do not currently have any mandatory patches exist in skeletal form only. These patch command files should ALWAYS be called in automatically during SYSGEN. This is done by answering "YES" to the appropriate questions during the SYSGEN dialogue. For example,

QUESTION	DEFAULT	RESPONSE
Generate monitor?	#Y #	<lf>
Monitor name?	#RSTS#	name<cr>
Monitor patching?	#??#	Y<cr>
Patch file medium?	#dev#	dev:<cr>
Patch file name?	#$MONITR.CMD#	<lf>

The patch file names on the patch kit are the same as the default names printed by SYSGEN and should always be accepted.

Note that application of patches to Monitor code in all of these command files may be done on-line using the PBUILD program with the command file EXEC.CMD.

4.3.2 ON-LINE PATCHING

On-Line patching is done after the system is installed and running. The following procedure should be followed:

A. If you received your kit on magnetic tape, transfer all patch files from the patch kit distribution media to disk, using the PATCPY program. PATCPY.BAS exists on the patch kit in account [1,2] and may be used for this transfer. Digital recommends that the account to which you are transferring the files have a clustersize of 16.

NOTE

If you use PATCPY to copy patch files for a single package (see Chapter 6 of the RSTS/E System Generation Manual), you MUST use the version of PATCPY included on the patch kit. This version handles the most up-to-date list of supported optional layered software; the released version of PATCPY may not handle all products.

Copy the patch files to an account as shown below:

```
RUN PATCPY
<PATCPY's header line>
Enter distribution device/PPN<SY:[1,2]>: dev:[1,2]
Enter output device/PPN<SY:[200,200]>: dev:[p,pn]
Packages to patch? ALL<cr>
```

If the specified output account does not exist, PATCPY will, optionally, create it.

NOTE

Two patch tapes may be included in RSTS/E 800 BPI magnetic tape kits. If this is the case, and if you are using any of the optional software contained on the second tape, you must run PATCPY twice. The list of command files published for each patch kit indicates which products are included on the second tape.

B. If you wish to patch the CUSP library as part of a system BUILD procedure, you may use the "BUILD/PATCH" function of the program $BUILD:

```
RUN $BUILD
<BUILD's header line>
System Build <No> ? YES
Source Input Device <SY:> ?
Library Output Device <SY:> ?
Target System Device <SY0:> ?
Library Account <[1,2]> ?
Locate logical 'LB:' on <SY:[1,1]> ?
Function (BUILD/PATCH, PATCH, BUILD) <BUILD/PATCH> ?
Patch file input location <SY:[200,200]> ?
Save patched sources <NO> ?
Run-Time System <BASIC> ?
        .
Additional control file is <NONE>? <lf>
```

If you only need to patch the library programs, specify "PATCH" in response to the "Function" question.

C. Most other patches must be applied using the program PBUILD. The format of the PBUILD dialogue is as follows:

```
RUN $PBUILD
<PBUILD's header line>
Read files to patch from <SY:[1,2]>:
Compile patched programs <YES>:
Library device <SY:[1,2]>:
System device <SY0:[1,2]>:
Save patched sources <NO>:
#filnam          (name of the patch command file you are applying)
```

4.3.3 OPTIONAL FEATURE PATCHES

RSTS/E Patch Kits patch files for all optional Feature patches published in the RSTS/E V7.2 Maintenance Notebook and the RSTS/E Software Dispatch. In general, no command files exist for these files unless there are also Mandatory patches for the component. If there are Mandatory patches for the components, comment lines will appear in command files that include references to any feature patches for the component. The referenced patches may be automatically applied along with the mandatory patches by simply editing the commented lines. Note that some of the feature patch files require manual editing (to supply installation-specific parameters) before they can be applied.

Feature patches may be applied automatically by running either $ONLPAT or $CPATCH, as indicated in the associated article. All patch file names correspond to the article sequence number. For example, the patch file for

BASIC-PLUS article Seq 4.1.4 F, "Default to EXTEND mode", is PA0401.004.

To apply this patch using $ONLPAT, you would type:

```
RUN $ONLPAT
Command File Name? PA0401.004
File to patch? (name of BASIC-PLUS run-time system)
    .
    .
Command File Name? ^Z
```

To use $CPATCH to apply LOGIN patch Seq 10.12.8 F, "Enable Auxiliary Password", you would type:

```
RUN $CPATCH
<CPATCH's header line>
File to patch - LOGIN.BAS=LOGIN.BAS
#PA1012.002
    .
    .
Patch from SY:[P,PN]PA1012.002 complete.
#^Z
File to patch - ^Z
```

followed by the commands necessary to compile the program into the desired account.

5.Ø RSTS/E Articles

Section 5.Ø is the repository for all RSTS/E articles. This section will include problem solutions, optional "Feature" patches, documentation errata, programming hints, and tips for better operation of RSTS/E.

Anyone who generates a RSTS/E system (whether on-line under time sharing or as the initial version of the system) should become familiar with these articles. This should be a continuing process of education as sub-sections are added and updated.

The section which follows is an index to all articles included in the original Maintenance Notebook. This index will be updated monthly as new articles are published in the RSTS/E Software Dispatch. Note that all Mandatory and Feature patches included in this list are included on the RSTS/E V7.2 Patch Kit "A".

5.1 Cumulative Index of All RSTS/E V7.2 Maintenance Notebook Articles

BASIC-PLUS

TECO

RSTS/E UTILITIES

System Utilities Package

Error Control Package

Backup Package

Spooling and Operator Services Package

RSX Emulator and Utilities Package

RT-11 Emulator and Utilities Package

5.2 Patch Levels for Commonly Used System Programs (CUSPs)

This report reflects the current Version/Edit level of all of the Commonly Used System Programs (CUSPs) supplied as part of the standard RSTS/E V7.2-Ø4 System Library Programs release.

System Utilities Package

BUILD V7.2-Ø4	DIRECT V7.2-Ø4	DISPLY V7.2-Ø4
DSKINT V7.2-Ø4	GRIPE V7.2-Ø4	HELP V7.2-Ø4
INIT V7.2-Ø4	LOGIN V7.2-Ø4	LOGOUT V7.2-Ø4
MONEY V7.2-Ø4	ODT V7.2-Ø4	PLEASE V7.2-Ø4
QUOLST V7.2-Ø4	REACT V7.2-Ø4	REORDR V7.2-Ø4
SHUTUP V7.2-Ø4	SWITCH V7.2-Ø4	SYSTAT V7.2-Ø4
TALK V7.2-Ø4	TTYSET V7.2-Ø4	UMOUNT V7.2-Ø4
UTILTY V7.2-Ø4	VTØ5 V7.2-Ø4	VT5Ø V7.2-Ø4

Data Manipulation Package

BPCREF V7.2-Ø4	BPCRF1 V7.2-Ø4	COPY V7.2-Ø4
FILCOM V7.2-Ø4	FIT V7.2-Ø4	FLINT V7.2-Ø4
MAKSIL V7.2-Ø4	PMDUMP V7.2-Ø4	RUNOFF V7.2-Ø4

Error Control Package

ANALYS V7.2-Ø4	ANALY1 V7.2-Ø4	ANALY2 V7.2-Ø4
ANALY3 V7.2-Ø4	ERRBLD V7.2-Ø4A	ERRCPY V7.2-Ø4
ERRDET V7.2-Ø4	ERRDIS V7.2-Ø4	ERRINT V7.2-Ø4

Backup Package

BACCOM V7.2-Ø4	BACCON V7.2-Ø4	BACDEL V7.2-Ø4
BACDIR V7.2-Ø4	BACDMP V7.2-Ø4	BACDSK V7.2-Ø4
BACENT V7.2-Ø4	BACFRM V7.2-Ø4	BACLAB V7.2-Ø4
BACLOD V7.2-Ø4	BACLST V7.2-Ø4	BACMNT V7.2-Ø4
BACPRM V7.2-Ø4	BACKTO V7.2-Ø4	BACKUP V7.2-Ø4

Spooling and Operator Services Package

BATCH V7.2-Ø4	BATDCD V7.2-Ø4	BATDEC V7.2-Ø4
BATIDL V7.2-Ø4	BATRUN V7.2-Ø4	CHARS V7.2-Ø4
OPSER V7.2-Ø4	OPSRUN V7.2-Ø4	QUE V7.2-Ø4
QUEMAN V7.2-Ø4	QUMRUN V7.2-Ø4	SPLIDL V7.2-Ø4
SPLRUN V7.2-Ø4	SPOOL V7.2-Ø4	

Automated Patching Facility Package

ATPK V7.2-Ø4	AUTOED V7.2-Ø4	CPATCH V7.2-Ø4
ONLPAT V7.2-Ø4	PATCPY V7.2-Ø4	PBUILD V7.2-Ø4

Device Test Package

CPEXER V7.2-Ø4	CPUTST V7.2-Ø4	DSKEXR V7.2-Ø4
DSKSEK V7.2-Ø4	DTEXER V7.2-Ø4	DXEXER V7.2-Ø4
KBEXER V7.2-Ø4	LPEXER V7.2-Ø4	MTEXER V7.2-Ø4
PPEXER V7.2-Ø4	PREXER V7.2-Ø4	DDEXER V7.2-Ø4

DCL

PRELIN V7.2-Ø4	SHOTER V7.2-Ø4

5.3 Protection Codes for Commonly Used System Programs (CUSPs)

This table lists the protection codes for the Commonly Used System Programs (CUSPs) supplied as part of the standard RSTS/E V7.2 System Library Program release. These protection codes are used when the programs are installed, and should be used when re-compiling the programs after patching.

System Utilities Package

BUILD <124>	DIRECT <232>	DSKINT <124>	GRIPE <232>
INIT <124>	LOGIN <232>	LOGOUT <232>	MONEY <104>
ODT <124>	PLEASE <232>	QUOLST <232>	REACT <124>
REORDR <124>	SHUTUP <124>	SWITCH <232>	SYSTAT <232>
TALK <232>	TTYSET <104>	UMOUNT <232>	UTILTY <124>
VT5DPY <232>	VT50PY <232>		

Data Manipulation Package

BPCREF <104>	BPCRF1 <104>	COPY <104>	FILCOM <104>
FIT <232>	FLINT <104>	MAKSIL <104>	PMDUMP <104>
RUNOFF <104>			

Error Control Package

ANALYS <124>	ANALY1 <124>	ANALY2 <124>	ANALY3 <124>
ERRBLD <124>	ERRCPY <124>	ERRDET <124>	ERRDIS <124>
ERRINT <124>			

Backup Package

BACCOM <232>	BACCON <232>	BACDEL <232>	BACDIR <232>
BACDMP <232>	BACDSK <232>	BACENT <124>	BACFRM <232>
BACLAB <232>	BACLOD <232>	BACLST <232>	BACMNT <232>
BACPRM <124>	BACKTO <232>	BACKUP <232>	

Spooling and Operator Services Package

BATCH <124>	BATDCD <124>	BATDEC <124>	BATIDL <124>
BATRUN <124>	CHARS <124>	OPSER <124>	OPSRUN <124>
QUE <232>	QUEMAN <124>	QUMRUN <124>	SPLIDL <124>
SPLRUN <124>	SPOOL <124>		

Automated Patching Facility Package

ATPK <252>	AUTOED <124>	CPATCH <124>	ONLPAT <124>
PATCPY <124>	PBUILD <124>		

Device Test Package

CPEXER <124>	CPUTST <124>	DSKEXR <124>	DSKSEK <124>
DTEXER <124>	DXEXER <124>	KBEXER <124>	LPEXER <124>
MTEXER <124>	PPEXER <124>	PREXER <124>	DDEXER <124>

DCL

PRELIN <232>	SHOTER <124>

RSX Emulator Package

CRF.TSK <104>	CSPCOM.OLB <40>	CSPCOM.TSK <124>
LBR.TSK <104>	MAC.TSK <104>	PAT.TSK <104>
RNO.TSK <104>	RSXMAC.SML <40>	SLOTKB.TSK <104>
SYSLIB.OLB <40>	TKB.TSK <104>	

RT-11 Emulator Package

CREF.SAV <104>	HOOK.SAV <104>	LIBR.SAV <104>
LINK.SAV <104>	LOGIN.SAV <232>	LOGOUT.SAV <232>
MACRO.SAV <104>	ONLCLN.SAV <124>	PAT.SAV <104>
PIP.SAV <232>	SAVRES.SAV <124>	SILUS.SAV <104>
SYSBAT.SAV <124>	SYSGEN.SAV <124>	UTILTY.SAV <104>

5.4 Compiling CUSPs under BASIC-PLUS-2 or RSX (CSPCOM)

The patching procedure included in those articles that patch BASIC-PLUS source code refer to this section for the appropriate procedure to be followed if BASIC-PLUS is not your system default run-time system. (The BUILD/AUTOPATCH will perform all of these steps for you if you are installing patches from a patch kit.)

The sequence of commands for compiling BASIC-PLUS programs under the BASIC-PLUS run-time system is (items in square brackets are patch or program dependent):

```
BASIC/BPLUS  (if currently in DCL)

OLD PRGNAM.BAS
[APPEND APPEND.BAS]
COMPILE [SY0:]$PRGNAM[<prot>]
```

The paragraphs which follow describe the comparable commands if BASIC-PLUS-2 or RSX (CSPCOM) is your system default run-time system.

Note that the following CUSPs must always reside on SY0:, regardless of your system default run-time system:

ATPK INIT LOGIN LOGOUT SHUTUP UTILTY

BASIC-PLUS-2

If BASIC-PLUS-2 is your primary run-time system, first issue the command BASIC/BP2 (if you are currently using DCL) or SWITCH to BP2COM.

If an article indicates that the program "should be compiled under the BASIC2 run-time system", the compile sequence is:

```
SCALE Ø
OLD PRGNAM.BAS
[APPEND APPEND.BAS]
COMPILE [SYØ:]$PRGNAM[<prot>]/TSK/CHA/LIN/NODEB
```

If an article indicates that the program "must be task built against the BP2COM run-time system", use the following sequence of commands:

```
SCALE Ø
OLD PRGNAM.BAS
[APPEND APPEND.BAS]
COMPILE PRGNAM.OBJ/CHA/LIN/NODEB/OBJ
RUN SY:[1,2]TKB.TSK
[SYØ:]$PRGNAM.TSK/FP=PRGNAM.OBJ,LB:BP2COM.OLB/LB
/
HISEG=BP2COM
UNITS=12
ASG=SY:5:6:7:8:9:1Ø:11:12
//
RUN SY:[1,2]PIP.SAV
PRGNAM.OBJ/DE:NO
[[SYØ:]$PRGNAM.TSK<prot>/RE]
^Z
```

Programs which must be task built include those which must reside on SYØ:, as well as FILCOM and FIT.

RSX (CSPCOM)

If RSX is your primary run-time system, use the following sequence of commands:

```
SWITCH RSX
RUN $CSPCOM
PRGNAM.OBJ/OBJ=PRGNAM.BAS[,APPEND.BAS]
^Z
RUN SY:[1,2]TKB.TSK
PRGNAM.TSK/FP=PRGNAM.OBJ,LB:CSPCOM.OLB/LB
/
UNITS=12
ASG=SY:5:6:7:8:9:10:11:12
//
RUN SY:[1,2]PIP.SAV
PRGNAM.OBJ/DE:NO
[[SY0:]$PRGNAM.TSK<prot>/RE]
^Z
```

RSTS/E V7.2
Initialization
INIT.SYS Program Patches

Seq 1.1.1 F

1 of 3

CHANGE SAVRES DENSITY DEFAULT TO 1600 BPI - INIT.SYS FEATURE PATCH

PROBLEM:

SAVRES, as released, defaults to the lowest density (of 800 BPI and 1600 BPI) allowed by a given tape drive (normally 800 BPI) for all tape I/O. It may be desirable at some installations to have SAVRES default to the highest density allowed by a given tape drive for more compact storage of data. This is especially true if all drives on the system support 1600 BPI and the problem described below is not applicable.

CAUTION

> If the tape drive being used has a TM02 formatter, the hardware bootstrap of a 1600 BPI tape will not be possible. (You can determine the formatter type by using the HARDWR LIST suboption of INIT.) Therefore, if it is desirable for SAVRES to create tapes which are bootable on such a drive it is recommended that this patch not be installed. Normally, TU16 and TU45 drives use a TM02 formatter, TE16 and TU77 drives do not.

SOLUTION:

The following feature patch will cause the SAVRES option of INIT.SYS to default to the highest density allowed by a given tape drive for all tape I/O. This default can be overridden by attaching the /DENSITY:800 switch to the device specification. Refer also to article Seq 22.19.1 F, which supplies a similar patch for SAVRES.SAV.

PROCEDURE:

1. This is a feature patch to the RSTS/E INIT.SYS Program. Since patching the distribution medium is not recommended, the patch must be installed every time the COPY option is used to copy INIT.SYS from the distribution medium. Any copy of the patched INIT.SYS will propagate the feature.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

   Option: PATCH
   File to patch? INIT.SYS

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>            (RETURN for manual patch installation)
File to patch? INIT.SYS
File found in account [Ø,1]
```

The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? DIACTL
Offset address? 31Ø
 Base   Offset  Old     New?
??????  ØØØ31Ø  Ø3ØØ7Ø  ? "16
??????  ØØØ312  177460  ? "ØØ
??????  ØØØ314  Ø33Ø61  ? Ø34377
??????  ØØØ316  Ø3ØØ6Ø  ? <lf>      (no change; verify only)
??????  ØØØ32Ø  ØØØ377  ? <lf>      (no change; verify only)
??????  ØØØ322  ØØ144Ø  ? 16ØØ.
??????  ØØØ324  ØØ31ØØ  ? 8ØØ.
??????  ØØØ326  ØØØØØØ  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                  (CTRL/Z for new base)
Base address? SAVCTL
Offset address? 42
 Base   Offset  Old     New?
??????  ØØØØ42  Ø3ØØ7Ø  ? "16
??????  ØØØØ44  177460  ? "ØØ
??????  ØØØØ46  Ø33Ø61  ? Ø34377
??????  ØØØØ5Ø  Ø3ØØ6Ø  ? <lf>      (no change; verify only)
??????  ØØØØ52  ØØØ377  ? <lf>      (no change; verify only)
??????  ØØØØ54  ØØ144Ø  ? 16ØØ.
??????  ØØØØ56  ØØ31ØØ  ? 8ØØ.
??????  ØØØØ6Ø  ØØØØØØ  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                  (CTRL/Z for new base)
```

RSTS/E V7.2 Seq 1.1.1 F
Initialization
INIT.SYS Program Patches 3 of 3

```
Base address? RESCTL
Offset address? 30
 Base   Offset  Old     New?
??????  000030  030070  ? "16
??????  000032  177460  ? "00
??????  000034  033061  ? 034377
??????  000036  030060  ? <lf>      (no change; verify only)
??????  000040  000377  ? <lf>      (no change; verify only)
??????  000042  001440  ? 1600.
??????  000044  003100  ? 800.
??????  000046  000000  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                 (CTRL/Z for new base)
Base address? $$0101
Offset address? 0
 Base   Offset  Old     New?
??????  000000  ??????  ? Q!1
??????  000002  ??????  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

RSTS/E V7.2 Seq 1.1.2 F
Initialization
INIT.SYS Program Patches 1 of 2

MAKING /NOERROR THE DEFAULT - INIT.SYS FEATURE PATCH

PROBLEM:

The /NOERROR switch indicates that SAVRES should abort under the following conditions:

1. A contiguous file is made non-contiguous
2. A placed file is "unplaced"
3. A bad comparison occurs
4. An unexpected bad block is encountered on the input RSTS/E disk in a SAVE or IMAGE operation

Some installations, however, may always want SAVRES to abort under these circumstances.

SOLUTION:

The following feature patch will make /NOERROR, rather than /ERROR, the default in the SAVRES option of INIT.SYS. Note that the user may override the default for a particular operation by specifying /ERROR. Refer also to article Seq 22.19.2 F, which supplies a similar patch for SAVRES.SAV.

PROCEDURE:

1. This is a feature patch to the RSTS/E INIT.SYS Program. Since patching the distribution medium is not recommended, the patch must be installed every time the COPY option is used to copy INIT.SYS from the distribution medium. Any copy of the patched INIT.SYS will propagate the feature.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

   ```
   Option: PATCH
   File to patch? INIT.SYS
   ```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

   ```
   RUN $ONLPAT
   Command File Name? <cr>          (RETURN for manual patch installation)
   File to patch? INIT.SYS
   File found in account [Ø,1]
   ```

The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..NOER
Offset address? 2
 Base   Offset  Old     New?
??????  ØØØØØ2  ØØØØ1Ø  ? 4
??????  ØØØØØ4  ??????  ? <lf>      (no change)
??????  ØØØØØ6  ??????  ? <lf>      (no change)
??????  ØØØØ1Ø  ??????  ? <lf>      (no change)
??????  ØØØØ12  ØØØØØ4  ? 1Ø
??????  ØØØØ14  ??????  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                  (CTRL/Z for new base)
Base address? $$Ø1Ø1
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ??????  ? Q!2
??????  ØØØØØ2  ??????  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

RSTS/E V7.2
Initialization
INIT.SYS Program Patches

Seq 1.1.3 F

1 of 2

MAKING /NOSTATS THE DEFAULT - INIT.SYS FEATURE PATCH

PROBLEM:

SAVRES always prints a summary report after completing a transfer unless the /NOSTATS (no statistics) switch is specified. Certain installations may prefer that this report NOT be printed unless specifically requested.

SOLUTION:

The following feature patch will make /NOSTATS, rather than /STATS, the default in the SAVRES option of INIT.SYS. Note that the user may override this default for a particular operation by specifying /STATS. Refer also to article Seq 22.19.3 F, which supplies a similar patch for SAVRES.SAV.

PROCEDURE:

1. This is a feature patch to the RSTS/E INIT.SYS Program. Since patching the distribution medium is not recommended, the patch must be installed every time the COPY option is used to copy INIT.SYS from the distribution medium. Any copy of the patched INIT.SYS will propagate the feature.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

   ```
   Option: PATCH
   File to patch? INIT.SYS
   ```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

   ```
   RUN $ONLPAT
   Command File Name? <cr>          (RETURN for manual patch installation)
   File to patch? INIT.SYS
   File found in account [Ø,1]
   ```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..NOST
Offset address? 2
 Base   Offset  Old     New?
??????  000002  000040  ? 20
??????  000004  ??????  ? <lf>      (no change)
??????  000006  ??????  ? <lf>      (no change)
??????  000010  ??????  ? <lf>      (no change)
??????  000012  000020  ? 40
??????  000014  ??????  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                 (CTRL/Z for new base)
Base address? $$0101
Offset address? 0
 Base   Offset  Old     New?
??????  000000  ??????  ? Q!4
??????  000002  ??????  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

RSTS/E V7.2 Seq 1.1.4 F
Initialization
INIT.SYS Program Patches 1 of 2

CHANGING THE DEFAULT LINE FREQUENCY TO 50 HERTZ - INIT.SYS FEATURE PATCH

PROBLEM:

When new Save Image Libraries (SIL's) are installed with INIT, the line frequency will always default to 60 HERTZ. If your system uses an AC line frequency of 50 Hz, then every installation of a new monitor requires that you use the HARDWR HERTZ suboption to change this value.

SOLUTION:

The following INIT.SYS patch will set the default line frequency for the installed monitor SIL and INIT.SYS to 50 Hz. Note that if you have previously installed a monitor SIL with an unpatched copy of INIT.SYS, you must use the HARDWR HERTZ suboption to change the line frequency for that monitor SIL (if the monitor SIL is not currently installed, you must use the HERTZ suboption to change its default line frequency the next time you install it).

This patch is most effective if applied before any SILs are installed. If you are installing a monitor SIL for the first time, and you are using an INIT.SYS which is patched as indicated below, the default line frequency will be 50 Hz.

PROCEDURE:

1. This is a feature patch to the RSTS/E INIT.SYS Program. Since patching the distribution medium is not recommended, the patch must be installed every time the COPY option is used to copy INIT.SYS from the distribution medium. Any copy of the patched INIT.SYS will propagate the fix.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

   ```
   Option: PATCH
   File to patch? INIT.SYS
   ```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

   ```
   RUN $ONLPAT
   Command File Name? <cr>          (RETURN for manual patch installation)
   File to patch? INIT.SYS
   File found in account [0,1]
   ```

This patch is contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..DFHZ
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ØØØØ74  ? 5Ø.
??????  ØØØØØ2  ??????  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                  (CTRL/Z for new base)
Base address? $$Ø1Ø1
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ??????  ? Q!1Ø
??????  ØØØØØ2  ??????  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

DEVICES WITH NON-STANDARD UNIBUS ADDRESSES AND VECTORS

Some installations have devices which are installed at non-standard UNIBUS addresses or which vector to non-standard locations. INIT does not automatically recognize these devices. Of course, the best solution is to have field service re-configure these devices so that they conform to the standard. Appendix C of the RSTS/E System Generation Manual contains the information you need to determine the correct UNIBUS addresses and vectors for all devices supported by RSTS/E. Note that extra units such as the second RX, second PR, etc., do not have "homes" and must use the CSR option.

If re-configuration is not possible, you can use the HARDWR option of INIT. The CSR suboption sets non-standard UNIBUS addresses and the VECTOR suboption sets non-standard vectors. DIGITAL strongly recommends that you use only the CSR suboption. This tells INIT to find the device at its non-standard UNIBUS address, but lets INIT determine the device's vector. If the device is functioning properly, INIT will find the device's non-standard vector. The only device for which INIT cannot determine a vector is the card reader. If a card reader has a non-standard vector, you must use the VECTOR suboption. The PA611 paper tape reader must be powered on for INIT to find its vector. Use the VECTOR suboption if you intend to start your system with a PA611 paper tape reader powered off.

Be careful when you assign non-standard vectors to devices. INIT checks all device vectors (assigned through the VECTOR suboption or automatically determined) against a table of reserved locations. INIT also checks to see if any vector location is used by more than one device. Any conflict will print the message

Vector for Device XXn: (vvv) already in use - device disabled.

where vvv is the octal address of the erring vector.

The RSTS/E reserved locations, which may not be used as device vectors, are:

Addresses	RSTS/E usage
Ø-2	Detection of jumps to Ø and traps to Ø
4-36	System trap vectors
4Ø-56	Reload start addresses, failure HALT
1ØØ-1Ø2	KW11-L line frequency clock vector
1Ø4-1Ø6	KW11-P crystal clock vector
11Ø-112	Jump to Ø handling
114-116	Memory parity trap vector
144-146	Crash dump handling
234-236	Statistics handling
24Ø-242	PIRQ trap vector
244-246	FPP or FIS exception trap vector
25Ø-252	Memory Management Unit trap vector

HOW TO CHANGE THE NUMBER OF SMALL BUFFERS SPECIFIED AT SYSGEN

It is often useful to be able to change the number of small buffers in a monitor without repeating the entire system generation dialogue.

To do so, perform the following steps

1. Edit CONFIG.MAC to indicate how many small buffers you want. Change the value of the symbol SMLBUF to indicate how many small buffers you want.

2. Reassemble TBL.MAC.

3. Relink and re-SILUS the monitor.

The value of SMLBUF indicates approximately how many general small buffers the system will have if none are added during initialization. The value of SMLBUF does not directly affect FIP small buffers.

RSTS/E V7.2
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Monitor Patches

Seq 3.1.1 F

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MAKING RECEIVER DECLARATION NON-PRIVILEGED - MONITOR FEATURE PATCH

The RSTS/E monitor normally requires that a job have permanent or temporary privileges in order to declare itself to be a message receiver. There are some production environments in which it is useful for non-privileged jobs to have this capability. The following procedure allows you to patch the RSTS/E monitor to remove the privileged status of the message receiver declaration SYS call.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL.

2. The patch described below can be installed using the PATCH option of INIT.SYS:

   ```
   Option: PATCH
   File to patch? <lf>                (LINE FEED for installed monitor SIL)
   ```

3. This patch can be installed manually using ONLPAT, the on-line patching program.

   Note that if you answered 'No' to the 'Resident Send/Receive' question during system generation this patch will take effect immediately when applied to the installed monitor SIL.

   ```
   RUN $ONLPAT
   Command File Name? <cr>            (RETURN for manual patch installation)
   File to patch? <lf>                (LINE FEED for installed monitor SIL)
   File found in account [Ø,1]
   ```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The first part of the patch is as follows:

```
Module name? RSTS
Base address? $$Ø3Ø1
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ??????  ? Q!1
??????  ØØØØØ2  ??????  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If you are using INIT, you will return to "Option: " at this point. You must again select the PATCH option as in step 2 above.

   If you are using ONLPAT, you will return to the "Command File Name?" question. Type RETURN for manual patch installation as in step 3 above.

   Proceed as follows:

```
File to patch? <lf>                (LINE FEED for installed monitor SIL)
Module name? OVR
Base address? ..RCVP
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ??????  ? 24Ø
??????  ØØØØØ2  126427  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

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Monitor Patches

Seq 3.1.2 F

FIRST FIT MEMORY ALLOCATION - MONITOR FEATURE PATCH

When a residency request is made for a job or for a run-time system residency without a specific load address, the RSTS/E monitor does a best fit allocation: the job or run-time system is loaded into the smallest free area in memory in which it fits. For some systems, especially those with a large user memory region, a first fit allocation may result in better performance.

This monitor feature patch changes the memory allocation from best fit to first fit.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? <lf>                (LINE FEED for installed monitor SIL)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>            (RETURN for manual patch installation)
File to patch? <lf>                (LINE FEED for installed monitor SIL)
File found in account [Ø,1]
```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Module name? GEN
Base address? ..FFIT
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ØØ1627  ? 627
??????  ØØØØØ2  Ø2Ø2Ø3  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                  (CTRL/Z for new base)
Base address? ^Z                    (CTRL/Z for new module)
Module name? RSTS
Base address? $$Ø3Ø1
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ??????  ? Q!2
??????  ØØØØØ2  ??????  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

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Monitor Patches

Seq 3.1.3 F

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CACHE REPLACEMENT TIME - MONITOR FEATURE PATCH

When data is installed in the disk cache, it will not be removed until a certain minimum residency time has expired (unless the last block of a cluster is read in sequential mode). The minimum residency time is meant to keep some useful data in the cache, even when the cache is very small, and prevent thrashing. For systems with large caches or rapidly changing disk access patterns, it may be advantageous to reduce the minimum residency time from its default value of 1 minute. The residency time may be changed to any integer value in the range Ø. to 65535. inclusive. Refer to the RSTS/E System Manager's Guide for a discussion of caching tradeoffs.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL.

2. Determine the new minimum cache residency time in seconds. Use this value as n in Step 5 below. Be sure to include a period after the number so that it is interpreted as a decimal number.

3. The patch described in Step 5 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? <lf>                (LINE FEED for installed monitor SIL)
```

4. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>            (RETURN for manual patch installation)
File to patch? <lf>                (LINE FEED for installed monitor SIL)
File found in account [Ø,1]
```

The patch is also contained in a patch file appearing in patch kit version "A" or later.

NOTE

The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed.

5. The patch is as follows:

```
Module name? RSTS
Base address? ..CAGE
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ØØØØ74  ? n.       (from step 2)
??????  ØØØØØ2  ??????  ? ^Z       (CTRL/Z for new offset)
Offset address? ^Z                 (CTRL/Z for new base)
Base address? $$Ø3Ø1
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ??????  ? Q!4
??????  ØØØØØ2  ??????  ? ^C       (up-arrow/C to exit;CTRL/C for INIT)
```

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Monitor Patches

DISABLING THE USE OF DATA SPACE - MONITOR FEATURE PATCH

PROBLEM:

Some systems may find it desirable to permanently disable the use of Data Space by the monitor because optional software generated into the system is not compatible with the monitor using Data Space. If your monitor contains any unsupported software, such as a locally written device driver, then it is unlikely to work with data space. The only supported monitor software which works with Data Space is software that comes from either the RSTS/E V7.2, DECnet/E V2.Ø, FMS-11 V1.5, RSTS/E 3271 Protocol Emulator, or RSTS/E High Performance 278Ø/378Ø Protocol Emulator distribution kits. Note that Data Space will automatically not be used if your system includes the optional RSTS/E-278Ø (RJ278Ø) package.

Please refer to Section 1.1 of the RSTS/E V7.2 Release Notes for additional information of Data Space.

SOLUTION:

The patching procedure detailed below will cause the monitor to never use Data Space, regardless of whether the processor it is running on supports it or not.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? <lf>                (LINE FEED for installed monitor SIL)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program. Note, however, that if the patch is applied online to the installed monitor SIL, it will not take effect until the system is re-booted.

```
RUN $ONLPAT
Command File Name? <cr>            (RETURN for manual patch installation)
File to patch? <lf>                (LINE FEED for installed monitor SIL)
File found in account [Ø,1]
```

This patch is contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Module name? DEFALT
Base address? ..NODS
Offset address? Ø
 Base   Offset  Old     New?
ØØ1ØØØ  ØØØØØØ  ØØØØØØ  ? \
ØØ1ØØØ  ØØØØØØ     ØØØ  ? -1
ØØ1ØØØ  ØØØØØ1     ØØØ  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                  (CTRL/Z for new base)
Base address? ^Z                    (CTRL/Z for new module)
Module name? RSTS
Base address? $$ØЗØ1
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ??????  ? Q!1Ø
??????  ØØØØØ2  ??????  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

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Executive
Terminal Service Patches

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RESTRICTING TERMINAL MODES - TERMINAL SERVICE FEATURE PATCH

The RSTS/E monitor normally allows any user to OPEN a terminal in binary mode or echo control mode (if configured). There is a danger in the use of these terminal modes, since all characters (including CTRL/C) are passed to the user program. A novice user could easily find himself in a situation in which his terminal does not respond. A malicious user could "lock up" a terminal in a way which required the system manager to kill his or her job. The following procedure allows you to patch the RSTS/E monitor to specify which terminal OPEN modes require privileges. Privileged users and non-privileged users running privileged programs would still have full access to all available terminal modes. Attempts by non-privileged users to use restricted modes would be rejected with no error message.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL.

2. Decide which terminal modes you wish to make privileged. Consult the RSTS/E Programming Manual for the various modes which are available, and determine the associated MODE values. Compute the sum, n, of the MODE values corresponding to the modes you wish to restrict. If you calculate the sum of the mode values in decimal, include a decimal point after the value of n in the patch below so that it is interpreted as a decimal number.

3. The patch described in Step 5 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? <lf>                (LINE FEED for installed monitor SIL)
```

4. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>            (RETURN for manual patch installation)
File to patch? <lf>                (LINE FEED for installed monitor SIL)
File found in account [Ø,1]
```

The patch is also contained in a patch file appearing in patch kit version "A" or later.

NOTE

The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed.

5. The patch is as follows:

```
Module name? TER
Base address? ..KBMP
Offset address? -2
 Base   Offset  Old       New?
??????  177776  Ø42ØØ2  ? <lf>      (no change; verify only)
??????  ØØØØØØ  ØØØØØØ  ? n         (from step 2)
??????  ØØØØØ2  ??????  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                  (CTRL/Z for new base)
Base address? ^Z                    (CTRL/Z for new module)
Module name? RSTS
Base address? $$Ø3Ø3
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ??????  ? Q!1
??????  ØØØØØ2  ??????  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

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Executive
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Seq 3.3.2 F

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IMMEDIATE MODEM HANGUP - TERMINAL SERVICE FEATURE PATCH

When the carrier frequency drops on a modem line connecting a terminal to RSTS/E, the monitor normally waits approximately 5 seconds before hanging up the line. This allows recovery from transient line failures or accidental unseating of a phone from an acoustic coupler. In certain areas, such as the United Kingdom, computer systems are required to disconnect from such a line within milliseconds. The following patch causes RSTS/E to hang up a modem line as soon as it detects loss of carrier signal on that line. Note that LOGIN automatically hangs up after an unsuccessful log-in attempt.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL that supports modem control.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? <lf>                (LINE FEED for installed monitor SIL)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>            (RETURN for manual patch installation)
File to patch? <lf>                (LINE FEED for installed monitor SIL)
File found in account [Ø,1]
```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

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4. The patch is as follows:

```
Module name? TER
Base address? ..UKMD
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ØØØ4Ø4  ? 24Ø
??????  ØØØØØ2  Ø12704  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                 (CTRL/Z for new base)
Base address? ^Z                   (CTRL/Z for new module)
Module name? RSTS
Base address? $$Ø3Ø3
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ??????  ? Q!2
??????  ØØØØØ2  ??????  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

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Executive
Terminal Service Patches 1 of 2

CHANGING SPECIAL LOGIN TERMINAL - TERMINAL SERVICE FEATURE PATCH

The number of jobs that can log in to a RSTS/E system is limited by the swapping space available, the JOB MAX set at system start-up time, and the login setting (set by the LOGINS, NO LOGINS, and SET LOGINS functions of UTILTY). However, the console terminal (KBØ:) is a special terminal, and can log in regardless of the login setting, provided that swapping space and JOB MAX permit.

With the patch given below, one or two special keyboards can be selected, or this feature can be disabled entirely.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL.

2. Decide which terminals should be allowed to log in regardless of the login setting, and use those numbers as m and n in the patch below. If you wish to allow only one terminal, use its number as m and use -1 in place of n. If you wish to disable this feature, use -1 in place of both m and n. Be sure you include the decimal point after the new value of m or n so that it is interpreted as a decimal number.

3. The patch described in Step 5 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? <lf>                (LINE FEED for installed monitor SIL)
```

4. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>            (RETURN for manual patch installation)
File to patch? <lf>                (LINE FEED for installed monitor SIL)
File found in account [Ø,1]
```

The patch is also contained in a patch file appearing in patch kit version "A" or later.

NOTE

The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed.

5. The patch is as follows:

```
Module name? TER
Base address? ..CTZ.
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ØØØØØØ  ? m.*2 (or -1) (from step 2)
??????  ØØØØØ2  ØØ14Ø7  ? ^Z           (CTRL/Z for new offset)
Offset address? ^Z                    (CTRL/Z for new base)
Base address? ..CTY.
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  177777  ? n.*2 (or -1) (from step 2)
??????  ØØØØØ2  ØØ14Ø4  ? ^Z           (CTRL/Z for new offset)
Offset address? ^Z                    (CTRL/Z for new base)
Base address? ^Z                      (CTRL/Z for new module)
Module name? RSTS
Base address? $$Ø3Ø3
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ??????  ? Q!4
??????  ØØØØØ2  ??????  ? ^C       (up-arrow/C to exit;CTRL/C for INIT)
```

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Terminal Service Patches

Seq 3.3.4 F

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CHANGING A TERMINAL'S INPUT BUFFER QUOTA - TERMINAL SERVICE FEATURE PATCH

Inside every terminal's DDB (Device Data Block) is an "input buffer quota" value. The default value is 6. Since there are 3Ø. characters in a buffer, this is equal to 6 times 3Ø. or 18Ø. characters. Terminal service will attempt to buffer that many characters before telling the terminal to stop (by sending it an XOFF). You can increase the input buffer quota value for one or more high-speed input terminals by using this feature patch.

NOTE

> There is no guarantee that a terminal will be able to allocate its full buffer quota. A heavy system load may leave less than the terminal's full buffer quota available. In addition, while the installation of this patch will not have any direct adverse effect on a system, it does cause more small buffers to be used.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL.

2. Decide which terminal will have its buffer quota altered, and use that number as n in the patch below. Be sure you include the decimal point after the value of n so that it is interpreted as a decimal number. Also decide what the new buffer quota for that terminal should be, and use that number as m in the patch below. The legal values for m are 6. through about 2Ø. inclusive.

3. The patch described in Step 5 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? <lf>                (LINE FEED for installed monitor SIL)
```

4. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>            (RETURN for manual patch installation)
File to patch? <lf>                (LINE FEED for installed monitor SIL)
File found in account [Ø,1]
```

The patch is also contained in a patch file appearing in patch kit version "A" or later.

NOTE

The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed.

5. The patch is as follows:

```
Module name? RSTS
Base address? KBDDDB
Offset address? DDS.KB*n.+26          (n. is the KB number)
 Base   Offset  Old       New?
??????  ??????  ØØØØØ6  ? m.          (from step 2)
??????  ??????  ØØØØØØ  ? ^Z          (CTRL/Z for new offset)
Offset address? ^Z                    (CTRL/Z for new base)
Base address? $$Ø3Ø3
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ??????  ? Q!1Ø
??????  ØØØØØ2  ??????  ? ^C          (up-arrow/C to exit;CTRL/C for INIT)
```

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INPUT ESCAPE SEQUENCE HANDLING - TERMINAL SERVICE FEATURE PATCH

RSTS/E allows multiple character incoming escape sequences. The RSTS/E Programming Manual fully describes the escape sequence handling.

One of the multi-character escape sequences is ESCape followed by "P" followed by one modifier character. On the VT52 terminal, the upper left hand key on the auxiliary keypad (usually blue) generates ESC P. When the VT100 terminal is operating in VT52 mode, the upper lefthand key on the auxiliary keypad (usually labelled "PF1") generates ESC P. If the terminal user types this key and then any other graphic key, the whole sequence is gathered by the terminal service and delivered to the application program. None of the sequence is echoed. Thus, the blue key can be considered a "function" key to be followed by some function code character.

On the other hand, some existing applications using the VT52 may expect this key to generate a standalone escape sequence with no required (or desired) modifier character. You may install the following patch to change the terminal service so that the ESCape, "P" sequence does not expect a modifier character. Note that this patch affects all terminals on the system.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? <lf>                (LINE FEED for installed monitor SIL)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>            (RETURN for manual patch installation)
File to patch? <lf>                (LINE FEED for installed monitor SIL)
File found in account [0,1]
```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Module name? TER
Base address? ..ESCP
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  Ø5ØØØ1  ? Q&177400
??????  ØØØØØ2  ??????  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                  (CTRL/Z for new base)
Base address? ^Z                    (CTRL/Z for new module)
Module name? RSTS
Base address? $$Ø3Ø3
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ??????  ? Q!2Ø
??????  ØØØØØ2  ??????  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

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Seq 3.3.6 F

1 of 2

RESTRICTING PSEUDO KEYBOARD MODES - TERMINAL SERVICE FEATURE PATCH

The RSTS/E monitor normally allows any user to OPEN a pseudo keyboard with mode 1%, which causes the controlled job to detach rather than be killed if the controlling job closes the pseudo keyboard prematurely. There is a danger in the use of this mode, since a non-privileged user could fill the system with detached jobs. The following procedure allows you to patch the RSTS/E monitor to specify which pseudo keyboard OPEN modes require privileges. Privileged users and non-privileged users running privileged programs would still have full access to all available pseudo keyboard modes. If a non-privileged user specifies a restricted mode, the mode value will be ignored but no error message will be printed.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL.

2. Decide which pseudo keyboard modes you wish to make privileged. Consult the RSTS/E Programming Manual for the various modes which are available, and determine the associated MODE values. Compute the sum, n, of the MODE values corresponding to the modes you wish to restrict. If you calculate the sum of the mode values in decimal, include a decimal point after the value of n in the patch below so that it is interpreted as a decimal number.

3. The patch described in Step 5 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? <lf>                (LINE FEED for installed monitor SIL)
```

4. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>            (RETURN for manual patch installation)
File to patch? <lf>                (LINE FEED for installed monitor SIL)
File found in account [Ø,1]
```

The patch is also contained in a patch file appearing in patch kit version "A" or later.

NOTE

The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed.

5. The patch is as follows:

```
Module name? TER
Base address? ..PKMP
Offset address? -2
 Base   Offset  Old       New?
??????  177776  142761  ? <lf>      (no change; verify only)
??????  000000  000000  ? n         (from step 2)
??????  000002  ??????  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                  (CTRL/Z for new base)
Base address? ^Z                    (CTRL/Z for new module)
Module name? RSTS
Base address? $$0303
Offset address? 0
 Base   Offset  Old       New?
??????  000000  ??????  ? Q!40
??????  000002  ??????  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

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INCREASING THE TIME ALLOWED FOR DIAL UP - TERMINAL SERVICE FEATURE PATCH

PROBLEM:

Terminal Service is distributed with a 30 second timeout limit for dialing to a host. This time may not be sufficient, for example, when dialing to a long-distance number.

SOLUTION:

You can increase the timeout limit with the following patch. We recommend that you increase the timeout limit to 90 or 120 seconds. The maximum timeout limit is 127 seconds.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? <lf>                (LINE FEED for installed monitor SIL)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program. Note, however, that if the patch is applied online to the installed monitor SIL, it will not take effect until the system is re-booted.

```
RUN $ONLPAT
Command File Name? <cr>            (RETURN for manual patch installation)
File to patch? <lf>                (LINE FEED for installed monitor SIL)
File found in account [0,1]
```

This patch is contained in a patch file appearing in patch kit version "A" or later.

NOTE

The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed.

4. The patch is as follows:

```
Module name? TER
Base address? ..WRNG
Offset address? -2
 Base   Offset  Old     New?
??????  177776  Ø12704  ? <LF>      (no change; verify only)
??????  ØØØØØØ  ??????  ? \
??????  ØØØØØØ     ???  ? n.       (n.=number of seconds 1-127.)
                                    (the period indicates decimal)
                                    (value as opposed to octal.)
??????  ØØØØØ1     1ØØ  ? ^Z       (CTRL/Z for new offset)
Offset address? ^Z                  (CTRL/Z for new base)
Base address? ^Z                    (CTRL/Z for new module)
Module name? RSTS
Base address? $$Ø3Ø3
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ??????  ? Q!1ØØ
??????  ØØØØØ2  ??????  ? ^C       (up-arrow/C to exit;CTRL/C for INIT)
```

2741 HARDWARE OPTIONS REQUIRED BY RSTS/E

RSTS/E supports 2741-compatible terminals connected through DL11D and DL11E single-line interfaces and through DH11 and DZ11 multiplexors. Certain 2741 hardware options are required for proper operation under RSTS/E.

The ability to detect "reverse break" is an option on 2741 terminals supplied by some manufacturers, including IBM. A reverse break is a control sequence sent by the computer to a terminal which is currently transmitting (keyboard is unlocked). The purpose of the reverse break is to force the terminal into the receive state (keyboard locked). RSTS/E sends a reverse break any time the system has output for the 2741 terminal but internal status tables indicate that the terminal is in the transmit state. If the terminal does not recognize the reverse break sequence, lock the keyboard, and switch to the receive state, the output will be lost and the terminal can end up in a strange state.

IBM refers to the reverse break detection capability on the IBM 2741 Model 1 Communications Terminal as Feature #4708 - Receive Interrupt. This option must be installed on all IBM 2741 terminals for correct operation under RSTS/E.

The ATTENTION key is also optional on IBM 2741 terminals and is required for operation under RSTS/E. The ATTN key generates a break which is interpreted in several ways by RSTS/E software. The RSTS/E System User's Guide describes the various functions of the ATTN key. IBM refers to the ATTN key and the associated break generation hardware as Feature #7900 - Transmit Interrupt. This option is commonly included on 2741 terminals supplied by IBM and is a standard feature on many 2741-compatible terminals supplied by other manufacturers.

NOTE

2741-compatible terminals are supported only for customers upgrading from RSTS/E V7.1 to RSTS/E V7.2.

2741 TERMINAL INTERFACE WIRING

The DL11D and DL11E terminal line interfaces require a special configuration for supporting the 2741. The configuration requires 6 data bits, 1 start bit, 1 stop bit, odd parity, 134.5 baud, and rotary switch position 3 for both input and output (full counter-clockwise is position 1). The following jumpers apply to each condition:

Condition	Jumper	
6 Data bits	NB1	out
	NB2	in
1 Stop bit	2SB	in
	J9	out
	J1Ø	in
	J11	out
Odd parity	NP	in
	EPS	in

The 134.5 baud specification requires a 1.Ø3296M crystal (DEC part #18-Ø55Ø2-6). Refer to the DL11 Installation Procedure for specifications pertinent to the DL11D and DL11E.

UNDERSTANDING SYNCHRONIZATION DELAYS

DIGITAL's video terminals (VT50, VT52, VT100, etc.) use two special control characters (commonly called XOFF and XON) to request the host computer to suspend and resume data transmission. One use of this synchronization protocol allows the terminal to "freeze" a screen of data giving the user a chance to read it before it has scrolled off the screen. On VT50-series terminals, this special mode, called HOLD SCREEN MODE, is enabled and disabled with escape sequences. Once enabled, the terminal detects when a line is about to be scrolled from the screen. The character received from the host computer that would cause the scroll is line feed (LF). At this point, the terminal sends an XOFF to the host and waits for the user to type the SCROLL key. During this time, the terminal will accept and buffer in a temporary storage area (called a silo) further characters received from the host. Even if the host computer can cease transmission with no software delays, there are delays in line transmission that cause a determinable number of characters to be received by the terminal after it has sent the XOFF.

HOLD SCREEN MODE is just one use of this synchronization protocol. Another use is in the handling of the hard copy option of the VT50-series terminals. The copier is slow (at least compared to the video screen) and the terminal must ask the host computer to suspend transmission so that it does not miss data when the copier is running.

The LA34, LA38, and LA120 terminals use this synchronization protocol, and when the LA180 DECprinter I is connected to the computer through a serial line interface (referred to as the LA180S), it also uses this protocol. If the printer "gets behind" due to high line transmission speed or carriage restore time, it requests the host to suspend data transmission. The printer will also send an XOFF if its ONLINE/OFFLINE switch is placed into the OFFLINE position or if it runs out of paper.

The RSTS/E terminal service processing of the synchronization protocol is enabled and disabled by the TTYSET commands STALL and NO STALL.

Below is the formula used for calculating the largest number of characters that would be received after the terminal has sent the XOFF:

$$1 + (3*Y/X) + 2*D*Y \quad \text{where}$$

X is the terminal's transmission rate in characters per second (CPS), Y is the host computer's transmission rate in CPS, and D is the delay time in seconds for a character to travel from one end of the line to the other.

> Note: This formula assumes that there is no host computer software delay. In reality there is always some delay at the host computer. This delay might be very small or possibly large, depending on system loading and other I/O interrupt activity.

Considering the formula from left to right:

The 1 is the character storage requirement for the line feed that triggered the XOFF in the first place.

The 3*Y/X is due to the nature of the UART (Universal Asynchronous Receiver/Transmitter) in the terminal. Since the UART is normally double buffered, there can be up to two characters already in the UART's buffers when the terminal decides to send the XOFF. Those two characters plus the XOFF correspond to three character times of terminal to host transmit during which the host may be sending to the terminal. Therefore, it is the ratio of the host and terminal transmission rates that is important for three terminal transmission times.

The 2*D is the total time delay for the line in both directions (the 2) to clear. During this time the host computer may have sent up to 2*D*Y characters to the terminal.

The formula presented here is not completely correct for the VT5Ø series of video terminals. The VT5Ø does not double buffer transmission to the host computer in its UART. On the other hand, the formula can be used as a worst case formula to ensure correct operation of the XON/XOFF Synchronization Protocol.

The following tables give the required size of the temporary storage area (silo) given: 1) the transmission speed (baud rate) from the host computer to the terminal, 2) the transmission speed from the terminal to the host computer, and 3) the physical delay of the transmission line. Local terminal connections have essentially a zero delay factor. The Phone Company specifies a nominal worst case delay of 5Øms in a coast-to-coast connection, assuming it is not via satellite.

The horizontal scale of baud rates is the baud rate from the host computer to the terminal.

The vertical scale of baud rates is the baud rate from the terminal to the host computer. Baud rates can be converted to characters per second (CPS) by dividing the baud rate by 1Ø (1 start bit + 8 data bits + 1 stop bit = 1Ø bits), with the exception of 11Ø baud which corresponds to 1Ø CPS (1 start bit + 8 data bits + 2 stop bits).

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Øms Line Delay

Transmit Speed to Terminal (Y)

Receive Speed from Terminal (X)	11Ø	15Ø	3ØØ	6ØØ	12ØØ	24ØØ	48ØØ	96ØØ
11Ø	4	6	1Ø	19	37	73	145	289
15Ø	3	4	7	13	25	49	97	193
3ØØ	2	3	4	7	13	25	49	97
6ØØ	2	2	3	4	7	13	25	49
12ØØ	1	1	2	3	4	7	13	25
24ØØ	1	1	1	2	3	4	7	13
48ØØ	1	1	1	1	2	3	4	7
96ØØ	1	1	1	1	1	2	3	4

50ms Line Delay

Transmit Speed to Terminal (Y)

Receive Speed from Terminal (X)	11Ø	15Ø	3ØØ	6ØØ	12ØØ	24ØØ	48ØØ	96ØØ
11Ø	5	7	13	25	49	97	193	385
15Ø	4	6	1Ø	19	37	73	145	289
3ØØ	3	4	7	13	25	49	97	193
6ØØ	3	3	6	1Ø	19	37	73	145
12ØØ	2	3	5	9	16	31	61	121
24ØØ	2	3	4	8	15	28	55	1Ø9
48ØØ	2	3	4	7	14	27	52	1Ø3
96ØØ	2	3	4	7	13	26	51	1ØØ

By referring to the manual that came with your terminal, you can determine which baud rate combinations are legal for your terminal.

UNDERSTANDING TERMINAL PARITY AND STOP BIT SETTINGS

Terminal Parity

The TTYSET commands "NO PARITY", "EVEN PARITY", and "ODD PARITY" control the format in which data characters are sent to a terminal. NO PARITY (the default) sends the full 8 bits of a byte out to a terminal. EVEN PARITY and ODD PARITY trim the byte to 7 bits of data and then set or clear the eighth bit to achieve the correct parity setting. (Note: Binary Output Mode is "Data Binary Output Mode". NO PARITY yields 8 bit data, EVEN PARITY and ODD PARITY yield 7 bit data.)

The DL11A/B/C/D/E and DJ11 interfaces do not have programmable hardware parity generation. For these interfaces, terminal service generates the output parity bit. The DH11 and DZ11 have programmable hardware parity generation, which is used by terminal service.

Stop Bit Settings

Terminal interfaces with programmable baud rate settings (DH11 and DZ11) also have programmable stop-bit settings. RSTS/E will automatically select 2 stop bits for speed settings of 11Ø baud or less and 1 stop bit for speeds greater than 11Ø baud. Older mechanical terminals, such as the ASR33 (which runs at 11Ø baud), require the time delay of 2 stop bits for synchronization. Modern terminals need only 1 stop bit.

When converting from baud rates to characters per second (CPS), the correct number of stop bits becomes clear. Asynchronous communication consists of 1 start bit, 8 data bits, and 1 or 2 stop bit(s).

(11Ø bits per second)/(1+8+2 bits per character)=11Ø/11=1Ø characters per second

(3ØØ bits per second)/(1+8+1 bits per character)=3ØØ/1Ø=3Ø characters per second

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MODEM CONTROL ON PRIVATE, LEASED LINES

Some RSTS/E installations use private, leased phone lines for terminal connections. If the line has no modem or no modem control (i.e., data signals only) then the line should be set as a local line using the INIT SET option. In this case the private, leased line is simply a long local connection. On the other hand, many private, leased lines do use modem control.

When using modem control, there are five modem signals used by RSTS/E:

1. Ring Indicator (Circuit CE, pin 22)

   This signal is true if the modem's "phone" is ringing. RSTS/E does not control this signal; the modem does. Private, leased lines normally do not "ring".

2. Carrier Detect (Circuit CF, pin 8)

   This signal is true when the modem is receiving carrier from the modem on the other end of the line. RSTS/E does not control this signal; the modem does.

3. Clear to Send (Circuit CB, pin 5)

   This signal is true when it is "OK to send data" to the other modem. RSTS/E does not control this signal; the modem does.

4. Data Terminal Ready (Circuit CD, pin 2Ø)

   This signal is controlled by RSTS/E, not the modem. When RSTS/E sets this signal to true, the modem answers the phone (if it is not already answered) and sends carrier to the modem at the other end of the connection.

5. Request to Send (Circuit CA, pin 4)

   This signal is controlled by RSTS/E, not the modem. When RSTS/E sets this signal to true, the modem tells the other modem it is now "clear to send".

RSTS/E always sets and clears Data Terminal Ready and Request to Send together.

The normal sequence for a dial-up modem line is:

1. Someone calls in. The modem asserts Ring Indicator.

2. RSTS/E sets Data Terminal Ready and Request to Send.

3. The modem answers the phone and sends out carrier and Clear to Send. The Ring Indicator goes off.

4. The other end sends carrier and Request to Send. The modem sets Carrier Detect and Clear to Send.

5. RSTS/E enables the line for data communication.

6. Data communication occurs...

7. The other end drops carrier. The modem clears Carrier Detect and Clear to Send.

8. RSTS/E starts a 5 second timeout.

9. The timeout expires. RSTS/E clears Data Terminal Ready and Request to Send.

10. The connection is now broken.

In addition, RSTS/E polls all modem lines once each second. If Carrier Detect has come on without a Ring Indication, the line will be enabled by setting Data Terminal Ready and Request to Send. If Carrier Detect is on when the system is initially started, this happens immediately. So, to use a modem-controlled private, leased line as a local line:

1. Strap the Ring Indicator signal false. This ensures that RSTS/E never sees a "ringing" line to get confused about.

2. Strap the Carrier Detect and Clear to Send signals true. This ensures that RSTS/E will immediately enable the line by setting Data Terminal Ready and Request to Send.

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AUXILIARY LIBRARY ACCOUNTS - FILE PROCESSOR FEATURE PATCH

The standard system library for RSTS/E systems is account [1,2]. This account is normally referenced by the $ character in file specifications. The special characters !, %, and & can also be used to refer tothree auxiliary libraries. The default assignments for these characters are [1,3], [1,4], and [1,5], respectively. Although the association of character with account is defined, the three accounts must be created with REACT before the special characters can be used successfully.

In some installations, the system manager may want to change the account numbers referenced by the three special characters. The account numbers are defined by four words in the RSTS/E monitor. The default account numbers are altered with a simple patch as described below.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL.

2. Decide which account numbers you wish to use for the auxiliary library characters. You may change any or all of the default assignments (although changing the assignment of the $ library character is strongly discouraged). To specify a new project-programmer number of [p,pn], type a new value at the appropriate offset. The new value has the form:

   p.*256.+pn.

   where p is the new project number (followed by a decimal point to ensure that it is interpreted as a decimal number), the multiplication shifts the project to the high byte (again, do not omit the decimal point after the 256), and pn is the new programmer number (followed by a decimal point). p and pn must be between Ø and 254, and p may not be zero.

3. The patch described in Step 5 below can be installed using the PATCH option of INIT.SYS:

   Option: PATCH
   File to patch? <lf> (LINE FEED for installed monitor SIL)

4. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>          (RETURN for manual patch installation)
File to patch? <lf>              (LINE FEED for installed monitor SIL)
File found in account [Ø,1]
```

The patch is also contained in a patch file appearing in patch kit version "A" or later.

NOTE

The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed.

5. In this example, the ! account is patched to [1ØØ,25Ø], the % account is left unchanged, and the & account is changed to [1,99]. You should type in appropriate values for your system. The patch is as follows:

```
Module name? RSTS
Base address? $$Ø3Ø5
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ??????  ? Q!1
??????  ØØØØØ2  ??????  ? ^Z              (CTRL/Z for new offset)
Offset address? ^Z                        (CTRL/Z for new base)
Base address? ..PPN.
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ØØØ4Ø2  ? <lf>            (No change to $)
??????  ØØØØØ2  ØØØ4Ø3  ? 1ØØ.*256.+25Ø.  (New value for !)
??????  ØØØØØ4  ØØØ4Ø4  ? <lf>            (No change to %)
??????  ØØØØØ6  ØØØ4Ø5  ? 1.*256.+99.     (New value for &)
??????  ØØØØ1Ø  ??????  ? ^C          (up-arrow/C to exit;CTRL/C for INIT)
```

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CHANGING DEFAULT PROTECTION CODE - FILE PROCESSOR FEATURE PATCH

When a user creates a file without specifying a protection code for that file, and if the personal default protection code is not set, the RSTS/E monitor creates that file with the system default protection code. This is normally 60., which allows the user read/write access to the file, but restricts all non-privileged users from any access. The legal value range for the default protection code is 0. to 63. inclusive. The following procedure allows you to patch the RSTS/E monitor to change your system's default protection code.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL.

2. The patch described below can be installed using the PATCH option of INIT.SYS:

   ```
   Option: PATCH
   File to patch? <lf>                (LINE FEED for installed monitor SIL)
   ```

3. This patch can be installed manually using ONLPAT, the on-line patching program.

   Note that if you answered 'No' to the 'Resident file OPEN/CLOSE' question during system generation this patch will take effect immediately when applied to the installed monitor SIL.

   ```
   RUN $ONLPAT
   Command File Name? <cr>          (RETURN for manual patch installation)
   File to patch? <lf>              (LINE FEED for installed monitor SIL)
   File found in account [0,1]
   ```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

NOTE

The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed.

4. The first part of the patch is as follows:

```
Module name? RSTS
Base address? $$Ø3Ø5
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ??????  ? Q!2
??????  ØØØØØ2  ??????  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If you are using INIT, you will return to "Option: " at this point. You must again select the PATCH option as in step 2 above.

   If you are using ONLPAT, you will return to the "Command File Name?" question. Type RETURN for manual patch installation as in step 3 above.

   Proceed as follows (be sure you include the decimal point after the new value so that it is interpreted as a decimal number):

```
File to patch? <lf>                 (LINE FEED for installed monitor SIL)
Module name? OVR
Base address? ..DPRT
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ     Ø74  ? n.        (the new default)
??????  ØØØØØ1     364  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

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RESTRICTING DISK MODES - FILE PROCESSOR FEATURE PATCH

The RSTS/E monitor normally allows any user to OPEN a disk file using any mode except 4Ø96. (the read regardless mode) or 256. (data caching), and requires that a user have privileges to open a disk file with MODE 4Ø96. or 256.

You may wish to allow non-privileged users to use mode 4Ø96. or 256. or to restrict one or more of the other disk modes (see the RSTS/E Programming Manual for a complete list). The following procedure allows you to patch the RSTS/E monitor to specify which disk file OPEN modes require privileges. Privileged users and non-privileged users running privileged programs would still have full access to all available modes. If a non-privileged user specifies a restricted mode, the mode value will be ignored but no error message will be printed.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL.

2. Decide which disk file modes you wish to make privileged. Consult the RSTS/E Programming Manual for the various modes which are available, and determine the associated MODE values. Compute the sum, n, of the MODE values corresponding to the modes you wish to restrict. If you wish to restrict special update mode, but leave normal update mode unrestricted, use a value of 4 (not 5). If you wish to restrict both update modes, use 4+1. You may type the addition directly to the new value question of PATCH. Be sure to include a decimal point after each number so that it is interpreted as decimal.

3. The patch described below can be installed using the PATCH option of INIT.SYS:

   Option: PATCH
   File to patch? <lf> (LINE FEED for installed monitor SIL)

4. This patch can be installed manually using ONLPAT, the on-line patching program.

   Note that if you answered 'No' to the 'Resident file OPEN/CLOSE' question during system generation this patch will take effect immediately when applied to the installed monitor SIL.

```
RUN $ONLPAT
Command File Name? <cr>          (RETURN for manual patch installation)
File to patch? <lf>              (LINE FEED for installed monitor SIL)
File found in account [0,1]
```

The patch is also contained in a patch file appearing in patch kit version "A" or later.

NOTE

The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed.

5. The first part of the patch is as follows:

```
Module name? RSTS
Base address? $$0305
Offset address? 0
 Base   Offset  Old       New?
??????  000000  ??????  ? Q!4
??????  000002  ??????  ? ^C       (up-arrow/C to exit;CTRL/C for INIT)
```

6. If you are using INIT, you will return to "Option: " at this point. You must again select the PATCH option as in step 3 above.

   If you are using ONLPAT, you will return to the "Command File Name?" question. Type RETURN for manual patch installation as in step 4 above.

   Proceed as follows:

```
File to patch? <lf>              (LINE FEED for installed monitor SIL)
Module name? OVR
Base address? ..DKNP
Offset address? 0
 Base   Offset  Old       New?
??????  000000  010400  ? n.       (from step 2)
??????  000002  010037  ? ^C       (up-arrow/C to exit;CTRL/C for INIT)
```

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Executive
File Processor Patches

Seq 3.5.4 F

1 of 2

MAKING FIP SYS CALLS PRIVILEGED - FILE PROCESSOR FEATURE PATCH

The following FIP SYS calls are normally non-privileged:

-25. File Attribute Read/Write
-17. Change File's run-time system Name
+1Ø. Assign a Device
+13. Zero a Device or Account
+14. Read Accounting Data
+15. Indexed Directory Lookup
+17. Wildcard Directory Lookup

It is possible to make one or more of these SYS calls privileged. Doing so will restrict the use of that SYS call to only privileged users and/or privileged programs.

CAUTION

> The standard CUSP programs assume that the above SYS calls are non-privileged; unexpected results may occur using the CUSPs if one or more of the above are made privileged.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL.

2. Decide which SYS call code you wish to make privileged. Be sure to include a decimal point after the SYS call code to ensure that it is interpreted in decimal.

3. The patch described in Step 5 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? <lf>                (LINE FEED for installed monitor SIL)
```

4. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>            (RETURN for manual patch installation)
File to patch? <lf>                (LINE FEED for installed monitor SIL)
File found in account [Ø,1]
```

The patch is also contained in a patch file appearing in patch kit version "A" or later.

NOTE

The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed.

5. The patch is as follows:

```
Module name? RSTS
Base address? $$Ø3Ø5
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ??????  ? Q!1Ø
??????  ØØØØØ2  ??????  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                  (CTRL/Z for new base)
Base address? $UUOTB
Offset address? n.-UU$MIN*2         (from step 2)
 Base   Offset  Old       New?
??????  ??????  ??????  ? Q!1
??????  ??????  ??????  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

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Executive
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Seq 3.5.5 F

1 of 2

RESTRICTING NON-PRIVILEGED ACCESS TO NON-FILE STRUCTURED DISKS - FILE PROCESSOR FEATURE PATCH

Normally, a non-privileged user is given read and write access to a non-file structured disk if it was that user's open request which mounted the disk as non-file structured. Certain installations may wish to prohibit non-privileged users from ever getting any access to a non-file structured disk.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL.

2. The patch described below can be installed using the PATCH option of INIT.SYS:

   ```
   Option: PATCH
   File to patch? <lf>                (LINE FEED for installed monitor SIL)
   ```

3. This patch can be installed manually using ONLPAT, the on-line patching program.

   Note that if you answered 'No' to the 'Resident file OPEN/CLOSE' question during system generation this patch will take effect immediately when applied to the installed monitor SIL.

   ```
   RUN $ONLPAT
   Command File Name? <cr>            (RETURN for manual patch installation)
   File to patch? <lf>                (LINE FEED for installed monitor SIL)
   File found in account [Ø,1]
   ```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

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Seq 3.5.5 F

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4. The first part of the patch is as follows:

```
Module name? RSTS
Base address? $$Ø3Ø5
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ??????  ? Q!2Ø
??????  ØØØØØ2  ??????  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If you are using INIT, you will return to "Option: " at this point. You must again select the PATCH option as in step 2 above.

   If you are using ONLPAT, you will return to the "Command File Name?" question. Type RETURN for manual patch installation as in step 3 above.

   Proceed as follows:

```
File to patch? <lf>                (LINE FEED for installed monitor SIL)
Module name? OVR
Base address? ..NFSP
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ØØ1414  ? 1423
??????  ØØØØØ2  1Ø1Ø2Ø  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

RSTS/E V7.2 Seq 3.5.6 F
Executive
File Processor Patches 1 of 2

NON-PRIVILEGED WRITES TO NON-FILE STRUCTURED DISKS
- FILE PROCESSOR FEATURE PATCH

Normally, a non-privileged user is given write access to a non-file structured disk if it was that user's open request which mounted the disk as non-file structured. Certain installations may wish to prohibit non-privileged users from ever obtaining write access to a non-file structured disk.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL.

2. The patch described below can be installed using the PATCH option of INIT.SYS:

   ```
   Option: PATCH
   File to patch? <lf>                (LINE FEED for installed monitor SIL)
   ```

3. This patch can be installed manually using ONLPAT, the on-line patching program.

   Note that if you answered 'No' to the 'Resident file OPEN/CLOSE' question during system generation this patch will take effect immediately when applied to the installed monitor SIL.

   ```
   RUN $ONLPAT
   Command File Name? <cr>            (RETURN for manual patch installation)
   File to patch? <lf>                (LINE FEED for installed monitor SIL)
   File found in account [Ø,1]
   ```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The first part of the patch is as follows:

```
Module name? RSTS
Base address? $$Ø3Ø5
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ??????  ? Q!4Ø
??????  ØØØØØ2  ??????  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If you are using INIT, you will return to "Option: " at this point. You must again select the PATCH option as in step 2 above.

   If you are using ONLPAT, you will return to the "Command File Name?" question. Type RETURN for manual patch installation as in step 3 above.

   Proceed as follows:

```
File to patch? <lf>                 (LINE FEED for installed monitor SIL)
Module name? OVR
Base address? ..NFSW
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ØØ1ØØØ  ? 1ØØ1
??????  ØØØØØ2  ØØ5Ø16  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

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ALLOWING CROSS ACCOUNT CREATIONS - FILE PROCESSOR FEATURE PATCH

Normally, a non-privileged job cannot create files in any account other than its own. Some installations may wish to allow a non-privileged job to create files in any account within its project number (i.e., create files in any [x,*] account if the job's account is [x,y]).

This feature patch changes the File Processor's cross account check to allow any job to create files within its project. A non-privileged job still cannot create files in accounts outside of its project number group.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL.

2. The patch described below can be installed using the PATCH option of INIT.SYS:

   ```
   Option: PATCH
   File to patch? <lf>                (LINE FEED for installed monitor SIL)
   ```

3. This patch can be installed manually using ONLPAT, the on-line patching program.

   Note that if you answered 'No' to the 'Resident file OPEN/CLOSE' question during system generation this patch will take effect immediately when applied to the installed monitor SIL.

   ```
   RUN $ONLPAT
   Command File Name? <cr>            (RETURN for manual patch installation)
   File to patch? <lf>                (LINE FEED for installed monitor SIL)
   File found in account [Ø,1]
   ```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The first part of the patch is as follows:

```
Module name? RSTS
Base address? $$Ø3Ø5
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ??????  ? Q!1ØØ
??????  ØØØØØ2  ??????  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If you are using INIT, you will return to "Option: " at this point. You must again select the PATCH option as in step 2 above.

   If you are using ONLPAT, you will return to the "Command File Name?" question. Type RETURN for manual patch installation as in step 3 above.

   Proceed as follows:

```
File to patch? <lf>                (LINE FEED for installed monitor SIL)
Module name? OVR
Base address? ..XGRP
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ØØ1334  ? 24Ø
??????  ØØØØØ2  124237  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

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Seq 3.5.8 F

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ALLOWING CROSS ACCOUNT RENAME OPERATIONS - FILE PROCESSOR FEATURE PATCH

Normally, a non-privileged job cannot rename files in any account other than its own. Some installations may wish to allow a non-privileged job to rename files in any account within its project number (i.e., rename files in any [x,*] account if the job's account is [x,y]).

This feature patch changes the File Processor's cross account check to allow any job to rename files within its project. A non-privileged job still cannot rename files in accounts outside of its project number group.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL.

2. The patch described below can be installed using the PATCH option of INIT.SYS:

   ```
   Option: PATCH
   File to patch? <lf>                (LINE FEED for installed monitor SIL)
   ```

3. This patch can be installed manually using ONLPAT, the on-line patching program.

   Note that if you answered 'No' to the 'Resident file DELETE/RENAME' question during system generation this patch will take effect immediately when applied to the installed monitor SIL.

   ```
   RUN $ONLPAT
   Command File Name? <cr>            (RETURN for manual patch installation)
   File to patch? <lf>                (LINE FEED for installed monitor SIL)
   File found in account [Ø,1]
   ```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The first part of the patch is as follows:

```
Module name? RSTS
Base address? $$Ø3Ø5
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ??????  ? Q!2ØØ
??????  ØØØØØ2  ??????  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If you are using INIT, you will return to "Option: " at this point. You must again select the PATCH option as in step 2 above.

   If you are using ONLPAT, you will return to the "Command File Name?" question. Type RETURN for manual patch installation as in step 3 above.

   Proceed as follows:

```
File to patch? <lf>                (LINE FEED for installed monitor SIL)
Module name? OVR
Base address? ..XGRR
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ØØ136Ø  ? 24Ø
??????  ØØØØØ2  126Ø37  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

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Seq 3.5.9 F

EXTENDING DIRECTORY LOOKUP - FILE PROCESSOR FEATURE PATCH

Normally, the FIP calls 15 (Directory look up on Index) and 17 (Directory look up by File Name/Wildcard directory look up) will not allow a non-privileged user to find information about any file on the system to which he or she does not have read or run access. Some installations, where security is not an issue, may find it desirable to allow non-privileged users to look up files to which they do not normally have access. If this patch is applied, non-privileged use of FIP calls 15 and 17 will return information about all files. Since PIP.SAV (for the /L command) and BASIC-PLUS (for the CATALOG command) use these calls, these commands would be unrestricted for non-privileged users. The DIRECT program does not use these calls; another feature patch, Seq 1Ø.3.1 F, may be used to extend its use.

NOTE

For consistency, Digital recommends that you either use both patches (Seq 3.5.9 F and Seq 1Ø.3.1 F) or neither of them.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SILs.

2. The patch described below can be installed using the PATCH option of INIT.SYS:

   ```
   Option: PATCH
   File to patch? <lf>                (LINE FEED for installed monitor SIL)
   ```

3. This patch can be installed manually using ONLPAT, the on-line patching program.

   Note that if you answered 'No' to the 'Resident directory lookup' question during system generation this patch will take effect immediately when applied to the installed monitor SIL.

   ```
   RUN $ONLPAT
   Command File Name? <cr>            (RETURN for manual patch installation)
   File to patch? <lf>                (LINE FEED for installed monitor SIL)
   File found in account [Ø,1]
   ```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The first part of the patch is as follows:

```
Module name? RSTS
Base address? $$Ø3Ø5
Offset address? 1
 Base   Offset  Old       New?
??????  ØØØØØ1     ???  ? Q!1
??????  ØØØØØ2     ???  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If you are using INIT, you will return to "Option: " at this point. You must again select the PATCH option as in step 2 above.

   If you are using ONLPAT, you will return to the "Command File Name?" question. Type RETURN for manual patch installation as in step 3 above.

   Proceed as follows:

```
File to patch? <lf>                (LINE FEED for installed monitor SIL)
Module name? OVR
Base address? ..DIRP
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ØØ1415  ? 415
??????  ØØØØØ2  Ø21Ø37  ? C         (up-arrow/C to exit;CTRL/C for INIT)
```

RESTRICTING NON-PRIVILEGED USE OF UU.TRM - FILE PROCESSOR FEATURE PATCH

The UU.TRM directive allows a user to set various characteristics of a terminal. Some installations may wish to restrict a non-privileged user's ability to set terminal characteristics.

Protection checking in UU.TRM is done with two 2-word bit masks. Each of the 4Ø(8) bits in a mask corresponds to a FIRQB byte offset. If the bit is on, the corresponding byte in the FIRQB must be zero for all non-privileged callers. If the corresponding byte in the FIRQB is not zero, a "?Protection violation" error is returned.

The two-word mask at patch locations ..TRM1 and ..TRM2 is checked when a non-privileged user specifies the job's console keyboard in the call. The two-word mask at locations ..TRM3 and ..TRM4 is checked when a non-privileged user specifies any other keyboard that the job owns.

..TRM1 AND ..TRM3 are masks for bytes Ø-17(8) of the FIRQB, and ..TRM2 AND ..TRM4 are the masks for bytes 2Ø-37(8). For example, if the value 1 is ORed into location ..TRM2, a non-privileged user could not change parity (byte 2Ø) at the job's console.

If none of these words are patched, the system is setup so that a non-privileged user may change anything on the job's console, except speeds and ring characteristics, and may change nothing on other terminals that job owns (but the characteristics may still be read).

Note that by OR'ing value 1Ø(8) into ..TRM3, the user is "not allowed" to specify FQFUN (which must be 16. to invoke UU.TRM), so a "?Protection violation" error is returned without divulging the characteristics of any non-console keyboard owned by the job.

The following is a table relating FIRQB byte number with its corresponding mask word and value to "OR" to force the parameter to be zero.

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FIRQB BYTE	MASK WORD		OCTAL VALUE	DECIMAL VALUE
	Console	Non-console		
Ø/2Ø	..TRM1/2	..TRM3/4	1	1.
1/21	..TRM1/2	..TRM3/4	2	2.
2/22	..TRM1/2	..TRM3/4	4	4.
3/23	..TRM1/2	..TRM3/4	1Ø	8.
4/24	..TRM1/2	..TRM3/4	2Ø	16.
5/25	..TRM1/2	..TRM3/4	4Ø	32.
6/26	..TRM1/2	..TRM3/4	1Ø	64.
7/27	..TRM1/2	..TRM3/4	2ØØ	128.
1Ø/3Ø	..TRM1/2	..TRM3/4	4ØØ	256.
11/31	..TRM1/2	..TRM3/4	1ØØØ	512.
12/32	..TRM1/2	..TRM3/4	2ØØØ	1Ø24.
13/33	..TRM1/2	..TRM3/4	4ØØØ	2Ø48.
14/34	..TRM1/2	..TRM3/4	1ØØØØ	4Ø96.
15/35	..TRM1/2	..TRM3/4	2ØØØØ	8192.
16/36	..TRM1/2	..TRM3/4	4ØØØØ	16384.
17/37	..TRM1/2	..TRM3/4	1ØØØØØ	32768.

Compute a value for ..TRM1 by taking the values from the table above corresponding to the bytes you wish to disable and adding them to give a value "a" which you will use in the patch.

Similarly compute a value for ..TRM2 and call this value "b".

Similarly compute a value for ..TRM3 and call this value "c".

Similarly compute a value for ..TRM4 and call this value "d".

Apply these values in step 5 below.

NOTE

To allow non-privileged users to change terminal speeds on their console, as was the case in V7.Ø, "a" should equal Ø and "b" should equal 1ØØ.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL.

2. The patch described below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? <lf>                (LINE FEED for installed monitor SIL)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program. Note that this patch will take effect immediately when applied to the installed monitor SIL.

```
RUN $ONLPAT
Command File Name? <cr>            (RETURN for manual patch installation)
File to patch? <lf>                (LINE FEED for installed monitor SIL)
File found in account [Ø,1]
```

This patch is contained in a patch file appearing in patch kit version "A" or later.

NOTE

The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed.

4. The first part of the patch is as follows:

```
Module name? RSTS
Base address? $$Ø3Ø5
Offset address? 1
 Base   Offset  Old     New?
??????  ØØØØØ1     ???  ? Q!2
??????  ØØØØØ2     ???  ? ^C    (up-arrow/C to exit;CTRL/C for INIT)
```

5. If you are using INIT, you will return to "Option: " at this point. You must again select the PATCH option as in step 2 above.

   If you are using ONLPAT, you will return to the "Command File Name?" question. Type RETURN for manual patch installation as in step 3 above.

   Proceed as follows:

```
File to patch? <lf>                (LINE FEED for installed monitor SIL)
Module name? OVR
Base address? ..TRM1
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  1ØØØØØ  ? a         ;Value from above
??????  ØØØØØ2  Ø127Ø2  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                 (CTRL/Z for new base)
Base address? ..TRM2
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ØØØ1Ø2  ? b         ;Value from above
??????  ØØØØØ2  ØØ57Ø5  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                 (CTRL/Z for new base)
Base address? ..TRM3
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  177ØØØ  ? c         ;Value from above
??????  ØØØØØ2  Ø127Ø2  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                 (CTRL/Z for new base)
Base address? ..TRM4
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  177777  ? d         ;Value from above
??????  ØØØØØ2  ØØ52ØØ  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

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ALLOWING USERS WITH TEMPORARY PRIVILEGES TO SET PRIVILEGED PROTECTION CODES - FILE PROCESSOR FEATURE PATCH

The patch described below will allow a program using the FIP RENAME SYS call (or BASIC-PLUS "NAME AS" command) with temporary privileges to set the 128 bit in the protection code.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL.

2. The patch described below can be installed using the PATCH option of INIT.SYS:

   ```
   Option: PATCH
   File to patch? <lf>              (LINE FEED for installed monitor SIL)
   ```

3. This patch can be installed manually using ONLPAT, the on-line patching program.

   Note that if you answered 'No' to the 'Resident file DELETE/RENAME' question during system generation this patch will take effect immediately when applied to the installed monitor SIL.

   ```
   RUN $ONLPAT
   Command File Name? <cr>          (RETURN for manual patch installation)
   File to patch? <lf>              (LINE FEED for installed monitor SIL)
   File found in account [Ø,1]
   ```

   This patch is contained in a patch file appearing in patch kit version "A" or later.

4. The first part of the patch is as follows:

```
Module name? RSTS
Base address? $$Ø3Ø5
Offset address? 1
 Base   Offset  Old     New?
??????  ØØØØØ1    ???  ? Q!4
??????  ØØØØØ2    ???  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If you are using INIT, you will return to "Option: " at this point. You must again select the PATCH option as in step 2 above.

   If you are using ONLPAT, you will return to the "Command File Name?" question. Type RETURN for manual patch installation as in step 3 above.

   Proceed as follows:

```
File to patch? <lf>                (LINE FEED for installed monitor SIL)
Module name? OVR
Base address? DLNØ
Offset address? 612
 Base   Offset  Old     New?
??????  ØØØ612  ØØ14Ø2  ? <LF>      (no change; verify only)
??????  ØØØ614  Ø427ØØ  ? 24Ø
??????  ØØØ616  ØØØ2ØØ  ? 24Ø
??????  ØØØ62Ø  1Ø5737  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

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Executive
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MAKING REASSIGN A PRIVILEGED FUNCTION - FILE PROCESSOR FEATURE PATCH

RSTS/E currently allows non-privileged users to reassign a device to another user. On some systems, it may be desirable to restrict the reassign function to privileged users.

The patching procedure detailed below restricts device reassignment to privileged users.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL.

2. The patch described below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? <lf>                (LINE FEED for installed monitor SIL)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program. Note that this patch will take effect immediately when applied to the installed monitor SIL.

```
RUN $ONLPAT
Command File Name? <cr>            (RETURN for manual patch installation)
File to patch? <lf>                (LINE FEED for installed monitor SIL)
File found in account [Ø,1]
```

   This patch is contained in a patch file appearing in patch kit version "A" or later.

4. The first part of the patch is as follows:

```
Module name? RSTS
Base address? $$Ø3Ø5
Offset address? 1
 Base   Offset  Old     New?
??????  ØØØØØ1     ???  ? Q!1Ø
??????  ØØØØØ2     ???  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If you are using INIT, you will return to "Option: " at this point. You must again select the PATCH option as in step 2 above.

   If you are using ONLPAT, you will return to the "Command File Name?" question. Type RETURN for manual patch installation as in step 3 above.

   Proceed as follows:

```
File to patch? <lf>                (LINE FEED for installed monitor SIL)
Module name? OVR
Base address? ASSØ
Offset address? 46
 Base   Offset  Old     New?
??????  ØØØØ46  Ø32711  ? 4Ø2
??????  ØØØØ5Ø  ØØØ4ØØ  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

SPECIAL LINE PRINTER DRUMS - DEVICE DRIVER FEATURE PATCH

Most DEC LP11 line printer drums contain a character which corresponds to octal code Ø4Ø (the ASCII SPACE character). This character may be a blank, the British Pound Sterling character, or some other optional non-standard character. Normally, this character is irrelevant, since the LP11 is usually wired to print only ASCII codes Ø41 through 137 (octal) for the 64-character set, or Ø41 through 176 for the 96-character set. The SPACE character (Ø4Ø), "non-printing" characters (codes ØØØ to Ø11, Ø13, and Ø16 to Ø37), and character codes greater than 137 (on printers with the 64-character set) all print as spaces. The space is created by suppressing printer action, rather than actually having a hammer strike a character position on the printer drum.

By making a simple wiring change to the LP11, the range of printing characters can be extended to include ASCII code Ø4Ø. If the printer drum contains a special character in the Ø4Ø position, sending an Ø4Ø code to the printer will cause that special character to be printed.

In conjunction with this change, you can patch the RSTS/E line printer driver to allow special handling of ASCII Ø4Ø on a unit-by-unit basis. Normally, the driver sends Ø4Ø codes (SPACEs) unchanged to the printer. If the wiring change is not installed in the printer, this character will appear as a space, regardless of the symbol on the line printer drum. The patch allows you to specify an ASCII code which the driver will translate to Ø4Ø before sending it to the printer. The special character will thus be printed. In addition, the driver will translate all Ø4Ø codes to Ø37, which is a non-printing character and appears as a space. Note that translation of Ø4Ø is performed only if the special character translation is enabled.

Ideally, you should choose a character which is not commonly used for other purposes but which can be typed and printed on any standard terminal. This allows you to use any standard editor to insert the special character into text destined for the printer. Remember that the conversion in the printer driver overrides the standard symbol (if any) for the selected code. For example, if you select the code 1Ø1 (the letter A), the special character is printed in place of any A sent to the driver. It would therefore be impossible to print an A.

All normal printing characters have some meaning in RSTS/E or BASIC-PLUS. For example, the "&" character ends a comment field in the EXTEND mode of BASIC-PLUS, is an abbreviation for account [1,5], and is a special character in RUNOFF source files. The "@" character is seldom used in printed material, but RSTS/E uses it as an assignable account designator.

If none of the printable characters is suitable, one of the ASCII control characters (codes ØØ1 to Ø37) may be used. For example, CTRL/F (ØØ6) can be generated with most terminals and will echo and print as ^F, if UP ARROW mode is selected with TTYSET. It has no meaning to any standard DEC terminal.

As system manager, you must choose the character which is appropriate for your installation by studying the ASCII code table and considering your users' needs. The procedure for installing the patch is described below.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL that includes line printer support.

2. Decide which line printer unit should have special character handling. If more than one unit is to be patched, repeat the steps below for each unit you wish to modify.

3. Select the character to represent the special printer symbol. If this character is a printable character (e.g., &), specify the new value in the patch by simply typing

   ```
   '&
   ```

   and replacing the & with the character you have chosen. If the character is a control character, specify its ASCII code as an octal number (or decimal number followed by a decimal point), or as 'x-1ØØ to represent CTRL/x. For example, CTRL/N may be specified as

   ```
   16
   ```

   or as

   ```
   14.
   ```

   or as

   ```
   'N-1ØØ
   ```

   in the patch.

4. The patch described in Step 6 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? <lf>                (LINE FEED for installed monitor SIL)
```

5. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>            (RETURN for manual patch installation)
File to patch? <lf>                (LINE FEED for installed monitor SIL)
File found in account [0,1]
```

The patch is also contained in a patch file appearing in patch kit version "A" or later.

NOTE

> The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed.

6. In this example, the symbol n is used to denote the line printer unit being modified. You should type the actual unit number (between zero and the number of printers -1). The patch is as follows:

```
Module name? RSTS
Base address? LPDDDB
Offset address? DDS.LP*n+30        (n is the unit number)
 Base   Offset  Old       New?
??????  ??????  000000  ? (new value from step 3)
??????  ??????  000000  ? ^Z       (CTRL/Z for new offset)
Offset address? ^Z                 (CTRL/Z for new base)
Base address? $$0307
Offset address? 0
 Base   Offset  Old       New?
??????  000000  ??????  ? Q!1
??????  000002  ??????  ? ^C       (up-arrow/C to exit;CTRL/C for INIT)
```

7. Install the hardware modification to the printer. The modification is different for the several printer models, as listed below:

LPØ1 (231Ø) Wiring change required to card cage backplane. Remove wire A3A4-36 and connect this wire through a 1K pullup resistor to +5 Volts.

LPØ2 (241Ø) Change to AR16 Data Register Card. Remove card from slot A3A24. Lift Pin 5 on Z15 and tie Pin 5 to ground.

LPØ4 (247Ø) Wiring change required to card cage backplane. Remove wire from A3A24-Ø4 and connect this wire through a 1K pullup resistor to +5 Volts.

LPØ5 (223Ø) Insert jumper W1 on the Logic Control Board 29-21112.

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Device Driver Patches

Seq 3.7.2 F

CHANGING DEFAULT PRINTER FORM LENGTH - DEVICE DRIVER FEATURE PATCH

When a line printer is OPENed, the default, hardware, form length is set to 66. This is the actual form length for most applications. You can change the default form length by installing the patch given below. The legal form length values are between 7. and 127. inclusive. Note that this patch changes the default form length for ALL line printers on the system.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL which includes line printer support.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? <lf>                (LINE FEED for installed monitor SIL)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>            (RETURN for manual patch installation)
File to patch? <lf>                (LINE FEED for installed monitor SIL)
File found in account [Ø,1]
```

The patch is also contained in a patch file appearing in patch kit version "A" or later.

NOTE

The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed.

4. Be sure you include the decimal point after the new value so that it is interpreted as a decimal number.
The patch is as follows:

```
Module name? RSTS
Base address? ..LP66
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ØØØ1Ø2  ? n.        (the new default)
??????  ØØØØØ2  112712  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                  (CTRL/Z for new base)
Base address? $$Ø3Ø7
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ??????  ? Q!2
??????  ØØØØØ2  ??????  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If you are using the line printer spooling package, you must change the control file (or files) which start the spoolers. Include the /DFLENGTH:n switch in the command line for each spooler to specify the new default form length.

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Executive
Device Driver Patches

Seq 3.7.3 F

ALLOW SPECIAL CONTROL CHARACTERS - DEVICE DRIVER FEATURE PATCH

All line printers supported by RSTS/E software use only 7-bit characters; the sign bit of the character is always Ø. In fact, the line printer driver interprets characters with the sign bit "on" (ASCII values greater than 127. decimal) as forms control characters if the special OPEN MODE 512%+n% is used. (See the RSTS/E Programming Manual.) The line printer driver also uses character values greater than 127. internally for space compression purposes and to suppress trailing blanks.

Some RSTS/E installations have special line printers that require the use of control characters with values greater than 127, even though the use of such equipment is not supported. The feature patch descibed below will allow full 8-bit characters to be passed unmodified to the line printer.

CAUTION

> The patch described below produces some side effects which must be recognized before installation. First, if your line printer cannot interpret 8-bit characters (all supported printers fall into this category), do not install this patch or unpredictable results may occur. Second, this patch prevents the use of software formatting (MODE 512%) and prevents internal space compression, i.e., trailing blanks will be printed. Third, this patch affects every line printer on your system.
>
> The patch also has some effect on the spooling package. Incorrect page counts will probably result if the RESTART or REQUE options are used. In addition, unless the line printer spooler start-up option /LPFORM:NO is used, a user specifying LPFORM will probably crash the spooling package.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL that includes line printer support.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? <lf>          (LINE FEED for installed monitor SIL)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>              (RETURN for manual patch installation)
File to patch? <lf>                  (LINE FEED for installed monitor SIL)
File found in account [Ø,1]
```

The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Module name? RSTS
Base address? ..LPSP
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ØØØØØØ  ? ØØ2ØØØ
??????  ØØØØØ2  ØØ5Ø61  ? ^Z          (CTRL/Z for new offset)
Offset address? ^Z                   (CTRL/Z for new base)
Base address? $$Ø3Ø7
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ??????  ? Q!4
??????  ØØØØØ2  ??????  ? ^C          (up-arrow/C to exit;CTRL/C for INIT)
```

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Seq 3.7.4 F

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TU16/TE16/TU45/TU77 MAGNETIC TAPE DENSITY/PARITY DEFAULT - DEVICE DRIVER FEATURE PATCH

The default density and parity settings for TU16, TE16, TU45, or TU77 magnetic tape (device MM) under RSTS/E V7.2 are 800 BPI and ODD parity. A program can change the density and/or parity value for either file structured or non-file structured operations by using the MAGTAPE function.

You can change your system's default settings for density and/or parity by installing the patch given below. This is useful if you frequently interchange tapes with other systems which use 1600-BPI phase-encoded defaults. It is also useful if you want to use the 1600-BPI recording mode as your installation's standard.

NOTE

> The 600-foot RSTS/E V7.2 distribution magnetic tapes for TU16, TE16, TU45, and TU77 (including optional languages such as COBOL and FORTRAN) are written at 800 BPI with ODD parity. If you use this kind of distribution kit, do not install this patch until after you have completed the system library build procedures, including any optional software.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SIL which is configured for TU16, TE16, TU45, or TU77 magnetic tape.

2. Select the desired magnetic tape density and parity. To use 1600 BPI phase encoded mode, specify a new value of 0 in the patch. To return to 800 BPI and ODD parity, specify a new value of 140. Any other value will cause file structured operations to fail.

3. The patch described in Step 5 below can be installed using the PATCH option of INIT.SYS:

   ```
   Option: PATCH
   File to patch? <lf>          (LINE FEED for installed monitor SIL)
   ```

4. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>          (RETURN for manual patch installation)
File to patch? <lf>              (LINE FEED for installed monitor SIL)
File found in account [Ø,1]
```

The patch is also contained in a patch file appearing in patch kit version "A" or later.

NOTE

> The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed.

5. The patch is as follows:

```
Module name? RSTS
Base address? ..MTDP
Offset address? 1
 Base   Offset  Old       New?
??????  ØØØØØ1     14Ø  ? n          (from step 2)
??????  ØØØØØ2     ???  ? ^Z         (CTRL/Z for new offset)
Offset address? ^Z                   (CTRL/Z for new base)
Base address? $$Ø3Ø7
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ??????  ? Q!1Ø
??????  ØØØØØ2  ??????  ? ^C         (up-arrow/C to exit;CTRL/C for INIT)
```

USING THE CSS PAPER TAPE READER ON RSTS/E V7.2 - DEVICE DRIVER FEATURE PATCH

PROBLEM:

The paper tape reader device driver included in the RSTS/E V7.2 object library does not work with the CSS paper tape reader (PA611).

SOLUTION:

The paper tape reader driver for RSTS/E V7.2 is for Digital Equipment Corporation model PC11. The following optional patch will make the driver compatible with the CSS paper tape reader model PA611. Note that after applying this patch, the device driver does not work with model PC11.

PROCEDURE:

1. This is a feature patch to the RSTS/E V7.2 executive. It may be installed in any target monitor SILs.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? <lf>                (LINE FEED for installed monitor SIL)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>            (RETURN for manual patch installation)
File to patch? <lf>                (LINE FEED for installed monitor SIL)
File found in account [Ø,1]
```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Module name? RSTS
Base address? ..PCSS
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  1ØØ2ØØ  ? 1ØØ1ØØ
??????  ØØØØØ2  ??????  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                  (CTRL/Z for new base)
Base address? $$Ø3Ø7
Offset address? Ø
 Base   Offset  Old       New?
??????  ØØØØØØ  ??????  ? Q!2Ø
??????  ØØØØØ2  ??????  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

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TS11 REWIND PROBLEMS - MANDATORY DEVICE DRIVER PATCH

PROBLEM:

Timing conditions associated with the rewind operation of the TS11 mag tape drive can cause the RSTS/E TS11 driver to indicate that the TS11 is unavailable, hung, or write-locked.

Under some conditions it is possible for a new request to be issued to the TS11 unit before it has completed a rewind. This extra request is not acknowledged by the TS11 controller, as the controller is busy with the rewind. The RSTS/E driver expects a response from the controller within a reasonable time following a request; long rewinds may exceed this time limit, causing the driver to indicate that the device is unavailable to the user.

SOLUTION:

The patching procedure detailed below corrects the above problem.

PROCEDURE:

1. This is a required patch to the RSTS/E V7.2 executive. It must be installed in all target monitor SILs configured with the TS11 magnetic tape driver (MSDVR). Note that the patch will fail on systems not configured for TS11 magnetic tape controllers.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? <lf>                (LINE FEED for installed monitor SIL)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program. Note, however, that if the patch is applied online to the installed monitor SIL, it will not take effect until the system is re-booted.

```
RUN $ONLPAT
Command File Name? <cr>            (RETURN for manual patch installation)
File to patch? <lf>                (LINE FEED for installed monitor SIL)
File found in account [0,1]
```

The patch is also contained in a command file ($MONITR.CMD) appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Module name? RSTS
Base address? QUEL3Q
Offset address? 10
 Base   Offset  Old     New?
??????  000010  012100  ? 137
??????  000012  001403  ? MSDVR
??????  000014  004567  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                 (CTRL/Z for new base)
Base address? MSDVR
Offset address? 3734
 Base   Offset  Old     New?
??????  003734  004737  ? 137
??????  003736  ??????  ? MSDVR+72
??????  003740  005064  ? ^Z        (CTRL/Z for new offset)
Offset address? 0
 Base   Offset  Old     New?
??????  000000  000000  ? 13746
??????  000002  000000  ? 177776
??????  000004  000000  ? 12737
??????  000006  000000  ? 34240
??????  000010  000000  ? 177776
??????  000012  000000  ? 26127
??????  000014  000000  ? 2
??????  000016  000000  ? QMSCON
??????  000020  000000  ? 1410
??????  000022  000000  ? 12637
??????  000024  000000  ? 177776
??????  000026  000000  ? 12100
??????  000030  000000  ? 1402
??????  000032  000000  ? 137
??????  000034  000000  ? QUEL3Q+14
??????  000036  000000  ? 137
??????  000040  000000  ? QUEL3Q+22
??????  000042  000000  ? 32764
??????  000044  000000  ? 30000
??????  000046  000000  ? 66
??????  000050  000000  ? 1764
??????  000052  000000  ? 52764
??????  000054  000000  ? 2
??????  000056  000000  ? 66
??????  000060  000000  ? 12637
```

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```
??????  000062  000000  ? 177776
??????  000064  000000  ? 12601
??????  000066  000000  ? 12600
??????  000070  000000  ? 207
??????  000072  000000  ? 5064
??????  000074  000000  ? 66
??????  000076  000000  ? 4737
??????  000100  000000  ? QUEL3Q
??????  000102  000000  ? 207
??????  000104  ??????  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                  (CTRL/Z for new base)
Base address? $$0307
Offset address? 0
 Base   Offset  Old     New?
??????  000000  ??????  ? Q!40
??????  000002  ??????  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

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Executive
FMS Monitor Patches 1 of 3

FMSTIO PATCH - MANDATORY FMS MONITOR PATCH

PROBLEM:

This patch to the RSTS/E V7.2 monitor code is required to correct a problem that may cause the system to crash when inputting an FMS mixed picture field. Failure to install this patch may result in a crash of the system when running FMS applications.

NOTE

> This patch is for RSTS/E V7.2 ONLY. It is NOT to be applied to RSTS/E V7.1. Also, the patch described in the "FMS-11/RSTS Installation Guide and Release Notes" is to be applied to RSTS/E V7.1 ONLY. That patch is NOT to be applied to RSTS/E V7.2.

SOLUTION:

The patching procedure detailed below corrects the above problem.

PROCEDURE:

1. This is a required patch to the RSTS/E V7.2 executive. It must be installed in all target monitor SILs which include FMS-11 support in the monitor. This code is included if you answer "Yes" to the "FMS-11 support" question during system generation. If the FMS-11 code was not included in the monitor during your system generation, the patch will fail with a "Module not found in SIL" error after you specify FMS as the Module name.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? <lf>                (LINE FEED for installed monitor SIL)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program. Note, however, that if the patch is applied online to the installed monitor SIL, it will not take effect until the system is re-booted.

```
RUN $ONLPAT
Command File Name? <cr>              (RETURN for manual patch installation)
File to patch? <lf>                  (LINE FEED for installed monitor SIL)
File found in account [0,1]
```

The patch is also contained in a command file ($MONITR.CMD) appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Module name?  FMS
Base address?  $FMSSE
Offset address?  456
 Base   Offset  Old     New?
??????  000456  112402  ?  000137
??????  000460  004767  ?  FMSPAT+30
??????  000462  006156  ?  000240
??????  000464  103003  ?  000240
??????  000466  005265  ?  000240
??????  000470  000036  ?  000240
??????  000472  000771  ?  000240
??????  000474  077310  ?  000240
??????  000476  016502  ?  ^Z       (CTRL/Z for new offset)
Offset address?  6000
 Base   Offset  Old     New?
??????  006000  112002  ?  000137
??????  006002  004767  ?  FMSPAT+0
??????  006004  000634  ?  000240
??????  006006  103003  ?  000240
??????  006010  005265  ?  000240
??????  006012  000036  ?  000240
??????  006014  000771  ?  000240
??????  006016  077110  ?  000240
??????  006020  004767  ?  ^Z       (CTRL/Z for new offset)
Offset address?  ^Z                  (CTRL/Z for new base)
Base address?  FMSPAT
Offset address?  0
 Base   Offset  Old     New?
??????  000000  000000  ?  112002
??????  000002  000000  ?  004737
```

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```
??????  000004  000000  ?  $FMSSE+6642
??????  000006  000000  ?  103003
??????  000010  000000  ?  005265
??????  000012  000000  ?  000036
??????  000014  000000  ?  000771
??????  000016  000000  ?  005701
??????  000020  000000  ?  001401
??????  000022  000000  ?  077112
??????  000024  000000  ?  000137
??????  000026  000000  ?  $FMSSE+6020
??????  000030  000000  ?  112402
??????  000032  000000  ?  004737
??????  000034  000000  ?  $FMSSE+6642
??????  000036  000000  ?  103003
??????  000040  000000  ?  005265
??????  000042  000000  ?  000036
??????  000044  000000  ?  000771
??????  000046  000000  ?  005703
??????  000050  000000  ?  001401
??????  000052  000000  ?  077312
??????  000054  000000  ?  000137
??????  000056  000000  ?  $FMSSE+476
??????  000060  ??????   ?  ^C       (up-arrow/C to exit; CTRL/C for INIT)
```

SPECIAL PRINT-USING CHARACTERS - BASIC-PLUS FEATURE PATCH

The PRINT-USING option of BASIC-PLUS provides for floating dollar sign, comma insertion every three digits to the left of the decimal point, and printing of the decimal point. The $-sign is used for the currency symbol in the United States and Canada, but various other symbols are used for other monetary systems. In the United Kingdom it would be useful to float the Pound Sterling symbol (or whatever ASCII character is used to represent that symbol) instead of the $-sign. In France, a floating Franc symbol (or F) would be generally more useful than the floating $-sign. The role of the comma and period are also reversed in France (e.g., 9,999,999.Ø2 should be printed as 9.999.999,Ø2).

To accommodate these differences in monetary systems, PRINT-USING is coded to allow substitution of any character for the floating currency symbol, the decimal point character, and the "every three digits" character. These three characters are defined by three words in the BASIC-PLUS run-time system. System defaults and several suggestions are shown in the table below:

Location	Usage	Default	England	France
..PUCH+Ø	Floating currency symbol	$ (Ø44)	& (Ø46)	F (1Ø6)
..PUCH+2	Decimal point character	. (Ø56)	. (Ø56)	, (Ø54)
..PUCH+4	Every three digits character	, (Ø54)	, (Ø54)	. (Ø56)

Substitution of different characters, such as those listed under England and France above, is done with a simple patch. Any change will affect both the PRINT-USING format string and the output produced. For example, if the suggestions under "France" were installed, the following PRINT-USING statement would result in the output shown:

```
PRINT USING "FF#.######,##", 3673298.Ø2, 4545.2Ø

F3.673.298,Ø2
    F4.545,2Ø
```

Since any change in this area does render the PRINT-USING documentation slightly incorrect, an appropriate note should be published for users of the system.

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BASIC-PLUS
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PROCEDURE:

1. This is a feature patch to the BASIC-PLUS run-time system. It may be installed in any BASIC-PLUS run-time system configured with Print-Using.

2. Determine the three special characters you wish to use for the floating currency symbol, the decimal point character, and the "every three digits" character. The chosen characters can be entered as either:

```
'x      where x is the chosen printable character
 n      where n is the octal value of the chosen character
 n.     where n is the decimal value of the chosen character
```

3. The patch described in Step 5 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? BASIC.RTS          (BASIC-PLUS run-time system name)
```

4. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>           (RETURN for manual patch installation)
File to patch? [Ø,1]BASIC.RTS     (BASIC-PLUS run-time system name)
File found in account [Ø,1]
```

The patch is also contained in a patch file appearing in patch kit version "A" or later.

NOTE

The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed.

5. The patch is as follows:

```
Base address? ..PUCH
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ØØØØ44  ? 'f       (currency sign from step 2)
??????  ØØØØØ2  ØØØØ56  ? ',       (decimal point from step 2)
??????  ØØØØØ4  ØØØØ54  ? '.       ("every three" from step 2)
??????  ØØØØØ6  ??????  ? ^C      (up-arrow/C to exit;CTRL/C for INIT)
```

6. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, or if it is your system default run-time system, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD BASIC<cr>                    (BASIC-PLUS run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD BASIC/STAY/ADDR:nnn<cr>        (BASIC-PLUS run-time system name)
#EXIT<cr>

Ready
```

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DEFAULT SCALE FACTOR - BASIC-PLUS FEATURE PATCH

The BASIC-PLUS default SCALE factor may be modified by utilizing the procedure in this article. A complete description of SCALE factors is included in the BASIC-PLUS Language Manual.

PROCEDURE:

1. This is a feature patch to the BASIC-PLUS run-time system. It may be installed in any BASIC-PLUS run-time system configured with the 4-word, scaled math package.

2. Determine the new BASIC-PLUS default SCALE factor. This default SCALE factor must be between Ø and 6 inclusive.

3. The patch described in Step 5 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? BASIC.RTS          (BASIC-PLUS run-time system name)
```

4. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>           (RETURN for manual patch installation)
File to patch? [Ø,1]BASIC.RTS     (BASIC-PLUS run-time system name)
File found in account [Ø,1]
```

The patch is also contained in a patch file appearing in patch kit version "A" or later.

NOTE

The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed.

5. The patch is as follows:

```
Base address? ..SCA.
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ØØØØØØ  ? n          (from step 2)
??????  ØØØØØ2  ??????  ? ^C         (up-arrow/C to exit;CTRL/C for INIT)
```

6. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, or if it is your system default run-time system, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD BASIC<cr>                  (BASIC-PLUS run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD BASIC/STAY/ADDR:nnn<cr>      (BASIC-PLUS run-time system name)
#EXIT<cr>

Ready
```

OMITTING SCALE FACTOR WARNING MESSAGE - BASIC-PLUS FEATURE PATCH

Normally, if a BASIC-PLUS program is compiled with one SCALE factor and then is run under a different job SCALE factor, the "%SCALE Factor Interlock" warning message is printed and execution proceeds using the program's SCALE factor. It may be desirable to omit the printing of this message.

PROCEDURE:

1. This is a feature patch to the BASIC-PLUS run-time system. It may be installed in any BASIC-PLUS run-time system configured with the 4-word, scaled math package.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? BASIC.RTS          (BASIC-PLUS run-time system name)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>           (RETURN for manual patch installation)
File to patch? [Ø,1]BASIC.RTS     (BASIC-PLUS run-time system name)
File found in account [Ø,1]
```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..SCE.
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  1Ø4577  ? 24Ø      (for no warning message)
??????  ØØØØØ2  ØØØ2Ø7  ? ^C      (up-arrow/C to exit;CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, or if it is your system default run-time system, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD BASIC<cr>                    (BASIC-PLUS run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD BASIC/STAY/ADDR:nnn<cr>        (BASIC-PLUS run-time system name)
#EXIT<cr>

Ready
```

DEFAULT TO EXTEND MODE - BASIC-PLUS FEATURE PATCH

Normally, BASIC-PLUS defaults to NO EXTEND mode. To change this default to EXTEND mode, apply the patch in this article.

NOTE

> In future releases of RSTS/E, BASIC-PLUS will change its default from NOEXTEND mode to EXTEND mode. Digital recommends that you install this patch to prepare your users for the transition. Note that when the default is changed, a Feature patch will be provided to change the default back to NOEXTEND mode. Please also note that the use of EXTEND mode will ease any transition to other versions of BASIC-PLUS or BASIC-PLUS-2.

PROCEDURE:

1. This is a feature patch to the BASIC-PLUS run-time system. It may be installed in any BASIC-PLUS run-time system.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? BASIC.RTS          (BASIC-PLUS run-time system name)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>           (RETURN for manual patch installation)
File to patch? [Ø,1]BASIC.RTS     (BASIC-PLUS run-time system name)
File found in account [Ø,1]
```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..XTN.
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ØØØØØØ  ? 2ØØØØ
??????  ØØØØØ2  ??????  ? ^C       (up-arrow/C to exit;CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, or if it is your system default run-time system, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD BASIC<cr>                    (BASIC-PLUS run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD BASIC/STAY/ADDR:nnn<cr>        (BASIC-PLUS run-time system name)
#EXIT<cr>

Ready
```

NO IMMEDIATE MODE FROM .BAS FILE - BASIC-PLUS FEATURE PATCH

Normally, BASIC-PLUS allows immediate-mode commands to appear in the file accessed by the "OLD" command. This may be undesirable in hostile environments where, for example, students could write programs which included "UNSAVE" commands. To prevent BASIC-PLUS from accepting immediate mode commands in files, apply the patch in this article.

NOTE

> In future releases of RSTS/E, BASIC-PLUS will change its default to not allow immediate-mode commands to be executed from a program file accessed by the "OLD" command. This will be done to increase compatibility with other products. A Feature patch will be provided to allow users to continue using this feature.

PROCEDURE:

1. This is a feature patch to the BASIC-PLUS run-time system. It may be installed in any BASIC-PLUS run-time system.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? BASIC.RTS          (BASIC-PLUS run-time system name)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>           (RETURN for manual patch installation)
File to patch? [Ø,1]BASIC.RTS     (BASIC-PLUS run-time system name)
File found in account [Ø,1]
```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..IBAS
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ØØØ4Ø1  ? 14Ø1
??????  ØØØØØ2  1Ø4767  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, or if it is your system default run-time system, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD BASIC<cr>                  (BASIC-PLUS run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD BASIC/STAY/ADDR:nnn<cr>      (BASIC-PLUS run-time system name)
#EXIT<cr>

Ready
```

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NO PPN'S IN CATALOG COMMAND - BASIC-PLUS FEATURE PATCH

Normally, BASIC-PLUS allows any user to list the contents of another user's directory with the CATALOG [P,PN] command. The patch in this article prevents BASIC-PLUS from accepting a project, programmer number in the CATALOG command. Thus, only the user's own directory may be listed.

PROCEDURE:

1. This is a feature patch to the BASIC-PLUS run-time system. It may be installed in any BASIC-PLUS run-time system.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? BASIC.RTS          (BASIC-PLUS run-time system name)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>           (RETURN for manual patch installation)
File to patch? [Ø,1]BASIC.RTS     (BASIC-PLUS run-time system name)
File found in account [Ø,1]
```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..CAT.
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ØØØ4Ø1  ? 5Ø64
??????  ØØØØØ2  ØØØØØ6  ? ^C       (up-arrow/C to exit;CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, or if it is your system default run-time system, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD BASIC<cr>                    (BASIC-PLUS run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD BASIC/STAY/ADDR:nnn<cr>        (BASIC-PLUS run-time system name)
#EXIT<cr>

Ready
```

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DISABLING THE CCL SYS CALL - BASIC-PLUS FEATURE PATCH

Normally, BASIC-PLUS allows any user to execute any valid CCL command on the system with SYS call 14. However, some installations may choose to disable this feature to discourage users from writing programs that will simulate the features of a standard run-time system. The patch in this article prevents BASIC-PLUS from executing SYS call 14.

PROCEDURE:

1. This is a feature patch to the BASIC-PLUS run-time system. It may be installed in any BASIC-PLUS run-time system.

2. The patch described in Step 4 below can be installed using the PATCH option of init.sys:

```
Option: PATCH
File to patch? BASIC.RTS          (BASIC-PLUS run-time system name)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>           (RETURN for manual patch installation)
File to patch? [Ø,1]BASIC.RTS     (BASIC-PLUS run-time system name)
File found in account [Ø,1]
```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..CCL.
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ??????  ? UUOBAD
??????  ØØØØØ2  ??????  ? ^C       (up-arrow/C to exit;CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, or if it is your system default run-time system, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD BASIC<cr>                    (BASIC-PLUS run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD BASIC/STAY/ADDR:nnn<cr>        (BASIC-PLUS run-time system name)
#EXIT<cr>

Ready
```

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CLEAR I/O BUFFERS USED BY OPEN STATEMENTS - BASIC-PLUS FEATURE PATCH

PROBLEM:

BASIC-PLUS does not clear I/O buffers used by OPEN statements.

SOLUTION:

The patching procedure detailed below will cause BASIC-PLUS to clear I/O buffers used by OPEN statements. This patch need only be applied when high security is needed.

NOTE: Applying this patch will cause BASIC-PLUS file commands (OLD, SAVE, REPLACE) to execute more slowly.

PROCEDURE:

1. This is a feature patch to the BASIC-PLUS Run-Time System. It may be installed on any BASIC-PLUS Run-Time System.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

   ```
   Option: PATCH
   File to patch? BASIC.RTS          (BASIC-PLUS Run-Time System name)
   ```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

   ```
   RUN $ONLPAT
   Command File Name? <cr>      (RETURN for manual patch installation)
   File to patch? [Ø,1]BASIC.RTS     (BASIC-PLUS Run-Time System name)
   File found in account [Ø,1]
   ```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? RC
Offset address? 6774
 Base  Offset  Old     New?
?????? 006774 005062   ? 4737
?????? 006776 000006   ? PA+102
?????? 007000 016764   ? ^Z          (CTRL/Z for new offset)
Offset address? ^Z                   (CTRL/Z for new base)
Base address? PA
Offset address? 102
 Base  Offset  Old     New?
?????? 000102 000000   ? 5062
?????? 000104 000000   ? 6
?????? 000106 000000   ? 10046
?????? 000110 000000   ? 10246
?????? 000112 000000   ? 66202
?????? 000114 000000   ? 10
?????? 000116 000000   ? 105022
?????? 000120 000000   ? 77002
?????? 000122 000000   ? 12602
?????? 000124 000000   ? 12600
?????? 000126 000000   ? 207
?????? 000130 ??????   ? ^C          (up-arrow/C to exit;)
                                     (CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, or if it is your system default run-time system, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD BASIC<cr>                (BASIC-PLUS Run-Time System name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD BASIC/STAY/ADDR:nnn<cr>     (BASIC-PLUS Run-Time System name)
#EXIT<cr>

Ready
```

NOTE: IF IT IS NECESSARY, THE PATCH SPACE THIS PATCH USES MAY BE RE-USED FOR MANDATORY PATCHES.

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FORCE "ILLEGAL STATEMENT" ERROR WHEN USING OBSOLETE SEND/RECEIVE -
BASIC-PLUS FEATURE PATCH

PROBLEM:

The BASIC-PLUS distributed with RSTS/E V7.1 is the last release of RSTS/E which will support Send/Receive SYS call 18 (SYS(CHR$(6%)+CHR$(18%)+...).

SOLUTION:

The patching procedure detailed below will cause BASIC-PLUS to generate an "?Illegal Statement" error whenever the obsolete Send/Receive SYS call (SYS(CHR$(6%)+CHR$(18%)+....) is used. This patch will help to identify programs which use this obsolete SYS call so they may be changed to the new format Send/Receive SYS call (Refer to RSTS/E Programming Manual, Chapter 8 for information).

NOTE: IT IS SUGGESTED THAT YOU APPLY THE PATCH WHICH FOLLOWS TO A COPY OF YOUR BASIC-PLUS RUN-TIME SYSTEM. YOU CAN THEN SWITCH TO THE NEW RUN-TIME SYSTEM, OLD/COMPILE ALL USER WRITTEN PROGRAMS WHICH YOU SUSPECT MAY USE SYS CALL 18, AND TRACK DOWN AND CHANGE THE CALLS WITH LESS IMPACT ON YOUR SYSTEM. THIS PATCH MUST NOT BE APPLIED TO YOUR ACTUAL BASIC-PLUS RUN-TIME SYSTEM.

PROCEDURE:

1. This is a feature patch to the BASIC-PLUS Run-Time System. It may be installed on any BASIC-PLUS Run-Time System.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

   ```
   Option: PATCH
   File to patch? BASIC.RTS          (BASIC-PLUS Run-Time System name)
   ```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

   ```
   RUN $ONLPAT
   Command File Name? <cr>       (RETURN for manual patch installation)
   File to patch? [0,1]BASIC.RTS     (BASIC-PLUS Run-Time System name)
   File found in account [0,1]
   ```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? SN
Offset address? 422
 Base  Offset  Old     New?
?????? 000422  111302  ? 104771
?????? 000424  010246  ? ^Z                (CTRL/Z for new offset)
Offset address? ^Z                         (CTRL/Z for new base)
Base address? ^Z
File to patch? ^Z
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, or if it is your system default run-time system, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD BASIC<cr>                  (BASIC-PLUS Run-Time System name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD BASIC/STAY/ADDR:nnn<cr>      (BASIC-PLUS Run-Time System name)
#EXIT<cr>

Ready
```

THE BASIC-PLUS DEBUG FACILITY

A feature of BASIC-PLUS, the DEBUG facility, is available with RSTS/E V7.2 as an unsupported feature, and may be changed or removed in future versions of BASIC-PLUS.

The DEBUG commands extend the present BASIC-PLUS immediate-mode debugging commands by allowing you to trace the flow of your program and to set breakpoints. These commands provide a subset of the functions provided by the BASIC-PLUS-2 debugging facility, and are only available as immediate-mode commands. They cannot be used within BASIC-PLUS programs. The commands are used in one of two ways:

1. Issuing them between the OLD and RUN of a program and, thereafter, whenever a breakpoint is hit.

2. By including STOP statements within the program, and then issuing the DEBUG commands when the first STOP statement is encountered and, thereafter, whenever another STOP statement or breakpoint is hit.

Any DEBUG commands are disabled when:

1. A "RUN <program-name>" command is successfully executed, or
2. A NEW, OLD, or EXIT command is executed, or
3. Any valid CCL command is executed.

The keywords used with the DEBUG facility have been implemented with the second character of each keyword changed to a question mark ("?"). The patch described in article Seq 4.1Ø.3 F may be used to change the question marks to the characters required to make the keyword names match the names of their respective functions (for example, "T?ACE" is changed to "TRACE"). Note that, if this patch is applied, any program with a variable or function name that represents a variant of TRACE, UNTRACE, BREAK, or UNBREAK (such as TRACE%, FNBREAK$, etc.) will not compile until the variable name is changed.

For the purposes of this discussion, assume that the patch described above has been installed. If you include the DEBUG features, but choose not to install the patch, replace all occurrences of the keywords below as follows:

With Patch	Without Patch
TRACE	T?ACE
UNTRACE	U?TRACE
BREAK	B?EAK
UNBREAK	U?BREAK

TRACE/UNTRACE

The TRACE command causes BASIC-PLUS to print the message "at line nnn" (where "nnn" represents a line number) each time that a line number is encountered or the current line number changes.

The UNTRACE command disables any previous invocation of the TRACE command.

BREAK/UNBREAK

The BREAK command allows you to specify that execution should stop any time that a specified line number is encountered. Up to 1Ø such breakpoints can be set. The BREAK command is of the form

BREAK [N1, N2, N3 ..., N1Ø]

where "Nn" represents a line number between 1 and 32767.

When a breakpoint is encountered, BASIC-PLUS prints the message "Break at line nnn" and returns to "Ready" as though a STOP statement had been executed. At this point you can examine or change the values of variables, execute the DUMP command (if enabled, see article Seq 4.1Ø.2 N), or execute any other legal command. Type "CONT" (continue) to resume execution.

If the BREAK command is issued without a line number argument, BASIC-PLUS will BREAK each time that a new line is encountered.

The UNBREAK command is used to disable breakpoints, and is of the form

UNBREAK [N1, N2, N3, ..., N1Ø]

If no line numbers are specified, all breakpoints are disabled.

UNDERSTANDING LINE NUMBERS IN THE DEBUG FACILITY

(This section discusses the actual implementation of the DEBUG facility in the BASIC-PLUS run-time system, and should help to explain certain anomalies that you may encounter.)

The DEBUG code is entered whenever an internal construct called a "statement header" is encountered. Statement headers are generated for the following BASIC-PLUS elements:

Line numbers	DIMENSION statements	DATA statements
FOR statements	NEXT statements	
DEF statements	FNEND statements	

When a statement header is encountered, BASIC-PLUS first checks to see if the BREAK or TRACE feature has been requested. If not, program execution continues.

If BREAK or TRACE has been requested, BASIC-PLUS now compares the current line number with the previously encountered line number. If they are the same, program execution continues.

If a different line number has been encountered, BASIC-PLUS then checks to see if the statement header represents a function definition ("DEF") statement. If so, program execution continues.

Because of the internal structure of BASIC-PLUS, it is not possible to BREAK at a function definition. As you can see from the algorithm used, any attempt to BREAK at a function definition is rejected while the program is being executed, rather than when the "BREAK" command is specified.

If the BREAK feature has been requested, BASIC-PLUS compares the current line number with the list of breakpoints that have been requested. If the current line number is included in the breakpoint list, BASIC-PLUS prints "Break at line nnn," and returns to keyboard monitor ("Ready") state.

If the TRACE feature has been requested, BASIC-PLUS prints "at line nnn" and proceeds with execution of the program.

SUPPORT POLICY FOR THE BASIC-PLUS DEBUG FEATURE

DIGITAL makes no commitment, expressed or implied, to support the BASIC-PLUS run-time system, or any BASIC-PLUS System programs (CUSPs) used with that run-time system, if the DEBUG feature is enabled in the BASIC-PLUS run-time system.

If you experience problems with the DEBUG feature, please submit an FYI-type (priority 5) Software Performance Report (SPR). While DIGITAL makes no commitment to fix problems reported with the DEBUG facility, we would like to know about any problems that you encounter.

ENABLING THE DEBUG FACILITY

The DEBUG facility requires approximately 16Ø (decimal) additional words in the BASIC-PLUS run-time system. In most cases, this means that one or more of the other optional features (String Arithmetic, Print Using, etc.) must be omitted to prevent the BASIC-PLUS run-time system from exceeding 16K words in size.

To include the DEBUG facility in your BASIC-PLUS run-time system, respond "Y/D" to SYSGEN's "Generate BASIC-PLUS?" query.

THE BASIC-PLUS DUMP FACILITY

A feature of BASIC-PLUS, the DUMP facility, is available with RSTS/E as an unsupported feature, and may be changed or removed in future versions of BASIC-PLUS.

The keyword D?MP has been implemented to write a post-mortem dump to the specified file on a random-access device if the patch described in article Seq 4.1Ø.4 F is installed. To change the keyword to DUMP, also install the patch described in article Seq 4.1Ø.6 F. Note that, if this patch is installed, any program with a variable or function named DUMP, DUMP%, DUMP$, FNDUMP(), etc. will not compile until the name of the variable is changed.

For the purposes of this discussion, assume that the patch described above has been installed. If you enable the DUMP facility, but choose not to install this patch, replace all occurrences of "DUMP" with "D?MP" in the discussion below.

The DUMP command provides an extension to the present BASIC-PLUS immediate mode debugging commands by allowing you to take a "snap-shot" dump of your current job. After DUMPing your program, you can use the BPDA (BASIC-PLUS Dump Analyzer) program to display the contents of all variables used by the program. In addition, you can continue executing your program after issuing the DUMP command; this allows you to inspect the state of the program at several stages of execution.

The DUMP command is only available as an immediate-mode command (i.e., it cannot be used in a BASIC-PLUS program), and has the syntax

DUMP <file-specification>

If no device name is specified, the public disk structure ("sy:") is used. If no filename is specified, the current program name is used. If no file type is specified, ".PMD" is used.

THE BASIC-PLUS DUMP ANALYSIS PROGRAM

After the DUMP command has been issued, you can use the BPDA program to print the contents of each variable that is used in the program, as well as the contents of the buffer of any open files.

The BPDA program asks for an input file name. The default file type is ".PMD". There is no default for the file name. Wildcards are illegal.

When BPDA asks for the output file name, responding with <cr> will direct the output to your terminal. If no filename is specified, the input filename is used with the default file type ".PDA".

You may also respond to the "Input file?" query with a command of the form:

<outfile> = <infile>

The DUMP facility has not been implemented as a standard feature because it could be used to obtain confidential information, such as student grades or payroll information, in applications where a user could type CTRL/C and examine the contents of buffers and variables. If the feature is enabled, however, there are two mechanisms available to protect against this kind of situation.

1. Non-privileged users are normally prevented from using the DUMP command on programs that are running from compiled files. This restriction may be removed if desired (see article Seq 4.10.5 F).

2. Whether or not non-privileged users are allowed to use the DUMP command on programs that are executed from compiled files, they still may not use the DUMP command on a program that uses temporary privileges, since the BASIC-PLUS run-time system clears the program from memory before a non-privileged user returns to keyboard monitor state.

Some installations may find it desirable to generate two versions of the BASIC-PLUS run-time system, one for development and one for production. This would prevent the potential problems described above, while providing the DUMP feature for development work.

SUPPORT POLICY FOR THE BASIC-PLUS DUMP FACILITY

DIGITAL makes no commitment, expressed or implied, to support the BASIC-PLUS run-time system, or any BASIC-PLUS System programs (CUSPs) used with that run-time system, if the DUMP facility is enabled.

If you experience problems with the DUMP feature, please submit an FYI-type (priority 5) Software Performance Report (SPR). While DIGITAL makes no commitment to fix problems reported with the DUMP facility, we would like to know about any problems that you encounter.

CHANGING THE BASIC-PLUS DEBUG KEYWORDS - BASIC-PLUS FEATURE PATCH

PROBLEM:

If support for the DEBUG facility has been included in the BASIC-PLUS run-time system, the keywords BREAK, TRACE, UNBREAK, and UNTRACE are initially enabled with the second character of the keyword changed to a question mark ("?"), i.e., B?EAK, T?ACE, U?BREAK, and U?TRACE.

SOLUTION:

The patching procedure detailed below will replace the question marks with the correct characters, thus changing the keywords to BREAK, TRACE, UNBREAK, and UNTRACE.

NOTE

> If this patch is installed, any program with a variable or function name of one of these keywords, such as BREAK% or FNTRACE$, will fail to compile until the variable name has been changed.

PROCEDURE:

1. This is a feature patch to the BASIC-PLUS run-time system. It may be installed in any BASIC-PLUS run-time system.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

   ```
   Option: PATCH
   File to patch? BASIC.RTS          (BASIC-PLUS run-time system name)
   ```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

   ```
   RUN $ONLPAT
   Command File Name? <cr>           (RETURN for manual patch installation)
   File to patch? [0,1]BASIC.RTS     (BASIC-PLUS run-time system name)
   File found in account [0,1]
   ```

   This patch is contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..BEA.
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ     Ø77  ? 'R
??????  ØØØØØ1     ???  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                  (CTRL/Z for new base)
Base address? ..TAC.
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ     Ø77  ? 'R
??????  ØØØØØ1     ???  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                  (CTRL/Z for new base)
Base address? ..UBR.
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ     Ø77  ? 'N
??????  ØØØØØ1     ???  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                  (CTRL/Z for new base)
Base address? ..UTR.
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ     Ø77  ? 'N
??????  ØØØØØ1     ???  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, or if it is your system default run-time system, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD BASIC<cr>                   (BASIC-PLUS run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD BASIC/STAY/ADDR:nnn<cr>        (BASIC-PLUS run-time system name)
#EXIT<cr>

Ready
```

ENABLING THE BASIC-PLUS DUMP FEATURE - BASIC-PLUS FEATURE PATCH

PROBLEM:

The (unsupported) BASIC-PLUS "DUMP" feature is initially disabled. Some installations may choose to enable this feature, even though it is unsupported. (See article Seq 4.1Ø.2 N for a complete description of the DUMP feature. See article Seq 4.1Ø.6 N to change the keyword from "D?MP" to "DUMP".)

SOLUTION:

The patching procedure detailed below will enable the DUMP feature.

PROCEDURE:

1. This is a feature patch to the BASIC-PLUS run-time system. It may be installed in any BASIC-PLUS run-time system.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? BASIC.RTS          (BASIC-PLUS run-time system name)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>           (RETURN for manual patch installation)
File to patch? [Ø,1]BASIC.RTS     (BASIC-PLUS run-time system name)
File found in account [Ø,1]
```

   This patch is contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..PMD.
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  1Ø4755  ? BNE+2
??????  ØØØØØ2  ??????  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, or if it is your system default run-time system, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD BASIC<cr>                    (BASIC-PLUS run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD BASIC/STAY/ADDR:nnn<cr>        (BASIC-PLUS run-time system name)
#EXIT<cr>

Ready
```

RSTS/E V7.2 Seq 4.1Ø.5 F
BASIC-PLUS
Non-standard BASIC-PLUS Features 1 of 2

ENABLING DUMP FROM COMPILED FILES FOR NON-PRIVILEGED USERS - BASIC-PLUS FEATURE PATCH

PROBLEM:

Normally, if the DUMP feature is enabled (see article Seq 4.1Ø.2 N), BASIC-PLUS will not allow non-privileged users to DUMP programs that are executing from compiled files, even though they may DUMP programs that are executing from source files. This protection prevents users from DUMPing programs which may contain confidential information in their variable strings or file buffers.

Some installations, however, may want to allow all users to DUMP all BASIC-PLUS programs to which they have RUN access, regardless of whether the program is compiled.

SOLUTION:

The patching procedure detailed below will cause BASIC-PLUS to allow all users to DUMP programs that they are executing. (Note that a program whose protection code includes the 128. bit for temporary privileges is always cleared from a non-privileged user's job space before returning the keyboard monitor ("Ready") state. Hence, a non-privileged user can never DUMP such a program.)

PROCEDURE:

1. This is a feature patch to the BASIC-PLUS run-time system. It may be installed in any BASIC-PLUS run-time system.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? BASIC.RTS          (BASIC-PLUS run-time system name)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>           (RETURN for manual patch installation)
File to patch? [Ø,1]BASIC.RTS     (BASIC-PLUS run-time system name)
File found in account [Ø,1]
```

RSTS/E V7.2 Seq 4.1Ø.5 F
BASIC-PLUS
Non-standard BASIC-PLUS Features 2 of 2

This patch is contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..NPD.
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ØØ4767  ? NOP
??????  ØØØØØ2  ??????  ? NOP
??????  ØØØØØ4  Ø05Ø46  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, or if it is your system default run-time system, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD BASIC<cr>                  (BASIC-PLUS run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD BASIC/STAY/ADDR:nnn<cr>      (BASIC-PLUS run-time system name)
#EXIT<cr>

Ready
```

RSTS/E V7.2 Seq 4.1Ø.6 F
BASIC-PLUS
Non-standard BASIC-PLUS Features 1 of 2

CHANGING THE BASIC-PLUS D?MP KEYWORD - BASIC-PLUS FEATURE PATCH

PROBLEM:

The DUMP command, which is disabled unless the patch described in article Seq 4.1Ø.4 F is installed, has been implemented with the keyword "D?MP." Some installations may desire to change this keyword to "DUMP."

SOLUTION:

The patching procedure detailed below will change the keyword "D?MP" to "DUMP." If this patch is installed, please note that any program which uses a variable or function name such as DUMP% or FNDUMP$, will not compile until the variable name is changed.

PROCEDURE:

1. This is a feature patch to the BASIC-PLUS run-time system. It may be installed in any BASIC-PLUS run-time system.

2. The patche described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? BASIC.RTS          (BASIC-PLUS run-time system name)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>           (RETURN for manual patch installation)
File to patch? [Ø,1]BASIC.RTS     (BASIC-PLUS run-time system name)
File found in account [Ø,1]
```

   This patch is contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..DMP.
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ     Ø77  ? 'U
??????  ØØØØØ1     ???  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, or if it is your system default run-time system, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD BASIC<cr>                    (BASIC-PLUS run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD BASIC/STAY/ADDR:nnn<cr>        (BASIC-PLUS run-time system name)
#EXIT<cr>

Ready
```

NOTE ON THE HANDLING OF THE /B+ AND /B2 SWITCHES

When TECO reads a page of text into the editing buffer, it stops when it encounters a FORMFEED character, or when the buffer is full. In the latter case, the last line in the buffer will be complete (i.e., it includes the line delimiter), but no look-ahead is done to examine the next line in the file.

If TECO is used with the /B+ or /B2 switch to edit a very long BASIC-PLUS or BASIC-PLUS-2 source program that is not segmented with FORMFEED characters, chances are good that the last line in the buffer will not coincide with the last line of a (numbered) multiple-line combination.

When the buffer is written to the output file, TECO assumes that the last line in the buffer is the last line of a multiple-line combination, and terminates it with a CARRIAGE-RETURN character, rather than with a LINEFEED (or AMPERSAND) CARRIAGE-RETURN character combination. This can cause the remaining lines of that multiple-line combination to be lost when the program is subsequently OLDed.

To avoid this problem, lengthy BASIC-PLUS or BASIC-PLUS-2 programs should be segmented into smaller sections (approximately 150 to 200 lines) with FORMFEED characters before editing them with TECO's /B+ or /B2 switches.

RSTS/E V7.2 Seq 10.3.1 F
System Utilities Package
DIRECT 1 of 2

ALLOW NON-PRIVILEGED ACCESS TO OTHER DIRECTORIES - DIRECT FEATURE PATCH

PROBLEM:

Non-privileged users are only allowed to list the directory information of files on the system to which they have read or run access. However, some installations, for which security is not a concern, may find it desirable to allow non-privileged users to list all files in the system.

SOLUTION:

Another feature patch, Seq 3.5.9 F, extends the use of FIP calls 15 (Directory look up on Index) and 17 (Directory lookup by File Name/Wildcard directory lookup). Since DIRECT does not use these calls, a separate procedure is necessary to cause DIRECT to allow non-privileged users to list directory information of all files on the system.

NOTE

For consistency, Digital recommends that you either use both patches (Seq 3.5.9 F and Seq 10.3.1 F) or neither of them.

PROCEDURE:

1. For purposes of this discussion, we will assume that the program to be patched is located in your privileged account on the public disk structure. If this is not the case, replace all program references with suitable text according to the requirements of your installation.

   We assume the executable version of the program will be stored in the System Library Account ($). If this is not the case, replace references to $ in step 3 below with the appropriate package or library account.

   The procedure below assumes that BASIC-PLUS is your system default run-time system.

   If you are using CSPCOM or BASIC-PLUS-2, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   If you are using BASIC-PLUS-2, this program should be compiled under the BASIC2 run-time system.

2. This patch is contained in a patch file appearing in patch kit version "A" or later. If you do not have this distribution you can produce a command file by specifying a file for [logfile=] in the procedure below.

   To apply the patch manually, perform the following RSTS/E system commands.

```
RUN $CPATCH<cr>
<CPATCH's header line>

File to patch - DIRECT.BAS=DIRECT.BAS<cr>
#[logfile=]KB:/CS:58126<cr>
*H/2!/V<cr>
2!              PROGRAM         : DIRECT.BAS
*H/300<tab>/V<cr>
300     CROSS.PROTECT%=-1% &
*G/-1/-2C/0/V<cr>
300     CROSS.PROTECT%=0% &
*EX<cr>
Patch from _KB:[P,PN]CPATCH.CMD complete
#^Z
File to patch - ^Z

Ready
```

3. Use this procedure if your system default run-time system is BASIC-PLUS; otherwise, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   To re-compile the program and re-enter it into the system library, type the following RSTS/E commands.

```
OLD DIRECT<cr>

Ready

COMPILE $DIRECT<232><cr>

Ready
```

4. The person making the changes to the program should now take whatever steps are necessary, according to installation guidelines, to save the new version of the program.

5. The source (.BAS) version of the program may now be removed from the public structure.

INSTALLING USER MODIFICATIONS OR FEATURE PATCHES TO LOGIN

When you install feature patches or your own patches to LOGIN, you should take the following steps.

1. Log into a privileged account at TWO terminals.
2. Copy LOGIN.(BAC,TSK) to LOGIN.OLD
3. Install the new version of LOGIN
4. Test the new version extensively
5. Delete LOGIN.OLD

If a patch to LOGIN causes it to fail, and you have logged out of the ONLY privileged, attached job on the system, the only way to recover is to crash the system and stop it when INIT.(BAC,TSK) starts to execute. By logging in to the second terminal, you can quickly restore the previous (working) version of LOGIN, if necessary.

UNSCRUPULOUS PROGRAMS MAY CHAIN TO LOGIN - LOGIN FEATURE PATCH

PROBLEM:

Users, particularly in an educational environment, have been known to write programs that simulate the LOGIN dialogue, store the account number and password, and then CHAIN to LOGIN. In this way, a hostile user can gain access to the accounts of other users without the knowledge (or permission) of those users.

SOLUTION:

The patching procedure detailed below will cause LOGIN to report both the original account and the new account when invoked by a logged-in job. While this will not prevent a user from writing such a program, it will allow the victimized user to report the account that was used to the system manager.

Note that the variable W$ has been defined in the patch as a null string (W$="") at line 28000. The null string can be replaced with some message such as "Please inform the System Manager" if desired.

Assume that the LOGIN-simulating program resides in account [2,219]. When the patch described below has been installed, a typical run may look like this:

```
HELLO 1,224
Password:

Old Account:      [2,219]

New Account:      [1,224]

Please inform the System Manager.

Ready
```

PROCEDURE:

1. For purposes of this discussion, we will assume that the program to be patched is located in your privileged account on the public disk structure. If this is not the case, replace all program references with suitable text according to the requirements of your installation.

   The executable version of the program must be stored in the System Library Account ($) on the system disk.

   The procedure below assumes that BASIC-PLUS is your system default run-time system.

If you are using CSPCOM or BASIC-PLUS-2, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

If you are using BASIC-PLUS-2, this program must be task built against the BP2COM run-time system.

2. This patch is contained in a patch file appearing in patch kit version "A" or later. If you do not have this distribution you can produce a command file by specifying a file for [logfile=] in the procedure below.

NOTE

If you wish to have W$ indicate a particular message, the patch file for this patch requires manual editing before it can be successfully installed. Be sure to include the quotes around the desired message. The patch verify line which follows the insertion of the message will vary, echoing the message you have chosen.

To apply the patch manually, perform the following RSTS/E system commands.

```
RUN $CPATCH<cr>
<CPATCH's header line>

File to patch - LOGIN.BAS=LOGIN.BAS<cr>
#[logfile=]<cr>
*H/2!/V<cr>
2!              PROGRAM         : LOGIN.BAS
*H/15000<tab>/V<cr>
15000   GOSUB 22900 &
*18AV<cr>
        !\ GOSUB 28000 IF W% &
*G/!/-1DV<cr>
        \ GOSUB 28000 IF W% &
*H/28000<tab>/V<cr>
28000   PRINT &
*7AV<cr>
        \ W$="" &
*G/""/-2C/""/V<cr>              <Insert a message here, if desired.>
        \ W$="" &
*EX<cr>
Patch from _KB:[P,PN]CPATCH.CMD complete
#^Z
File to patch - ^Z

Ready
```

3. Use this procedure if your system default run-time system is BASIC-PLUS; otherwise, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   To re-compile the program and re-enter it into the system library, type the following RSTS/E commands.

   ```
   OLD LOGIN<cr>

   Ready

   COMPILE SYØ:$LOGIN<232><cr>

   Ready
   ```

4. The person making the changes to the program should now take whatever steps are necessary, according to installation guidelines, to save the new version of the program.

5. The source (.BAS) version of the program may now be removed from the public structure.

RSTS/E V7.2 Seq 1Ø.12.3 F
System Utilities Package
LOGIN 1 of 2

LOGIN CAN PRINT A MESSAGE FOR SPECIFIC ACCOUNTS - LOGIN FEATURE PATCH

PROBLEM:

Some installations may choose, on occasion, to establish messages for the users of specific accounts.

SOLUTION:

The patching procedure detailed below will allow the System Manager, or anyone else with access to a given account, to establish a message file that will be printed anytime that someone logs in under that account. To create the file, use $PIP (or a suitable text editor) to create the file "MESSAG.TXT" in the appropriate account.

Each time that a user logs in, LOGIN will check for the presence of the file "MESSAG.TXT" in that account, and print the contents of that file if it exists. This file will be printed (if present) even if the system message ($NOTICE.TXT) has been suppressed with a slash ("/") in the account specification.

Note that anyone with write-access to the file MESSAG.TXT, including users of that account, will be able to create, change, or delete the message.

PROCEDURE:

1. For purposes of this discussion, we will assume that the program to be patched is located in your privileged account on the public disk structure. If this is not the case, replace all program references with suitable text according to the requirements of your installation.

   The executable version of the program must be stored in the System Library Account ($) on the system disk.

   The procedure below assumes that BASIC-PLUS is your system default run-time system.

   If you are using CSPCOM or BASIC-PLUS-2, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   If you are using BASIC-PLUS-2, this program must be task built against the BP2COM run-time system.

2. This patch is contained in a patch file appearing in patch kit version "A" or later. If you do not have this distribution you can produce a command file by specifying a file for [logfile=] in the procedure below.

   To apply the patch manually, perform the following RSTS/E system commands.

```
RUN $CPATCH<cr>
<CPATCH's header line>

File to patch - LOGIN.BAS=LOGIN.BAS<cr>
#[logfile=]KB:/CS:64049<cr>
*H/2!/V<cr>
2!              PROGRAM         : LOGIN.BAS
*H/32405<tab>/V<cr>
32405   !RESUME 14020 IF ERL=14000% OR ERL=14010% &
*G/!/-1DV<cr>
32405   RESUME 14020 IF ERL=14000% OR ERL=14010% &
*EX<cr>
Patch from KB:[P,PN]CPATCH.CMD complete
#^Z
File to patch - ^Z

Ready
```

3. Use this procedure if your system default run-time system is BASIC-PLUS; otherwise, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   To re-compile the program and re-enter it into the system library, type the following RSTS/E commands.

```
OLD LOGIN<cr>

Ready

COMPILE SY0:$LOGIN<232><cr>

Ready
```

4. The person making the changes to the program should now take whatever steps are necessary, according to installation guidelines, to save the new version of the program.

5. The source (.BAS) version of the program may now be removed from the public structure.

RSTS/E V7.2
System Utilities Package
LOGIN

Seq 1Ø.12.4 F

LOGIN CAN CHAIN TO A SPECIFIED PROGRAM - LOGIN FEATURE PATCH

PROBLEM:

Some installations may find it desirable to have LOGIN chain to a specified program when some or all users log in.

SOLUTION:

The patching procedure detailed below will cause LOGIN to chain to the specified program, if it exists. (LOGIN will proceed normally if the program does not exist.)

At line 22950, the variable MGR.PROG$ should be set to some program name, as follows:

START	This will cause LOGIN to chain to the program "START" if it exists in the current user's account.
#START	This will cause LOGIN to chain to the program "START" if it exists in the user's group library ([*,Ø]).
$START	This will always cause LOGIN to chain to the program "START" if it exists in the system library ([1,2]).

PROCEDURE:

1. For purposes of this discussion, we will assume that the program to be patched is located in your privileged account on the public disk structure. If this is not the case, replace all program references with suitable text according to the requirements of your installation.

   The executable version of the program must stored in the System Library Account ($) on the system disk.

   The procedure below assumes that BASIC-PLUS is your system default run-time system.

   If you are using CSPCOM or BASIC-PLUS-2, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

If you are using BASIC-PLUS-2, this program must be task built against the BP2COM run-time system.

2. This patch is contained in a patch file appearing in patch kit version "A" or later. If you do not have this distribution you can produce a command file by specifying a file for [logfile=] in the procedure below.

NOTE

The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed. Specifically, "START" should be replaced with the desired program name (be sure to include the quotes). The patch verify line which follows the insertion of the program name will vary, echoing the program name you have chosen.

To apply the patch manually, perform the following RSTS/E system commands.

```
RUN $CPATCH<cr>
<CPATCH's header line>

File to patch - LOGIN.BAS=LOGIN.BAS<cr>
#[logfile=]<cr>
*H/2!/V<cr>
2!              PROGRAM         : LOGIN.BAS
*H/22950<tab>/V<cr>
22950   MGR.PROG$="" &
*G/""/-2C/"START"/V<cr>         <Replace "START" with the desired program name>
22950   MGR.PROG$="START" &
*EX<cr>
Patch from _KB:[P,PN]CPATCH.CMD complete
#^Z
File to patch - ^Z

Ready
```

3. Use this procedure if your system default run-time system is BASIC-PLUS; otherwise, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   To re-compile the program and re-enter it into the system library, type the following RSTS/E commands.

   OLD LOGIN<cr>

   Ready

   COMPILE SYØ:$LOGIN<232><cr>

   Ready

4. The person making the changes to the program should now take whatever steps are necessary, according to installation guidelines, to save the new version of the program.

5. The source (.BAS) version of the program may now be removed from the public structure.

RSTS/E V7.2 Seq 1Ø.12.5 F
System Utilities Package
LOGIN 1 of 2

DON'T LOG ACCESS ATTEMPTS OVER DIAL-UP LINES - LOGIN FEATURE PATCH

PROBLEM:

We assume that most installations will find it desirable to log all access attempts made from dial-up lines. This enables an installation to keep track of which accounts are being used to gain system access over dial-up lines and what type of logged-out requests are made over these lines. This log is normally sent to OPSER, but will be sent to KBØ: if OPSER is not running.

SOLUTION:

For those systems that choose not to log access attempts over dial-up lines, the patching procedure detailed below will prevent access attempts made over dial-up lines from being logged to OPSER.

PROCEDURE:

1. For purposes of this discussion, we will assume that the program to be patched is located in your privileged account on the public disk structure. If this is not the case, replace all program references with suitable text according to the requirements of your installation.

   The executable version of the program must be stored in the system Library Account ($) on the system disk.

   The procedure below assumes that BASIC-PLUS is your system default run-time system.

   If you are using CSPCOM or BASIC-PLUS-2, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   If you are using BASIC-PLUS-2, this program must be task built against the BP2COM run-time system.

2. This patch is contained in a patch file appearing in patch kit version "A" or later. If you do not have this distribution you can produce a command file by specifying a file for [logfile=] in the procedure below.

   To apply the patch manually, perform the following RSTS/E system commands.

```
RUN $CPATCH<cr>
<CPATCH's header line>

File to patch - LOGIN.BAS=LOGIN.BAS<cr>
#[logfile=]KB:/CS:14877<cr>
*H/2!/V<cr>
2!              PROGRAM         : LOGIN.BAS
*H/13100<tab>/V<cr>
13100   SEND.OPSER%=-1% IF (L.CLASS% AND JCLS.REM.BIT%) &
*G/=/35C/0%/V<cr>
13100   SEND.OPSER%=0% &
*H/22500<tab>/V<cr>
22500   ! &
*12AV<cr>
        \ SEND.OPSER%=(TTINTF% AND 16384%)<>0% &
*G/=/22DV<cr>
        \ SEND.OPSER%=0% &
*EX<cr>
Patch from _KB:[P,PN]CPATCH.CMD complete
#^Z
File to patch - ^Z

Ready
```

3. Use this procedure if your system default run-time system is BASIC-PLUS; otherwise, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   To re-compile the program and re-enter it into the system library, type the following RSTS/E commands.

   ```
   OLD LOGIN<cr>

   Ready

   COMPILE SY0:$LOGIN<232><cr>

   Ready
   ```

4. The person making the changes to the program should now take whatever steps are necessary, according to installation guidelines, to save the new version of the program.

5. The source (.BAS) version of the program may now be removed from the public structure.

CHANGING LOGIN TO SET A DIFFERENT SWAP MAXIMUM - LOGIN FEATURE PATCH

PROBLEM:

The LOGIN system program sets the swap maximum to 31K words for all users. This action means that all users run with a swap maximum of 31K words (or the system Swap Maximum, if that is lower than 31K).

SOLUTION:

1. The LOGIN program may be modified to set a swap maximum of less than 31K words for non-privileged accounts. To do this, you must change the value 31% in the statement "J% = 31%" (very first statement in line 15Ø1Ø) to any value less than or equal to the current default swap maximum used at system start up time.

   To change the swap maximum for non-privileged accounts, substitute the desired swap maximum for "NN" in the patch below.

2. LOGIN may also be modified to lower the swap maximum for privileged accounts. To do this, you must change the "J% = 31%" expression in the second physical line at line number 15Ø1Ø. The statement on this line checks for a 1 as the project number of the account.

   To change the swap maximum for privileged accounts, substitute the desired swap maximum for "ZZ" in the patch below.

PROCEDURE:

1. For purposes of this discussion, we will assume that the program to be patched is located in your privileged account on the public disk structure. If this is not the case, replace all program references with suitable text according to the requirements of your installation.

   The executable version of the program must be stored in the System Library Account ($) on the system disk.

   The procedure below assumes that BASIC-PLUS is your system default run-time system.

   If you are using CSPCOM or BASIC-PLUS-2, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

If you are using BASIC-PLUS-2, this program must be task built against the BP2COM run-time system.

2. This patch is contained in a patch file appearing in patch kit version "A" or later. If you do not have this distribution you can produce a command file by specifying a file for [logfile=] in the procedure below.

NOTE

The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed. Specifically, have "NN" and/or "ZZ" indicate the desired swap maximums.

To apply the patch manually, perform the following RSTS/E system commands.

```
RUN $CPATCH<cr>
<CPATCH's header line>

File to patch - LOGIN.BAS=LOGIN.BAS<cr>
#[logfile=]KB:<cr>
*H/2!/V<cr>
2!              PROGRAM         : LOGIN.BAS
*H/15Ø1Ø<tab>/V<cr>
15Ø1Ø   J%=31% &
*G/31/-2C/NN/V<cr>                              (from Step 1)
15Ø1Ø   J%=NN% &                                (will vary, based on NN)
*AV<cr>
        \ J%=31% IF (ACCOUNT% AND -256%)=256% &
*G/31/-2C/ZZ/V<cr>                              (from Step 2)
        \ J%=ZZ% IF (ACCOUNT% AND -256%)=256% & (will vary, based on ZZ)
*EX<cr>
Patch from _KB:[P,PN]CPATCH.CMD complete
#^Z
File to patch - ^Z

Ready
```

3. Use this procedure if your system default run-time system is BASIC-PLUS; otherwise, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

To re-compile the program and re-enter it into the system library, type the following RSTS/E commands.

```
OLD LOGIN<cr>

Ready

COMPILE SYØ:$LOGIN<232><cr>

Ready
```

4. The person making the changes to the program should now take whatever steps are necessary, according to installation guidelines, to save the new version of the program.

5. The source (.BAS) version of the program should now be removed from the public structure. As noted in the RSTS/E Programming Manual, it is recommended that the system manager not replace the original LOGIN source file with the modified version.

ENABLE LOGGED-OUT COMMANDS - LOGIN FEATURE PATCH

PROBLEM:

LOGIN does not let users invoke any of the following programs if they are logged out: HELP, SET, SYSTAT, and QUE. Some installations may want to allow all users to be able to run these programs, even if they are not logged in.

SOLUTION:

The patching procedure detailed below allows logged out access to all of the programs listed above.

PROCEDURE:

1. For purposes of this discussion, we will assume that the program to be patched is located in your privileged account on the public disk structure. If this is not the case, replace all program references with suitable text according to the requirements of your installation.

   The executable version of the program must be stored in the System Library Account ($) on the system disk.

   The procedure below assumes that BASIC-PLUS is your system default run-time system.

   If you are using CSPCOM or BASIC-PLUS-2, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   If you are using BASIC-PLUS-2, this program must be task built against the BP2COM run-time system.

2. This patch is contained in a patch file appearing in patch kit version "A" or later. If you do not have this distribution you can produce a command file by specifying a file for [logfile=] in the procedure below.

   To apply the patch manually, perform the following RSTS/E system commands.

```
RUN $CPATCH<cr>
<CPATCH's header line>

File to patch - LOGIN.BAS=LOGIN.BAS<cr>
#[logfile=]KB:/CS:6686<cr>
*H/2!/V<cr>
2!              PROGRAM         : LOGIN.BAS
*H/3224Ø<tab>/DV<cr>
3224Ø   DATA    HELP,   $HELP,  4,      3
*H/3225Ø<tab>/DV<cr>
3225Ø   DATA    SET,    $TTYSET,3,      4
*H/3226Ø<tab>/DV<cr>
3226Ø   DATA    SYSTAT, $SYSTAT,2,      4
*H/3227Ø<tab>/DV<cr>
3227Ø   DATA    QUEUE,  $QUE,   2,      4
*EX<cr>
Patch from _KB:[P,PN]CPATCH.CMD complete
#^Z
File to patch - ^Z

Ready
```

3. Use this procedure if your system default run-time system is BASIC-PLUS; otherwise, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   To re-compile the program and re-enter it into the system library, type the following RSTS/E commands.

   ```
   OLD LOGIN<cr>

   Ready

   COMPILE SYØ:$LOGIN<232><cr>

   Ready
   ```

4. The person making the changes to the program should now take whatever steps are necessary, according to installation guidelines, to save the new version of the program.

5. The source (.BAS) version of the program should now be removed from the public structure.

RSTS/E V7.2 Seq 10.12.8 F
System Utilities Package
LOGIN 1 of 3

ENABLE AUXILIARY PASSWORD - LOGIN FEATURE PATCH

PROBLEM:

Some installations may find it desirable to augment system security by requiring privileged users to supply an auxiliary password when logging in over dial-up lines or when using DECnet/E.

SOLUTION:

The patching procedure detailed below enables code in LOGIN which will require privileged users to supply an extra password in the cases noted above. (You may wish to change the auxiliary password periodically, for additional security.)

PROCEDURE:

1. For purposes of this discussion, we will assume that the program to be patched is located in your privileged account on the public disk structure. If this is not the case, replace all program references with suitable text according to the requirements of your installation.

   The executable version of the program must be stored in the System Library Account ($) on the system disk.

   The procedure below assumes that BASIC-PLUS is your system default run-time system.

   If you are using CSPCOM or BASIC-PLUS-2, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   If you are using BASIC-PLUS-2, this program must be task built against the BP2COM Run-Time System.

2. This patch is contained in a patch file appearing in patch kit version "A" or later. If you do not have this distribution you can produce a command file by specifying a file for [logfile=] in the procedure below.

RSTS/E V7.2 Seq 10.12.8 F
System Utilities Package
LOGIN 2 of 3

NOTE

The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed. Specifically, "AUXPASS" should be replaced by the desired auxiliary password (be sure to include the quotes). The patch verify line which follows the insertion of the password will vary, echoing the password you have chosen.

To apply the patch manually, perform the following RSTS/E system commands.

```
RUN $CPATCH<cr>
<CPATCH's header line>

File to patch - LOGIN.BAS=LOGIN.BAS<cr>
#[logfile=]KB:<cr>
*H/2!/V<cr>
2!              PROGRAM         : LOGIN.BAS
*H/13015<tab>/V<cr>
13015   L.PROJ%=M%(6%) &
*2AV<cr>
        !\ GOSUB 13100 &
*G/!/-DV<cr>
        \ GOSUB 13100 &
*H/22505<tab>/8AV<cr>
        \ L.PASS$="" &
*G/""/-2C/"AUXPASS"/V<cr>       <Change "AUXPASS" to the desired auxiliary password>
        \ L.PASS$="AUXPASS" &
*EX<cr>
Patch from _KB:[P,PN]CPATCH.CMD complete
#^Z
File to patch - ^Z

Ready
```

3. Use this procedure if your system default run-time system is BASIC-PLUS; otherwise, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   To re-compile the program and re-enter it into the system library, type the following RSTS/E commands.

```
OLD LOGIN<cr>

Ready

COMPILE SYØ:$LOGIN<232><cr>

Ready
```

4. The person making the changes to the program should now take whatever steps are necessary, according to installation guidelines, to save the new version of the program.

5. The source (.BAS) version of the program should now be removed from the public structure.

RSTS/E V7.2
System Utilities Package
SHUTUP

Seq 1Ø.21.1 F

1 of 3

CHANGING 'SHUTUP' SLEEP PARAMETERS - SHUTUP FEATURE PATCH

PROBLEM:

In the "Initial Job Killing Phase", SHUTUP makes two passes through the system job table looking for active jobs which can be logged off the system or KILLed. For those jobs which are attached to a keyboard, the following text string is FORCEd to the terminal's input buffer to simulate the log off sequence:

CTRL/C CTRL/C "BYE/Y" <cr>

Since this method requires the running of the system LOGOUT program, the actual logging off process can consume a fair amount of elapsed time after the text string FORCE is made.

The SHUTUP program is initially set up with the following parameters which control a program pause (SLEEP) at the end of the job table search pass:

```
SLEEP.BASE%      = 1Ø%
SLEEP.INCREMENT% =  2%
```

The length of the SLEEP period in seconds is calculated as:

SLEEP time = SLEEP.BASE% + (SLEEP.INCREMENT% * <number of terminals "killed">)

where the number of terminals "killed" is the total number of jobs sent the FORCE text string during the pass through the job table. For example, for 3 terminals, a period of 16 seconds results; for 1Ø terminals, a period of 3Ø seconds results.

Some installations may desire to change these parameters to alter the SLEEP period during this phase of SHUTUP operation. A case in point is when a system has at least one terminal running on the system at 11Ø baud. At this transmission speed, it requires 25-3Ø seconds just to type out the LOGOUT message which appears after typing BYE/Y. Changing the value of SLEEP.BASE% to 3Ø% should eliminate this problem.

SOLUTION:

Below is presented a procedure for changing the value(s) SLEEP.BASE% and/or SLEEP.INCREMENT%.

Assume the following parameter values for the edit session which follows:

```
xx = new SLEEP.BASE%      value
yy = new SLEEP.INCREMENT% value
```

PROCEDURE:

1. For purposes of this discussion, we will assume that the program to be patched is located in your privileged account on the public disk structure. If this is not the case, replace all program references with suitable text according to the requirements of your installation.

   We assume the executable version of the program will be stored in the System Library Account ($). If this is not the case, replace references to $ in step 3 below with the appropriate package or library account.

   The procedure below assumes that BASIC-PLUS is your system default run-time system.

   If you are using CSPCOM or BASIC-PLUS-2, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   If you are using BASIC-PLUS-2, this program must be task built against the BP2COM run-time system.

2. This patch is contained in a patch file appearing in patch kit version "A" or later. If you do not have this distribution you can produce a command file by specifying a file for [logfile=] in the procedure below.

   NOTE

   The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed. Specifically, change references to "xx" and "yy" to the desired values.

   To apply the indicated corrections manually, perform the following RSTS/E system commands.

```
RUN $CPATCH<cr>
<CPATCH's header line>

File to patch - SHUTUP.BAS=SHUTUP.BAS<cr>
#[logfil=]<cr>
*H/2!/V<cr>
2!              PROGRAM         : SHUTUP
*H/1Ø31<tab>/V<cr>
1Ø31        SLEEP.BASE% = 1Ø% &
*G/1Ø/-2C/xx/V<cr>
1Ø31        SLEEP.BASE% = xx% &
*AV<cr>
        \ SLEEP.INCREMENT% = 2% &
*G/2/-C/yy/V<cr>
        \ SLEEP.INCREMENT% = yy% &
*EX<cr>
Patch from [P,PN]CPATCH.CMD complete
#^Z
File to patch - ^Z

Ready
```

3. Use this procedure if your system default run-time system is BASIC-PLUS; otherwise, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   To re-compile the program and re-enter it into the system library, type the following RSTS/E commands.

   ```
   OLD SHUTUP<cr>

   Ready

   COMPILE SYØ:$SHUTUP<cr>

   Ready
   ```

4. The person making the changes to the program should now take whatever steps are necessary, according to installation guidelines, to save the new version of the program.

5. The source (.BAS) version of the program may now be removed from the public structure.

RSTS/E V7.2 Seq 10.30.1 N
System Utilities Package
VT55 1 of 1

VT55 GRAPHICS DISPLAY TERMINAL SUPPORT

Software support for the VT55 Graphics Display Terminal has been included in RSTS/E. The software consists of the following files which may be installed on the library account [1,2]:

VT55.BAS
DEMO55.BAS

VT55.BAS is a collection of BASIC-PLUS callable routines that provide access to the VT55 terminal.

To run the test program and assure correct operation of the graphic functions of the terminal:

1. Login to any account from a VT55
2. OLD $DEMO55
3. APPEND $VT55
4. RUN

The program will prompt for the KB: number of the VT55, and then proceed with a simple but thorough test of the terminal and its software.

A manual presently exists describing methods for programming the VT55 terminal and it may be ordered from the Software Distribution Center.

VT55 Programming Manual Order #: AA-4949A-TC

UNDERSTANDING "PA MEMORY SYSTEM" ERROR LOGS

The following information is logged when a memory error causes a trap or an instruction abort. These logs can be recognized by the fact that "MEM ERR" is not zero.

CACHECTL This is the data RSTS/E sets into the Cache Control Register (777746). It is meaningless for systems without cache memory.

ADDR LSB
ADDR MSB These words contain the address of the word in memory which failed. On the PDP-11/70, they are the contents of the Low Error Address Register (777740) and High Error Address Register (777742). Bits <15:14> of ADDR MSB indicate the cycle type of the failure. On other processors, these words are assembled from the other logged information.

MEM ERR On processors with cache, this is the contents of the Memory System Error register (777744). On other processors, this word always contains 100000 (CPU Abort, no cache error). If the same cache group fails five times in the same minute, that cache group will be disabled.

The remaining registers are not logged on the 11/70, which does not have accessible memory CSR's. In any case, they are not meaningful unless the error occurred in main memory.

CSR This is the address of the CSR which indicated an error.

(CSR) This is the contents of that CSR. A second entry is also printed for an MS11M or MS11L with the extended address function selected.

K Range This tells how finely the CSR contents can resolve the location of the error. For all current memory controllers (MF11-LP, MF11-UP, MF11-WP, MF11S-K, MM11-DP, MM11-YP, and MS11-JP), this value is 1, indicating that the CSR locates the error to within 1K words. For older semiconductor memory controllers (MS11-AP, MS11-BP, and MS11-CP) that do not provide the address of the error in the CSR, this value is the number of 1K-word blocks (up to 31.) controlled by the CSR.

Fail When it discovers a CSR announcing an error, RSTS/E looks through all memory in the range of the error (see above) to find which words actually have errors. Thus, for a controller which resolves the error location to within 1K words, RSTS/E checks 1024. words (or 512. if the memory is interleaved). This word tells how many words in the range had an error indication.

Base Adr To get the physical address of the start of the range mentioned above, add two zero digits (six bits) to this value.

Fail #n The next words in the error log tell which words in the given range actually have errors. The addresses are given as byte offsets from the base given above. Up to 5 such offsets may be logged.

Once a second, except on 11/70's, RSTS/E checks all memory CSR's for errors that do not cause traps or aborts. The logs for these errors can be recognized by the fact that "MEM ERR" is zero. These errors include uncorrectable errors detected on NPR cycles, and correctable (single-bit) ECC errors. Uncorrectable errors are logged whenever they are detected, but only one correctable error will be logged for each CSR, for each time RSTS/E is started. When a correctable error is logged, only the CSR address and CSR contents will be meaningful.

RSTS/E V7.2
Error Control Package
ERRBLD

Seq 12.8.1 M

CORRECT DATA FORMAT ERROR - MANDATORY ERRBLD PATCH

PROBLEM:

"?ERRBLD - %Data format error at Line 7060" is generated when ERRBLD.TSK is run.

SOLUTION:

The patching procedure detailed below corrects the above problem.

PROCEDURE:

1. For purposes of this discussion, we will assume that the program to be patched is located in your privileged account on the public disk structure. If this is not the case, replace all program references with suitable text according to the requirements of your installation.

   We assume the executable version of the program will be stored in the System Library Account ($). If this is not the case, replace references to $ in Step 3 below with the appropriate package or library account.

   The procedure below assumes that BASIC-PLUS is your system default run-time system.

   If you are using CSPCOM or BASIC-PLUS-2, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   If you are using BASIC-PLUS-2, this program should be compiled under the BASIC2 run-time system.

2. The command file for this patch appears in patch kit version "A" or later. The patch will already have been applied if you utilized the patch kit during your standard program build.

   To apply the patch manually, perform the following RSTS/E system commands.

RSTS/E V7.2 Seq 12.8.1 M
Error Control Package
ERRBLD 2 of 3

```
RUN $CPATCH<cr>
<CPATCH's header line>

File to patch - ERRBLD.BAS=ERRBLD.BAS<cr>
#[logfile=]KB:/CS:7658<cr>
*H/2!/V<cr>
2!              PROGRAM         : ERRBLD.BAS
*H/6!/:V<cr>
6!              EDIT            : Ø4
*G/Ø4/I/A/V<cr>
6!              EDIT            : Ø4A
*H/7!/V<cr>
7!              EDIT DATE       : Ø7-MAY-82
*G/Ø7-MAY-82/-9C/14-MAY-82/V<cr>
7!              EDIT DATE       : 14-MAY-82
*H/2Ø<tab>/V<cr>
2Ø      ! &
*G/REASON/AI<cr>
<tab>! V7.2-Ø4A<tab>14-MAY-82<tab>CORRECT DATA FORMAT ERROR &<cr>
<esc>*V<cr>
        ! &
*H/1Ø1Ø<tab>/V<cr>
1Ø1Ø    I$="V7.2-Ø4" &
*G/Ø4/I/A/V<cr>
1Ø1Ø    I$="V7.2-Ø4A" &
*H/95ØØ<tab>/V<cr>
95ØØ    DATA    "*UDA",    69,    17, &
*G/!/V<cr>
        ! &
*ØAI<cr>
<cr>
951Ø<esc>*V<cr>
951Ø    ! &
*H/96ØØ<tab>/V<cr>
96ØØ    DATA    "Success", &
*G/!/V<cr>
        ! &
*ØAI<cr>
<cr>
961Ø<esc>*V<cr>
961Ø    ! &
*EX<cr>
Patch from _KB:[P,PN]CPATCH.CMD complete
#^Z
File to patch - ^Z

Ready
```

3. Use this procedure if your system default run-time system is BASIC-PLUS; otherwise, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   To re-compile the program and re-enter it into the system library, type the following RSTS/E commands. Note that the program should then be RUN.

   OLD ERRBLD<cr>

   Ready

   COMPILE $ERRBLD<cr>

   Ready

   RUN $ERRBLD<cr>

   Ready

4. The person making the changes to the program should now take whatever steps are necessary, according to installation guidelines, to save the new version of the program.

5. The source (.BAS) version of the program should now be removed from the public structure.

DISABLE PRINTING OF "PLACED FILE..." WARNING MESSAGES - BACDIR FEATURE PATCH

PROBLEM:

The "PLACED FILE..." warning messages that are printed on the terminal during a BACKUP or RESTORE operation may take extra time and use a great deal of extra paper, especially if there are many placed files on the system. Since the same messages are output to the listing file, it may be considered redundant for them to be output to the terminal as well, especially through OPSER to KBØ:.

SOLUTION:

The patching procedure detailed below suppresses the logging of "PLACED FILE..." warning messages to the terminal.

PROCEDURE:

1. For purposes of this discussion, we will assume that the program to be patched is located in your privileged account on the public disk structure. If this is not the case, replace all program references with suitable text according to the requirements of your installation.

   We assume the executable version of the program will be stored in the System Library Account ($). If this is not the case, replace references to $ in Step 3 below with the appropriate package or library account.

   The procedure below assumes that BASIC-PLUS is your system default run-time system.

   If you are using CSPCOM or BASIC-PLUS-2, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   If you are using BASIC-PLUS-2, this program should be compiled under the BASIC2 run-time system.

2. The command file for this patch appears in patch kit version "A" or later. If you do not have this distribution you can produce a command file by specifying a file for [logfile=] in the procedure below.

   To apply the patch manually, perform the following RSTS/E system commands.

RSTS/E V7.2
Backup Package
BACDIR

Seq 13.5.1 F

2 of 3

```
RUN $CPATCH<cr>
<CPATCH's header line>

File to patch - BACDIR.BAS=BACDIR.BAS<cr>
#[logfile=]KB:/CS:5708<cr>
*H/2!/V<cr>
2!                PROGRAM          : BACDIR.BAS
*H/11080<tab>/V<cr>
11080    Y2%=Y2% OR 1024% &
*25AV<cr>
                  \ GOSUB 23100 &
*G/<tab>/I/!/V<cr>
         !        \ GOSUB 23100 &
*H/11220<tab>/V<cr>
11220    IF Z0%(P0%,12%) AND 2% AND D0%=2% THEN &
*5AV<cr>
                  \ GOSUB 23100 &
*G/<tab>/I/!/V<cr>
         !        \ GOSUB 23100 &
*EX<cr>
Patch from _KB:[P,PN]CPATCH.CMD complete
#^Z
File to patch - ^Z

Ready
```

3. Use this procedure if your system default run-time system is BASIC-PLUS; otherwise, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   To re-compile the program and re-enter it into the system library, type the following RSTS/E commands.

```
OLD BACDIR<cr>

Ready

COMPILE $BACDIR<232><cr>

Ready
```

4. The person making the changes to the program should now take whatever steps are necessary, according to installation guidelines, to save the new version of the program.

5. The source (.BAS) version of the program should now be removed from the public structure.

NOTES ON THE USE OF THE SERIAL LA18Ø (LA18ØS) TERMINAL UNDER RSTS/E V7.2

The first part of this article describes the behavior of the Serial LA18Ø terminal (called the LA18ØS) when its power is turned off, either at system start-up time or at some later time during timesharing, and makes recommendations to prevent loss of data.

If any terminal (including an LA18ØS) is powered off when the system is booted, the device appears to the system to be operational. If a user tries to print a file on the terminal, the system will send characters to the device at the usual speed and assume that they are being printed properly. Obviously, since the device is powered off, the characters are not being printed, but the device cannot return any indication of that fact to the system. The entire file will be sent as if it were printing.

If a spooler is started on such a KB: line, any files queued to that spooler will be sent, just as if the device were printing properly. The queue will gradually empty, and any files queued with /DELETE will be deleted.

Since there is no method by which the software can accurately differentiate between a terminal which is powered off and one which is printing properly, it is highly recommended that the person starting up a RSTS/E system check to ensure that all terminal devices which are ordinarily spooled are powered on and properly online before system start-up is performed.

A second class of problems involves the behavior of the LA18ØS when it is powered off or powered on after it has been ASSIGNed or OPENed.

During its power down and power up sequence, the LA18ØS terminal may send spurious characters to the host processor. The ASCII code of these characters appears to be random, but they occasionally take on the value of control characters (for example, CTRL/C). Since the program printing on the terminal may not expect input of any kind from the terminal, these spurious characters may result in unexpected errors: a CTRL/C may cause the program to print READY; a CTRL/O will cause all further output to be discarded without printing; etc. There is no way for the software to protect against all possible spurious inputs. RSTS/E is able to protect against all spurious input except CTRL/S (XON) and CTRL/Q (XOFF) via the MODE 32% option on the OPEN statement. However, spurious XON/XOFF characters can still cause loss of synchronization between the host system and the terminal. The only way to prevent this problem is to ensure that the LA18ØS is never powered off or powered on while it is ASSIGNed or OPENed.

A final problem concerns loss of data when the LA18ØS is powered off. The LA18ØS contains an internal buffer which is used to hold characters which have been received from the host processor but which have not yet been printed. When the LA18ØS goes OFFLINE (either because the ONLINE/OFFLINE switch is placed in the OFFLINE position, or because some exception condition, such as a paper jam, has been detected) this buffer may still contain some unprinted data. If the terminal is placed back ONLINE, printing will resume with no loss of data. If, however, the terminal is turned off, the buffer is cleared and any data in the buffer is lost. The only protection against this loss is to ensure that the LA18ØS is not powered off while it is printing.

In summary, DIGITAL recommends that any LA18ØS terminal to be used under RSTS/E timesharing be powered on before system start-up and that it remain on whenever it is in use. If the terminal is powered off, loss of data and unexpected errors may result.

Another kind of problem has been encountered when spooling to an LA18ØS. This problem concerns the manner in which the terminal device handles printed lines which are longer than the width of the terminal.

When a line is printed on the LA18ØS, the device prints characters until it gets to the physical right margin. At that point, the logic of the terminal inhibits further printing until a carriage return character moves the print head back from the margin. When a CR is encountered in such a situation, the LA18ØS also generates a line-feed, causing spacing to a new line. Since most print lines are terminated by a CR-LF sequence, however, the second LF will, again, cause spacing to a new line, leaving one line blank. Thus, printing a line which is longer than the width of the LA18ØS (i.e., longer than 132 characters) will cause a blank line on the printed output.

When performing normal print operations under RSTS/E, the user will not ordinarily encounter this problem. The RSTS/E Terminal Service ordinarily keeps track of the characters printed on the terminal and explicitly issues a CR-LF sequence to the terminal when the print head reaches the right margin (as defined by the WIDTH parameter in a TTYSET command). Thus, lines printed to that terminal which are longer than the width of the terminal result in printing of all characters, but on multiple lines. The only programs which will have trouble are those which need to keep track of vertical position on the page (for example, the line printer spooler) and, therefore, invoke the special MODE (Mode 4%) to inhibit the automatic CR-LF by terminal service. Files printed by such programs will have blank lines after each line which was longer than the terminal width. There is no practical software remedy for this problem.

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DISABLE OPERATOR QUEUEING TO OTHER USERS ACCOUNT - QUE FEATURE PATCH

PROBLEM:

Under BATCH, operators, as defined in OPSER's table of operators, can QUE files to be printed or jobs to be run for another user. Some installations may consider this too great a security risk.

SOLUTION:

The following patch disables the above mentioned feature. It does not affect the operator's ability to modify or kill other users' jobs once they are in the queue, as that poses no apparent threat to system security. It also does not affect a privileged user's ability to QUE files or jobs to another account. Refer to article Seq 14.6.3 F, which supplies a similar patch for QUMRUN.

PROCEDURE:

1. For purposes of this discussion, we will assume that the program to be patched is located in your privileged account on the public disk structure. If this is not the case, replace all program references with suitable text according to the requirements of your installation.

   The executable version of the program must be stored in the System Library Account ($). Note that QUE cannot reside in any other account.

   The procedure below assumes that BASIC-PLUS is your system default run-time system.

   If you are using CSPCOM or BASIC-PLUS-2, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   If you are using BASIC-PLUS-2, this program should be compiled under the BASIC2 run-time system.

2. This patch is contained in a patch file appearing in patch kit version "A" or later. If you do not have this distribution you can produce a command file by specifying a file for [logfile=] in the procedure below.

   To apply the patch manually, perform the following RSTS/E system commands.

```
RUN $CPATCH<cr>
<CPATCH's header line>

File to patch - QUE.BAS=QUE.BAS<cr>
#[logfile=]KB:/CS:11874<cr>
*H/2!/V<cr>
2!              PROGRAM         : QUE
*H/2Ø15<tab>/V<cr>
2Ø15    IF NOT PRIV% AND Y1%(Ø%,1%)<>SWAP%(P8%)+P9% THEN &
*G/NOT PRIV%/-9C/P8%<>1%/V<cr>
2Ø15    IF P8%<>1% AND Y1%(Ø%,1%)<>SWAP%(P8%)+P9% THEN &
*EX<cr>
Patch from KB:[P,PN]CPATCH.CMD complete
#^Z
File to patch - ^Z

Ready
```

3. Use this procedure if your system default run-time system is BASIC-PLUS; otherwise, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   To re-compile the program and re-enter it into the system library, type the following RSTS/E commands.

   ```
   OLD QUE<cr>

   Ready

   COMPILE $QUE<232><cr>

   Ready
   ```

4. The person making the changes to the program should now take whatever steps are necessary, according to installation guidelines, to save the new version of the program.

5. The source (.BAS) version of the program may now be removed from the public structure.

DISABLING 'JOB WITH DIFFERENT FORM NAME WAITING' MESSAGE
- QUMRUN FEATURE PATCH

PROBLEM:

QUMRUN will print a message on the OPERATOR SERVICES CONSOLE whenever one of the LP: spoolers has no JOBs which it may print but there are eligible JOBs waiting in the spooler's queue with a form name which is different from that of the spooler. It may be desirable to disable this feature.

SOLUTION:

The following patch will disable this feature.

PROCEDURE:

1. For purposes of this discussion, we will assume that the program to be patched is located in your privileged account on the public disk structure. If this is not the case, replace all program references with suitable text according to the requirements of your installation.

   We assume the executable version of the program will be stored in the System Library Account ($). If this is not the case, replace references to $ in step 3 below with the appropriate package or library account.

   The procedure below assumes that BASIC-PLUS is your system default run-time system.

   If you are using CSPCOM or BASIC-PLUS-2, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   If you are using BASIC-PLUS-2, this program should be compiled under the BASIC2 run-time system.

2. This patch is contained in a patch file appearing in patch kit version "A" or later. If you do not have this distribution you can produce a command file by specifying a file for [logfile=] in the procedure below.

   To apply the patch manually, perform the following RSTS/E system commands.

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Spooling and Operator Services Package
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```
RUN $CPATCH<cr>
<CPATCH's header line>

File to patch - QUMRUN.BAS=QUMRUN.BAS<cr>
#[logfile=]KB:/CS:57315<cr>
*H/2!/V<cr>
2!              PROGRAM         : QUMRUN.BAS
*H/138Ø<tab>/V<cr>
138Ø    DFORMS% = Ø% &
*G/IF Z4% = 2%/I/ AND Ø%/V<cr>
        \       IF Z4% = 2% AND Ø% THEN &
*EX<cr>
Patch from KB:[P,PN]CPATCH.CMD complete
#^Z
File to patch - ^Z

Ready
```

3. Use this procedure if your system default run-time system is BASIC-PLUS; otherwise, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   To re-compile the program and re-enter it into the system library, type the following RSTS/E commands.

   ```
   OLD QUMRUN<cr>

   Ready

   COMPILE $QUMRUN<cr>

   Ready
   ```

4. The person making the changes to the program should now take whatever steps are necessary, according to installation guidelines, to save the new version of the program.

5. The source (.BAS) version of the program may now be removed from the public structure.

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Spooling and Operator Services Package
QUMRUN

RESTRICTING THE ASSIGNMENT OF BA: - QUMRUN FEATURE PATCH

PROBLEM:

Some installations may find it desirable to limit the number of BATCH streams which can be used for jobs that are queued to BA:.

SOLUTION:

The patching procedure detailed below will cause QUMRUN to avoid assigning jobs to BA6: and BA7: unless the user has specified BA6: or BA7:.

PROCEDURE:

1. For purposes of this discussion, we will assume that the program to be patched is located in your privileged account on the public disk structure. If this is not the case, replace all program references with suitable text according to the requirements of your installation.

   We assume the executable version of the program will be stored in the System Library Account ($). If this is not the case, replace references to $ in step 3 below with the appropriate package or library account.

   The procedure below assumes that BASIC-PLUS is your system default run-time system.

   If you are using CSPCOM or BASIC-PLUS-2, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   If you are using BASIC-PLUS-2, this program should be compiled under the BASIC2 run-time system.

2. This patch is contained in a patch file appearing in patch kit version "A" or later. If you do not have this distribution you can produce a command file by specifying a file for [logfile=] in the procedure below.

   To apply the patch manually, perform the following RSTS/E system commands.

```
RUN $CPATCH<cr>
<CPATCH's header line>

File to patch - QUMRUN.BAS=QUMRUN.BAS<cr>
#[logfile=]KB:/CS:10597<cr>
*H/2!/V<cr>
2!              PROGRAM         : QUMRUN.BAS
*H/15070<tab>/V<cr>
15070   DEF* FNN% &
*G/DFORMS2%/V<cr>
        \       DFORMS2%=(FNC%(LEFT(O$(Z3%,2%),2%),Z0%(Z7%,9%)) AND &
*0AI<cr>
<tab>\<tab>DFORMS1%=0% IF O$(Z3%,0%)="BA" &<cr>
<tab><tab><tab>IF (Z0%(Z7%,1%) AND 255%)=255% IF O%(Z3%,1%)>5% &<cr>
<esc>*V<cr>
        \       DFORMS2%=(FNC%(LEFT(O$(Z3%,2%),2%),Z0%(Z7%,9%)) AND &
*EX<cr>
Patch from KB:[P,PN]CPATCH.CMD complete
#^Z
File to patch - ^Z

Ready
```

3. Use this procedure if your system default run-time system is BASIC-PLUS; otherwise, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   To re-compile the program and re-enter it into the system library, type the following RSTS/E commands.

   ```
   OLD QUMRUN<cr>

   Ready

   COMPILE $QUMRUN<cr>

   Ready
   ```

4. The person making the changes to the program should now take whatever steps are necessary, according to installation guidelines, to save the new version of the program.

5. The source (.BAS) version of the program may now be removed from the public structure.

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Spooling and Operator Services Package
QUMRUN 1 of 2

DISABLE OPERATOR QUEUEING TO OTHER USERS ACCOUNT - QUMRUN FEATURE PATCH

PROBLEM:

Under BATCH, operators, as defined in OPSER's table of operators, can QUE files to be printed or jobs to be run for another user. Some installations may consider this too great a security risk.

SOLUTION:

The following patch disables the above mentioned feature. It does not affect the operator's ability to modify or kill jobs once they are in the queue, as that poses no apparent threat to system security. It also does not affect a privileged user's ability to QUE files/jobs to another account. Refer to article Seq 14.4.1 F, which supplies a similar patch for QUE.

PROCEDURE:

1. For purposes of this discussion, we will assume that the program to be patched is located in your privileged account on the public disk structure. If this is not the case, replace all program references with suitable text according to the requirements of your installation.

   We assume the executable version of the program will be stored in the System Library Account ($). If this is not the case, replace references to $ in step 3 below with the appropriate package or library account.

   The procedure below assumes that BASIC-PLUS is your system default run-time system.

   If you are using CSPCOM or BASIC-PLUS-2, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   If you are using BASIC-PLUS-2, this program should be compiled under the BASIC2 run-time system.

2. This patch is contained in a patch file appearing in patch kit version "A" or later. If you do not have this distribution you can produce a command file by specifying a file for [logfile=] in the procedure below.

   To apply the patch manually, perform the following RSTS/E system commands.

```
RUN $CPATCH<cr>
<CPATCH's header line>

File to patch - QUMRUN.BAS=QUMRUN.BAS<cr>
#[logfile=]KB:/CS:16561<cr>
*H/2!/V<cr>
2!              PROGRAM         : QUMRUN.BAS
*H/10070<tab>/V<cr>
10070   IF (CVT$%(MID(M$,16%,2%))=0%) OR ONE.SHOT% THEN &
*3AV<cr>
                        E%=-1% UNLESS VALID.OP% &
*G/UNLESS /I/(P% AND 255%)=1% OR (/G/VALID.OP%/I/ AND T%<>6%)/V<cr>
                        E%=-1% UNLESS (P% AND 255%)=1% OR (VALID.OP% AND T%<>6%) &
*EX<cr>
Patch from KB:[P,PN]CPATCH.CMD complete
#^Z
File to patch - ^Z

Ready
```

3. Use this procedure if your system default run-time system is BASIC-PLUS; otherwise, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   To re-compile the program and re-enter it into the system library, type the following RSTS/E commands.

   ```
   OLD QUMRUN<cr>

   Ready

   COMPILE $QUMRUN<cr>

   Ready
   ```

4. The person making the changes to the program should now take whatever steps are necessary, according to installation guidelines, to save the new version of the program.

5. The source (.BAS) version of the program may now be removed from the public structure.

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SPLRUN 1 of 2

ELIMINATING EXTRA FORM FEEDS ON SPECIAL FORMS - SPLRUN FEATURE PATCH

PROBLEM:

At the beginning of each job, the spooler performs two top-of-form operations. The purpose of this action is to ensure that the new job really starts at the top of a new form, with at least one blank page between it and the last job. When using special paper forms, however, it is usually necessary to do a forms alignment. In this case, it may be annoying to have the extra top of form executed, because it wastes a page of the form.

SOLUTION:

The following patch inhibits the extra top-of-form operation at the start of a new job. Note that it inhibits the action not only after a forms-alignment process, but also at the beginning of any job. If this patch is used, it is essential that the paper be very carefully aligned in the printer. If the paper is misaligned, one job will begin on the same physical page as the end of the previous job.

PROCEDURE:

1. For purposes of this discussion, we will assume that the program to be patched is located in your privileged account on the public disk structure. If this is not the case, replace all program references with suitable text according to the requirements of your installation.

   We assume the executable version of the program will be stored in the System Library Account ($). If this is not the case, replace references to $ in step 3 below with the appropriate package or library account.

   The procedure below assumes that BASIC-PLUS is your system default run-time system.

   If you are using CSPCOM or BASIC-PLUS-2, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   If you are using BASIC-PLUS-2, this program should be compiled under the BASIC2 run-time system.

2. This patch is contained in a patch file appearing in patch kit version "A" or later. If you do not have this distribution you can produce a command file by specifying a file for [logfile=] in the procedure below.

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SPLRUN 2 of 2

To apply the patch manually, perform the following RSTS/E system commands.

```
RUN $CPATCH<cr>
<CPATCH's header line>

File to patch - SPLRUN.BAS=SPLRUN.BAS<cr>
#[logfile=]KB:/CS:32856<cr>
*H/2!/V<cr>
2!              PROGRAM         : SPLRUN.BAS
*H/3200/V<cr>
3200    GOSUB 14500 IF PRTLNE%<>1% &
*AV<cr>
        \ NXTLNE%=2% \ RECLEN%=0% \ GOSUB 14800 &
*2KV<cr>
        \ GO SUB 21000 &
*EX<cr>
Patch from KB:[P,PN]CPATCH.CMD complete
#^Z
File to patch - ^Z

Ready
```

3. Use this procedure if your system default run-time system is BASIC-PLUS; otherwise, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   To re-compile the program and re-enter it into the system library, type the following RSTS/E commands.

   ```
   OLD SPLRUN<cr>

   Ready

   COMPILE $SPLRUN<cr>

   Ready
   ```

4. The person making the changes to the program should now take whatever steps are necessary, according to installation guidelines, to save the new version of the program.

5. The source (.BAS) version of the program may now be removed from the public structure.

$EOJ DOES NOT RESET ERROR CONDITION - BATRUN FEATURE PATCH

PROBLEM:

The $EOJ command does not reset the "running in error" flag in BATRUN. Thus, exceeding the ERROR level prevents succeeding $JOB commands from being processed. Without this feature patch, a batch control file containing multiple $JOB and $EOJ commands will terminate immediately once an error which exceeds the error level is detected. With this patch installed, all succeeding $JOB commands within the control file will be processed, regardless of whether any previous job within the control file failed to complete properly due to an exceeded error level condition.

SOLUTION:

The following patch will allow each $EOJ command to reset the ERROR flag so that processing can continue with the next $JOB command.

PROCEDURE:

1. For purposes of this discussion, we will assume that the program to be patched is located in your privileged account on the public disk structure. If this is not the case, replace all program references with suitable text according to the requirements of your installation.

   We assume the executable version of the program will be stored in the System Library Account ($). If this is not the case, replace references to $ in step 3 below with the appropriate package or library account.

   The procedure below assumes that BASIC-PLUS is your system default run-time system.

   If you are using CSPCOM or BASIC-PLUS-2, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   If you are using BASIC-PLUS-2, this program should be compiled under the BASIC2 run-time system.

2. This patch is contained in a patch file appearing in patch kit version "A" or later. If you do not have this distribution you can produce a command file by specifying a file for [logfile=] in the procedure below.

   To apply the patch manually, perform the following RSTS/E system commands.

```
RUN $CPATCH<cr>
<CPATCH's header line>

File to patch - BATRUN.BAS=BATRUN.BAS<cr>
#[logfile=]KB:/CS:53265<cr>
*H/2!/V<cr>
2!              PROGRAM         : BATRUN.BAS<cr>
*H/4ØØ<tab>/V<cr>
4ØØ     ! &
*G/!<tab>E8%/V<cr>
!       E8%             RUNNING IN LOCAL ERROR STATE FLAG. &
*ØAKV<cr>
!       E9%             RUNNING IN ERROR STATE FLAG. &
*H/11Ø3Ø<tab>/V<cr>
11Ø3Ø   I%=I%+2% IF CVT$%(MID(OUTPUT$,I%+1%,2%))=3328% &
*G/<tab>\ E9%,/4DG/-1%/-3C/Ø%/V<cr>
        \ E9%,ZØ%(J9%,5Ø%)=FNEØ%("ERROR LEVEL EXCEEDED",Ø%) IF &
*H/13Ø1Ø<tab>/V<cr>
13Ø1Ø   E8%=Ø% &
*G/E8%=Ø%/-6C/E9%=Ø%/V<cr>
13Ø1Ø   E9%=Ø% &
*H/1713Ø<tab>/V<cr>
1713Ø   GOSUB 11ØØØ &
*G/FNW%=-1% IF E8%/-3C/E9%/V<cr>
        \ FNW%=-1% IF E9% &
*EX<cr>
Patch from KB:[P,PN]CPATCH.CMD complete
#^Z
File to patch - ^Z

Ready
```

3. Use this procedure if your system default run-time system is BASIC-PLUS; otherwise, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   To re-compile the program and re-enter it into the system library, type the following RSTS/E commands.

```
OLD BATRUN<cr>

Ready

COMPILE $BATRUN<cr>

Ready
```

4. The person making the changes to the program should now take whatever steps are necessary, according to installation guidelines, to save the new version of the program.

5. The source (.BAS) version of the program may now be removed from the public structure.

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USING SAVE/RESTORE ON A TWO-DISK SYSTEM

This article describes the procedure for using SAVE/RESTORE to backup the disks on a system which has only two disk drives and no magnetic tape drives. On such a system, you can back up the system disk by shutting down the RSTS/E system and using the SAVRES option of INIT. It is impossible, however, to perform such a backup of the non-system disk, since the procedure would require that the system disk, the disk being backed up, and the SAVE volume all be mounted simultaneously, and hence would require three or more disk drives, or a magnetic tape drive.

The solution presented in this article is to place a copy of the INIT.SYS system initialization code on the non-system disk, allowing it to run as the "system" disk for off-line SAVE/RESTORE operations. This procedure has one drawback: the INIT.SYS initialization code requires about 450 blocks on the non-system disk (about 10% of an RK05). If you have small disks, such as RK05's or RL01's, you may wish to make the dangerous choice of not backing up your non-system disk(s) and thereby risk loss of data from hardware or software failure, or you could consider expanding your hardware to include another disk drive or magnetic tape unit. For disks larger than RL01's, the overhead of having the INIT.SYS initialization code on each non-system disk is usually small enough to be tolerable, although you must decide based on your system's needs.

You should put the INIT.SYS initialization code ([0,1]INIT.SYS) on the non-system disk immediately after initializing the disk with DSKINT. This ensures that there is enough space for INIT.SYS. After generating the monitor, run-time system, and system library, perform the procedures outlined below. In the examples below, the notation "SY0:" denotes the disk drive on which your normal system disk is mounted, and "xxn:" denotes the other disk drive, which is used for various purposes in the procedure.

1. Ensure that HOOK.SAV is on your system disk in account [1,2]. This will be the case if your SYSGEN target system was SY:. If this file does not already exist in [1,2], mount your distribution system disk (with the /RONLY switch) on xxn: and use the following commands to copy HOOK.SAV to your system disk (user responses are underlined):

   RUN $PIP.SAV<cr>
   *SY0:$*.*=xxn:$HOOK.SAV<cr>
   *^Z

   Ready

2. If you have not yet initialized the non-system disk that you plan to use, shut down the system, mount the disk on xxn:, and use DSKINT to initialize the disk. You may then start timesharing.

3. Issue the commands given below:

```
RUN $PIP.SAV<cr>
*xxn:[Ø,1]*.*=[Ø,1]INIT.SYS<cr>
*^Z

Ready

RUN $HOOK.SAV<cr>
*xxn:[Ø,1]INIT.SYS<cr>
Hook complete
*^Z

Ready
```

4. Your non-system disk is now ready to use. You may dismount it and mount it as a public disk if you desire. When you wish to back up that disk, you must shut down your system, bootstrap the non-system disk, and mount a scratch disk in place of your normal system disk. You may now use the SAVRES option of INIT to SAVE or IMAGE-copy your non-system disk to the backup disk.

NOTE

If you ever patch [Ø,1]INIT.SYS on the system disk, be sure to patch that file on all disks which have [Ø,1]INIT.SYS.

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Seq 16.1.2 N

USING BACKUP ON A TWO-DISK SYSTEM

This article describes the procedure for using the RSTS/E V7.2 BACKUP package to back up the disks on a system which has only two disk drives and no magnetic tape drive. On such a system, you can back up the system disk normally by dismounting the non-system disk. The only requirement is that the BACKUP package exist entirely on the system disk. However, it is impossible to take a normal backup of the non-system disk. Such a procedure would require that the system disk, the disk being backed up, and the backup volume all be mounted simultaneously, and hence would require three or more disk drives.

The solution presented in this article is to place a minimal system on the other disk, allowing it to run as the system disk during the backup. You must follow this procedure for every RSTS/E file structured disk pack, public or private, which you ever mount along with the system disk and which you want to be able to back up. This procedure has one major drawback: the minimal system requires a large number of blocks on the non-system disk (approximately 1400). If you have RK05 or RL01 disks, you should not use this procedure. Instead, use SAVE/RESTORE to preserve these disks. If you have RK06 disks, carefully consider the consequences of using a large part of your non-system disk capacity (almost 6% for RK06) for backup. If you do not wish to use such a large part of your non-system disk capacity for backup, you should use SAVE/RESTORE instead (see article Seq 16.1.1 N). The only disadvantage with SAVE/RESTORE is that you cannot save or restore individual files, but must copy an entire disk. For disks larger than RK06s, the overhead of having a small system on each nonsystem disk is usually small enough to be tolerable, although you must decide based upon your system's needs.

If you decide to build a small system on each non-system disk, you may use your standard monitor SIL, the SYSGEN.SIL provided by Digital, or another SIL generated especially for the purpose. The last choice allows you to build a small, special-purpose monitor for use only during backup and restore, thereby minimizing the disk space required. If you generate a special monitor, it should support at least 2 jobs, your two disks, one terminal (KB0:), have nothing resident, no options, and a minimal number of small buffers. (Note that such a system may cause BACKUP to run slowly. If you can afford the disk space and wish to optimize the system for speed, more options and/or small buffers should be included.) Remember to install any applicable patches to the SIL.

You should place the minimal system for backup on the non-system disk immediately after initializing the disk with DSKINT. This placement ensures that contiguous space is available for the required files. After generating the monitor, run-time system, and system library (including the BACKUP package), perform the procedures outlined below. In the examples, the

notation "SYØ:" denotes the disk drive on which your normal system disk is mounted, and "xxn:" denotes the other disk drive on the system, which is used for various purposes in the procedure. Note that the procedure below assumes that your primary run-time system is BASIC-PLUS (e.g., the Backup Package, SHUTUP, and INIT are .BAC files). If these programs are in .TSK form on your system, be sure to substitute the proper file type where appropriate.

1. Ensure that the monitor SIL you want to use for your small backup system is on the system disk. Generate it or copy it if necessary.

2. If you have not yet initialized the non-system disk you plan to use, shut down the system, mount the disk on xxn:, and use DSKINT to initialize the disk. You may then start timesharing.

3. Issue the commands given below:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#MOUNT xxn:packid/PRIVATE<cr>
#UNLOCK xxn:<cr>
#^Z

Ready

RUN $PIP.SAV<cr>
*xxn:[Ø,1]*.*/MO:16=[Ø,1]bbbbbb.RTS,[Ø,1]ERR.ERR<cr>
*xxn:[Ø,1]*.*=[Ø,1]INIT.SYS,[Ø,1]ssssss.SIL<cr>
     where ssssss is the SIL you wish to use on your backup disk, and
     bbbbbb is the run-time system under which SHUTUP, UTILTY, and the
     BACKUP package were compiled
*xxn:$*.*/W=SYØ:$BAC???.BAC,$BACKUP.PRM,$BACKUP.HLP,$SHUTUP.BAC,$UTILTY.BAC<cr>
     to copy SHUTUP, UTILTY, and the BACKUP package to the non-system disk
     (use a file type of .TSK if appropriate)
*xxn:[Ø,1]SWAP.SYS/MO:16/SI:128=NL:
     (if using BASIC-PLUS-2 or CSPCOM/RSX, use /SI:224 rather than /SI:128)
*^Z

Ready

RUN $HOOK.SAV<cr>
*xxn:[Ø,1]INIT.SYS<cr>
Hook complete
*^Z

Ready
```

4. Shut down your system, and use the BOOT option of the initialization code to bootstrap the disk xxn:. Use INSTALL to install the ssssss SIL, which you copied in step 3. Use DEFAULT to set defaults for the backup system. Specify 16K (28K for BASIC-PLUS-2 or RSX) as the SWAP MAX, and bbbbbb as the default run-time system.

Your non-system disk is now ready to use. You may dismount it and mount it as a public disk if you desire. When you wish to back up that disk, you must shut down your system and bootstrap the non-system disk. Use START to start timesharing from the small system on the non-system disk. Since INIT.BAC (or INIT.TSK) was not moved to the non-system disk, the messages:

```
?Can't find file or account
?Program lost-sorry

Ready
```

will be printed. You may now do your backup. (Alternatively, you may want to move INIT.BAC (or INIT.TSK) to your non-system disk at the time you moved the BACKUP package. In this case, you can include a control file to bring up a limited RSTS/E system and include the backup commands in the control file.)

Physically remove your normal system disk from SYØ: and mount a backup volume in its place. Then use the BACKUP package to preserve the files on the disk. Use a similar procedure to restore any files to the disk. If you lose the entire file structure of the disk, including the system and/or the BACKUP package, you can restore the disk using a system recovery medium as described in article Seq 16.1.3 N.

NOTE

If you ever patch or replace on the system disk any of the BACKUP or system modules that you copied in the above procedure, you must do so while the non-system disk is not mounted as a public disk. After replacing the module(s), mount the non-system disk with the /PRIVATE switch and use PIP (with the /UP switch, update in place, if the output file is INIT.SYS, the monitor SIL, or the default run-time system) to change the file on the non-system disk. Repeat for each disk used on drive xxn: that contains a minimal system for backup purposes. Also, if any patches are installed to the RSTS/E monitor or the INIT.SYS code, be sure to install them on all disks which contain copies of a RSTS/E system.

CREATING A SYSTEM DISK RECOVERY MEDIUM

Regular use of the RSTS/E BACKUP package provides protection against loss of files if the system crashes, if disk errors occur, or if important files are accidentally destroyed. However, the one situation from which BACKUP cannot recover is when the system disk or one or more of the monitor files is destroyed and the system cannot be started at all. One option in such an event is to use the RSTS/E distribution kit to regenerate the system, install all patches, build the complete system library, and then restore the remaining files on the system disk from the most recent backup. This is time consuming and error prone. Recovery is much simpler if you have a "recovery medium".

One means of creating a system disk recovery medium is SAVE/RESTORE. SAVE/RESTORE runs much more quickly than BACKUP for saving an entire disk and generates a bootable recovery medium. SAVE/RESTORE, however, cannot perform selective backups or back up the system disk while the system is running.

DIGITAL recommends that you use a procedure, such as the one outlined below, to regularly protect your system against the catastrophic loss of critical files that might result from hardware or software failure.

1. Use SAVE/RESTORE periodically (perhaps weekly) to back up all of your disks. This will provide you with a bootable medium that can be used to restore your entire disk(s) in the event of catastrophic failure.

2. Use BACKUP to back up those files which have changed since SAVE/RESTORE was last run. This will allow you to recover files that have changed recently without shutting down your system disk to back them up.

The remainder of this article tells you how to create a system recovery medium (disk or tape) if for some reason you choose not to use SAVE/RESTORE on your system. The resulting recovery medium will contain your fully patched monitor, BASIC-PLUS (or appropriate) run-time system, and enough of the BACKUP package to restore the rest of the system disk file structure. The recovery medium is bootable in a manner similar to the distribution medium and any intermediate tape (or disk) which you may have created during SYSGEN.

In order to recover from destruction of the system disk, you will need the recovery medium and a recent backup of your system disk. Note that this backup must include an up-to-date version of the file [1,2]ACCT.SYS so that the recovery can enter all accounts properly. If you ever change your monitor, or install any patches in any of the files placed on the recovery medium, you should rebuild that medium.

To build the recovery medium, you must have ADDed the RT11 run-time system to RSTS/E. You must also have the programs PIP.SAV and HOOK.SAV in account [1,2].

Follow the instructions in the following sections, depending on whether you wish to build a recovery disk or magnetic tape. In the examples, the file name RSTS.SIL is used as the monitor SIL. You should substitute the actual file name for your system.

Building a recovery disk

Using PIP, create the file RECOVR.CMD in [1,2] containing the following text:

("[x,y]" is the account containing the BACKUP package)

("rrrrrr" is the run-time system under which the Backup Package is compiled)

("ccc" is the file type of the compiled programs)

```
RUN $PIP.SAV<cr>
*$RECOVR.CMD=KB:<cr>
SY0:[x,y]*.*<232>/RTS:rrrrrr=IN:[x,y]BAC???.ccc<cr>
SY0:[x,y]*.*=IN:[x,y]BACKUP.PRM<cr>
SY0:[x,y]BACENT.ccc<104>/RE<cr>
^Z
*^Z
```

Mount a formatted and initialized disk on a free disk drive. (The text below uses xxn: as the device designator and "packid" as the pack identification for the recovery pack.) If necessary, shut down your system and use DSKINT to format a pack, or use the program DSKINT.BAC to re-initialize an already formatted scratch pack.

Using UTILTY or UMOUNT, logically mount xxn:.

Follow the procedure below to build the recovery disk (user responses are underlined):

```
RUN $REACT<cr>
<REACT's header line>
System Account Manager
Function? E<cr>
Proj,Prog? x,y<cr>
Disk:Password? xxn:pppppp<cr>
Quota? <cr>
Cluster Size? <cr>
Account Name? nnnnnn<cr>
Proj,Prog? 1,2<cr>
Disk:Password? xxn:pppppp<cr>
Quota? <cr>
Cluster Size? <cr>
Account Name? nnnnnn<cr>
Proj,Prog? ^Z

Ready
```

```
RUN $PIP.SAV<cr>
*xxn:[0,1]*.*/MO:16=SY:[0,1]RT11.RTS<cr>
*xxn:[0,1]*.*/MO:16=SY:[0,1]rrrrrr.RTS<cr>
*xxn:[0,1]*.*/MO:16=SY:[0,1]ERR.ERR<cr>
*xxn:[0,1]*.*=SY:[0,1]INIT.SYS,[0,1]RSTS.SIL<cr>
*xxn:$*.*=SY:$PIP.SAV,$UTILTY.SAV,$RECOVR.CMD<cr>
*xxn:$*.*=SY:$REACT.ccc,$ACCT.SYS<cr>
*xxn:[x,y]*.*=SY:[x,y]BAC???.ccc<cr>
*xxn:[x,y]*.*=SY:[x,y]BACKUP.PRM<cr>
*xxn:$PIP.SAV<232>/RE<cr>
*^Z

Ready

RUN $HOOK.SAV<cr>
*xxn:[0,1]INIT.SYS<cr>
Hook complete
*^Z

Ready
```

Dismount the recovery disk and save it. Also dismount the distribution medium.

To recover from the destruction of the system disk or one or more of the system files, you need the recovery disk and a recent BACKUP.

Mount the recovery disk on one disk drive and bootstrap it. The RSTS/E initialization code runs and prints a header and the OPTION: prompt.

On another disk drive, mount the disk on which to restore the system disk. Using the DSKINT option, recreate your system disk with the same parameters that you used at system generation time.

Then use the COPY option to move your monitor files to the new system disk. Use the /A switch to copy all relevant files (see the RSTS/E System Generation Manual). As part of the COPY option, INIT bootstraps that disk. If necessary, use the HARDWR option to change controller characteristics.

Then INSTALL your monitor SIL and use REFRESH to create the required system files on your system disk. Use DEFAULT to change the system default run-time system to RT11.

START the system on your new system disk and continue as follows:

?Can't find file or account

```
.ASSIGN xxn:IN
.MOUNT IN:packid/RO<cr>
.R IN:UTILTY<cr>
*ADD rrrrrr<cr>
*^z

.R IN:$PIP.SAV<cr>
*$*.*=IN:$ACCT.SYS<cr>
*^Z
```

Now run REACT to create all the accounts on the new system disk that were on the old system disk. Ignore the errors generated when REACT attempts to enter an account that already exists, either on SY: or on another disk.

```
.R IN:REACT<cr>
<REACT's header line>
System Account Manager
Function? S<cr>
    .
    .
    .
Function? ^Z

.R IN:$PIP.SAV<cr>
*@IN:RECOVR.CMD<cr>
*^Z
.R IN:UTILTY<cr>
*REMOVE rrrrrr<cr>
*DISMOUNT IN:<cr>
*SHUTUP<cr>

Option:
```

Dismount the recovery disk from drive xxn:. Use DEFAULT to change the system default run-time system back to rrrrrr. START the system. Your new system disk now has enough of the BACKUP package to restore the entire disk from a recent BACKUP. Do this now, specifying that all files be superseded. Your system disk is now ready to use.

Building a recovery magnetic tape

Using PIP, create the file RECOVR.CMD in [1,2] containing the following text:

("[x,y]" is the account containing the BACKUP package)

("rrrrrr" is the run-time system under which the Backup Package is compiled)

("ccc" is the file type of the compiled programs)

```
RUN $PIP.SAV<cr>
*$RECOVR.CMD=KB:<cr>
SY0:[x,y]*.*<232>/RTS:rrrrrr=IN:[x,y]BAC???.ccc<cr>
SY0:[x,y]*.*=IN:[x,y]BACKUP.PRM<cr>
SY0:[x,y]BACENT.ccc<104>/RE<cr>
^Z
*^Z
```

Mount a magnetic tape on a free drive (referred to below as xxn:). Follow the procedure below to build the recovery tape (user responses are underlined):

```
ASSIGN xxn:.DOS<cr>

Ready

RUN $PIP.SAV<cr>
*xxn:/ZE<cr>
Really zero xxn:/density:ddd/parity:ppp? YES<cr>
*^Z

Ready
```

In the following, "ddd" represents the tape unit density.

```
RUN $HOOK.SAV<cr>
*xxn:[0,1]INIT.SYS/D:ddd,SY:[0,1]INIT.SYS<cr>
Hook complete
*^Z

Ready
```

```
RUN $PIP.SAV<cr>
*xxn:[Ø,1]*.*=[Ø,1]RT11.RTS<cr>
*xxn:[Ø,1]*.*=[Ø,1]rrrrrr.RTS<cr>
*xxn:[Ø,1]*.*=[Ø,1]ERR.ERR<cr>
*xxn:[Ø,1]=SY:[Ø,1]RSTS.SIL<cr>
*xxn:$*.*=SY:$PIP.SAV,$UTILTY.SAV,$RECOVR.CMD<cr>
*xxn:$*.*=$REACT.ccc,$ACCT.SYS<cr>
*xxn:[x,y]*.*=SY:[x,y]BAC???.ccc<cr>
*xxn:[x,y]*.*=SY:[x,y]BACKUP.PRM<cr>
#^Z
```

Ready

Dismount the tape and save it.

To recover from the destruction of the system disk or one or more of the system files, you need the recovery tape and a recent BACKUP.

Mount the recovery tape on a tape drive (referred to below as xxn:) and bootstrap it. The RSTS/E initialization code runs and prints a header and the OPTION: prompt.

Mount the disk on which to restore the system disk.

Using the DSKINT option, recreate your system disk with the same parameters that you used at system generation time.

Then use the COPY option to move your monitor files to the new system disk. Use the /A switch to copy all files with the appropriate file types (see the RSTS/E System Generation Manual). As part of the COPY option, INIT bootstraps that disk. If necessary, use the HARDWR option to change controller characteristics.

Then INSTALL your monitor SIL and use REFRESH to create the required system files on your system disk. Use DEFAULT to change the default run-time system to RT11.

START the system on your new system disk and continue as follows:

```
?Can't find file or account
.ASSIGN xxn:.DOS<cr>
.ASSIGN xxn:IN<cr>

.R IN:PIP<cr>
*$*.*<232>=IN:$PIP.SAV/NO<cr>
*$*.*<104>=IN:$UTILTY.SAV/NO<cr>
*$*.*=IN:$RECOVR.CMD/NO<cr>
*$*.*<124>/RTS:rrrrrr=IN:$REACT.ccc/NO<cr>
*$*.*=IN:$ACCT.SYS/NO<cr>
*^Z

.R UTILTY.SAV<cr>
#ADD rrrrrr<cr>
#^Z

.R $REACT<cr>
<REACT's header line>
System Account Manager
Function? S<cr>
    .
    .
    .
Function? ^Z

.R $PIP<cr>
*@$RECOVR.CMD<cr>
*$RECOVR.CMD/DE<cr>
*^Z
```

Dismount the recovery tape from drive xxn:.

Your new system disk now has enough of the BACKUP package to restore the entire disk from a recent BACKUP.

Do this now, specifying that all files be superseded.

Your system disk is now ready to use.

Notes on systems with multiple public disks

During the recovery procedure, after starting the system on your new system disk, you must physically mount and write-enable the other disks in your system's public structure. Type the command

```
MOUNT xxn:packid
```

for each non-system public disk, replacing xxn: with the disk name and unit, and packid with the pack ID for that disk. This procedure ensures that all required disk space is available for the recovery.

Take the following precautions when creating a recovery disk:

1. If you can mount the recovery disk on an unused drive or in place of a private disk, do so. This leaves the full public disk structure mounted.

2. If you cannot mount the recovery disk in addition to the full public structure, you must dismount a non-system public disk. This disk must not contain any of the files required for the creation of the recovery disk or the actual recovery procedure. This disk can be dismounted while creating the recovery disk, and need not be mounted until a recovery is complete. If necessary, use PIP to copy files from this disk to another disk on the public structure:

   ```
   RUN $PIP.SAV<cr>
   *out:*.*=in:file.typ<cr>
   *^Z
   ```

   In these commands, "in:" is the name and unit number of the disk to be cleared of files, "out:" is the name and unit number of any other public disk, and file.typ is a file to be moved.

   NOTE

   You must not specify wildcard filenames for input when transferring files between public disks in the same account.

   Repeat these commands to PIP to copy each file on in: necessary for building the recovery disk or for the recovery procedure itself.

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RSTS/E V7.2 PATCH KIT "A" PATCHING PROCEDURE

NOTE

This article appears on Patch Kit "A" as $PATCHA.DOC. The Pack ID for disk media is "PATCHA".

I. INTRODUCTION

Patch Kit "A" contains "Mandatory" and optional "Feature" patches published in the RSTS/E V7.2 Maintenance Notebook and RSTS/E V7.2 Software Dispatch Review.

Patches to be applied during System Generation:

1. There are mandatory patches for the monitor (in $MONITR.CMD).

2. There are mandatory patches for DECnet/E support (in $DECNTC.CMD).

3. There are mandatory patches for RJ278Ø support (in $RJ278Ø.CMD).

Other patches (requiring the use of PATCPY):

1. There are mandatory patches to the standard CUSP library. These may be applied when installing BUILD.CTL and specifying BUILD/PATCH.

2. The Patch Kit includes all patches published for optional layered software that appear in the RSTS/E Software Dispatch Review. Please be sure to read the sections which follow prior to installing optional layered software.

3. The Patch Kit contains all feature patches included in the RSTS/E V7.2 Maintenance Notebook.

Note that there are currently no articles corresponding to the Mandatory RSTS/E patches noted above. The articles will be published in an upcoming issue of the V7.2 RSTS/E Software Dispatch.

II. PATCH COMMAND FILES FOR MANDATORY PATCHES

The following is a list of all patch command files containing "Mandatory" patches.

Command File	Component to patch		Comments
Using ONLPAT:			
MONITR.CMD	Monitor patches		Has Patches
INIT.CMD	Initialization code		
BASIC.CMD	BASIC-PLUS Run-Time System		
RSXRTS.CMD	RSX Emulator		
DECNTC.CMD	DECnet/E monitor patches		Has Patches
RJ278Ø.CMD	RSTS/E 278Ø Device Driver		Has Patches
Using PBUILD:			
EXEC.CMD	All of the above except RSX		
RMS.CMD	RMS-11 V1.8		1,7
UT278Ø.CMD	RSTS/E 278Ø library		1,2
DECNET.CMD	DECnet/E V2.Ø Utilities		
BP2EIS.CMD	BASIC-PLUS-2 V1.6 (EIS)		6
BP2FIS.CMD	BASIC-PLUS-2 V1.6 (FIS)		6
BP2FPU.CMD	BASIC-PLUS-2 V1.6 (FPU)		6
COBOL.V41	COBOL V4.1		1
DECAL.CMD	DECAL V2		1,2,5
DMSDBL.CMD	DMS DIBOL-11/DECFORM V4.5	See Note	8
RMSDBL.CMD	RMS DIBOL-11/DECFORM V4.5	See Note	8
DMS5ØØ.CMD	DMS-5ØØ VØ2 (complete)		1,2,3
DMSDMS.CMD	DMS-5ØØ VØ2 (ISAM/RAM only)		1,2,3
DMSIAM.CMD	DMS-5ØØ VØ2		1,2,3
DMSDSR.CMD	DMS-5ØØ VØ2		1,2,3
DTR.V24	DATATRIEVE V2.4		1
FORTRA.V25	FORTRAN IV V2.5		4
F77.V4Ø	FORTRAN-77 V4		
INDENT.CMD	INDENT V1.1		

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Notation:

1. Requires distribution kit for that component - answer the PBUILD "Read files to patch from" question with "dev:", where dev: is the device on which the appropriate distribution kit is mounted, unless additional instructions are listed below.

2. During patching, you must be running under the BASIC-PLUS run-time system.

3. Prior to the installation of DMS-500 V02 on RSTS/E V7.2, you must be running under the BASIC-PLUS run-time system. If you are not, you must first switch run-time systems. For example,

   RUN $SWITCH<cr>
   Keyboard monitor to switch to? BASIC<cr>

   Various error messages may appear during the running of the demonstration program as part of the installation procedure. These problems will be corrected by the auto-patch kit.

   Note that optional patch file PA2401.CMD, included in the Patch Kit, will repeat just the demonstration portion of the installation procedure.

   The BASIC-PLUS feature patch which causes BASIC-PLUS to default to EXTEND mode must not be installed to the BASIC-PLUS run-time system while DMS-500 V02 is building or being patched. The build procedure for DMS-500 V02 will fail if this patch is installed.

4. Be sure to refer to Appendix D of the RSTS/E FORTRAN IV Installation Guide (AA-C762C-TC) before attempting to apply FORTRAN IV V2.5 patches. As noted in that document, all files to be patched must reside in the account under which you are running. Therefore, the "Read files to patch from" question should be answered with "[p,pn]", where [p,pn] is the current user account.

   Also note that the first "patch" or file prints procedures to be performed after the installation of the patches.

5. For DECAL V2 patching, answer the "Read files to patch from" question with "dev:[250,1]", where dev: is the device on which the DECAL V2 distribution kit is mounted. This is necessary because the required source files reside in that account. DECAL.CMD determines which account patched sources are to be compiled on by asking the question:

   Locate DECAL Package on <SY:[1,2]> ? [p,pn]

6. If you use the BUILD/PATCH option to apply patches, several questions will be asked BEFORE BASBLD IS ACTUALLY RUN so that alternate names and accounts may be determined. These questions are very similar to those asked in the BASIC-PLUS-2 installation procedure. Be sure to specify the same answer for corresponding questions asked by the autopatch procedure and the installation procedure (BASBLD).

7. This patch kit contains several RMSLIB articles published in the RSTS/E V7.2 Software Dispatch Review. As described in article Seq 48.1.4 N, the patch procedure now includes a method for patching the resident library(ies) as well. The procedure:

   a. Applies initial patches to RMSLIB.

   b. Rebuilds the resident libraries, if requested.

      If the procedure was invoked using the BUILD program, the resident libraries are automatically rebuilt.

      If the procedure was invoked using the PBUILD program, you will be prompted to determine whether or not you wish to rebuild the libraries. Be sure to use this method if you do NOT want to re-build the libraries for some reason.

   c. Applies ONLPAT patches to the resident libraries.

   d. Applies final patches to RMSLIB.

   e. Applies final patches to RMSUTL and RMSIFL.

   f. Rebuilds the RMS utilities.

8. As noted in articles Sequence numbers 26.59.1N and 26.18.1N, two DIBOL Check Digit Modules which were omitted from the DIBOL distribution kit are included on the Patch Kit. These modules will automatically be included if you install DIBOL using the BUILD/PATCH option, or run PBUILD.

   Note that there are currently no mandatory patches for DIBOL V4.5. The patch kit will install only the Check Digit Modules.

NOTES ON ATPK

INTRODUCTION

ATPK (pronounced "at-pee-kay") is included in RSTS/E V7.2 for use as a part of the BUILD procedure. It can also be used, however, as a general purpose indirect command file processor. ATPK can control a job by use of a pseudo-keyboard (PK) and run programs from a script previously defined in a command file. As an indirect command file processor, ATPK runs at the user's keyboard and reports the job dialogue there as it happens. ATPK can also be used as a simple batch processor, running detached and reporting the job's dialogue in a log file.

STARTING UP ATPK

ATPK may be invoked in one of the following ways:

```
RUN $ATPK
*<startup command>
```

or, if the CCL is installed,

```
ATPK <startup command>

        or
ATPK
*<startup command>
```

ATPK will accept either of the CCL commands "ATPK" or "@" if they have been installed by the system manager.

<startup command> is of the form:

```
[<log file> =] <command file> [/<switches>]
```

Valid switches are:

/DET	Run ATPK detached (available only to privileged users). Note that if a log file is not specified, output will be to the keyboard whether or not ATPK detaches. At the end of a successful detached run, ATPK will kill itself.
/DEL	Delete command file on successful completion (used by BUILD).

/RTS:<rts> Start the controlled job under the keyboard monitor <rts>. If <rts> is not a keyboard monitor RTS, no error will be reported and the new job will start up under the system default RTS. If this switch is not specified, the job will start under the user's current job default RTS.

/LOG If the user is privileged, the controlled job and any jobs started with the $LOGIN command will be created regardless of whether logins have been disabled.

/CHA[IN]: <program> [;<line>] [=\<core common>\]

On successful completion, chain to <program> at line number <line>, if specified, with <core common> loaded in core common, if specified. Any character not contained in <core common> may be used in place of the backslashes to delimit the <core common> argument. This switch allows BUILD to patch itself or ATPK and then chain back to itself for the rest of the build.

The dialogue of the controlled job will normally be printed on the terminal. If a log file is specified, the dialogue will also be printed there. If both a log file and the /DET switch are specified, the dialogue will be printed only in the log file.

The default file types for the command and log files are, respectively, .CMD and .LOG.

PROCESSING THE COMMAND FILE

ATPK usually sends each line of the control file "as is" to the PK when the job at the PK enters a program or monitor keyboard wait stall. Four characters in the command file are handled specially, however:

$ as first character on line, indicates an ATPK command.
! as first character on line, indicates a comment.
^ indicates a control character.
_ indicates that the next character is not a special character. (i.e., an underscore character quotes the following character.)

ATPK commands:

Any command file line beginning with a dollar sign ("$") will be considered an ATPK command. Valid ATPK commands are:

$DISABLE LOG	Turn dialogue reporting to the log file (and/or keyboard) off.
$ENABLE LOG	Resume printing the controlled job's dialogue in the log file (and/or at the keyboard).
$ALLOW NO ERRORS	Abort if any (fatal or warning) errors are encountered by the controlled job.
$ALLOW WARNING ERRORS	Abort if a fatal error is encountered by the controlled job, but allow warning errors.
$ALLOW FATAL ERRORS	Do not abort if any errors are encountered by the controlled job (default setting).
$WAIT	Accept a line of input from the keyboard and send it as input to the controlled job. If a program is running at the controlled job after this line has been processed, continue accepting command lines from the keyboard until the program has stopped running and the controlled job is in a keyboard monitor wait (i.e., SYSTAT would show the job in a "^C" state). After this command has been processed, input will resume from the command file.
$@<command file>	Switch input command stream to <command file>. ATPK will abort if the command file is not found. No nesting of these indirect command files is allowed; ATPK will abort if it finds the "$@" command in the <command file>.
$DETACH	Causes ATPK to detach. This command may be used after the $WAIT command to cause ATPK to detach after user input at the start of the controlled job.
$LOGIN [KB[n]:] [(p,pn)]	Log in a keyboard under the user's account or the account specified by (p,pn). This command, which is only available to privileged users, causes ATPK to create a job running LOGIN with instructions to attach to the specified keyboard and log in under the specified account. If (p,pn) is not specified, the

account that ATPK is running under will be used. If n is not specified (e.g., $LOGIN KB:), LOGIN will be instructed to attach to the keyboard from which ATPK was started. This may be useful to log the user back in following a command that started up ATPK with the /DET switch. If the keyboard specification is missing altogether, a new job will be started at the pseudo keyboard under ATPK's control. The current job at the pseudo keyboard, if any, will first be killed in this case. If LOGIN fails to attach or log in at the pseudo keyboard under ATPK, an error message will be printed and ATPK will abort. If LOGIN fails at any other keyboard, no error will be returned to ATPK.

COMMENTS:

Any line starting with an exclamation point ("!") will be recorded in the log and not sent to the controlled job.

CONTROL CHARACTERS:

Any character preceded by an uparrow ("^") will be converted to a control character before being sent to the controlled job. If a command line consists only of an uparrow followed by a single character, the single control character will be sent to the controlled job with no extra line terminator.

QUOTED CHARACTERS:

Any "$" or "!" that is meant to be the first character of a line to be sent to the controlled job, or any "^" or "_" in the command file that is not to be interpreted as a special character by ATPK must be preceded with the underscore character. Every underscore character (except those preceded by another underscore character) will be removed from the command line before it is sent to the controlled job.

USING ATPK FOR SILENT SYSTEM STARTUP

If it is desired, most of system startup may be controlled under ATPK. INIT.BAC (or INIT.TSK) need only run long enough to invoke ATPK. At the end of system startup, the ATPK log can be queued to the line printer. This section suggests guidelines for writing ATPK startup files and gives a sample set of these control files.

When designing the ATPK startup command files, most of the functions of INIT.BAC will have to be performed with UTILTY. The recommended procedure for bringing a non-system disk online after a crash is to clean the disk with ONLCLN.SAV and then MOUNT and UNLOCK the disk with UTILTY.

When starting up the spooling package under ATPK, two points in particular should be noted. First, the $LOGIN command should be used to re-log in the pseudo keyboard after a spooling program detaches. Secondly, when the spooling programs are invoked, they generally prompt for input and then sleep while awaiting a response. Since ATPK will not respond unless the controlled program enters an input stall (as opposed to a sleep), ATPK will not detect when the spooler needs the command line. This problem may be circumvented by including the startup command(s) on the same command file line as the command that invokes the spooling program. If the commands are separated with an uparrow-M, ATPK will insert a carriage return (the equivalent of a CTRL/M) between the commands, causing them to be sent to the pseudo keyboard at the same time, but as separate lines.

The way ERRCPY is normally started up by INIT is as follows: INIT runs as job 1, attaches to KBØ:, forces the commands to KBØ: to run ERRINT, and then exits. The system then processes the type-ahead on KBØ: and runs ERRINT, as job 1. To avoid using KBØ: in this way for the silent system startup, two chain entries have been added to ERRINT so that ATPK, running detached as job 1, can simply chain to ERRINT for normal or crash system startup. Chaining to ERRINT at line 31Ø2Ø can be used for normal startup; crash dump output will not be used. For a crash recovery, chaining to ERRINT at line 31Ø3Ø will cause crash dump output to be used.

Care must be taken when starting up certain programs by forcing to other terminals under ATPK, so that timing problems do not develop. For example, under INIT, VT5ØPY could be started up to run detached and report to a terminal by logging in that terminal, forcing the command to run VT5ØPY, forcing the VT5ØPY command line, and then forcing commands to modify the displayed options. Since INIT runs at a low priority, it would be prevented from running while VT5ØPY was running, and would force the next line only when VT5ØPY was ready. If the same technique were used; using ATPK's $LOGIN command to log in the keyboard and then forcing the commands with UTILTY, all the commands would be typed at the terminal before VT5ØPY had the chance to detach. As it detaches, VT5ØPY briefly closes the keyboard. The typed-ahead commands would then invoke LOGIN at the keyboard and prevent VT5ØPY from gaining access to it. VT5ØPY may be started up under ATPK using commands such as the following:

```
RUN $DISPLY
6Ø/24/DCA/TAB/ECHO/DET/KB5:
$LOGIN
RUN $UTILTY
FORCE KB5: F1
FORCE KB5: P
FORCE KB5: -O
FORCE KB5: J-S
EXIT
```

Because of the way the $LOGIN command works, VT5ØPY will be given enough time to open the keyboard (KB5: in the above example) before the other commands are forced.

The following is a sample set of control files that could be used for silent system startup.

$START.CTL:

```
FORCE KBØ: RUN $ATPK
FORCE KBØ: $STRTUP.LOG=$START.CMD/DET/LOG/CHA:$ERRINT;31Ø2Ø
END
```

$CRASH.CTL:

```
FORCE KBØ: RUN $ATPK
FORCE KBØ: $STRTUP.LOG=$CRASH.CMD/DET/LOG/CHA:$ERRINT;31Ø3Ø
END
```

$START.CMD:

```
$@[1,2]RTS.CMD
$@[1,2]MOUNT.CMD
$@[1,2]TTY.CMD
$@[1,2]SPOOL.CMD
$@[1,2]CCL.CMD
RUN $UTILTY
REMOVE LOGICAL LB
ADD LOGICAL DM1:[1,11]LB
LOGINS
SEND ALL RSTS/E IS NOW ON THE AIR...
EXIT
RUN $QUE
Q LPØ:/DELETE/PRI:2ØØ=$STRTUP.LOG
EXIT
```

$CRASH.CMD:

```
$@[1,2]RTS.CMD
$@[1,2]ANALYS.CMD
$@[1,2]CLEAN.CMD
$@[1,2]MOUNT.CMD
$@[1,2]TTY.CMD
$@[1,2]SPOOL.CMD
RUN $QUE
Q LP0:/PRI:200=$ANALYS.DMP
EXIT
$@[1,2]CCL.CMD
RUN $UTILTY
REMOVE LOGICAL LB
ADD LOGICAL DM1:[1,11]LB
LOGINS
SEND ALL RSTS/E IS NOW ON THE AIR...
EXIT
RUN $QUE
Q LP0:/DELETE/PRI:200=$STRTUP.LOG
EXIT
```

$RTS.CMD:

```
RUN $UTILTY
SEND KB0:Adding run-time systems
ADD RT11
ADD RSX
ADD BP2COM
ADD BASIC2
ADD BASIC
ADD BAS4F
EXIT
```

$ANALYS.CMD:

```
RUN $UTILTY
SEND KB0:Running ANALYS
EXIT
RUN $ANALYS
[0,1]CRASH.SYS
[1,2]ANALYS.DMP
[1,2]ERRCRS.FIL
```

$CLEAN.CMD:

```
RUN $UTILTY
SEND KBØ:Cleaning Disks
EXIT
RUN $ONLCLN
DB1:
^C
RUN $ONLCLN
DB2:
^C
```

$MOUNT.CMD:

```
RUN $UTILTY
SEND KBØ:Mounting Disks
MOUNT DB1:PACK1
UNLOCK DB1:
MOUNT DB2:PACK2
UNLOCK DB2:
EXIT
```

$TTY.CMD:

```
RUN $UTILTY
SEND KBØ:Setting Terminal Characteristics
EXIT
RUN $TTYSET
KB16:;VT52;SPEED 24ØØ
KB17:;VT1ØØ;SPEED 48ØØ;GAG
EXIT
```

$SPOOL.CMD:

```
RUN $UTILTY
SEND KBØ:Starting Spoolers
EXIT
RUN $OPSER ^MLOG OPSER.LOG;ALL ^MCHA KBØ: ^MDETACH
$LOGIN
RUN $QUEMAN ^MDETACH/PRIORITY:Ø
$LOGIN
RUN $SPOOL ^MLPØ:/HEAD:2
$LOGIN
RUN $BATCH ^MBAØ:/ERROR:FATAL/NOQUEUE/NODELETE
$LOGIN
```

$CCL.CMD:

```
RUN $UTILTY
SEND KB0:Adding CCL's.
CCL ATT-ACH=$LOGIN.*;PRIV 30000
CCL ATP-K=$ATPK.*;PRIV 30000
CCL BCK-=$RMSBCK.TSK;0
CCL BPC-REF=$BPCREF.*;30000
CCL BYE-=$LOGOUT.*;PRIV 0
CCL CCL-=[0,1]DCL.DCL;PRIV 0
CCL CNV-=$RMSCNV.TSK;0
CCL DCL-=[0,1]DCL.DCL;PRIV 0
CCL DEF-=$RMSDEF.TSK;0
CCL DFN-=$RMSDFN.TSK;0
CCL DES-=$RMSDES.TSK;0
CCL DIS-MOUNT=$UMOUNT.*;PRIV 30000
CCL DI-RECTORY=$DIRECT.*;PRIV 30000
CCL DSP-=$RMSDSP.TSK;0
CCL EDT-=$EDT.TSK;0
CCL FIT-=$FIT.*;PRIV 30000
CCL HELLO-=$LOGIN.*;PRIV 0
CCL HELP-=$HELP.*;30000
CCL IFL-=$RMSIFL.TSK;0
CCL LBR-=$LBR.TSK;0
CCL LIBR-=$LIBR.SAV;8208
CCL LIN-K=$LINK.SAV;8208
CCL LOG-IN=$LOGIN.*;PRIV 0
CCL MACR-O=$MACRO.SAV;8216
CCL MAC-=$MAC.TSK;0
CCL MAK-E=$TECO.TEC;0
CCL MOU-NT=$UMOUNT.*;PRIV 30000
CCL MU-NG=$TECO.TEC;0
CCL PAT-=$PAT.TSK;0
CCL PIP-=$PIP.SAV;8208
CCL PL-EASE=$PLEASE.*;PRIV 30000
CCL QU-EUE=$QUE.*;PRIV 30000
CCL RST-=$RMSRST.TSK;PRIV 0
CCL SE-T=$TTYSET.*;PRIV 30000
CCL SRT-=$SORT.TSK;0
CCL SU-BMIT=$QUE.*;PRIV 30000
CCL SW-ITCH=$SWITCH.*;PRIV 30000
CCL SY-STAT=$SYSTAT.*;PRIV 30000
CCL TE-CO=$TECO.TEC;0
CCL TKB-=$TKB.TSK;0
CCL TY-PE=$TYPE.TEC;8
CCL UT-ILTY=$UTILTY.*;30000
EXIT
```

OTHER FEATURES

By specifying a log file and KB: as your input file, you can make a copy of interactive dialogue to queue to the line printer, etc. Note that ATPK will not be completely transparent in such a session. Any line typed at the keyboard will not be sent to the PK until the next time the controlled job enters a keyboard input wait state.

When inputting from the terminal, CTRL/Z's get passed on through to the controlled job. A CTRL/C at any time will cause the controlled job to be killed, the log file closed, and ATPK to exit. A CTRL/C may be sent to the job by typing uparrow-C.

INSTALLING ATPK AS A CCL COMMAND

The following sequence will install the CCL commands "ATPK" and "@" to run the ATPK program. Either or both of the commands may be installed.

```
RUN $UTILTY<cr>
<UTILTY's header line>
#CCL ATP-K=[1,2]ATPK.*;PRIV 3ØØØØ<cr>
#CCL @-=[1,2]ATPK.*;PRIV 3ØØØØ<cr>
#^Z
```

(This assumes that ATPK is located on SY:[1,2]. Note that the DCL LINK command assumes this location.)

ALLOWING ACCESS TO ATPK BY NON-PRIVILEGED USERS

ATPK is installed on the system with a protection code of <252>. If non-privileged users are to be allowed to run ATPK, it must be renamed to have a protection code of <232> after the system installation is complete and after any patches have been applied to ATPK and it is re-compiled.

SUPPORT POLICY FOR ATPK

ATPK is supported only as a part of the BUILD procedure. DIGITAL makes no commitment, expressed or implied, to support ATPK as an indirect command file processor, or to supply an indirect command file processor in future releases of RSTS/E that is compatible with the present version of ATPK.

If you experience problems when using ATPK as an indirect command file processor, please submit an FYI-type (Priority 5) Software Performance Report (SPR). While DIGITAL makes no commitment to fix problems reported with ATPK as an indirect command file processor, we would like to know about any problems that you encounter.

RSTS/E V7.2
Automated Patching Facility Package
ATPK

ALLOWING ATPK TO DETACH FOR NON-PRIVILEGED USERS - ATPK FEATURE PATCH

At some installations it may be desirable to allow non-privileged users to run ATPK detached as a "mini batch processor", even though running a detached job is usually a privileged operation under RSTS/E. This optional patch will allow ATPK to detach for any user if the /DET switch is specified at the end of ATPK's startup command, or if the $DETACH command is encountered in the command file.

PROCEDURE:

1. For purposes of this discussion, we will assume that the program to be patched is located in your privileged account on the public disk structure. If this is not the case, replace all program references with suitable text according to the requirements of your installation.

   We assume the executable version of the program will be stored in the System Library Account ($). If this is not the case, replace references to $ in step 3 below with the appropriate package or library account.

   The procedure below assumes that BASIC-PLUS is your system default run-time system.

   If you are using CSPCOM or BASIC-PLUS-2, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   If you are using BASIC-PLUS-2, this program must be task built against the BP2COM run-time system.

2. This patch is contained in a patch file appearing in patch kit version "A" or later. If you do not have this distribution you can produce a command file by specifying a file for [logfile=] in the procedure below.

   To apply the patch manually, perform the following RSTS/E system commands.

```
RUN $CPATCH<cr>
<CPATCH's header line>

File to patch - ATPK.BAS=ATPK.BAS<cr>
#[logfile=]KB:/CS:62461<cr>
*H/2!/V<cr>
2!              PROGRAM         : ATPK.BAS
*H/3000<tab>/V<cr>
3000    ! &
*G/IF DETACHED% /V<cr>
        \ RETURN IF DETACHED% OR NOT PRIV% &
*I/!/V<cr>
        \ RETURN IF DETACHED% !OR NOT PRIV% &
*EX<cr>
Patch from KB:[P,PN]CPATCH.CMD complete
#^Z
File to patch - ^Z

Ready
```

3. Use this procedure if your system default run-time system is BASIC-PLUS; otherwise, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   To re-compile the program and re-enter it into the system library, type the following RSTS/E commands. Note the protection code of <232> to allow non-privileged users to run ATPK.

   ```
   OLD ATPK<cr>

   Ready

   COMPILE SY0:$ATPK<232><cr>

   Ready
   ```

4. The person making the changes to the program should now take whatever steps are necessary, according to installation guidelines, to save the new version of the program.

5. The source (.BAS) version of the program may now be removed from the public structure.

RSTS/E V7.2
Automated Patching Facility Package
ATPK

LIMITING THE USE OF THE $LOGIN COMMAND - ATPK FEATURE PATCH

The $LOGIN command of ATPK provides an easy way for a privileged user to log in under any account at any keyboard. While the $LOGIN command does not compromise normal RSTS/E security (it is available only to privileged users), it may be desirable to disable this feature at installations that have implemented their own security measures.

This optional patch will cause ATPK to ignore any keyboard or account number specification used with the $LOGIN command. The $LOGIN command may still be used to log a privileged user back in under his or her own account at the pseudo keyboard after the job controlled by ATPK has detached or terminated.

PROCEDURE:

1. For purposes of this discussion, we will assume that the program to be patched is located in your privileged account on the public disk structure. If this is not the case, replace all program references with suitable text according to the requirements of your installation.

   We assume the executable version of the program will be stored in the System Library Account ($). If this is not the case, replace references to $ in step 3 below with the appropriate package or library account.

   The procedure below assumes that BASIC-PLUS is your system default run-time system.

   If you are using CSPCOM or BASIC-PLUS-2, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   If you are using BASIC-PLUS-2, this program must be task built against the BP2COM run-time system.

2. This patch is contained in a patch file appearing in patch kit version "A" or later. If you do not have this distribution you can produce a command file by specifying a file for [logfile=] in the procedure below.

   To apply the patch manually, perform the following RSTS/E system commands.

RSTS/E V7.2
Automated Patching Facility Package
ATPK


```
RUN $CPATCH<cr>
<CPATCH's header line>

File to patch - ATPK.BAS=ATPK.BAS<cr>
#[logfile=]KB:/CS:28893<cr>
*H/2!/V<cr>
2!              PROGRAM         : ATPK.BAS
*H/29ØØ<tab>/V<cr>
29ØØ    ! &
*G/!\/V<cr>
        !\ TØ%=Ø% &
*-2JDV<cr>
        \ TØ%=Ø% &
*EX<cr>
Patch from KB:[P,PN]CPATCH.CMD complete
#^Z
File to patch - ^Z

Ready
```

3. Use this procedure if your system default run-time system is BASIC-PLUS; otherwise, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   To re-compile the program and re-enter it into the system library, type the following RSTS/E commands. Specify a protection code of <232> if ATPK is to be runnable by non-privileged users on your system.

   ```
   OLD ATPK<cr>

   Ready

   COMPILE SYØ:$ATPK<252><cr>

   Ready
   ```

4. The person making the changes to the program should now take whatever steps are necessary, according to installation guidelines, to save the new version of the program.

5. The source (.BAS) version of the program may now be removed from the public structure.

RSTS/E V7.2
DCL
Package Notes

Seq 2Ø.1.1 N

1 of 1

FILE SPECIFICATIONS IN DCL

The rules about file specifications in DCL are slightly more restrictive than elsewhere in RSTS/E.

The special PPN character "!" does not work in DCL. The exclamation point is used as the comment delimiter.

The special PPN characters "@", "%", "&", and "#" are accepted in the current version, but their use is not supported. They are reserved DCL characters, and may have other meanings in the future.

The special PPN character "$" is legal and supported in DCL. It will continue to designate the system library [1,2].

The traditional RSTS/E file specification switches /MODE, /SIZE, /POSITION, /CLUSTERSIZE, and /RONLY cannot be used in DCL. Many of the same features are available through DCL, but you must use DCL notation. Protection codes in angle brackets ("<nn>") cannot be used in DCL. The DCL syntax for protection codes is "/PROTECTION:nn".

Parentheses ("()") cannot be used to delimit the project-programmer number of a file in DCL. Brackets ("[]") must be used instead. Parentheses are reserved.

The single-character wildcard "?" works in DCL, but it is unsupported. It may have a different meaning in the future.

RSTS/E V7.2 Seq 2Ø.1.2 N
DCL
Package Notes 1 of 2

DCL CAN TRANSLATE LOGICAL DEVICE NAMES TWICE

PROBLEM:

DCL has two related problems in the translation of device names. The system can translate a logical device name twice, and can translate a name once even if you precede it with an underscore.

The following example shows double translation.

```
$ ASSIGN _DB: FOO:

$ ASSIGN _NL: DB:

$ DIR FOO:
?Device not file-structured - file NL:??????.???

$
```

What happens in the above example is that the system correctly translates the logical name "FOO:" to "DB:", and then incorrectly retranslates the name "DB:" to "NL:".

The following example shows the underscore being ignored.

```
$ ASSIGN _NL: DB:

$ DIR _DB:
?Device not file-structured - file NL:??????.???

$
```

These problems occur only with the following commands.

APPEND
COPY
DIRECTORY
FORTRAN/FOR
LINK
MACRO/RT11
RENAME
SET PROTECTION
TYPE

The problems occur only with local operations; they do not occur if you specify a remote file.

SOLUTION:

You can work around the double-translation problem. Don't use the name of a physical device as a logical device name. All physical device names consist of two letters or of two letters followed by a number. If you avoid using these forms when you assign logical names, double translation will not occur.

SETTING UP THE DCL LINK COMMAND

This article explains how to set up your system so that the DCL LINK command can be used. If you intend that the LINK command will be used, you should read this article before you install any layered languages. Other aspects of setting up DCL are described in the System Generation Manual and the System Manager's Guide.

The DCL LINK command provides a simple way of linking programs. It lets you link programs in two RT11-based languages (FORTRAN-IV and MACRO-11) and five RSX-11-based languages (BASIC-PLUS-2, COBOL-81, DIBOL, FORTRAN-77, and FORTRAN-IV-PLUS). With several of these languages, the LINK command also lets you specify an overlay structure using a simple dialogue.

The requirements for setting up the LINK command depend on what languages you want to be able to link with, and whether you want to be able to link with FMS. The following paragraphs explain how to set LINK up for each language.

The default language assumed by the LINK command is BASIC-PLUS-2. You may wish to change this default if your installation does not have BASIC-PLUS-2, or if you prefer that a different language be the default. Refer to article Seq 2Ø.2.8 F if you wish to change the default language to FORTRAN IV or RT11; Refer to article Seq 2Ø.2.9 F if you wish to change the default language to DIBOL, COBOL-81, FORTRAN-77, or FORTRAN-IV-PLUS.

Disabling Languages

You should disable linking with a particular language if your installation does not have all of the files or other requirements for that language. The following table shows what file to delete for each language to be disabled. These files are installed automatically when you install DCL.

Language to Disable	File to Delete
All RSX-based languages	[1,2]PRELIN (.BAC or .TSK)
BASIC-PLUS-2	LB:BP2.LNK
COBOL-81	(none)
DIBOL	LB:DIB.LNK
FORTRAN-IV	(none)
FORTRAN-77	LB:F77.LNK
FORTRAN-IV-PLUS	LB:F4P.LNK
MACRO/RT11	(none)

If a user tries to link with a language you have disabled in this manner, DCL will display the message "?Command not available".

Requirements for RT11-based Languages

MACRO-11

Location	Required File	When Installed
SY:[1,2]	LINK.SAV	RSTS/E System Generation
SY:[1,2]	SYSLIB.OBJ	RSTS/E System Generation

LINK/RT11 is automatically disabled if LINK.SAV is not present. If LINK.SAV is not present and a user types LINK/RT11, the system will display the message "?Command not available."

FORTRAN-IV V2.5

Location	Required File	When Installed
SY:[1,2]	LINK.SAV	RSTS/E System Generation
SY:[1,2]	SYSLIB.OBJ	RSTS/E System Generation
SY:[1,2]	FORLIB.OBJ	FORTRAN-IV Installation

Also:

When you install FORTRAN-IV you have the options of either including the FORTRAN library routines in SYSLIB.OBJ or putting them separately, in FORLIB.OBJ. For LINK/FOR to work properly, select FORLIB.OBJ.

LINK/FOR is automatically disabled if LINK.SAV is not present. If LINK.SAV is not present and a user types LINK/RT11, the system will display the message "?Command not available."

Requirements for RSX-based Languages

All of the RSX-based languages have certain linking requirements in common. These follow.

Location	Required File	When Installed
SY:[1,2]	PRELIN (.BAC or .TSK)	RSTS/E DCL Installation
SY:[1,2]	TKB.TSK	RSTS/E RSX Emulator Build
LB:	RMSRES.TSK	RSTS/E RMS Installation
LB:	RMSRES.STB	RSTS/E RMS Installation
SY:[0,1] (usually)	RMSRES.LIB	RSTS/E RMS Installation
LB:	RMSLIB.OLB	RSTS/E RMS Installation
LB:	SYSLIB.OLB	RSTS/E RSX Emulator Build
LB:	RMSRLX.ODL	RSTS/E RMS Installation

Also:

1. When you generate your system specify RSX emulation in the monitor and resident library support. Answer YES to the questions "Resident libraries ?" and "RSX directives ?"

2. Install the RSX Emulator Package.

3. Establish a library account with the system-wide logical name LB:. (This is done automatically during the RSX installation.)

4. Install the RMS package. Select the RMSRES resident library.

5. ADD the RMSRES resident library.

6. The PRELIN (pre-link) program has a protection code of 232.

Forms Management System

You can use Digital's Forms Management System (FMS) with any of the RSX-based languages. There are certain requirements for setting up the LINK command to link FMS into the program. These follow.

Location	Required File	When Installed
LB:	FDVRES.TSK	FMS Installation
LB:	FDVRES.STB	FMS Installation
SY:[0,1] (usually)	FDVRES.LIB	FMS Installation
LB:	FDVRES.OLB	FMS Installation
LB:	HLLDFN.OBJ	FMS Installation
LB:	FDVDRS.OBJ	FMS Installation

Also:

1. ADD the FDVRES resident library.

2. You must have the appropriate high-level language interface file in account LB:. These are: HLLBP2.OBJ for BASIC-PLUS-2, HLLDBL.OBJ for DIBOL, HLLFOR.OBJ for FORTRAN-IV-PLUS and FORTRAN-77, and HLLCOB.OBJ for COBOL-81. They are installed during FMS Installation.

BASIC-PLUS-2 V1.6

Location	Required File	When Installed
LB:	BP2.LNK	RSTS/E DCL Installation
LB:	BASICS.TSK	BASIC-PLUS-2 Installation
LB:	BASICS.STB	BASIC-PLUS-2 Installation
SY:[0,1] (usually)	BASICS.LIB	BASIC-PLUS-2 Installation
LB:	BASRMS.OLB	BASIC-PLUS-2 Installation
LB:	BP2COM.OLB	BASIC-PLUS-2 Installation
LB:	BP2IC7.ODL	BASIC-PLUS-2 Installation

Also:

1. ADD the BASICS resident library.

2. If you gave a name other than BP2COM to the BASIC-PLUS-2 object library, then edit the file LB:BP2.LNK, and change LB:BP2COM.OLB to the appropriate file specification.

COBOL-81

Location	Required File	When Installed
(If you select CIS (Commercial Instruction Set) when you install COBOL-81:)		
LB:	C81CIS.TSK	COBOL-81 Installation
LB:	C81CIS.STB	COBOL-81 Installation
SY:[Ø,1] (usually)	C81CIS.LIB	COBOL-81 Installation
(If you select NONCIS when you install COBOL-81:)		
LB:	C81LIB.TSK	COBOL-81 Installation
LB:	C81LIB.STB	COBOL-81 Installation
SY:[Ø,1] (usually)	C81LIB.LIB	COBOL-81 Installation
(In either case:)		
SY:[1,2]	C81ODL.TSK	COBOL-81 Installation
SY:[1,2]	ATPK (.BAC or .TSK)	RSTS/E Standard CUSP Build
SY:[1,2]	PIP.SAV	RSTS/E System Generation

Also:

1. ATPK's protection code must include 128. In other words, it must be a privileged program. The standard CUSP installation procedure sets ATPK's protection code to 252, which is satisfactory.

2. ADD the COBOL resident library, C81CIS or C81LIB.

If [1,2]PIP.SAV or [1,2]C81ODL.TSK is not present, the LINK command will fail with "?Can't find file or account". If [1,2]ATPK is not present, the LINK command will fail with "?Unexpected error in PRELIN ... ?Can't find file or account".

DIBOL V4.5

Location	Required File	When Installed
LB:	DIB.LNK	RSTS/E DCL Installation
LB:	DBRRES.TSK	DIBOL Installation
LB:	DBRRES.STB	DIBOL Installation
SY:[Ø,1] (usually)	DBRRES.LIB	DIBOL Installation
LB:	DBRLIB.OLB	DIBOL Installation

Also:

1. When you install the DIBOL V4.5 compiler select the RMS I/O package (rather than DMS).

FORTRAN-77 V4.Ø

Location	Required File	When Installed
LB:	F77.LNK	RSTS/E DCL Installation
LB:	F4POTS.OLB	FORTRAN-77 Installation
LB:	RMS11M.ODL	FORTRAN-77 Installation

Also:

1. When you install the FORTRAN-77 V4.Ø compiler select the RMS I/O package (rather than FCS).

2. When you install FORTRAN-77 you have the option of either including the FORTRAN library routines in SYSLIB.OLB or putting them separately in F4POTS.OLB. For LINK/F77 to work properly, select F4POTS.OLB.

3. Edit the file LB:RMS11M.ODL. Change all occurrences of "LB:[1,1]" to "LB:".

FORTRAN-IV-PLUS V3.Ø

Location	Required File	When Installed
LB:	F4P.LNK	RSTS/E DCL Installation
LB:	F4POTS.OLB	FORTRAN-IV-PLUS Installation
LB:	RMS11M.ODL	FORTRAN-IV-PLUS Installation

Also:

1. When you install the FORTRAN-IV-PLUS compiler select the RMS I/O package (rather than FCS).

2. When you install FORTRAN-IV-PLUS you have the option of either including the FORTRAN library routines in SYSLIB.OLB or putting them separately in F4POTS.OLB. For LINK/F4P to work properly, select F4POTS.OLB.

3. Edit the file LB:RMS11M.ODL. Change all occurrences of "LB:[1,1]" to "LB:".

SOME DIFFERENCES BETWEEN DCL AND BASIC-PLUS

This section is for the new DCL user who is familiar with the command environment of BASIC-PLUS (or of the RT11 or RSX run-time systems). It warns you of some of the more common pitfalls.

In DCL, the input file specification goes first, and the output file specification goes second. They are separated by a space. You cannot type embedded spaces within a file specification. Thus instead of:

```
PIP NEW.FIL=OLD.FIL
```

you would type:

```
$ COPY OLD.FIL NEW.FIL
```

DCL does not allow protection codes in angle brackets, nor the standard RSTS/E file specification switches /MODE, /SIZE, /CLUSTERSIZE, /POSITION, and /RONLY. However, there are DCL equivalents for many of these. The /PROTECTION switch is accepted both by BASIC-PLUS and by several DCL commands.

There are no DCL commands corresponding to ATTACH and HELLO. If you want to use the ATTACH and HELLO commands while in the DCL environment, you must install them as CCL commands.

Several DCL commands have the same names as familiar BASIC-PLUS or CCL commands, but different meanings or different syntax. The following list contrasts these commands:

1. APPEND

   DCL:
   Appends the contents of one file to the end of another file. The files may contain text or anything else.

   BASIC-PLUS:
   Merges the contents of a previously saved BASIC-PLUS source program into a BASIC-PLUS program currently in memory. (Use the /APPEND qualifier of PIP to append one file to another.)

2. ASSIGN

DCL:

Establishes a logical name for a device or PPN. The syntax is "ASSIGN device: logical", with a space required before the logical name. (In DCL, the ALLOCATE command reserves a device for your use, and the SET PROTECTION/DEFAULT command changes the default protection code for files you create.)

BASIC-PLUS:

Establishes a logical name for a device or PPN; reserves a device for your use only; changes the default protection code for files you create; or associates a PPN with the @ character. The syntax to assign a logical name is "ASSIGN device:logical", with no space required before the logical name.

3. DISMOUNT

DCL:

The syntax is "DISMOUNT device: [label]", with a space required between the device name and the optional label.

CCL:

The syntax is "DISMOUNT device:[label]", with no space required before the optional label. (The CCL and DCL commands also accept different qualifiers.)

4. MOUNT

DCL:

The syntax is "MOUNT device: label", with a space required between the device name and the label.

CCL:

The syntax is "MOUNT device:label", with no space required before the label. (The CCL and DCL commands also accept different qualifiers.)

5. PRINT

DCL:
Queues a file for printing.

BASIC-PLUS:
Displays the value of a variable, or outputs it into a file. (Use the QUE program to queue a file for printing.)

6. RENAME

DCL:
Changes the name and/or type of a file. The syntax is "RENAME oldname newname".

BASIC-PLUS:
Changes the name of the program currently in memory. (Use the /RENAME qualifier of PIP to change to name and/or type of a file.)

7. SET

DCL:
This has several options: SET HOST, SET TERMINAL, SET PROTECTION, and SET QUEUE.

BASIC-PLUS:
Sets terminal characteristics.

8. SUBMIT

DCL and CCL:
Submits a file for batch processing. The syntax of the DCL and CCL commands is essentially the same. However, the qualifiers are different.

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NOTE

In DCL, you can continue a command line by ending it with a hyphen. For example (underscored text is what you type):

```
$ COPY A.A, -
Continue:  B.B, -
Continue:  C.C
To:        D.D
```

This can surprise you if you type the CCL command "SYSTAT/-" while in the DCL command environment.

RUNNING DCL AT INCREASED PRIORITY - DCL.RTS FEATURE PATCH

This patch might significantly improve the speed with which your system responds to user input typed at the DCL command level.

This patch causes DCL to run at a CPU priority 4 greater than other programs. Since the normal job priority is -8, DCL will generally run at a priority of -4. As soon as DCL invokes any CUSP or user program, the job's priority will drop by 4, to its normal level. Without this patch, DCL runs at the same priority as other programs.

This will cause RSTS/E to give preferential treatment to jobs at the DCL command level. DCL will prompt them and issue error messages to them faster than it otherwise would. Whether the improvement is significant depends on how heavily your system is loaded.

This patch will also slightly degrade the speed of everything else on the system that is running at a lower priority. At most RSTS installations, nearly everything runs at a lower priority. Logged-out jobs and ERRCPY, the error logger, run at priority Ø, but most other things generally run at priority -8. Since DCL consumes little CPU time, the effect on other jobs is slight at most installations.

Try this patch and see how it affects performance. We expect that most installations will find that the net effect of this patch is beneficial.

The patching procedure detailed below will cause DCL to run at a priority 4 greater than other programs.

PROCEDURE:

1. This is a feature patch to the DCL run-time system. It may be installed in any DCL run-time system.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

   ```
   Option: PATCH
   File to patch? DCL.RTS              (DCL run-time system name)
   ```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>            (RETURN for manual patch installation)
File to patch? [0,1]DCL.RTS        (DCL run-time system name)
File found in account [0,1]
```

This patch is contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..PRIO
Offset address? 0
 Base   Offset  Old     New?
??????  000000  000000  ? \
??????  000000     000  ? -1
??????  000001     000  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD DCL<cr>                    (DCL run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD DCL/STAY/ADDR:nnn<cr>        (DCL run-time system name)
#EXIT<cr>

Ready
```

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DCL.RTS 1 of 2

CHANGING DCL BASIC COMMAND DEFAULT FROM /BPLUS TO /BP2 - DCL.RTS FEATURE PATCH

PROBLEM:

The DCL BASIC command switches the user into BASIC-PLUS if /BPLUS is specified, or into BASIC-PLUS-2 if /BP2 is specified. If neither is specified, the command switches the user into BASIC-PLUS. Your installation may find it convenient to make BASIC-PLUS-2 the default.

SOLUTION:

The patching procedure detailed below allows you to change DCL's default for the BASIC command from /BPLUS to /BP2.

PROCEDURE:

1. This is a feature patch to the DCL run-time system. It may be installed in any DCL run-time system.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? DCL.RTS              (DCL run-time system name)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>             (RETURN for manual patch installation)
File to patch? [Ø,1]DCL.RTS         (DCL run-time system name)
File found in account [Ø,1]
```

   This patch is contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..BASL
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ??????  ? BP2$Q
??????  ØØØØØ2  177777  ? ^C       (up-arrow/C to exit;CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD DCL<cr>                    (DCL run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD DCL/STAY/ADDR:nnn<cr>        (DCL run-time system name)
#EXIT<cr>

Ready
```

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DCL
DCL.RTS 1 of 2

CHANGING BASIC-PLUS KBM NAME IN DCL - DCL.RTS FEATURE PATCH

PROBLEM:

DCL assumes that the keyboard monitor for BASIC-PLUS is called BASIC. Your installation may have installed BASIC-PLUS under a different name, such as BAS4F. If so, you must patch DCL so that the BASIC/BPLUS command switches to the correct keyboard monitor.

SOLUTION:

The patching procedure detailed below allows you to change the name of the BASIC-PLUS keyboard monitor invoked by DCL.

PROCEDURE:

1. This is a feature patch to the DCL run-time system. It may be installed in any DCL run-time system.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? DCL.RTS              (DCL run-time system name)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>             (RETURN for manual patch installation)
File to patch? [Ø,1]DCL.RTS         (DCL run-time system name)
File found in account [Ø,1]
```

   This patch is contained in a patch file appearing in patch kit version "A" or later.

NOTE

> The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed. Specifically, specify the name of your BASIC-PLUS keyboard monitor. Note that the name should be padded with Ø's if it is less than 6 characters long.

4. The patch is as follows:

```
Base address? ...BPL
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  Ø41ØØ6  ? \
??????  ØØØØØØ     ØØ6  ? <lf>      (no change; verify only)
??????  ØØØØØ1     1Ø2  ? 'B
??????  ØØØØØ2     1Ø1  ? 'A
??????  ØØØØØ3     123  ? 'S
??????  ØØØØØ4     111  ? 'I
??????  ØØØØØ5     1Ø3  ? 'C
??????  ØØØØØ6     ØØØ  ? Ø         (pad with Ø's, if necessary)
??????  ØØØØØ7     ???  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD DCL<cr>                    (DCL run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD DCL/STAY/ADDR:nnn<cr>        (DCL run-time system name)
#EXIT<cr>

Ready
```

CHANGING BASIC-PLUS-2 KBM NAME IN DCL - DCL.RTS FEATURE PATCH

PROBLEM:

DCL assumes that the keyboard monitor for BASIC-PLUS-2 is called BP2COM. Your installation may have installed BP2COM under a different name. If so, you must patch DCL so that the BASIC/BP2 command switches to the correct keyboard monitor.

SOLUTION:

The patching procedure detailed below allows you to change the name of the BASIC-PLUS-2 keyboard monitor invoked by DCL.

PROCEDURE:

1. This is a feature patch to the DCL run-time system. It may be installed in any DCL run-time system.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? DCL.RTS              (DCL run-time system name)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>             (RETURN for manual patch installation)
File to patch? [Ø,1]DCL.RTS         (DCL run-time system name)
File found in account [Ø,1]
```

   This patch is contained in a patch file appearing in patch kit version "A" or later.

NOTE

> The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed. Specifically, specify the name of your BASIC-PLUS-2 keyboard monitor. Note that the name should be padded with Ø's if it is less than 6 characters long.

4. The patch is as follows:

```
Base address? ...BP2
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ    ØØ6  ? <lf>      (no change; verify only)
??????  ØØØØØ1    1Ø2  ? 'B
??????  ØØØØØ2    12Ø  ? 'P
??????  ØØØØØ3    Ø62  ? '2
??????  ØØØØØ4    1Ø3  ? 'C
??????  ØØØØØ5    117  ? 'O
??????  ØØØØØ6    115  ? 'M        (pad with Ø's, if necessary)
??????  ØØØØØ7    ???  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD DCL<cr>                    (DCL run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD DCL/STAY/ADDR:nnn<cr>        (DCL run-time system name)
#EXIT<cr>

Ready
```

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DCL
DCL.RTS 1 of 2

CHANGING DCL MACRO COMMAND DEFAULT FROM /RSX11 TO /RT11
- DCL.RTS FEATURE PATCH

PROBLEM:

The DCL MACRO command can invoke either the RT11 MACRO assembler or the RSX-11M MACRO assembler. If the user specifies MACRO/RT11, then the RT11 MACRO assembler is invoked. If the user specifies MACRO/RSX11, then the RSX-11M MACRO assembler is invoked.

/RSX11 is the default. If the user does not specify a assembler, then the RSX-11M MACRO assembler is invoked.

Your installation may find it convenient to make the RT11 assembler the default.

SOLUTION:

The patching procedure detailed below allows you to change DCL's default for the MACRO command from /RSX11 to /RT11. With this patch installed, the MACRO command will invoke the RT11 assembler if the user does not specify an assembler.

PROCEDURE:

1. This is a feature patch to the DCL run-time system. It may be installed in any DCL run-time system.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? DCL.RTS              (DCL run-time system name)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>             (RETURN for manual patch installation)
File to patch? [Ø,1]DCL.RTS         (DCL run-time system name)
File found in account [Ø,1]
```

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DCL
DCL.RTS 2 of 2

This patch is contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..MACL
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ??????  ? RT11$Q
??????  ØØØØØ2  177777  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD DCL<cr>                    (DCL run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD DCL/STAY/ADDR:nnn<cr>        (DCL run-time system name)
#EXIT<cr>

Ready
```

RSTS/E V7.2 Seq 2Ø.2.6 F
DCL
DCL.RTS 1 of 2

CHANGING DCL FORTRAN COMMAND DEFAULT TO FORTRAN IV - DCL.RTS FEATURE PATCH

PROBLEM:

The FORTRAN command can invoke either the PDP-11 FORTRAN-IV compiler or the PDP-11 FORTRAN-IV-PLUS or FORTRAN-77 compiler. If the user specifies FORTRAN/FOR, then the FORTRAN-IV compiler is invoked (if your installation has it). If the user specifies FORTRAN/F4P, then the FORTRAN-IV-PLUS compiler is invoked (if your installation has it). If the user specifies FORTRAN/F77, then the FORTRAN-77 compiler is invoked (if your installation has it).

/F77 is the default. If the user does not specify a compiler, then the FORTRAN-77 compiler is invoked. If your installation does not have FORTRAN-77, an error message is printed.

Your installation may find it convenient to change the default to /FOR.

SOLUTION:

The patching procedure detailed below allows you to make the FORTRAN command invoke FORTRAN-IV when the user does not specify a compiler. Refer to article Seq 2Ø.2.7 F if you wish to make /F4P the default.

PROCEDURE:

1. This is a feature patch to the DCL run-time system. It may be installed in any DCL run-time system.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? DCL.RTS              (DCL run-time system name)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>             (RETURN for manual patch installation)
File to patch? [Ø,1]DCL.RTS         (DCL run-time system name)
File found in account [Ø,1]
```

   This patch is contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..FORF
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ØØØØØ1  ? FOR
??????  ØØØØØ2  ØØØØØØ  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                  (CTRL/Z for new base)
Base address? ..FORL
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ??????  ? FOR$Q
??????  ØØØØØ2  177777  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD DCL<cr>                     (DCL run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD DCL/STAY/ADDR:nnn<cr>         (DCL run-time system name)
#EXIT<cr>

Ready
```

RSTS/E V7.2 Seq 20.2.7 F
DCL
DCL.RTS 1 of 2

CHANGING DCL FORTRAN COMMAND DEFAULT TO FORTRAN-IV-PLUS
- DCL.RTS FEATURE PATCH

PROBLEM:

The FORTRAN command can invoke either the PDP-11 FORTRAN-IV compiler, the PDP-11 FORTRAN-IV-PLUS compiler, or the PDP-11 FORTRAN-77 compiler. If the user specifies FORTRAN/FOR, then the FORTRAN-IV compiler is invoked (if your installation has it). If the user specifies FORTRAN/F4P, then the FORTRAN-IV-PLUS compiler is invoked (if your installation has it). If the user specifies FORTRAN/F77, then the FORTRAN-77 compiler is invoked (if your installation has it).

/F77 is the default. If the user does not specify a compiler, then the FORTRAN-77 compiler is invoked. If your installation does not have FORTRAN-77, an error message is printed.

Your installation may find it convenient to change the default to /F4P.

SOLUTION:

The patching procedure detailed below allows you to make the FORTRAN command invoke FORTRAN-IV-PLUS when the user does not specify a compiler. Refer to article Seq 20.2.6 F if you wish to make FORTRAN IV the default.

PROCEDURE:

1. This is a feature patch to the DCL run-time system. It may be installed in any DCL run-time system.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? DCL.RTS              (DCL run-time system name)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>             (RETURN for manual patch installation)
File to patch? [0,1]DCL.RTS         (DCL run-time system name)
File found in account [0,1]
```

This patch is contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..FORL
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ??????  ? F4P$Q
??????  ØØØØØ2  177777  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD DCL<cr>                    (DCL run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD DCL/STAY/ADDR:nnn<cr>        (DCL run-time system name)
#EXIT<cr>

Ready
```

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DCL
DCL.RTS 1 of 2

CHANGING DEFAULT LANGUAGE FOR LINK TO FORTRAN IV OR RT11 MACRO
- DCL.RTS FEATURE PATCH

PROBLEM:

The DCL LINK command can link programs written in any of several languages. The LINK command accepts a qualifier that specifies what language the program is written in. If the user does not specify such a qualifier, the LINK command assumes that the program is written in BASIC-PLUS-2 (as if the user had typed /BP2).

Your installation may find it convenient to change the default, especially if you do not have BASIC-PLUS-2. You can change the default to FORTRAN-IV, RT11 MACRO, DIBOL, FORTRAN-77, FORTRAN-IV-PLUS, or COBOL-81.

SOLUTION:

The patching procedure detailed allows you to make the LINK command default to /FOR or /RT11 when the user does not specify a language. Refer to article Seq 20.2.9 F if you wish to make DIBOL, COBOL-81, FORTRAN-77, or FORTRAN-IV-PLUS the default.

PROCEDURE:

1. This is a feature patch to the DCL run-time system. It may be installed in any DCL run-time system.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

   ```
   Option: PATCH
   File to patch? DCL.RTS              (DCL run-time system name)
   ```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

   ```
   RUN $ONLPAT
   Command File Name? <cr>             (RETURN for manual patch installation)
   File to patch? [0,1]DCL.RTS         (DCL run-time system name)
   File found in account [0,1]
   ```

   This patch is contained in a patch file appearing in patch kit version "A" or later.

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NOTE

The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed.

4. The patch which follows changes the default language used by the DCL LINK command to FORTRAN-IV. To default to RT11 MACRO, substitute RT11$Q for FOR$Q:

```
Base address? ..LINL
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ??????  ? FOR$Q     (or use RT11$Q)
??????  ØØØØØ2  177777  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                  (CTRL/Z for new base)
Base address? ..LINF
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ØØØØØ2  ? RT11
??????  ØØØØØ2  ØØØØØ4  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD DCL<cr>                     (DCL run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD DCL/STAY/ADDR:nnn<cr>         (DCL run-time system name)
#EXIT<cr>

Ready
```

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CHANGING DEFAULT LANGUAGE FOR LINK TO DIBOL, COBOL-81, FORTRAN-77, OR FORTRAN-IV-PLUS - DCL.RTS FEATURE PATCH

PROBLEM:

The DCL LINK command can link programs written in any of several languages. The LINK command accepts a qualifier that specifies what language the program is written in. If the user does not specify such a qualifier, the LINK command assumes that the program is written in BASIC-PLUS-2 (as if the user had typed /BP2).

Your installation may find it convenient to change the default, especially if you do not have BASIC-PLUS-2. You can change the default to FORTRAN-IV, RT11 MACRO, DIBOL, FORTRAN-77, FORTRAN-IV-PLUS, or COBOL-81.

SOLUTION:

The patching procedure detailed allows you to make the LINK command default to /C81, /DIB, /F77, OR /F4P when the user does not specify a language. Refer to article Seq 20.2.8 F if you wish to make FORTRAN IV OR RT11 MACRO the default.

PROCEDURE:

1. This is a feature patch to the DCL run-time system. It may be installed in any DCL run-time system.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? DCL.RTS              (DCL run-time system name)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>             (RETURN for manual patch installation)
File to patch? [0,1]DCL.RTS         (DCL run-time system name)
File found in account [0,1]
```

   This patch is contained in a patch file appearing in patch kit version "A" or later.

NOTE

The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed.

4. The patch which follows changes the default language used by the DCL LINK command to COBOL-81. To default to DIBOL, substitute DIB$Q for C81$Q; to default to FORTRAN-77,substitute F77$Q for C81$Q; to default to FORTRAN-IV-PLUS,substitute F4P$Q for C81$Q;

```
Base address? ..LINL
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ??????  ? C81$Q     (or use DIB$Q, F77$Q, or F4P$Q)
??????  ØØØØØ2  177777  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD DCL<cr>                    (DCL run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD DCL/STAY/ADDR:nnn<cr>        (DCL run-time system name)
#EXIT<cr>

Ready
```

ENABLE COBOL-81 AND FMS RESIDENT LIBRARIES TO CLUSTER - PRELIN FEATURE PATCH

PROBLEM:

When you use the DCL LINK command to link a COBOL-81 program that uses FMS (LINK/C81/FMS), the command will fail with "?MEMORY ALLOCATION CONFLICT" if you selected clustering when you built the FMS resident library. Clustering enables the FMS and COBOL-81 resident libraries to share the same range of addresses. This makes 4K words of additional memory available to COBOL-81 programs that use FMS. For information on clustering, refer to the installation instructions for FMS.

SOLUTION:

The patching procedure detailed below will enable the FMS and COBOL-81 resident libraries to cluster, provided that you select clustering when you build the FMS resident library.

PROCEDURE:

1. For purposes of this discussion, we will assume that the program to be patched is located in your privileged account on the public disk structure. If this is not the case, replace all program references with suitable text according to the requirements of your installation.

   We assume the executable version of the program will be stored in the System Library Account ($). If this is not the case, replace references to $ in Step 3 below with the appropriate package or library account.

   The procedure below assumes that BASIC-PLUS is your system default run-time system.

   If you are using CSPCOM or BASIC-PLUS-2, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   If you are using BASIC-PLUS-2, this program should be compiled under the BASIC2 run-time system.

2. This patch is contained in a patch file appearing in patch kit version "A" or later. If you do not have this distribution you can produce a command file by specifying a file for [logfile=] in the procedure below.

   To apply the patch manually, perform the following RSTS/E system commands.

```
RUN $CPATCH<cr>
<CPATCH's header line>

File to patch - PRELIN.BAS=PRELIN.BAS<cr>
#[logfile=]KB:/CS:36934<cr>
*H/2!/V<cr>
2!              PROGRAM         : PRELIN.BAS
*H/1020<tab>/V<cr>
1020    PAT.CLSTR% = FALSE% &
*KI<cr>
PAT.CLSTR% = TRUE% &<cr>
<esc>*V<cr>
                ! BY DEFAULT DON'T CLUSTER FMS AND COBOL LIBRARIES &
*EX<cr>
Patch from _KB:[P,PN]CPATCH.CMD complete
#^Z
File to patch - ^Z

Ready
```

3. Use this procedure if your system default run-time system is BASIC-PLUS; otherwise, refer to Section 5.4 of the RSTS/E V7.2 Maintenance Notebook for the correct procedure to compile the program.

   To re-compile the program and re-enter it into the system library, type the following RSTS/E commands.

```
OLD PRELIN<cr>

Ready

COMPILE $PRELIN<232><cr>

Ready
```

4. The person making the changes to the program should now take whatever steps are necessary, according to installation guidelines, to save the new version of the program.

5. The source (.BAS) version of the program should now be removed from the public structure.

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USING RTSODT FOR DEBUGGING RUN-TIME SYSTEMS

A version of ODT is provided on the RSTS/E V7.2 distribution kit as an unsupported feature which can be linked with user-written run-time systems.

To use RTSODT with run-time systems that are assembled and task-built under the RSX run-time system you may specify "RTSODT" in the ODL file. For example:

```
; ODTBLD.ODL
;
;       *** RSXODT.RTS OVERLAY DESCRIPTION ***
;
; RSXODT VERSION V7.2
;

        .NAME   RSXODT
        .ROOT   RSXODT-LB:SYSLIB/DL-RSXEMU-RSXPMD-RSXRUN-RSXPLA-RSXKBM-ODT
;
; RSXRTS MUST BE THE FIRST MODULE LINKED IN ANY RSX BASED RTS
; RSXODT MUST BE THE LAST MODULE LINKED IN IF YOU WANT ODT
;
RSXEMU: .FCTR   LB:SYSLIB/LB:RSXRTS:RSXIO:RSXAST:RSXSST:RSXDIR
RSXPMD: .FCTR   LB:SYSLIB/LB:RSXPMD
RSXRUN: .FCTR   LB:SYSLIB/LB:RSXRUN
RSXPLA: .FCTR   LB:SYSLIB/LB:RSXPLA
RSXKBM: .FCTR   LB:SYSLIB/LB:RSXKBM:RSXAT:RSXHLP:RSXMCR
ODT:    .FCTR   LB:SYSLIB/LB:RTSODT
        .END
```

Refer to article Seq 22.1.2 N for a description of the use of RTSODT with run-time systems that are assembled and linked under the RT11 run-time system.

NOTES ON WRITING KEYBOARD MONITORS

A keyboard monitor is a program which accepts input from a job's "console" terminal or "keyboard", and takes action on the input (called "commands", or "keyboard monitor commands"). The result of a command may be the execution of a program, such as the BASIC-PLUS "RUN" command, or a CCL command. A keyboard monitor command may merely cause a change in the state of the job, such as the allocation of a device to the job, or the definition of a user logical name.

Every job on a RSTS/E system must have a default run-time system, and every run-time system which can be a job's default run-time system must have a keyboard monitor. Whereas run-time systems are generally difficult to write, and are normally written in MACRO-11, keyboard monitors are relatively easy to write, and in theory may be written in any programming language.

A "feature" patch of the RSX run-time system, as described in article Seq 21.3.5 F, provides a way for RSTS/E system programmers to implement their own keyboard monitors without having to learn the mysteries of run-time systems. However, some guidelines and precautions must be kept in mind.

First, let us examine some of the reasons why system programmers may want to write their own keyboard monitors.

- Change the user interface

  RSTS first came into existence at a time when most terminals were Model 33 Teletypes (R) or equivalents, and video display terminals were rare. Now, several years later, many RSTS/E systems may not have any hardcopy terminals other than the system console terminal. Many commercial applications using video display terminals are forms or menu driven. The standard RSTS/E keyboard monitors do not, and perhaps cannot, take advantage of video terminal features.

- Change the command set

  RSTS/E itself has a very limited command set that is shared by its various keyboard monitors. BASIC-PLUS has a somewhat fuller set of commands, but some of these are not relevant to someone not programming in BASIC-PLUS. DCL provides a rich command set, but it might not be appropriate for your system. Extending or changing the command set may be done through the use of CCL commands, but another way is to write a keyboard monitor.

- Many users of RSTS/E systems are non-programmers and they do not need access to the full capabilities of RSTS/E. Limiting what these users can do may actually help them. They do not have to learn commands which are irrelevant to their use of the system, and they are protected from typing commands by accident that would cause something to happen that they did not expect.

Next, let us review some guidelines for writing keyboard monitors.

- Open a channel for terminal I/O

  All standard RSTS/E keyboard monitors use channel Ø for terminal I/O because channel Ø is always open except when the job is detached. However, if a keyboard monitor is to use special terminal modes, such as echo control mode, open "KB:" on a channel other than Ø so that you can use those modes.

- Prompt for command input

  The "Ready" message is a prompt. So is a dot or a special character such as ">" or "$". So is a form on a screen. It is just a way to let the user know the keyboard monitor is ready for input. You may choose to have a different prompt, depending on whether the job is logged in or logged out. BASIC-PLUS prompts a logged-out job with "Bye". If you use a form to prompt, you should display a different form when the job is logged out, to let the other users know that they can log into the system using that terminal.

- Wait for a command line

  After prompting the user, wait for a command line from the keyboard. Execute a .READ or GET instruction, depending on the language. If you are coding in MACRO-11, you can put a value of -1 in the XRTIME word of the XRB, so that terminal service will flag the job as being in keyboard monitor wait state (displayed as "^C" by SYSTAT). However, you cannot do the same in BASIC-PLUS, which does not allow negative WAIT times.

- Convert the command line to upper case

  At least convert the command part of the line to upper case. (If you like, you may choose to convert to lower case.) At any rate, convert to one case before processing. Your users should be free to type their commands in either case and achieve the same results.

- Check for abbreviations

  The ability to abbreviate commands is not mandatory (BASIC-PLUS does not have it), but your users will love you for it. Each RSTS/E CCL command can be abbreviated to some minimum number of characters, usually two or three, when that command is added to the system. Any number of characters from the minimum to the full length of the command can be typed as the command. If you process your own commands this way, your users won't have to learn separate rules for your commands and for CCL commands.

- Let CCL do part of your work

  Getting a command line executed as a CCL command line is easy, especially in BASIC-PLUS (V7.2). However, you may want to impose some restrictions, rather than allowing every user to execute any CCL command. This is entirely governed by considerations specific to your system.

- RUN programs

  Implementing a RUN command is also easy in BASIC-PLUS, by using the CHAIN statement. If you can code in MACRO-11, the RUN command is not difficult in MACRO-11 either. However, consider whether you want to give your users the full gamut of all executable programs on the system.

- The rest is up to you

  After CCL commands and RUN, not many standard system commands are left. You may or may not need ASSIGN and DEASSIGN commands. You do need a BYE or LOGOUT command, but these are normally CCL commands already. You really have a free hand in designing your command set.

Lastly, observe the following precautions.

- Be careful with privileges

  It would be unusual for a keyboard monitor to require privileges. Thus, a keyboard monitor is normally non-privileged. If you do make it privileged for any reason, drop privileges temporarily upon entry to the program, regain privileges only long enough to execute privileged functions, and drop privileges again as soon as you can.

- Distinguish between logged-in and logged-out jobs

  Remember that logged-out jobs are always privileged. When the job is logged out, you don't want to process commands the same way as when the job is logged in. In fact, a keyboard monitor normally does not want to

process commands from a logged-out job at all. For this reason, the "feature" patch to the RSX run-time system does not allow the "menu" program to be called unless the job is logged in.

- Be careful with terminal types

  If your keyboard monitor is specifically written to handle video terminals with special characteristics, make sure other terminals on the system, such as hardcopy terminals, will still work. One way to achieve this is to include a very simple keyboard monitor mechanism in your keyboard monitor for such terminals. Another approach is to always invoke another keyboard monitor for such terminals (switch to another run-time system or run (CHAIN to) another program).

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MAKING TASK IMAGES NON-SWAPPABLE - RSX.RTS FEATURE PATCH

Sometimes a situation exists where it would be desirable to lock a job in memory so that it would not be swapped out between run bursts. The RSTS/E Programming Manual describes the BASIC-PLUS SYS call which locks a job in memory. This article describes how task images may be made non-swappable through the use of a Task Builder switch.

CAUTION

> Locking jobs in memory may cause fragmentation of user space and is normally not recommended. Use of the capability described in this article may cause severe system performance degradation, and may even lock out ALL other jobs on your system.

The Task Builder (TKB) switch "/CP" indicates a "checkpointable" or swappable task or job. This is the default for all .TSK files built by TKB. By specifying "/-CP" for the task output file, e.g.,

```
TKB TASK/-CP,MAP=OBJ
```

the resulting task image will be marked as non-swappable. When the task is run, if the patch described below is installed in the run-time system, the job will be locked for the duration of its execution. The job will be unlocked when the task terminates and "Ready" (or an equivalent prompt) is printed.

The following patch applies only to the RSX.RTS distributed with V7.2, and does not apply to any other run-time system. Thus, the only task images which can be locked in memory are those built to run under the RSX run-time system. This excludes all task images built using the HISEG option.

PROCEDURE:

1. This is a feature patch to the RSX run-time system only.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? RSX.RTS              (RSX run-time system name)
```

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3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>            (RETURN for manual patch installation)
File to patch? [Ø,1]RSX.RTS        (RSX run-time system name)
File found in account [Ø,1]
```

This patch is contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..NSW
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ØØØ24Ø  ? .SET
??????  ØØØØØ2  Ø137ØØ  ? ^C       (up-arrow/C to exit;CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, or if it is your system default run-time system, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD RSX<cr>                    (RSX run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD RSX/STAY/ADDR:nnn<cr>        (RSX run-time system name)
#EXIT<cr>

Ready
```

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DISABLING POST-MORTEM DUMPS FOR CTRL/C ABORTS - RSX.RTS FEATURE PATCH

The Post-Mortem Dump capability of the RSX run-time system is enabled for task images built with the Task Builder /PM switch. (See the RSTS/E Task Builder Manual.) When such a task is executed, a post-mortem dump file is created if the task is aborted for any reason. Thus, the error condition which caused the task to abort may be analyzed through examination of the saved job image.

Strictly speaking, typing CTRL/C to terminate the execution of a task is to abort it. For example, the program might be in an infinite loop, and, unless CTRL/C were typed, the program would continue to execute indefinitely. In such a case, a post-mortem dump caused by typing CTRL/C may reveal what the program was doing over and over again. However, it may not always be desirable to generate a dump at the typing of CTRL/C, while at the same time a dump is desired for other kinds of aborts. This article describes a feature patch to the RSX run-time system to disable the generation of post-mortem dumps when CTRL/C is typed to abort any task.

PROCEDURE:

1. This is a feature patch to the RSX run-time system.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? RSX.RTS              (RSX run-time system name)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>             (RETURN for manual patch installation)
File to patch? [Ø,1]RSX.RTS         (RSX run-time system name)
File found in account [Ø,1]
```

   This patch is contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..CCPM
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ØØØ4Ø4  ? 24Ø
??????  ØØØØØ2  123727  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, or if it is your system default run-time system, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD RSX<cr>                    (RSX run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD RSX/STAY/ADDR:nnn<cr>        (RSX run-time system name)
#EXIT<cr>

Ready
```

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CHANGE KEYBOARD MONITOR PROMPT - RSX.RTS FEATURE PATCH

The Keyboard Monitor in the RSX run-time system prompts with a "greater-than" sign (">") when it is ready to accept a command from the terminal. This prompt is analogous to the "Ready" message of BASIC-PLUS, or the "." (dot) printed by the RT11 run-time system. In RSTS/E V7.2, it is possible to make the RSX run-time system the system default run-time system. There are advantages to doing this. However, one side effect, which may be considered undesirable by some users, is that the familiar "Ready" message is not printed unless the job is using BASIC-PLUS as its private default run-time system.

The procedure described below will change the Keyboard Monitor prompt of the RSX run-time system from ">" to "<CR><LF>Ready<CR><LF><LF>" (logged in) and to "<CR><LF>Bye<CR><LF><LF>" (logged out). It also changes the RSX run-time system to behave like BASIC-PLUS in the following ways:

1. Typing an empty line does not result in another prompt.

2. Line Feed is echoed immediately after typing Carriage Return.

3. Typing CTRL/Z results in the "?End of file on device" error message.

PROCEDURE:

1. This is a feature patch to the RSX run-time system.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? RSX.RTS          (RSX run-time system name)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>         (RETURN for manual patch installation)
File to patch? [Ø,1]RSX.RTS     (RSX run-time system name)
File found in account [Ø,1]
```

This patch is contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..RDY
Offset address? 2
 Base   Offset  Old     New?
??????  000002  000001  ? 10.
??????  000004  001000  ? 0
??????  000006  000076  ? 5015
??????  000010  000000  ? "RE+20000
??????  000012  000000  ? "AD+20040
??????  000014  000000  ? 'Y+6440
??????  000016  000000  ? 5012
??????  000020  000000  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                 (CTRL/Z for new base)
Base address? ..BYE
Offset address? 2
 Base   Offset  Old     New?
??????  000002  000001  ? 8.
??????  000004  001000  ? 0
??????  000006  000076  ? 5015
??????  000010  000000  ? "BY+20000
??????  000012  000000  ? 'E+6440
??????  000014  000000  ? 5012
??????  000016  000000  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                 (CTRL/Z for new base)
Base address? ..RPT
Offset address? <lf>
 Base   Offset  Old     New?
??????  000000  012716  ? NOP
??????  000002  ??????  ? NOP
??????  000004  000207  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                 (CTRL/Z for new base)
Base address? ..RMOD
Offset address? <lf>
 Base   Offset  Old     New?
??????  000000  001000  ? 0
??????  000002  016646  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                 (CTRL/Z for new base)
Base address? ..EOF
Offset address? <lf>
 Base   Offset  Old     New?
??????  000000  000240  ? 4737
??????  000002  000240  ? ..ERMS
??????  000004  000207  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

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5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, or if it is your system default run-time system, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD RSX<cr>                    (RSX run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD RSX/STAY/ADDR:nnn<cr>        (RSX run-time system name)
#EXIT<cr>

Ready
```

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CHANGE PROGRAM NAME OF KEYBOARD MONITOR - RSX.RTS FEATURE PATCH

The Keyboard Monitor in the RSX run-time system sets up a "program name" of "...MCR" (Monitor Console Routine) when it is waiting for a command to be typed at a terminal. By comparsion, BASIC-PLUS sets up a program name of "NONAME", and the RT11 run-time system set up the name "RT11". This name is displayed by SYSTAT, or by typing CTRL/T (if the feature is included on the system). Some users may prefer to change the "...MCR" name to the familiar "NONAME", or to some other name of their choice.

The procedure described below will change the program name of the RSX Keyboard Monitor to "NONAME". Any other six-character alphanumeric (or RAD5Ø) name may be substituted.

PROCEDURE:

1. This is a feature patch to the RSX run-time system.

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? RSX.RTS              (RSX run-time system name)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>             (RETURN for manual patch installation)
File to patch? [Ø,1]RSX.RTS         (RSX run-time system name)
File found in account [Ø,1]
```

   This patch is contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..NAM
Offset address? <lf>
 Base   Offset  Old     New?
??????  000000  131574  ? %NON
??????  000002  050712  ? %AME
??????  000004  000000  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, or if it is your system default run-time system, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD RSX<cr>                    (RSX run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD RSX/STAY/ADDR:nnn<cr>        (RSX run-time system name)
#EXIT<cr>

Ready
```

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INVOKING A MENU PROGRAM - RSX.RTS FEATURE PATCH

PROBLEM:

Some installations may elect for certain users to return to a menu program, instead of one of the standard RSTS/E Keyboard Monitors such as BASIC-PLUS.

SOLUTION:

The following feature patch to the RSX run-time system will change its keyboard monitor such that it invokes a program called "MENU" in account [1,1Ø] instead of issuing its normal ">" prompt. "MENU" must be compiled (i.e.. executable). If a specific file type is required, include it in the following patch. Otherwise, the effect of the patch will be equivalent to typing "RUN [1,1Ø]MENU" to the keyboard monitor.

The first portion of the patch determines the filename specification of the menu program to be invoked. Any valid RSTS/E filename specification, including device, PPN, filename, and file type (up to 26 characters) may be patched in. The filename string begins at Base "..MENU", Offset Ø. Two ASCII characters per word may be patched in, using the quote (") prefix.

The second portion of the patch determines the line number at which the program is to be started. Be sure to include the decimal point (".") after the line number value so that it is interpreted as a decimal number.

If the menu program cannot be run for any reason, the RSX run-time system will default to its normal keyboard monitor.

PROCEDURE:

1. This is a feature patch to the RSX run-time system. It may be installed in any RSX run-time system. Alternatively, you may install it in a new run-time system created from the RSX run-time system. For example,

```
RUN $PIP.SAV<cr>
*SY:[Ø,1]MENU.RTS/MO:16=SY:[Ø,1]RSX.RTS<cr>
*^Z

Ready
```

2. The patch described in Step 4 below can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? RSX.RTS              (RSX run-time system name)
```

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>             (RETURN for manual patch installation)
File to patch? [Ø,1]RSX.RTS         (RSX run-time system name)
File found in account [Ø,1]
```

This patch is contained in a patch file appearing in patch kit version "A" or later.

NOTE

The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed. Specifically, change [1,1Ø]MENU to the desired account and program name.

4. The patch is as follows:

```
Base address? ..MENU
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  Ø2ØØ4Ø  ? "[1       (File specification
??????  ØØØØØ2  Ø2ØØ4Ø  ? ",1       (of menu program)
??????  ØØØØØ4  Ø2ØØ4Ø  ? "Ø]
??????  ØØØØØ6  Ø2ØØ4Ø  ? "ME
??????  ØØØØ1Ø  Ø2ØØ4Ø  ? "NU
??????  ØØØØ12  Ø2ØØ4Ø  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                  (CTRL/Z for new base)
Base address? ..LINE
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ØØØØØØ  ? Ø.        (Line number to start at)
??????  ØØØØØ2  ??????  ? ^C        (up-arrow/C to exit;CTRL/C for INIT)
```

5. If the above patch was installed using ONLPAT, it will take effect the next time the run-time system is reloaded. If the run-time system has been ADDed, or if it is your system default run-time system, execute the following commands:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#UNLOAD RSX<cr>                    (RSX run-time system name)
#EXIT<cr>

Ready
```

NOTE: The UNLOAD command will not remove the run-time system, but simply instructs the monitor to reload it the next time a job requests it.

If, in addition to being previously ADDed, the run-time system had been ADDed with the /STAY switch, also reload it as follows:

```
RUN $UTILTY<cr>
<UTILTY's header line>
#LOAD RSX/STAY/ADDR:nnn<cr>        (RSX run-time system name)
#EXIT<cr>

Ready
```

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CRF.TSK

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USING THE RSX CRF UTILITY

An RSX CRF.TSK utility is included on the RSTS distribution kit as an unsupported product. It is not, therefore, copied from the distribution by any of the build procedures. This program will create cross reference listings from the binary cross reference (.CRF) files optionally produced by the RSX task builder (TKB) and and RSX MACRO assembler (MAC). The cross reference file created by MAC lists page and line number references to data items and routines, whereas the cross reference file created by TKB lists tha names of the object modules which reference these items. The following are examples of these two types of output:

MACRO Assembler output:

```
CRF        CREATED BY  MACRO  ON 15-JUL-79 AT Ø6:Ø2     PAGE 1
SYMBOL CROSS REFERENCE                                   CREF   Ø7.Ø65
SYMBOL  VALUE           REFERENCES
CR      = ØØØØ15        #4-18Ø
FF      = ØØØØ14        #4-18Ø
HT      = ØØØØ11        #4-18Ø
LF      = ØØØØ12        #4-18Ø
L$$IST  = ******         1-1        1-2        2-53       3-1        4-182
RSTS    = ØØØØØ1        #4-39
R$$11M  = ØØØØØØ        #4-38
SPA     = ØØØØ4Ø        #4-18Ø
VT      = ØØØØ13        #4-18Ø
V1145   = ******         4-157
$$$VER  = Ø34Ø66        #3-2       #5-1
```

Task Builder output:

```
CRF        CREATED BY  TKB    ON 15-JUL-79 AT Ø6:23     PAGE 1

GLOBAL CROSS REFERENCE                                   CREF   Ø7.Ø65

SYMBOL  VALUE      REFERENCES...

A.BTTN  ØØØØØ2    # DIRSYM
A.DFUI  ØØØ1Ø2      CRFIN   # FCSGBL
A.LULU  ØØØØØ2    # DIRSYM
A.LUNA  ØØØØØ4    # DIRSYM
A.LUNU  ØØØØØ6    # DIRSYM
A.TRBA  ØØØØØ2    # DIRSYM
BADDIR  ØØØØØ1    # ERR       FIP
BADNAM  ØØØØØ2    # ERR       FIP
```

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More details on the CRF output can be found in the RSX-11 Utilities Procedures Manual.

To request that MAC or TKB produce a binary cross reference file, the /CR switch must be specified in the command line to these programs. For MAC the switch is included with the listing file specification and for TKB it is included with the map file specification. The binary file created has the same name as the listing or map file and its file type is always .CRF.

CRF.TSK is run using either the RUN command or the CRF CCL if installed. When run using the RUN command, CRF will prompt with "CRF>". Typing the CTRL/Z combination to this prompt will cause an exit to your default RTS. The command line is a single RSTS/E file specification of the file into which the cross reference listing is to be placed. The default file type for this file is .LST. If the file specified already exists, CRF appends the listing to it, otherwise a new file is created. The CRF output is variable length records and, therefore, if the file specified for output already exists, it must also be a variable length file. The listing file produced by MAC and the map file created by TKB are both variable length files making them prime candidates.

CRF also accepts as input an indirect command file (preceded by "@") which can contain a list of file specifications. Each specification in the file will be processed as if it was separately entered to the "CRF>" prompt. The default file type for the command file is .CMD. CRF only allows one level of command indirection.

CRF requires the binary cross reference file to have the same name as the output file with a file type of ".CRF". CRF always deletes the binary ".CRF" file when it is done. Therefore, if it is desirable to keep the binary file, it must be copied to a non-".CRF" file prior to running CRF.TSK.

USE OF UNDERSCORE IN RT-11 EMULATOR UTILITIES

RSTS/E allows the use of the underscore ("_") character before a device name in a file specification to indicate that the device name is not to undergo logical translation. Utilities provided with the RT-11 emulator will allow the use of the underscore character; however, due to the nature of the emulator, it is still possible for the device name to undergo translation before a file is opened.

In the RT-11 emulator, file specifications given to a utility are scanned using the RT-11 CSI (command string interpreter). At this time, the device designation may or may not undergo logical translation (depending on whether or not the underscore was used). The CSI returns RT-11 file description blocks to the utilities.

When the utility program then requests the emulator to open a file, the file open code does an additional logical translation on the specified device name. This is an unavoidable consequence of allowing logical device names to be specified in RT-11 file description blocks.

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Package Notes

USING RTSODT FOR DEBUGGING RUN-TIME SYSTEMS

A version of ODT is provided on the RSTS/E distribution kit as an unsupported feature which can be linked with user-written run-time systems.

To use RTSODT with run-time systems that are assembled and linked under the RT11 run-time system, execute the following commands:

```
RUN $LBR.TSK<cr>
LBR>RTSODT.OBJ=LB:SYSLIB/EX:RTSODT<cr>
LBR>^Z

Ready

RUN $PIP.SAV<cr>
*RTSODT.OBJ=RTSODT.OBJ/RMS:FB<cr>
*^Z

Ready
```

You may now include RTSODT.OBJ in the list of input files during the LINK. For example:

```
RUN $LINK<cr>
*RT11OD/Z,RT11OD/W,RT11OD=RT11/X/H:#177776/U:#4000/C<cr>
*#ERR.STB,#RTSODT<cr>
*PATCH<cr>
*^Z

Ready
```

Refer to article Seq 21.1.1 N for a description of the use of RTSODT with run-time systems that are assembled and linked under the RSX run-time system.

RSTS/E V7.2
RT-11 Emulator and Utilities Package
HOOK.SAV

NOTES ON HOOK.SAV

HOOK.SAV is a program which will write a bootstrap program on RSTS/E file-structured disks and magnetic tapes. Though it is intended only for use during SYSGEN, it can be used to make any RSTS/E file-structured disk or tape bootable.

Creating a bootable RSTS/E File-structured Disk

Mount the disk to be "HOOKed":

```
RUN $UTILTY<cr>
<UTILTY's header line>
#MOUNT xxn:packid/PRIVATE<cr>
#^Z
```

Ready

Copy INIT.SYS from your system disk to the output device:

```
RUN $PIP.SAV<cr>
*xxn:[Ø,1]*.*=SYØ:[Ø,1]INIT.SYS<cr>
*^Z
```

Ready

Then, run HOOK.SAV:

```
RUN $HOOK.SAV<cr>
*xxn:[Ø,1]INIT.SYS<cr>
Hook complete
*^Z
```

Ready

Creating a bootable RSTS/E DOS-format Magnetic Tape

Mount a scratch magnetic tape on a tape drive. (Note that HOOK.SAV will zero the tape before using it.) Then, run HOOK.SAV:

```
RUN $HOOK.SAV<cr>
*xxn:[Ø,1]INIT.SYS[/D[:n.]],SYØ:[Ø,1]INIT.SYS<cr>
Hook complete
*^Z
```

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HOOK.SAV

Ready

NOTES

1. Magnetic tape density: Specify "/D:n" after the "output" dev:filnam, as follows:

/D:800.	Set 800 BPI, odd parity
/D	Same as /D:800.
/D:1600.	Set 1600 BPI, phase encoded
/D:1600	Same as /D:1600.

Note:

- o /D:800 (no dot) is an illegal specification
- o If /D is not specified, the drive's current settings are used.
- o HOOK will assign the tape drive to you, in DOS format, at the density that you specify (or do not specify).

2. Normally, HOOK finds the bootstraps for disks and magnetic tapes in SY0:[0,1]INIT.SYS. If, as may happen on a development machine, [0,1]INIT.SYS does not have the most recent version of the appropriate bootstrap, you can specify an alternate file in which to find the bootstraps. Hence, a full HOOK command line looks like

<outdev:filename> , <file for mt-only> , <bootstraps>

The bootstrap file must meet the following criteria:

- o It must reside on a mounted disk
- o It must be a SAV-format SIL with a symbol table
- o It must have the global symbols "BOOTS" and "MBOOTS" defined for the start of the disk and magnetic tape boots, respectively.
- o The bootstraps must be in the standard RSTS/E format, 400(8) bytes for each disk bootstrap, and 1000(8) bytes for each magnetic tape bootstrap.
- o In short, the bootstrap file should look like INIT.SYS.

3. HOOK writes magnetic tapes with DOS labels. If the tape is written at 800 BPI, the name of the first file on the tape will be [0,1]MTBOOT.SYS. If the tape is written at 1600 BPI, the name of the first file will be [0,1]MSBOOT.SYS. Note that the difference is important; the 800 BPI bootstrap is significantly different from the 1600 BPI bootstrap.

4. If no filename is specified with the device specification for magnetic tape, the default name INIT.SYS is used, with the current PPN. In other words, if you are logged in under [123,1] and specify

    MT0:/D:800.,[0,1]FOO.FOO

    the files on the tape will be "[0,1]MTBOOT.SYS" and "[123,1]INIT.SYS".

    If you have any reason to wonder if a magnetic tape is bootable, check the directory, which should have 2 files with legal RSTS/E filenames. The first file should be 1 block long. If the directory looks unusual, it is not a bootable RSTS/E tape.

5. The following might be useful information.

    Standard command lines:

    DK0:[0,1]INIT.SYS
        Load and execute [0,1]INIT.SYS when DK0: is booted.

    MM1:[0,1]INIT.SYS/D:1600,DR0:[0,1]INIT.SYS
        Load and execute MM1:[0,1]INIT.SYS when MM1: is booted; copy the file to be executed from DR1:[0,1]INIT.SYS; set the density to 1600 BPI.

    Non-standard command lines:

    DB3:[0,1]INIT.SYS,,[4,4]NEWINI.SYS
        Load and execute [0,1]INIT.SYS when DB3: is booted; get the bootstrap from [4,4]NEWINI.SYS.

    MM0:,[0,1]INIT.SYS <not recommended>
        Load and execute a file called INIT.SYS that was copied from [0,1]INIT.SYS.

6. Possible Errors:

?Can't open disk NFS
Someone else is using the disk to be HOOKed, or you are not privileged.

?Can't open [Ø,1]SYØ:INIT.SYS
You must be privileged to run HOOK.SAV

?Directory error
The output disk is not a valid RSTS/E file-structured disk.

?File high limit too large
The file to be loaded by the bootstrap program is too large.

?Error reading boot block
An I/O error occurred while reading the disk to be HOOKed; it may be off-line.

?Error writing boot block
An I/O error occurred while writing the bootstrap program; the disk may be write-locked.

?Error reading pack ID
An I/O error occurred while reading the disk to be HOOKed.

?Error reading INIT.SYS
An I/O error occurred while reading INIT.SYS.

?Explicit unit number required
The device name specified must include an explicit unit number.

?Ill cmd?
HOOK.SAV could not interpret the specified command line.

?Illegal density
The density that you specified cannot be used on this tape drive.

?Illegal overlay number in INIT
You are using an obsolete version of INIT.SYS.

?INIT.SYS is not a SAV format SIL
You are using an obsolete version of INIT.SYS.

?Not a bootable device
HOOK.SAV cannot write a bootstrap for that device.

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HOOK.SAV

?Null file can't be hooked
    Self explanatory.

?No BOOT in STB
    You are using an obsolete version of INIT.SYS.

Second input file required for magtape hook
    You must specify a file to be copied to the magnetic tape.

?UFD open failure
    An I/O error occurred.

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RT-11 Emulator and Utilities Package
PIP.SAV

SETTING /NEWFILE AS A DEFAULT PIP.SAV OPTION - PIP.SAV FEATURE PATCH

PROBLEM:

When transferring a disk file to a new disk file, PIP transfers the creation date and time, and last access date of the existing file to the newly created file. This may be undesirable in some environments where files are backed up by creation or access dates.

SOLUTION:

This problem may be solved on a per-command basis by using the /NEWFILE option. However, if it is deemed that this operation is desired as the default, the following PIP patch may be applied.

If this patch is applied /NEWFILE will be the default operation. To transfer a file and retain all accounting information the /RETAIN switch may be used on a per-command basis to override the new default.

PROCEDURE:

1. This is a feature patch to PIP.SAV.

2. The patch described in Step 4 below can NOT be installed using the PATCH option of INIT.SYS.

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>              (RETURN for manual patch installation)
File to patch? [1,2]PIP.SAV
File found in account [1,2]
```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..NEWF
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ØØ1Ø37  ? (Q&377)+BR
??????  ØØØØØ2  ØØ5767  ? ^C        (up-arrow/C to exit)
```

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PIP.SAV

TRANSFERRING FILES BY DATE OF LAST ACCESS - PIP.SAV FEATURE PATCH

PROBLEM:

PIP allows file operations selectively by creation date through the use of a number of switches (i.e., /TODAY, /SINCE, /UNTIL, etc.). In some instances it would be desirable to have such switches key off of the last access date.

SOLUTION:

Two new switches have been added to PIP to allow specifying either creation date (/CREATION) or date of last access (/DLA). The default operation is to key off of the creation date. The following patch will set the default operation to key all date selections off of the date of last access.

PROCEDURE:

1. This is a feature patch to PIP.SAV.

2. The patch described in Step 4 below CANNOT be installed using the INIT.SYS PATCH option.

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>              (RETURN for manual patch installation)
File to patch? [1,2]PIP.SAV
File found in account [1,2]
```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..DLAC
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ØØ1ØØ2  ? (Q&377)+BR
??????  ØØØØØ2  Ø167ØØ  ? ^C        (up-arrow/C to exit)
```

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RT-11 Emulator and Utilities Package
PIP.SAV

REQUIRING VOLUME I.D. SPECIFICATIONS WITH ANSI MAGNETIC TAPES - PIP.SAV FEATURE PATCH

PROBLEM:

When using PIP.SAV to write multi-volume ANSI format magnetic tapes, a volume ID may be specified when mounting a tape. The default action for PIP is to check the volume I.D. against that of the tape being mounted, and if the two do not match to reject the mounted tape. In some environments it might be desirable to force the specification of the volume I.D. to insure maximum tape security.

SOLUTION:

The following patch will reject the mounting of an ANSI format magnetic tape if no volume I.D. is specified.

PROCEDURE:

1. This is a feature patch to PIP.SAV.

2. The patch described in Step 4 below can NOT be installed using the PATCH option of INIT.SYS.

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>          (RETURN for manual patch installation)
File to patch? [1,2]PIP.SAV
File found in account [1,2]
```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..VIDS
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ØØØ4Ø3  ? NOP
??????  ØØØØØ2  Ø327Ø4  ? ^C       (up-arrow/C to exit)
```

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PIP.SAV

SETTING /LOG AS A DEFAULT PIP.SAV OPTION - PIP.SAV FEATURE PATCH

PROBLEM:

In some environments it is desirable to have the /LOG option with PIP.SAV set for all transactions.

NOTE

Certain control files for older products which use PIP.SAV may not run with this optional feature patch installed.

SOLUTION:

The following PIP.SAV feature patch will set the /LOG option for every PIP.SAV command which allows the use of /LOG. Note that the /NOLOG switch may be used to suppress the logging for a particular operation.

PROCEDURE:

1. This is a feature patch to PIP.SAV.

2. The patch described in Step 4 below can NOT be installed using the PATCH option of INIT.SYS.

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>              (RETURN for manual patch installation)
File to patch? [1,2]PIP.SAV
File found in account [1,2]
```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..SCNF
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  ØØØØØØ  ? 1ØØØØØ
??????  ØØØØØ2  ØØ4437  ? ^C        (up-arrow/C to exit)
```

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RT-11 Emulator and Utilities Package
PIP.SAV

MAKING /ERASE IMPLY /DELETE - PIP.SAV FEATURE PATCH

PROBLEM:

Some users may want to make the /ERASE switch imply /DELETE.

SOLUTION:

The patching procedure detailed below will cause the /ERASE switch to imply /DELETE.

PROCEDURE:

1. This is a feature patch to PIP.SAV.

2. The patch described in Step 4 below can NOT be installed using the PATCH option of INIT.SYS.

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>              (RETURN for manual patch installation)
File to patch? [1,2]PIP.SAV
File found in account [1,2]
```

   This patch is contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..ERDE
Offset address? Ø
 Base   Offset  Old     New?
??????  ØØØØØØ  Ø1ØØØØ  ? 1ØØØ1
??????  ØØØØØ2  ØØØØØØ  ? ^C        (up-arrow/C to exit)
```

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PIP.SAV

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CHANGING THE MAXIMUM ALLOWABLE MAGNETIC TAPE BLOCKING SIZE
- PIP.SAV FEATURE PATCH

PROBLEM:

The current maximum allowable blocking size that PIP permits on magnetic tape is 4Ø96. Some installations may want to change this to 8192. to allow better usage of magnetic tape.

SOLUTION:

The procedure described below shows how this can be accomplished.

NOTE

> Unless the CCL '/SI' switch is used to increase PIP's size or the procedure described in article Seq 22.1.3 N is used to increase the default load size, PIP will not allow larger blocksizes because of lack of buffer space. This can be overcome by changing PIP's size to 2ØK words.

PROCEDURE:

1. This is a feature patch to PIP.SAV.

2. The patch described in Step 4 below can NOT be installed using the PATCH option of INIT.SYS.

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>              (RETURN for manual patch installation)
File to patch? [1,2]PIP.SAV
File found in account [1,2]
```

   This patch is contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..BSHI
Offset address? Ø
 Base    Offset  Old      New?
??????  ØØØØØØ  Ø1ØØØØ  ? 8192.
??????  ØØØØØ2  ØØ3ØØ4  ? ^C        (up-arrow/C to exit)
```

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SAVRES.SAV

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CHANGE SAVRES DEFAULT DENSITY TO 1600 BPI - SAVRES.SAV FEATURE PATCH

PROBLEM:

SAVRES, as released, defaults to the lowest density (of 800 BPI and 1600 BPI) allowed by a given tape drive (normally 800 BPI) for all tape I/O. It may be desirable at some installations to have SAVRES default to the highest density allowed by a given tape drive for more compact storage of data. This is especially true if all drives on the system support 1600 BPI and the problem described below is not applicable.

CAUTION

> If the tape drive being used has a TM02 formatter, the hardware bootstrap of a 1600 BPI tape will not be possible. (You can determine the formatter type by using the HARDWR LIST suboption of INIT.) Therefore, if it is desirable for SAVRES to create tapes which are bootable on such a drive it is recommended that this patch not be installed. Normally, TU16 and TU45 drives use a TM02 formatter, TE16 and TU77 drives do not.

SOLUTION:

The following feature patch will cause SAVRES to default to the highest density allowed by a given tape drive for all tape I/O. This default can be overridden by attaching the /DENSITY:800 switch to the device specification. Refer also to article Seq 1.1.1 F, which supplies a similar patch for the SAVRES option of INIT.

PROCEDURE:

1. This is a feature patch to SAVRES.SAV.

2. The patch described in Step 4 below can NOT be installed using the PATCH option of INIT.SYS.

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>              (RETURN for manual patch installation)
File to patch? [1,2]SAVRES.SAV
File found in account [1,2]
```

The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? DIACTL
Offset address? 310
 Base   Offset  Old     New?
??????  000310  030070  ? "16
??????  000312  177460  ? "00
??????  000314  033061  ? 034377
??????  000316  030060  ? <lf>      (no change; verify only)
??????  000320  000377  ? <lf>      (no change; verify only)
??????  000322  001440  ? 1600.
??????  000324  003100  ? 800.
??????  000326  000000  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                 (CTRL/Z for new base)
Base address? SAVCTL
Offset address? 42
 Base   Offset  Old     New?
??????  000042  030070  ? "16
??????  000044  177460  ? "00
??????  000046  033061  ? 034377
??????  000050  030060  ? <lf>      (no change; verify only)
??????  000052  000377  ? <lf>      (no change; verify only)
??????  000054  001440  ? 1600.
??????  000056  003100  ? 800.
??????  000060  000000  ? ^Z        (CTRL/Z for new offset)
Offset address? ^Z                 (CTRL/Z for new base)
Base address? RESCTL
Offset address? 30
 Base   Offset  Old     New?
??????  000030  030070  ? "16
??????  000032  177460  ? "00
??????  000034  033061  ? 034377
??????  000036  030060  ? <lf>      (no change; verify only)
??????  000040  000377  ? <lf>      (no change; verify only)
??????  000042  001440  ? 1600.
??????  000044  003100  ? 800.
??????  000046  000000  ? ^C        (up-arrow/C to exit)
```

RSTS/E V7.2
RT-11 Emulator and Utilities Package
SAVRES.SAV

MAKING /NOERROR THE DEFAULT - SAVRES.SAV FEATURE PATCH

PROBLEM:

The /NOERROR switch indicates that SAVRES should abort under the following conditions:

1. A contiguous file is made non-contiguous
2. A placed file is "unplaced"
3. A bad comparison occurs
4. An unexpected bad block is encountered on the input RSTS/E disk in a SAVE or IMAGE operation

Some installations, however, may always want SAVRES to abort under these circumstances.

SOLUTION:

The following feature patch will make /NOERROR, rather than /ERROR, the default in SAVRES.SAV. Note that the user may override the default for a particular operation by specifying /ERROR. Refer also to article Seq 1.1.2 F, which supplies a similar patch for the SAVRES option of INIT.

PROCEDURE:

1. This is a feature patch to SAVRES.SAV.

2. The patch described in Step 4 below can NOT be installed using the PATCH option of INIT.SYS.

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>              (RETURN for manual patch installation)
File to patch? [1,2]SAVRES.SAV
File found in account [1,2]
```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

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4. The patch is as follows:

```
Base address? ..NOER
Offset address? 2
 Base   Offset  Old     New?
??????  000002  000010  ? 4
??????  000004  ??????  ? <lf>      (no change)
??????  000006  ??????  ? <lf>      (no change)
??????  000010  ??????  ? <lf>      (no change)
??????  000012  000004  ? 10
??????  000014  ??????  ? ^C        (up-arrow/C to exit)
```

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RT-11 Emulator and Utilities Package
SAVRES.SAV

Seq 22.19.3 F

1 of 1

MAKING /NOSTATS THE DEFAULT - SAVRES.SAV FEATURE PATCH

PROBLEM:

SAVRES always prints a summary report after completing a transfer unless the /NOSTATS (no statistics) switch is specified. Certain installations may prefer that this report NOT be printed unless specifically requested.

SOLUTION:

The following feature patch will make /NOSTATS, rather than /STATS, the default in SAVRES.SAV. Note that the user may override this default for a particular operation by specifying /STATS. Refer also to article Seq 1.1.3 F, which supplies a similar patch for the SAVRES option of INIT.

PROCEDURE:

1. This is a feature patch to SAVRES.SAV.

2. The patch described in Step 4 below can NOT be installed using the PATCH option of INIT.SYS.

3. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <cr>              (RETURN for manual patch installation)
File to patch? [1,2]SAVRES.SAV
File found in account [1,2]
```

   The patch is also contained in a patch file appearing in patch kit version "A" or later.

4. The patch is as follows:

```
Base address? ..NOST
Offset address? 2
 Base   Offset  Old     New?
??????  000002  000040  ? 20
??????  000004  ??????  ? <lf>      (no change)
??????  000006  ??????  ? <lf>      (no change)
??????  000010  ??????  ? <lf>      (no change)
??????  000012  000020  ? 40
??????  000014  ??????  ? ^C        (up-arrow/C to exit)
```

6.Ø Software Product Descriptions (SPDs) and Option Bulletins

6.1 Software Product Descriptions (SPDs)

Periodically, new or revised Software Product Description (SPD) bulletins will appear in the RSTS/E Software Dispatch for various software products marketed by DIGITAL. This section of the notebook is provided as a convenient place to file these SPDs for future reference.

Every SPD has a unique number, a sample of which is shown below:

SPD 13.1.2Ø

This number appears on the first page of the SPD bulletin, at the far right hand side of the PRODUCT NAME: line.

Note that the last part of the SPD number is the revision level, with Ø being assigned for original issues of SPDs.

6.2 Option Bulletins

Periodically, new or revised Option Bulletins will appear in the RSTS/E Software Dispatch for various products marketed by DIGITAL. This section of the release notes is provided as a convenient place to file these bulletins. There is no filing scheme for option bulletins.

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