RT-11

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THE SOFTWARE DISPATCH

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RT-11 SOFTWARE DISPATCH

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The RT-11 Software Dispatch complements the RT-11 Software Dispatch Review. New and revised Software Product Descriptions, programming notes, software problems and solutions, and documentation corrections are published here. Much of the material is developed from Software Performance Report (SPR) answers significant to the general audience and is printed here to supplement the maintenance notebook (established by the Software Dispatch Review).

PRODUCTS SUPPORTED in the RT-11 SOFTWARE DISPATCH

APL-11 V1
BASIC-11/RT-11 V2
BASIC/RT Extensions V1
COS-350/2780
CTS-300 V3, V4, V5
CTS-300 DICAM V1
CTS-300 DICAM II V1
CTS-300/DIS V1
DECnet/RT V1
FOCAL/RT-11 V1B
FORTRAN Graphics Package V1.1
FORTRAN/RT-11 Extensions V1B
FORTRAN/RT-11 LSI Extensions V1
FORTRAN IV/RT-11 V2
GAMMA-11 F/B V2, V2C
Industrial BASIC/RT-11 V1
Lab Applications-11 V3
LSP-11 V1
MSB11 V1
MSB/FORTRAN IV V1
MU BASIC-11/RT-11 V1
PDL/RT-11 V1
PEAK-11 V2
PLOT 11/RT-11 V1.1
RT-11/03 FORTRAN Extensions V1
REMOTE/RT-11 V1
RT-11 V3, V3B
RT-11 (CTS-300) /LSI-11 2780 V2
RT-11/2780 (CTS-300/ 2780) V2
SSP-11/RT-11 V1

DISTRIBUTION

The RT-11 Software Dispatch is directed to one software contact for each software product. No mailing will be made to addresses without a software contact name. **Address change requests should be sent to the nearest DIGITAL field office. Include the new address and mailing label from the most recently received publication.**

Software binary and sources are provided under licenses only. The standard Terms and Conditions, OEM Agreement, and/or Quantity Discount Agreement contain the licenses for all binaries other than DECsystem-10.

Eleanor F. Hunter, Editor
Ann Owens, Associate Editor

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SPR USER LETTER

Submitted by Sheila Hatchell, 8/11 Administration

The Dispatch SPR User Letter has been revised to reflect the new SPR form which is now available. These forms can be obtained from your local DIGITAL Office or SPR Center, or by requesting them from SPR Administration.

How to Make the Best Use of the SPR Form

What We Can Do for You:

1. Blank SPR forms are available upon request in the desired quantities through the SPR Administration (P.O. Box F) and your local office/SPR Center.
2. Copies of the SPR acknowledgement and answer are sent to the appropriate DIGITAL Office/SPR Center for their information.
3. STATUS FOR SUBMITTED SPRs IS PROVIDED UPON REQUEST.
4. SPRs marked PROBLEM/ERROR will have a response for DIGITAL SUPPORTED products. These SPRs should refer to suspected deficiencies in the software.
5. SPRs marked SUGGESTION are forwarded to the pertinent software group for information purposes, and are responded to at their discretion.

What Your Can Do for Us:

1. Fill out the form completely either by typing or printing clearly. **PLEASE INCLUDE YOUR SOFTWARE SERVICE CUSTOMER NUMBER IN THE ADDRESS BOX.**
2. Limit only one problem per SPR form. Several problems on an SPR can lengthen the turnaround time.
3. WHENEVER POSSIBLE, SUBMIT AN SPR WITH ATTACHMENTS, SUCH AS MACHINE READABLE DATA, DETAILED INSTRUCTIONS ON HOW TO REPRODUCE THE PROBLEM, PROGRAM AND/OR DATA FILES, LISTINGS, AND CONSOLE LOG.
4. It would be helpful to all concerned if problems with patches are reported as soon as possible.
5. For security SPRs, it is imperative that the DO NOT PUBLISH box be marked.
6. It would be helpful if tapes submitted with SPRs are labeled (track and density), and have a directory attached.
7. Complete the questionnaire that is supplied with each SPR answer. Your feedback is essential in monitoring the quality of our responses.
8. SPRs should not be used for problems concerning software policy, software distribution, or hardware. The local office should be contacted in these cases.

CTS-3ØØ VØ5
DIBOL
TSD VBØ5-Ø1H
XMTSD VCØ5-Ø1F
(PATCH 18)

ACCEPT CAUSES ERRORS (LG)

Under TSD and XMTSD, if ACCEPT instructions are used to read single characters from a data file and place them in an A1 field, a TRAP TO 4 or an Inconsistent OPEN error message will occur under the following conditions:

a. the data file is not terminated with a CTRL/Z.

b. the last block of the file has at least one null character following the last record.

Patch 18 corrects this problem so that a "MOUNT SUCCESSOR FOR INPUT" message is generated in the situation described above.

The version number of TSD changes to VB05-01I, and XMTSD changes to VC05-01G.

Using the editor, create the following source files. Name them as indicated in the comment line that begins each file. Then, to install the patch, follow the procedure shown following the source files.

```
;P018A.MAC

        .TITLE  $DIO
        .CSECT  $DIO

        .=      .+5420
        JSR     PC,P018A
        .PSECT  $P018A
P018A:  MOV     R2,12(R1)
        MOV     R1,R2
        RTS     PC
        .END


;P018V1.MAC

        .TITLE  DTO
        .CSECT  DTO

        .=      .+4543
        .ASCII  /I/

        .END


;P018B.MAC

        .TITLE  $KDIO
        .CSECT  $DIO

        .=      .+4740
        JSR     PC,P018B
        .PSECT  $P018B
P018B:  MOV     R2,12(R1)
        MOV     R1,R2
        RTS     PC
        .END


;P018V2.MAC

        .TITLE  $KDTO
        .CSECT  $KDTO

        .=      .+4110
        .ASCII  /G/

        .END
```

CTS-3ØØ VØ5
DIBOL
TSD VBØ5-Ø1H
XMTSD VCØ5-Ø1F
(PATCH 18)


```
.MACRO P018A,P018V1,P018B,P018V2
ERRORS DETECTED:  0
ERRORS DETECTED:  0
ERRORS DETECTED:  0
ERRORS DETECTED:  0

.RENAME (DIO,DTO,KDIO,KDTO).OBJ *.OLD
 Files renamed:
DK:DIO.OBJ      to DK:DIO.OLD
DK:DTO.OBJ      to DK:DTO.OLD
DK:KDIO.OBJ     to DK:KDIO.OLD
DK:KDTO.OBJ     to DK:KDTO.OLD

.R PAT
*DIO.OBJ=DIO.OLD/C:151124,P018A/C:012641

.R PAT
*DTO.OBJ=DTO.OLD/C:112203,P018V1/C:003170

.R PAT
*KDIO.OBJ=KDIO.OLD/C:160315,P018B/C:013727

.R PAT
*KDTO.OBJ=KDTO.OLD/C:075677,P018V2/C:005470

.R TSDGEN       ;FOR NORMAL TSD

.R TSDGEN       ;FOR EXTENDED MEMORY TSD
```

CTS-3ØØ VØ5 Seq 14 M
DIBOL
SUD VAØ5-Ø1F 1 of 2
(PATCH 19)

I-O ERROR ON ISAM STORE/DELETE (LG)

The problem described below occurs under the Single-Job monitor and Single-User DIBOL only.

If you are STOREing or DELETEing records in an ISAM file, when a group splits it is possible to receive an error 22 I-O ERROR, where no error should be received at all.

Patch 19 corrects this problem and changes the version number of SUD to VAØ5-Ø1G.

Using the editor, create the following source files. Name them as indicated in the comment line that begins each file. Then, to install the patch, follow the procedure shown following the source files.

CTS-3ØØ VØ5 Seq 14 M
DIBOL
SUD VAØ5-Ø1F 2 of 2
(PATCH 19)

```
;P019.MAC

        .TITLE  $ISAM
        .CSECT  $ISAM

P019:
        .=      .+3362
        JMP     P019A
        .PSECT  $P019

P019A:  BCC     4$
        TSTB    @#52
        BEQ     4$
        JMP     P019+3370
4$:     JMP     P019+3376
        .END


;P019V1.MAC

        .TITLE  DIRT
        .CSECT  $DIRT

        .=      .+11103
        .ASCII  /G/

        .END


.MACRO P019,P019V1
ERRORS DETECTED:  0
ERRORS DETECTED:  0

.RENAME ISAM.OBJ,DIRT.OBJ *.OLD
 Files renamed:
DK:ISAM.OBJ     to DK:ISAM.OLD
DK:DIRT.OBJ     to DK:DIRT.OLD

.R PAT
*ISAM.OBJ=ISAM.OLD/C:156363,P019/C:016570

.R PAT
*DIRT.OBJ=DIRT.OLD/C:122216,P019V1/C:005253


.R LIBR
*DIBOL=DIBOL,DIRT/R
*^C
```

RT-11 VØ3B-ØØ
MONITOR
FB VØ3B-ØØE
FB (S) VØ3B-ØØM
XM (S) VØ3B-ØØS

Seq 31 M
1 of 2
Supersedes article dated Jan 1980

PROBLEM WHEN FOREGROUND AND BACKGROUND JOB USE CSI AT SAME TIME
(SPR 11-24615 MAS)

**Replacement Article for patch Seq 31 M published in January 198Ø. The original article did not include the binary FB monitor patch for the PD and DD monitors. Also, the size of BSTRAP.MAC must be increased from 57 to 68 blocks.

If a foreground job is using the CSI, and a background job or keyboard command uses the CSI at the same time, unpredictable results occur. Either or both jobs may function incorrectly, or be aborted prematurely.

The following patches will correct this problem.

The binary FB monitor patch contains the variable xx, which represents the physical device name for your system volume. If the physical device name is RK, RF, DX, DT, DP, DY, DS, or DM install the following patch.

```
.R PATCH <RET>

FILE NAME--
*xxMNFB.SYS/A/C <RET>
*4764\  1Ø5     1Ø6 <RET>
*41Ø46/ 42737   52737 <RET>
*E

Checksum?       16Ø1 <RET>
```

If the physical device name is PD or DD, install the following patch.

```
.R PATCH <RET>

FILE NAME--
*xxMNFB.SYS/A/C <RET>
*4764\  1Ø5     1Ø6 <RET>
*41Ø66/ 42737   52737 <RET>
*E

Checksum?       26Ø1 <RET>
```

The resultant version will be RT-11FB VØ3B-ØØF.

RT-11 VØ3B-ØØ Seq 31 M
MONITOR
FB VØ3B-ØØE 2 of 2
FB (S) VØ3B-ØØM
XM (S) VØ3B-ØØS

The following changes are for SYSGENed monitors only.

Patch to RT-11FB (S)VØ3B-ØØM and RT-11XM (S)VØ3B-ØØS.

```
.R EDIT <RET>
*EBBSTRAP.MAC[68]<ESC>RV<ESC><ESC>
;BSTRAP EDIT LEVEL 22
*G22<ESC>-DI3<ESC>V<ESC><ESC>
;BSTRAP EDIT LEVEL 23
*FBSTRNG:<ESC>GFB<ESC>V<ESC><ESC>
        .ASCIZ  "FB (S)VØ3B-Ø'...'M"
*GM<ESC>-DIN<ESC>V<ESC><ESC>
        .ASCIZ  "FB (S)VØ3B-Ø'...'N"
*GXM<ESC>V<ESC><ESC>
        .ASCIZ  "XM (S)VØ3B-Ø'...'S"
*G'S<ESC>-DIT<ESC>V<ESC><ESC>
        .ASCIZ  "XM (S)VØ3B-Ø'...'T"
*EX<ESC><ESC>

.


.R EDIT <RET>
*EBRMONFB.MAC[155]<ESC>RV<ESC><ESC>
;RMONFB EDIT LEVEL 11
*G11<ESC>-DI2<ESC>V<ESC><ESC>
;RMONFB EDIT LEVEL 12
*FC$SIGN:<ESC>GGTLIN$<ESC>ØAL<ESC><ESC>
        BIC     #GTLIN$,@#JSW
*GC<ESC>-DIS<ESC>V<ESC><ESC>
        BIS     #GTLIN$,@#JSW
*EX<ESC><ESC>
```

The resultant version will be RT-11FB (S)VØ3B-ØØN and RT-11XM (S)VØ3B-ØØT.

RT-11 VØ3B-ØØ
MONITOR
SJ (S) VØ3B-ØØI

Seq 32 M

1 of 1

SYSTEM GENERATED SJ MONITOR WITH ESCAPE SEQUENCE SUPPORT (JM)

A single job monitor generated with escape sequence support will not boot. The escape sequence conditional code in RMONSJ.MAC causes a symbol (TTO2) to be out of place. The result is that a wrong value is restored from the stack.

The following source changes correct the problem in RT-11SJ (S) VØ3B-ØØI.

```
.R EDIT <RET>
*EBBSTRAP.MAC[69]<ESC>RV<ESC><ESC>
;BSTRAP EDIT LEVEL 23
*G3<ESC>=C4<ESC>V<ESC><ESC>
;BSTRAP EDIT LEVEL 24
*2FSJ<ESC>V<ESC><ESC>
        .ASCIZ  "SJ (S) VØ3B-Ø'...'I"
*GI<ESC>=CJ<ESC>V<ESC><ESC>
        .ASCIZ  "SJ (S) VØ3B-Ø'...'J"
*EX<ESC><ESC>

.

.R EDIT <RET>
*EBRMONSJ.MAC[71]<ESC>RV<ESC><ESC>
;RMONSJ EDIT LEVEL 2
*G2<ESC>=C3<ESC>V<ESC><ESC>
;RMONSJ EDIT LEVEL 3
*FTTO2:<ESC>V<ESC><ESC>
TTO2:   TST     (PC)+
*I<RET>
$-ASK<ESC>-3AU-LL<ESC><ESC>
TTO2:
.IF     NE      ESC$P
*EX<ESC><ESC>

.
```

After installing the above source patches, re-assembling, and re-linking the resultant version will be RT-11SJ (S) VØ3B-ØØJ.

RT-11 VØ3B-ØØ Seq 12 M
SOURCE
DM.MAC 1 of 1

HARD ERROR RECOVERY IN DM HANDLER (11-25677 SD)

The DM handler does not reset the controller error bit when a hard error occurs causing the next access to also fail.

The following patch will correct this problem.

```
.R EDIT <RET>
*EBDM.MAC<ESC>RV<ESC><ESC>
; DM EDIT LEVEL 2.
*G2<ESC>-C3<ESC>V<ESC><ESC>
; DM EDIT LEVEL 3.
*FDMHENL:<ESC>V<ESC><ESC>
DMHENL: BIS     #1,@-(R5)
*AV<ESC><ESC>
.IF NE RK6$S
*I      BIS     #CERR,@R4       ;SHDØ3 <RET>
<ESC>-AV<ESC><ESC>
        BIS     #CERR,@R4       ;SHDØ3
*EX<ESC><ESC>
```

RT-11 VØ3B-ØØ Seq 24 M
UTILITIES
DUMP VØ3.Ø3 1 of 1

DUMPING DISK FILES WITH MAGTAPE HANDLER LOADED (11-27695 MG)

PROBLEM:

If a magtape handler (MM or MT) is LOADed, attempting to dump a disk using either the /O or /S switch confuses DUMP, which begins sequentially accessing each block on the disk until it reaches the first block to be dumped. The '**** TAPE MARK ****' message is also issued after the last block of a disk file is dumped.

The following mandatory patch corrects the problem.

Patch to DUMP VØ3.Ø3:

```
.R PATCH<RET>

FILE NAME--
*DUMP.SAV/C<RET>
*3402/  5001    12701<LF>
3404/   112767  2<LF>
3406/   2       12700<LF>
3410/   3112    5732<LF>
3412/   12703   12746<LF>
3414/   4446    5736<LF>
3416/   10300   104342<LF>
3420/   12746   103415<LF>
3422/   6736    116703<LF>
3424/   104342  3310<LF>
3426/   103403  120327<LF>
3430/   5767    11<LF>
3432/   3306    1411<LF>
3434/   1012    5201<LF>
3436/   105267  120327<LF>
3440/   3062    20<LF>
3442/   62703   1405<LF>
3444/   2       5201<LF>
3446/   5201    120327<LF>
3450/   20127   13<LF>
3452/   3       1401<LF>
3454/   1360    5003<LF>
3456/   105067  110367<RET>
*6722\  40      101<RET>
*E

Checksum?  55403<RET>
```

The resultant version is DUMP VØ3.Ø3A.

RT-11 SOFTWARE DISPATCH
CUMULATIVE INDEX
MARCH 1980

This is a complete listing of all articles for current versions of RT-11 and related products. In the case of subordinate software, missing sequence numbers may pertain to problems unique to interaction with previous versions of the same product or other major operating systems.

IMPORTANT!

Unassigned articles are indicated: UNASSIGNED.

Flags are currently being installed for all articles. The flags and definitions are as follows:

M = Mandatory Patch. These patches correct errors in the software product. All users are required to apply these patches to maintain consistent "user level" unless the accompanying article specifies otherwise.

F = Optional Feature Patch. These patches extend or configure functionality into the product. These functions will be treated as a supported part of the product for the duration of the current release and will be incorporated with any future release, unless otherwise stated.

R = Restriction. These articles discuss areas that will not be patched in the current release because they require major modification 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 manual set and provide more detailed information about a program or package. They also provide procedural information to make it easier to use a program or package.

Component	Sequence	Mon/Yr
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APL WORKSPACE	03 R	Nov 77
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INTERNAL MEMORY ALLOCATION PROBLEMS	05 M	Dec 77
ERROR FOR SCALAR RESULT OF DECODE OR INNER PRODUCT OPERATION	06 M	Feb 78
SYSTEM ERROR ON PARAMETER RETURN	07 M	May 78
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RESEQUENCE PRODUCES AN INCORRECT PROGRAM UNDER CERTAIN CONDITIONS	01 M	Aug 78
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REM STATEMENT CONTAINING LEFT PARENTHESIS CAUSES SUBSEQUENT SPACES AND PERIODS TO BE REMOVED	04 R	Jun 78
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TERMINAL MAY HANG	06 M	Jul 78
DATA FILES	07 M	Jul 78
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SINGLE PRECISION HANG AND NUMERIC CONVERSION PROBLEM (PATCH F)	09 M	Aug 78
CONVERSION PROGRAM	10 M	Sep 78
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SAVE dev: AND REPLACE dev: - PATCH E	21 M	Feb 79
SINGLE PRECISION HANG AND NUMERIC CONVERSION PROBLEM - PATCH F	22 M	Feb 79

Component	Sequence	Mon/Yr
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Component	Sequence	Mon/Yr
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@START NOT WORKING WHEN DOWN-LINE LOADING	08 M	Mar 78
LIBRARIES FROM FOCAL SOURCE DISK MUST BE REFORMATTED	09 N	Aug 78
CLOCK PROBLEM FOR PAPER TAPE (STAND-ALONE) FOCAL USERS	10 M	Nov 78
FORTRAN GRAPHICS PACKAGE, V1.1		
DECGRAPHIC		
NMBR SUBROUTINE IN DECgraphic	01 R	JAN 79
FORTRAN/RT-11 EXTENSIONS V1		
RUNNING PROGRAM WITH "SETR"	01 M	Oct 78
IBEF NOT PROPERLY DECREMENTED	02 R	Oct 78
LPS DEVICE CONFLICT CAUSED BY CALL SETR AFTER CALL RTS	03 R	Oct 78
IADC AFTER RTS DOES NOT WORK	04 M	Oct 78
SUBROUTINE NAMING CONFLICT	05 N	Oct 78
PLOT55 DESCRIPTION	06 N	Oct 78
ILLEGAL MEMORY REFERENCE ERROR	07 M	Oct 78
DEVICE CONFLICT ERROR	08 R	Oct 78
TWO PROBLEMS WITH THE RT-11/FORTRAN GRAPHICS EXTENSIONS	09 M	Oct 78
FORTRAN/RT-11 EXTENSIONS V1B		
FORTRAN CRASHES AFTER RUNNING PROGRAM WITH "SETR"	01 M	Oct 78
TWO PROBLEMS WITH THE RT-11/FORTRAN GRAPHICS EXTENSIONS	02 M	Oct 78
NEGATIVE INTENSITY	03 N	Nov 78
PROGRAM TERMINATION ERROR USING RT-11 F/B	04 R	Apr 79
FORTRAN/RT-11 EXTENSIONS V2.1		
FORTRAN CRASHES AFTER RUNNING PROGRAM WITH "SETR"	01 M	Mar 79
TWO PROBLEMS WITH THE RT-11/FORTRAN GRAPHICS EXTENSIONS	02 M	Mar 79
NEGATIVE INTENSITY	03 N	Mar 79
FORTRAN IV/RT-11 V2		
COMPILER		
DISPOSE = 'KEEP' OPTION	01 R	Jan 79
CRASH DUMPS	02 N	Jan 79
SYNTAX ERRORS IN SOURCE PROGRAM MAY CAUSE COMPILER TO ABORT	03 M	Jan 79
SIMRT	04 M	Jan 79
SIMRT CONTINUED	05 M	Jan 79
KNOWN FORTRAN IV V2 BUGS	06 N	Jan 79
USE OF THE FIND STATEMENT	07 M	Jan 79
RAISING COMPLEX NUMBERS	08 M	Jan 79
EXTRA CHARACTERS MAY RESULT IN COMPILER TRAPPING	09 M	Jan 79
TRANSMITTING ASCII DATA	10 R	Jan 79
IN-LINE CODE	11 N	Jan 79
ERRORS OCCUR WITH NO DO LOOP	12 M	Jan 79
FORTRAN "ACCEPT" STATEMENT	13 R	Jan 79
FORTRAN IV/RT-11 V2.1		
FORTRAN IV V2.1 MAINTENANCE RELEASE	01 N	Dec 78
PATCH 1	02 M	Feb 79
PATCH 2	03 M	Feb 79
PATCH 3	04 M	Feb 79
PATCH 4	05 M	Sep 79
CARRIAGE CONTROL OPTION - PATCH 5	06 M	May 79
OPEN FAILURE WITH TYPE='OLD' - PATCH 6	07 M	Sep 79

Component	Sequence	Mon/Yr
FORTRAN LIBRARY FUNCTION ERRTST - PATCH 7	08 M	Aug 79
REGISTER ALLOCATION - PATCH 8	09 M	Sep 79
SMALLER EXECUTION-TIME PROGRAMS	10 N	Jun 79
FORTRAN OTS - PATCH 9	11 M	Sep 79
I/O FROM A FORTRAN COMPLETION ROUTINE - PATCH 10	12 M	Aug 79
FORTRAN FAILS TO COMPILE DO-LOOPS - PATCH 11	13 M	Aug 79
CALL CLOSE (FORTRAN LIBRARY SUBROUTINE) - PATCH 12	14 M	Aug 79
UNFORMATTED BYTE I/O - PATCH 13	15 F	Aug 79
LIST DIRECTED INPUT ERRORS - PATCH 14	16 M	Aug 79
DISP='DELETE' OPTION - PATCH 15	17 M	Aug 79
FORMATTED RECORD OUTPUT - PATCH 16	18 M	Aug 79
COMMON SUBEXPRESSION OPTIMIZATION - PATCH 17	19 M	Aug 79
CALL ASSIGN CARRIAGE CONTROL - PATCH 18	20 M	Aug 79
NON-PLAS VIRTUAL ARRAY INITIALIZATION - PATCH 19	21 M	Aug 79
BYTE COMPARISON AND COMMON SUBEXPRESSION OPTIMIZATION - PATCH 20	22 M	Aug 79
DIRECT ACCESS READ - PATCH 21	23 M	Aug 79
COMPLEX VARIABLE TO CONSTANT COMPARISON - PATCH 22	24 M	Aug 79

GAMMA-11 F/B V2

DATA ANALYSIS PROGRAM	01 M	Feb 79
STUDY PROGRAM DISPLAYS TOO MANY INDEX LINES PER PAGE	02 M	Feb 77
BASIC AND FOCAL	03 M	Feb 77
BACKGROUND PROGRAM CAN HANG THE FOREGROUND TERMINAL	04 M	Feb 77
CNTL/C UNDER SINGLE JOB MONITOR	05 M	Feb 77
CROSSHAIRS FAIL TO APPEAR IN SLICE	06 M	Feb 77
UNDOCUMENTED PROGRAMS	07 N	Mar 77
FORTRAN SUPPORT INCORRECTLY CONVERTS DATA AND TIME OF INQUISITION	08 M	May 77
"RS" COMMAND IS INCORRECTLY	09 N	Jun 77

GAMMA-11 F/B V2C

GATED LIST MODE IMAGES	01 O	Sep 78
TU16 SUPPORT	02 M	Sep 78
PROBLEMS WITH PLAYBACK BUFFER COMMENTS AND FLOOD CORRECTIONS	03 M	Oct 78
STATIC FOREGROUND ACQUISITION FAILS ON RK06 OR RL01 SYSTEMS	04 M	Oct 78
DYNAMIC CURVE CALCULATIONS MAY FAIL	05 M	Dec 79
RK06, 7 AND RL01 FOREGROUND ACQUISITIONS PROBLEMS	06 M	Dec 78
PROBLEMS WITH FLOOD CORRECTIONS	07 M	Dec 78
PROBLEMS WITH REGION OF INTEREST	08 M	Dec 78
KW11-P REAL-TIME CLOCK INCORRECTLY INITIALIZED	09 M	Dec 78
GAMMA-11 V2C NCV11 REAL-TIME CLOCK CAN BE DISABLED	10 M	Dec 78
KW11-P REAL-TIME CLOCK RUNS TOO FAST DURING GSA STUDIES	11 M	Dec 78
BUILDING AN RL01 GAMMA-11 V2C SYSTEM	12 M	Dec 78
PREDEFINED GATED LIST MODE STUDIES	13 M	Dec 78
GATED LIST MODE DATA ACQUISITION SET-UP	14 M	Dec 78
PROBLEMS WITH MAGTAPE DISTRIBUTION	15 N	Dec 78
SUBROUTINE 'GMXG' GENERATES ILLEGAL ADDRESS MESSAGE	16 F	Jul 79
FGAMMA/BGAMMA RACE CONDITION	17 M	Feb 79
DELAYED START LIST MODE STUDIES	18 M	Feb 79
FORMATTING GATED LIST MODE STUDIES	19 M	Feb 79
SLICE PROBLEMS	20 M	Feb 79
DOUBLE INTERPOLATION OF 64 X 64 MATRIX DATA	21 M	Feb 79
GAMMA-11 AND RT-11 DATE ROLLOVER	22 M	Feb 79
PROBLEMS WITH PATIENT MONITOR AND GSA ADMIN BLOCKS	23 M	Feb 79
FOREGROUND GATED LIST MODE STUDIES FAIL	24 M	Feb 79
NCV11 JOYSTICK AND LIST MODE PROBLEMS	25 M	May 79
SYSTEM SUMMARY FOR RK07 DISKS	26 O	May 79
MORE PROBLEMS WITH FLOOD CORRECTION	27 M	May 79
TWO MINOR PROBLEMS WITH PLAYBACK BUFFERS	28 M	May 79
TRANSFER STUDY CAN CORRUPT A DISK DIRECTORY	29 M	May 79
FOUR FRAME MINIMUM FOR GSA STUDIES	30 M	May 79
GAMMA-11/BASIC PATCHES	31 M	May 79
CONTINUE ANALYSIS CA) OCCASIONALLY FAILS	32 M	May 79
ASCII STRING VARIABLE TABLE (FORTRAN AND BASIC) -- SUBROUTINE GPAR AND GPAW --	33 M	Jul 79
GAMMA-11 SYSTEMS WITH RK07 AS A DEVICE	34 M	Sep 79
INVOKING AN RT-11 INDIRECT COMMAND FILE FROM GAMMA-11	35 O	Oct 79
PROBLEM WITH ABORTING GAMMA-11	36 M	Oct 79
PROBLEMS WITH FORTRAN SUBROUTINES 'GPFR' AND 'GPFW'	37 F	Nov 79
PROBLEMS WITH THE SAME COMMAND (S) IN RI	38 M	Nov 79

Component	Sequence	Mon/Yr
GAMMA-11 F/B V2.4		
CONTINUE ANALYSIS (CA) OCCASIONALLY FAILS	01 M	Oct 79
GAMMA-11 SYSTEMS WITH RK07 DISKS AS A DEVICE	02 M	Jan 80
PROBLEM WITH ABORTING GAMMA-11	03 M	Oct 79
PROBLEMS WITH FOUR BIT MAP ANALYSIS COMMANDS	04 M	Oct 79
PROBLEMS WITH FORTRAN SUBROUTINES 'GPFR' AND GPFW'	05 F	Jan 80
PROBLEMS WITH DATA ANALYSIS	06 M	Jan 80
PROBLEMS WITH DYNAMIC ACQUISTION ON RK05 GAMMA-11	07 M	Nov 79
PROBLEMS WITH DATA ACQUISTION	08 M	Nov 79
TRANSFER STUDIES WITH MAGTAPE PROBLEM	09 M	Nov 79
LABORATORY APPLICATIONS-11 V3		
A NEW MODULE TO ENHANCE DATA FLOW WITHIN LA-11	01 N	Oct 76
HISTO.MAC		
ACQUIRING AND PROCESSING HISTOGRAM DATA	01 M	Sep 76
LABMAC.SML		
ERRONEOUS MACRO	01 M	Sep 77
INCLUDING LABMAC.SML IN SYSMAC.SML	02 M	Mar 79
PEAK.MAC		
WIDE PEAKS	01 M	Mar 76
PEAK PROBLEMS AND CORRECTIONS	02 M	Jul 76
ARITHMETIC CORRECTION FOR PEAK AREA	03 M	Dec 76
MISSING PATCH IN RELEASE NOTES	04 M	Oct 77
SPARTA		
LPS AND AR-11 VECTOR AND STATUS REGISTER	01 N	Dec 75
USING SPARTA AND FLOATING POINT BUFFERS	02 N	Feb 76
AR-11 TIMING PROBLEMS WITH ADSAM AND SPARTA	03 O	Feb 76
FFT SCALING CORRECTION	04 M	Feb 76
SCALE FACTOR CORRECTION FOR SPARTA COMMANDS FAC AND FCC	05 M	Mar 76
DATA DISPLAYS USING LA-11	06 N	Mar 76
DATA PREPARATION FOR SPARTA COMMANDS FAC AND FCC	07 N	Apr 76
SPARTA CORRECTIONS FOR POINT-PLOT DISPLAY	08 M	Apr 76
ADDING COMMANDS TO SPARTA	09 M	May 76
CORRECTION FOR THE DPV COMMAND WITH POINT PLOT DISPLAY	10 M	Jun 76
GENERAL SUBROUTINE MODULE FOR EAE	11 O	Jun 76
INCORRECT PHASE ANGLE CALCULATION	12 M	Oct 76
"MOU" AND "MIN" COMMANDS CAN BE READ OUT AND IN CORRECTLY	13 N	Jan 77
MULTIPLE SYNCH PULSES	14 M	Jan 77
AUTO AND CROSS CORRELATION	15 M	Jan 77
ALLOCATING MORE THAN 16K BUFFERS IN SPARTA	16 M	Feb 77
A/D SAMPLING: FAST MODE	17 M	Jul 77
A/D SAMPLING: FAST MODE EXIT	19 M	Mar 78
SCALE FACTOR PRINT FOR THE FFT	20 M	Jan 79
SWEEP.MAC		
SWEEP SAMPLING: FAST MODE	01 M	Aug 77
THRU		
HOW TO START DATA ACQUISITION WHEN CSTART EQUALS ZERO	01 N	Jun 76
MULTICHANNEL SINGLE RATE SCHMIT TRIGGER SWITCH BOUNCE	02 M	Dec 76
CONTINUOUS SAMPLING: CONDITIONAL ASSEMBLY ERRORS	03 M	Jul 77
CONTINUOUS SAMPLING: DMA WITH DUAL SAMPLE + HOLD	04 M	Jul 77
DOCUMENTATION CORRECTIONS	05 M	Nov 77
LSP-11 V1		
PATCH NO. 1 - GENERAL CORRECTIONS NO. 1	01 M	Jun 79
PATCH NO. 2 - PEAK CORRECTION NO. 1	02 M	Jun 79
PATCH NO. 3 - PEAK CORRECTION NO. 2	03 M	Jun 79
LV11/RT-11 PLOTTING PACKAGE V2		
SUBROUTINE PLOT DOES NOT CORRECTLY REPRODUCT VT11 PICTURE	01 M	Apr 78

Component	Sequence	Mon/Yr
MSB-11 V1.0		
MSB-11 SOFTWARE ON THE PDP-11/03	01 M	Jul 79
MU BASIC/RT-11 V1		
BUILDING MU BASIC/RT-11 UNDER RT-11 V2C	01	Feb 76
REMOTE TERMINAL SUPPORT ON MODEMS	02	May 76
OVERLAY... LINE WORKS INCORRECTLY	03	May 76
USING IMMEDIATE MODE "GOSUBs"	04	Dec 76
CLOCK LOSES TIME ON RT-11 WHEN RUNNING MU BASIC	05	Jul 77
REM STATEMENTS	06	Feb 78
ADDITIONAL FILES ON RELEASE KIT (MUB*.*)	07 N	May 78
MU BASIC/RT-11 SYSTEM INSTALLATION GUIDE		
REPLACEMENT PAGES	01	Jan 77
REPLACEMENT PAGES	02 N	Jan 78
REPLACEMENT PAGES	03 N	Jan 78
MU BASIC-11/RT-11 V2		
MU BASIC-11/RT-11 V2 CONVERSION PROGRAM	01 R	Nov 78
OPERATION OF CTRL/C, RCTRLC AND SYS (6) FUNCTIONS AND THE CTRL/C COMMAND	02 N	Nov 78
MEMORY REQUIREMENTS OF OPTIONAL FUNCTIONS ETC.	03 O	Nov 78
MU BASIC-11/RT-11 V2 RELEASE NOTES AND INSTALLATION GUIDE CHANGES	04 N	Dec 78
ORDER OF COMMON STATEMENTS AT START OF MUCNFG.B00, MUCNF1.B00, MUCNF2.B00	05 M	Dec 78
OPERATION OF OLD, RUN, CHAIN AND OVERLAY WHEN THE SPECIFIED FILE IS NOT FOUND	06 N	Feb 79
CREATING AND ACCESSING VIRTUAL ARRAY FILES	07 N	Feb 79
STORAGE OF THE NULL CHARACTER IN STRING VARIABLES AND VIRTUAL STRING ARRAYS	08 N	Feb 79
USE OF COMPILE COMMAND	09 N	Feb 79
MU BASIC-11/RT-11 V2 CONFIGURATION PROGRAM PATCH 1	10 O	Feb 79
CHAINING WITH COMMON -PATCH A	11 M	Feb 79
VIRTUAL FILE I/O - PATCH B	12 M	Feb 79
SYS (1,n) FUNCTION - PATCH C	13 M	Feb 79
RESEQ - PATCH D	14 M	Feb 79
VALUES IN PATCHES A, B, C	15 N	Feb 79
LISTNH /OLD - PATCH E	16 M	Mar 79
CALL - PATCH F	17 M	Mar 79
MU BASIC-11 DEVICE INDEPENDENCE FOR INIT.B00 - SPECIIAL PATCH YY1	18 M	May 79
DOUBLE PRECISION INTEGER VARIABLES - PATCH G	19 M	May 79
INPUT #/PRINT # - PATCH H	20 M	May 79
OLD OF A ZERO BLOCK FILE - PATCH I	21 M	May 79
ADDITION TO PATCH B - PATCH J	22 M	May 79
MU BASIC-11/RT-11 V2 PERFORMANCE IMPROVEMENT PATCH NO. 1	23 M	May 79
MU BASIC-11/RT-11 V2 PERFORMANCE IMPROVEMENT PATCH NO. 2	24 M	May 79
MU BASIC-11/RT-11 V2 PERFORMANCE IMPROVEMENT PATCH NO. 3	25 M	May 79
MU BASIC-11/RT-11 V2 PERFORMANCE IMPROVEMENT PATCH NO. 4a	26 M	May 79
MU BASIC-11/RT-11 V2 PERFORMANCE IMPROVEMENT PATCH NO. 4b	27 M	May 79
MU BASIC-11/RT-11 V2 PERFORMANCE IMPROVEMENT PATCH NO. 4c	28 M	May 79
MU BASIC-11/RT-11 V2 PERFORMANCE IMPROVEMENT PATCH NO. 5	29 M	May 79
MU BASIC-11/RT-11 V2 PERFORMANCE IMPROVEMENT PATCH NO. 6	30 M	May 79
MU BASIC-11/RT-11 V2 PERFORMANCE IMPROVEMENT PATCH NO. 7	31 M	May 79
MU BASIC-11/RT-11 V2 PERFORMANCE IMPROVEMENT PATCH NO. 8	32 M	May 79
DEVICE MNEMONIC PROBLEM - PATCH K	33 M	Jul 79
CLOSE - PATCH L	34 M	Jul 79
REM STATEMENTS ON MULTI-STATEMENT LINES	35 M	Jul 79
DEASSIGNING A TERMINAL - PATCH N	36 M	Jul 79
~~OVERLAYING THE ERROR MESSAGE MODULE - SPECIAL PATCH WW1~~	~~37 M~~	~~Jul 79~~
UNEQUAL USER PARTITION SIZE ALLOCATION - SPECIAL PATCH XX1	38 M	Jul 79
HOW TO CHANGE INIT.B00's DEVICE AFTER INSTALLING SPECIAL PATCH YY1	39 M	Jul 79
INTEGERS IN DOUBLE PRECISION MU BASIC-11	40 M	Jul 79
STRING MANIPULATION IN ASSEMBLY LANGUAGE ROUTINES	41 N	Aug 79
SIZING MU BASIC-11	42 N	Aug 79
ERROR IN TABLE 4-1 OF THE USER'S GUIDE	43 N	Aug 79
RESTRICTION OF USR RESIDENCY WHEN RUNNING IN FOREGROUND	44 N	Aug 79
NOTES ON PERFORMANCE PATCHES NO. 4a, NO. 4b, NO. 4c	45 N	Aug 79
MAXIMUM ARRAY SUBSCRIPT SIZE	46 N	Aug 79

Component	Sequence	Mon/Yr
ASSEMBLING SOURCE FILES (SOURCE LICENSE HOLDERS ONLY)	47 M	Sep 79
USE OF SYS (1,n) FUNCTION WHEN ',n' IS OMITTED	48 M	Sep 79
DISABLING CR/LF USING TTYSET - PATCH P	49 M	Dec 79
HANDLER FETCH ERROR MAY LEAD TO MONITOR FAULT - PATCH Q	50 M	Jan 80
PDL/RT-11 V1B		
CLARIFICATION OF SEARCH FAILURE IN SUBROUTINE FIND	01 N	Jul 78
FIND SUBROUTINE	02 R	Jul 78
PATCHES TO PDL	03 M	Jul 78
SUBROUTINE QKGT	04 M	Jul 78
PDL SUBROUTINE 'RDAA'	05 M	Sep 78
PDL PEAK ALGORITHM WILL NOT RECOGNIZE VALID PEAKS	06 M	Sep 78
PEAK-11 V1		
"MREPRT" AND "REPRT" GET CONFUSED	01 M	Aug 78
REMOTE/RT-11 V1		
SCHEDULER DOES NOT PROPERLY SET PROCESSOR PRIORITY	01 M	May 76
NOEDIT- 0 HALTS	02 M	May 76
NUSERS=1 STAYS IN A FILE MESSAGE LOOP	03 M	May 76
INCORRECT SWAP AREA ALLOCATION FOR FOUR OR MORE USERS	04 M	May 76
REBOOT FROM SATELLITE DURING EDIT HANGS HOST	05 M	Jun 76
HARD ERROR ON LOOKUP IS FATAL	06 M	Jun 76
SECONDARY MODE PROGRAM LOAD FEATURE NOT COMPLETELY FUNCTIONAL	07 M	Jun 76
ONE SECOND TIMER FOR LINE TIMEOUTS IS SET INCORRECTLY	08 M	Aug 76
LINE FEEDS MAY CAUSE SYSTEM ERRORS--ASSEMBLY ERROR WITH DIAL AND NODDC	09 M	Aug 76
PROPER GENERATION OF REMOTE IS DEPENDENT ON MODULE ORDER	10 M	Aug 76
ASCII CODES 173 AND 174 DO NOT PRINT	11 M	Aug 76
IMPROPER FILLER HANDLING FOR VT05	12 O	Aug 76
SYSTEM CRASHES IF RUN IN FOREGROUND WITHOUT /N	13 O	Aug 76
"UNSAVE" COMMAND CAUSES SYSTEM ERRORS	14 M	Dec 76
FLET WILL REMOVE MORE THAN ONE USER FROM THE WAIT QUEUE	15 M	Dec 76
STACK FOR USER THREE IMPROPERLY SET	16 O	Dec 76
SECONDARY MODE LOADS DO NOT OPERATE PROPERLY	17 M	Jan 77
@START COMMAND GIVEN ON TERMINAL WITHOUT SATELLITE CAUSES CRASH	18 O	Jan 77
"RTSIM" DOES NOT SUPPORT 50 Hz LINE CLOCK	19 O	Jan 77
CHANNEL ACTIVE ERROR	20 M	Mar 77
THREE WORDS LOST ON DOWNLINE LOAD	21 M	Mar 77
CSISPC NOT PROPERLY SIMULATED	22 M	May 77
EXCEEDING CHARACTERS PER LINE LIMIT	23 M	Oct 77
UNASSIGNED	24	XXX XX
@RE IN THE SATELLITE DOES NOT WORK	25 R	Mar 78
"HANG" CONDITIONS	26 R	Apr 78
UANSSIGNED	27	XXX XX
USING KG-11 CRC CALCULATOR	28 M	Aug 78
PASTE CAUSES LINE DUPLICATION	29 M	Aug 78
"DAISY CHAIN" ARRANGEMENT IN RTSIM.MAC	30 M	Aug 78
OPTIONAL RMON IS OMITTED FROM RTS1M BY DEFINING NORMON=0	31 M	Oct 78
DL-11 ERROR AND CRC ERROR IN HOST	32 M	Oct 78
RT-11 V3		
DOCUMENTATION		
TYPOGRAPHICAL ERRORS	01 N	Mar 78
ERROR IN FOREGROUND/BACKGROUND DEMONSTRATION	02 M	Aug 78
THE /LIST OPTION FOR THE DIBOL, FORTRAN, AND MACRO KEYBOARD MONITOR COMMANDS	03 M	Nov 78
EDIT		
EDIT DOES NOT OPERATE CORRECTLY UNDER XM MONITOR	01 M	Mar 78
MACRO		
.NARG FAILS WHEN AUTOMATIC LABEL GENERATION IS USED	01 M	Apr 78

Component	Sequence	Mon/Yr
MISCELLANEOUS		
GETSTR AND PUTSTR ROUTINES FOR IN-LINE CODE	01 M	Jun 78
ERROR IN THE CONCAT ROUTINE	02 M	Jun 78
ERROR IN MTATCH ROUTINE	03 M	Nov 78
ODD RING BUFFER SIZES CAUSE ASSEMBLY ERRORS	04 R	Jun 79
MONITOR		
INCORRECT IDENTIFIER IN .TWAIT REQUEST CAUSES PROBLEMS	01 M	Mar 78
.CHAIN, .EXIT FROM VIRTUAL JOB; USR MOVING INTO PAR1 AREA	02 M	Apr 78
PATCH TO INTERRUPT EXIT ROUTINE	03 M	Apr 78
IMPROPER HANDLING OF THE KW11-P CLOCK	04 M	May 78
SPECIFYING 50-CYCLE CLOCK SUPPORT DURING SYSGEN OPERATIONS	05 M	Jun 78
EDITORS AND V3B MONITORS	06 M	Jun 78
TYPING NON-ASCII FILES TO CONSOLE AFTER ISSUING A GTON HANGS THE SYSTEM	07 M	Jun 78
LINK/FRUN FAILS WHEN PROGRAM IS OVERLAYED AND USES LIBRARIES	08 M	Jul 78
MULTITERMINAL CORRECTIONS	09 M	Aug 78
PATCH TO XM ADDRESS CHECKING	10 M	Aug 78
FIXES FOR TWO FB/XM PROBLEMS	11 M	Aug 78
TERMINATING CONSOLE OUTPUT	12 M	Aug 78
ISSUING SEEKS TO DX HANDLER IN XM CAUSES RANDOM SYSTEM FAILURES	13 M	Oct 78
CERTAIN EXTENDED MEMORY REQUESTS CANNOT BE ISSUED FROM BOTH MAINLINE CODE AND COMPLETION ROUTINES	14 M	Oct 78
THE "RUN" AND "GET" MONITOR COMMANDS DO NOT CORRECTLY LOAD THE PORTION OF A PROGRAM THAT OVERLAYS KMON	15 M	Oct 78
DX SJ MONITOR BOOTSTRAP CORRECTIONS	16 O	Oct 78
TYPING CTRL/O TO THE CONSOLE TERMINAL SOMETIMES CRASHES	17 M	Nov 78
LINK CAUSES ODD MONITOR ADDRESS TRAP	18 M	Nov 78
CHAINING FROM A VIRTUAL JOB AND RELATED PROBLEMS	19 M	Dec 78
DIRECTORY CORRUPTION	20 M	Dec 78
FIXES FOR FB/XM PROBLEM IN V03.02	21 M	Apr 79
CORRECTION TO "DIRECTORY CORRUPTION" PATCH	22 M	May 79
FLOPPY SYSGEN WITH KW11-P CLOCK	23 M	May 79
INPUT FILE LOST WHEN USING CSIGEN	24 M	Jun 79
SOURCES		
UNRESOLVED DIFFERENCES IN DEMOX1.MAC	01 M	Aug 78
DISTRIBUTED MAGTAPE HANDLER CORRECTIONS	02 M	Sep 78
MAGTAPE XM AND FSM CORRECTIONS	03 M	May 79
SYSTEM HANDLERS		
DM HANDLER CORRECTIONS	01 M	Oct 78
DM SYSTEM HANDLERS CORRECTIONS	02 M	Dec 78
DM HANDLER ERROR HANDLING CORRECTIONS	03 M	Jan 79
DM CTO AND SPFUN 376 CORRECTIONS	04 M	May 79
UTILITIES		
DUP DEFAULT FILE SIZE AND NULL FILE TYPES ARE INCORRECT	01 M	Mar 78
DIR MAY INCORRECTLY LIST DIRECTORIES OF MAGTAPES	02 M	Mar 78
/L OPTION TO PIP MAY CUASE SYSTEM CRASH	03 M	Mar 78
LINK OUTPUT INVALID IF OBJ HAS AN EMPTY GSD RECORD	04 M	Mar 78
PAT GIVES FATAL ERROR IF OBJ HAS AN EMPTY RECORD	05 M	Apr 78
UNASSIGNED	06	XXX XX
EDIT VT11 DISPLAY FUNCTIONS WILL NOT OPERATE UNDER XM MONITOR	07 M/R	Apr 78
TRANSFERS IN INTERCHANGE FORMAT WHEN NO SYSTEM DATE IS GIVEN	08 M	Jun 78
DUP SCAN RATE FOR FLOPPY	09 M	Jun 78
DUP /I AND /W SWITCHES DO NOT WORK PROPERLY	10 M	Jun 78
LINK/FRUN FAILS WHEN PROGRAM IS OVERLAYED AND USES LIBRARIES	11 M	Jul 78
DUP DOES NOT DIFFERENTIATE BETWEEN DELETED .BAD FILES AND PERMANENT ONES	12 M	Jul 78
ERRORS IN FILEX INTERCHANGE FORMAT	13 M	Jul 78
LINK PRODUCES INCORRECT .LDA FILES	14 M	Sep 78
DUP DOES NOT DETECT END OF SEGMENT IF IT IS FIRST ENTRY IN A DIRECTORY SEGMENT DURING A SQUEEZE OPERATION	15 M	Oct 78
LIBR CLEARING OF LOCATION ZERO	16 M	Oct 78
LINK ERROR IN PSECTS MOVED TO ROOT	17 M	Oct 78
PIP ERRONEOUSLY DELETES FILES	18 M	Oct 78

Component	Sequence	Mon/Yr
LIBR BLOCK BOUNDARY PROBLEM	19 M	Dec 78
LINK CAN CAUSE TRAP TO 4	20 M	Feb 79
CORRECTIONS TO FILEX	21 M	May 79
DIR CORRECTIONS	22 M	Nov 79
BAD BLOCK REPLACEMENT ON RK06s	23 N	Oct 79
WILD CARD MAGTAPE COPY ERROR PROCESSING CORRECTION	24 M	Oct 79

RT-11 V3B

DOCUMENTATION		
ERROR IN FOREGROUND/BACKGROUND DEMONSTRATION	01 M	Aug 78
THE /LIST OPTION FOR THE DIBOL, FORTRAN, AND MACRO KEYBOARD MONITOR COMMANDS	02 M	Nov 78
UPDATE PAGES	03 N	Dec 78
RT-11 SOFTWARE SUPPORT DOCUMENTATION	04 M	Feb 79
SUMMARY OF UPDATES FOR RT-11 V03B DOCUMENTATION	05 M	Feb 79
NEW DEVICE RELEASE DOCUMENTATION, RT-11 V03B	06 N	Jun 79
.FORK AND .SYNCH BLOCK DOCUMENTATION	07 N	Jul 79
THE DEVICE TIME-OUT FEATURE	08 N	Sep 79
CORRECTION OF ERROR RETURNS IN .SYNCH CALL	09 M	Aug 79
EXAMPLE CODE IN .FORK DOCUMENTATION IS INCORRECT	10 N	Aug 79
EXTENDED MEMORY RESTRICTIONS	11 N	Dec 79
MISCELLANEOUS		
ERRORS IN THE SYSGEN CONDITIONAL FILE	01 M	Jul 78
ERRORS IN MTATCH ROUTINE	02 M	Nov 78
ODD RING BUFFER SIZES CAUSE ASSEMBLY ERRORS	03 R	Jun 79
INCORRECT NULL HANDLER DEVICE IDENTIFIER	04 M	Jun 79
GENERATING A SINGLE JOB MONITOR MAY CAUSE AN UNDEFINED GLOBAL	05 M	Aug 79
INCORRECT DEVICE IDENTIFIER FOR PC11	06 M	Sep 79
ERROR IN MTIN AND MTOUT ROUTINES	07 M	Sep 79
HIGH SPEED RING BUFFER PROBLEM ON SYSTEMS WITH ONE DL11	08 M	Jan 80
MONITOR		
SOURCE PATCHING PROCEDURES FOR V3B	01 M	Aug 78
MULTITERMINAL CORRECTIONS	02 M	Aug 78
SINGLE JOB TIMER SUPPORT CORRECTIONS	03 M	Aug 78
FIXES FOR TWO FB/XM PROBLEMS IN VP3B	04 M	Aug 78
TERMINATING CONSOLE OUTPUT	05 M	Aug 78
EDITORS AND V03B MONITORS	06 O	Aug 78
SEEK IN RK DRIVER	07 M	Aug 78
RL01 CONTROLLER VECTOR AT 160	08 M	Aug 78
FPU EXCEPTION HANDLING IN XM MONITOR	09 M	Sep 78
TWO EXTENDED MEMORY MONITOR PROBLEMS	10 M	Oct 78
TYPING CTRL/O TO THE CONSOLE TERMINAL SOMETIMES CRASHES RT-11	11 M	Oct 78
DX SJ MONITOR BOOTSTRAP CORRECTIONS	12 O	Oct 78
THE EDIT AND HELP MONITOR COMMANDS FAIL AFTER A VIRTUAL JOB HAS RUN	13 M	Nov 78
DIRECTORY CORRUPTION AND .UNPROTECT CORRECTIONS	14 M	Jan 79
FB AND XM MONITOR CLOCK SUPPORT	15 M	Apr 79
CHANGING CLOCK RATE ON GENERATED MONITORS	16 M	Apr 79
MULTI-TERMINAL CORRECTIONS TO DECREASE INTERRUPT LATENCY	17 M	Apr 79
FIXES FOR FB/XM PROBLEM IN V03B.00	18 M	Apr 79
FLOPPY SYSGEN WITH KW11-P CLOCK	19 M	May 79
DISTRIBUTED FB MONITOR CLOCK SUPPORT	20 M	May 79
OPTIONAL PATCH TO IMPROVE PERFORMANCE ON PDP-11/03 SYSTEMS	21 O	May 79
DISTRIBUTED PD AND DD FB MONITORS CLOCK SUPPORT	22 M	May 79
OPTIONAL PATCH TO IMPROVE PERFORMANCE ON PDP-11/03 AND PDT SYSTEMS FOR DD AND PD FB MONITORS	23 O	May 79
INPUT FILE LOST WHEN USING CSIGEN	24 M	Jun 79
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DY HANDLER DOUBLE DENSITY ONLY SUPPORT	04 M	Apr 79
DL QUEUE ELEMENT AND XM ZERO FILL CORRECTIONS	05 M	Apr 79
MAGTAPE XM AND FSM CORRECTIONS	06 M	May 79
DL HANDLER SEEK AND UNIT CORRECTIONS	07 M	Aug 79
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MAGTAPE ABORT ENTRY CORRECTION IN XM	09 M	Dec 79
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FILE SEQUENCE NUMBER SEARCH CORRECTION	11 M	Feb 80
HARD ERROR RECOVERY IN DM HANDLER	12 M	Mar 80
SYSTEM HANDLERS		
RL01 HANDLER CORRECTIONS	01 M	Sep 78
ISSUING A SEEK TO THE DY HANDLER CAUSES THE SYSTEM TO CRASH	02 M	Oct 78
DM HANDLER CORRECTIONS	03 M	Oct 78
DM SYSTEM HANDLERS CORRECTIONS	04 M	Dec 78
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DM HANDLER ERROR HANDLING CORRECTIONS	06 M	Jan 79
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ERRORS IN FILEX INTERCHANGE FORMAT	01 M	Jul 78
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DUP DOES NOT DETECT END OF SEGMENT	05 M	Oct 78
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LINK CAUSES MONITOR ODD ADDRESS TRAP	07 M	Nov 78
LIBR BLOCK BOUNDARY PROBLEM	08 M	Jan 79
EDIT ESCAPE CODE CORRECTION	09 O	Dec 78
ERROR IN ODT	10 M	Feb 79
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LINK CAN CAUSE TRAP TO 4	12 M	Feb 79
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RT-11/2780 V2

CORRECTIONS TO 2780 PACKAGE	01	Sep 77
RUNNING 2780 ON RT-11 V3	02	Nov 77
PATCHING THE 2780 IN RT-11 V3	03 M	Jan 79
CHECK FOR ZERO LENGTH RECORD	04 M	Jan 79
RESTRICTION OF THE CONSOLE AS AN INPUT/OUTPUT DEVICE	05 R	Jan 79

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Software Product Description

PRODUCT NAME: DECnet-RT, Version 1.1, RT-11 Network Software **SPD 10.72.4**

DESCRIPTION:

DECnet-RT, Version 1.1, allows a suitably configured RT-11 system to participate as a Phase II DECnet node in point-to-point computer networks. DECnet-RT offers task-to-task communications, network file transfer and network resource-sharing capabilities, using the DIGITAL Network Architecture (DNA) protocols. DECnet-RT communicates with adjacent nodes over synchronous and asynchronous communication lines. Access to DECnet-RT is supported for RT-11 user programs written in MACRO-11 and FORTRAN.

DECnet-RT is a Phase II network product and is warranted for use only with Phase II DECnet products supplied by DIGITAL.

The functionality available to an RT-11 user depends, in part, on the configuration of the rest of the network. Each DECnet product offers its own level of functionality and its own set of features to the user. Networks consisting entirely of DECnet-RT nodes (a two-node network because DECnet-RT supports one communication line) have the full functionality described in this SPD. Networks that mix DECnet-RT nodes with other DECnet products may limit the functions available to the DECnet-RT user because some DECnet-RT features may not be supported by all DECnet products.

The Phase II products and functions available to users on mixed networks can be determined by comparison of the SPDs for the component products. An overview of DECnet and common functionality available with mixed networks can be obtained from the General Phase II DECnet SPD.

Task-to-Task Communication

Using DECnet-RT, an RT-11 user program written in MACRO-11 or FORTRAN can exchange messages with other programs using Phase II DECnet DNA protocols. The two user programs must be adjacent DECnet nodes. (Adjacent nodes control opposite ends of a point-to-point communication line.) If the nodes are adjacent, the second node can be any Phase II DECnet system. The DECnet messages sent and received by the two user programs can be in any data format.

Network File Transfers Utilities

Using DECnet-RT utilities, a user can transfer sequential ASCII files between Phase II DECnet nodes. Files can be transferred in both directions between a locally supported RT-11 File System device and the file system of an adjacent DECnet node.

In addition, other types of files may be transferred where formats are compatible between the Phase II DECnet nodes.

Additional facilities allow system command files or batch files to be submitted to a remote node where the list of commands is in the format expected by the node responsible for the execution. DECnet-RT does not support system command or batch files to be submitted from other systems.

Network Resource Access

File Access
File access is supported to and from remote DECnet systems by explicit subroutine calls in FORTRAN and MACRO tasks.

READ, WRITE, OPEN and CLOSE, and DELETE operations can be initiated by local FORTRAN and MACRO tasks for sequential files residing at remote DECnet systems. Other nodes supporting File Access can exercise this capability for files located on the RT-11 node. Fixed and variable length record formats are supported. Further, files accessed remotely can contain either ASCII or binary information.

Network Information Program

Using the DECnet-RT NIP utility, a user can set node name and password, and display statistics related to the communication lines, including data on traffic and errors. Output can be directed to the terminal or to a log file.

Terminal Communication Utility

The DECnet-RT TLK utility allows a user at a DECnet-RT node to send messages to adjacent DECnet nodes that support the same feature. Messages can be directed to a specific terminal or to the operator's console at the destination node. TLK dialog mode allows users on the two systems to type messages to one another.

Communications

- DECnet-RT Version 1.1 supports the DIGITAL Data Communications Message Protocol (DDCMP) for full- or half-duplex transmission in point-to-point operation using serial synchronous or asynchronous facilities. DDCMP provides error detection/correction and physical link management facilities.

- One point-to-point link can be supported by a RT-11 node. Only one link can connect any pair of nodes.

DECnet-RT Operation

DECnet-RT is implemented as a driver under RT-11 FB/XM and as subroutines that would be linked with the foreground or background RT-11 program. Minimum memory residency requirements for a driver and network code are 7K words (14K bytes), and at least 1K words (2K bytes) for temporary data storage. Consequently, the user should plan to dedicate at least 8K words (16K bytes) of memory storage to network control functions. Additional memory will be required for a user-written network task or any DECnet utility functions to be invoked (file transfer, TLK). Maximum additional memory required for DECnet-RT, Version 1.1 utility is 10K words.

DECnet-RT Configuration

The process of configuring a DECnet-RT node is based primarily on trade-offs of cost, performance, and functionality, within the realm of satisfying the user's application requirements. It can be readily expected that network applications will run the full gamut from low-speed, low-cost situations to those of relatively high performance and functionality. The performance of a given DECnet node is a function not only of the expected network traffic and resultant processing ("global" conditions), but also of the amount of concurrent processing peculiar to that node ("local" conditions). Thus, node performance depends on many factors, including:

- CPU power
- Number of device interrupts per unit time
- Communication line characteristics
- Number and size of buffers
- Message size and frequency
- "Local" applications

It is important to note that the rate at which user data may be shipped ("throughput") over a communications line may sometimes approach, but will never equal or exceed, the actual line speed. The reason, simply stated, is that the actual throughput is a function of many factors, including the user application(s), network topology, protocol overhead, and the factors cited at the beginnning of this section.

There are basically two groups of communications interfaces presented in the tables below. They differ in many respects, particularly in their effect upon CPU utilization.

- The DMC11 is a direct memory access (DMA) device. Also, the DDCMP line protocol is executed in microcode by the DMC11 communication controller, thus, off-loading the PDP-11. Thus, the only DECnet load the processor sees is completed incoming and outgoing messages.
- With character interrupt devices such as the DUP11, CPU cycles are required for not only the DDCMP processing, but also each character sent and received.

The following tables describe what physical hardware configurations are supported by DECnet-RT in terms of CPU class and communication interface. It should be noted that the attachment of such devices as A/D converters and multiple terminals may reduce the line speed which can effectively be supported.

DECnet-RT

Maximum Line Configurations On 11/03 CPUs, PDT-11/130 or PDT-11/150

Device Group	Max. No. of Lines	Maximum Linespeed (Kilobits/sec)	Maximum Device Bandwidth (Kilobits/sec)	Mode
DUV11, DLV11-E	1	2.4	2.4	FDX.HDX

DECnet-RT

Maximum Line Configurations On 11/04-11/70 CPUs

Device Group	Max. No. of Lines	Maximum Linespeed (Kilobits/sec)	Maximum Device Bandwidth (Kilobits/sec)	Mode
DL11				
DU11, DUP11	1	9.6*	9.6*	FDX.HDX
DMC11-AR, -DA	1	19.2	19.2	FDX.HDX
DMC11-AL, -MD	1	56.0	56.0	FDX.HDX
DMC11-AL, -MA	1	1000.0	1000.0	FDX.HDX

*restricted to maximum of 4.8 on PDP-11/10 or 11/04, 11/23

Maximum Number of Lines

The largest number of physical lines which can be attached and driven by the DECnet-RT system.

Maximum Device Bandwidth

The maximum total number of bits per second which can be handled by a CPU for a given communication device. For example, DECnet-RT on a PDP-11/04 can accommodate one full-duplex character-interrupt device at 4.8KB.

Maximum Line Speed

The fastest clock rate at which the device can be driven under DECnet-RT. This means that even if devices have the ability to operate at a maximum rate, they must be configured subject to the "maximum device bandwidth" restriction above.

Mode

This indicates whether the line is operating in either half-duplex (a single bit stream) or full-duplex (two concurrent bit streams) mode . In some instances in tables, a half-duplex line is quoted as having maximum bandwidth approximately double that comparable full-duplex line. This reflects the single bit stream character of half-duplex lines, and the fact that two of them place a load on the CPU roughly equivalent to one full-duplex line with traffic in both directions.

System Generation

Generation and installation of DECnet-RT, Version 1.1 requires a valid RT-11 V3B or later system with at least 32K bytes of memory and an RK05 disk or larger plus one additional device for distribution media. Generation on floppy diskette or TU58 DECtape II only systems is not supported.

MINIMUM HARDWARE REQUIRED:

Any valid RT-11 FB/XM system configuration with:

- a minimum of 8K words (16K bytes additional available memory for the DECnet-RT software and data storage
- PDP-11/03 through PDP-11/70 central processor with one or more of the appropriate communications devices:
  - DU11-DA low-speed synchronous interface
  - DUP11-DA low-speed synchronous interface
  - DMC11-AR-DA high-speed synchronous EIA interface
  - DMC11-AL-MD high-speed local synchronous interface
  - DMC11-AL-MA high-speed local synchronous interface
  - DL11-E asynchronous interface with modem control
  - DL11-C asynchronous interface, 20mA current loop (1)
  - DL11-WA asynchronous interface, 20mA current loop (1)
  - DUV11-DA low-speed synchronous interface
  - DLV11-E asynchronous interface with modem control
  - DLV11-F asynchronous interface (1)

    NOTE:
    (1) For 20 mA operation requires either the H319 option for optical isolation or one side of the 20mA line to be in passive mode.
  - PDT-11/130
  - PDT-11/150 with dual floppies

OPTIONAL HARDWARE:

None

PREREQUISITE SOFTWARE:

RT-11 FB/XM operating system, Version 03B

OPTIONAL SOFTWARE:

None

TRAINING CREDITS:

No training credits are included with a DECnet software license. Training courses on DECnet software are scheduled at regular intervals in DIGITAL's Training Center. Arrangements should be made directly with DIGITAL's Educational Services Department.

SUPPORT CATEGORY:

DIGITAL SUPPORTED

DECnet-RT is a DIGITAL Supported Software Product

SOFTWARE INSTALLATION:

DIGITAL INSTALLED

DIGITAL installation is required for Software Product Support. There is no charge for installation if performed at the time of system installation. DIGITAL installed software products, except for operating systems, are subject to an add-on installation fee when purchased subsequent to system installation.

Installation under DIGITAL Supported will convert the RT-11 system into a node with connection potential to a DECnet Phase II network. This installation does not include a demonstration of network connection.

SOFTWARE PRODUCT SUPPORT:

DECnet-RT includes standard services as defined in the Software Support Categories Addendum of this SPD.

The customer may purchase DECnet-RT licenses with options that do not include support services. The category of support applicable to such software is Customer Supported. When a DECnet-RT product option that does not include support services is connnected to a DECnet network, the category of support applicable to all DECnet products in the network is Customer Supported.

CUSTOMER RESPONSIBILITIES:

Before installation of the software, the customer must:

1. Install or have installed all hardware, including terminals, to be used on the system.
2. Make available to DIGITAL personnel all hardware, including terminals, to be used during installation for a reasonable period of time each day, as mutually agreed upon by DIGITAL and the customer, until installation is complete.

Delays caused by any failure to meet these responsibilities will be charged at the then prevailing rate for time and materials.

ORDERING INFORMATION:

Options with no support services are only available after the purchase of one supported license.

A single-use license only option is a license to copy the software previously obtained under license.

Source and/or listing options are only available after the purchase of at least one supported license and after a source license agreement is in effect.

The following key (D, E, G, M, Q, R, T, V, X, Y, Z) represents the distribution media for the product and must be specified at the end of the order number, e.g., QJ685-AD = binaries on 9-track 800 BPI Magtape (NRZI).

D = 9-track 800 BPI Magtape (NRZI)
E = RK05 Disk Cartridge
G = TU58 DECtape II Cartridge
M = 9-track 1600 BPI Magtape (PE)
Q = RL01 Disk Cartridge
R = Microfiche
T = RK06 Disk Cartridge
V = RK07 Disk Cartridge
X = RX02 Double Density Diskette
Y = RX01 Floppy Diskette
Z = No hardware dependency

QJ685 -A— Single-use license, binaries, documentation, support services (media: D, E, G, M, Q, T, V, X, Y)

QJ685 -C— Single-use license, binaries, documentation, no support services (media: D, E, G, M, Q, T, V, X, Y)

QJ685 -D— Single-use license only, no binaries, no documentation, no support services (media: Z)

Source /Listing Options

QJ685 -E— All sources (media: D, E, G, M, Q, T, V, X, Y)

QJ685 -F— Listings (media: R)

Update Options

Users of DECnet-RT, Version 1.0 whose specified Support Category warranty has expired may order under license the following software update at the then current charge for such update. The update is distributed in binary or source form on the appropriate medium and includes no installation or other services unless specifically stated.

QJ685 -H— Binaries, documentation (media: D, E, G, M, Q, T, V, X, Y)

QJ685 -H— Right to copy for single-use (under existing license, no binaries, no documentation, no support service (media: Z)

QJ685 -N— Sources (media: D, E, G, M, Q, T, V, X, Y)

Users of DECnet-RT, Version 1.0, whose specified Support Category warranty has not expired may order under license the following software update for the then current media charge. The update is distributed in binary or source form on the appropriate medium and includes no installation or other services unless specifically stated.

QJ685 -W— Binaries, documentation (media: D, E, G, M, Q, T, V, X, Y)

QJ685 -L— Sources (media: D, E, G, M, Q, T, V, X, Y)

Miscellaneous Options

QJ685 -G— Documentation only (media: Z)

ADDITIONAL SERVICES:

QJ680 -S— DECnet Level I Services (media: Z)

Level II services are also available. Consult the DECnet Phase II Products SPD (10.78) for a description of Level I and Level II services.

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Software Product Description

PRODUCT NAME: FORTRAN/RT-11 Extensions, Version 2.1 **SPD 12.12.6**

DESCRIPTION:

The FORTRAN/RT-11 Extensions consist of:

- FORTRAN IV/RT-11, Version 2.1
- A library of graphics subroutines supporting the VT11 and VS60 display processors
- A library of laboratory subroutines supporting the LPS11 Laboratory Peripheral System, the AR11 Analog Real Time Subsystem, and the AD11-K, KW11-K, and DR11-K laboratory I/O modules
- A FORTRAN debugger

The FORTRAN/RT-11 graphics library is a comprehensive set of FORTRAN-callable subroutines that enable the user to create and interact with graphic output on the VT11 and VS60 display processors. The subroutines enable the programmer to use many of the features of the VS60. If the library is configured for the VT11, the subroutines emulate the VS60 features whenever possible. Programs can thus be written for either device. The user need only link the program with the appropriate library. For additional flexibility, most subroutines are written in FORTRAN to facilitate maintenance and modification.

The FORTRAN/RT-11 VT55 subroutine provides access to all of the graphics features of the VT55 graphics terminal. In addition, single subroutine calls can be used to plot lines or complete data curves.

The laboratory subroutine library provides the capability of acquiring data in all of the modes provided by the LPS11 and AR11 hardware and to operate a CRT display through the digital-to-analog converters provided in these units. A completion routine capability allows the user to write subroutines which are activated asynchronously upon completion of many actions, such as the filling of a data buffer. DR11-K support allows up to eight of these interfaces to be operated simultaneously. The AD11-K (with optional AM11-K), AA11-K, and KW11-K are supported in a fashion compatible with the LPS11 support. The library is easily configured for the particular set of hardware on the user's machine.

The FORTRAN debugger enables users at the console terminal to debug the programs at the FORTRAN level.

MINIMUM HARDWARE REQUIRED:

Any valid RT-11 configuration with at least 32K bytes of memory. 48K bytes of memory are recommended for large graphics display files such as may be encountered with the VS60.

OPTIONAL HARDWARE:

Any optional devices supported by the operating system and FORTRAN IV/RT-11, Version 2.1.

VT11A	Graphics Display Processor
VS60	Graphics Display Processor
VT55	Graphics Terminal
LPS-11	Laboratory Peripheral System
AR11	Analog Real-Time Subsystem
DR11-K	Digital I/O System (up to 8)
AD11-K	Analog-to-digital converter
KW11-K	Real-time clock
AM11-K	Multiplexer
AA11-K	Digital-to-analog converter

PREREQUISITE SOFTWARE:

RT-11 Operating System, Version 03B (with the exception of the XM feature under the Foreground/Background monitor).

OPTIONAL SOFTWARE:

None

TRAINING CREDITS:

None

SUPPORT CATEGORY:

FORTRAN/RT-11 Extensions is a DIGITAL Supported Software Product.

SOFTWARE INSTALLATION:

FORTRAN/RT-11 Extensions is a software product engineered to be installed by the customer and includes other Software Product Support services listed below.

SOFTWARE PRODUCT SUPPORT:

FORTRAN/RT-11 Extensions includes Standard Services as defined in the Software Support Categories Addendum of this SPD.

ORDERING INFORMATION:

Options with no support services are only available after the purchase of one supported license.

A single-use license only option is a license to copy the software previously obtained under license.

Source and/or listing options are only available after the purchase of at least one supported license and after a source license agreement is in effect.

The following key (D, E, Q, R, T, Y, Z) represents the distribution media for the product and must be specified at the end of the order number, e.g., QJ980-AD = binaries on 9-track 800 BPI Magtape (NRZI).

D = 9-track 800 BPI Magtape (NRZI)
E = RK05 Disk Cartridge
Q = RL01 Disk Cartridge
R = Microfiche
T = RK06 Disk Cartridge
Y = RX01 Floppy Diskette
Z = No hardware dependency

QJ980 -A— Single-use license, binaries, documentation, support services (media: D, E, Q, T, Y)

QJ980 -C— Single-use license, binaries, documentation, no support services (media: D, E, Q, T, Y)

QJ980 -D— Single-use license only, no binaries, no documentation, no support services (media: Z)

Source/Listing Options

QJ980 -E— All sources (media: D, E, Q, T)

QJ980 -F— Listings (media: R)

Update Options

Users of FORTRAN/RT-11 Extensions, Version 1.0 or 1B, whose specified Support Category warranty has expired may order under license the following software update at the then current charge for such update. The update is distributed in source or binary form on the appropriate medium and includes no installation or other services unless specifically stated.

QJ980 -H— Binaries, documentation (media: D, E, Q, T, Y)

QJ980 -H— Right to copy for single-use (under existing license), no binaries, no documentation, no support services (media: Z)

QJ980 -N— Sources update (media: D, E, Q, T)

Users of FORTRAN/RT-11 Extensions, Version 1.0 or 1B, whose specified Support Category warranty has not expired may order under license the following software update for the then current media charge. The update is distributed in source or binary form on the appropriate medium and includes no installation or other services unless specifically stated.

QJ980 -W— Binaries, documentation (media: D, E, Q, T, Y)

ADDITIONAL SERVICES:

The following additional service is available:

- Binary Program Update Service

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Software Product Description

PRODUCT NAME: FMS-11/RT-11, Version 1.0 **SPD 12.22.1**

DESCRIPTION:

FMS-11/RT-11 is a set of utilities and subroutines that provide a multi-terminal video forms capability for programs written in MACRO-11, BASIC-11, or FORTRAN IV under the RT-11 operating system. Forms defined using FMS-11 can use the following features of DIGITAL's VT100 terminal:

- Reverse video characters
- Bold characters
- Underline characters
- Blinking characters
- 132-column lines
- Jump and smooth scrolling
- Split screen
- Reverse screen

FMS-11/RT-11 applications may be developed under the RT-11 operating system and executed under the control of either RT-11 or its execute-only subsets, RT^2 or RT^2/PDT.

The FMS-11 system can be used as a general purpose manager of formatted operator I/O to programs written in any of the supported languages and also as a front end in traditional source data entry applications.

Each field in an FMS-11/RT-11 form can be assigned attributes such as:

- Validation "picture"
- Embedded text characters
- Right/left justification
- Fixed decimal
- "Must complete"

A default value and a line of explanatory "HELP" text can be associated with each field of a form. In addition, a separate "HELP" display can be associated at the form level.

Another feature of FMS-11/RT-11 is "named data", which allows named strings of constant data to be associated with a form at form creation time and retrieved dynamically by name or number during program execution.

FMS-11/RT-11 applications written in MACRO-11 or FORTRAN IV can be built for either single- or multi-terminal. In multi-terminal applications the terminals can run different tasks and can change tasks independently of one another. The FMS-11/RT-11 software will support the maximum number of VT100s allowed under each RT-11 hardware configuration.

FMS-11/RT-11 consists of the following software components:

FRED (Form Editor) — The application developer uses the interactive Form Editor to create and modify video forms by typing them on the screen as they are to appear to the application user. All of the form attributes and individual field attributes are assigned in this form editing process. Form descriptions can be stored as data files for further processing or in form libraries for immediate use by application programs.

FRMUTL (Form Utility) — is a multi-function program which manipulates FMS-11/RT-11 forms descriptions. It can be used to list the directory of a form library or to print a complete description of a form from a form library or from a data file. FRMUTL can also be used to produce an RT-11 object module of form descriptions to be linked with the application when memory-resident forms are desired.

FDV (Form Driver) — is a reentrant subroutine called from application programs to perform screen processing. The Form Driver manages terminal I/O, displays forms, manipulates the screen, performs basic input validation, and responds to the operator's requests for "HELP". Operations are performed on a per-field or form-wide basis using the form description generated by FRED during the form editing process.

The Form Driver's high level language call interface allows applications written in BASIC-11 or FORTRAN IV to take full advantage of the Form Driver's capabilities.

ARTS (Application Run-Time Supervisor) — allows each terminal to run a MACRO-11 or FORTRAN IV application program independently of the programs on the other terminals. As an interface between the application programs and the RT-11 monitor, ARTS acts as a multi-tasking submonitor, providing subroutines for terminal and mass storage I/O and for shared and private file access management. Unique ARTS features include resident tasks not attached to any terminal and intertask message services. ARTS (with all of its tasks) runs in the background partition of the RT-11 monitor.

KED (Video Keypad Editor) — is a general purpose text editor which operates on standard ASCII files. KED uses the function keypad to control the full spectrum of video features of the VT100. Most editing operations are implemented as only one or two keystrokes on the function keypad.

When editing a main file, the user can also copy material in from one auxiliary file and write material out to another auxiliary output file. KED assists in the preparation of source programs by allowing the user to edit files through a full-screen, bidirectional scrolled "window" into the file. In addition to the standard character, word, and line operations, KED also provides flexible search, replace, cut, paste, and repeat functions.

MINIMUM HARDWARE REQUIRED:

For application execution:

Any valid RT-11, RT² or RT²/PDT system with a VT100 terminal.

The table below summarizes the minimum memory requirement for systems executing FMS-11/RT-11 applications. The figures include 8K bytes for the Form Driver and from 2K to 12K bytes for ARTS, depending on the functionality included at FMS-11 SYSGEN time.

	MACRO-11	FORTRAN IV	BASIC-11
Single-Terminal	32Kb	56Kb	56Kb
Multi-Terminal	56Kb	56Kb*	

*Multi-Terminal FORTRAN support is limited to very small programs.

Form application development:

Any valid RT-11 system with a least 56K bytes of memory and at least one VT100 terminal. The DIGITAL-supplied SYSGEN procedure for FMS-11/RT-11 requires a disk of at least 2.5 MB capacity in addition to the software load device.

OPTIONAL HARDWARE:

Supports additional VT100 terminals up to the maximum allowed under the RT-11/hardware configuration.

PREREQUISITE SOFTWARE:

For application execution:

RT-11 Operating System, Version 3B
RT², Version 3B or RT²/PDT, Version 3B

For application development:

RT-11 Operating System, Version 3B

OPTIONAL SOFTWARE:

BASIC-11/RT-11, Version 2.0
FORTRAN IV/RT-11, Version 2.1

TRAINING CREDITS:

None

SUPPORT CATEGORY:

DIGITAL SUPPORTED

FMS-11/RT-11 is a DIGITAL Supported Software Product

SOFTWARE INSTALLATION:

CUSTOMER INSTALLED

FMS-11/RT-11 is a software product engineered to be installed by the customer and includes other Software Product Support services listed below.

SOFTWARE PRODUCT SUPPORT:

FMS-11/RT-11 includes standard services as defined in the Software Support Categories Addendum of this SPD.

ORDERING INFORMATION:

Options with no support services are only available after the purchase of one supported license.

A single-use license only option is a license to copy the software previously obtained under license.

The following key (E, G, Q, Y, Z) represents the distribution media for the product and must be specified at the end of the order number, e.g., QJ713-AY = binaries on RX01 Floppy Diskette.

E = RK05 Disk Cartridge
G = TU58 DECtape II Cartridge
Q = RL01 Disk Cartridge
Y = RX01 Floppy Diskette
Z = No hardware dependency

QJ713 -A— Single-use license, binaries, documentation, support services (media: E, G, Q, Y)

QJ713 -C— Single-use license, binaries, documentation, no support services (media: E, G, Q, Y)

QJ713 -D— Single-use license only for all FMS-11/RT-11 components, no binaries, no documentation, no support services (media: Z)

QJ714 -D— Single-use license for ARTS and FDV only, no binaries, no documentation, no support services (media: Z)

Miscellaneous Options

QJ713 -G— Documentation only kit (media: Z)

ADDITIONAL SERVICES:

None

digital
Software Product Description

PRODUCT NAME: GAMMA-11 F/B, Version 3.0 **SPD 15.60.6**

DESCRIPTION:

GAMMA-11 F/B is a hardware/software system for nuclear medicine. GAMMA-11 F/B is designed to acquire, store, display, and manipulate images from the gamma camera in order to supply quantitative, meaningful clinical information.

In the foreground/background configuration, gamma camera data acquisition can take place independently of another process. This configuration includes two terminals. One terminal is designated the foreground acquisition terminal for the gamma camera and controls the setup and initiation of data collection. The other terminal, designated the background terminal, can be used simultaneously with the foreground terminal for data analysis by GAMMA-11 F/B programs, for program development in BASIC or FORTRAN, or for running any other programs that do not need immediate access to the disks for successful completion.

Only one terminal is included in the single-job configuration. This configuration has all the capabilities of the foreground/background system, except that data acquisition and processing can not be carried out simultaneously.

A transportable configuration (MDA11) also exists which provides data acquisition capabilities only.

Data Acquisition

GAMMA-11 F/B programs allow data acquired to be stored in seven different size matrices for static studies and four different size matrices for dynamic studies. Thus a user can choose the proper size and resolution for the job at hand. List mode acquisition (i.e., unstructured data) is also available. Static studies can be collected and terminated by a preset time, preset count, or matrix element overflow. Static studies can be linked to provide easy collection of and access to sequential static views. Dynamic studies are collected at a specified frame rate. List mode studies can be acquired with an effective frame rate of 100 frames per second.

An external synchronizing time marker can be included when acquiring either dynamic or list mode studies. When acquired with the time marker, these modes are called Gate Synchronized Acquisition (GSA) and Physiological List Mode (PLM), respectively, and are used primarily for cardiac studies.

GSA data is stored in 32 x 32, 64 x 64, or 128 x 128 matrices. The maximum number of images per study is determined by the amount of memory. During GSA acquisition (background) images are displayed 'line' on the video display.

The heart cycle time (or time between external synchronized events) is continuously monitored and displayed. During GSA acquisition (foreground) there is no line display of images, however, heart cycle time is monitored and displayed.

For GSA data acquisition, the operator can either choose fixed time intervals for each image or allow the program to divide the heart cycle time (averaged over 30 seconds) by the number of images chosen. A heart cycle time window can be selected so that if a given cycle time falls outside of this window, then the following cycle is rejected.

Acquisition in 128 x 128 word and 256 x 256 byte require the NCV11 interface. 256 x 256 byte acquisition requires a minimum of 64KW of memory. For display of 256 x 256 images, two additional M7068 bit maps are required (four total).

NOTE: List mode studies and 256 x 256 byte acquisition are not possible on the MDA11.

Physiological List Mode studies are acquired with one millisecond time intervals.

Data is reframed by creating a number of images based on the interval between successive external time markers.

With dual isotope collection, two separate images (one for each isotope) can be collected simultaneously. This capability does not apply to GSA or PLM.

NOTE: This gamma camera must also have the dual isotope option.

Once collection parameters and procedures are established, they can be set up as protocols or predefined studies. Up to 20 predefined studies can be used to speed setup, minimize error, and standardize collection procedures.

Patient Study Index

Once collected, patient studies are identified by a system-generated index file. Each study is identified by patient name, number, organ, study type, and

acquisition date. Studies are selected for analysis by index number; the user need not be concerned with the physcial location of disk data.

Patient Monitor

Patient Monitor (background) displays line camera data prior to acquisition. It allows for patient positioning and validation of external trigger input for GSA or PLM. MDA11 and foreground patient monitors have a pseudo display. The display is made up of 4-5 ASCII characters.

Data Analysis and Display

Data is displayed on the VSV01 color video monitor. The VSV01 color display includes a hardware character generator permitting display, along with the image, of patient identification and image counting statistics. All photographs taken from the display are thus positively identified.

NOTE: No data analysis or display is possible on the MDA11 system.

Display Features:

- Color or monochrome display
- 64 colors; 16 colors displayed simultaneously
- Up to 31 color spectra defined
- Intensity or isometric display
- 4- or 8-image display (16 with optional VSV01 bit maps)
- Normal or magnified display
- Lower and upper thresholding with or without contrast enhancement
- Dual/full size image display (split screen or overlayed)
- Negative image display
- Display 256 x 256 byte data

Data Manipulation Features:

- Skip frames (forward or backward)
- Sequential frame add
- Image rotation (90-degree steps)
- Image translation (horizontal and vertical)
- Non-uniformity correction
- Frame algebra — add, subtract, multiply, divide or merge frames; add, subtract, or multiply frames by a constant
- 9-point smoothing
- 9 save areas for temporary storage of images or ROI curves
- Up to 55 optional save areas for temporary storage of images
- Slice profiles (vertical or horizontal)
- Isocontour generation
- Interpolation of images (optional VSV01 bit maps required for 256 x 256 byte interpolation)
- Select quarter of image

Region of Interest Features:

- Regular (keyboard controlled)
- Irregular (joystick controlled)
- Circumference or fill mode definition (irregular)
- Pertinent count rate information for each region displayed with image
- Up to 12 regions displayed
- Simultaneous display of curves and images with ROIs outlined
- Select regions by thresholding (irregular)
- Select regions in magnified mode (irregular)
- Time/activity curves displayed normally, averaged, or overlayed
- Ability to expand selected portions of ROI curves

Dynamic Playback:

- Sequences of preprocessed images can be displayed in cine mode.
- 2 to 4 playback buffers can be combined into one and displayed synchronously.
- Speed and direction of playback can be controlled via the joystick or keyboard.

Predefined Analysis Features:

- Multiple commands can be entered on a single line
- Predefined analysis procedures (macros) can be created, edited, saved, and executed from the system disk
- Predefined analysis can be linked with predefined study acquisition to semiautomate the system.
- Macros can call FORTRAN or BASIC programs; special calls allow macro reentry.

Miscellaneous Features:

- Dual isotope display and processing
- Additional disk space not required for reconstructed images in list mode analysis
- Comment editor

Utility Programs

Study Deletion — This function requires user verification to prevent accidental deletion of important data.

Study Transfer — This function transfers patient studies between any two RT-11 file-structured devices (disks, magnetic tape, floppy disks, etc.)

Application Programs

Included with GAMMA-11 F/B is the GAMMA-11 Applications package that provides the user with a series of application programs for nuclear medicine written in BASIC or FORTRAN. This application software is provided on an "as is" basis.

MINIMUM HARDWARE REQUIRED:

Any UNIBUS PDP-11 (except PDP 11/70) with line frequency clock that meets the following main memory requirements:

- 32K bytes for single-job operation with RK05 as system disk
- 64K bytes for foreground/background operation with RK05 as system disk
- 64K bytes for single job operation with RL01, RK06, or RK07 as system disks
- 96K bytes for foreground/background operation with RL01, RK06, or RK07 disks

and includes,

Mass Storage (one of the following):

- One RK05, RL01, or RK06 disk with a second disk or RT-11 supported magnetic tape unit
- One RK07 disk and an RT-11 supported magnetic tape unit (except TS-11)
- Two RK05, RL01, or RK06 disks

Terminals:

- Any console terminal supported by the prerequisite software. (Two terminals are required for foreground/background operation. The foreground terminal must operate at 1200 baud or greater.) Foreground terminal requires a DL11 and must be VT52 or VT100.

Display:

- VSV01 Video Display

Interface: (one of the following)

- NC11 gamma camera interface with KW11-P (AR11 needed for foreground/background operation and/or GSA or PLM), or
- NCV11 gamma camera interface (includes KWV11; AR11 not needed)

OPTIONAL HARDWARE:

- Any RT-11 supported mass storage device for off-line data storage except TA11 cassette
- A system total of 256K bytes main memory
- MDA11 acquisition system
- MDA11 software for the MDA11 system is distributed with the GAMMA-11 F/B software. Each MDA11 system includes a DZ license to copy this MDA software for use on that MDA11 system. RX02 drive is required on the host system for communication.

PREREQUISITE SOFTWARE:

None

OPTIONAL SOFTWARE:

FORTRAN IV/RT-11, Version 2.1

TRAINING CREDITS:

TWO (2) — Applies only to options that include support services. Consult the latest Educational Services Catalog at your local office for the available courses, course requirements, and guidelines.

SUPPORT CATEGORY:

DIGITAL SUPPORTED

GAMMA-11 F/B is a DIGITAL Supported Software Product.

SOFTWARE INSTALLATION:

DIGITAL INSTALLED

DIGITAL installation is required for Software Product Support. There is no charge for installation if performed at the time of system installation. DIGITAL installed software products, except for operating systems, are subject to an add-on installation fee when purchased subsequent to system installation.

SOFTWARE PRODUCT SUPPORT:

GAMMA-11 F/B includes standard services as defined in the Software Support Categories Addendum of this SPD.

The GAMMA-11 Applications package is offered on an "as is " basis. The above DIGITAL INSTALLED does not apply to the GAMMA-11 Applications package.

ORDERING INFORMATION:

Source and/or listing options are only available after the purchase of at least one supported license and after a source license agreement is in effect.

The following key (A, D) represents the form of power source for the product and must be specified at the end of the number, i.e., GMA11-AA = system using 115 volt/60 Hertz power.

A = 115 volt/60 Hertz
D = 230 volt/50 Hertz

The following key (D, E, Q, T, Z) represents the distribution media for the product and must be specified at the end of the order number, e.g., QJ723-AD = binaries on 9-track 800 BPI Magtape (NRZI).

D = 9-track 800 BPI Magtape (NRZI)
E = RK05 Disk Cartridge
Q = RL01 Disk Cartridge
T = RK06 Disk Cartridge
Z = No hardware dependency

GMA11 -C— GAMMA-11 single job system includes hardware, single-use license for GAMMA-11, RT-11, BASIC-11/RT-11, binaries on RL01 disk, documentation, support services (power: A, D)

Source/Listing Options

QJ721 -E— All GAMMA-11 sources (media: D, E, Q, T)

Upgrade Options

The following option is available as an upgrade kit from GAMMA-11, Version 7.0, for use on the same single CPU on which GAMMA-11, Version 7.0, is licensed. The license previously granted for GAMMA-11, Version 7.0 shall be extended to cover this upgrade.

QJ723 -A— Single-use license for GAMMA-11 F/B, RT-11, BASIC-11/RT-11, binaries, documentation, support services (media: D, E)

Update Options

Users of GAMMA-11 F/B, Version 2.0, whose specified Support Category warranty has expired may order under license the following software update at the then current media charge for such update. The update is distributed in source or binary form on the appropriate medium and includes no installation or other services unless specifically stated.

QJ721 -H— Binaries, documentation (media: D, E, Q, T)

QJ721 -H— Right to copy for single-use (under existing license), no binaries, no documentation (media: Z)

Users of GAMMA-11 F/B, Version 2.0, whose specified Support Category warranty has not expired may order under license the following software update for the then current media charge. The update is distributed in source or binary form on the appropriate medium and includes no installation or other services unless specifically stated.

QJ721 -W— Binaries, documentation (media: D, E, Q, T)

NOTE: RT-11 and BASIC Updates and Upgrades are not included in GAMMA-11.

Miscellaneous Options

QJ721 -G— Documentation only kit (media: Z)

ADDITIONAL SERVICES:

The following additional service is available:

- Binary Program Update Service

DIGITAL EQUIPMENT COMPUTER USERS SOCIETY

INTRODUCTION

DECUS, the Digital Equipment Computer Users Society, was established in March of 1961 to advance the effective use of DIGITAL computers. It is a not-for-profit users group supported in part by Digital Equipment Corporation.

OBJECTIVES

The objectives of the Society are to advance the effective utilization of computers, computer peripheral equipment, and software manufactured and marketed by Digital Equipment Corporation, by promoting the interchange of information concerning their uses; advance the art of computation through mutual education and exchange of ideas and information; establish standards and provide channels to facilitate the exchange of computer programs among DECUS members; provide feedback to the computer industry on equipment and software needs; and to reduce the duplication of development efforts.

ORGANIZATION

The Digital Equipment Computer Users Society is a federation of chapters, whose membership is determined by geographic location. The membership is organized to meet the specific needs of members in its area such as Symposia and Special User Group activities. The DECUS chapters are:

- *AUSTRALIAN CHAPTER (Australia, Indonesia, Malaysia, New Zealand, PNG, Singapore,)*
- *EUROPEAN CHAPTER (Europe, Middle East, North Africa, Russia)*
- *CANADIAN CHAPTER (Canada)*
- *U.S. CHAPTER (U.S. and All Others)*

ACTIVITIES

1. SYMPOSIA

Symposia are sponsored throughout the year by each of the DECUS Chapters and Regional/National User Groups. These meetings provide an opportunity for users of DIGITAL computers to meet with other users and with DIGITAL management, engineers, and customer service representatives. They provide a forum for users to exchange information on technique and approaches to issues of common interest and to provide feedback to DIGITAL on existing and future products and services. Sessions at the symposia include user-driven workshops, tutorials, product panels, as well as application/system-specific presentations.

The technical papers and presentations from each symposium are published as DECUS Proceedings.

2. SPECIAL USER GROUPS

DECUS encourages subgrouping of users with common interests and/or geographical proximity.

Special Interest Groups (SIGs) promote the interchange of specialized information for application areas, subject areas (such as languages), or specific operating systems. A group of users must petition the Chapter Executive Board for recognition as a Special Interest Group. The group must have a chairman, a DIGITAL representative, and its organization must meet the guidelines of the Chapter Executive Board.

Geographic subgroupings are formed to service the DECUS members within a specific area although they may also be based on interests as in SIGs. There are four types of geographic subgroupings:

1. *LUGs — Local User Groups*
2. *NUGs — National User Groups*
3. *RUGS — Regional User Groups*
4. *SLUGs — Student Local User Groups*

3. STANDARDS

DECUS promotes user activity in reviewing DIGITAL standards. Users are given the opportunity to comment on DIGITAL standards prior to their finalization.

4. PROGRAM LIBRARY

One of the major activities of the users group is the DECUS Program Library. The Library contains programs written and submitted by users and is maintained and operated separate from the Digital Software Distribution Center. A wide range of software is available, including languages, editors, numerical functions, utilities, display routines, and various other types of application software.

MEMBERSHIP

Membership in DECUS is voluntary and is not subject to membership fee. Members are invited to take an active interest in the Society by contributing to the Program Library, to newsletters, and by participating in its Special User Groups and Symposia. There are two types of membership: Installation Membership and Association Membership.

INSTALLATION MEMBERSHIP

An organization, institution, or individual that has purchased, leased or has on order a computer manufactured by Digital Equipment Corporation is eligible for Installation Membership in DECUS.

An Installation should appoint a person immediately concerned with the use of the computer to act as delegate to the Society. A delegate receives all official communications and has a vote on DECUS policies and elections. An organization or company is eligible for as many voting delegates as it has DIGITAL computers. Each delegate must file an application for Installation Membership.

ASSOCIATE MEMBERSHIP

Any person who is not an appointed Installation Delegate, who has a bona fide interest in DECUS is eligible for Associate Membership.

Membership status is acquired by submitting the enclosed application to the appropriate Chapter Executive Secretary for approval by the Chapter Executive Board.

To obtain a membership form for DECUS, please return this form to the appropriate Chapter office listed below.

NAME: _____
(First) (Last/Family Name)

COMPANY: (INSTALLATION): _____

ADDRESS 1: _____

2: _____

3: _____

4: _____
(City Town,State Province, and Zip Postal Code)

COUNTRY: _____

TELEPHONE: _____ TELEX _____

I obtained this form from _____

DECUS OFFICES

DECUS Australia
P.O. Box 384
Chatswood
NSW 2067
Australia

DECUS Canada
P.O. Box 11500
Ottawa, Ontario K2H 8K8
Canada

DECUS Europe
P.O. Box 510
12, avenue des Morgines
CH-1213 Petit-Lancy 1/GE
Switzerland

DECUS U.S. and
Office of the Executive Director
One Iron Way
Marlboro, Massachusetts 01752
USA

SOFTWARE PROBLEMS OR ENHANCEMENTS

Questions, problems, and enhancements to DIGITAL software should be reported on a Software Performance Report (SPR) form and mailed to the SPR Center at one of the following Digital Offices: *(SPR forms are available from the SPR Center).*

Areas Covered	SPR Center
United States; remainder of Far East, Middle East, Africa Latin America	Administrative Services Group, SWS P.O. Box F Maynard, Ma 01754
Canada	Digital Equipment Canada P.O. Box 11500 Ottawa, Ontario Canada K2H 8K8
United Kingdom, Bahraine, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Qatar, Oman, Saudi Arabia, Syria, United Arab Emirates, Yemen, Arab Republic.	Digital Equipment Corp. LTD Fountain House Butts Centre GB - Reading RG17QN England
Australia-Melbourne	Digital Equipment Aust. PTY. LTD 60 Park Street So. Melbourne Victoria Australia 3205
Australia-Sydney	Digital Equipment Aust. PTY. LTD 123 125 Willoughby Rd. P. O. Box 491 Crows Nest NSW Australia 2065
Brazil	Digital Equipment Comercio Ind. Rua Batatais 429 Esq AL Campin 01423 Jardim Paulista Sao Paulo 0100 Brazil
Caribbean	De Latin America P. O. Box 11038 Fernando Juncos Sta. Santurce PR 00910
France	Digital Equipment France 18, rue Saarinen France Silic 225 F - 94528 Rungis - Cedex France
Italy	Digital Equipment S.P.A. Viale Fulvio Testi 117 I-20092 Cinisillo Balsamo Milan, Italy

Areas Covered	SPR Center
Japan	Digital Equipment Corp. INTL 3rd Floor Kowa Bldg. 8-7 Sanban Cho Chiyoda Ku Tokyo 102 Japan
New Zealand	Digital Equipment N.Z. LTD P.O. Box 17093 Greenlane, Auckland 5, New Zealand
Belgium, Holland, Luxemburg	Digital Equipment B.V. KAAP Horndreef 38 NL - Utrecht/Overvecht Holland
Sweden	Digital Equipment Corp. AB Englundavägen 7 S-171 24 Solna, Sweden
Denmark	Digital Equipment Corp. APS Kristineberg 3 DK-2100 Copenhagen Ø Denmark
Finland	Digital Equipment Corp. OY PL16 SF - 02201 ESPOO 20 Finland
Norway	Digital Equipment Corp. A/S Pottenmakerveien 8 N - Oslo 5 Norway
Austria, East Germany, West Germany, Poland, Hungary, Rumania, Czechoslovakia, Russia, Bulgaria	Digital Equipment Corp. GMBH Wallsteinplatz 2 D - 8 Munich 40 West Germany
Israël	DECSYS Computers LTD. 4, Yirmiyahou Str. P.O. Box 6359 IL - Tel-Aviv 63505 Israël

Areas Covered	SPR Center
Greece, Portugal, Spain, Switzerland, Yugoslavia & Sina (Morocco, Algeria, Tunisia, Cyprus, Turkey, Malta)	Digital Equipment Corp. SA 9, route des Jeunes 1211 Geneva 26 Switzerland

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