

RT-11

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**THE
SOFTWARE
DISPATCH**

digital

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	FORTTRAN/RT-11 Extensions V2.1	PLOT 11/RT-11 V1.1
BASIC-11/RT-11 V2	FORTTRAN IV/RT-11 V2, V2.1	RT-11 V3B, RT-11 V4
BASIC/RT Extensions V1	GAMMA-11 F/B V2C, V3	RT-11 (CTS-300) LSI-11
CTS-300 V5	Lab Applications-11 LIBRARY V3	2780 V2
DECnet/RT V1, V1.1	LSP-11 V1	RT-11/2780
FOCAL/RT-11 V1B	MSB11 V1	(CTS-300/2780) V2
FORTTRAN Graphics	MSB/FORTTRAN IV V1	SSP-11/RT-11 V1.1
Package V1.1	MU BASIC-11/RT-11 V2	

DISTRIBUTION

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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 You 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.

DECnet-RT V1.1
for RT-11 V4
NFT

50.9.1 M
1 of 2

NFT INCORRECTLY ALLOCATES RT-11 QUEUE ELEMENTS (SPR 11-29222, WMD)

The DECnet-RT NFT utility will produce various error messages such as 'SYNTAX ERROR' if DECnet-RT is built with the XM monitor. This occurs because a QSET statement was attempting to use more RT-11 queue elements than than were allocated for it. The result was that the command parsing tables were being corrupted. The following correction solves this problem by causing the QSET statement to use only those elements allocated for it. This correction should be applied even though the FB flavor of the monitor is to be used.

Note that all corrections must be made on a copy of the original distribution media. The PAT utility will corrupt the original object file if an error occurs during the application of the correction file. During the following procedure the pseudo device name KI: refers to the original distribution media and the pseudo device OU: refers to the media on which the correction is to be applied.

1) Copy the file NFT.OBJ from the distribution media to the media on which the correction will be applied:

```
COPY KI:NFT.OBJ OU:NFT.OBJ
```

2) Create the following file named NFT.PAT on the correction media:

```
.TITLE NFT
.IDENT /V01.11/
.CSECT NFT
;
; NFTP01 - CAUSE NFT TO ALLOCATE PROPER NUMBER OF Q ELEMENTS
;
; *** BEGIN NFTP01 ***
;
X=.
.=X+6
        MOVB    #20.,RO                ; INDICATE 20. Q ELEMENTS
;
        .PSECT NFTP01
NFTP01::
;
; *** END NFTP01 ***
;
        .END
```

DECnet-RT V1.1
for RT-11 V4
NFT

50.9.1 M
2 of 2

3) Assemble the correction file:

```
.MACRO/OBJECT:OU:NFT.POB OU:NFT.PAT
ERRORS DETECTED : 0
```

.

If any errors are detected, re-edit the file and re-assemble.

4) Apply the correction file:

```
.R PAT
*OU:NFT.NEW=OU:NFT.OBJ/C:4375,OU:NFT.POB/C:7612
```

.

If any errors are detected by PAT then verify that the entered checksums are correct and that the file NFT.PAT is correct. Go back to step one.

5) If the PAT program gives no errors then replace the original object with the corrected version of the object module and delete any extra files:

```
.COPY OU:NFT.NEW KI:NFT.OBJ
.DELETE/NOQUERY OU:NFT.NEW,OU:NFT.POB
```

.

6) The distribution device KI: now has the corrected file NFT.OBJ. The NFT utility must be re-built to include the corrected module. This can be achieved by assigning the proper pseudo devices specified during NETGEN (if any) and invoking the command file to re-build NFT:

```
.@NFTBLD
```

An alternative method is to re-run NETGEN as directed in the DECnet-RT V1.1 User's Guide chapter 13.

DECnet-RT V1.1
for RT-11 V4
FAL

50.10.1 M
1 of 2

FAL INCORRECTLY ALLOCATES RT-11 QUEUE ELEMENTS (WMD)

The DECnet-RT FAL utility is allocating too many RT-11 queue elements from an internal queue element area. This can cause random problems especially if the XM flavor of the monitor is selected. This correction causes FAL to allocate the proper amount of queue elements from the internal queue element area. This correction should be applied even if the FB flavor of the monitor is to be used.

Note that all corrections must be made on a copy of the original distribution media. The PAT utility will corrupt the original object file if an error occurs during the application of the correction file. During the following procedure the pseudo device name KI: refers to the original distribution media and the pseudo device OU: refers to the media on which the correction is to be applied.

1) Copy the file FAL.OBJ from the distribution media to the media on which the correction will be applied:

```
COPY KI:FAL.OBJ OU:FAL.OBJ
```

2) Create the following file named FAL.PAT on the correction media:

```
.TITLE FAL
.IDENT /V01.11/
.CSECT FAL
;
; FALP01 - CAUSE FAL TO ALLOCATE THE PROPER NUMBER OF Q ELEMENTS
;
; *** BEGIN FALP01 ***
;
X=.
.=X+162
      MOVB    #20.,R0          ; INDICATE 20. Q ELEMENTS
;
      .PSECT FALP01
FALP01::
;
; *** END FALP01 ***
;
      .END
```

DECnet-RT V1.1
for RT-11 V4
FAL

50.10.1 M
2 of 2

3) Assemble the correction file:

```
.MACRO/OBJECT:OU:FAL.POB OU:FAL.PAT  
ERRORS DETECTED : 0  
.
```

If any errors are detected, re-edit the file and re-assemble.

4) Apply the correction file:

```
.R PAT  
*OU:FAL.NEW=OU:FAL.OBJ/C:152736,OU:FAL.POB/C:10277  
.
```

If any errors are detected by PAT then verify that the entered checksums are correct and that the file FAL.PAT is correct. Go back to step one.

5) If the PAT program gives no errors then replace the original object with the corrected version of the object module and delete any extra files:

```
.COPY OU:FAL.NEW KI:FAL.OBJ  
.DELETE/NOQUERY OU:FAL.NEW,OU:FAL.POB  
.
```

6) The distribution device KI: now has the corrected file FAL.OBJ. The FAL utility must be re-built to include the corrected module. This can be achieved by assigning the proper pseudo devices specified during NETGEN (if any) and invoking the command file to re-build FAL:

```
.@FALBLD
```

An alternative method is to re-run NETGEN as directed in the DECnet-RT V1.1 Users Guide chapter 13.

DECnet-RT V1.1
for RT-11 V4
Fortran User Interfaces

50.16.1 N
1 of 1

NOTES ON THE USE OF THE DECnet-RT FORTRAN INTERFACES (WMD)

The following notes apply to the usage of the FORTRAN NSP and FORTRAN DAP user interfaces in DECnet-RT V1.1 .

1) The FORTRAN group recommends that all FORTRAN users set the USR to no-swap. DECnet-RT requires this. If the USR is allowed to swap, several file related functions such as CLOSE will hang the user task. This is caused by the fact that if the USR is swapping, FORTRAN will wait for I/O to complete on all luns rather than the lun of interest, before performing the requested function. DECnet-RT is running asynchronously underneath the user task and always has I/O pending and hence the hang.

2) Remember that all non-DECnet luns must be accessed before opening the network. An assignment of the lun, or a lookup of a file is insufficient as these do not perform I/O on the lun.

3) All open files must be closed before issuing a NEXIT call. The NEXIT call is not the same as the EXIT call in respect to the closure of open files.

4) A FORTRAN read statement strips off the trailing carriage control from ASCII records and the FORTRAN write re-appends these characters before writing these records out. Remember this when a FORTRAN task is communicating to a MACRO task or vice versa.

5) FORTRAN users now may use either the threaded or the inline form of the compiler. The compiler restriction imposed under DECnet-RT V1.0 has now been lifted.

DECnet-RT V1.1
for RT-11 V4
MACRO User Interfaces

50.16.2 N
1 of 1

NOTES ON DECnet-RT MACRO PROGRAMMING (WMD)

The following notes apply to the usage of the MACRO NSP or the MACRO DAP user interfaces in DECnet-RT V1.1 .

1) User tasks must be careful about where the USR is allowed to swap. The USR must not be allowed to swap over any of the DECnet-RT routines as a high percentage of these routines operate at ast level. Consult the RT-11 Advanced Programmer's Guide on USR considerations.

2) User tasks using multiple levels of indirect should also be careful about the USR's location in memory. Even if the USR is set noswap it will move when new levels of indirect are entered. As a result it is recommended that all DECnet-RT routines be put at the highest possible addresses to allow the USR to move over non-ast user code if it is necessary.

3) When intermixing MACRO and FORTRAN DECnet tasks be aware that FORTRAN strips off carriage control during read operations and can add carriage control during write operations.

**RT-11 V4.0
CUMULATIVE INDEX
JUNE 1980**

This is a complete listing of all articles for RT-11 V4.0 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.

+ = Articles appeared in the RT-11 Software Dispatch Review, March 1980.

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DECnet-RT V1.1

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FAL

FAL INCORRECTLY ALLOCATES RT-11 QUEUE ELEMENTS	50.10.1 M	Jun 80
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FORTTRAN USER INTERFACES

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MACRO USER INTERFACES

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RT-11 Software Dispatch, June 1980

CTS-300 V5
DIBOL
SUD VA05-00G
(PATCH 21)

Seq 15 M

1 of 2

LP: MAY PRINT UNWANTED CHARACTERS (LG)

Under Single-User DIBOL, when writing to the lineprinter it is possible for extraneous characters to be output as part of the last buffer when the DIBOL CLOSE statement is executed. The problem can occur if the PROC statement specifies a buffer size greater than two blocks.

Patch 21 prevents this from happening, and changes the version number of SUD to VA05-00H.

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-300 V5
DIBOL
SUD VA05-00G
(PATCH 21)

Seq 15 M

2 of 2

;P021.MAC

.TITLE \$IO
.CSECT \$IO

```
P021:      . =      .+4570
           JMP      P021A
           . =      P021+6050
           JSR      PC,P021B
           .PSECT $P021
P021A:    BEQ      WB3
           ADD      40(R5),4(R1)
           JMP      P021+4576
WB3:      JMP      P021+4602
P021B:    CMFB     2(R3),#376
           BEQ      15$
           ASR      R0
15$:      SUB      R0,(R3)
           RTS      PC
           .END
```

;P021V1.MAC

.TITLE DIRT
.CSECT \$DIRT

. = .+11103
.ASCII /H/

.END

.MACRO P021,P021V1
ERRORS DETECTED: 0
ERRORS DETECTED: 0

.RENAME (IO,DIRT,DIBOL).OBJ *.OLD
Files renamed:
DK:IO.OBJ to DK:IO.OLD
DK:DIRT.OBJ to DK:DIRT.OLD
DK:DIBOL.OBJ to DK:DIBOL.OLD

.R PAT
*IO.OBJ=IO.OLD/C:177317,P021/C:020116

.R PAT
*DIRT.OBJ=DIRT.OLD/C:123711,P021V1/C:005254

.R LIBR
*DIBOL=DIBOL.OLD,IO/R,DIRT/R
*^C

DECnet-RT V1.1
for RT-11 V3B
NFT

50.9.1 M
1 of 2

NFT INCORRECTLY ALLOCATES RT-11 QUEUE ELEMENTS (SPR 11-29222, WMD)

The DECnet-RT NFT utility will produce various error messages such as 'SYNTAX ERROR' if DECnet-RT is built with the XM monitor. This occurs because a QSET statement was attempting to use more RT-11 queue elements than than were allocated for it. The result was that the command parsing tables were being corrupted. The following correction solves this problem by causing the QSET statement to use only those elements allocated for it. This correction should be applied even though the FB flavor of the monitor is to be used.

Note that all corrections must be made on a copy of the original distribution media. The PAT utility will corrupt the original object file if an error occurs during the application of the correction file. During the following procedure the pseudo device name KI: refers to the original distribution media and the pseudo device OU: refers to the media on which the correction is to be applied.

- 1) Copy the file NFT.OBJ from the distribution media to the media on which the correction will be applied:

```
COPY KI:NFT.OBJ OU:NFT.OBJ
```

- 2) Create the following file named NFT.PAT on the correction media:

```
.TITLE NFT
.IDENT /V01.11/
.CSECT NFT
;
; NFTP01 - CAUSE NFT TO ALLOCATE PROPER NUMBER OF Q ELEMENTS
;
; *** BEGIN NFTP01 ***
;
X=.
.=X+6
      MOVB    #20.,R0          ; INDICATE 20. Q ELEMENTS
;
      .PSECT NFTP01
NFTP01::
;
; *** END NFTP01 ***
;
      .END
```


DECnet-RT V1.1
for RT-11 V3B
NFT

50.9.1 M
2 of 2

3) Assemble the correction file:

```
.MACRO/OBJECT:OU:NFT.POB OU:NFT.PAT
ERRORS DETECTED : 0
.
```

If any errors are detected, re-edit the file and re-assemble.

4) Apply the correction file:

```
.R PAT
*OU:NFT.NEW=OU:NFT.OBJ/C:554,OU:NFT.POB/C:7612
.
```

If any errors are detected by PAT then verify that the entered checksums are correct and that the file NFT.PAT is correct. Go back to step one.

5) If the PAT program gives no errors then replace the original object with the corrected version of the object module and delete any extra files:

```
.COPY OU:NFT.NEW KI:NFT.OBJ
.DELETE/NOQUERY OU:NFT.NEW,OU:NFT.POB
.
```

6) The distribution device KI: now has the corrected file NFT.OBJ. The NFT utility must be re-built to include the corrected module. This can be achieved by assigning the proper pseudo devices specified during NETGEN (if any) and invoking the command file to re-build NFT:

```
.@NFTBLD
```

An alternative method is to re-run NETGEN as directed in the DECnet-RT V1.1 User's Guide chapter 13.

DECnet-RT V1.1
for RT-11 V3B
FAL

50.10.1 M
1 of 2

FAL INCORRECTLY ALLOCATES RT-11 QUEUE ELEMENTS (WMD)

The DECnet-RT FAL utility is allocating too many RT-11 queue elements from an internal queue element area. This can cause random problems especially if the XM flavor of the monitor is selected. This correction causes FAL to allocate the proper amount of queue elements from the internal queue element area. This correction should be applied even if the FB flavor of the monitor is to be used.

Note that all corrections must be made on a copy of the original distribution media. The PAT utility will corrupt the original object file if an error occurs during the application of the correction file. During the following procedure the pseudo device name KI: refers to the original distribution media and the pseudo device OU: refers to the media on which the correction is to be applied.

1) Copy the file FAL.OBJ from the distribution media to the media on which the correction will be applied:

```
COPY KI:FAL.OBJ OU:FAL.OBJ
```

2) Create the following file named FAL.PAT on the correction media:

```
.TITLE FAL
.IDENT /V01.11/
.CSECT FAL
;
; FALP01 - CAUSE FAL TO ALLOCATE THE PROPER NUMBER OF Q ELEMENTS
;
; *** BEGIN FALP01 ***
;
X=.
.=X+162
      MOVB    #20.,R0          ; INDICATE 20. Q ELEMENTS
;
      .PSECT FALP01
FALP01::
;
; *** END FALP01 ***
;
      .END
```

DECnet-RT V1.1
for RT-11 V3B
FAL

50.10.1 M
2 of 2

3) Assemble the correction file:

```
.MACRO/OBJECT:OU:FAL.POB OU:FAL.PAT
ERRORS DETECTED : 0
.
```

If any errors are detected, re-edit the file and re-assemble.

4) Apply the correction file:

```
.R PAT
*OU:FAL.NEW=OU:FAL.OBJ/C:146662,OU:FAL.POB/C:10277
.
```

If any errors are detected by PAT then verify that the entered checksums are correct and that the file FAL.PAT is correct. Go back to step one.

5) If the PAT program gives no errors then replace the original object with the corrected version of the object module and delete any extra files:

```
.COPY OU:FAL.NEW KI:FAL.OBJ
.DELETE/NOQUERY OU:FAL.NEW,OU:FAL.POB
.
```

6) The distribution device KI: now has the corrected file FAL.OBJ. The FAL utility must be re-built to include the corrected module. This can be achieved by assigning the proper pseudo devices specified during NETGEN (if any) and invoking the command file to re-build FAL:

```
.@FALBLD
```

An alternative method is to re-run NETGEN as directed in the DECnet-RT V1.1 Users Guide chapter 13.

DECnet-RT V1.1
for RT-11 V3B
Fortran User Interfaces

50.16.1 N
1 of 1

NOTES ON THE USE OF THE DECnet-RT FORTRAN INTERFACES (WMD)

The following notes apply to the useage of the FORTRAN NSP and FORTRAN DAP user interfaces in DECnet-RT V1.1 .

1) The FORTRAN group recommends that all FORTRAN users set the USR to no-swap. DECnet-RT requires this. If the USR is allowed to swap, several file related functions such as CLOSE will hang the user task. This is caused by the fact that if the USR is swapping, FORTRAN will wait for I/O to complete on all luns rather than the lun of interest, before performing the requested function. DECnet-RT is running asynchronously underneath the user task and always has I/O pending and hense the hang.

2) Remember that all non-DECnet luns must be accessed before opening the network. An assignment of the lun, or a lookup of a file is insufficient as these do not perform I/O on the lun.

3) All open files must be closed before issuing a NEXIT call. The NEXIT call is not the same as the EXIT call in respect to the closure of open files.

4) A FORTRAN read statement strips off the trailing carriage control from ASCII records and the FORTRAN write re-appends these characters before writing these records out. Remember this when a FORTRAN task is communicating to a MACRO task or vise versa.

5) FORTRAN users now may use either the threaded or the inline form of the compiler. The compiler restriction imposed under DECnet-RT V1.0 has now been lifted.

DECnet-RT V1.1
for RT-11 V3B
MACRO User Interfaces

50.16.2 N
1 of 1

NOTES ON DECnet-RT MACRO PROGRAMMING (WMD)

The following notes apply to the useage of the MACRO NSP or the MACRO DAP user interfaces in DECnet-RT V1.1 .

1) User tasks must be careful about where the USR is allowed to swap. The USR must not be allowed to swap over any of the DECnet-RT routines as a high percentage of these routines operate at ast level. Consult the RT-11 Advanced Programmer's Guide on USR considerations.

2) User tasks using multiple levels of indirect should also be careful about the USR's location in memory. Even if the USR is set noswap it will move when new levels of indirect are entered. As a result it is recommended that all DECnet-RT routines be put at the highest possible addresses to allow the USR to move over non-ast user code if it is necessary.

3) When intermixing MACRO and FORTRAN DECnet tasks be aware that FORTRAN strips off carriage control during read operations and can add carriage control during write operations.

RT-11 Software Dispatch, June 1980

RT-11 V03B-00

Seq 16 M

SOURCE

TM.MAC

1 of 1

TJ.MAC

SHORT MAGTAPE READS IN XM (SPR 11-20511A SD)

Short, multi-block magtape read requests in XM do not clear out the user buffer correctly. The following patch corrects the problem:

```
.R EDIT <RET>
*EBTM.MAC<ESC>RV<ESC><ESC>
; TM EDIT LEVEL 4.
*G4<ESC>-C5<ESC>V<ESC><ESC>
; TM EDIT LEVEL 5.
*FXBUMP:<ESC>V<ESC><ESC>
XBUMP:  ADD      #512.,OLDBA
*I      MOV      MTCQE,-(SP) <RET>
        ADD      #Q$PAR,@SP <RET>
        ADD      #10,@(SP)+ <RET>
<ESC>-3A<ESC>4L<ESC><ESC>
XBUMP:  MOV      MTCQE,-(SP)
        ADD      #Q$PAR,@SP
        ADD      #10,@(SP)+
        ADD      #512.,OLDBA
*EX<ESC><ESC>
```

```
.R EDIT <RET>
*EBTJ.MAC<ESC>RV<ESC><ESC>
; TJ EDIT LEVEL 4.
*G4<ESC>-C5<ESC>V<ESC><ESC>
; TJ EDIT LEVEL 5.
*FXBUMP:<ESC>V<ESC><ESC>
XBUMP:  ADD      #512.,OLDBA
*I      MOV      MTCQE,-(SP) <RET>
        ADD      #Q$PAR,@SP <RET>
        ADD      #10,@(SP)+ <RET>
<ESC>-3A<ESC>4L<ESC><ESC>
XBUMP:  MOV      MTCQE,-(SP)
        ADD      #Q$PAR,@SP
        ADD      #10,@(SP)+
        ADD      #512.,OLDBA
*EX<ESC><ESC>
```

NOTE

The magtape handlers can only be generated as described in "Distributed Magtape Handler Corrections (BD)", Seq 03M which was published in the RT-11 September 1978 Software Dispatch.

RT-11 V03B-00
SOURCE
TJ.MAC

Seq 17 M
1 of 1

MM HANDLER WRITELOCK ERRORS (SPR 11-28529 SD)

The MM magtape handler does not report writelock errors properly. The following source patch to TJ.MAC will correct the problem when the handler is reassembled, linked and installed.

```
.R EDIT <RET>
*EBTJ.MAC<ESC>RV<ESC><ESC>
; TJ EDIT LEVEL 5.
*G5<ESC>-C6<ESC>V<ESC><ESC>
; TJ EDIT LEVEL 6.
*FERWRIT:<ESC>V<ESC><ESC>
ERWRIT: TST    @#MTFC
*3A<ESC>V<ESC><ESC>
        BR      AB1
*I      BIT      #WRL,@#MTDS <RET>
        BEQ      AB1 <RET>
        MOV      #WRITELOCK,R4 <RET>
<ESC>-3LL<ESC><ESC>
        BIT      #WRL,@#MTDS
        BEQ      AB1
        MOV      #WRITELOCK,R4
        BR      AB1
*GNEF<ESC>V<ESC><ESC>
        BIT      #NEF,R4
*2AV<ESC><ESC>
        BIT      #WRL,R5
*4KV<ESC><ESC>
2$:      BIT      #INCVPE+PEFLRC+CORCRC+NSG,R4
*I      BR      NQ1 <RET>
<ESC>-2LL<ESC><ESC>
        BEQ      2$
        BR      NQ1
2$:      BIT      #INCVPE+PEFLRC+CORCRC+NSG,R4
*EX<ESC><ESC>
.
```

Note

The magtape handlers can only be generated as described in "Distributed Magtape Handler Corrections (BD)", Seq 03M which was published in the RT-11 September 1978 Software Dispatch.

RT-11 Software Dispatch, June 1980

RT-11 V03B-00
UTILITIES
BATCH.SAV V03.03

Seq 32 M

1 of 2

SAVE/RESTORE OF TERMINAL I/O LOGGING ACTION IN BATCH (SPR 11-27947 MG)

PROBLEM:

Logging action status (set by the BATCH directives TTYIN, TTYOUT, TTYIO and NOTTY) is not correctly saved during a \$CALL. The following patches correct the errors in BATCH.SAV and BATCH.MAC.

NOTE: Due to the method of stacking and restoring the information needed, the logging action (TTYIN, TTYOUT, TTYIO or NOTTY) that is in effect at the time of the \$CALL will be the default action in the \$CALLED batch stream.

Patch to BATCH.SAV V03.03:

.R PATCH<RET>

FILE NAME--

*BATCH.SAV/C<RET>

*6120;0R

*0,442/ 177762 177760<RET>

*0,1300/ 20 22<RET>

*0,1330/ 5311 4767<LF>

0,1332/ 12120 15746<RET>

*0,17302/ 0 5311<LF>

0,17304/ 0 12120<LF>

0,17306/ 0 17420<LF>

0,17310/ 0 60<LF>

0,17312/ 0 207<RET>

*0,1526/ 20 22<RET>

*0,1552/ 5211 4767<LF>

0,1554/ 12120 15536<RET>

*0,17314/ 0 5211<LF>

0,17316/ 0 12120<LF>

0,17320/ 0 12174<LF>

0,17322/ 0 60<LF>

0,17324/ 0 207<RET>

*0,3734/ 12774 240<LF>

0,3736/ 40106 4767<LF>

0,3740/ 60 13364<RET>

*0,17326/ 0 42774<LF>

0,17330/ 0 177376<LF>

0,17332/ 0 60<LF>

0,17334/ 0 52774<LF>

0,17336/ 0 40106<LF>

RT-11 V03B-00
 UTILITIES
 BATCH.SAV V03.03

Seq 32 M
 2 of 2

0,17340/	0	60<LF>
0,17342/	0	207<RET>
*0,1052\	40	101<RET>
*E		

Checksum? 51145<RET>

Patch to BATCH.MAC:

```
.R EDIT<RET>
*EBBATCH.MAC[103]<ESC><ESC>
*F.TITLE<ESC><ESC>
*A-2JI ;EDIT LEVEL 1<ESC>V<ESC><ESC> ;EDIT LEVEL 1
.TITLE RT-11 BATCH V03.03
*FSAVNUM<ESC><ESC>
*G10<ESC>=C9. ;001<ESC>V<ESC><ESC>
SAVNUM=9. ;001
*FBEXIT<ESC><ESC>
*AI NOTTYB= 400 ;001<RET>
<ESC>-2A3L<ESC><ESC>
BEXIT= 100000
NOTTYB= 400 ;001
BGET= 200
*FVERID:<ESC><ESC>
*G3 /<ESC>=C3A/ ;001<ESC>V<ESC><ESC>
VERID: .ASCIZ /BATCH V03.03A/ ;001
*FEOJSUB:<ESC><ESC>
*13AI- MOV @BATSW1(R4),(R0)+ ;001<RET>
<ESC>-2A3L<ESC><ESC>
MOV (R1)+,(R0)+
MOV @BATSW1(R4),(R0)+ ;001
ADD #6,R1
*FSWTR1:<ESC><ESC>
*15AI MOV (R1)+,@BATSW1(R4) ;001<RET>
<ESC>-2A3L<ESC><ESC>
MOV R0,-(SP)
MOV (R1)+,@BATSW1(R4) ;001
ADD #6,R0
*FSWTR2:<ESC><ESC>
*KI BIC #^C<NOTTYB!HELP>,@BATSW1(R4) ;001<RET>
BIS #SOURCE!DESTON!BSOURC!BDESTN,@BATSW1(R4) ;001<RET>
<ESC>-3A4L<ESC><ESC>
JMP EOJEOJ
SWTR2: BIC #^C<NOTTYB!HELP>,@BATSW1(R4) ;001
BIS #SOURCE!DESTON!BSOURC!BDESTN,@BATSW1(R4) ;001
BIT #ABORT,(R4)
*EX<ESC><ESC>
```

The resultant version will be BATCH V03.03A.

RT-11 Software Dispatch, June 1980

RT-11 V03B-00
UTILITIES
DIR V03.01B

Seq 33 M

1 of 1

CORRECTION TO PREVIOUS DIR PATCH (SPR 11-28224 MG)

PROBLEM:

The SOFTWARE DISPATCH article, DIR PROBLEM Seq 23 M (Feb 80), was in error.

The following mandatory patch corrects the problem. (NOTE: All previous patches must be applied before applying this one. User responses are underlined.)

Patch to DIR V03.01B:

.R PATCH<RET>

FILE NAME--

*DIR.SAV/C<RET>

*14356/ 101277 103277<RET>

*1054/ 102 103<RET>

*E

Checksum? 75031<RET>

The resultant version is DIR V03.01C.

RT-11 V3B
CUMULATIVE INDEX
JUNE 1980

This is a complete listing of all articles for RT-11 V4.0 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.

<u>Component</u>	<u>Sequence</u>	<u>Mon/Yr</u>
APL-11 V1		
APL.SAV PROGRAM PATCHES		
ERRONEOUS "DEFINITION ERROR" DURING FUNCTION EDITING	01 M	Nov 77
LOSS OF LOWER-CASE ON RE-ENTRY TO APL-11	02 M	Nov 77
APL WORKSPACE	03 R	Nov 77
"SYSTEM ERROR"S GENERATED BY NULL LINE ELEMENTS	04	Dec 77
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
BASIC-11/RT-11 V2		
RESEQUENCE PRODUCES AN INCORRECT PROGRAM UNDER CERTAIN CONDITIONS	01 M	Aug 78
PRINT USING	02 M	Jun 78
MAX SIZE OF LINE ENTERED TO BASIC-11	03 M	Jun 78
REM STATEMENT CONTAINING LEFT PARENTHESIS CAUSES SUBSEQUENT SPACES AND PERIODS TO BE REMOVED	04 R	Jun 78
RUN (NH) COMMAND MAY GIVE AN ERROR MESSAGE	05 M	Jul 78
TERMINAL MAY HANG	06 M	Jul 78
DATA FILES	07 M	Jul 78
SAVE DEV: AND REPLACE DEV:	08 M	Jul 78
SINGLE PRECISION HANG AND NUMERIC CONVERSION PROBLEM (PATCH F)	09 M	Aug 78
CONVERSION PROGRAM	10 M	Sep 78
OVERLAYING WHILE IN A SUBROUTINE	11 R	Nov 78
OPERATION OF CTRLC, AND RCTRLC AND SYS (6) FUNCTIONS AND THE CTRL/C COMMAND	12 N	Nov 78
BASIC-11/RT-11 V2 CONVERSION PROGRAM PATCH 1	13 M	Feb 79
OPERATION OF OLD, RUN, CHAIN AND OVERLAY WHEN THE SPECIFIED FILE IS NOT FOUND	14 N	Feb 79
CREATING AND ACCESSING VIRTUAL ARRAY FILES	15 N	Feb 79
REPUBLICAION OF PATCHES	16 N	Feb 79
PRINT USING - PATCH A	17 M	Feb 79
RESEQ - PATCH B	18 M	Feb 79
EDITING A DIM #n STATEMENT - PATCH C	19 M	Feb 79
DOUBLE PRECISION HANG - PATCH D	20 M	Feb 79
SAVE dev: AND REPLACE dev: - PATCH E	21 M	Feb 79
SINGLE PRECISION HANG AND NUMERIC CONVERSION PROBLEM - PATCH F	22 M	Feb 79

<u>Component</u>	<u>Sequence</u>	<u>Mon/Yr</u>
SAVE .XXX & UNSAVE .XXX - PATCH G	23 M	Feb 79
NEW - PATCH H	24 M	Feb 79
STORAGE OF THE NULL CHARACTER IN STRING VARIABLES AND VIRTUAL STRING ARRAYS	25 N	Feb 79
USE OF COMPILE COMMAND	26 N	Feb 79
RESEQ - PATCH I	27 M	Mar 79
LISTNH /OLD - PATCH J	28 M	Mar 79
SYS(1) - PATCH K	29 M	Mar 79
CALL - PATCH L	30 M	Mar 79
DOUBLE PRECISION INTEGER VARIABLES - PATCH M	31 M	May 79
FILESIZE 0 - PATCH N	32 M	May 79
INTEGERS IN DOUBLE PRECISION BASIC-11	33 M	Jul 79
REM STATEMENTS ON MULTI-STATEMENT LINES - PATCH O	34 M	Jul 79
STRING MANIPULATION IN ASSEMBLY LANGUAGE ROUTINES	35 N	Aug 79
MAXIMUM ARRAY SUBSCRIPT SIZE	36 N	Aug 79

BASIC/RT-11 EXTENSIONS V1

"IPK" SUBROUTINE	01 M	Aug 77
SAMPLING A/D CHANNEL NO. 15	02 R	Aug 77
SAMPLING AR11	03 M	Sep 77
"CLRD" AND "PUTD" ROUTINES	04 M	Nov 77
"SETR" AND "WAIT" COMBINATION MAY FAIL	05	Apr 78
BASIC/RT-11 EXTENSION BUILD PROCEDURE RESTRICTION	06 R	Mar 79

CTS-300 V5

DECFORM		
TWO PROBLEMS WITH FOCOMP	01 M	May 79
DIBOL		
TWO PROBLEMS: FILE CORRUPTION POSSIBILITY AND REPETITIVE I/O ERRORS	01 M	Mar 79
OPENING NON-STANDARD HANDLERS	02 M	Apr 79
ANOTHER FILE CORRUPTION POSSIBILITY	03 M	Apr 79
TWO PROBLEMS: OPENING 0 LENGTH FILE IN SUD AND OPENING LP IN I MODE	04 M	Jun 79
LINE PRINTER PROBLEM AND PROBLEM WITH LARGE ISAM FILE	05 M	Jun 79
I/O ERRORS AND PROBLEM WITH FMAC SUBROUTINE	06 M	Jun 79
ISAM FILE CORRUPTION	07 M	Jun 79
SHUFFLE CAUSES TRAP TO 4	08 M	Jul 79
MISLEADING ERROR MESSAGES	09 M	Aug 79
ERRONEOUS I/O ERROR	10 M	Aug 79
TWO PROBLEMS WITH MULTI-VOLUME FILES	11 M	Oct 79
INCORRECT ERROR ON WRITING DUPLICATE FILE TO MAGTAPE	12 M	Dec 79
ACCEPT CAUSES ERRORS	13 M	Mar 80
I-O ERROR ON ISAM STORE/DELETE	14 M	Mar 80
LP: MAY PRINT UNWANTED CHARACTERS	15 M	Jun 80
DICOMP		
DICOMP DISLIKES SOME COMMENTS	01 M	Sep 79
ISMUTL		
REORG PROBLEMS DUE TO INSUFFICIENT SPACE ON DEVICE	01 M	Feb 80
REDUCE		
HOW TO REDUCE PAINLESSLY	01 N	Aug 79
A REDUCING PROBLEM	02 M	Dec 79
SORTM		
MERGE DOES NOT ACCEPT EMPTY FILES	01 M	Apr 79
MERGING ISAM FILES	02 M	May 80

CTS-300 RDCP (2780/3780) V1.0

SENDING OF TRANSPARENT DATA AND TRANSLATION OF DATA AFTER SENDING A TRANSPARENT FILE	01 M	Jul 79
SEND A TRANSPARENT FILE AFTER RECEIVING AN ASCII DATA FILE	02 M	Oct 79
AN ACK IS RECEIVED WHEN ENQ HAS ALREADY BEEN SENT	03 M	Oct 79
MISCELLANEOUS ERRORS	04 M	Aug 79
RDCP11 LOOP MAY OCCUR	05 M	Oct 79
ASCII TRANSMISSION OF A FILE	06 M	Oct 79

<u>Component</u>	<u>Sequence</u>	<u>Mon/Yr</u>
DECnet-RT V1		
DAP		
DAP ROUTINES DO NOT ARBITRATE DAP SEGMENT SIZE PROPERLY	07 M	Jan 79
NOTES ON CHANGES TO DAP INTERFACE	09 N	Feb 79
CORRECT BUFFER POINTER ERROR	16.11 M	May 79
DAP ATTEMPTS TO SEND A MESSAGE TOO LONG	17.7 M	Sep 79
DDCMP		
DDCMP LINE COUNTERS OVERFLOW TO ZERO	01 O	Jul 78
DMC		
DMC LINE COUNTERS OVERFLOW TO ZERO	01 O	Jul 78
DOCUMENTATION		
USER'S GUIDE DOCUMENTATION ERRORS	2.1 N	Aug 79
FAL		
CORRECT FAL PROCESSING OF END OF STREAM MESSAGE	01 M	Jan 79
FAL INCORRECTLY ALLOCATES DISC SPACE FOR FILES	02 M	Feb 79
FAL INCORRECTLY HANDLES REMOTE FILE REQUESTS	04 M	Feb 79
TIMING DEPENDENCY IN RT TO RSTS FILE TRANSFERS	17.5 M	Jul 79
MRS FIELD NOT DEFAULTED PROPERLY	17.6 M	Jul 79
FORTRAN INTERFACE		
DIFFERENCES IN RT AND RSX FORTRAN INTERFACE IMPLEMENTATIONS	01 N	Jul 78
USE OF THREADED AND INLINE FORTRAN COMPILER OPTIONS	04 R	Jan 79
FORTRAN REMOTE OPEN FOR WRITE MODIFIES FILE ATTRIBUTES	05 N	Jan 79
MODEM CONTROL		
SUPPORT OF ASYNCHRONOUS HALF DUPLEX MODEMS	01 R	Jul 78
NFARS		
DAP ROUTINES CHANGE MODE DURING FILE TRANSFER	02 M	Feb 79
CHECK FOR BLOCK MODE TRANSFER	03 M	Feb 79
DAP DEFAULTS DO NOT ALLOW RECORDS TO SPAN BLOCKS	06 O	Jan 79
ASCII FILE ACCESS TO VAX/RSX SYSTEMS	08 M	Feb 79
INVALID FILE TYPE SENT TO VAX IN ASCII TRANSFER	10 M	Mar 79
NSP		
PROTOCOL VIOLATION IN NODE INITIALIZATION	01 M	Jan 79
NFT		
NFT ASCII FILE TRANSFER TO VAX/RSX SYSTEMS	03 M	Feb 79
LOGICAL BLOCK NUMBERS NOW START AT ONE	17.5 M	May 79
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NFT		
NFT INCORRECTLY ALLOCATES RT-11 QUEUE ELEMENTS	50.9.1 M	Jun 80
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FAL INCORRECTLY ALLOCATES RT-11 QUEUE ELEMENTS	50.10.1 M	Jun 80
FORTRAN USER INTERFACES		
NOTES ON THE USE OF THE DECnet-RT FORTRAN INTERFACES	50.16.1 N	Jun 80
MACRO USER INTERFACES		
NOTES ON DECnet-RT MACRO PROGRAMMING	50.16.2 N	Jun 80
FEP-11, FORTRAN ENHANCEMENT PACKAGE (ALSO PERTAINS TO: RT-11/FORTRAN UPGRADE PACKAGE FOR MINC)		
FEP-11 INITIAL PROBLEMS, SOLUTIONS AND HINTS	01 M	May 79
PROBLEMS WITH IEEE-BUS SUBROUTINES	02 M	Feb 80

<u>Component</u>	<u>Sequence</u>	<u>Mon/Yr</u>
FMS-11 V1		
CONSOLE TERMINAL SPECIAL MODE BIT CLEARED	01 M	Jun 79
INCORRECT MCDEMO FILE TYPES	02 O	Jun 79
TSKINI INPUT BUFFER TOO SMALL	03 M	Jun 79
ARTS ERROR MESSAGE3 LACK '?'	04 M	Jun 79
HANDLER FETCH CORRUPTS FORM FILE ID	05 M	Jul 79
ZERO-FILLED FIELD VALIDATION PROBLEM	06 M	Jul 79
FILED VIDEO ATTRIBUTES PROBLEM	07 M	Jul 79
FRED ERROR MESSAGES LACK'??'	08 M	Jul 79
ERROR IN SCROLL FORWARD/BACKWARD CODE	09 M	Jul 79
ERROR IN EXIT SCROLLED AREA FORWARD CODE	10 M	Jul 79
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FOCAL/RT-11 V1B		
FOR COMMAND WITHOUT AN ARGUMENT	01 M	Oct 75
OPERATE COMMAND CAUSES ERROR	04 M	Aug 76
FCLK ROUTINE GIVES INCORRECT TIME	05 O	Aug 76
"LIBRARY ASK" COMMAND	06 O	Feb 77
"/Z" SWITCH	07 M	Aug 77
@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

<u>Component</u>	<u>Sequence</u>	<u>Mon/Yr</u>
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
FORTRAN LIBRARY FUNCTION ERRST - 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

<u>Component</u>	<u>Sequence</u>	<u>Mon/Yr</u>
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 GPW --	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

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 ACQUISITION ON RK05 GAMMA-11	07 M	Nov 79
PROBLEMS WITH DATA ACQUISITION	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

<u>Component</u>	<u>Sequence</u>	<u>Mon/Yr</u>
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 REPRODUCE VT11 PICTURE	01 M	Apr 78
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.BOO, MUCNF1.BOO, MUCNF2.BOO	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.BOO - SPECIAL 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

Component	Sequence	Mon/Yr
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.BOO'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
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

"MREPT" AND "REPRT" GET CONFUSED	01 M	Aug 78
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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
UNASSIGNED	27	XXX XX

<u>Component</u>	<u>Sequence</u>	<u>Mon/Yr</u>
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 RTSIM 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 M	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
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

<u>Component</u>	<u>Sequence</u>	<u>Mon/Yr</u>
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
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
NOTES ON .MFPS/ .MTPS PROGRAMMED REQUEST	12 N	Apr 80
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
SYSGEN FOR TU58 SUPPORT	09 F	May 80
DEVICE TIME-OUT SUPPORT IN SYSGEN	10 F	May 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

<u>Component</u>	<u>Sequence</u>	<u>Mon/Yr</u>
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
NON-STANDARD VECTOR ADDRESSES FOR RX01 AND RX02 SECOND CONTROLLER	25 M	Nov 79
ABORT DURING COMPLETION CAUSES SYSTEM FAILURES	26 M	Nov 79
.ELRG CAN CAUSE THE SYSTEM TO CRASH	27 M	Sep 79
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Software Product Description

PRODUCT NAME: RT-11, Version 4.0
Single-User Operating System

SPD 12.1.14

DESCRIPTION:

RT-11 is a disk-based, single-user, real-time operating system designed for interactive program development and/or on-line applications on some PDP-11 and PDT-11 based systems. RT-11 supports both single job (SJ) and foreground/background (FB) modes of processing. In addition to a variety of system and program development utilities, RT-11 offers optional support of a number of high-level language processors, including FORTRAN IV, BASIC, and APL.

The emphasis in RT-11 is on efficient use of system resources, minimizing system requirements in the CPU and on the mass storage device, while maximizing system throughput. RT-11's ease of use is partially due to the system simplicity inherent in its design.

The RT-11 operating system offers several configurations:

The FB monitor — allows two programs to operate: a foreground program and a background program. The real-time function is accomplished in the foreground, which generally has priority on system resources. Functions that do not have critical response time requirements, such as program development, are accomplished in the background, that operates whenever the foreground program cannot run. Within their priorities, both foreground and background are fully functional RT-11 programs with access to system capabilities. Although they operate independently, foreground and background can communicate through disk files and/or the message transmission facility.

The XM monitor — The XM (Extended Memory) monitor is a version of the FB monitor for supporting systems with greater than 64K bytes of memory. A system generation must be performed for XM support. This feature is accessible through those optional high-level language processors that can automatically produce programs that address areas of memory other than the lowest 64K bytes. The MACRO-11 programmer can also take advantage of this feature for storing data and instructions above the lowest 64K bytes of memory. A linker option allows FORTRAN IV and MACRO-11 programmers to load overlays in extended memory for fast access.

The SJ monitor — is for users not requiring FB operation or the additional FB features. SJ requires less memory and has lower overhead. Should the user's requirements change, a properly written program that runs under the SJ monitor can be executed under the FB or XM monitor as a background program without modifications.

RT-11 system features include:

Ease of Use — RT-11 is designed for the single, interactive user. The English-language keyboard commands are easy to use and understand. The EXECUTE command, for example, allows transition from source to executing code with one command. Indirect command files allow command sequences to be stored and invoked repeatedly by the user.

Contiguous File Structure — The RT-11 contiguous file structure for random-access devices incurs minimum file access overhead.

Configuration Independence — The RT-11 system provides device-independent I/O programming. For example, at run time, the user can send output directly to a printer or write it to a disk file for later printing.

Flexible Real Time I/O — RT-11 satisfies a wide variety of input/output requirements by providing three modes of I/O operation:

- Synchronous I/O, where user program processing is suspended until the completion of the I/O event.
- Asynchronous I/O, where an I/O event is started, and user program processing continues until a user-defined point is reached. Processing is then suspended until the I/O event is completed.
- Event driven I/O, where an I/O event is started, and user program processing continues until the I/O event completes. Processing is then interrupted to service the completed I/O event.

Low System Overhead — The RT-11 SJ monitor requires not more than 6K bytes of permanent memory to provide system control and I/O for the system device and the operator's terminal. FB operation adds not more than 5K bytes to this requirement. Options selected through system generation can increase memory requirements.

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RT-11's modular structure enables some monitor components to be swapped in as needed. However, if the program's memory requirements allow it, the complete monitor stays resident in memory to increase system responsiveness.

Ease of Expansion — The RT-11 system supports a wide range of PDP-11 peripherals. Beyond that, the modularity of the I/O system allows users with unique devices to interface them easily, merely by writing a device handler and storing it as a file on the system device.

When a new peripheral handler is added to an RT-11 system, properly coded programs can immediately use the device without requiring additional coding or reassembly.

Industry Compatible Magnetic Tape — RT-11 supports 7- or 9-track industry-compatible magtape with a subset of ANSI-compatible labels and fixed-length unformatted blocks.

Indirect Command Files — A set of system commands can be stored in an indirect command file that can be executed through a single keyboard command. In addition, an indirect command file can be called automatically on system start-up.

BATCH — RT-11 BATCH is a complete job control subsystem that provides batch-mode processing of user jobs in both the SJ and FB environments. BATCH processes job streams in the background partition, allowing real-time jobs or other user jobs to run in the foreground. RT-11 BATCH can be used in either SJ monitor configurations of 32K or more bytes of memory, or in any FB or XM configuration.

SYSLIB — RT-11 provides access to system services directly from a FORTRAN program. (FORTRAN IV is available under separate license.) Routines are provided to perform direct I/O, asynchronous FORTRAN subroutines, FORTRAN interrupt routines, and multiterminal support.

HELP — The HELP command allows a user to access useful information about keyboard commands. This information can be modified to meet the user's need.

Multiterminal Support — RT-11 is optionally able to support from one to sixteen terminals (four maximum on PDT-11), in addition to the console terminal. These terminals can be addressed by specially written programs (or by optional software), and can be interfaced by up to eight DL11s, one or two DZ11s (one DZ11-E is two DZ11s), up to eight DLV11s, one or two DLV11-Js, or up to four DZV11s. A terminal on a local DL (DLV) interface must be connected to the hardware console interface (vectors 60, 64) at bootstrap time. There can only be one "command console terminal" per system at any time. Originally the command console is the terminal that is connected to the hardware console interface, but it can be reassigned to any other local

terminal through a simple keyboard command. The foreground job can communicate with a private console terminal, one other than the command console always used by the background job. Multiterminal support is available with the RT-11 SJ, FB, or XM monitors. The multiterminal support allows dial-up remote users to be connected via Bell 103-type modems. RT-11 does not support leased lines. A system generation must be performed for RT-11 multiterminal support.

System Generation — RT-11 is shipped already generated and ready to use. Users can do their own system generation. This is desirable for users who require special features (such as error logging, extended memory support, device time-out support, or multiterminal support), or a system highly optimized for their application. A minimum of a dual RX01 (or larger) disk and 32K bytes of memory are required in order to generate a custom RT-11 system. However, it is highly recommended that a user have at least 56K bytes of memory and an RK05 disk or larger to do a system generation. Diskette system generation also requires a hard copy terminal or a line printer and must be done via the procedure described in the *RT-11 Installation and System Generation Guide*. System generation is not supported on TU58 DECtape II or on the PDT-11/130. System generation on the PDT-11/150 series requires a dual floppy system, 60K bytes of memory, and a hard copy terminal or line printer.

RT-11 system programs include:

EDIT — The RT-11 text editor is used to create and modify ASCII text files. Both character- and line-oriented commands are included, along with provisions for command interaction, editing macros, and file manipulation.

KED and K52 — The RT-11 keypad editors are designed for use on VT100, VT52, VT55, and VT105 video terminals. KED and K52 use the additional function keypad keys on those terminals to allow a user to position a visible cursor anywhere in a text file and to make changes and insertions easily.

MACRO-11 — MACRO-11 provides macro assembly language programming under RT-11. It has the facilities for using macro libraries, CREF (Cross Reference) listing, conditional assembly directives, and pseudo operators. MACRO-11 offers the convenience of global symbols for linking object modules and extensive error diagnostics.

LINKER — The RT-11 linker (LINK) converts the relocatable object modules produced by the assembler or optional compilers into a run-time format. Services performed by LINK include converting relative addresses to absolute addresses, resolving external references among object modules, and initializing all parameters required by the monitor to run a program.

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Overlays do not require any special instructions or function calls. The user designates an overlay structure at linker command time, and the linker automatically produces a runnable memory image with the desired overlays. Ease of use of the overlay structure is of primary importance, but the power of the overlay system has not been compromised. The system allows multiple overlays in up to seven memory regions, subject only to the memory size. Under the XM monitor, the linker allows overlays to be loaded into extended memory at run-time and executed directly from that memory.

PIP — The RT-11 peripheral interchange program (PIP) is a program that allows transfer of files (ASCII or binary) between any RT-11 supported devices. PIP also allows the user to rename, protect, and delete files.

RESOURCE — The RT-11 resource program (RESORC) examines the currently running RT-11 system and displays useful information about the status of the monitor and the system configuration.

LIBRARIAN — The RT-11 librarian (LIBR) creates and maintains libraries of commonly used object module subroutines and assembly language macro definitions. The linker uses object libraries (as specified by the user) to resolve undefined external symbols.

DUP — The RT-11 device utility program (DUP) performs general utility functions in support of mass storage devices. Among DUP functions are initializing devices, scanning for bad blocks, and consolidating free space on a disk.

DIRECTORY — The RT-11 directory program (DIR) is used to list the file directory for file-structured devices. DIR allows directory listing sorted by file name, file type, date, size, or position.

UTILITIES — Several other program development utilities are provided. DUMP allows the contents of a file to be printed in various formats. SRCCOM is an ASCII file comparison program that helps locate the changes made in source files. BINCOM is a binary file comparison program that helps locate the changes made in binary files. FILEX allows transfer of RT-11 files to and from some other operating system environments. FORMAT allows the user to format RK05, RK06, and RK07 disks, and RX02 diskettes. FORMAT also provides disk verification by writing patterns and reading them on each block of the volume.

SYSTEM JOBS — The FB monitor can optionally support up to six extra jobs, called system jobs. These system jobs are programs supplied by DIGITAL and run in parallel with the user-written foreground and background jobs. System job support is available only through system generation. DIGITAL does not support user-written system jobs.

Two RT-11 utilities (Error Logger and Queue Package) can run as system jobs (in addition to the background and foreground jobs) if system job support is enabled through the system generation process. The system job feature is available to the FB and XM monitors only. Both utilities also run as simple foreground jobs.

The Error Logger keeps statistics on successful and unsuccessful transfers for random access devices. System generation must be performed for error logging support.

The Queue Package sends files to any valid RT-11 device; it is particularly useful for queuing files for subsequent printing. If run as a simple foreground job, the Queue Package does not require system generation.

DEBUGGING AND PATCHING — RT-11 provides several utilities to aid users in finding, diagnosing, and correcting programming errors.

- **ODT** — The on-line debugging technique utility aids in interactive program debugging.
- **VDT** — The virtual debugging technique utility aids in the interactive debugging of extended memory programs and multiterminal applications.
- **PATCH** — The PATCH program performs minor modifications to memory image files that are output by the pre-RT-11 Version 4.0 linkers. PATCH cannot be used to modify files linked with the RT-11 Version 4.0 linker.
- **SIPP** — The save image patch program can be used to patch files that were linked with the RT-11 Version 4.0 linker (and also some files linked with the Versions 03 and 03B linkers).
- **PAT** — The object module patch program performs minor modifications to files in object format.
- **SLP** — The source file patch program provides an easy way to make changes to source files.

MINIMUM HARDWARE REQUIRED:

A minimum RT-11 system must include the following:

- **Processor:** PDP-11 or LSI-11 or PDT-11 processor (see Table I for specific CPUs supported).
- **Memory:** At least 24K bytes of memory for SJ or at least 32K bytes of memory for FB or greater than 64K bytes for XM. At least 32K bytes of memory are required to perform a system generation.
- **Console terminal:** LA30, LA34, LA36, LA38, LA120, LS120, LT33, LT35, VT05, VT50, VT52, VT55, VT100, or VT105.
- **Clock:** Line frequency clock for FB operation.
- **EIS, KT11 Memory Management Unit, and line frequency clock for XM.**

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- System device: Every RT-11 system must have a random-access mass storage device (or TU58 cartridge tape) for the system device (see Table I for specific devices).
- System backup device: Every RT-11 system must have a system backup device other than the system device (see Table I).

Same as software distribution device, or any supported removable disk cartridge or disk pack device.

- Software distribution device: Either the system device or the system backup device must also be a distribution medium.

9-track (800 BPI) magnetic tape (for system device that is either RK05, RK06, RK07, RL01, RL02, or RP03)

RK05, RL01, or RL02 cartridge disk

RX01 or RX02 diskette

TU58 DECtape II cartridge tape

Table I
RT-11 Minimum Hardware Requirements

Processor	Minimum Memory	System Device Medium	Backup Device Medium
PDT-11/130	32K bytes	TU58	TU58
PDT-11/150	32K bytes	RX01	RX01
PDP-11 Unibus 11/04, 11/05, 11/10, 11/20, 11/34, 11/35, 11/40, 11/44, 11/45, 11/50 11/55, 11/60	24K bytes (32K bytes required for RK06 or RK07 system device)	RJS03/RJS04 RK05 RK06* RK07* RL01 RL02 RP03 RX01 RX02	Magnetic Tape RK05 RL01 RL02 RX01 RX02 TU58
PDP-11/03 (LSI-11)	24K bytes	RK05 RL01 RL02 RX01 RX02 TU58	RK05 RL01 RL02 RX01 RX02 TU58
PDP-11/23	64K bytes	RL01 RL02 RX02 TU58	RL01 RL02 RX02 TU58

*RT-11 is not distributed on RK06 or RK07 disk cartridges.

OPTIONAL HARDWARE:

NOTE: In some cases, not all hardware features of the following options are supported. Hardware or software restrictions can limit the number of devices that a given system can support.

- Additional memory to a system total of 56K bytes (60K bytes with MSV11-DD memory or PDT-11) for systems running the SJ or FB monitor
- Additional memory to a system total of 248K bytes for systems running the XM monitor
- KK11-A cache memory for PDP-11/34
- KW11-P or KVV11-A programmable real-time clock

I/O Peripherals:

- One CR11 or CM11 card reader
- One LA180, LAV11, LPV11, LP11, LP25, LS11, or LP35 line printer
- One PC11 paper tape reader/punch
- One VT11A/VS60 Graphics Display processor

Magnetic Tape Devices:

- One TC11 DECtape controller and up to four dual transports (total of eight units)
- Up to eight TU16/TE16 and/or TU45 magnetic tape drives (32K bytes required)
- Up to eight TU10/TE10 and/or TS03 magnetic tape drives (32K bytes required)
- Up to eight TS11 (1600 BPI) magnetic tape drives (32K bytes required)
- Up to two TU58 DECtape II dual cartridge tape systems (total of four units) interfaced via DL11, DLV11, or MXV11

Disk Devices:

- One RH11 disk controller with up to eight RJS03 or RJS04 fixed-head disk drives
- One RK11 or RKV11 disk cartridge controller with up to eight RK05J or RK05F disk drives (RK05F counts as two drives)
- One RK611 or RK711 disk cartridge controller with up to eight RK06 and/or RK07 disk drives (32K bytes required)
- One RL11 or RLV11 disk cartridge controller with up to four RL01 and/or RL02 disk drives
- One RL21 or RLV21 disk cartridge controller with up to four RL01 and/or RL02 disk drives
- RPR11 disk controller with up to four RP03 disk pack drives
- Up to two RX11 or RXV11 floppy disk systems with dual RX01 diskette drives (total of four units)
- Up to two RX211 or RXV21 floppy disk systems with dual RX02 diskette drives (total of four units)

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Terminals:

- The maximum input data rate for a single terminal is 300 baud. The aggregate total input data rate for a system is 4800 baud.
- The output baud rate can be set to any speed. RT-11 sends output as fast as possible, depending on the capacity of the CPU and the nature of its load.
- LA30, LA34, LA36, LA38, LA120, LT33, LT35, VT05, VT50, VT52, VT55, VT100, and VT105 terminals.
- One hard-copy device connected to a DL(V) interface for use as a serial line printer.

*Terminal Interfaces**

- Up to eight lines
 - DL11-A, B, C, D, E, W
 - DLV11-E, F
 - DLV11-J (counts as four lines)
 - MXV11-AA, AC
- Up to sixteen lines (up to eight lines on LSI-11, PDP-11/03)
 - DZ11-A, B, C, D, E, F
 - DZV11
 - DFT11-AB cluster controller (PDT only)
- No more than 17 lines total, including console

*Communications Interfaces:**

- DL11 or DLV11-E single-line interfaces
- Up to two DZ11 asynchronous 8-line multiplexer (32K bytes required)
- DZ11-E asynchronous 16-line multiplexer (32K bytes required)
- Up to four DZV11 asynchronous 4-line multiplexer (32K bytes required)
- PDT-11 modem port

PREREQUISITE SOFTWARE:

None

OPTIONAL SOFTWARE:

APL-11
 BASIC-11/RT-11
 DECnet-RT
 FMS-11/RT-11
 FORTRAN IV/RT-11
 MU BASIC-11/RT-11

TRAINING CREDITS:

One (1) - Applies only to options that include support services. Consult the latest Educational Services Catalog at your local DIGITAL office for the available courses, course requirements, and guidelines.

*NOTE: RT-11 provides remote terminal support only for dial-up lines. RT-11 does not support leased lines.

SUPPORT CATEGORY:

DIGITAL SUPPORTED

RT-11 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:

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

ORDERING INFORMATION:

All binary licensed software, including any subsequent updates, is furnished under the licensing provisions of DIGITAL's Standard Terms and Conditions of Sale, which provide in part that the software and any part thereof may be used on only the single CPU on which the software is first installed, and may be copied, in whole or in part (with the proper inclusion of the DIGITAL copyright notice and any DIGITAL proprietary notices on the software) only for use on such CPU. All source licensed software is furnished only under the terms and conditions of a separate Software Program Sources License Agreement between Purchaser and DIGITAL.

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.

Sources and/or listings 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, H, Q, R, X, Y, Z) represents the distribution media for the product and must be specified at the end of the order number, e.g., QJ013-AE = binaries on RK05 Disk Cartridge.

D = 9-track 800 BPI Magtape (NRZI)
 E = RK05 Disk Cartridge
 G = TU58 DECtape II Cartridge
 H = RL02 Disk Cartridge
 Q = RL01 Disk Cartridge
 R = Microfiche
 X = RX02 Double Density Diskette
 Y = RX01 Floppy Diskette
 Z = No hardware dependency

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NOTE: Only TU58 and RX01 distribution kits contain additional volumes that are bootable on the PDT-11.

QJ013 -A— Single-use license, binaries, documentation, support services (media: D, E, G, H, Q, X, Y)

QJ013 -C— Single-use license, binaries, documentation, no support services (media: D, E, G, H, Q, X, Y)

QJ013 -D— Single-use license only, no binaries, no documentation, no support services (media: Z)

Upgrade Options

RT-11, Version 4.0 is available as an upgrade kit from RT-11, Version 03B for use on the same single CPU on which the former system is licensed. The previous license shall be extended to cover this upgrade.

Users of RT-11, Version 03B whose Specified Support Category warranty has not expired may order under license the following software upgrades. The upgrade is distributed in binary form on the appropriate medium and includes no installation or other services unless specifically stated.

QJ012 -A— RT-11 binaries, documentation, no support services (media: D, E, G, H, Q, X, Y)

Users of RT-11 whose warranty or Standard Program Update Service has expired may order under license the following software upgrades. The upgrade is distributed in binary form on the appropriate medium and includes no installation or other services unless specifically stated.

QJ012 -C— RT-11 binaries, documentation, no support services (media: D, E, G, H, Q, X, Y)

QJ012 -D— Single-use license only, no binaries, no documentation, no support services (media: Z)

Sources/Listings Options

NOTE: Source kits provided by DIGITAL do not necessarily contain all the source files used by DIGITAL to build the binary kits.

QJ013 -E— All sources (media: D, E, H, Q)

QJ013 -F— Listings (media: R)

Sources/Listings Update Options

The following options are available to licensed users as updates to source/listing options. The update is distributed in source form on the appropriate medium and includes no installation or other services unless specifically stated.

QJ013 -N— Sources update; requires RT-11, Version 4.0 binary distribution for source assembly (media: D, E, H, Q)

QJ013 -N— Listings update (media: R)

Miscellaneous Options

QJ013 -G— Documentation only kit (media: Z)

ADDITIONAL SERVICES:

Post-warranty Software Product Services are available for licensed customers. Customers should contact their local DIGITAL office for additional information.

QJ013 -S— Consulting Service (media: Z)

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Software Product Description

PRODUCT NAME: RT², Version 4.0
RT-11 Run-Time System

SPD 12.4.2

DESCRIPTION:

RT² is a license to use a subset of the RT-11, Version 4.0 software on an LSI-11 based system with an RL01, RL02 or RK05 cartridge disk or RX01 or RX02 floppy disk as the systems device. RT² software provides a single job (SJ) or foreground/background (FB) execute-only environment for applications developed on an RT-11 system. It is the user's responsibility to transport the RT² software and the user-developed software from the RT-11 system to the target RT² system.

RT² includes license to copy only the following RT-11, Version 4.0 modules as received in an RT-11 kit from DIGITAL and to copy RT-11, Version 4.0 monitors systemed for use on the LSI-11.

- RT11BL.SYS baseline SJ monitor
- RT11SJ.SYS RT-11 SJ monitor
- RT11FB.SYS RT-11 FB monitor
- DD.SYS TU58 handler
- DY.SYS RX02 handler
- DL.SYS RL01/RL02 handler
- RX.SYS RK05 handler
- DX.SYS RX01 handler
- TT.SYS terminal handler
- LP.SYS line printer handler
- LS.SYS serial line printer handler
- DUP.SAV Device Utility Program
- KED.SAV Keypad Editor
- K52.SAV
- PIP.SAV Peripheral Interchange Program
- DIR.SAV Directory Listing Program

Single-use licenses are available to operate the BASIC and APL run-time systems as optional software under RT².

Applications developed under FORTRAN IV/RT-11 may be copied under the RT² license, along with the FORTRAN IV OTS. The FORTRAN IV Compiler may not be used on RT².

MINIMUM HARDWARE REQUIRED:

Any valid LSI-11 based system with:

- at least 24K bytes of memory for the SJ monitor
- at least 32K bytes of memory for the FB RL01, RL02, or RX02 monitor
- an RKV11, RLV11, or RLV21 cartridge disk system or an RXV11 or RXV21 floppy disk system
- an LA36, LA38, VT52 or VT100 console terminal

An RT-11, Version 4.0 system is required for developing applications software and building an RT² system.

OPTIONAL HARDWARE:

- System total of 256K words of memory
- LAV11-P line printer

PREREQUISITE SOFTWARE:

RT-11 Version 4.0 Operating System

OPTIONAL SOFTWARE:

BASIC-11/RT-11
APL-11

TRAINING CREDITS:

None

SUPPORT CATEGORY:

CUSTOMER SUPPORTED

RT² is provided on an "as is" basis without warranty expressed or implied. Any software services, if available, will be provided at the then current charges.

ORDERING INFORMATION:

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DIGITAL copyright notice and any DIGITAL proprietary notices on the software) only for use on such CPU. All source licensed software is furnished only under the terms and conditions of a separate Software Program Sources License Agreement between Purchaser and DIGITAL.

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The following key (Z) represents the distribution media for the product and must be specified at the end of the order number, e.g., QJV13-DZ = single-use license only.

Z = No hardware dependency

QJV13 -D— Single-use license only (media: Z)
Minimum quantity: 50

ADDITIONAL SERVICES:

None

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Software Product Description

PRODUCT NAME: BASIC-11/RT-11, Version 2.0

SPD 12.5.8

DESCRIPTION:

BASIC is a conversational programming language developed at Dartmouth College that uses simple English language-like statements and familiar mathematical notations to perform operations.

BASIC-11/RT-11 is an incremental, interactive, interpretive compiler operating under the RT-11 operating system.

BASIC-11/RT-11 features include:

- A variety of program manipulation commands including commands for saving, editing, running, and retrieving BASIC programs
- Support for real, integer, double precision, and string data types
- Immediate mode statements for debugging and desk calculator usage
- Sequential data storage using the RT-11 file system
- String capability, including string arrays and functions
- Disk virtual arrays for string, integer, and real data types
- Chaining with COMMON to accommodate large programs
- CALL facility for invoking assembly language subroutines using a PDP-11 FORTRAN-compatible call interface
- Formatted output using the PRINT USING statement

MINIMUM HARDWARE REQUIRED:

One of the following:

- Any valid RT-11 operating system configuration on a PDP-11. At least 32K bytes of memory are recommended for speed and support of all BASIC-11 features.
- Any valid RT-11 operating system on a PDT-11/150 series system configuration.
- Any valid RT-11 operating system on a PDT-11/130 system configuration.

OPTIONAL HARDWARE:

Supports any mass storage, unit record, or terminal device supported by RT-11, with the additions of:

- KE11-B Extended Arithmetic Element
- KE11-E Extended Instruction Set
- FP11 Floating Point Processor
- KE11-F or KEV11 Floating Point Instruction Set

PREREQUISITE SOFTWARE:

RT-11 Operating System, Version 4.0

OPTIONAL SOFTWARE:

FMS-11/RT-11 systems with at least 56K bytes of memory.

TRAINING CREDITS:

None

SUPPORT CATEGORY:

DIGITAL SUPPORTED

BASIC-11/RT-11 is a DIGITAL Supported Software Product.

SOFTWARE INSTALLATION:

CUSTOMER INSTALLED

BASIC-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:

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

ORDERING INFORMATION:

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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, H, Q, R, Y, Z) represents the distribution media for the product and must be specified at the end of the order number, e.g., QJ913-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
 H = RL02 Disk Cartridge
 Q = RL01 Disk Cartridge
 R = Microfiche
 Y = RX01 Floppy Diskette
 Z = No hardware dependency

QJ913 -A— Single-use license, binaries, documentation, support services (media: D, E, G, H, Q, Y)

QJ913 -C— Single-use license, binaries, documentation, no support services (media: D, E, G, H, Q, Y)

QJ913 -D— Single-use license only, no binaries, no documentation, no support services (media: Z)

Sources/Listings Options

QJ913 -E— Sources (media: D, E, H, Q, Y)

QJ913 -F— Listings (media: R)

Update Options

Users of BASIC-11/RT-11, Version 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 binary form on the appropriate medium and includes no installation or other services unless specifically stated.

QJ913 -H— Binaries, documentation (media: D, E, G, H, Q, Y)

QJ913 -H— Right to copy for single use (under existing license), no binaries, no documentation (media: Z)

Users of BASIC-11/RT-11, Version 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 binary form on the appropriate medium and includes no installation or other services unless specifically stated.

QJ913 -W— Binaries, documentation (media: D, E, G, H, Q, Y)

Source/Listing Update Options

The following options are available to licensed users as updates to source/listing options. The update is distributed in source form on the appropriate medium and includes no installation or other services unless specifically stated.

QJ913 -N— Sources Update (D, E, H, Q, Y)

QJ913 -N— Listings update (media: R)

Miscellaneous Options

QJ913 -G— Documentation only kit (media: Z)

ADDITIONAL SERVICES:

Post-warranty Software Product Services for this software product are available with the prerequisite being the purchase of a RT-11 Self-Maintenance Service for Software. Customers should contact their local DIGITAL office for additional information.

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Software Product Description

PRODUCT NAME: CTS-300, Version 6.0
Commercial Transaction System-300

SPD 12.9.9

DESCRIPTION:

CTS-300 is a disk based single-user/multiuser system designed to support commercial applications on small PDP-11 based DEC Datasystems or equivalent configurations. CTS-300 applications are written in DIBOL, DIGITAL's own Business Oriented High-level Language. DIBOL is similar to COBOL in that it has a Data Division and a Procedure Division, but DIBOL is a more concise language. DIBOL provides the application programmer with the ability to do data manipulation, arithmetic expression evaluation, table subscripting, record redefinition, external calls to other programs, spooling, sequential and random access, and indexed access to files. Exception conditions cause control to transfer to a user-specified statement where the cause of the condition can be determined.

The following table illustrates the user/job capacity versus minimum configurations under each of the Datasystems:

	D150 (PDT150)	D320 (11/03)	D330 (11/23)	D350 (1134A)
Number of users	1	1-4	1-8	1-12
Number of jobs	1-4	1-4	1-16	1-16
Memory	32-60K bytes	32-56K bytes	32-248K bytes	32-248K bytes
Disk capacity	512K bytes	1-32M bytes	1-42M bytes	10-266M bytes

Although 12 users is the stated limit, most application environments should use caution beyond the eighth user, because terminal response time is likely to degrade as more users are added to the system. Particular care needs to be exercised with program size, overlay technique, file size and layout, etc.

CTS-300 is also available in fully supported mode *only* on other equivalently configured systems that meet minimum requirements.

CTS-300 is a packaged software system consisting of the RT-11 operating system, a choice of three run-time systems, and a number of utilities. Since RT-11 is included in this package, a CTS-300 licensee can order any RT-11 dependent product without reordering a specific license for RT-11.

Although CTS-300 is a layered product, it should be noted that DIBOL will not run concurrently with other languages.

Run-Time Systems (RTS):

SUD — Single-user DIBOL RTS allows one DIBOL user or job to be run on a system. It is designed for an entry level system running in 32K bytes of memory. SUD runs on all RT-11 monitors (SJ, FB, XM). SUD also runs as the background job in the FB monitor with a line printer spooler running in the foreground. Control returns to the monitor upon completion of the SUD program.

TSD — Time Shared DIBOL RTS allows 1 to 4 DIBOL users or jobs to run simultaneously. It is designed for a medium-sized system running in 56K bytes of memory. File sharing facilities at the record level permit multiple users to share and update the same data files. TSD is an executive that normally is run on an SJ monitor SYSGENed for multiterminal support. TSD controls loading of DIBOL programs, allocation and recovery of memory for DIBOL programs, program scheduling, detached programs, file-sharing, record I/O, intertask communication, as well as other less visible functions. A DIBOL line printer spooler also runs in the TSD environment. Program completion, or the detaching of a program returns control to the TSD executive.

XMTSD — Extended Memory TSD RTS allows 1 to 12 DIBOL users or 1 to 16 DIBOL jobs to run simultaneously (up to 12 could be attached to terminals with the remainder running in a detached environment). Designed for larger systems running in 128K to 248K bytes of memory using the XM monitor, XMTSD has the same features and capability found in TSD. In addition, XMTSD offers multiuser program development. When XMTSD is loaded in the foreground of the XM monitor, the background is reserved for queuing and executing indirect command files. These files can contain compile and link instructions. Programs can be created and modified by running a CRT oriented editor called DKED, that executes as a DIBOL job. More than one copy of DKED can run concurrently.

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The same DIBOL program can be migrated from one RTS to another without modification. Relinking is required when changing from SUD to TSD or XMTSD or vice versa. DIBOL programs linked for TSD or XMTSD will run under either RTS. A single-key Indexed Sequential Access Method (ISAM) file system is also available for each RTS.

CTS-300 Utility Programs:

CTSGEN — The CTS-300 Generator Program is an interactive DIBOL-11 utility program that tailors the system to a user's needs. It can create a SUD, TSD or XMTSD RTS to match the specific hardware and software of the installation. Through CTSGEN a user specifies such items as the total number of terminals, jobs, messages, and files open at one time. Support for DDT and forced job start-up are also among the choices available.

DDT — The DIBOL Debugging Technique is a system utility that allows for user/programmer interaction with a DIBOL program while it is executing. Using DDT, a programmer can set predetermined stopping points to halt the program, examine and/or alter the contents of variables, and trace through lines of a DIBOL program. These features allow a programmer to locate problems, correct data values, and test any programming errors directly, before reediting and recompiling.

DECFORM — The DECFORM Data Entry utility is a program generator that processes screen format directives and produces a DIBOL program that, when compiled and executed, performs specified data entry functions. In addition to defining screen formats, auto-duplication, alphabetic or decimal checking, range checking, field totaling, cross-field validation, and auto-increment characteristics, DECFORM makes possible additions, inquiries, changes, and verifications to sequentially ordered files or Indexed Sequential Access Method (ISAM) files. Deletions are possible only with ISAM files. DECFORM is primarily a tool to facilitate and reduce program development efforts. Its major use is in data file creation, modification and inquiry.

DKED — Is a version of RT-11's keyboard editor (KED) that runs as a job under TSD or XMTSD. It is a text editor, designed to run in VT52 mode on a VT52 or VT100, and is used to create and modify ASCII text files.

DICOMP — DICOMP is the DIBOL compiler. It translates DIBOL source programs into interpretive code that, when linked, can be executed by the three RTS.

DMS-300 — Data Management Services provide capabilities for handling sequential, random, or keyed records in files. Records in an ISAM file can be keyed by a symbolic value. DMS-300 also supports file sharing and multivolume files. Sequential and random file processing are standard in every RTS. ISAM is an option. DIBOL has special language statements to use these file access methods efficiently.

ISMUTL — ISAM files are created and maintained by means of the ISAM Utility Program. Its three major functions are CREATE, STATUS, and REORGANIZE.

- **CREATE** is used to create a new ISAM file. Options are provided to create an empty ISAM file, or convert a sequential file to an ISAM file. The CREATE function can be carried out without operator intervention.
- **STATUS** provides a concise view of the current structure of the file: length of keys, records, and groups, levels of indexing, and information about the use of load exclusion and overflow areas in the data file.
- **REORGANIZE** is used to reorganize an ISAM file for more efficient operation. It is used when most of the groups in the file are filled and the overflow area or append area is filled. The effect of REORG is to redistribute the records of the file so it appears to be a newly created file.

LPTSPL — The Line Printer Spooler is a utility program that prints data files and program source files. In response to an LPQUE statement, the spooler program receives information on the file to be printed. The spooler queues the file and begins to print it when the line printer is available. In the SUD RTS, the spooler outputs to one line printer. In the TSD and SMTSD RTS, the spooler is a DIBOL program consisting of a queue manager and four satellite programs that output to as many as four line printers.

SORT/MERGE — The SORT/MERGE utility permits the user to define the parameters for the sorting and/or merging of data files. A DIBOL program is then generated by the system to perform the required sort and/or merge. The user can specify up to eight key fields to control the ordering of the output records, in either ascending or descending sequence. A wide range of operating parameters, such as the number of work files to be used, is provided to enable the user to achieve maximum sort efficiency.

STATUS — The job and system state program, STATUS, retrieves and displays information about the TSD or XMTSD RTS. STATUS passes the information listed below to a line printer or a terminal:

- Available free core
- List of active jobs
- Detailed information of a specified active job
- Detailed information of pending messages
- List of pending line printer jobs
- Characteristics of the current RTS

MINIMUM HARDWARE REQUIRED:

CTS-300 is intended to run primarily on DEC Datasystem 150s and 300s; it will operate, however, on other similarly configured hardware with the following minimum:

- A VT05, VT50H, VT52, VT100, or LA36 console terminal. A VT50H, VT52, or VT100 terminal (in VT52 mode) is required for use with DECFORM, ISMUTL, and STATUS utilities

- The Extended Instruction Set (EIS or equivalent) for XMTSD
- Memory management hardware is needed in the D330 and D350 series to use extended memory (memory above 56K bytes); it is needed, as well, in any 11/23, 1134A, 11/44 or 11/60 processor intending to use extended memory.
- Memory required for SUD — 32K bytes; TSD — 56K bytes; XMTSD — 128K bytes

OPTIONAL HARDWARE:

The following options are available for D150 systems:

- Additional memory up to a system total of 60K bytes
- LA180 or LA120 Serial Printer
- VT100 Advanced Video Option (VT1XX-AB)

The following options are available for D320 systems:

- Additional memory up to a system total of 56K bytes
- VT100 Advanced Video Option (VT1XX-AB)
- Up to a system total of four VT05, VT50H, VT52, VT100, LA36 or LA120 terminals
- Up to four LAV11 or LPV11 line printers
- Up to four DLV11 asynchronous line interfaces (one per terminal)
- One DZV11 asynchronous line multiplexer with up to four lines
- RKV disk cartridge system with controller
- RK05 disk cartridge drives up to eight
- RLV disk cartridge system with controller
- RL disk cartridge drives up to four, two of which can be RL02 add-ons
- Up to two RXV floppy disk systems, with four drives total

The following options are available for special D323S and D325S systems:

- Additional memory up to a system total of 56K bytes
- VT100 advanced video option (VT1XX-AB)
- Up to a system total of four VT05, VT50H, VT52, VT100, LA36, or LA120 terminals
- Up to four LA11 or LP11 line printers
- Up to four DL11 asynchronous line interfaces (one per terminal)
- One DZ11 asynchronous line multiplexer with up to four lines
- RL disk cartridge system with controller
- RL disk cartridge drives up to four
- Up to two RX floppy disk systems, with four drive total

The following options are available for D330 systems:

- Additional memory up to a system total of 248K bytes
- VT100 advanced video options (VT1XX-AB)
- Up to a system total of eight VT05, VT50H, VT52, VT100, LA36 or LA120 terminals
- Up to four LAV11 or LPV11 line printers
- Up to eight DLV11 serial asynchronous line interfaces (one per terminal) for eight lines total

- Up to two DZV11 asynchronous line multiplexers for eight lines total
- RLV disk cartridge system with controller
- RL disk cartridge drives up to four
- Up to two RXV floppy disk systems, with four drives total

NOTE: Due to limited expansion space inside a base 11/23 CPU system box, additional hardware options can require an expander box and cabinet.

The following options are available for D350 systems:

- Additional memory to a system total of 248K bytes
- VT100 advanced video option (VT1XX-AB)
- Up to a system total of twelve VT05, VT50H, VT100, LA34, LA36, LA38, or LA120 terminals
- Up to four LS11, LA11, or LP11 line printers
- Up to sixteen DL11 asynchronous line interfaces (one per terminal) for sixteen lines total
- Up to two DZ11 multiplexers with up to eight lines each
- RK11 disk cartridge system with controller
- RK05 disk cartridge drives up to eight
- RL disk cartridge system with controller
- RL disk cartridge drives up to four
- RPR11 disk pack system with up to eight drives
- Up to two RX floppy disk systems, with four drives total
- RK611 disk pack system
- RK06 disk pack drives up to eight, or RK711 disk pack system
- RK07 disk pack drive up to eight

NOTE: A mix of up to eight RK06s and RK07s total is possible

- CR11 card reader
- TME11 magnetic tape controller with up to eight TU10 transports or TJE16 controller with up to two TS03 transports.

NOTE: CTS-300 will run on the 11/44 processor; but no more than 248K bytes of memory can be used by CTS-300.

PREREQUISITE SOFTWARE:

None

OPTIONAL SOFTWARE:

CTS-300 RDCP 2780/3780
CTS-300 DICAM/3271

TRAINING CREDITS:

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

SUPPORT CATEGORY:

DIGITAL SUPPORTED

CTS-300 is a DIGITAL Supported Software Product.

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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

CTS-300 includes standard services as defined in the Software Support Categories Addendum of this SPD.

CTS-300 installation requires a system generation. To help customers, DIGITAL will perform the initial system generation if the system disk is an RL01, RL02, RK05, RK06 or RK07. When requested by the customer, DIGITAL will install floppy disk systems, on a time and materials basis.

ORDERING INFORMATION:

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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, H, Q, 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., QJ354-AV = distribution on RK07 Disk Cartridge.

E = RK05 Disk Cartridge
H = RL02 Disk Cartridge
Q = RL01 Disk Cartridge
T = RK06 Disk Cartridge
V = RK07 Disk Cartridge
X = RX02 Double Density Diskette
Y = RX01 Floppy Diskette
Z = No hardware dependency

This software is available with a valid DEC Datasystem 150, 320, 330, or 350 that includes support services. License only CTS-300 is available only with a valid DEC Datasystem 150, 320, 330, or 350 that does not include software support services.

D150 Floppy Disk Based (RX01)
DS352 RX01 Floppy Disk Based
DS356 RPR02 Disk Pack Based
D322 RX01 Floppy Disk Based
D323 RX02 Floppy Disk Based
D324 RK05 Cartridge Disk Based
D325 RL01 Cartridge Disk Based
D333 RX02 Floppy Disk Based

D335 RL01 Cartridge Disk Based
D336 RL02 Cartridge Disk Based
D354 RK05 Cartridge Disk Based
D355 RL01 Cartridge Disk Based
D356 RL02 Cartridge Disk Based
D357 RK06 Cartridge Disk Based
D358 RK07 Cartridge Disk Based

CTS-300 is also offered with full DIGITAL support services only on hardware configurations that meet minimum system requirements. A customer would order the line item:

QJ354 -A— Single-use license, binaries, documentation, support services (media: E, H, Q, T, V, X, Y)

A partial listing of other DIGITAL packaged systems that meet CTS-300 requirements are listed below. For a more complete configuration guide, refer to the RT-11, Version 4.0 SPD (12.1).

D532, D535, D538
D542, D548
DM30-LLB, DM30-HHB
RE37-HHB
SE30-HHB, SE30-LLB, SE30-MMA
SE40-HHA, SE40-MMA
SE60-HHA
SM20-LLA
SM30-HHB, SM30-LLB, SM30-MMA
SM40-HHA, SM40-MMA
SM60-HHA, SM60-HHB, SM60-LLA, SM60-MMA
SP30-HVA, SP30-LLA
SP60-HVA
SR20-LLA, SR20-SSA
SR30-LLB, SR30-SSB
SR60-LLA
SR-VXLLB, SR-VXSSA, SR-VXSSB
SR-WXLLA, SR-WXSSA

Update Options

Users of previous CTS-300 versions 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 form on the appropriate medium and includes no installation or other services are included unless specifically stated.

QJ354 -H— Binaries, documentation (media: E, H, Q, T, V, X, Y)

QJ354 -H— Right to copy for single use (under existing license), no binaries, no documentation(media: Z)

Users of previous CTS-300 versions 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 form on the appropriate medium and includes no installation or other services unless specifically stated.

QJ354 -W— Binaries, documentation (media: E, H, Q, T, V, X, Y)

ADDITIONAL SERVICES:

Post-warranty Software Product Services are available for licensed customers. Customers should contact their local DIGITAL office for additional information.

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Software Product Description

PRODUCT NAME: FORTRAN IV/RT-11, Version 2.1

SPD 12.10.11

DESCRIPTION:

FORTAN IV is an extended implementation of the FORTRAN language based on the ANSI FORTRAN, X3.9-1966 standard. It operates under the RT-11 operating system. The PDP-11 FORTRAN IV language includes the following extensions to the ANSI standard:

- General expressions allowed in all meaningful contexts
- Mixed-mode arithmetic
- BYTE data type for character manipulation
- ENCODE, DECODE statements
- PRINT, TYPE, ACCEPT input/output statements
- Direct-access unformatted input/output DEFINE FILE statement
- Comments allowed at end of each source line
- PROGRAM statement
- OPEN and CLOSE file access control statements
- List-directed input/output

Additionally, virtual arrays are supported on systems with memory management directives. Virtual arrays are memory-resident, and require enough main memory to contain all elements of all arrays.

The PDP-11 FORTRAN IV compiler is a fast, one-pass compiler. Compiler options allow program size (threaded code) versus execution speed (in-line code) tradeoffs. FORTRAN IV compiler optimizations include:

- Common subexpression elimination
- Local code tailoring
- Array vectoring
- Optional in-line code generation for integer and logical operations

Object Time System

FORTAN IV includes a set of object modules, called the OTS (Object Time System), that are selectively linked with compiler-produced object modules to produce an executable program.

The RT-11 system provides several special features for FORTRAN IV. FORTRAN programs may be developed under RT-11 and output in absolute binary format for execution on a stand-alone PDP-11 system with minimal peripherals, or for loading into ROM or PROM memory.

Using SYSLIB, the RT-11 FORTRAN system subroutine library, all features of the RT-11 monitor are available to FORTRAN programs. Additionally, SYSLIB provides subroutines which support extensive character string manipulations, where the characters are stored as variable-length strings in BYTE arrays.

MINIMUM HARDWARE REQUIRED:

Any valid RT-11 configuration (32K bytes of memory are required for string support).

RT-11 Memory Management Unit and EIS hardware are required for virtual arrays.

OPTIONAL HARDWARE:

FORTAN IV supports all devices supported by the operating system.

FORTAN IV generated code can be selected to support the following arithmetic hardware options:

- KE11-A Extended Arithmetic Element
- KE11-B Extended Arithmetic Element
- KE11-E Extended Instruction Set
- KE11-F Floating Instruction Set
- KEV11 Extended Arithmetic Chip

The FORTRAN IV OTS additionally supports the FP11 floating point processor.

PREREQUISITE SOFTWARE:

RT-11 Operating System, Version 4.0

OPTIONAL SOFTWARE:

FORTAN/RT-11 Extensions
PLOT 11/RT-11
SSP-11, Scientific Subroutine Package
FMS-11/RT-11

TRAINING CREDITS:

None

SUPPORT CATEGORY:

DIGITAL SUPPORTED
FORTAN IV/RT-11 is a DIGITAL Supported Software Product.

SOFTWARE INSTALLATION:

CUSTOMER INSTALLED

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

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SOFTWARE PRODUCT SUPPORT:

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

ORDERING INFORMATION:

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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.

Sources and/or listings 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, H, Q, R, Y, Z) represents the distribution media for the product and must be specified at the end of the order number, e.g., QJ813-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
 H = RL02 Disk Cartridge
 Q = RL01 Disk Cartridge
 R = Microfiche
 Y = RX01 Floppy Diskette
 Z = No hardware dependency

QJ813 -A— Single-use license, binaries, documentation, support services (media: D, E, G, H, Q, Y)

QJ813 -C— Single-use license, binaries, documentation, no support services (media: D, E, H, G, Q, Y)

QJ813 -D— Single-use license only, no binaries, no documentation, no support services (media: Z)

Sources/Listings Options

QJ813 -E— Sources (media: D, E, Q,)

QJ813 -F— Listings (media: R)

Upgrade Options

Customers who are currently licensed users of FORTRAN IV/RT-11 may obtain this new product by purchasing a license to an upgrade kit for use on the same CPU as their previous license.

QJE06 -A— Single-use license, binaries, documentation, support services (media: Y)

Update Options

Users of FORTRAN IV/RT-11 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 form on the appropriate medium and includes no installation or other services unless specifically stated.

QJ813 -H— Binaries, documentation (media: D, E, G, H, Q, Y)

QJ813 -H— Right to copy for single-use (under existing license), no binaries, no documentation, no support services (media: Z)

Users of FORTRAN IV/RT-11, Version 1C or 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 binary form on the appropriate medium and includes no installation or other services unless specifically stated.

QJ813 -W— Binaries, documentation (media: D, E, G, H, Q, Y)

Sources/Listings Update Options:

The following options are available to licensed users as updates to sources and/or listings options. The update is distributed in source form on the appropriate medium and includes no installation or other services unless specifically stated otherwise.

QJ813 -N— Sources update (media: D, E, Q)

Miscellaneous Options

QJ813 -G— Documentation only kit (media: Z)

ADDITIONAL SERVICES:

None

digital

Software Product Description

PRODUCT NAME: RT²/PDT, Version 4.0
Run-Time System for PDT-11

SPD 12.13.2

DESCRIPTION:

RT²/PDT is a subset of the RT-11 Real Time Operating System. It provides a Baseline Single-Job (BL), Single-Job (SJ), or a Foreground/Background (FB) execute-only environment on a PDT for applications that the user can develop on a full-scale RT-11 system.

RT²/PDT allows the user to develop applications using the full power of the entire complement of RT-11 programming tools. The resultant software is licensed for use on a PDT system in a run-time only environment. It is the user's responsibility to transport the RT²/PDT system and user-developed software to the target PDT system.

An RT²/PDT license allows the user to copy only the following RT-11 modules as distributed in an RT-11 kit from DIGITAL and to copy RT-11 monitors sysgened for use on the PDT.

MODULE	DESCRIPTION
RT11BL.SYS	RT-11 baseline SJ monitor
RT11SJ.SYS	RT-11 SJ monitor
RT11FB.SYS	RT-11 FB monitor
LP.SYS	Line printer handler
LS.SYS	Serial line printer handler
PD.SYS	PDT-11 handler
TT.SYS	Terminal handler
SWAP.SYS	Monitor scratch blocks for system Utility Program
DIR.SAV	Directory listing program
DUP.SAV	Device Utility Program
KED.SAV	Keypad Editor
PIP.SAV	Peripheral Interchange Program

Single-use licenses are available to operate BASIC-11/RT-11, APL and FMS-11 run-time systems as optional software under RT²/PDT. Applications developed under FORTRAN IV/RT-11 can be copied

under the RT²/PDT license, along with the FORTRAN IV OTS. The FORTRAN IV compiler cannot be used on RT²/PDT.

MINIMUM HARDWARE REQUIRED:

- PDT-11/150 series system or a PDT-11/130 system with at least 32K bytes of memory.
- An RT-11, Version 4.0 system is required for developing application software and building the RT²/PDT system.

OPTIONAL HARDWARE:

- System total of 60K bytes of memory
- DFT11-AB Cluster Controller (3 EIA Ports)
- LA36 hardcopy terminal
- LA38 hardcopy terminal
- LA120 or LS120 hardcopy terminal
- LA180-C or LA180-E line printer
- VT100 video terminal

PREREQUISITE SOFTWARE:

RT-11, Version 4.0 Operating System (with DIGITAL Supported/DIGITAL Installed support) is required on the development system from which RT²/PDT is copied.

OPTIONAL SOFTWARE:

The following software can be used with RT²/PDT in a run-time environment.

APL-11
BASIC-11/RT-11
FMS-11/RT-11 (only components ARTS and FDV)

TRAINING CREDITS:

None

SUPPORT CATEGORY:

CUSTOMER SUPPORTED

RT²/PDT is provided on an "as is" basis without warranty expressed or implied. Any software services, if available, will be provided at the then current charges.

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ORDERING INFORMATION:

All binary licensed software, including any subsequent updates, is furnished under the licensing provisions of DIGITAL's Standard Terms and Conditions of Sale, which provide in part that the software and any part thereof may be used on only the single CPU on which the software is first installed, and may be copied, in whole or in part (with the proper inclusion of the DIGITAL copyright notice and any DIGITAL proprietary notices on the software) only for use on such CPU. All source licensed software is furnished only under the terms and conditions of a separate Software Program Sources License Agreement between Purchaser and DIGITAL.

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

The following key (Z) represents the distribution media for the product and must be specified at the end of the order number, e.g., QJV33-DZ = single-use license only.

Z = No hardware dependency

QJV33 -D— Single-use license only, no binaries, no documentation, no support services
(media: Z) Minimum quantity: 50

ADDITIONAL SERVICES:

None

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Software Product Description

PRODUCT NAME: MU BASIC-11/RT-11, Version 2.0

SPD 12.20.5

DESCRIPTION:

BASIC is a conversational programming language developed at Dartmouth College that uses simple English language-like statements and familiar mathematical notations to perform operations.

MU BASIC-11/RT-11 is an interpreter operating under the RT-11 operating system foreground/background (FB) monitor with multiterminal capability (up to eight).

MU BASIC-11/RT-11 features:

- One to four users on PDP-11/03, LSI-11, or PDT-11/150 systems.
- One to eight users with equal size memory partitions on larger PDP-11s; no swapping.
- A variety of program manipulation commands, including commands for saving, editing, running, and retrieving BASIC programs.
- Support for real (single or double precision) integer and string data types.
- Ability to run in either the foreground or background under the RT-11 FB monitor concurrently with another job; supports all RT-11 supported devices (except VT11).
- Support for all terminals supported by RT-11.
- User identification and file protection scheme to control system access and utilization (optional); public and group libraries for file sharing; privileged user capability.
- All peripheral devices can be used by any user at any terminal. However, the ASSIGN and DEASSIGN commands permit restricted use of a non-public device to a single user.
- Limited ability for a user to ASSIGN a terminal (that is currently not in use) as an input or output device.
- Sequential data storage using the RT-11 file system. The maximum number of simultaneously open files is limited only by available memory and RT-11 channel considerations.
- Virtual arrays on disk (integer, real, and string) for processing quantities of data too large to fit in available memory, or for performing random-access I/O.

- Program chaining and overlaying with COMMON to accommodate large programs.
- Formatted output with PRINT USING statement.
- String support, complete with string arrays and functions.
- A CALL statement that allows easy interfacing of assembly language routines. These routines can be called by name and passed multiple arguments. These routines must be included at link time.
- Immediate mode execution for desk calculator operation and program debugging.
- Privileged mode to protect applications programs.

MINIMUM HARDWARE REQUIRED:

Any valid RT-11, Version 4.0 (FB monitor with multiterminal support) configuration with:

- RK11, RX11, or RL11 controller and drive
- Line frequency clock
- 56K bytes of memory

Total memory required depends on the number of users, length of programs, BASIC features included, devices used, and number of simultaneously open files. A maximum of four users are supported for PDP-11/03, LSI-11, or PDT-11/150 based systems.

DECtape II is not supported as the system device.

OPTIONAL HARDWARE:

Supports any device supported by the prerequisite software (except VT11).

PREREQUISITE SOFTWARE:

One of the following:

- RT-11, Version 4.0 operating system with multiterminal support multiterminal support must be sysgened into RT-11; and RT-11 SYSGEN is included in an MU BASIC-11/RT-11 installation.
- RT², Version 4.0 with multiterminal support

OPTIONAL SOFTWARE:

None

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TRAINING CREDITS:

None

SUPPORT CATEGORY:

DIGITAL SUPPORTED

MU BASIC-11/RT-11 is a DIGITAL Supported Software Product.

SOFTWARE INSTALLATION:

CUSTOMER INSTALLED

MU BASIC-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:

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

ORDERING INFORMATION:

All binary licensed software, including any subsequent updates, is furnished under the licensing provisions of DIGITAL's Standard Terms and Conditions of Sale, which provide in part that the software and any part thereof may be used on only the single CPU on which the software is first installed, and may be copied, in whole or in part (with the proper inclusion of the DIGITAL copyright notice and any DIGITAL proprietary notices on the software) only for use on such CPU. All source licensed software is furnished only under the terms and conditions of a separate Software Program Sources License Agreement between Purchaser and DIGITAL.

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.

Sources and/or listings 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 (E, G, H, Q, R, Y, Z) represents the distribution media for the product and must be specified at the end of the order number, e.g., QJ921-AY = binaries on RX01 Floppy Diskette.

E = RK05 Disk Cartridge
 G = TU58 DEctape II Cartridge
 H = RL02 Disk Cartridge
 Q = RL01 Disk Cartridge
 R = Microfiche
 Y = RX01 Floppy Diskette
 Z = No hardware dependency

QJ921 -A— Single-use license, binaries documentation, support services (media: E, G, H, Q, Y)

QJ921 -C— Single-use license, binaries, documentation, no support services (media: E, G, H, Q, Y)

QJ921 -D— Single-use license only, no binaries, no documentation, no support services (media: Z)

Sources/Listings Options

QJ921 -E— Sources (media: E, H, Q, Y)

QJ921 -F— Listings (media: R)

Update Options

Users of MU BASIC-11/RT-11 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 form on the appropriate medium and includes no installation or other services unless specifically stated.

QJ921 -H— Binaries, documentation (media: E, G, H, Q, Y)

QJ921 -H— Right to copy for single-use (under existing license), no binaries, no documentation (media: Z)

Users of MU BASIC-11/RT-11 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 form on the appropriate medium and includes no installation or other services unless specifically stated.

QJ921 -W— Binaries, documentation (media: E, G, H, Q, Y)

Sources/Listings Update Options

The following options are available to licensed users as updates to sources and/or listings options. The update is distributed in source form on the appropriate medium and includes no installation or other services unless specifically stated.

QJ921 -N— Sources update (media: E, H, Q, Y)

QJ921 -N— Listings Update (media: R)

Miscellaneous Options

QJ921 -G— Documentation only kit (media: Z)

ADDITIONAL SERVICES:

Post-warranty Software Product Services for this software product are available with the prerequisite being the purchase of the RT-11 Self-Maintenance Service for Software. Customers should contact their local DIGITAL office for additional information.

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Software Product Description

PRODUCT NAME: PROM/RT-11, Version 1.0
PROM Programming Utility

SPD 12.21.1

DESCRIPTION:

PROM/RT-11 is a software utility designed to control and operate a universal PROM programming hardware device. The programmer hardware connects to a 11/03, 11/23, or 11/34 RT-11 development system over an RS-232C serial line. This is distinct from the console interface on the system.

The package allows the user to create PROM or EPROM-based applications using RT-11 by taking the completed microcomputer program and creating the appropriate chips from PROM or EPROM option boards.

PROM/RT-11 operates under the RT-11 Version 03B or 4.0 Operating System. The utility program will run in either the background or the foreground of the RT-11 system; when used in the foreground, it will allow concurrent program development and PROM programmer operations.

The following user commands are supported by this product:

COPY	Copies an existing PROM chip by reading its contents and replicating in another chip.
DIAGNOSE	Runs extended PROM programmer and interface diagnostics to analyze/isolate a hardware problem.
HELP	Prints a list of all valid commands on the terminal
INTERFACE	Alters Control and Status Register (CSR) and vector addresses for serial interface to PROM programmer hardware.
LIST	Prints a listing of the contents of a PROM and EPROM chip.
MODIFY	Modifies the contents of one or more existing PROM or EPROM chips.
PROGRAM	Programs a set of PROM or EPROM chips from an RT-11 file; automatic verify is included.
SEQUENTIAL	Redefines PROGRAM, MODIFY and VERIFY commands to be used to prepare PROMs that are not intended for use with a PDP-11.
VERIFY	Verifies that existing PROM or EPROM chips match the contents of a master PROM or program file.

MINIMUM HARDWARE REQUIRED:

Any valid 11/03, 11/23, or 11/34 RT-11 Version 03B or 4.0 based systems with a minimum of 32K bytes of Random Access Memory for background operation or 56K bytes of Random Access Memory for foreground operation. In addition, the system must include an RS-232C serial line interface with a cable which is dedicated to the PROM programmer, and a PB11K PROM adapter kit, for the type of PROM chips being blasted.

SUPPORTED INTERFACES: DLV11-E, DLV11-F, DLV11-J (1 port), MXV11-A (1 port), DL11-W and DL11-E

OPTIONAL HARDWARE:

Additional PB11K Adapter Kits

PREREQUISITE SOFTWARE:

RT-11, Version 03B or 4.0

OPTIONAL SOFTWARE:

None

TRAINING CREDITS:

None

SUPPORT CATEGORY:

CUSTOMER SUPPORTED

PROM/RT-11 is provided on an "as is" basis without warranty expressed or implied. Any software services, if available, will be provided at the then current charges.

ORDERING INFORMATION:

All binary licensed software, including any subsequent updates, is furnished under the licensing provisions of DIGITAL's Standard Terms and Conditions of Sale, which provide in part that the software and any part thereof may be used on only the single CPU on which the software is first installed, and may be copied, in whole or in part (with the proper inclusion of the DIGITAL copyright notice and any DIGITAL proprietary notices on the software) only for use on such CPU. All source licensed software is furnished only under the terms and conditions of a separate Software Program Sources License Agreement between Purchaser and DIGITAL.

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The following key (Q, Y) represents the distribution media for the product and must be specified at the end of the order number, e.g., PB11-AY = binaries on RX01 Floppy Diskette.

Q = RL01 Disk Cartridge
Y = RX01 Floppy Diskette

PB11 -A— PROM programmer hardware, single-use license, binaries and documentation (media: Q, Y)

ADDITIONAL SERVICES:

None

digital

Software Product Description

PRODUCT NAME: FMS-11/RT-11, Version 1.1

SPD 12.22.2

DESCRIPTION:

FMS-11/RT-11 is a set of utilities and subroutines that provide a multiterminal 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 can be developed under the RT-11 operating system and executed under the control of either RT-11 or its execute-only subsets, RT² or RT²/PDT.

The FMS-11 system can be used as a general purpose manager of 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 with each form.

Another feature of FMS-11/RT-11 is "named data", that 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 multiterminal applications. In multiterminal 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 terminals allowed under each RT-11 hardware configuration.

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

Form Editor (FRED) — The application developer uses the interactive Form Editor to create and modify video forms by typing them on a VT100 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.

Form Utility (FRMUTL) — is a multifunction program that 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.

Form Driver (FDV) — 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.

The Form Driver will support VT100 or VT52 terminals although the video attributes (e.g. reverse video) supported by the VT100 are not supported on the VT52. A separate Form Driver Library must be used for each class of terminal.

Application Run-Time Supervisor (ARTS) — allows each terminal in a multiterminal system 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 multitasking 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.

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MINIMUM HARDWARE REQUIRED:*For application execution:*

Any valid RT-11, RT² or RT²/PDT system with a VT100 or VT52 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 capability included at FMS-11 SYSGEN time.

	MACRO-11	FORTTRAN IV	BASIC-11
Single-Terminal	32Kb	56Kb	56Kb
Multiterminal	56Kb	56Kb*	

*Multiterminal FORTRAN support is limited to very small programs.

Form application development:

Any valid RT-11 system with at 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 or VT52-terminals for application execution up to the maximum allowed under the RT-11/hardware configuration.

PREREQUISITE SOFTWARE:*For application execution:*

RT-11 Operating System, Version 4.0
RT², Version 4.0 or RT²/PDT, Version 4.0

For application development:

RT-11 Operating System, Version 4.0

OPTIONAL SOFTWARE:

BASIC-11/RT-11
FORTTRAN IV/RT-11

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:

All binary licensed software, including any subsequent updates, is furnished under the licensing provisions of DIGITAL's Standard Terms and Conditions of Sale, which provide in part that the software and any part thereof may be used on only the single CPU on which the software is first installed, and may be copied, in whole or in part (with the proper inclusion of the DIGITAL copyright notice and any DIGITAL proprietary notices on the software) only for use on such CPU. All source licensed software is furnished only under the terms and conditions of a separate Software Program Sources License Agreement between Purchaser and DIGITAL.

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, H, 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
H = RL02 Disk 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, H, Q, Y)

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

Update Options

Users of FMS-11/RT-11 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 form on the appropriate medium and includes no installation or other services unless specifically stated.

QJ713 -H— Binaries, documentation (media: E, G, H, Q, Y)

QJ713 -H— Right to copy for single-use (under existing license), no binaries, no documentation (media: Z)

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QJ714 -H— Right to copy for single-use for ARTS and FDV only (under existing license), no binaries, no documentation (media: Z)

Users of FMS-11/RT-11 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 form on the appropriate medium and includes no installation or other services unless specifically stated.

QJ713 -W— Binaries, documentation (media: E, G, H, Q, Y)

Miscellaneous Options

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

ADDITIONAL SERVICES:

None

digital

Software Product Description

PRODUCT NAME: APL-11/RT, Version 2.0

SPD 14.42.0

DESCRIPTION:

APL is a mathematically structured programming language that features many functions which operate on arrays of arbitrary order. APL can define recursive procedures that use local variables. The special APL character set can be used on a terminal that supports it, or can be simulated with mnemonic escape sequences on other terminals. The user can interact with the APL interpreter to examine and change variables, alter statements without recompilation, and trace program action.

In its simplest mode of operation, APL-11/RT performs the functions of an intelligent calculator. APL has been used extensively in the areas of science, engineering, education, and business applications.

Some features of APL-11/RT:

- Multiple statement lines
 - Standard PDP-11 file-naming formats
 - User workspace saved on all disk devices supported by the operating system
 - Advanced primitive functions:
 - Execute a character string (commands, statement lines)
 - Format primitive functions for building output reports
 - Set functions for determining set union, intersection, etc.
 - Scan operator for producing year-to-date totals, etc.
 - Divide-quad functions for finding matrix inverses and solving sets of linear equations
 - System variables for controlling the user's workspace, such as index origin, page width, and atomic vector
 - System functions:
 - Functions for converting between programs as executable objects and variables
 - Functions for determining the class of objects or names in the workspace
- System commands for saving, loading, and copying workspaces
 - User-level file operations on ASCII sequential and direct access files

MINIMUM HARDWARE REQUIRED:

Any valid RT-11 system configuration with at least 44K bytes of memory (48K bytes are recommended).

OPTIONAL HARDWARE:

- FP11 Floating Point Processors
- EIS and FIS Instruction Sets
- 300 BAUD LA37 terminal (LA36 with the APL option installed)
- 1200 BAUD LA120 terminal with the APL option installed

PREREQUISITE SOFTWARE:

RT-11 Operating System, Version 4.0

OPTIONAL SOFTWARE:

None

TRAINING CREDITS:

None

SUPPORT CATEGORY:

DIGITAL SUPPORTED

APL-11/RT is a DIGITAL Supported Software Product.

SOFTWARE INSTALLATION:

CUSTOMER INSTALLED

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

SOFTWARE PRODUCT SUPPORT

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

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ORDERING INFORMATION:

All binary licensed software, including any subsequent updates, is furnished under the licensing provisions of DIGITAL's Standard Terms and Conditions of Sale, which provide in part that the software and any part thereof may be used on only the single CPU on which the software is first installed, and may be copied, in whole or in part (with the proper inclusion of the DIGITAL copyright notice and any DIGITAL proprietary notices on the software) only for use on such CPU. All source licensed software is furnished only under the terms and conditions of a separate Software Program Sources License Agreement between Purchaser and DIGITAL.

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.

Sources and/or listings 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, H, Q, R, Y, Z) represents the distribution media for the product and must be specified at the end of the order number, e.g., QJ909-AE = binaries on RK05 Disk Cartridge.

D = 9-track 800 BPI Magtape (NRZI)
 E = RK05 Disk Cartridge
 G = TU58 DECtape II Cartridge
 H = RL02 Disk Cartridge
 Q = RL01 Disk Cartridge
 R = Microfiche
 Y = RX01 Floppy Diskette
 Z = No hardware dependency

NOTE: An RX01 diskette can be read on an RX02 drive.

QJ909 -A— Single-use license, binaries, documentation, support services (media: D, E, G, H, Q, Y)

QJ909 -C— Single-use license, binaries, documentation, no support services (media: D, E, G, H, Q, Y)

QJ909 -D— Single-use license only, no binaries, no documentation, no support services (media: Z)

Sources/Listings Options

QJ909 -E— Sources (media: D, E, H, Q)

QJ909 -F— Listings (media: R)

Update Options

Users of APL-11, 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 form on the appropriate medium and includes no installation or other services unless specifically stated.

QJ909 -H— Binaries, documentation (media: D, E, G, H, Q, Y)

QJ909 -H— Right to copy for single-use (under existing license), no binaries, no documentation (media: Z)

Miscellaneous Options

QJ909 -G— Documentation only kit (media: Z)

ADDITIONAL SERVICES:

None



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).*

<u>Areas Covered</u>	<u>SPR Center</u>	<u>Areas Covered</u>	<u>SPR Center</u>
United States; remainder of Far East, Middle East, Africa Latin America	Administrative Services Group, SWS P.O. Box F Maynard, Ma 01754	Japan	Digital Equipment Corp. INTL 3rd Floor Kowa Bldg. 8-7 Sanban Cho Chiyoda Ku Tokyo 102 Japan
Canada	Digital Equipment Canada P.O. Box 11500 Ottawa, Ontario Canada K2H 8K8	New Zealand	Digital Equipment N.Z. LTD P.O. Box 17093 Greenlane, Auckland 5, New Zealand
United Kingdom, Bahrain, 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	Belgium, Holland, Luxemburg	Digital Equipment B.V. KAAP Horndreef 38 NL - Utrecht/Overvecht Holland
Australia-Melbourne	Digital Equipment Aust. PTY. LTD 60 Park Street So. Melbourne Victoria Australia 3205	Sweden	Digital Equipment Corp. AB Englundavägen 7 S-171 24 Solna, Sweden
Australia-Sydney	Digital Equipment Aust. PTY. LTD 123 125 Willoughby Rd. P. O. Box 491 Crows Nest NSW Australia 2065	Denmark	Digital Equipment Corp. APS Kristineberg 3 DK-2100 Copenhagen Ø Denmark
Brazil	Digital Equipment Comercio Ind. Rua Batatais 429 Esq AL Campin 01423 Jardim Paulista Sao Paulo 0100 Brazil	Finland	Digital Equipment Corp. OY PL16 SF - 02201 ESPOO 20 Finland
Caribbean	De Latin America P. O. Box 11038 Fernando Juncos Sta. Santurce PR 00910	Norway	Digital Equipment Corp. A/S Pottenmakerveien 8 N - Oslo 5 Norway
France	Digital Equipment France 18, rue Saarinen France Silic 225 F - 94528 Rungis - Cedex France	Austria, East Germany, West Germany, Poland, Hungary, Rumania, Czechoslovakia, Russia, Bulgaria	Digital Equipment Corp. GMBH Wallsteinplatz 2 D - 8 Munich 40 West Germany
Italy	Digital Equipment S.P.A. Viale Fulvio Testi 117 I-20092 Cinisillo Balsamo Milan, Italy	Israël	DECSYS Computers LTD. 4, Yirmiyahou Str. P.O. Box 6359 IL - Tel-Aviv 63505 Israël

Areas Covered

Greece, Portugal,
Spain, Switzerland,
Yugoslavia & Sina
(Morocco, Algeria,
Tunisia, Cyprus,
Turkey, Malta)

SPR Center

Digital Equipment Corp. SA
9, route des Jeunes
1211 Geneva 26
Switzerland

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