

**RT-11**

October 1978

AD-C740B-B6

**THE  
SOFTWARE  
DISPATCH**

**digital**  
**SOFTWARE SERVICES**  
OPERATIONS GROUP

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## RT-11 SOFTWARE DISPATCH

Published by  
Administrative Services Group, Software Services  
Digital Equipment Corporation  
P.O.Box F  
Maynard MA 01754

The RT-11 Software Dispatch complements the RT-11 V3B Software Dispatch Review. It publishes new and revised Software Product Descriptions, programming notes, software problems and solutions, and documentation corrections. Much of the material is developed from answers to customer Software Performance Reports (SPRs) significant to the general audience, and is printed here to establish a reference notebook for the customer's software interests.

### PRODUCTS SUPPORTED in the RT-11 SOFTWARE DISPATCH

APL-11 V1	FORTTRAN GRAPHICS PKG V1.1	MSB/FORTTRAN IV V1
BASIC/RT-11 V2	FORTTRAN/RT-11 Extensions V1B	MU BASIC/RT-11 V1
BASIC/RT Extensions V1	FORTTRAN/RT-11 LSI Extensions V1	PDL/RT-11 V1
COS-350/2780	FORTTRAN IV/RT-11 V2	PEAK-11 V2
CTS-300 V3, V4	GAMMA-11 F/B V2, V2C	PLOT-11/RT-11 V1.1
CTS-300 DICAM V1	INDUSTRIAL BASIC/RT-11 V1	RT-11/03 FORTRAN Extensions V1
CTS-300 DICAM II V1	LA-11 V3	REMOTE/RT-11 V1
CTS-300/DIS V1	LSP-11 V1	RT-11 V3, V3B
DECnet/RT-V1	LV11/RT-11 Plotting Pkg.V2	RT-11(CTS-300)LSI-11 2780 V2
FOCAL/RT-11 V1B	MSB11-V1	RT-11/2780 V2
	SSP-11/RT-11 V1	

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Eleanor F.Hunter, Editor  
Roxanne Alexander, Associate Editor

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TYPESET-8  
TYPESET-11

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**USER LETTER**  
**Jan Fair, SPR Administration**

Customers (and others) have brought to our attention the need for additional information regarding SPR service, particularly as it involves SPR Administration. The following represents our attempt to fulfill this need. Your comments and suggestions are most welcome.

**HOW TO MAKE THE BEST USE OF SPR FORM**

**What WE Can Do for YOU**

1. Blank SPR forms are available upon request in the desired quantities through SPR Administration (P.O.Box F) and your local office/SPR Center.
2. Copies of the SPR acknowledgment and answer are sent to the appropriate DIGITAL Office/SPR Center for their information.
3. SPRs marked *SOFTWARE ERROR* or *INQUIRY* will have a response for supported Category A and B products. These SPRs should refer to suspected deficiencies in the software.
4. SPRs marked *FYI* or *SUGGESTION* are forwarded to the pertinent software group for information purposes, and are responded to at their discretion.
5. SPRs marked *DOCUMENTATION ERROR* should report those problems dealing with software manuals or newsletters, and will be forwarded to the pertinent software group.

**What YOU Can Do For US**

1. Customer Name and Address and Problem Statement should always be typed or printed clearly.
2. SPRs should not be used for problems concerning software policy, software distribution, or hardware. Your local office should be contacted in these cases.
3. It would be most helpful to all concerned, if problems with patches are reported as soon as possible.
4. For security SPRs, it is imperative that the *DO NOT PUBLISH* box be marked.
5. It would be helpful if tapes submitted with SPRs are labeled (track and density), and have a directory attached.
6. Should you ever receive an unacceptable SPR response, please contact us or the appropriate SPR Center so that the response may be readdressed.

## ANNOUNCING MU BASIC-11/RT-11 VERSION 2

What is it? MU BASIC is an extension of the same BASIC used in BASIC-11/RT-11 and BASIC-11/IAS-RSX. It runs on any RT-11 System 11/03 through 11/60) with 28K or more words and supports up to 8 users. It takes advantage of up to 256K Bytes of memory. Its low price for one to eight users is without comparison in microcomputers, desktop calculators, or other minis. Both DG and HP are quickly dropping out of the Small Multi-User BASIC market. The BASIC language on MU BASIC is highly functional, and will run programs written for BASIC-11/RT-11 and BASIC-11/IAS-RSX.

Who wants it? MU BASIC fits into a number of markets. The education market especially on the secondary level, finds MU BASIC (usually with an 11T03 system) a nice adjunct to teaching programming in math courses.

In the lab and industrial market, the RT-11 foreground real time capability coexists with MU BASIC and can afford a low price solution for multiple access and analysis of real time data. The extended memory capability of MU BASIC-11/RT-11 gives customers a chance to take advantage of greater than 32K words of memory without concerning themselves with the intricacies of PLAS.

Many OEMs are leaning toward MU BASIC for Data-Entry based applications. MU BASIC affords these people secure multiterminal file access, up to 8 terminals, an easy implementation language (BASIC) and, because of the ease of BASIC, a system which can be customized for each end user site with a minimum of work for the OEM. The speed of MU BASIC is sufficient for most Data-Entry applications.

Care should be taken in representing the performance of MU BASIC, especially on Floppy Disks. The more file accesses are done, the slower the system appears. As a rule of thumb, discourage more than 4 terminals on a Floppy based MU system that requires file access.

What are its unique features? The following are unique, salable MU BASIC features:

- . One to eight users with equal size memory partitions; no swapping of user partitions.
- . 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 type.
- . Ability to run in either the foreground or background under RT-11 F/B monitor concurrently with another job; supports all RT-11 supported devices (except VT11). MU BASIC runs in background only in systems using the RT-11 monitor.
- . 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.

- . Resource sharing: All peripheral devices can be used by any user at any terminal; ASSIGN and DEASSIGN commands available to restrict usage of non-public devices.
- . 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 by available memory and RT-11 channel considerations.
- . One or two dimensional 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 which 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. These routines are compatible with FORTRAN IV.
- . Immediate mode execution for "desk calculator" operation and program debugging.
- . "ON ERROR" statement for error processing.
- . Privileged user mode to protect BASIC applications programs.

KNOWN FORTRAN IV V2 BUGS (JE)

The following list identifies known bugs in the FORTRAN IV V2 compiler. This list is applicable to the FORTRAN offering currently supported under RT-11 V3 and RSTS/E V6C. Solutions to the problems identified in this article will be published in subsequent issues of this publication. This list has been generated to aid the user in identifying known problems until such time as an appropriate patch can be generated.

- Problem No. 1 - Extra characters following an END statement results in the compiler trapping without an error notification.
- Problem No. 2 - "End of line" comments with characters after column 73 generate "I" errors and cause termination of statement compilation.
- Problem No. 3 - The "ERR=" option when used with an OPEN statement does not trap errors when they occur.
- Problem No. 4 - The standalone RT-11 I/O simulator (SIMRT) included in the version 2 kit does work for the inline code option.
- Problem No. 5 - ENCODE/DECODE does not work for the threaded code option. ENCODE/DECODE does work for the inline code option.
- Problem No. 6 - PROGRAM statements in the same module as IMPLICIT statements cause an erroneous warning to be generated.
- Problem No. 7 - Raising a complex number to a negative integer power produces an incorrect result.
- Problem No. 8 - In threaded mode BLOCK DATA generates bad object files. This problem does not occur in inline mode.  
  
Solution - none needed since the current version of the RT and RSTS Linker do not detect the bad object files. Operation of the linkers is as the user would expect with appropriate results. This problem is not currently visible to a user, however, may present a problem with subsequent linker updates.
- Problem No. 9 - Use of the FIND statement causes undefined results.

FORTRAN IV/RT-11 V2  
COMPILER

Seq 2 M  
1 of 1

### USE OF THE FIND STATEMENT (JE)

Use of the FIND statement causes undefined results.

The following patch applies to FORTRAN IV V2 compiler available under RT-11 V3 and RSTS/E V6C.

1. Type in the following patch file:

```
; PAT001.MAC
; THIS IS PATCH NUMBER 1
; FOR RT11 AND RSTS FORTRAN IV
; THIS PATCH FIXES THE PROBLEM WITH THE FORTRAN FIND STATEMENT
      .TITLE  SFIND
      .IDENT  /F4002.1/
      .PSECT  DJS$1
      .GLOBL  SAVR4$,SFIND
      .=.+4
SFIND:  TST     -(SP)
        MOV     2(SP),-(SP)
        JSR    PC,SAVR4$
        ADD     #4,SP
      .END
```

2. Assemble the file with MACRO-11

```
.R MACRO
* PAT001=PAT001
* ↑C
```

3. Install the patch using PAT , to the backed up OTS object file OTSCOM.OBJ

```
.R PAT
* OTSCOM=OTSCOM, PAT001
```

4. Rebuild the OTS using the procedures described in the FORTRAN Installation Guide.
5. Test the patch by compiling, linking, and running the following FORTRAN program:

```
C THIS PROGRAM TESTS FORTRAN SYSTEM PATCH 1
```

```
      DEFINE FILE 1(4,4,U,INDX)
      WRITE(1'1)I
      INDX=555
      FIND(1'3)
      TYPE *, INDX
      END
```

A 3 should be typed at the terminal

FORTRAN IV/RT-11 V2  
COMPILER

Seq 5 R  
1 of 1

TRANSMITTING ASCII DATA (SPR 11-15279 JE)

Transmitting ASCII data to the system terminal to do cursor addressing presents a problem.

The problem is caused by premature termination of output when nulls are encountered. In previous versions of Fortran, output was done as character-by-character transfer, either to the file buffer or to the terminal using TTYOUT. This method of output had two undesirable consequences.

1. It involved significant overhead, slowing down jobs that were I/O bound at the terminal.
2. It prevented FORTRAN foreground jobs from being switched.

For these reasons, the PUTREC routine was altered to: look at the length, pick up the character after the last, save it and replace it with a 200 byte (which indicates the the end of output), do a .PRINT on the line, then replace the 200 byte with the original character and go on.

This reduced the overhead by a factor of 4 and allowed foreground jobs to be switched. However, it caused ASCII output to be terminated when it encountered a null byte or a 200 byte.

The solution to the problem is to write a MACRO subroutine which takes the array and the length as arguments and goes through a loop that does .TTYOUTs on the data.

RT-11 Software Dispatch, October 1978

FORTTRAN IV/RT-11 V2  
COMPILER

Seq 6 N  
1 of 1

IN-LINE CODE (SPR 11-15335 JE)

IN-LINE Code is not supported for the FPU. If you have an FPU, you should generate FORTTRAN for threaded code.

RT-11 Software Dispatch, October 1978

RT-11 V03-02  
MONITOR  
DXMNSJ.SYS V03

Seq 16 0  
1 of 2

DX SJ MONITOR BOOTSTRAP CORRECTIONS (11-17912 BD)

The system will halt during DX SJ monitor boot if a read error occurs. These patches will allow the bootstrap to continue and/or the appropriate error messages to be printed.

The version number is not affected by the following binary patch:

.R PATCH <RET>

FILE NAME--

\*DXMNSJ.SYS/C <RET>

\*234/ 167 5037 <LF>

236/ 470 44 <LF>

240/ 0 167 <LF>

242/ 0 464 <RET>

\*E

Checksum? 65610 <RET>

.R PATCH <RET>

FILE NAME--

\*DXMNSJ.BL/C <RET>

\*234/ 167 5037 <LF>

236/ 470 44 <LF>

240/ 0 167 <LF>

242/ 0 464 <RET>

\*E

Checksum? 65610 <RET>

RT-11 V03-02  
MONITOR  
DXMNSJ.SYS V03

Seq 16 0  
2 of 2

The following source edits should be applied to SYSGENed monitors only.

```
.R EDIT <RET>
*EBBSTRAP.MAC<ESC>RV<ESC><ESC>
;BSTRAP EDIT LEVEL 0
*GO<ESC>-DI1<ESC>V<ESC><ESC>
;BSTRAP EDIT LEVEL 1
*F@#20<ESC>AV<ESC><ESC>
      JMP      BOOT
*I      CLR      @#44 <RET>
<ESC>-L<ESC><ESC>
      CLR      @#44
*EX<ESC><ESC>
```

RT-11 Software Dispatch, October 1978

RT-11 V03B-00  
MONITOR  
DXMNSJ.SYS V03B

Seq 12 0  
1 of 2

DX SJ MONITOR BOOTSTRAP CORRECTIONS (11-17912 BD)

The system will halt during DX SJ monitor boot if a read error occurs. These patches will allow the bootstrap to continue and/or the appropriate error messages to be printed.

The version number is not affected by the following binary patch:

.R PATCH <RET>

FILE NAME--  
\*DXMNSJ.SYS/C <RET>  
\*234/ 167 5037 <LF>  
236/ 470 44 <LF>  
240/ 0 167 <LF>  
242/ 0 464 <RET>  
\*E

Checksum? 65610 <RET>

.R PATCH <RET>

FILE NAME--  
\*DXMNSJ.BL/C <RET>  
\*234/ 167 5037 <LF>  
236/ 470 44 <LF>  
240/ 0 167 <LF>  
242/ 0 464 <RET>  
\*E

Checksum? 65610 <RET>

RT-11 V03B-00  
MONITOR  
DXMNSJ.SYS V03B

Seq 12 0  
2 of 2

The following source edits should be applied to SYSGENed monitors only.

```
.R EDIT <RET>
*EBBSTRAP.MAC<ESC>RV<ESC><ESC>
;BSTRAP EDIT LEVEL 7
*G7<ESC>-DI8<ESC>V<ESC><ESC>
;BSTRAP EDIT LEVEL 8
*F@#20<ESC>AV<ESC><ESC>
      JMP      BOOT
*I      CLR      @#44 <RET>
<ESC>-L<ESC><ESC>
      CLR      @#44
*EX<ESC><ESC>
```

.

RT-11 SOFTWARE DISPATCH  
CUMULATIVE INDEX  
OCTOBER 1978

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

**IMPORTANT!**

Retracted articles are indicated: RETRACTION.

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

M = Mandatory patch. These are critical patches which each customer is required to install.

O = Optional patch. These articles are applicable only if the reported problems have occurred at the customer site or if they are unique to his operation.

R = Restriction. These problems are not patchable in released software. Restrictions are reviewed and corrected when possible as part of the normal release cycle.

N = NOTE. This information may be helpful to the user.

<u>Component</u>	<u>Sequence</u>	<u>Mon/Yr</u>
<b>APL-11 V1</b>		
<b>APL.SAV PROGRAM PATCHES</b>		
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
<b>BASIC-11/RT-11 V2</b>		
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
<b>BASIC/RT-11 EXTENSIONS V1</b>		
"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
<b>CTS-300 V3</b>		
CTS-300 V03 RELEASE NOTES	01	Apr 77
USE OF RSTAT WITH ISAM FILES	02 R	Aug 77
PATCH NUMBERS AND TITLES	03	Nov 77
<b>DECFORM</b>		
DECFORM ERRORS	01	Apr 77
REPLACEMENT PAGES	02	Apr 77
SEARCHMODE AND RENAM PROBLEM - NEW VERSION NUMBER	03	Jun 77
EXTRA CHARACTERS AT STATEMENT END	04	Jun 77

<u>Component</u>	<u>Sequence</u>	<u>Mon/Yr</u>
FOCOMP INCORRECTLY ALLOCATES AN EXTRA CHARACTER	05	Nov 77
REPLACEMENT PAGES	06	Aug 77
DECFORM RESTRICTIONS	07	Sep 77
CONDITIONAL GOTO AND CONDITIONAL SKIP	08	Oct 77
DECFORM PROBLEMS AND RESTRICTIONS	09 R	Nov 77
HANG ON EXIT	10	Jan 78
TWO PROBLEMS IN FOCOMP	11 M	Feb 78
EOF AFTER CHANGED RECORD	12 M	Mar 78
LOST RECORD ON DUPLICATE KEY	13 M	Apr 78
MESSAGE FOR SPEED READERS	14 M	Apr 78
EXCITING DECFORM VIA FIVE-PART QUESTION	15 M	May 78
<b>DOCUMENTATION</b>		
MULTIVOLUME FILES ON MAGTAPE	01 N	Feb 78
PAGE CORRECTION	02	Apr 78
DOCUMENT ERROR	03	Apr 78
<b>DICOMP</b>		
IMPROPER GLOBAL INFORMATION	01	Jul 77
COMMENT CAUSES ERROR	02	Aug 77
<b>FILEX</b>		
RESTRICTION ON FILEX	01	Sep 77
FILEX INFORMATION AND RESTRICTION	02 R	Mar 78
OUT ERR WITH 128-CHARACTERS RECORDS	03 M	Jul 78
BLANK RECORDS	04 M	Sep 78
<b>ISMUTL</b>		
INDEXING PROBLEM	01	Jul 77
WRONG RECORD COUNT	02	Jul 77
CTS-300 SYSTEM REFERENCE MANUAL	03	Oct 77
INCORRECT APPEND CALCULATION	04	Sep 77
ERR 16 IN REORG	05	Oct 77
THREE PROBLEMS IN ISMUTL	06 M	Jan 78
REPLACEMENT PAGES	07 N	Feb 78
WRONG FILE SPACE ALLOCATION	08 M	Apr 78
ERRONEOUS ERROR MESSAGE	09 M	Apr 78
ERROR 28	10 M	Apr 78
LEGAL CHARACTERS IN ISAM RECORDS	11 R	May 78
DUPLICATE KEYS IN THE INPUT FILE	12 M	Jun 78
MORE INPUT RECORDS THAN SPECIFIED	13 M	Jul 78
THREE PROBLEMS IN ISMUTL	14 M	Sep 78
FOUR PROBLEMS IN ISMUTL	15 M	Oct 78
<b>LPTSPL</b>		
NO CONTINUE AFTER PROGRAM ABORT	01 M	May 78
<b>SINGLE USER DIBOL</b>		
SPURIOUS I/O ERRORS DURING ISAM STORE	01	Jun 77
CHANGE READS STATEMENT TO ACCEPT 8-BIT ASCII	02	Apr 77
LOCASE CONVERTS UNDERLINE TO RUBOUT	03	Jun 77
ISAM RECORDS CROSSING BLOCK BOUNDARIES	04	Aug 77
PROBLEM WITH 32KB OR LESS	05	Sep 77
REPLACEMENT PAGES	06	Oct 77
"NOT ENOUGH MEMORY" CONDITION	07 M	Jan 78
RECORDS BEING LOST	08 M	Feb 78
RUNNING V3 ON LSI	09 M	Apr 78
<b>SORTG</b>		
TAGSORTS NOT ALLOWED ON ISAM FILES	01	May 77
CORRECTION TO VERSION "A" PATCH	02	Oct 77
<b>SORTM</b>		
I/O ERROR INTERPRETED AS AN INPUT END OF FILE	01	Apr 77
NEGATIVE NUMBERS IN SORT/MERGE	02	Oct 77
SORTING CARETS	03 M	Jan 78
INCORRECT RECORD COUNT	04 M	Feb 78
FIRST RECORD OUT OF ORDER	05 M	Mar 78
ERR 16 IN TSD	06 M	Jul 78
MERGE WITH DESCENDING KEY	07 M	Sep 78

<u>Component</u>	<u>Sequence</u>	<u>Mon/Yr</u>
<b>TSD</b>		
CHANGE READS STATEMENT TO ACCEPT 8-BIT ASCII	01	Apr 77
REPLACEMENT PAGES	02	Apr 77
PROGRAM SIZE CALCULATIONS FOR TSD	03	May 77
I/O RACE CONDITION	04	Jun 77
GARBLED OUTPUT DUE TO ALPHA OR DECIMAL DISPLAYS	05	May 77
PROBLEM WITH RENAM	06	Jun 77
LOCASE CONVERTS UNDERLINE TO RUBOUT	07	Jun 77
ISAM FILE SHARING PROBLEM	08	Jun 77
IMPOSSIBLE TRAP ON OVERLAYING	09	Jun 77
ISAM RECORDS CROSSING BLOCK BOUNDARIES	10	Aug 77
RECORDS BEING LOST	11 M	Feb 78
PERMANENTLY LOCKED GROUP	12 M	Mar 78
RUNNING V3 ON LSI	13 M	Apr 78
CLOSING ISAM FROM AN EXTERNAL SUBROUTINE	14 M	Apr 78
PROBLEM WITH ISAM INPUT	15 M	Apr 78
<b>CTS-300 V3 AND CTS-300/DIS V3.5</b>		
ISAM REPAIR PROGRAM	01 0	Mar 78
<b>CTS-300 V4</b>		
<b>DECFORM</b>		
ADDITIONAL INFORMATION ON MATH OPTION	01 N	Dec 77
UNDEFINED GLOBALS WITH DECFORM	02	Jan 78
TWO PROBLEMS IN FOCOMP	03 M	Feb 78
EOF AFTER CHANGED RECORD	04 M	Mar 78
LOST RECORD ON DUPLICATE KEY	05 M	Apr 78
MESSAGE FOR SPEED READERS	06 M	Apr 78
EXITING DECFORM VIA FIVE-PART QUESTION	07 M	Jun 78
TOO FEW DATA FIELDS RETURNED	08 M	Jun 78
USR NOSWAP CAUSES TRAP TO 4	09 M	Aug 78
RANDOM ERRORS WITH FIELD CHECK	10 M	Oct 78
<b>DICOMP</b>		
TRAP TO 4 UNDER XM	01 M	Feb 78
TRAP TO 10 UNDER FB	02 M	Feb 78
DON'T WASTE PAPER	03 M	Jul 78
<b>DOCUMENTATION</b>		
REPLACEMENT PAGES	01 N	Dec 77
DOCUMENTATION CHANGES TO CTS-300 SYSTEM USER'S GUIDE	02 N	Jun 78
DOCUMENTATION CHANGES TO DECFORM USER'S GUIDE	03 N	Jun 78
<b>ISMUTL</b>		
THREE PROBLEMS IN ISMUTL	01 M	Dec 77
WRONG FILE SPACE ALLOCATION	02 M	Apr 78
ERRONEOUS ERROR MESSAGE	03 M	Apr 78
ERROR 28	04 M	Apr 78
LEGAL CHARACTERS IN ISAM RECORDS	05 R	May 78
DUPLICATE KEYS IN THE INPUT FILE	06 M	Jun 78
MORE INPUT RECORDS THAN SPECIFIED	07 M	Jul 78
THREE PROBLEMS IN ISMUTL	08 M	Sep 78
FOUR PROBLEMS IN ISMUTL	09 M	Oct 78
<b>LPTSPL</b>		
JOB MISHANDLING	01 M	Jan 78
<b>REDUCE</b>		
MULTIPLE FILE PROBLEM	01 M	Jan 78
BAD FILE CAUSES SYSTEM HALT	02 M	Sep 78
<b>SINGLE USER DIBOL</b>		
PROBLEM WITH CLOSING A FILE	01 M	Dec 77
RANDOM ACCESS PROBLEM	02 M	Jan 78
MINUS ZERO	03 M	Jan 78
LPQUE DOES NOT WORK	04 M	Jan 78
CHANNEL 1	05 M	Jan 78
FIELD EDITING	06 M	Jan 78
WRONG ERROR MESSAGE	07 M	Feb 78
MINUS ZERO	08 M	Feb 78

<u>Component</u>	<u>Sequence</u>	<u>Mon/Yr</u>
S.U. DIBOL WORKS ONLY UNDER XM	09 M	Feb 78
RECORDS BEING LOST	10 M	Feb 78
NO SINGLE USER ON 11/10	11 M	Feb 78
RENAME PROBLEM	12 M	Apr 78
NO MAGTAPE IN V4	13 M	Apr 78
ABORT ON SECOND LPQUE STATEMENT	14 M	Jun 78
XCALL VERSN BEGETS TRAP TO 4 (See TSD, Seq 34 M)	15 M	Jun 78
LPNUM CAUSES FILE NOT FOUND	16 M	Jun 78
BAD OPEN	17 M	Jul 78
MONITOR TRAP WITH DIVIDE	18 M	Jul 78
RECORD NUMBERS GREATER THAN 65,535	19 M	Jul 78
PROBLEM ACCEPTING FROM A FILE	20 M	Jul 78
NO CTRL/C TRAP UNDER SUD	21 M	Aug 78
DIRECT CURSOR POSITIONING UNDER SUD	22 M	Aug 78
TTSTS DOES NOT WORK UNDER SINGLE USER DIBOL	23 M	Sep 78
CTRL/C TRAP AND TTSTS	24 M	Oct 78
ERR 23 WITH CARD READER	25 M	Oct 78
<b>SORTG</b>		
KDTYP MISSING	01 M	Feb 78
<b>SORTM</b>		
SORTING CARETS	01 N	Dec 77
TAGSORTS WITH MULTIPLE KEYS	02 M	Jan 78
FIRST RECORD OUT OF ORDER	03 M	Mar 78
ERR 16 IN TSD	04 M	Jul 78
<b>SORTP</b>		
NO PROTECTION FROM MIXING DATA MODES	01 M	Jun 78
<b>STATUS.TSD</b>		
WRONG JX INFORMATION	01 M	Dec 77
PENDING MESSAGES	02 M	Jan 78
PROBLEM DURING JOB STARTUP	03 M	Mar 78
<b>TSD</b>		
PROBLEM WITH MULTIPLE ISAM FILES	01 M	Dec 77
TNMBR TRAPS TO 4	01a M	Jan 78
RANDOM ACCESS PROBLEM	02 M	Jan 78
MINUS ZERO	03 M	Jan 78
DELETE CAUSES STACK OVERFLOW	04 M	Jan 78
FIELD EDITING	05 M	Jan 78
PROBLEM WITH ISAM INPUT	06 M	Jan 78
SEND CAUSES STACK OVERFLOW	07 M	Feb 78
STATUS GIVES FALSE REPORT	08 M	Feb 78
FILE SHARING	09 M	Feb 78
CHANNEL IN USE PROBLEM	10 M	Feb 78
PROGRAMS CREATED IN REGION 0	11 M	Feb 78
IMPLICIT JOB STARTUP PROBLEM	12 M	Feb 78
PENDING MESSAGES DESTROY SYMBOL TABLE	13 M	Feb 78
TERMINALS IGNORED	14 M	Feb 78
TROUBLE WITH TSD UNDER FB	15 M	Feb 78
MEMORY FAULT WITH SEND/RCV	16 M	Feb 78
PERMANENTLY LOCKED GROUP	17 M	Mar 78
SLOW TERMINAL I/O	18 M	Mar 78
PROBLEM WITH FORCED JOB AND TERMINAL NUMBER	19 M	Mar 78
INCORRECT CHECK FOR FREE SPACE	20 M	Mar 78
SYSGEN/TSDGEN PROBLEM	21 M	Mar 78
OPENING LP: GENERATES ERRORS	22 M	Mar 78
RECORDS BEING LOST	23 M	Apr 78
BAD I/O, FLAG NOT CLEARED	24 M	Apr 78
CLOSING ISAM FROM EXTERNAL SUBROUTINE	25 M	Apr 78
DISPLAY FROM DETACHED PROGRAM TO DETACHED TERMINAL	26 M	Apr 78
NO MAGTAPE IN V4	27 M	Apr 78
BASE LEVEL 2	28 M	Apr 78
R6 STACK OVERFLOW	29 M	May 78
TSD HANGS IF LP GOES OFF LINE	30 M	Jun 78
SLEEP PAST MIDNIGHT, NEVER WAKE UP	31 M	Jun 78
LOWER CASE CONVERTS TO UPPER CASE	32 M	Jun 78
THREE PROBLEMS IN XMTSD	33 M	Jun 78
XCALL VERSN BEGETS TRAP TO 4 (See Single User DIBOL, Seq 15 M)	34 M	Jun 78
SLAVE REFUSES TO WORK	35 M	Jun 78
MORE LP: NOHANG DIFFICULTIES	36 M	Jun 78
MORE TRAPS TO 4 AND 10	37 M	Jun 78

<u>Component</u>	<u>Sequence</u>	<u>Mon/Yr</u>
NO ALIGN OR DELETE WITH LPQUE	38 M	Jun 78
TRAP TO 10 CAUSED BY OPEN ISAM FILE	39 M	Jun 78
NO ROOM FOR BUFFER CAUSES TRAP TO 4/10	40 M	Jun 78
MAGTAPE READ DOES NOT WORK	41 M	Jul 78
MONITOR TRAP WITH DIVIDE	42 M	Jul 78
RECORD NUMBERS GREATER THAN 65,535	43 M	Jul 78
BAD BINARY FILE	44 M	Jul 78
STOP CHAIN FAILURE	45 M	Aug 78
SKIPPED TERMINALS CAUSE FORCED JOB STARTUP PROBLEM	46 M	Aug 78
SKIPPED TERMINALS CAUSE "SEND" PROBLEM	47 M	Aug 78
ANOTHER EXTENDED MEMORY ALLOCATION PROBLEM	48 M	Aug 78
REMOTE TERMINAL PROBLEM	49 M	Aug 78
SEND TO -2 SOMETIMES FAILS	50 M	Aug 78
WASTED SPACE	51 M	Aug 78
CANNOT INTERRUPT TIGHT I/O LOOPS	52 M	Aug 78
PROBLEM WITH SEND	53 M	Sep 78
CTRL/C TRAP AND TTSTS	54 M	Oct 78
ATTACH SOMETIMES GETS CONFUSED	55 M	Oct 78
SHUFFLER/LINE PRINTER CONFLICT	56 M	Oct 78

CTS-300/DIS V3.5

USE OF RSTAT WITH ISAM FILES	01 R	NOV 77
<b>DECFORM</b>		
SEARCHMODE AND RENAM PROBLEM - NEW VERSION NUMBER	01	Oct 77
MICRO CODE CAUSES TRAP TO 10	02	Oct 77
DECFORM RESTRICTIONS	03	Nov 77
EXTRA CHARACTERS AT STATEMENT END	04	Nov 77
FOCOMP INCORRECTLY ALLOCATES AN EXTRA CHARACTER	05	Nov 77
CONDITIONAL GOTO AND CONDITIONAL SKIP	06	Nov 77
DECFORM PROBLEMS AND RESTRICTION	07	Nov 77
HANG ONE EXIT	08 M	Jan 78
TWO PROBLEMS IN FOCOMP	09 M	Feb 78
EOF AFTER CHANGED RECORD	10 M	Mar 78
NEGATIVE NUMBER ENDING IN ZERO	11 M	Mar 78
LOST RECORD ON DUPLICATE KEY	12 M	Apr 78
MESSAGE FOR SPEED READERS	13 M	Apr 78
EXITING DECFORM VIA FIVE-PART QUESTION	14 M	May 78
<b>DICOMP</b>		
IMPROPER GLOBAL INFORMATION	01	Nov 77
COMMENT CAUSES ERROR	02	Nov 77
<b>DOCUMENTATION</b>		
MULTIVOLUME FILES ON MAGTAPE	01 N	Feb 78
PAGE CORRECTION	02 N	Apr 78
DOCUMENT ERROR	03 N	Apr 78
<b>FILEX</b>		
RESTRICTION ON FILEX	01 R	Nov 77
FILEX INFORMATION AND RESTRICTION	02 R	Mar 78
OUT ERR WITH 128-CHARACTERS RECORDS	03 M	Jul 78
BLANK RECORDS	04 M	Sep 78
<b>ISMUTL</b>		
INDEXING PROBLEM	01	Nov 77
INCORRECT APPEND CALCULATION	02	Nov 77
ERR 16 IN REORG	03	Nov 77
WRONG RECORD COUNT	04	Nov 77
THREE PROBLEMS IN ISMUTL	05	Jan 78
REPLACEMENT PAGES	06 N	Feb 78
WRONG FILE SPACE ALLOCATION	07 M	Apr 78
ERRONEOUS ERROR MESSAGE	08 M	Apr 78
ERROR 28	09 M	Apr 78
LEGAL CHARACTERS IN ISAM RECORDS	10 R	May 78
DUPLICATE KEYS IN THE INPUT FILE	11 M	Jun 78
MORE INPUT RECORDS THAN SPECIFIED	12 M	Jul 78
THREE PROBLEMS IN ISMUTL	13 M	Sep 78
FOUR PROBLEMS IN ISMUTL	14 M	Oct 78

<u>Component</u>	<u>Sequence</u>	<u>Mon/Yr</u>
<b>LPTSPL</b>		
NO CONTINUE AFTER PROGRAM ABORT	01 M	May 78
<b>SINGLE USER DIBOL</b>		
LOCASE CONVERTS UNDERLINE TO RUBOUT	01	Oct 77
ISAM RECORDS CROSSING BLOCK BOUNDARIES	02	Nov 77
PROBLEM IN 32K OR LESS	03	NOV 77
"NOT ENOUGH MEMORY" CONDITION	04	JAN 78
SPURIOUS I/O ERRORS CURING ISAM STORE	05	JAN 78
RECORDS BEING LOST	06 M	Feb 78
<b>SORTG</b>		
TAGSORTS NOT ALLOWED ON ISAM FILES	01	Oct 77
CORRECTION TO VERSION "A" PATCH	02	Nov 77
<b>SORTM</b>		
NEGATIVE NUMBERS IN SORT/MERGE	01	Nov 77
SORTING CARETS	02 N	Jan 78
INCORRECT RECORD COUNT	03 M	Feb 78
FIRST RECORD OUT OF ORDER	04 M	Mar 78
ERR 16 IN TSD	05 M	Jul 78
MERGE WITH DESCENDING KEY	06 M	Sep 78
<b>TSD</b>		
I/O RACE CONDITION	01	Nov 77
ERRONEOUS PATCH TO TSD	01a	Nov 77
INCORRECT JOB NUMBER AT STARTUP TIME	02	Sep 77
PROBLEM WITH RENAM	03	Sep 77
LOCASE CONVERTS UNDERLINE TO RUBOUT	04	Oct 77
ISAM FILE SHARING PROBLEM	05	Nov 77
IMPOSSIBLE TRAP ON OVERLAYING	06	Nov 77
ISAM RECORDS CROSSING BLOCK BOUNDARIES	07	Nov 77
RECORDS BEING LOST	08 M	Feb 78
PERMANENTLY LOCKED GROUP	09 M	Mar 78
CLOSING ISAM FROM AN EXTERNAL SUBROUTINE	10 M	Apr 78
PROBLEM WITH ISAM INPUT	11 M	Apr 78
<b>DECnet-RT V1</b>		
<b>DDCMP</b>		
DDCMP LINE COUNTERS OVERFLOW TO ZERO	01 0	Jul 78
<b>DMC</b>		
DMC LINE COUNTERS OVERFLOW TO ZERO	01 0	Jul 78
<b>FORTRAN INTERFACE</b>		
DIFFERENCES IN RT AND RSX FORTRAN INTERFACE IMPLEMENTATIONS	01 N	Jul 78
<b>MODEM CONTROL</b>		
SUPPORT OF ASYNCHRONOUS HALF DUPLEX MODEMS	01 R	Jul 78
<b>FOCAL/RT-11 V1B</b>		
FOR COMMAND WITHOUT AN ARGUMENT	01 M	Oct 75
OPERATE COMMAND CAUSES ERROR	04 M	Aug 76
FCLK ROUTINE GIVES INCORRECT TIME	05 0	Aug 76
"LIBRARY ASK" COMMAND	06 0	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
<b>FORTRAN IV/RT-11 V2</b>		
<b>COMPILER</b>		
KNOWN FORTRAN IV V2 BUGS	01 N	Oct 78
USE OF THE FIND STATEMENT	02 M	Oct 78
RAISING COMPLEX NUMBERS	03 M	Oct 78
EXTRA CHARACTERS MAY RESULT IN COMPILER TRAPPING	04 M	Oct 78
TRANSMITTING ASCII DATA	05 R	Oct 78
IN-LINE CODE	06 N	Oct 78

<u>Component</u>	<u>Sequence</u>	<u>Mon/Yr</u>
<b>FORTRAN/RT-11 EXTENSIONS V1</b>		
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
<b>FORTRAN/RT-11 EXTENSIONS V1B</b>		
FORTRAN CRASHES AFTER RUNNING PROGRAM WITH "SETR"	01 M	Oct 78
<b>GAMMA-11 F/B V2</b>		
DATA ANALYSIS PROGRAM	01 M	Feb 77
STUDY TRANSFER 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
<b>GAMMA-11 F/B V2C</b>		
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
<b>LABORATORY APPLICATIONS-11 V3</b>		
A NEW MODULE TO ENHANCE DATA FLOW WITHIN LA-11	01 N	Oct 76
<b>HISTO.MAC</b>		
ACQUIRING AND PROCESSING HISTOGRAM DATA	01 M	Sep 76
<b>LABMAC.SML</b>		
ERRONEOUS MACRO	01 M	Sep 77
<b>PEAK.MAC</b>		
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
<b>SPARTA</b>		
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

<u>Component</u>	<u>Sequence</u>	<u>Mon/Yr</u>
<b>SWEEP.MAC</b>		
SWEEP SAMPLING: FAST MODE	01 M	Aug 77
<b>THRU</b>		
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
<b>LV11/RT-11 PLOTTING PACKAGE V2</b>		
SUBROUTINE PLOT DOES NOT CORRECTLY REPRODUCE VT11 PICTURE	01 M	Apr 78
<b>MU BASIC/RT-11 V1</b>		
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
<b>MU BASIC/RT-11 SYSTEM INSTALLATION GUIDE</b>		
REPLACEMENT PAGES	01	Jan 77
REPLACEMENT PAGES	02 N	Jan 78
REPLACEMENT PAGES	03 N	Jan 78
<b>PDL/RT-11 V1B</b>		
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
<b>PEAK-11 V1</b>		
"MREPR" AND "REPR" GET CONFUSED	01 M	Aug 78
<b>REMOTE/RT-11 V1</b>		
SCHEDULER DOES NOT PROPERLY SET PROCESSOR PRIORITY	01 M	May 76
NOEDIT- 0 HALTS	02 M	May 76
NUMERS=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

<u>Component</u>	<u>Sequence</u>	<u>Mon/Yr</u>
@RE IN THE SATELLITE DOES NOT WORK	25 R	Mar 78
"HANG" CONDITIONS	26 R	Apr 78
UANSIGNED	27	XXX XX
USING KG-11 CRC CALCULATOR	28 M	Aug 78
PASTE CAUSES LINE DUPLICATION	29 M	Aug 78
"DAISY CHAIN" ARRANGEMENT IN RTSIM.MAC	30 M	Aug 78
OPTIONAL RMON IS OMITTED FROM RTSIM BY DEFINING NORMON=0	31 M	Oct 78
DL-11 ERROR AND CRC ERROR IN HOST	32 M	Oct 78
<b>RT-11 V3</b>		
<b>DOCUMENTATION</b>		
TYPOGRAPHICAL ERRORS	01 N	Mar 78
ERROR IN FOREGROUND/BACKGROUND DEMONSTRATION	02 M	Aug 78
<b>EDIT</b>		
EDIT DOES NOT OPERATE CORRECTLY UNDER XM MONITOR	01 M	Mar 78
<b>MACRO</b>		
.NARG FAILS WHEN AUTOMATIC LABEL GENERATION IS USED	01 M	Apr 78
<b>MISCELLANEOUS</b>		
GETSTR AND PUTSTR ROUTINES FOR IN-LINE CODE	01 M	Jun 78
ERROR IN THE CONCAT ROUTINE	02 M	Jun 78
<b>MONITOR</b>		
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
<b>SOURCES</b>		
UNRESOLVED DIFFERENCES IN DEMOX1.MAC	01 M	Aug 78
DISTRIBUTED MAGTAPE HANDLER CORRECTIONS	02 M	Sep 78
<b>SYSTEM HANDLERS</b>		
DM HANDLER CORRECTIONS	01 M	Oct 78
<b>UTILITIES</b>		
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 CAUSE SYSTEM CRASH	03 M	Mar 78
LINK OUTPUT INVALID IF OBJ HAS AN EMPTY GSD RECORD	04 M	Mar 78
PAT GIVES FATAL ERROR IF OBJ HAS AN EMPTY RECORD	05 M	Apr 78
UNASSIGNED	06	XXX XX
EDIT VT11 DISPLAY FUNCTIONS WILL NOT OPERATE UNDER XM MONITOR	07 M/R	Apr 78
TRANSFERS IN INTERCHANGE FORMAT WHEN NO SYSTEM DATE IS GIVEN	08 M	Jun 78
DUP SCAN RATE FOR FLOPPY	09 M	Jun 78
DUP /I AND /W SWITCHES DO NOT WORK PROPERLY	10 M	Jun 78
LINK/FRUN FAILS WHEN PROGRAM IS OVERLAYED AND USES LIBRARIES	11 M	Jul 78
DUP DOES NOT DIFFERENTIATE BETWEEN DELETED .BAD FILES AND PERMANENT ONES	12 M	Jul 78
ERRORS IN FILEX INTERCHANGE FORMAT	13 M	Jul 78
LINK PRODUCES INCORRECT .LDA FILES	14 M	Sep 78

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

RT-11 V3B

**DOCUMENTATION**

ERROR IN FOREGROUND/BACKGROUND DEMONSTRATION	01 M	Aug 78
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**MISCELLANEOUS**

ERRORS IN THE SYSGEN CONDITIONAL FILE	01 M	Jul 78
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**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
FFU 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

**SOURCES**

UNRESOLVED DIFFERENCES IN DEMOX1.MAC	01 M	Jul 78
ISSUING A SEEK TO DX HANDLER IN XM CAUSES RANDOM SYSTEM FAILURES	02 M	Sep 78
DISTRIBUTED MAGTAPE HANDLER CORRECTIONS	03 M	Sep 78

**SYSTEM HANDLERS**

RL01 HANDLER CORRECTIONS	01 M	Sep 78
ISSUING A SEEK TO THE DY HANDLER CAUSES THE SYSTEM TO CRASH	02 M	Oct 78
DM HANDLER CORRECTIONS	03 M	Oct 78

**UTILITIES**

ERRORS IN FILEX INTERCHANGE FORMAT	01 M	Jul 78
LINK PRODUCES INCORRECT .LDA FILES	02 M	Sep 78
LIBR CLEARING OF LOCATION ZERO	03 M	Oct 78
LINK ERROR IN PSECTS MOVED TO ROOT	04 M	Oct 78
DUP DOES NOT DETECT END OF SEGMENT	05 M	Oct 78
COPY/DEVICE FAILS ON DISK TO MAGTAPE	06 M	Oct 78

RT-11/2780 V2

CORRECTIONS TO 2780 PACKAGE	01	Sep 77
RUNNING 2780 ON RT-11 V3	02	Nov 77
PATCHING THE 2780 IN RT-11 V3	03 M	Sep 78



# Software Product Description

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**PRODUCT NAME: RT-11, Version 03B, Single-User Operating System**

**SPD 12.1.10**

## **DESCRIPTION:**

RT-11 is a disk-based single-user real time operating system designed for interactive program development and/or on-line applications on the PDP-11. 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, FOCAL, 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 restriction to a single or dual partition architecture.

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, which operates whenever the foreground program cannot run. Within their priorities, both foreground and background are complete RT-11 systems with access to system capabilities. Although they operate independently, foreground and background can communicate through disk files and/or message transmission areas in memory.

*The FB monitor* — can support systems with greater than 56K bytes of memory. (When exercising this feature, the FB monitor is referred to as the XM monitor.) This feature is primarily provided for use by those optional high-level language processors that can automatically produce programs which can address areas of memory other than the lowest 56K bytes. The assembly language programmer can also take advantage of this feature for storing data arrays above the lowest 56K bytes of memory, or for loading code in other areas of memory. Because the linker builds programs only for the lowest 56K bytes of memory, however, it is the assembly language programmer's responsibility to provide base address relocation. The user must do a system generation to include XM support.

*The SJ monitor* — is for users not requiring FB operation or the additional FB features. SJ requires less memory and 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 with no 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 statement. Indirect files allow command sequences to be stored and invoked repeatedly by the user.

*Contiguous File Structure:* — The RT-11 contiguous file structure 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 has been designed to satisfy a wide variety of input/output requirements by providing three modes of I/O operation:

- Synchronous I/O, where processing is suspended until the completion of the I/O event.
- Asynchronous I/O, where an I/O event is started, and 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 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 4.5K 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 4K bytes to this requirement.

RT-11's modular structure enables other functions to be swapped in as needed. On the other hand, if the program's memory requirements allow it, the complete monitor stays resident in memory to further increase system responsiveness.

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*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, storing it as a file, and installing it through a single keyboard command into the system.

When a new peripheral handler is added to an RT-11 system, all 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 ANSI-compatible labels and fixed-length blocks.

*Indirect Command Files:* — A set of system commands can be strung together in an indirect command file so they 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 or other user jobs to run in the foreground. RT-11 BATCH can be used in either SJ monitor configurations of 24K or more bytes of memory, or in any FB or XM configuration.

*FORTTRAN:* — The FORTRAN IV language compiler is available under separate license as an option, and RT-11 provides access to system services directly from a FORTRAN program. Routines are provided to perform direct file I/O, asynchronous FORTRAN subroutines, FORTRAN interrupt routines, and multi-terminal 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 1 to 16 terminals (8 maximum on LSI-11) in addition to the console terminal. These terminals can be addressed by specially written programs (or by optional software), and may be interfaced by (up to 8) DL11s, (1 or 2) DZ11s, (up to 8) DLV11s, or one (1) DZV11, but there can only be one "console terminal" (DL or DLV only) per system at any time. The foreground task may communicate with a terminal other than the one for the background task. Only RT-11 FB has multi-terminal support. The multi-terminal support allows dial-up remote users to be connected via Bell 103A-type modems. Leased lines are not supported by RT-11. RT-11 must be system generated for multi-terminal support.

*System Generation:* — RT-11 is shipped already generated and ready to use. Users can do their own system generation (not included with DIGITAL installation). This is desirable for users who require special features (such as error logging, extended memory, or multi-terminal support) or a system optimized for their application. A dual RX01 (or larger) disk, and 32K bytes of memory are required in order to gener-

ate a custom RT-11 system. However, it is recommended that a user have at least 56K bytes of memory and an RK05 disk or larger to do a system generation.

*Error Logging:* — RT-11 optionally supports error logging to keep statistics on successful and unsuccessful transfers for each random access device. RT-11 must be system generated for error logging support.

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 have been included, along with provisions for command interaction, editing macros, and file manipulation.

*MACRO-11:* — With at least 24K bytes of memory, MACRO-11 provides full macro programming under RT-11. It has the facilities for maintaining and using a macro library on the RT-11 system device as well as 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. MACRO-11 also runs in 16K byte configurations with limited performance and subset capability.

*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, linking global references among object modules, and initializing all parameters required by the monitor to run a program.

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. While ease of use has been paramount, the power of the overlay system has not been compromised. The system allows any number of overlays in any number of memory areas, subject only to the memory size.

*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 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.

*ODT:* — The on-line debugging technique utility (ODT) aids in debugging assembled and linked object programs interactively. ODT has limited use when FB is supporting extended memory.

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**DUP:** — The RT-11 device utility program (DUP) performs general utility functions in support of disk devices. Among DUP functions are initializing devices, scanning for bad blocks, and compressing data on a disk.

**DIRECT:** — 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, 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. FILEX allows transfer of RT-11 files to and from some other DIGITAL operating system environments. PATCH and PAT allow memory images and relocatable binary files to be permanently modified. FORMAT allows the user to format RK05 media.

#### MINIMUM HARDWARE REQUIRED:

See Figure 1.

#### OPTIONAL HARDWARE:

- Additional memory to a system total of 56K bytes (60K bytes with MSV11-DD) for systems running the SJ monitor
- Additional memory to a system total of 248K bytes for systems running the FB monitor

#### NOTE:

Due to the complexity of memory mapping, use of this feature in assembly language is suggested for advanced programmers only. High level language use of this feature, however, takes no special skills.

The following options are available for LSI-11 based systems:

- MSV11-DD memory with BDV11 Bootstrap (allow access of 60K bytes of memory using SJ or FB)
- LAV11 line printer
- RXV11 floppy disk system
- RKV11 cartridge disk system
- RLV11 cartridge disk system (24K bytes required)
- DLV11-E, DLV11-F, or DLV11-J asynchronous line unit (Dial-up remote users only)
- One DZV11 asynchronous 4 line multiplexer (32K bytes required) (Dial-up remote users only)
- LPV11 line printer
- 11/03 WC or WD writable control store

The following options are available for systems other than LSI-11 based:

- TA11 DECassette (24K bytes required for RT-11 based PIP operations)
- TC11 DECTape system
- TM11, TMA11, TMB11, TM02, or TM03 magnetic tape, (24K bytes required for PIP operations)
- RX11 floppy disk system
- RK11/RK05 disk cartridge system

- RK611/RK06 disk subsystem (32K bytes required)
- RK711/RK07 disk subsystem (32K bytes required)
- KK11-A cache memory for the PDP-11/34
- RL11 cartridge disk system (24K bytes required)
- RPR11/RPR02 or RPR11/RP03 disk pack
- RJS03, RJS04, or RF11 fixed-head disk
- PC11 paper tape reader/punch
- CR11 or CM11 card reader
- LP11 or LS11 line printer
- DL11 asynchronous single line unit (Dial-up remote users only)
- DZ11 asynchronous 8-line multiplexer (32K bytes required) (Dial-up remote users only)
- KW11-P programmable real-time clock
- VS60 display processor (graphics with FORTRAN graphics package)
- VT55 DECgraphic scope (PLOT-55 subroutines included with RT-11)
- VT11A graphics display processor (graphics with FORTRAN, FOCAL/RT-11, LA, or FORTRAN graphics package)
- LPS11 laboratory peripheral system (supported by FORTRAN extensions, FOCAL/RT-11, and LA-11 only)
- AR11 analog real-time system (supported by FORTRAN extensions, FOCAL/RT-11, and LA-11 only)
- DR11-K DIGITAL I/O option (supported by FORTRAN extensions, only)
- UNIBUS laboratory peripherals (AD11-K, AM11-K, AA11-K, and KW11-K) (supported by FORTRAN extensions only)

#### PREREQUISITE SOFTWARE:

None

#### OPTIONAL SOFTWARE:

BASIC/RT-11  
 MU BASIC/RT-11(objects only, must be built and patched on RT-11, Version 2C, which is included with MU BASIC)  
 GAMMA-11 F/B  
 FOCAL/RT-11  
 FORTRAN IV/RT-11  
 APL-11  
 Lab Applications-11 Library  
 PLOT-11/RT-11  
 MSB11 Mark Sense Batch  
 DECnet/RT

#### TRAINING CREDITS:

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

#### SUPPORT CATEGORY:

A — Software Support will be provided as stated in the Software Support Categories Addendum to this SPD.

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**UPDATE POLICY:**

Software Updates, if any, released by DIGITAL during the one (1) year period following installation, will be provided to the customer for a media charge (includes no installation). After the first year, updates, if any, will be made available according to then prevailing DIGITAL policies.

**Growth Constraints:**

An update is the primary way in which DIGITAL provides corrected versions of a software product to users of that product. An RT-11 Version 03B update will be functionally the same product as RT-11 Version 03B, but it includes corrections to deficiencies discovered in this product, and it may include enhancements. An enhancement is a capability not explicitly provided by this product, or it is an improvement in stability or efficiency. The following items describe the growth constraints of an RT-11 Version 03B update.

1. The minimum hardware requirements for executing an RT-11 Version 03B update will not be greater than the minimum hardware requirements for the same device configurations supported by RT-11 Version 03B.
2. Permanent memory overhead in an RT-11 Version 03B update incurred to provide 1) system control for all non-optional functions, and 2) system device and operator's console terminal I/O for those devices supported by RT-11 Version 03B will not be greater than 4.5K bytes for the baseline single job monitor and not greater than 8.5K bytes for the baseline foreground/background monitor, where .5K of these figures represents the first 512 bytes of memory required for device and program control.
3. If an RT-11 Version 03B update includes enhancements to the RT-11 Version 03B monitor, the permanent memory overhead incurred for the enhanced monitor may be greater than the permanent memory overhead stated above. Use of the enhancements and the attendant memory required is optional.
4. Permanent system device storage requirements in a RT-11 Version 03B update for the single job monitor or the foreground/background monitor, including the non-optional system control functions, the system device handler, and the operator's console terminal support, will not be greater than 150 blocks. A block contains 512 bytes.
5. System programs provided in an RT-11 Version 03B update will execute in the same minimum hardware configurations specified for the functionally equivalent RT-11 Version 03B system programs. The system programs' resident memory requirements and/or execution characteristics can change.
6. Permanent system device storage requirements in an RT-11 Version 03B update for the system programs may be different from the requirements for the functionally equivalent RT-11 Version 03B programs.
7. An RT-11 Version 03B user program's execution speed can change when run under functionally equivalent conditions using an RT-11 Version 03B update, but best efforts will be applied to minimize degradation, if any.
8. If an RT-11 Version 03B update offers enhancements to RT-11 Version 03B to provide speed or space improvements, better internal consistency, improved reliability, or other enhancements, any of which affect the published specifications for program interfaces, the Update will include program conversion utilities and/or documented conversion procedures to protect the user software development investments. The conversion utilities and/or documented conversion procedures can include file or data conversion, source conversions or editing, program recompilation or reassembly, or relinking.
9. If an RT-11 Version 03B update includes enhancements to RT-11 Version 03B system error messages and/or command language, best efforts will be applied to minimize user inconvenience.

**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 Agreement between Purchaser and DIGITAL.

A single-use license only option is a license to copy the software previously obtained under license, and use such software in accordance with DIGITAL's Standard Terms and Conditions of Sale. The category of support applicable to such copied software is Category C.

Standard options with no support services are only available after the purchase of one supported license. When a software license is ordered without support services, the category of support applicable to such software is Category C.

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 (C, D, E, Q, R, T, Y, Z) represents the distribution media for the product and must be specified at the end of the order number, e.g., QJ013-AE = binaries on RK05 disk.

C = DEctape  
 D = 9-track Magnetic Tape  
 E = RK05 Disk Cartridge  
 Q = RL01 Disk Cartridge  
 R = Microfiche  
 T = RK06 Disk Cartridge

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Y = RX01 Floppy Diskette  
 Z = No hardware dependency

*Standard Options*

- QJ013 -A— Single-use license, binaries, documentation, support services (media: C, D, E, Q, T, Y)
- QJ013 -C— Single-use license, binaries, documentation, no support services (media: C, D, E, Q, T, Y)
- QJ013 -D— Single-use license only, no binaries, no documentation, no support services (media: Z)

*Upgrade Options*

The following option is available as an upgrade kit from DOS/BATCH for use on the same single CPU on which DOS/BATCH is licensed. The license previously granted for DOS/BATCH shall be extended to cover this upgrade.

- QJ260 -A— Single-use license for RT-11 and FORTRAN/RT-11, binaries, documentation, support services (media: C, E)

The following option is available as an upgrade kit from MSB11 for use on the same single CPU on which MSB11 is licensed. The license previously granted for MSB11 shall be extended to cover this upgrade.

- QJE03 -A— Single-use license for RT-11 binaries, documentation, support services (media: Y)

*Update Options*

Users of 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 otherwise.

- QJ013 -W— RT-11 binaries, documentation, no support services (media: C, D, E, T, Y)

Users of 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 otherwise.

- QJ013 -H— RT-11 binaries, documentation, no support services (media: C, D, E, T, Y)

*Source/Listing Options*

- QJ013 -E— All sources (media: D, E, Q, T, Y)
- QJ013 -F— Listings (media: R)

*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 otherwise.

- QJ013 -N— Sources update; requires RT-11 Version 3 or 03B for source assembly (media: D, E, T)

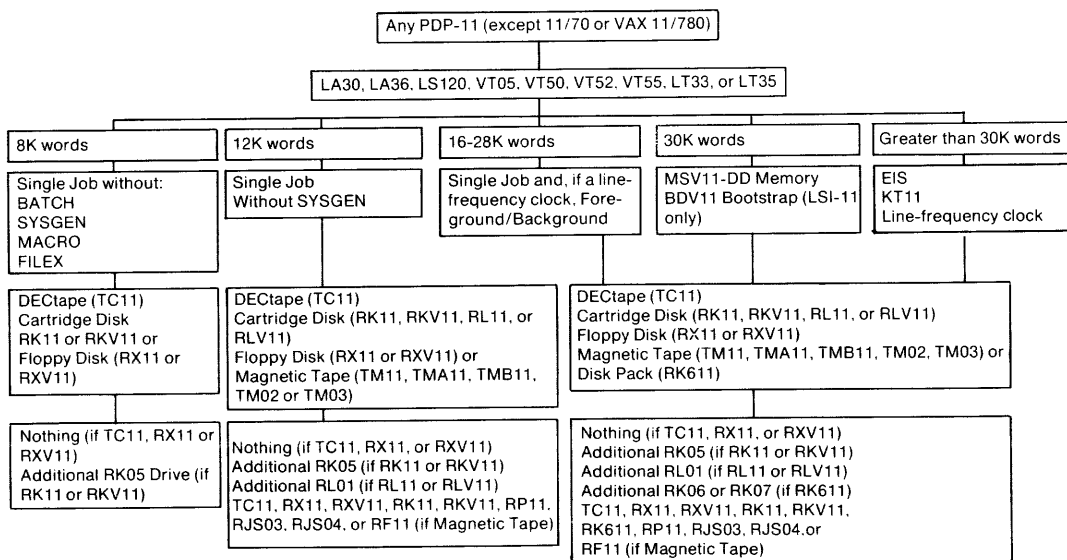
*Miscellaneous Options*

- QJ013 -G— Pre-delivery kit (media: Z)

**ADDITIONAL SERVICES:**

- QJ013 -S— Consulting Service (media: Z)
- QJ013 -3— Binary Program Update Service for licensed RT-11 users (media: C, D, E, Q, T, Y)
- QJ926 -3— Binary Program Update Service for licensed RT-11 and FORTRAN IV/RT-11 users (media: C, D, E, Q, T, Y)
- QJ939 -3— Binary Program Update Service for licensed RT-11 and BASIC/RT-11 users (media: C, D, E, Q, T, Y)
- QJ927 -3— Binary Program Update Service for licensed RT-11, FORTRAN IV/RT-11 and BASIC/RT-11 users (media: C, D, E, Q, T, Y)

FIGURE 1



ADDENDUM

SOFTWARE SUPPORT CATEGORIES

Each software product (hereinafter 'SOFTWARE') with a designated Support Category A or B in the applicable Software Product Description (SPD) existing at the time of order will be the current release at the time of delivery and will conform to the SPD. DIGITAL's sole obligation shall be to correct defects (nonconformance of the SOFTWARE to the SPD) as described below. Any SOFTWARE with a designated Support Category C will be furnished on an 'as is' basis.

For SOFTWARE with a designated Support Category A or B, DIGITAL will provide the services set forth below without additional charge.

CATEGORY A

1. Upon notification by customer to the nearest DIGITAL office that the computer system, including all required prerequisite hardware and software, is ready for the installation of the SOFTWARE, DIGITAL will install such SOFTWARE in any location within the contiguous forty-eight (48) United States, the District of Columbia, or a country in which DIGITAL or a subsidiary of DIGITAL has a software service facility. The notification must be received by DIGITAL and the system must be ready for installation within thirty (30) days after the delivery of the SOFTWARE to customer or DIGITAL will have no obligation to install. Installation will consist of: (1) verification that all components of the SOFTWARE have been received by customer, (2) loading the SOFTWARE, and (3) executing a DIGITAL sample procedure.
2. During the ninety (90) day period after installation, if the customer encounters a problem with the current unaltered release of the SOFTWARE which DIGITAL determines to be a defect in the SOFTWARE, DIGITAL will provide the following remedial service (on site where necessary): (1) if the SOFTWARE is inoperable, apply a temporary correction (TC) or make a reasonable attempt to develop an emergency by-pass, and (2) assist the customer to prepare a Software Performance Report (SPR) and submit it to DIGITAL.
3. During the one (1) year period following installation, if the customer encounters a problem with the SOFTWARE which his diagnosis indicates is caused by a SOFTWARE defect, the customer may submit an SPR to DIGITAL. DIGITAL will respond to problems reported in SPRs which are caused by defects in the current unaltered release of the SOFTWARE via the Maintenance Periodical for the SOFTWARE, which reports SPRs received, code corrections, temporary corrections, generally useful emergency by-passes and/or notice of the availability of corrected code. Software Updates, if any, released by DIGITAL during the one (1) year period, will be provided to the customer on DIGITAL's standard distribution media as specified in the applicable SPD. The customer will be charged only for the media on which such updates are provided, unless otherwise stated in the applicable SPD, at DIGITAL's then current media prices.

CATEGORY B

During the one (1) year period following delivery, the services provided to the customer will be the same as set forth in 3 above.

CATEGORY C

SOFTWARE is provided on an 'as is' basis. Any software services, if available, will be provided at the then current charges.

DIGITAL shall have the right to make additional charges for any additional effort required to provide services resulting from customer use of other than current unaltered release of the SOFTWARE operated in accordance with the SPD.



# Software Product Description

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**PRODUCT NAME: BASIC-11/RT-11, Version 2**

**SPD 12.5.5**

## **DESCRIPTION:**

BASIC is a high-level conversational programming language, developed at Dartmouth College, that uses simple English-like statements and familiar mathematical notations to perform an operation. Because of its conversational structure, BASIC is simple enough for the inexperienced programmer while having capability sufficient to control all of the system resources. Because of its simplicity, BASIC reduces programming time for developing applications programs.

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 calling interface.
- Formatted output using the PRINT USING statement.

## **MINIMUM HARDWARE REQUIRED:**

One of the following:

- Any valid RT-11 operating system configuration. At least 32K bytes of memory are recommended for speed and support of all BASIC-11 features.
- Any valid PDT-11/150 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 3 or later

## **OPTIONAL SOFTWARE:**

None

## **TRAINING CREDITS:**

None

## **SUPPORT CATEGORY:**

B — Software Support will be provided as stated in the Software Support Categories Addendum to this SPD.

## **UPDATE POLICY:**

Software Updates, if any, released by DIGITAL during the one (1) year period following installation, will be provided to the customer for a media charge (includes no installation). After the first year, updates, if any, will be made available according to then prevailing DIGITAL policies.

## **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 Agreement between Purchaser and DIGITAL.

Standard options with no support services are only available after the purchase of one supported license. When a software license is ordered without support services, the category of support applicable to such software is Category C.

A single-use license only option is a license to copy the software previously obtained under license, and use such software in accordance with DIGITAL's Standard Terms and Conditions of Sale. The category of support applicable to such copied software is Category C.

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

The following key (C, D, E, Q, R, T, Y, Z) represents the distribution media for the product and must be specified at the end of the order number, e.g., QJ913-AD = binaries on 9-track magnetic tape.

C = DEctape  
 D = 9-track Magnetic Tape  
 E = RK05 Disk Cartridge  
 Q = RL01 Disk Cartridge  
 R = Microfiche  
 T = RK06 Disk Cartridge  
 Y = RX01 Floppy Diskette  
 Z = No hardware dependency

#### Standard Options

QJ913 -A— Single-use license, binaries, documentation, support services (media: C, D, E, Q, T, Y)  
 QJ913 -C— Single-use license, binaries, documentation, no support services (media: C, D, E, Q, T, Y)  
 QJ913 -D— Single-use license only, no binaries, no documentation, no support services (media: Z)

#### 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 otherwise.

QJ913 -H— Binaries, documentation (media: C, D, E, T, Y)

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 otherwise.

QJ913 -W— Binaries, documentation (media: C, D, E, T, Y)

#### Source/Listing Options

QJ913 -E— All sources (media: D, E, Q, T, Y)  
 QJ913 -F— Listings (media: R)

#### 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 otherwise.

QJ913 -N— Sources update (media: D, E, T)

#### Miscellaneous Options

QJ913 -G— Pre-delivery kit (media: Z)

#### ADDITIONAL SERVICES:

None

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**ADDENDUM  
SOFTWARE SUPPORT CATEGORIES**

Each software product (hereinafter 'SOFTWARE') with a designated Support Category A or B in the applicable Software Product Description (SPD) existing at the time of order will be the current release at the time of delivery and will conform to the SPD. DIGITAL's sole obligation shall be to correct defects (nonconformance of the SOFTWARE to the SPD) as described below. Any SOFTWARE with a designated Support Category C will be furnished on an 'as is' basis.

For SOFTWARE with a designated Support Category A or B, DIGITAL will provide the services set forth below without additional charge.

**CATEGORY A**

1. Upon notification by customer to the nearest DIGITAL office that the computer system, including all required prerequisite hardware and software, is ready for the installation of the SOFTWARE, DIGITAL will install such SOFTWARE in any location within the contiguous forty-eight (48) United States, the District of Columbia, or a country in which DIGITAL or a subsidiary of DIGITAL has a software service facility. The notification must be received by DIGITAL and the system must be ready for installation within thirty (30) days after the delivery of the SOFTWARE to customer or DIGITAL will have no obligation to install. Installation will consist of: (1) verification that all components of the SOFTWARE have been received by customer, (2) loading the SOFTWARE, and (3) executing a DIGITAL sample procedure.
2. During the ninety (90) day period after installation, if the customer encounters a problem with the current unaltered release of the SOFTWARE which DIGITAL determines to be a defect in the SOFTWARE, DIGITAL will provide the following remedial service (on site where necessary): (1) if the SOFTWARE is inoperable, apply a temporary correction (TC) or make a reasonable attempt to develop an emergency by-pass, and (2) assist the customer to prepare a Software Performance Report (SPR) and submit it to DIGITAL.
3. During the one (1) year period following installation, if the customer encounters a problem with the SOFTWARE which his diagnosis indicates is caused by a SOFTWARE defect, the customer may submit an SPR to DIGITAL. DIGITAL will respond to problems reported in SPRs which are caused by defects in the current unaltered release of the SOFTWARE via the Maintenance Periodical for the SOFTWARE, which reports SPRs received, code corrections, temporary corrections, generally useful emergency by-passes and/or notice of the availability of corrected code. Software Updates, if any, released by DIGITAL during the one (1) year period, will be provided to the customer on DIGITAL's standard distribution media as specified in the applicable SPD. The customer will be charged only for the media on which such updates are provided, unless otherwise stated in the applicable SPD, at DIGITAL's then current media prices.

**CATEGORY B**

During the one (1) year period following delivery, the services provided to the customer will be the same as set forth in 3 above.

**CATEGORY C**

SOFTWARE is provided on an 'as is' basis. Any software services, if available, will be provided at the then current charges.

DIGITAL shall have the right to make additional charges for any additional effort required to provide services resulting from customer use of other than current unaltered release of the SOFTWARE operated in accordance with the SPD.

# digital

## Software Product Description

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PRODUCT NAME: MU BASIC-11/RT-11, Version 2

SPD 12.20.3

### DESCRIPTION:

BASIC is a high-level conversational programming language developed at Dartmouth College that uses simple English statements and familiar mathematical notations to perform an operation. Because its conversational structure, BASIC is simple enough for the inexperienced programmer to use while having capability sufficient to control system resources. Because of its simplicity, BASIC reduces the programming time needed to develop applications programs.

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

MU BASIC-11/RT-11 features include:

- One to eight users with equal size memory partitions; 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 03B (FB monitor with multi-terminal 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 is recommended for LSI-11 based systems.

DECTape is not recommended as the system device.

### OPTIONAL HARDWARE SUPPORTED:

Supports any device supported by the prerequisite software.

### PREREQUISITE SOFTWARE:

One of the following:

- RT-11, Version 03B, operating system
- RT<sup>2</sup>, Version 03B

### OPTIONAL SOFTWARE SUPPORTED:

None

### TRAINING CREDITS:

None

### SUPPORT CATEGORY:

A — Software Support will be provided as stated in the Software Support Categories Addendum to this SPD.

### UPDATE POLICY:

Software Updates, if any, released by DIGITAL during the one (1) year period following installation, will be provided to the customer without additional charge (includes no installation). After the first year, updates, if any, will be made available according to then prevailing DIGITAL policies.

**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 Agreement between Purchaser and DIGITAL.

Standard options with no support services are only available after the purchase of one supported license. When a software license is ordered without support services, the category of support applicable to such software is Category C.

A single-use license only option is a license to copy the software previously obtained under license, and use such software in accordance with DIGITAL's Standard Terms and Conditions of Sale. The category of support applicable to such copied software is Category C.

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

The following key (E, 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 floppy disk.

- E = RK05 Disk Cartridge
- Q = RL01 Disk Cartridge
- R = Microfiche
- Y = RX01 Floppy Diskette
- Z = No hardware dependency

*Standard Options*

- QJ921 -A— Single-use license, binaries, documentation, support services (media: E, Q, Y)
- QJ921 -C— Single-use license, binaries, documentation, no support services (media: E, Q, Y)
- QJ921 -D— Single-use license only, no binaries, no documentation, no support services (media: Z)

*Source/Listing Options*

- QJ921 -E— All sources (media: E, Q, Y)
- QJ921 -F— Listings (media: R)

*Update Options:*

Users of MU BASIC/RT-11 whose specified Support Category warranty has expired may order the following software update for the then current charge for such update, for use under the existing license. Except where the medium is designated as Z, the update is distributed in source or binary form on the appropriate medium. A software update where the medium is designated as Z grants the user of MU BASIC/RT-11 the right to copy the previously ordered QJ921-H or QJ921-W software update for use on an additional single CPU for which an MU BASIC/RT-11 license has been obtained. No installation or other services are included unless specifically stated otherwise.

- QJ921 -H— Binaries, documentation (media: E, Q, Y)
- QJ921 -H— Right to copy for single use (under existing license), no binaries, no documentation, no support services (media: Z)

Users of MU BASIC/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 source and binary form on the appropriate medium and includes no installation or other services unless specifically stated otherwise.

- QJ921 -W— Binaries, documentation (media: E, 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 otherwise.

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

*Miscellaneous Options*

- QJ921 -G— Pre-delivery kit (media: Z)

**ADDITIONAL SERVICES:**

None

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ADDENDUM  
SOFTWARE SUPPORT CATEGORIES

Each software product (hereinafter 'SOFTWARE') with a designated Support Category A or B in the applicable Software Product Description (SPD) existing at the time of order will be the current release at the time of delivery and will conform to the SPD. DIGITAL's sole obligation shall be to correct defects (nonconformance of the SOFTWARE to the SPD) as described below. Any SOFTWARE with a designated Support Category C will be furnished on an 'as is' basis.

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CATEGORY B

During the one (1) year period following delivery, the services provided to the customer will be the same as set forth in 3 above.

CATEGORY C

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# Software Product Description

PRODUCT NAME: **SSP-11**, Version 1.1, PDP-11 Scientific Subroutine Package

SPD 15.45.4

## DESCRIPTION:

The Scientific Subroutine Package is a collection of over 100 mathematical and statistical routines commonly required in scientific programming. The subroutines are written in FORTRAN and contain no I/O statements.

The algorithm used in each routine was selected on the basis of (1) minimum storage, (2) accuracy of the implementation (which was determined by its past history, among other factors), and (3) speed of execution. In certain cases, these criteria were conflicting and speed of execution was considered important. Many of the larger statistical routines are provided as a collection of several smaller routines. This enables easier incorporation in larger programs requiring overlays.

Among the SSP-11 subroutines are the following:

ABSNT	detection of missing data
ARRAY	vector storage double dimensioned storage conversion
AUTO	autocovariances
AVCAL	AND operation
AVDAT	data storage allocation
BESI	I Bessel function
BESJ	J Bessel function
BESK	K Bessel function
BESY	Y Bessel function
BOUND	selections of observations within bounds
CADD	add column of one matrix to column of another matrix
CANOR	canonical correlation
CCPY	copy column of matrix into vector
CCUT	partition column-wise
CEL1	elliptic integrals of the first kind
CEL2	elliptic integrals of the second kind
CHISQ	CHI square test for a contingency table
CINT	interchange two columns
CORRE	means, standard deviations, and correlations
CROSS	cross covariances
CS	Fresnel integrals
CSRT	sort matrix columns

CSUM	sum the columns of a matrix
CTAB	tabulate the columns of a matrix
CTIE	adjoin two matrices column-wise
DCLA	replace diagonal with scalar
DCPY	copy diagonal of matrix into vector
DISCR	discriminant functions
DMATX	means and dispersion matrix
EIGEN	eigenvalues and eigenvectors of a real, symmetric matrix
EXPI	exponential integral
EXSMO	triple exponential smoothing
FORIF	Fourier analysis of a given function
FORIT	Fourier analysis of a tabulated function
GAMMA	gamma function
GAUSS	normal random numbers
GDATA	data generation
GMADD	add two general matrices
GMPRD	product of two general matrices
GMSUB	subtract two general matrices
GMTRA	transpose of a general matrix
GTPRD	transpose product of two general matrices
KRANK	Kendall rank correlation
LEP	Legendre polynomial
LOAD	factor loading
LOC	location in compressed-stored matrix
MADD	add two matrices
MATA	transpose product of matrix by itself
MCPY	matrix copy
MEANQ	mean square operation
MFUN	matrix transformation by function
MOMEN	first four moments
MPRD	matrix product (row into column)
MSTR	storage conversion
MSUB	subtract two matrices
MTRA	transpose a matrix
MULTR	multiple regression and correlation
NROOT	eigenvalues and eigenvectors of a special nonsymmetric matrix

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ORDER	rearrangement of integer correlations	RTNI	refine estimate of root by Newton's iteration
PADD	add two polynomials	SCLA	matrix clear and add scalar
PADDM	multiply polynomial by constant and add to another polynomial	SADD	add scalar to matrix
PCLA	replace one polynomial by another	SDIV	matrix divided by a scalar
PLCD	complete linear synthetic division	SCMA	scalar multiply column and add to another column
PDER	derivative of a polynomial	SICI	sine/cosine integral
PDIV	divide one polynomial by another	SIMQ	solution of simultaneous linear algebraic equations
PILD	evaluate polynomial and its first derivative	SMO	application of filter coefficients (weights)
PINT	integral of a polynomial	SMPY	matrix multiplied by a scalar
PGCD	greatest common divisor of two polynomials	S ANK	Spearman rank correlation
PMPY	multiply two polynomials	SRMA	multiply a row by a scalar and add to another row
PNORM	normalize coefficient vector of polynomial	SSUB	subtract scalar from matrix
POLRT	real and complex roots of a real polynomial	SUBMX	build subset matrix
PSUB	subtract one polynomial from another	SUBST	subset selection from observation matrix
PQSD	quadratic synthetic division of a polynomial	TAB1	tabulation of data (one variable)
PVAL	value of a polynomial	TAB2	tabulation of data (two variables)
PVSUB	substitute variable of polynomial by another polynomial	TALLY	totals, means, standard deviations, minimums, and maximums
QATR	integral of a given function by trapezoidal rule using Romberg's extrapolation method	TPRD	transpose product
QSF	integral of equidistantly tabulated function by Simpson's Rule	TRACE	cumulative percentage of eigenvalues
QTEST	Cochran Q-test	TTST	tests on population means
RADD	add row of one matrix to row of another matrix	TWOAV	Friedman 2-way analysis of variance
RCPY	copy row of matrix into vector	UTEST	Mann-Whitney U-test
RANK	rank observations	VARMX	varimax rotation
RECP	reciprocal function for MFUN	WTEST	Kendall coefficient of concordance
RCUT	partition by row	XCPY	copy submatrix from given matrix
RKGS	solution of a system of first order differential equations with given initial values by the Runge-Kutta method		
RINT	interchanges two rows		
RK2	tabulated integral of first order differential equation by Runge-Kutta method		
RK1	integral of first-order differential equation by Runge-Kutta method		
RSUM	sum the rows of a matrix		
RTAB	tabulate the rows of a matrix		
RSRT	sort matrix rows		
RTMI	determine root within a range by Mueller's iteration		
RTIE	adjoin two matrices row-wise		
RTWI	refine estimate of root by Wegstein's iteration		

**MINIMUM HARDWARE REQUIRED:**

- Any valid RT-11 operating system configuration supporting FORTRAN IV/RT-11
- Any valid RSX-11M operating system configuration supporting either FORTRAN IV/IAS-RSX or FORTRAN IV-PLUS

**OPTIONAL HARDWARE:**

None

**PREREQUISITE SOFTWARE:**

- RSX-11M, Version 3.1, and either FORTRAN IV/IAS-RSX, Version 2, or FORTRAN IV-PLUS, Version 2.5
- RT-11, Version 3 and FORTRAN IV/RT-11, Version 2

**OPTIONAL SOFTWARE:**

None

**TRAINING CREDITS:**

None

**SUPPORT CATEGORY:**

B — Software Support will be provided as stated in the Software Support Categories Addendum to this SPD.

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**UPDATE POLICY:**

Software Updates, if any, released by DIGITAL during the one (1) year period following installation, will be provided to the customer for a media charge (includes no installation). After the first year, updates, if any, will be made available according to then prevailing DIGITAL policies.

**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 Agreement between Purchaser and DIGITAL.

A single-use license only option is a license to copy the software previously obtained under license, and use such software in accordance with DIGITAL's Standard Terms and Conditions of Sale. The category of support applicable to such copied software is Category C.

The following key (D, E, Q, T, Y, Z) represents the distribution media for the product and must be specified at the end of the order number, e.g., QJ960-AD = binaries on 9-track magnetic tape.

D = 9-track Magnetic Tape  
 E = RK05 Disk Cartridge  
 Q = RL01 Disk Cartridge  
 T = RK06 Disk Cartridge  
 Y = RX01 Floppy Diskette  
 Z = No hardware dependency

*Standard Options**For RT-11 Systems:*

QJ960 -A— Single-use license, binaries, documentation, support services (media: D, E, Q, T, Y)

QJ960 -D— Single-use license only, no binaries, no documentation, no support services (media: Z)

*For RSX-11M Systems:*

QJ962 -A— Single-use license, binaries, documentation, support services (media: D, E, Q, T, Y)

QJ962 -D— Single-use license only, no binaries, no documentation, no support services (media: Z)

*Update Options*

Users of SSP-11 whose specified Support Category warranty has expired may order the following software update at the then current charge for such update, for use under the existing license. Except where the medium is designated as Z, the update is distributed in source or binary form on the appropriate medium. A software update where the medium is designated as Z grants the user of SSP-11 the right to copy the previously ordered QJ960-H or QJ960-W software update for use on an additional single CPU for which an SSP-11 license has been obtained. No installation or support services are included unless specifically stated otherwise.

QJ960 -H— Binaries, documentation (media: D, E, Y)

QJ960 -H— Right to copy for single use (under existing license), no binaries, no documentation, no support services (media: Z)

Users of SSP-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 otherwise.

QJ960 -W— Binaries, documentation (media: D, E, Y)

**ADDITIONAL SERVICES:**

None

ADDENDUM  
SOFTWARE SUPPORT CATEGORIES

Each software product (hereinafter 'SOFTWARE') with a designated Support Category A or B in the applicable Software Product Description (SPD) existing at the time of order will be the current release at the time of delivery and will conform to the SPD. DIGITAL's sole obligation shall be to correct defects (nonconformance of the SOFTWARE to the SPD) as described below. Any SOFTWARE with a designated Support Category C will be furnished on an 'as is' basis.

For SOFTWARE with a designated Support Category A or B, DIGITAL will provide the services set forth below without additional charge.

CATEGORY A

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CATEGORY B

During the one (1) year period following delivery, the services provided to the customer will be the same as set forth in 3 above.

CATEGORY C

SOFTWARE is provided on an 'as is' basis. Any software services, if available, will be provided at the then current charges.

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# Software Product Description

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**PRODUCT NAME: MSB/FORTRAN IV, Version 1**

**SPD 15.83.1**

**DESCRIPTION:**

MSB/FORTRAN IV is a packaged FORTRAN IV compiler accessed by MSB-11's single stream batch processor. Users enter jobs only through the card reader and receive output from the printer as each job is processed. FORTRAN and BASIC jobs may be combined within the batch stream. Input must be prepared on DIGITAL's "PDP FORTRAN" (or "PDP BASIC") cards.

MSB/FORTRAN IV is an extended FORTRAN IV which operates on any MSB-11 system. The FORTRAN IV system is designed to minimize the size of executable programs. The compiler produces object code without using temporary files, and no intermediate assembly step is required. All features and services of the MSB-11 monitor are available to the FORTRAN programmer without the need for assembly language coding. In addition to routines for calling the monitor functions, the system library also contains extensive string manipulation routines. These routines create strings in LOGICAL: 1 arrays, and allow their manipulation as string entities. These functions operate on variable-length strings. The strings can be manipulated fully without concern for their length, a new FORTRAN capability.

**MINIMUM HARDWARE REQUIRED:**

Any valid MSB-11 system configuration.

**OPTIONAL HARDWARE:**

Supports any mass storage, unit record or terminal device supported by the prerequisite software.

**PREREQUISITE SOFTWARE:**

MSB-11, Version 1 or later.

**OPTIONAL SOFTWARE:**

None

**TRAINING CREDITS:**

None

**SUPPORT CATEGORY:**

B — Software Support will be provided as stated in the Software Support Categories Addendum to this SPD.

**UPDATE POLICY:**

Software Updates, if any, released by DIGITAL during the one (1) year period following installation, will be provided to the customer for a media charge (in-

cludes no installation). After the first year, updates, if any, will be made available according to then prevailing DIGITAL policies.

**ORDERING INFORMATION:**

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The following key (Y) represents the distribution media for the product and must be specified at the end of the order number, e.g., QJE02-AY = binaries on floppy disk.

Y = RX01 Floppy Diskette

*Standard Options*

QJE02 -A— Single-use license, binaries, documentation, support services (media: Y)

*Upgrade Options*

The following option is available as an upgrade kit from FORTRAN IV/RT-11 for use on the same single CPU on which FORTRAN IV/RT-11 is licensed. The license previously granted for FORTRAN IV/RT-11 shall be extended to cover this upgrade.

QJE05 -A— Single-use license, binaries, documentation, support services (media: Y)

**ADDITIONAL SERVICES:**

None

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ADDENDUM  
SOFTWARE SUPPORT CATEGORIES

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CATEGORY B

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## DECUS SPECIAL INTEREST GROUPS

A DECUS Special Interest Group (SIG) is an activity whereby members of the DIGITAL Equipment Computer Users Society who share common interests in a particular field, join together to promote the interchange of information. Specialization may be in application areas such as education or industry, specific software systems such as OS/8 and RSX-11, or a specific main-frame such as the DECsystem-10/20.

SIG members derive numerous benefits from communicating with others who share specialized interests and who may wish to share their experiences. SIGs sponsor business meetings, tutorials, and workshops at the various chapter symposia which fulfill the two-fold purpose of fostering communication among users and between users and DIGITAL. Channeled communication provides DIGITAL and the users with insight into the direction of future developments. SIGs provide direct feedback to DIGITAL's in-house activities and have thereby made substantial contributions to OS/8, RSX-11, RSTS and TOPS-10.

User submitted articles, minutes of local meetings, and letters comprise the major portion of the individual SIG newsletters. Suggestions, hints, bug fixes, program plans, or questions of a non-commercial nature are suitable material for SIG newsletters.

SIG members are encouraged to make presentations at the SIG sessions held during DECUS Symposia.

The semi-annual U.S. Symposia sessions are organized by special interest areas. Submissions received from the user community are reviewed by symposia committee members from the special interest groups for appropriate placement on the agenda.

Special Interest Group participation in the review of programs submitted to the DECUS Program Library provides an opportunity to improve the quality and utility of programs available to you and to fellow users.

DIGITAL standards are issued to DECUS members for review and on the theory and philosophy of the standards. DECUS is a voting member of ANSI X3. Users are encouraged to register their areas of expertise with DECUS and assist with reviewing standards. SIGs often play a role in this process.

Below is a list of U.S. based Special Interest Groups within DECUS.

If you would like information regarding membership in any of the Special Interest Groups, contact DECUS U.S. Chapter, 129 Parker Street, PK3-1/E55, Maynard, Massachusetts 01754 or one of the other DECUS Chapter offices in Kanata, Sidney or Geneva.

NETSIG—Networks Special Interest Group  
RSTS SIG—RSTS and RSTS/E Special Interest Group  
SIGIG—Special Interest Group on Interactive Graphics  
ESIG—Engineering Applications Special Interest Group  
SIG-18—18-Bit Users Special Interest Group  
12-Bit SIG—12-Bit User Special Interest Group  
RSX-11/IAS SIG  
RT-11 SIG  
EDUSIG—Educational Users Special Interest Group  
DEBUG—Digital Equipment Business Users Group  
MUSIG—Mumps Special Interest Group  
PASCAL SIG  
DBMS SIG  
TECO SIG  
LSI-11 SIG  
FOCAL SIG  
STANDARDS SIG



DIGITAL EQUIPMENT COMPUTER USERS SOCIETY

RT-11 SPECIAL INTEREST GROUP

A Special Interest Group has been formed to serve users of RT-11. The organization of the SIG consists of a SIG Chairman and working committees for standards, documentation, library submissions, newsletters, and help for new users. Submissions to the newsletter should be directed to:

John T. Rasted
JTR Associates
58 Rasted Lane
Meriden, CT 06450
(203) 634-1632

Other communications can be sent to:

Thomas J. Provost
P.O. Box 95
Middleton, MA 01949
(617) 774-2370
(617) 245-6600 (Boston tie line)

or

John T. Rasted
c/o DECUS
One Iron Way - MR2-3/E55
Marlboro, MA 01752

SIG's activities encompass the following:

- 1. Preparation of a SIG newsletter (user submissions are strongly encouraged).
2. Exchange of user-written programs. This exchange could include TASKS representing user-written extensions to RT-11 RT-11 (including, but not limited to device drivers) as well as utility and applications programs, etc.
3. Establishment of communications with the DECUS staff to obtain for SIG members early information on RT-11 related additions to the DECUS Library. These communications will also serve to provide prompt testing of such submissions.
4. Establishment of user input to appropriate groups within DEC, so that they will receive user feedback on any additions or needed changes to RT-11. Additionally, SIG members may receive early warning from DEC about RT-11 changes.
5. Establishment of SIG-maintained files of RT-11 errors and error solutions, where they exist, independent of DEC publications.
6. Establishment of RT-11 "Welcome Wagon" type services to aid new users.
7. Coordination of user input to standards and documentation work.

If you wish to become a member of the RT-11 SIG, please fill out the form below and return it to the DECUS Office. (Please type or print).

NAME \_\_\_\_\_ \*DECUS MEMBERSHIP NO. \_\_\_\_\_

AFFILIATION \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_

Are you registered with DEC as an RT-11 user? \_\_\_\_\_ Version Number \_\_\_\_\_

Fortran? \_\_\_\_\_ Basic? \_\_\_\_\_

\*Please note one must be a member of DECUS prior to requesting RT-11 SIG involvement. For general membership information, contact the DECUS Office, One Iron Way - MR2-3/E55, Marlboro, MA 01752

## SOFTWARE PROBLEMS OR ENHANCEMENTS

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

AREAS COVERED	SPR CENTER	AREAS COVERED	SPR CENTER
United States, remainder of Far East, Middle East, Africa Latin America	Administrative Services Group, SWS P.O.Box F Maynard MA 01754	Italy	Digital Equipment SPA Viale Fulvio Testi 117 20092 Cinisillo Balsamo Italy
Canada	Digital Equipment Canada P.O.Box 11500 Kanata Canada K2H 8K8 Ontario	Japan	Digital Equipment Corp., INTL 3rd Floor Kowa Building 8-7 Sanban Cho Chiyoda Ku Tokyo 102 Japan
United Kingdom	Digital Equipment Corp., LTD Fountain House Butts Centre RG1 7QN Reading England	New Zealand	Digital Equipment Corp., LTD Challenge House 3 Wolfe Street P.O.Box 2471 Auckland New Zealand 10010
Australia-Melbourne	Digital Equipment Aust. Pty., LTD 60 Park Street South Melbourne Victoria Australia 3205	Belgium, Holland	Digital Equipment BV KaaP Horndreef 38 3563 AV Utrecht Netherlands
Australia-Sydney	Digital Equipment Aust. Pty., LTD 123 125 Willoughby Road P.O.Box 491 Crows Nest NSW Australia 2065	Denmark, Finland, Norway, Sweden	Digital Equipment Corp., AB Englundavaegen 73 TR 171 41 Solna Sweden
Brazil	Digital Equipment Comercio Ind Rua Batatais 429 Esq AL Campin 01423 Jardim Paulista Sao Paulo 0100 Brazil	Switzerland, Spain, Greece, Romania, Portugal, Bulgaria Yugoslavia	Digital Equipment Corp., SA 20 Quai Ernest Ansermet Boite Postale 23 CH 1211 Geneva Switzerland
Caribbean	De Latin America P.O.Box 11038 Fernando Juncos Sta. Santurce PR 00910	Austria, Poland Hungary, Rumania East Germany, West Germany, Russia, Czechslovakia	Digital Equipment Corp., GMBH Wallsteinplatz 2 8000 Munchen 40 Germany 8000
France	Digital Equipment Corp., LTD. Centre Silic Cidex L225 18 Rue Saarinen 94533 Rungis France	Israel	DECSYS Computers, LTD 7 Habakuk Street Il-Tel Aviv 63505 Israel

DIGITAL EQUIPMENT CORPORATION, Corporate Headquarters: Maynard, Massachusetts 01754, Telephone: (617)897-5111—SALES AND SERVICE OFFICES: UNITED STATES—ALABAMA, Huntsville • ARIZONA, Phoenix and Tucson • CALIFORNIA, El Segundo, Los Angeles, Oakland, Ridgecrest, San Diego, San Francisco (Mountain View), Santa Ana, Santa Clara, Stanford, Sunnyvale and Woodland Hills • COLORADO, Englewood • CONNECTICUT, Fairfield and Meriden • DISTRICT OF COLUMBIA, Washington (Lanham, MD) • FLORIDA, Ft. Lauderdale and Orlando • GEORGIA, Atlanta • HAWAII, Honolulu • ILLINOIS, Chicago (Rolling Meadows) • INDIANA, Indianapolis • IOWA, Bettendorf • KENTUCKY, Louisville • LOUISIANA, New Orleans (Metairie) • MARYLAND, Odenton • MASSACHUSETTS, Marlborough, Waltham and Westfield • MICHIGAN, Detroit (Farmington Hills) • MINNESOTA, Minneapolis • MISSOURI, Kansas City (Independence) and St. Louis • NEW HAMPSHIRE, Manchester • NEW JERSEY, Cherry Hill, Fairfield, Metuchen and Princeton • NEW MEXICO, Albuquerque • NEW YORK, Albany, Buffalo (Cheektowaga), Long Island (Huntington Station), Manhattan, Rochester and Syracuse • NORTH CAROLINA, Durham/Chapel Hill • OHIO, Cleveland (Euclid), Columbus and Dayton • OKLAHOMA, Tulsa • OREGON, Eugene and Portland • PENNSYLVANIA, Allentown, Philadelphia (Bluebell) and Pittsburgh • SOUTH CAROLINA, Columbia • TENNESSEE, Knoxville and Nashville • TEXAS, Austin, Dallas and Houston • UTAH, Salt Lake City • VIRGINIA, Richmond • WASHINGTON, Bellevue • WISCONSIN, Milwaukee (Brookfield) • INTERNATIONAL—ARGENTINA, Buenos Aires • AUSTRALIA, Adelaide, Brisbane, Canberra, Melbourne, Perth and Sydney • AUSTRIA, Vienna • BELGIUM, Brussels • BOLIVIA, La Paz • BRAZIL, Rio de Janeiro and Sao Paulo • CANADA, Calgary, Edmonton, Halifax, London, Montreal, Ottawa, Toronto, Vancouver and Winnipeg • CHILE, Santiago • DENMARK, Copenhagen • FINLAND, Helsinki • FRANCE, Lyon, Grenoble and Paris • GERMAN FEDERAL REPUBLIC, Cologne, Frankfurt, Hamburg, Hannover, Munich, Nuremberg, Stuttgart and West Berlin • HONG KONG • INDIA, Bombay • INDONESIA, Djakarta • IRELAND, Dublin • ITALY, Milan, Rome and Turin • IRAN, Tehran • JAPAN, Osaka and Tokyo • MALAYSIA, Kuala Lumpur • MEXICO, Mexico City • NETHERLANDS, Utrecht • NEW ZEALAND, Auckland and Christchurch • NORWAY, Oslo • PUERTO RICO, Santurce • SINGAPORE • SPAIN, Madrid • SWEDEN, Gothenburg and Stockholm • SWITZERLAND, Geneva and Zurich • UNITED KINGDOM, Birmingham, Bristol, Epsom, Edinburgh, Leeds, Leicester, London, Manchester and Reading • VENEZUELA, Caracas •