
READ ME FIRST

**Release Notes for RT-11/FEP
and RT-11/FRP**

AA-K015C-TC

August 1982

These Release Notes for RT-11 operating systems describe the differences from previous versions of FEP (the *FORTRAN Enhancement Package*) software. They also describe the Distribution Kit for FEP and the Kit for FRP (the *FORTRAN Real-Time Package*). In addition, they describe the Warranty/Maintenance Kit distributed to FEP users whose software is under warranty or who have a maintenance contract with DIGITAL. They report late-discovered problems and restrictions, and describe the support services available to users.

OPERATING SYSTEM: RT-11, V4.0

SOFTWARE: (FEP V2.1 and FRP V1.0)
FORTRAN IV/RT-11, V2.5
REAL-11/MNC, V2.1
IBS, V2.1
SSP, V1.3
LSP, V1.2
FDT, V2.1

(FEP only)
RGL/11, V1.1

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1.0 INTRODUCTION

These Release Notes provide the following material:

- An overview of the FEP and FRP packages. Section 2.0
- A description of the various Distribution Kits for this product. This section also serves as a checklist you can use to verify that you received all components of the package. Section 3.0
- A description of the software and manuals in the Warranty/Maintenance Kit that users receive whose software is under warranty or who have a maintenance contract with DIGITAL. Section 4.0
- A list of known problems and restrictions of the product in this release. Section 5.0
- The procedures for requesting DIGITAL support services. Section 6.0

NOTE

Only the latest version of any software product is covered by DIGITAL's software warranties. Therefore, to continue receiving DIGITAL support, you must begin to use the software contained in this kit immediately.

This policy reflects the fact that a new release of a software product resolves most known problems found in previous versions of the product. Many of these problems may not have been discovered in the field and therefore may have no published correction.

2.0 PRODUCT OVERVIEW

FEP (FORTRAN Enhancement Package) and FRP (FORTRAN Real-Time Package) are software packages for users whose computational and data-transfer needs exceed the capabilities of MINC BASIC. The FEP and FRP Distribution Kits consist of these components:

1. An operating system: RT-11, Version 4.0.
2. A high-level language: FORTRAN IV/RT-11, Version 2.5.
3. A high-level software interface to the MNC modules: REAL-11/MNC, Version 2.1.
4. A high-level software interface to DIGITAL's IEEE bus, the IB11 or IBV11-A: the Instrument Bus Subroutines (IBS), Version 2.1.

5. A general-purpose package of data analysis subroutines: the Scientific Subroutines Package (SSP), Version 1.3.
6. A set of laboratory-oriented, signal-processing subroutines: the Laboratory Subroutines Package (LSP), Version 1.2.
7. An interactive software debugging tool for FORTRAN programmers: FORTRAN Debugging Technique (FDT), Version 2.1.

In addition, the FEP Distribution Kit contains:

1. A FORTRAN-callable library of VT125 graphic subroutines: RGL/11, Version 1.1.

It is this last item, RGL/11, that distinguishes the FEP package from FRP: FRP does not contain RGL/11. In the documentation, "FEP Laboratory Software" refers to REAL-11/MNC, IBS, SSP, LSP, and RGL/11; "FRP Laboratory Software" refers to REAL-11/MNC, IBS, SSP, and LSP.

3.0 DIFFERENCES FROM PREVIOUS VERSIONS

1. Differences between RT-11/FEP Version 2.1, RT-11/FRP Version 1.0 and FEP/RT Version 2.0

Version 2.1 of RT-11/FEP has three changes in its libraries of subroutines from Version 2.0. It contains:

- FORTRAN IV/RT-11, Version 2.5
- REAL-11/MNC, Version 2.1 (not 2.0)
- IBS, Version 2.1 (not 2.0)
- SSP, Version 1.3
- LSP, Version 1.2
- FDT, Version 2.1
- RGL/11, Version 1.1 (not RGL/FEP, Version 1.0)

Version 1.0 of RT-11/FRP has the same libraries of subroutines as RT-11/FEP except that it does not contain the graphic component, RGL/11. This is the first package of MNC application programs that provide either real-time data acquisition or a single-user, multitasking environment without an additional graphic subroutine library.

2. Differences between REAL-11/MNC Version 2.1 and 2.0

There are only minor differences in coding and documentation between REAL-11/MNC Versions 2.1 and 2.0.

3. Differences between IBS Version 2.1 and 2.0

The differences between IBS V2.1 and 2.0 are:

- There is now a separate command file to generate the IBS XM driver (handler) so the file XM.MAC from the RT-11 Distribution Kit is used as input during the driver assembly.

- For all calls that allow a talker and a list of listeners, specifying the talker but defaulting the listeners no longer produces the "Invalid parameter" error message.
- If the driver is not loaded when an IB call is made, the system does not crash after printing the "IB.SYS not loaded" error message.
- The receive sequence conforms to the IEEE spec.
- Secondary addresses specified by the range 96 to 126 (decimal) are allowed.
- If the software has been built for timeout and a timeout value has been set, the timeout value is cleared when the program exits.
- When IBSRQ is called with the SRQ routine defaulted, the first instrument address is not skipped. IBSRQ accepts defaulted addresses instead of returning the "Invalid parameter" error.
- If the FORTRAN program is sending, and the SRQ routine is receiving, there is no longer a window when the talker set up by the SRQ routine can be active while the MINC is talking.
- If the program has left an SRQ routine active, it is disabled when the FORTRAN program exits.

4. Differences between RGL/11 V1.1 and RGL/FEP V1.0

RGL/11 is part of the FEP package only; the differences between RGL/11 Version 1.1 and RGL/FEP Version 1.0 are:

- There is a new error message, which occurs if you try to scale an axis more than once:
770 %RGL-W-FIP, function is invalid with current graph paper
- You can scale either the upper or lower x-axis, but not both. If you try to scale both, you receive the FIP error message.
- The LTAXIS subroutine now can label either an x-axis or y-axis.
- There is now a limit on the number of cells that can be placed on an axis. The limit for the y-axis is 20. The limit for the x-axis is dependent on the number of subcells on the axis. If there will be only one subcell per cell, there is no limit on the number of cells; if there will be more than one subcell per cell, the limit on the number of cells is 20.

- When an error message is displayed, graphic displays now scroll up to allow the message to be totally visible; they scroll down when the message is erased.
- The RGL/11 overlay structures have been redone to provide more memory savings.
- The RGL/11 software now contains three libraries: RGLLIB, PRMLIB, and REXLIB. RGLLIB is the library for non-overlaid graphic programs, PRMLIB is for graphic programs using the standard overlay structure (either disk-resident or extended-memory resident), and REXLIB is for graphic programs using the alternate extended-memory overlay structure.

4.0 DISTRIBUTION KIT DOCUMENTATION CHECKLIST

The RT-11/FEP and RT-11/FRP software Distribution Kits contain kits of software media and manuals for the RT-11 operating system Version 4.0 and for the FORTRAN IV RT-11 Version 2.5 language software. In addition, each FEP or FRP kit contains MINC Newsletters, SPR forms (Software Performance Report forms) for reporting software and documentation problems, and the following documents. Please check that you have received the documentation listed here:

- Software Product Descriptions for RT-11/FEP V2.1 or RT-11/FRP V1.0, RGL/11 V1.1 (in FEP kits only), IBS V2.1, LSP V1.2, and SSP V1.3
- Introduction to FEP and FRP
- RT-11/FEP and RT-11/FRP Installation and User's Guide
- REAL-11/MNC FORTRAN Programmer's Reference Manual and Updates 1 and 2
- RGL/11 Programmer's Reference Manual (in FEP kits only)
- Instrument Bus Subroutines Programmer's Reference Manual and Update 1
- Scientific Subroutines Programmer's Reference Manual and Update 1
- Laboratory Subroutines Programmer's Reference Manual and Update 1
- FORTRAN Debugging Technique Reference Manual
- Microcomputers and Memories Handbook
- Microcomputer Interfaces
- IBV11-A LSI Instrument Bus User's Guide
- DEClab-11/MNC User's Guide
- MNCTP User's Guide

If you are unfamiliar with RT-11 or FORTRAN, or if you have never used the FEP or FRP package before, you should read the Introduction to FEP and FRP next. After reading that manual, you should read the RT-11/FEP and RT-11/FRP Installation and User's Guide to learn how to install the components of your package. Then you should refer to the individual reference manuals for information about the components you will use.

5.0 WARRANTY/MAINTENANCE KIT DOCUMENTATION CHECKLIST

If your FEP software is under warranty (90 days from installation) or if you have a maintenance contract with Digital Equipment Corporation, the kit you received contains only new and revised software and documentation. All the other documentation and software you received with your original FEP kit has not been changed by this release.

Please check that your Warranty/Maintenance Kit contains, in addition to the SPR forms (Software Performance Report forms), the following documents:

- Software Product Descriptions for RT-11/FEP for MINC V2.1, RGL/11 V1.1, and IBS V2.1
- Introduction to FEP and FRP
- RT-11/FEP and RT-11/FRP Installation and User's Guide
- REAL-11/MNC FORTRAN Programmer's Reference Manual Update 2
- Instrument Bus Subroutines Programmer's Reference Manual Update 1
- RGL/11 Programmer's Reference Manual

If you are already familiar with the FEP documentation set, you will want to know that this revision enhanced the software and documentation of the Instrument Bus Subroutines, REAL-11/MNC FORTRAN, and the graphic package of subroutines now called RGL/11. RGL/11 now has a simpler installation procedure and an overlay structure that allows you to create and use larger programs than you formerly could. Section 3.0 details these differences.

6.0 KNOWN PROBLEMS AND RESTRICTIONS

The following restrictions and corrections cover both software and documentation:

1. REAL-11/MNC

- a. An error condition exists that is not noted in the REAL-11/MNC FORTRAN Programmer's Reference Manual. A program that calls IGTBUF in a completion routine may be aborted at high sampling rates with the following message:

?REAL11-F-Asynchronous system trap (AST) overrun.

At sufficiently high sampling rates, the program may fail to receive any indication from REAL-11 that the sweep is finished or that an error has occurred.

- b. If you use ADFAST or ADSUM on multiple channels on a preamp (MNCAG) and specify a negative LDELAY and a gain of 0.5 or 50.00 (MODE = 1 or 3), under these conditions the first sweep starts immediately rather than when ST2 is fired.
- c. When you use gain specification 5 and data representation 16 for ADSWP, the REAL-11 software will not return the full 16 bits of data as the documentation indicates (REAL-11/MNC FORTRAN Programmer's Reference Manual, Section 7.4). To get around this problem, use gain specification 5 and data representation 0 for the mode specification.
- d. If you attempt to access A/D channel 63 and channel 63 does not exist on your system, the next sample acquired from a thermocouple preamp (MNCTP) may be invalid.
- e. Do not use IGTBUF in a completion routine when you are using ADFAST/ADSUM; to avoid the problem, put the IGTBUF subroutine call in the main program.
- f. When you use GTHIST with ISI mode, the first data point contains incorrect counts; however, the rest of the data points in the buffer contain correct data. Therefore, if you ignore the first data word, you can use GTHIST with ISI mode with no trouble.
- g. When the RT-11/FEP installation disk SYSGENS an XM monitor, it does not create the startup command file STARTX.COM. When the XM system is booted, the error message "?KMON-F-File not found DK:STARTX.COM" is displayed. You can safely ignore this message or you can create the file STARTX.COM with an editor. Consult the RT-11 System Messages Manual for more information.
- h. If you do a MNCGEN on an RX02 MINC, you must keep the operating system to a minimum to leave the necessary free space on the diskette. Use the following special-purpose system to run MNCGEN, with DY0: assigned to N (see MNCGEN procedure for definition of N).

.DIR/FULL DY0:

SWAP .SYS	25	01-Mar-80	TT .SYS	2	01-Mar-80
DY .SYS	4	01-Mar-80	PIP .SAV	23	01-Mar-80
RT11SJ.SYS	67	01-Mar-80	SYSMAC.SML	42	01-Mar-80
MACRO .SAV	51	01-Mar-80	LIBR .SAV	22	01-Mar-80
FORTRA.SAV	204	27-Jul-82	< UNUSED >	534	
9 Files, 440 Blocks					
534 Free blocks					

Use the following system for verification of MNCLIB. The files MNCLIB.OBJ, MVERN.FOR, and MTMP.OBJ have been copied onto this diskette from the system diskette that was used for the MNCGEN.

.DIR/FULL DY0:

SWAP	.SYS	25	01-Mar-80	RT11SJ.SYS	67	01-Mar-80	
TT	.SYS	2	01-Mar-80	DY	.SYS	4	01-Mar-80
LS	.SYS	2	01-Mar-80	PIP	.SAV	23	01-Mar-80
DUP	.SAV	41	01-Mar-80	DIR	.SAV	17	01-Mar-80
LINK	.SAV	41	01-Mar-80	FORTRA.SAV	204	27-Jul-82	
LIBR	.SAV	22	01-Mar-80	SYSLIB.OBJ	207	27-Jul-82	
STARTS.COM	1	27-Jul-82	MNCLIB.OBJ	134	27-Jul-82		
MVERN	.FOR	1	27-Jul-82	MTMP	.OBJ	38	27-Jul-82
< UNUSED > 145							
16 Files, 829 Blocks							
145 Free blocks							

2. Instrument Bus Subroutines (IBS)

- a. This release does not support multiple jobs using the same IBV11-A/IB11 unit; each job must have its own unit.
- b. If you set errors to nonfatal status with IBSTER (that is, if you call IBSTER(error:n) where n is any number but 1):
 - You must also set USR to NOSWAP to prevent it swapping over the IBS data areas at the end of your program when the error is printed out.
 - After an error occurs, the default talker and listener lists are not guaranteed to be intact. Therefore, you will need to re-establish them after an error.
- c. A serial poll of a nonexistent device will hang in the driver waiting for a status byte unless you have genned the driver for timeout support and have supplied a timeout value.
- d. With a system generated for multiple units, each time you select a new unit (see IBUNIT in Section 10.1), you must establish new default talker and listener lists.
- e. The FORTRAN OTS subroutine USEREX is not available to IBS users. USEREX sets up a routine which is called when the FORTRAN program exits normally. IBS uses this routine to disable any active SRQ routine and, if the IB handler was generated for timeout, to reset the timeout value.

- f. There is an additional error message:

IBS INTERNAL SOFTWARE ERROR

This error indicates a communication problem between the IB handler and the FORTRAN program. It is usually the result of a user error made during the generation of a special IB handler or during the linking of an RT-11XM program (described below).

- g. Under the extended-memory monitor, RT-11XM, IBS requires your program to be linked as a privileged job. Since a privileged job under RT-11XM must not issue EMTs from the memory that is mapped by Page Address Register 1 (PAR1), IBS subroutines must not be in memory between 20000 and 37776 (octal).

There are two ways to link your program to comply with this restriction. The easiest way is to start the program above 37776 with the /BOTTOM:n switch:

LINK/BOTTOM:37776 program,IBLIB

The most space-efficient way is to move the SYS\$I psect above 37776 with the /BOUNDARY:n switch. The linker then prompts for the psect to relocate:

LINK/BOUNDARY:37776 program,IBLIB
Boundary section? SYS\$I

NOTE

Under RT-11XM, LINK produces a privileged job by default.

- h. The IBLNR function call tests for listeners on the bus by sending a line feed (ASCII 10 decimal) to the addresses it is given. Most instruments ignore the line feed, but a few interpret it as a command and may respond to it either by starting a function or by asserting the SRQ line. If using IBLNR causes a problem, you can avoid using it and obtain the same information by using IBSTER to set to nonfatal status the "No valid listener on the bus" error (error 15) and then test for this condition with IBERRF after each attempt to send to the instrument with IBSEND or IBSEOI.
- i. When you use a handler generated for device timeout and a timeout occurs, the program prints the correct error message and stops running, but it does not return to the monitor. Either the byte that timed out must finish transmitting (which is not likely to occur), or you must abort the program with a CTRL/C (^C).

3. RGL/11 Programmer's Reference Manual (in FEP kits only)

- a. If the size of your program is very close to the amount of available memory, unexpected results may occur. If this happens, either try the standard overlay scheme or, if your program is running under the XM monitor, try the alternate overlay scheme to produce a smaller executable image.
- b. There is a restriction on the FORTRAN IV record size. The FORTRAN IV compiler must be built to allow 136 characters in a formatted (ASCII) record.
- c. It is possible to SYSGEN an XM monitor that is so large it requires RGLVF2, the second verification program, to be overlaid. If the XM monitor you create is this large, you must select and install RGL/11 software that runs overlaid RGL/11 programs. When you rerun the verification procedure using an overlay scheme, RGLVF2 should then execute successfully.

Even though RGLVF2 may require overlays, your application programs may not necessarily require them. However, we suggest that if you are using the XM monitor, you should use one of the extended-memory overlay schemes. Either one would give you a full 32K words of program space.

- d. Information on World Coordinates in a Data-Plotting Environment

In the data-plotting environment that DPAPER or PDATA create, a world coordinate system is set up so that the coordinates of the lower left corner of the screen are (-9.,-7.) and the coordinates of the upper right corner are (70.,40.). Within that coordinate system the coordinates of the graph are also established. For the graph's lower left corner they are (0.,0.); and for its upper right corner, they are (61.,33.). Figure 1 illustrates these coordinates.

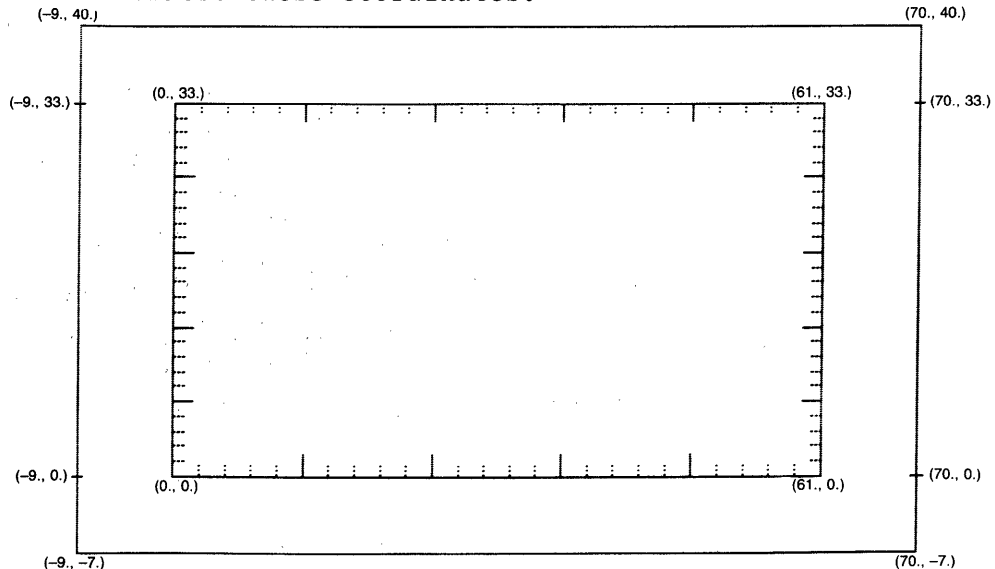


Figure 1: World Coordinate System for Data Plotting

This information is useful to you if, for example, you want to display a legend on a graph. To create a legend, you must perform three tasks:

1. Select the area in which you want to place the legend.
2. Determine the world coordinates of that area.
3. Call the appropriate RGL/11 subroutines in your application program to place the necessary graphic objects or text at those coordinates.

Suppose you select the upper left region of the graph area for a legend. You know that the top left corner of the graph has world coordinates of (0.,33.). Thus, a likely place to put the first legend entry is about 5 units along the x-axis and about 4 units down the y-axis; that is, at coordinates (5.,29.).

The following code added to the SHADE4.DEM program (see Section 3.6 of the RGL/11 Programmer's Reference Manual) adds the legend to the SHADE4 graph as shown in Figure 2.

```
C Draw legend.
CALL SLNPAT (4,)
CALL SSHADE (29.,1)
CALL BOX (5.,29.,7.,27.)
CALL MOVE (9.,29.)
CALL TEXT ('GROUP A')
CALL SLNPAT (1,)
CALL SSHADE (26.,)
CALL BOX (5.,26.,7.,24.)
CALL MOVE (9.,26.)
CALL TEXT ('GROUP B')
```

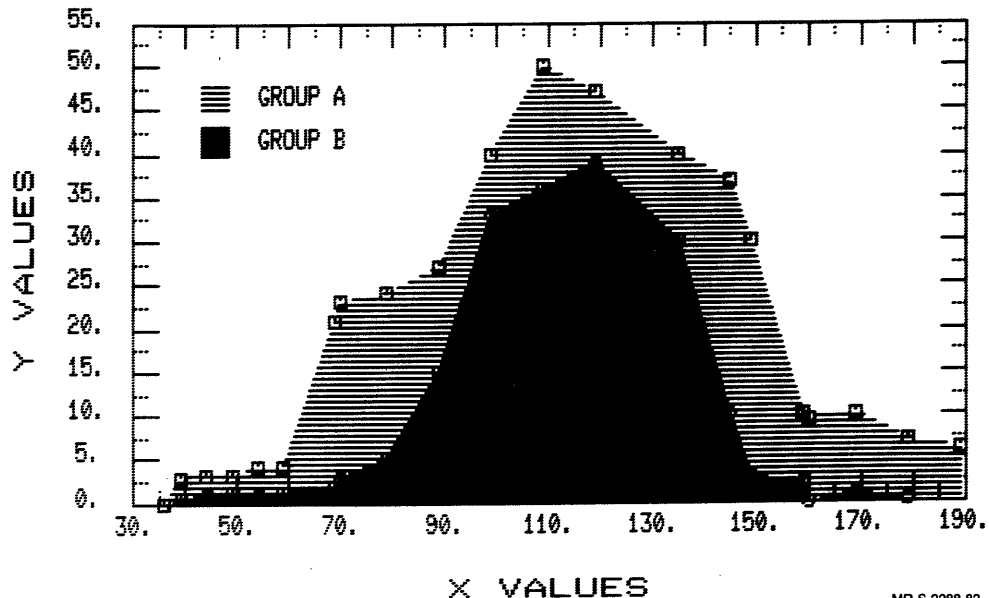


Figure 2: Graph Showing Legend

You would also want to know the graph's world coordinates if you want to create a 2-line top or bottom label, or use picture-drawing routines to enhance a graph or the screen on which the graph appears.

7.0 REPORTING SOFTWARE OR DOCUMENTATION PROBLEMS

While your software is under warranty, you can request assistance on software or documentation problems either by phone or by mail:

NOTE

Whether you use the phone service or the SPR service to report an apparent software problem, please provide DIGITAL personnel with a description of your hardware system and its serial number as well as information about your software.

1. PHONE SERVICE

The DIGITAL phone service is available between the hours of 8 A.M. to 8 P.M. Eastern Time, Monday to Friday.

From continental U.S. (except Georgia), call: 800-554-4013

From Georgia, call: 800-282-3860

From Hawaii, Alaska and Canada, call: 404-953-8650

In other parts of the world, contact your local DIGITAL office or authorized DIGITAL representative. In Europe, for example, there are three Telephone Advisory Centers (TACs) available to respond to questions about the software or documentation.

2. SPR (Software Performance Report) SERVICE

You may prefer to send DIGITAL a written request for service. DIGITAL provides a form (the SPR forms) for this type of request. Several SPR forms are included with this Distribution Kit. The forms contain most of the administrative information DIGITAL requires. Please fill them out completely, being sure to include your Software Customer Number, to get a quick response.

This option allows you to provide DIGITAL with hardcopy and machine-readable information that fully describes the nature of the problem and circumstances surrounding its occurrence. The SPR option is especially useful for resolving subtle problems. It also provides you with a written record of your report of the problem and guarantees you a written response if your software is covered by a DIGITAL warranty. Occasionally, DIGITAL may ask you to use this option.

READER'S COMMENTS

NOTE: This form is for document comments only. DIGITAL will use comments submitted on this form at the company's discretion. If you require a written reply and are eligible to receive one under Software Performance Report (SPR) service, submit your comments on an SPR form.

Did you find this manual understandable, usable, and well-organized? Please make suggestions for improvement.

Did you find errors in this manual? If so, specify the error and the page number.

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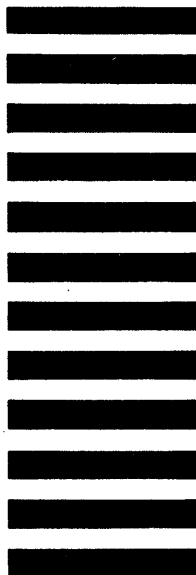
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