

Software Product Description

**PRODUCT NAME: RT-11/FORTRAN Enhancement Package,
for MINC (FEP), Version 2.1**

SPD 15.49.4

DESCRIPTION:

RT-11/FORTRAN Enhancement Package for MINC (FEP) is a FORTRAN systems software package consisting of the following eight components:

- RT-11, Version 4.0 Real-Time Operating System
- FORTRAN IV/RT-11, Version 2.5
- REAL-11/MNC, Version 2.1 Real-Time Data Acquisition and Control Library for MNC-series modules
- SSP-11, Version 1.3 Scientific Subroutines Package
- LSP-11, Version 1.2 Laboratory Subroutines Package
- INSTRUMENT Bus Subroutines, Version 2.1 Library for the control of instruments which communicate via IEEE-488 bus
- FDT, Version 2.1, Fortran Debugging Technique
- RGL/11, Version 1.1, ReGIS Graphics Library for VT-125 bit-map graphics and data plotting.

RT-11 — Supports single job (SJ), foreground/background (FB), and extended memory (XM) modes of processing. 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. Refer to SPD No. 12.1.xx for specifics.

FORTTRAN IV — Extended implementation of the FORTRAN language based on the ANSI FORTRAN, X3.9-1966 standard. It operates under the RT-11 Operating System. Refer to SPD No. 12.10.xx for specifics.

REAL-11 MNC Library — Provides FORTRAN-callable subroutines that control the following MNC-series modules:

- MNCKW (programmable real-time clock)
- MNCAD (A/D converter)

- MNCAG (analog preamplifier)
- MNCTP (thermocouple preamplifier)
- MNCAM (analog multiplexer)
- MNCAA (D/A converter)
- MNCDI (digital input)
- MNCDO (digital output)

This library provides buffered multiple-channel input and output sweeps (of analog or digital data) with FORTRAN completion support. Sampling can be initiated and triggered either by an external source or through the real-time clock. Time-interval histogram data can also be acquired. The library is self-configuring for the particular set of devices in the user's configuration. This library also provides the capability to transfer data messages between the MINC system and devices that can transmit and receive serial ASCII characters.

Scientific Subroutine Package (SSP-11) — Set of over 100 mathematical and statistical routines, commonly required in scientific programming. The subroutines are written in FORTRAN and contain no I/O statements.

Many of the larger statistical routines are provided as a collection of several smaller routines. This enables easier incorporation into larger programs requiring overlays. Refer to SPD No. 15.45.xx for specifics.

Laboratory Subroutine Package (LSP-11) — Set of FORTRAN-callable subroutines that perform a variety of standard analytical tasks, commonly encountered in the laboratory. All of the subroutines are dedicated to processing data that has been acquired by other laboratory data acquisition software.

LSP-11 provides the user with the following data manipulation subroutines:

- Peak processing
- Envelope processing
- Interval histogramming with reference points

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- Fast Fourier transform
- Phase angle and amplitude spectrum
- Power spectrum
- Correlation function

Refer to SPD No. 15.44.xx for specifics.

INSTRUMENT Bus Subroutines (IBS) — Runs under the RT-11 Operating System and consists of:

- Library of FORTRAN callable subroutines to support the IB11 and IBV11-A interface from an IEEE-488-1978 General-Purpose Instrument Bus
- Special device handler called by routines in the library

IBS allows the user to control the IEEE Bus through commands that control data transfer via the IBV11-A. Refer to SPD No. 12.14.xx for specifics.

FORTRAN Debugging Technique (FDT) — Sophisticated interactive debugging tool for FORTRAN IV programs. FDT provides step-by-step control of the execution of the user's program and the ability to examine and change the contents of any variable in the program during program execution.

FDT works with FORTRAN programs compiled with threaded code only and requires an additional 2K words of memory space during a debugging session.

RGL/11 (ReGIS Graphics Library) — Collection of FORTRAN-callable subroutines designed to support the graphics capabilities of the VT125 terminal. The package provides both picture drawing and data plotting capabilities. ReGIS (Remote Graphics Instruction Set) is the command protocol used to communicate between the RGL/11 package and the terminal. ReGIS commands that are used to draw a picture or a plot can be saved on a disk for later use. Refer to SPD No. 14.62.xx for specifics.

Picture Drawing Facilities

- Primitives — Generate lines, circles, arcs, and polygons, as well as setting control parameters that would indicate, for example, whether the user is working in degrees or radians.
- Windowing — Permits the definition of a world coordinate system.
- Color Support — Provides four shades of gray on the VT125. If an auxiliary color monitor is slaved from a VT125, the four shades of gray will appear as red, blue, green and black.
- Locators — Permit cursor movement and read back of the cursor position in the user's coordinate system.
- Hardcopy Support — Supports the LA34-VA as a graphic printer and includes routines to copy an entire graphics screen.
- Alternate character set — A Greek font is supplied.

Data Plotting Facilities

The data plotting facilities define and label graph "paper" on the screen. Plotting subroutines are divided

into static and dynamic segments. Static routines display all the user's data in one call. Dynamic routines allow the user to add data to a previously defined graph "paper" by plotting points. This package includes:

- Graph "paper" — User defines the type of paper to plot on; linear or logarithmic (base 10).
- Graph — Subroutines to plot data arrays and points or add data to an existing plot.
- Cursor Support — Digitizes information within a graph "paper". The cursor is moved by arrow keys on the keyboard.
- Axis Labeling — Labels the axis with either numeric values or characters.
- Data Scaling — Minimum and maximum axis values can be explicitly chosen or left to the system.

MINIMUM HARDWARE REQUIRED:

Any valid MINC-11, MINC-23, DECLAB-11/MNC or MINC/DECLAB23 system.

OPTIONAL HARDWARE:

- Any Q-Bus device supported by RT-11, Version 4.0
- Any terminal type supported by RT-11, Version 4.0
- LA34-VA hardcopy terminal
- Any standard RGB auxiliary color monitor
- FPF-11 Floating Point Processor

Optional MNC-Series Modules:

MODULE	DESCRIPTION	MAXIMUM NUMBER
MNCKW	Programmable Real-Time Clock	2
MNCAD	A/D Converter	1
MNCAM	Dual Multiplexer	7*
MNCAG	Preamplifier	5*
MNCTP	Thermocouple Preamplifier	7*
MNCAA	D/A Converter	8
MNCDI	Digital Input	8
MNCDO	Digital Output	8

* MNCAD required

NOTE: The maximum number of MNC-series modules in use at any one time is eight.

PREREQUISITE SOFTWARE:

None

OPTIONAL SOFTWARE:

Any software that utilizes the RT-11 Operating System, Version 4.0

Since RT-11 is included in this package, an RT-11/FEP licensee can order any RT-11 dependent product without reordering a specific license for RT-11.

TRAINING CREDITS:

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

SUPPORT CATEGORY:

DIGITAL SUPPORTED

RT-11/FORTRAN Enhancement Package for MINC is a DIGITAL Supported Software Product.

SOFTWARE INSTALLATION:

CUSTOMER INSTALLED

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

SOFTWARE PRODUCT SUPPORT:

RT-11/FORTRAN Enhancement Package for MINC includes standard warranty services as defined in the Software Support Categories Addendum of this SPD.

In addition, U.S. Customers are entitled to free telephone support by the Laboratory System Support Group for a 90-day period commencing either from the date of first use by the customer or thirty (30) days after delivery, whichever comes first. Delivery is F.O.B. DIGITAL's plants.

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H = RL02 Disk Cartridge

Q = RL01 Disk Cartridge

X = RX02 Double Density Diskette

Z = No hardware dependency

QJV32 -A— Single-use license, binaries, documentation, support services (media: H, Q, X)

QJV32 -D— Single-use license-only option, no binaries, no documentation, no support services (media: Z)

Update/Unsupported Options

Users of RT-11/FORTRAN Enhancement Package for MINC whose specified Support Category warranty has expired may order under license the following software option as an update to an earlier version. The option may also be purchased for use on a second or subsequent CPU, in conjunction with a binary, single-use, license-only option. Options are distributed in binary form on the appropriate medium and include no installation or other services unless specifically stated.

QJV32 -H— Binaries, documentation (media: H, Q, X)

QJV32 -H— Right to copy for single use, no binaries, no documentation (media: Z)

Miscellaneous Options

QJV32 -G— Documentation-only kit (media: Z)

ADDITIONAL SERVICES:

Basic Service is available to licensed customers as a post-warranty Software Product Service for this software product.

Customers should contact their local DIGITAL office for additional information on the availability of these services.