Software Product Description

PRODUCT NAME: VAX BASIC, Version 3.0

DESCRIPTION

VAX BASIC is an interactive, sharable language processor for the VAX/VMS and MicroVMS Operating Systems. VAX BASIC takes full advantage of the VAX floating point, decimal, and character instructions.

VAX BASIC provides a high-performance program development environment for both applications development and timesharing, by generating in-line VAX native mode instructions. It combines the interactivity of immediate mode program debugging with the power of a structured programming language integrated with key components of the VAX Information Architecture.

In addition to elementary BASIC features, VAX BASIC provides:

- BASIC Programming Support Environment
  - RUN command for immediate execution of BASIC programs
  - Dynamic linking (LOAD) of separately-compiled BASIC modules at RUN
  - EDIT command can invoke the system editor directly
  - HELP (INQUIRE) for on-line assistance
  - SEQUENCE command for generating line numbers
  - RESEQUENCE command for renumbering program lines
  - Direct execution of unnumbered statements (immediate mode)
  - Direct execution of Digital Command Language (DCL) statements
  - Optional line-by-line syntax checking
- Compile-Time Directives
  - Text inclusion through %INCLUDE and %INCLUDE %FROM %CDD and %INCLUDE from a text library
  - OPTION statement specifies compiler defaults from source modules
  - Conditional compilation (%IF)
  - Listing and cross-reference output control (%NOLIST, %LIST, %CROSS)
- Structured Programming Constructs
  - 31 character alphanumeric statement labels
  - 31 character variable names, allowing ($), (_) and (.)
  - DECLARE statement removes requirement for (%) and ($) suffixes
  - Explicit declarations provide access to many VAX data types
  - Line numbers completely optional
  - Statement condition/repeat modifiers simplify structure
  - IF...THEN...ELSE...END IF conditional blocks
  - SELECT...CASE...END SELECT multiway decision blocks
  - OTHERWISE out-of-range clause for ON GOTO and ON GOSUB statements
  - PROGRAM...END PROGRAM statements
- EXTERNAL statement allows access to global variables, functions, and constants, and allows data typing of parameters to aid in minimizing run-time mismatches.
- Language Subsets and Subset Flaggers
  - BASIC-PLUS-2 Subset Flagger for cross-system development
  - Declining Feature Flagger for program maintenance/conversion
  - Qualifier for ANSI Minimal BASIC conforming program execution
- Graphics
  - Statements modeled after ANSI BASIC Graphics and GKS Graphics standard
  - Graphic output including graph/plot and MAT graph/plot
  - Set statements to define and modify graphic attributes

software

— Manipulation of coordinate system to produce graphic output the suits the application

— ASK statements to retrieve information about input function attributes, viewing operations, transformations, and device capabilities

— Graphics procedures for drawing pictures

● Access to VAX Information Architecture

— RECORD structure for user-defined data types (similar to PASCAL)

— RECORD structure retrieval from the Common Data Dictionary

● Supports VAX/VMS Symbolic Debugger, VAX Language-Sensitive Editor and VAX Performance and Coverage Analyzer

● Structured exception handling (when blocks) for main and subprograms

● Multiline Statements and Multistatement Lines

● Program segmentation

— Picture Graphics subprograms

— Single and multiline user-defined functions using DEF

— SUB and FUNCTION programs as individually-compiled modules

— CALL statement passes parameters BY VALUE, REFerence, or DESCriptor

— Ability to invoke EXTERNAL function procedures from BASIC

— Up to 254 actual arguments per call on external modules

— COMMON and MAP statements for creating static storage areas

— Recursive CALL/function invocation

— Ability to pass optional arguments to non-BASIC procedures

● Implicit or Explicit data typing allowed

— Specification of data types permitted on COMMON, DECLARE, DEF, DIMENSION, EXTERNAL, FUNCTION, MAP, RECORD, and SUB statements.

— Default data allocation rules can be specified with DCL options, BASIC commands, or by the OPTION statement in program text.

— By default all declarations are implicit, however, the option TYPE=EXPLICIT can be used to require explicit declaration of all variables.

— Constant types can be specified with a literal notation as the option constant type.

— Integer data type:

BYTE (8 bit) with range of -128 to +127
WORD (16 bit) with range of -32768 to +32767

LONG (32 bit) with range of -2147483648 to +2147483647

— Real data type allows:

SINGLE (6 digits) with range of $.29 \times 10^{**}-38$ to $1.70 \times 10^{**}38$
DOUBLE (16 digits) with range of $.29 \times 10^{**}-38$ to $1.70 \times 10^{**}38$
GFLOAT (15 digits) with range of $.56 \times 10^{**}-308$ to $.90 \times 10^{**}308$
HFLOAT (33 digits) with range of $.84 \times 10^{**}-4932$ to $.59 \times 10^{**}4932$

— Packed DECIMAL type supports up to 31 digits.

— STRING data type, allowing both static (in MAP or COMMON) and dynamic length

● Symbolic names for control characters BEL, BS, HT, LF, VT, FF, CR, SO, SI, ESC, and DEL

● Ability to invoke all VMS system services via CALL or FUNCTION references

● Creation of user-defined program constants through DECLARE CONSTANT

● Support for VAX Symbolic Debugger on VMS and the full MicroVMS Operating Systems only

● File Organizations and Access Methods

— Sequential I/O

— Relative I/O

— Multikey Indexed I/O operations, including support for integer (word, longword, and quadword), string, segmented string keys, and packed decimal keys

— Block I/O (random access to 512 byte sequential file)

— Virtual Arrays (arrays mapped onto disk structures)

— Record File Address (RFA) access for high-performance applications

● Dynamic record definition and variable allocation via MAP DYNAMIC

● Extended Report Formatting Capabilities

— Suppression of zero fields

— Zero fill, blank fill, or asterisk fill numeric fields

— Commas in large numeric value

— CR (credit) or DR (debit) indicators

— Floating currency symbol for numeric fields

— Currency and decimal symbols can be changed for foreign usage

— FORMAT$ function accepts full PRINT USING editing syntax

● Arrays up to 32 dimensions, declarable at run-time

● Matrix Manipulation Capabilities

● Compatibility with key RSTS/E BASIC-PLUS features including:

— ON ERROR GOTO exception handling

— FIELD Statement

— CVT and SWAP% functions

— Virtual arrays

— Selected nonprivileged SYS calls

VAX BASIC uses the full printable ASCII character set, and 8-bit character codes within constants and I/O operations.

Subprograms and function programs compiled by VAX BASIC can be included by the LOAD command for dynamic linking when RUN is used. User-created libraries can be searched automatically when using RUN.

Subprograms and function programs written in other VAX/VMS native mode languages can be linked (by the VAX LINKER utility) with VAX BASIC programs and/or subprograms and invoked by the CALL statement in VAX BASIC. Similarly, VAX BASIC program modules can be invoked by other VAX languages.

STANDARD CONFORMANCE

ANSI Minimal BASIC Validated, December 1985

MINIMUM HARDWARE REQUIRED

Refer to the VAX/VMS System Software Order Table/ Optional Software Cross Reference Table (SPD 28.98.xx) for processor support.

Block Space Requirements (Block Cluster Size = 1):

Disk space required during installation: 1500 blocks
(768K bytes)

Disk space required for use (permanent): 1000 blocks
(512K bytes)

These block counts refer to the disk space required on the system disk. The sizes are approximate; actual sizes may vary depending on the user's system environment, configuration, and software options selected.

VAXcluster Environment

This layered product is fully supported when installed on any valid and licensed VAXcluster configuration, including those systems utilizing a common system disk, without restrictions.

GROWTH CONSIDERATIONS

The minimum hardware requirements for any future version of this product may be different from the minimum hardware requirements of the current version.

OPTIONAL HARDWARE

Floating point intensive applications should be run on configurations with the appropriate hardward support for the floating point data types being used. Consult the base operating system SPD for the appropriate floating point accelerator or other floating point hardware appropriate for your configuration.

PREREQUISITE SOFTWARE

For VAX Systems:

VAX/VMS Operating System

For MicroVAX Systems (I and II) Systems:

MicroVMS Operating System

For VAXstation (I and II) Systems:

MicroVMS Operating System

MicroVMS Workstation Software

* Both the MicroVMS Extended Base component and the MicroVMS Program Development component are required.

Refer to the VAX/VMS Systems Software Options Table/ Optional Software Cross Reference Table (SPD 28.99.xx) for the required versions.

OPTIONAL SOFTWARE

To use %INCLUDE %FROM %CDD:

VAX Common Data Dictionary (CDD) is required

To use /DIAGNOSTICS qualifier:

VAX Language-Sensitive Editor is required.

To use Embedded Graphics statements:

VAX GKS, Version 2.0 Run-Time license is required.

SOFTWARE WARRANTY

Warranty for this software product is provided by DIGITAL with the purchase of a license for the product as defined in the Software Warranty Addendum of this SPD.

INSTALLATION

This software product can be installed by the customer using the step-by-step documentation available for this product. Optionally you can purchase DIGITAL Installation Services which provide for the installation of the software product by an experienced DIGITAL Software Specialist.

Courtesy Installation Service

This software product will be installed by DIGITAL at no additional charge if you purchase it concurrent with a Startup Service Package that includes installation service. Both the host operating system and this product must be installed concurrently.

ORDERING INFORMATION

Refer to the VAX/VMS System Software Order Table/ Optional Software Cross Reference Table (SPD 28.98.xx) for ordering information.

Single-Use licensed software 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

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- Distribution and Documentation Option

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- Single-Use License Option

In addition to the right to use, the license gives you the one-time right to copy the software from your original CPU installation to the additional CPU. Therefore, the Distribution and Documentation Option is not required, but optional.

VAXcluster License Option

You are eligible for a VAXcluster license option on your second or each subsequent CPU that is part of a VAXcluster system. This is a Single-Use License offered at a reduced price and provides all of the License rights described above. A standard, Single-Use License Option (example: Qxxxx-UZ) is required with the first purchase of this software product and is also required for the first CPU of a VAXcluster system.

For software configuration purposes, a VAXcluster system is a set of VAX processors, each running the VMS operating system, where each VAX processor has a direct path to every other VAX processor via Computer Interconnect (CI) Bus.

Distribution and Documentation Option

The Distribution and Documentation option provides the machine-readable software and the basic documentation. You must have, or order, a Single-Use License to obtain this option. You will need this option to install the software for the first time. When revised versions of this software product become available, they may also be obtained by purchasing this option again.

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The Right-To-Copy Option allows a customer with multiple CPUs to copy a revised version of a software product from one CPU to another. Each CPU must be licensed for that product. You first install the revised software on one CPU; then you can make copies for additional CPUs by purchasing the Right-To-Copy Option for each additional CPU.

Documentation-Only Option

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Software Product Services

A variety of service options are available. For more information on these or other services, please contact your local DIGITAL office.