

# digital

# Software Product Description

**PRODUCT NAME: APL-SF, Version 2.0**

**SPD 8.16.4**

## **DESCRIPTION:**

APL (A Programming Language) is a concise programming language suitable for manipulating numeric and character array-structured data. It includes operators for array calculations. APL-SF is a conversational language that allows the programmer to interact with the APL run-time system and other running programs.

APL-SF is an APL language processor that runs under the TOPS-10 Operating System on a DECsystem-10 or the TOPS-20 System Software Package on a DEC-SYSTEM-20.

### *Features*

- Multiple statements in single line
- Statement branching anywhere in statement line
- Immediate-mode line editing of complex APL expressions
- User-controlled tab positioning for I/O operations
- User's active workspace size dynamically variable
- Workspace symbol table size dynamically variable
- User workspace saved on either disk or magtape devices
- All floating point calculations in double precision format (18 significant digits)
- Single operators Divide-Quad, Execute, Quote, and Dyadic Format, allowing user to
  - Solve a set of linear equations
  - Take the inverse of a matrix
  - Solve an overdetermined set of linear equations
  - Make unlimited evaluation of character strings (commands, function definitions, statement lines)
  - Write user-defined functions to perform output formatting and function editing
- User-level file access to  $\sim$ 
  - Standard ASCII sequential files
  - Internal format random-access files
  - Internal format sequential files
  - Binary random-access files
  - Immediate-mode I/O via any supported output device through the OUTPUT command
- System functions that
  - Perform file operations, including ENQ/DEQ
  - Allow creation of local functions
  - Can return information about names in the active workspace
  - Perform APPENDS to all APL file types
  - RENAME any file on disk
  - Control TIMEOUT on terminal waits
  - Output ASCII characters (including escape sequences) to terminal
- System variables that can be used to set and return information about the workspace and system environment.
- Facilities for functions to trap, diagnose, and signal errors.

### **MINIMUM HARDWARE REQUIRED:**

Any valid TOPS-10 or TOPS-20 configuration that includes:

- A KI10, KL10, or KS10 central processor (TOPS-10 configurations only)
- A system total of at least 128K words of memory, of which 45K words are available as user space
- 50K words of minimum permanent file storage space

### **OPTIONAL HARDWARE:**

Supports any mass storage, unit record, or terminal device supported by the prerequisite software, including the LA37 APL-ASCII terminal.

### **PREREQUISITE SOFTWARE:**

*On the DECsystem-10*

- TOPS-10 Operating System, Version 6.03, 6.03A or 7.00 with VM SER

*On the DECSYSTEM-20*

- TOPS-20 System Software Package, Version 4.0

### **OPTIONAL SOFTWARE:**

None

### **TRAINING CREDITS:**

None

### **SUPPORT CATEGORY:**

DIGITAL SUPPORTED

APL-SF is a DIGITAL Supported Software Product.

**SOFTWARE INSTALLATION:**

**CUSTOMER INSTALLED**

APL-SF is a software product engineered to be installed by the customer and includes other Software Support Services listed below.

**SOFTWARE PRODUCT SUPPORT:**

APL-SF includes standard warranty services as defined in the Software Support Categories of this SPD.

**ORDERING INFORMATION:**

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

Options with no support services are only available after the purchase of one supported license.

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

The following key (F, M, P, Z) represents the distribution media for the product and must be specified at the end of the order number, e.g., QH071-AF = binaries on 7-track Magtape.

- F = 7-track Magtape
- M = 9-track 1600 BPI Magtape (PE)
- P = 9-track 800 BPI Magtape (NRZI)
- Z = No hardware dependency

*For DECsystem-10*

- QH071 -A— Single-use license, binaries, documentation, support services (media: F, M, P)
- QH071 -U— Defense Acquisition Regulation/NASA Marking, binaries, documentation, support services (media: F, M, P)
- QH071 -D— Single-use license only, no binaries, no documentation, no support services (media: Z)

*For DECSYSTEM-20*

- QT012 -A— Single-use license, binaries, documentation, support services (media: M)
- QT012 -U— Defense Acquisition Regulation/NASA Marking, binaries, documentation, support services (media: M)

- QT012 -D— Single-use license only, no binaries, no documentation, no support services (media: Z)

*Update Options*

Users of APL-SF 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.

*For DECsystem-10*

- QH071 -H— Binaries, documentation (media: F, M, P)
- QH071 -H— Right to copy for single-use (under existing license), no binaries, no documentation (media: Z)

*For DECSYSTEM-20*

- QT012 -H— Binaries, documentation (media: M)
- QT012 -H— Right to copy for single-use (under existing license), no binaries, no documentation (media: Z)

*Upgrade Options*

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

*For DECsystem-10 (from APL-B or APL-BASIC)*

- QH074 -A— Single-use license, binaries, documentation, support services (media: F, M, P)

*For DECSYSTEM-20 (from APL-BASIC)*

- QT025 -A— Single-use license, binaries, documentation, support services (media: M)
- QT025 -U— Defense Acquisition Regulation/NASA Marking, binaries, documentation, support services (media: M)

*For DECsystem-10 (from APL-E or APL-F)*

- QH076 -A— Single-use license, binaries, documentation, support services (media: F, M, P)

**ADDITIONAL SERVICES:**

Post-warranty Software Product Services for this software product are available with the prerequisite being the purchase of the TOPS-10 and/or TOPS-20 Self-Maintenance Service for Software. Customers should contact their local DIGITAL office for additional information.