digital

Software Product Description

PRODUCT NAME: ADSS-B/F-15, Version 5C, Advanced Software System, B/F **SPD 17.6.0**

DESCRIPTION:

ADSS, the Advanced Software System, is a single-task keyboard monitor system primarily for use with DECtape. ADSS is designed for research and engineering environments where real-time data acquisition and control functions are combined with interactive program development and testing. ADSS is an integrated set of programs for the sequential preparation, compilation, assembly, debugging and operation of user programs.

The user controls the ADSS operating system by issuing instructions to the monitor. The monitor runs the jobs, supervises data and file manipulation, and interacts with the user in a simple, conversational manner. This system is sometimes called the Advanced Monitor System or the Keyboard Monitor System.

B/F, the Background/Foreground system, is a two-job DECtape or disk based real-time monitor system. B/F is an integrated set of software designed to meet the demands of research, engineering, and industrial environments, where one or more real-time tasks typically require continuous responsiveness from the computer but do not use 100% of its capacity.

Under control of the B/F Monitor, real-time tasks are handled in the computer foreground and have immediate access to the system's resources via interrupts. Background time (time left over between service calls for the real-time tasks) is available for program development and testing or other low-priority computation in an environment similar to that of the Advanced Software System. The Background/Foreground Monitor contains all the supervisory controls necessary for concurrent processing of background and foreground tasks.

Following are some notable features of the software:

DECtape or Disk-Resident System/User Software — all ADSS-B/F-15 software resides on either DECtape or disk until loaded and run.

Interactive Operation — an interactive keyboard/program monitor permits device-independent programming and automatic calling and loading of system and user programs.

Programming Languages — a choice of programming languages is given: FORTRAN IV, FOCAL or MACRO-15.

I/O Device Handlers — Data and file manipulation I/O device handlers are supplied for standard system peripherals, allowing device independent programming and overlapped computation with the simultaneous operation of asynchronous peripherals. Under B/F, mass storage devices, such as DECtape, disk, and magtape, can be shared between the background and foreground jobs.

Programmed Monitor Commands — Input/output programming is simplified by the use of a set of system commands which are standardized for system-supported I/O devices.

Conversational Programs — System utility programs interact with the operator in a simple, conversational manner.

Dynamic Storage Allocation — the available disk and DECtape storage is automatically allocated for optimum storage utilization.

DECtape/Disk File Structure — This allows DECtape and disk to be treated as directoried (named file oriented) devices or as sequential access (non-file oriented) devices.

Bank and Page Modes — The Background/Foreground and Advanced Software Systems are available in either a bank mode or a page mode version. In the page mode system (standard PDP-15 system) user programs are loaded and relocated in 4K word page units; address modification via index register is also permitted. The bank mode system is available to PDP-9/15 users and allows direct addressing up to 8K words. This system is particularly useful to the PDP-15 user who wishes to run PDP-9 programs such as those available from the DECUS library. The use of the index register for address modification is not permitted in bank mode. A bank mode system properly configured can be executed on both a PDP-9 and a PDP-15.

ADSS Batching Operation — in the Advanced Software System, an alternative to interactive operation is a batch processing capability of the monitor which permits user command input via paper tape or cards. This allows many programs to be run without operator intervention or supervision.

B/F Foreground Priority — in the Background/Foreground system, foreground takes precedence over background in the following ways:

Memory Allocation: Foreground is loaded first so that it can reserve whatever memory it needs.

Peripherals: Foreground, because it is loaded first, allocates those I/O device which it will use. Those which cannot be shared with background are then under exclusive control of the foreground job.

Execution: Foreground execution is triggered by either clock or external interrupts. Four levels of foreground priority are defined so that several tasks can be combined into one foreground job. Background runs only when there is no activity in the foreground.

B/F Foreground Protected — The foreground job is protected from the background job by both software checks and by memory protection hardware.

The following are components of the ADSS software:

Monitor:
Resident Monitor (KM15, KMS15, KM19-15, KMS9-15)
Non-resident Monitor
System Loader

Languages:
FORTRAN IV (F4, F4I, F4S, F4S9)
PDP-15 FORTRAN IV (F4B, FPF4B)
PDP-9/15 FORTRAN IV (F4B9)
FOCAL
MACRO-15 Assembler (MACRO, MACROI)

Text Editors:
EDIT
EDITVP Storage Scope Editor

Loaders:
Linking Loader
CHAIN and EXECUTE (Overlay Buyilder and Loader)

Debuggers:
DDT Dynamic Debugging Technique
DUMP Core Dump Lister

General Utilities:
DTCOPY DECtape copier
MTDUMP Magtape dumper
PIP Peripheral Interchange Program
SRCCOM Source Compare
UPDATE Library File Manager
8TRAN PDP-8 to PDP-15 Assembler Source Translator
89TRAN PDP-8 to PDP-9 Assembler Source Translator

On-line System Utilities:
SGEN System Generator
PATCH System Patcher

Off-line System Utilities:
.DTSBT DECtape bootstrap
RFSAV RF15/RS09 Disk save/restore
.RFSBT RS09 Disk bootstrap
.DKSBT RB09 Disk bootstrap
DKSAV RB09 Disk save/restore

I/O Handlers:
BCDB Batch card reader
CDB CR01E, CR02B, CR03B card reader
DKA, DKB, DKC, DKD, DKE, DKF RF15/RF09 disk
DKA, DKB, DKC, DKD RB09 disk
DPA, DPB, DPC, DPD, DPE, DPF RP15/RP02 disk
DRA, DRB, DRC, DRD RM09 drum
DTA, DTB, DTRC, DTD, DTE, DTF DECtape
DYA 339, VC38 graphic display
LPA LP15, LP09, 647 line printer
MAT, MTC, MTF magtape
PPA, PPB, PPC paper tape punch
PRA, PRB, paper tape reader
TTA teletypewriter
VPA, VPA.S storage scope
VTA VT15 graphic display

Checkout Package:
COMTST FORTRAN compiler test
RUN15 miscellaneous test
BASIC89 miscellaneous test

The following software is available as part of the B/F system:

Monitor:
Resident Monitor
Non-resident Monitor
System Loader

Languages:
FORTRAN IV (F4, F4A)
FOCAL
FOCAL2[1]
MACRO-15 Assembler (MACRO, MACROA)

Text Editor:
EDIT

Loaders:
Linking Loader
CHAIN and EXECUTE Overlay Builder and Loader

Debuggers:
DDT Dynamic Debugging Technique
DUMP Core Dump Lister

General Utilities:
DTCOPY DECtape copier
PIP Peripheral Interchange Program
SRCCOM Source Compare
UPDATE Library File Manager
IDLE Foreground Idler

On-line System Utilities:
BFSGEN System Generator
PATCH System Patcher

Off-line System Utilities:
.DTSBT DECtape bootstrap
RFSAV RF15/RS09 Disk Save/Restore
.RFSBT RS09 Disk bootstrap
.DKSBT RB09 Disk bootstrap
DKSAV RB09 Disk save/restore

I/O Handlers:
CDB card reader
CPA core-to-core handler
DKA RF15/RF09, RB09 disk
DTA DECtape
LPA LP15, LP09, 649 line printer
MTA.F magtape
PPA paper tape punch
PRA paper tape reader
TTA teletypewriter

Checkout Package:
TALK teletypewriter test
MURPH magtape test

MINIMUM HARDWARE REQUIRED:

Basic DECtape-based ADSS system:

For a PDP-15 computer:
- KP15 central processor[2]
- 8K words 18-bit core memory
- LT35 teletypewriter[3]
- PC15 paper tape reader/punch
- TC15 DECtape controller[4]
- TU56 DECtape transport[4]

For a PDP-9 computer:
- PDP-9 central processor
- 8K words 18-bit core memory
- LT35 teletypewriter[3]
- PC09 paper tape reader/punch (included with PDP-9 central processor)
- TC02 DECtape controller
- TU56 DECtape transport[4]

Basic Disk-based ADSS system:

For a PDP-15 computer:
- KP15 central processor[2]
- 8K words 18-bit core memory
- LT35 teletypewriter[3]
- PC15 paper tape reader/punch
- TC15 DECtape controller[4]
- TU56 DECtape transport[4]
- RF15 disk controller
- RS09 disk drive

For a PDP-9 computer:
- PDP-9 central processor
- 8K words 18-bit core memory
- LT35 teletypewriter
- PC09 paper tape reader/punch (included with the PDP-9 central processor)
- TC02 DECtape controller
- TU56 DECtape transport[4]
- RF09 disk controller with one RS09 disk drive or one RB09 fixed-head disk system

FORTRAN Requirements for basic ADSS systems:
- F4S — a system total of at least 12K words of memory
- F4S9 — a system total of at least 16K words of memory
- F4B, FPF4B and F4B9 — a system total of at least 16K words of memory and a KE15 or KE09A Extended Arithmetic Element

Basic DECtape-based B/F system:

For a PDP-15 computer:
- KP15 central processor
- 24K words of 18-bit core memory
- LT35 teletypewriter for background use[3]
- LT33 teletypewriter for foreground use[3]
- LT15A single teletypewriter controller[5]
- PC15 paper tape reader/punch
- KE15 Extended Arithmetic Element
- KA15 Automatic Priority Interrupt
- KM15 Memory Protect
- KW15 real-time clock
- TC15 DECtape controller[4]
- TU56 DECtape transport[4]

For a PDP-9 computer:
- PDP-9 central processor
- 16K words 18-bit core memory
- LT35 teletypewriter for background use[3]
- LT33 teletypewriter for foreground use[3]
- LT19 multiterminal teletypewriter controller
- PC09 paper tape reader/punch (included with the PDP-9 central processor)
- KE09A Extended Arithmetic Element
- KF09A Automatic Priority Interrupt
- KX09A Memory Protect
- Real-time clock (included with the central processor)
- TC02 DECtape controller
- Two (2) TU56 DECtape transports[4]

Basic Disk-based B/F system:

For a PDP-15 computer:
- KP15 central processor[2]
- 24K words 18-bit core memory

- LT35 teletypewriter for background use[3]
- LT33 teletypewriter for foreground use[3]
- LT15A single teletypewriter controller[5]
- PC15 paper tape reader/punch
- KE15 Extended Arithmetic Element
- KA15 Automatic Priority Interrupt
- KM15 Memory Protect
- KW15 Real-time clock
- TC15 DECtape controller[4]
- TU56 DECtape transport[4]
- RF15 disk controller
- Two (2) RS09 disk drives (262,144 words each)

For a PDP-9 computer:

- PDP-9 central processor
- 24K words 18-bit core memory
- LT35 teletypewriter for background use[3]
- LT33 teletypewriter for foreground use[3]
- LT19 multiterminal teletypewriter controller
- PC09 paper tape reader/punch (included with the PDP-9 central processor)
- KE09A Extended Arithmetic Element
- KF09A Automatic Priority Interrupt
- KX09A Memory Protect
- Real-time clock (included with the central processor)
- TC02 DECtape controller
- TU56 DECtape transport[4]
- RF09 disk controller[6]
- Two (2) RS09 disk drives (262,144 words each)[6]

OPTIONAL HARDWARE SUPPORTED:

For the PDP-15 under ADSS:

- KA15 Automatic Priority Interrupt
- CR03B card reader
- KW15 clock
- MM15, MK15, ME15 core memory (up to a system total of 32K words)
- TC15 controller with up to four (4) TU56 DECtape transports or TC02 controller with up to eight (8) TU55 DECtape transports
- RF15 controller with up to four (4) RS09 disk drives[7]
- RP15 controller with one (1) RP02 disk drive[8]
- KE15 Extended Arithmetic Element
- FP15 Floating Point Unit
- VT15 controller with one (1) VT04 graphics display[9]
- LP15 line printer
- TC9 controller with up to eight (8) TU10, TU20 or TU30 magnetic tape transports
- VP15A storage scope

For the PDP-9 under ADSS:

- KF09A Automatic Priority Interrupt
- CR01E, CR02B, or CR03B card reader
- Additional core memory up to a system total of 32K words
- TC02 controller with up to four (4) TU56 DECtape transports or up to eight (8) TU55 transports
- RB09 or RF09 controller with up to four (4) RS09 disk drives[7,10]
- RM09 drum[11]
- KE09A Extended Arithmetic Element
- 339, VC38 graphics display
- 647, LP09 line printer
- TC59 controller with up to eight (8) TU10 or TU20 magnetic tape transports
- VP09 storage scope

For the PDP-15 under B/F:

- CR03B card reader
- MM15, MK15, or ME15 core memory (up to a system total of 32K words)
- TC15 controller with up to four (4) TU56 DECtape transports or TC02 controller with up to eight (8) TU55 DECtape transports
- RF15 controller with up to four (4) RS09 disk drives[12]
- LP15 line printer
- TC59 controller with up to eight (8) TU10 or TU20 magnetic tape transports

For the PDP-9 under B/F:

- CR03B card reader
- Additional core memory up to a system total of 32K words
- TC02 controller with up to four (4) TU56 DECtape transports or eight (8) TU55 DECtape transports
- RF09 controller with up to four (4) RS09 disk drives[12]
- 647 or LP09 line printer
- TC59 controller with up to eight (8) TU10 or TU20 magnetic tape transports
- LT19 with LT33, LT35 terminals[13]

PREREQUISITE SOFTWARE:

None

OPTIONAL SOFTWARE SUPPORTED:

None

TRAINING CREDITS:

None

SUPPORT CATEGORY:

C, Software Support will be provided as listed in the Software Support Categories Addendum to this SPD.

UPDATE POLICY:

During the first year, Update Policy shall be in accordance with the Software Support Categories Addendum to this SPD. After the first year, updates, if any, will be made available according to then prevailing DIGITAL policies.

ORDERING INFORMATION:

This software is furnished under a license for use on a single CPU and can be copied and modified (with inclusion of DIGITAL's copyright notice) only for use on such CPU, except as may otherwise be provided in writing by DIGITAL.
Software will only be made available after a source license agreement is in effect.

The following key (C) represents the distribution media for the product and must be specified at the end of the "Q" number, i.e., QM010-AC = binaries on DECtape.

C = DECtape

Standard Options:

QM010 -C— Single-use license, binaries, sources, documentation, no support services (media: C)

ADDITIONAL SERVICES:

None

Notes:

1. Two-user FOCAL is available only in PDP-15 page mode systems.
2. ADSS can execute on an XVM processor, however, none of the XVM advanced memory and addressing features are supported.
3. For a PDP-9 or PDP-15, terminals can be either LT33 or LT35. On a PDP-15, the LA30C or LA36 can also be used up to a baud rate of 300. The LA36 is handled as if it were a teletypewriter. The extended carriage and lower case character set of the LA36 and the paper tape facility on teletypewriters are not supported.
4. A TC02 DECtape controller with two (2) TU55 DECtape transports can be used instead.
5. The LT15A supports only one terminal. When more than one terminal is desired, an LT19 control is required in addition to or in lieu of an LT15A.
6. An RB09 disk system can be substituted for the RF09 controller with RS09 disk drive.
7. Four (4) RS09 disk drives are logically equivalent to eight (8) single DECtape units. The system can not handle any controller with more than eight units.
8. The disk pack can be used as a file storage device but not as a system storage device.
9. The LK35 keyboard for the graphics console is not supported.
10. The two types of disk can not be supported on the same system.
11. The drum can be used as a file storage device but not as a system storage device.
12. The disk is not supported as an option in a DECtape-based system. For the PDP-9, the RF09 and RB09 disks are not supported in the same system. Four (4) RS09 disk drives are equivalent to eight DECtape units. The system can not handle controllers with more than eight units, with the exception of teletypewriters.
13. The standard B/F-15 system supports up to six (6) terminals. One is the console terminal and the remaining five are connected to an LT19 control (or LT15A and LT19 in possible PDP-15 configurations). During system generation, the system can be built to support up to 17 terminals, however, four (4) LT19 controllers are required. The paper tape teletypewriter facility is not supported. The LA30C and LA36 can operate at speeds up to 300 baud.