

PDP - 7 PROGRAM LIBRARY

December 30, 1964

1. BASIC SOFTWARE PACKAGE

Number	Name
Digital - 7-1-S	Symbolic Tape Editor
Digital - 7-2-S	FORTRAN II System - 8K
Digital - 7-3-S	Assembler - Basic & Extended
Digital - 7-4-S	DDT - Basic & Extended
Digital - 7-10-O	Teletype Output Package
Digital - 7-11-IO	Tic-Toc
Digital - 7-12-I	FF Loader
Digital - 7-13-I	Readin Mode Loader
Digital - 7-14-O	Octal Print Subroutine
Digital - 7-15-O	Decimal Integer Print
Digital - 7-30-A	Floating Point Package
Digital - 7-31-A	Multiply Subroutine
Digital - 7-32-A	Divide Subroutine
Digital - 7-33-A	Double Precision Integer Package
Digital - 7-34-A	Unsigned Multiply
Digital - 7-35-A	Unsigned Divide
Digital - 7-40-U	Master Tape Duplicator
Digital - 7-41-U	Tape Reproducer
Digital - 7-42-U	RIM Puncher
Digital - 7-43-U	CAL Handler Type II
Digital - 7-44-U	CAL Handler Type III

II. BASIC SOFTWARE FOR SPECIAL EQUIPMENT

Number	Name
A. Machines with DEC tape	
Digital - 7-20-IO	DECtog
Digital - 7-21-IO	DECtrieve
Digital - 7-22-IO	DECTape Subroutines
B. Machines with Card Reader, Card Punch, Line Printer	
Digital - 7-23-IO	Buffered Input - Output Package
C. Machines with 30G or 30D Display	
Digital - 7-24-IO	Pen Follow Subroutine
Digital - 7-25-IO	Character Display Subroutine
D. Machines with Mag Tape	
Digital - 7-45-U	Type 57A Compiler

III. BASIC SOFTWARE FOR MAINTENANCE

Digital - 7-50-M	Teleprinter Input-Output Test
Digital - 7-51-M	Clock Interrupt Test
Digital - 7-52-M	Contest II
Digital - 7-53-M	Reader & Punch Test
Digital - 7-54-M	MAINDEC 401 (Instruction Test)
Digital - 7-55-M	MAINDEC 402 (Memory)
Digital - 7-56-M	MAINDEC 403 (Address Test)
Digital - 7-57-M	MAINDEC 410 (RPB Test)

ABSTRACTS OF PROGRAMS

- NUMBER: Digital-7-1-S
NAME: Symbolic Tape Editor
ABSTRACT: The Editor is designed to prepare and edit paper tapes in ASCII or FIO-DEC codes using the Type 33 Teleprinter normally found on the PDP-7 (or optionally the Type 28 Teleprinter). The program includes commands which will read and punch paper tape; print, delete, change, and insert text.
- NUMBER: Digital-7-2-S
NAME: FORTRAN II System - 8K
ABSTRACT: The System consists of
 - (1) The Fortran II Compiler
 - (2) The Fortran Compatible Assembler
 - (3) Fortran Operating System
 - (4) Fortran LibraryThe System implements an expanded and slightly more powerful version of the FORTRAN II Compiler language.
- NUMBER: Digital-7-3-S
NAME: Assembler - Basic & Extended
ABSTRACT: Used to convert programs written in symbolic source language to binary. Teleprinter and paper tape punch are needed.
- NUMBER: Digital-7-4-S
NAME: DDT (Debugging Tape)
ABSTRACT: A program to aid in debugging machine language programs, using the source language symbols. Operation is from the teletype keyboard, and output is on the page-printer. One of DDT's most useful features is the "break-point", for examining specific areas of a program.
- NUMBER: Digital-7-10-O
NAME: Teletype Output Package
ABSTRACT: This package includes subroutines which allow the user to type 1, 3 or a string of characters on the on-line teletype and format control subroutines.

NUMBER: Digital-7-11-IO

NAME: Tic Toc

ABSTRACT: Teletype input-output conversion package for the PDP-7. Converts typed input to concise code and packs it three to a word. Converts packed concise code text to teletype and types it out. Routines may be used separately.

NUMBER: Digital-7-12-I

NAME: FF Loader

ABSTRACT: The FF loader will load a binary tape produced by the PDP-7 Assembly System, and will normally be punched at the beginning of such a tape.

NUMBER: Digital-7-13-I

NAME: Readin Mode Loader

ABSTRACT: This input routine will load a binary tape consisting of word pairs and terminated by a jump A instruction, dac A C (A). This routine uses the test word switches.

NUMBER: Digital-7-14-O

NAME: Octal Print Subroutine

ABSTRACT: This subroutine is used to convert a binary number to octal and print it. A teletype printer and the program Digital-7-10-O are needed.

NUMBER: Digital-7-15-O

NAME: Decimal Integer Print

ABSTRACT: The routine will print the signed decimal equivalent of an 18-bit binary number when called. Initial zeros are suppressed by spaces, and a minus sign will precede the first digit of a negative number. Needs Teletype Output Package (Digital-7-10-O).

NUMBER: Digital-7-30-A

NAME: Floating Point Package

ABSTRACT: A self-contained scientific programming system for the PDP-7. Data and results to 9 decimal digits with 6 digits optional. Instruction execution is interpretive, using double precision floating point arithmetic.

- NUMBER: Digital-7-31-A
NAME: Multiply Subroutine
ABSTRACT: This is a single precision signed one's complement multiplication subroutine.
- NUMBER: Digital-7-32-A
NAME: Divide Subroutine
ABSTRACT: A single precision signed, one's complement divide subroutine.
- NUMBER: Digital-7-33-A
NAME: Double Precision Integer Package
ABSTRACT: The package is a collection of subroutines which allow the user to perform double precision arithmetic, and double precision binary to BCD and BCD binary conversion.
- NUMBER: Digital-7-34-A
NAME: Unsigned Multiply Subroutine
ABSTRACT: This is a single precision unsigned one's complement multiplication subroutine.
- NUMBER: Digital-7-35-A
NAME: Unsigned Divide Subroutine
ABSTRACT: This is a single precision, unsigned, one's complement divide subroutine.
- NUMBER: Digital-7-40-U
NAME: Master Tape Duplicator
ABSTRACT: This program will make master tapes, with a character count and checksum at the end, and will verify such tapes and duplicate.
- NUMBER: Digital-7-41-U
NAME: Tape Reproducer
ABSTRACT: This program will read a tape and reproduce it exactly. The routine works in the interrupt mode and uses essentially all of memory as a buffer. A punch is needed.

- NUMBER: Digital-7-42-U
NAME: RIM Puncher
ABSTRACTS: Used to punch a readin mode tape from any area of core memory.
Digital-7-13-I is needed.
- NUMBER: Digital-7-43-U
NAME: CAL Handler Type II
ABSTRACTS: The Type II CAL Handler saves the exits from subroutine in a stack so that subroutines can be called to any level (so long as the stack size is not exceeded). Subroutines may be called recursively in a very simple manner.
- NUMBER: Digital-7-44-U
NAME: CAL Handler Type III
ABSTRACTS: The routine performs the bookkeeping operations necessary to display parameters and save exits when using cal to call subroutines. The exits are saved in a stack. Data may also be entered into the stack, allowing subroutines to be used recursively.
- NUMBER: Digital-7-20-IO
NAME: PDP-7 DEctog
ABSTRACTS: Allows the user to perform various functions using the DEctape, and the toggle switches of a PDP-7 computer. The programs are designed to detect any errors in the DEctape control.
- NUMBER: Digital-7-21-IO
NAME: PDP-7 DEctrieve
ABSTRACTS: Allows saving and restoring of programs or data using DEctapes and the toggle switches on the PDP-7.
- NUMBER: Digital-7-22-IO
NAME: PDP-7 DEctape Subroutines
ABSTRACTS: Allows the programmer to read, write or search the DEctape using prewritten and tested subroutines.
- NUMBER: Digital-7-23-IO
NAME: Buffered Input-Output Package
ABSTRACTS: This package includes routines for punching cards, reading cards

and printing on the line printer. They all make use of the program interrupt facility. The card punching and card reading routines are double-buffered; i.e., one buffer may be filled while the other is being punched. The line printing routine uses only the buffer in the printer.

NUMBER: Digital-7-24-IO
NAME: Pen Follow Subroutine
ABSTRACTS: This subroutine is used to track the light pen across the face of the CRT. A type 30 Display and type 32 Light Pen are needed.

NUMBER: Digital-7-25-IO
NAME: Character Display Subroutine
ABSTRACTS: The subroutine will display the requested character on the face of the CRT. A type 30 Display is needed.

NUMBER: Digital-7-45-U
NAME: Type 57A Compiler
ABSTRACTS: Allows the PDP-7 user to perform any combination of Type 57A functions by creating a program on-line using DDT and the symbolic expressions.

NUMBER: Digital-7-50-M
NAME: Teleprinter Input-Output Test
ABSTRACT: Tests Input and Output functions of the Teleprinter.
Four separate tests are used:

- 1) Repeating single character output line.
- 2) Repeating alphabetical sequence output line.
- 3) Input a line message - followed by output of same message.
- 4) Input of a character - output of same character.

NUMBER: Digital-7-51-M
NAME: Clock-Interrupt Test Program
ABSTRACT: Tests operation of clock, interrupt, reader, punch and teleprinter in the interrupt mode. Checks the iors instruction, and the operation of flags, and IO skip instructions. Requires Real Time Option, paper tape reader, and can use punch and teleprinter.

NUMBER: Digital-7-52-M
NAME: CONTEST II
ABSTRACT: Maintenance program to test the instructions, memory, clock, program interrupt, and reader, punch and teleprinter.

NUMBER: Digital-7-53-M
NAME: Reader and Punch Test
ABSTRACT: The Paper Tape Reader and Paper Tape Punch Test Routines exercise and test these devices. Parameters allow either alphanumeric format tape to be read or punched, and the time may be varied between reading or punching commands.

NUMBER: Digital-7-54-M
NAME: MAINDEC 401 (Instruction Test)
ABSTRACT: Instruction Test is a sequence of twelve programs which tests the operation of all PDP-7 instructions except the iot group. Indirect addressing and automatic indexing are also checked. Augmented instructions are checked with the defer bit both 1 and 0.

The manual loader (in locations 7762 through 7776) is used to read in all programs. The instructions used by the loader are assumed working only for readin purposes. These instructions are fully checked by the Instruction Test.

In general, an instruction is not used before it is tested. However, in order to facilitate usage, Programs 0 through 3 use instructions which have not been checked. These untested instructions are used to sense the AC switches. This part of each program (the last six instructions) is not an inherent part of the test and may be replaced by a single jmp.

NUMBER: Digital-7-55-M
NAME: MAINDEC 402 (Checkerboard)
ABSTRACTS: Memory checkerboard is a program which creates the worst possible noise conditions in memory. It then starts a word by word check for accuracy.

There are four discreet starting addresses which will produce four different noise patterns, one of which is the worse case for the particular memory stack used.

NUMBER: Digital-7-56-M
NAME: MAINDEC 403 (Address Test)
ABSTRACTS: Address Test is a maintenance program which will check the Type 149A Memory Module for proper address selection. The program comes in two parts, a high and a low order test.

The program will check all 4096 locations for failure, with the exception of 7762 to 7777 which contain the PDP-7 loader program.

The low part checks from location 20 to 7761 and the high part from "0" to 7741. The low part of the program will be in register "0" to 20 and the high part will be in 7742 and 7761.

NUMBER: Digital-7-57-M
NAME: MAINDEC 410 (RPB Test)
ABSTRACTS: Read binary test program is a maintenance program for the PDP-7 photo-electric paper tape reader during binary operation. As the reader reads a closed loop of tape containing alternating lines of six 1's and six 0's (77007700)₈ each bit is checked against data stored in core memory. This program detects two types of reader malfunction: picking up and dropping of information and feed holes.