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PROGRAM LIBRARY

DECUS NO.	8-120
TITLE	DISK/DECtape FAILSAFE
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COMPANY	Digital Equipment Corporation Maynard, Massachusetts
DATE	April, 1968
SOURCE LANGUAGE	

ABSTRACT

This program will punch the contents of the disk (or DECtape) onto paper tape which then can be loaded back onto the disk using the same program. The paper tape is punched in 200g word blocks in binary format, with a checksum for each block. FAILSAFE simplifies and speeds the process of rebuilding the Disk System Monitor after running disk tests.

MINIMUM HARDWARE

PDP-8, 8/S, or 8/I with 32K Disk or DECtape

OTHER PROGRAMS NEEDED

PDP-8 Disk System Builder (DEC-08-SBAB-PB)

SOURCE LANGUAGE

PALD or MACRO-8

STORAGE REQUIREMENT

0 - 1177

OPERATING INSTRUCTIONSI. Punching the Contents of the Disk Onto Paper TapeA. Determine how many blocks must be punched.

1. Use PIP to get a directory listing and determine the number of unused blocks.
2. For a one-disk system, the number of unused blocks subtracted from 373g will give the number of blocks which must be punched. This number includes the directory (blocks 177 thru 202).
3. For multiple-disk or DECtape systems, it is necessary to have a knowledge of the system directory. Refer to the DISK/DECtape Builder Manual DEC-08-SBAB-D.

NOTE: If, for example, there were 304 unused (free) blocks, then it would be necessary to punch 67 blocks—blocks 0 thru 62 and blocks 177 thru 202 (the directory).

If, however, there were 150 unused blocks, it would only be necessary to punch blocks 0 thru 222, since this includes the directory blocks.

- B. Load FAILSAFE, and start at location 200.
- C. Indicate that information is to be dumped onto paper tape by typing "DUMP)" or simply "D)".
- D. Using the Teletype, enter the first and last block numbers to be punched—as the information is requested.
- E. Repeat steps C and D to punch non-contiguous blocks.

II. Verifying a Tape Which Has Been Punched

- A. Remove the tape from the punch and place it in the paper tape reader.
- B. Indicate that the tape is to be verified by typing "VERIFY)" or simply "V)".
- C. Enter the last block number on the tape.
- D. When the entire tape has been read, the program will type "TAPE VERIFIED". If a checksum error occurs, the program will indicate the number of the last block which was read correctly. If there is no checksum but the block read from the tape does not correspond with the block on the disk, the program will type "ERROR IN BLOCK nnnn".

III. Reloading the Disk Using the Tape Punched by the PDP-8 FAILSAFE Program

- A. The Disk I/O Routine must be in core from locations 7600 to 7777. (It may be useful to punch a binary tape of the Disk I/O Routine which could be loaded with a bootstrap binary loader.)
- B. Load FAILSAFE and start at location 200.
- C. Place the tape which was previously punched by FAILSAFE in the reader.
- D. Indicate that a tape is to be loaded by typing "LOAD)" or simply "L)".
- E. Enter the last block number to be loaded from the tape.
- F. When the desired part of the tape has been loaded onto the disk, the program will type, "TAPE LOADED!". If there are more tapes, simply repeat steps C, D, and E. It is possible to go to the system monitor at this point by typing a ^C.
- G. If a checksum error occurs, it is possible to reread the block in question by removing the tape from the reader and physically moving the tape backwards to the last section of leader-trailer code. Then type "R)" to reread the desired block from the tape.

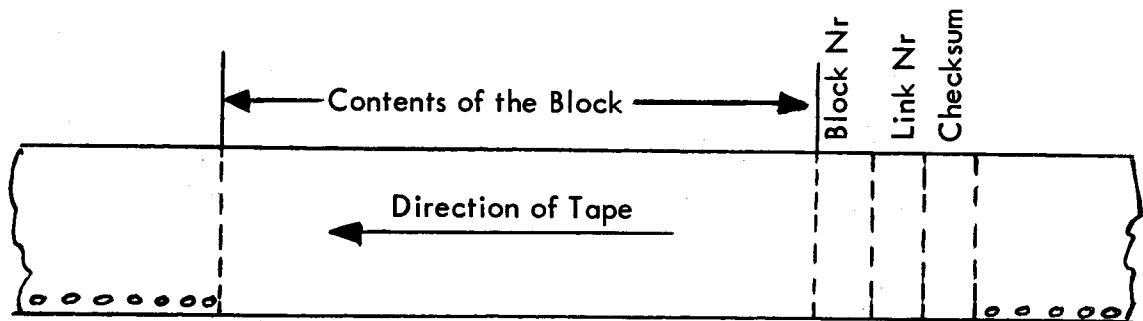
IV. Using the Low-Speed Reader and Punch

- A. It is possible to use PDP-8 FAILSAFE with the low-speed reader and punch by changing the contents of locations 176 and 177.

- B. To use the low-speed reader, change the contents of location 177 to 0743.
- C. To use the low-speed punch, change the contents of location 176 to 0633.
- D. When using the low-speed reader, it is important to turn the reader off whenever the program begins typing a message. Failure to do so may result in having to reload core.

V. Tape Format

- A. Leader-trailer (200) code.
- B. Contents of a block which consists of 200 (octal) words in 6 bit binary form.
- C. Block number—one 12-bit word in 6 bit binary form.
- D. Link number—one 12-bit word in 6 bit binary form.
- E. Checksum—one 12-bit word in 6 bit binary form. The checksum is the modulo 4096 (decimal) sum of the 202 (octal) words - B through D above.
- F. The tape would appear as follows:



.PIP
*OPT-L

*IN-S:

FB=0304

NAME	TYPE	BLK
------	------	-----

RD

PIP	.SYS (0)	0023
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EDIT	.SYS (0)	0015
------	----------	------

LOAD	.SYS (0)	0003
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.CD	.SYS (0)	0006
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*OPT-

.LOAD

*IN-R:

*

*OPT-1

ST=200

††

LOAD DUMP OR VERIFY - D
ENTER FIRST BLOCK NR - 0
ENTER LAST BLOCK NR - 62

LOAD DUMP OR VERIFY - D
ENTER FIRST BLOCK NR - 177
ENTER LAST BLOCK NR - 202

LOAD DUMP OR VERIFY - V
ENTER LAST BLOCK NR - 202
CHECKSUM AFTER BLOCK NR 0005
TYPE "R" TO RETRY, "S" TO RESTART - R

TAPPE VERIFIED!

LOAD DUMP OR VERIFY -

.

.LOAD
*IN-R:
*
*OPT-1
ST=200
↑↑
LOAD DUMP OR VERIFY - L
ENTER LAST BLOCK NR - 202

TAPE LOADED!

LOAD DUMP OR VERIFY -
.PIP
*OPT-L

*IN-S:
FB=0304

NAME	TYPE	BLK
SD		
PIP	.SYS (0)	0023
EDIT	.SYS (0)	0015
LOAD	.SYS (0)	0003
.CD	.SYS (0)	0006

*OPT-
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