DECUS
PROGRAM LIBRARY

DECUS NO.	8-370B
TITLE	DISK
AUTHOR	L. Gordon, R. A. Helwig, M. Conrad, B. Taylor
COMPANY	L. L. Thurstone Psychometric Laboratory University of North Carolina Chapel Hill, North Carolina
DATE	September 10, 1970
SOURCE LANGUAGE	PAL-8 WITH CONDITIONAL ASSEMBLIES

DECUS Program Library Write-up DECUS No. 8-370B

0.0 Identification/Introduction

0.1 Identification

DISK; September 10, 1970

Authors: Lawrence Gordon
Richard A. Helwig
Marvin Conrad
Bruce Taylor
L. L. Thurstone Psychometric Laboratory
University of North Carolina
Chapel Hill, North Carolina

0.2 References

FBUILD - Focal System Builder - DECUS No. 8-370A

0.3 Contents

1.0 Description

The DISK utility program is designed to maintain three 64K disk images upon a reel of DECtape, with facility for restoring any of these images to disk and recording the current contents of disk on tape. As currently implemented (but not restricted), the DISK program requires the following minimal hardware:

1 TC01 DECtape controller, 1 TU55 TRansport
64K DF32 Disk
Extended Arithmetic Element
8K of core

2.0 Operation

The DISK program is divided into three "PHASES"; I, II, and III.

Phase I operates between the disk and a magnetic tape mounted on unit #1. This tape is partitioned into three Disk-Image-Areas, called A, B, and C. To save a disk image on the DECtape mounted on unit #1, type one of the Image-Area names while holding down the "CTRL" key. For example, to record the contents of the disk on Disk-Image-Area B, type "CTRL-B". To later restore this image to the disk, type the Image-Area name. For example, to restore the contents of Disk-Image-Area A to disk, type "A". After any of these operations is completed, PHASE II is entered.

Phase II provides a variety of starting options, as described below. One of these options is to enter PHASE III.

Phase III, the "Build" phase, is a utility phase to assist the user in creating a special image directly onto the disk from the core Field 1.

2.1 Program Use

Mount a DISK system tape on an available transport, and set the unit number to 1. If the Disk Monitor or PS/8 System is running,

call the DISK program. Otherwise, use the binary loader to load DISK into Field 0 and start at 0200. Should the entire system be down, use the bootstrap loader described below. Now follow the "DISK Program Usage Chart", provided in section 3.0.

DISK is a part of the FOCAL-LIBRA Tape System Builder and is supplied in source form for the PAL8 assembler.

2.2 Saving the DISK program

Disk Monitor save: .SAVE DISK 0-1777;200

PS8 save: .SAVE SYS DISK 0-1777

2.3 Tape layout

A DISK system tape is structured as follows:

Blocks 0-7	Core image of the DISK program
Blocks 10-1007	Disk-Image-Area "A"
Blocks 1010-2007	Disk-Image-Area "B"
Blocks 2010-2071	Disk-Image-Area "C" (Disk-Image-Area "C" is a "Short Disk")

2.4 Bootstrap Recovery

When the system is totally dead, the following bootstrap will restart the system. Mount a DISK system tape that has been created using the "C" option on Unit #1.

```
7740    7200
7741    1352
7742    6766
7743    6771
7744    5343
7745    1353
7746    6766
7747    6771
7750    5347
7751    5756
7752    1600
7753    1320
7754    6200
7755    7777
7756    0200

LOAD ADD = 7740; START
```

The bootstrap loader will load the DISK program from blocks 0-7 of the tape on drive #1 and start the DISK program.

3.0 Program usage chart

PHASE I A. Program types: *WHICH DISK?
*

B. Response options.

1. Select a disk image: A or B or C.

a. Program copies the selected disk image onto the disk. You will be reminded of a "SHORT DISK" if you chose the "C" image-area

b. Go to PHASE II.

2. Select a Disk Image Area of tape on which to save a disk image: CTRL-A or CTRL-B or CTRL-C.

Program types: *REALLY?

a. Reply Y (Yes):

1). Program copies the existing disk onto the selected Disk Image Area. You will be reminded of a "SHORT DISK" if you chose the "C" image-area. The old image in that area is lost, but the disk remains intact.

2). Go to PHASE II.

b. Reply N (No):

1). You did not plan to write over that particular Disk Image Area.

2). Go to PHASE I

c. Reply C (Copy)

1). Program copies itself onto the beginning of the tape in front of Disk-Image-Area A.

2). Go to (I,B2,a,1)--as if "Y" were typed.

3. Bypass the disk image load and save operations entirely by typing S (Start).

Go to PHASE II.

PHASE II A. Program places RIM and Binary Loaders on the last page of Field 1 (17600-17777).

B. Program types: *START =

C. Response options.

1. R (Restart)

Go to PHASE I.

2. M (Disk Monitor)

a. It is assumed that the disk has a valid monitor system image.

b. Program enters Disk Monitor System.

3. L (Loaders)

Program transfers to the HLT in the Binary Loader at location 17700.

4. T (DECTape System)

a. It is assumed that either a Disk Monitor Tape (not the Disk System Tape) or a DECTape Library Tape is on Unit 8 with "WRITE ENABLED" on.

b. Program enters the tape system.

5. B (Build)

a. Build helps create special disk images, using Field 1 as a buffer.

b. Go to PHASE III, with n=0.

6. F (FOCAL)

   a. The program will load the revised FOCAL-LIBRA system, assumed to be on disk image "C".

   b. If the FOCAL-LIBRA system is not in core, disk will not start the system. Go to (I,A).

   c. FOCAL will be started.

7. P (PS/8 Disk System)

   a. It is assumed the disk has a valid PS/8 system image.

   b. Program enters PS/8 disk monitor system.

8. D (PS/8 DECTape System)

   a. It is assumed that a PS/8 system tape is mounted on unit 8 with "WRITE ENABLE" on.

   b. Program enters PS/8 tape monitor system.

PHASE III (Build Phase)

A. Program types:

   BUILD n (n=0 thru 15)

   ("START" OR "START 200" = BUILD;

   "CONT" = SKIP THIS BUILD)

B. Program halts with 7777 in Accumulator.

C. Response options:

   1. Press START

      a. Writes all of Field 1 onto disk track where 1 track = 4K.

      b. n is incremented by 1 (n=n+1).

      c. If n is less than 16, go to PHASE III;

         otherwise, go to PHASE I.

2. LOAD ADD 00200, press START

   a. With this option Field 1 can be built as desired with binary paper tapes and/or the console switch register.

   b. Go to (III,C,1,a).

3. Press CONTinue

   a. This option bypasses the building of partition n.

   b. Go to (III,C,1,b).

4. LOAD ADD 00200, press CONTinue

   a. This option escapes from the BUILD PHASE. The user may <u>not</u> alter the Accumulator before selecting this option.

   b. Go to PHASE I.