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USERS MANUAL FOR DISKORG,
THE DISK ORGANIZATION
SUBSYSTEM FOR THE PDP/15
COMPUTER

Kent R. Brobst, Leonard C. Moon,
and Thomas Ekberg

AMES LABORATORY, USERDA
IOWA STATE UNIVERSITY
AMES, IOWA 0305000

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Users Manual For DISKORG, The Disk Organization
Subsystem For The PDP-15 Computer

By

Kent R. Brobst, Leonard C. Moon, and Thomas Ekberg

Ames Laboratory, ERDA
Iowa State University
Ames, Iowa 50011

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ABSTRACT

DISKORG is the name given to a set of programs written in the ALECS language which forms the disk organization subsystem of the ALECS operating system. The ALECS operating system is a time-sharing multi-tasking operating system for the DEC PDP-15 computer. The ALECS language is a subset of PL/1. The ALECS compiler (cross-compiler) runs on a IBM 360/370 OSMVT computer in about 132K Bytes of main core.

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INTRODUCTION

DISKORG is the name given to a set of programs written in the ALECS language which forms the disk organization subsystem of the ALECS operating system. DISKORG is used to maintain data and task data sets on the PDP-15 disks.

Information on disk is stored in one of three different structures: the catalog, a directory, or a data set. The catalog contains, among other things, a description of each data set (the data set descriptor) in the library associated with the particular directory. The descriptor defines the boundaries of the data set on the disk.

There are thirteen commands which DISKORG will accept. Each command is a three letter operation code (OPCODE). The first letter of the OPCODE refers to the operation to be performed. This letter can be A, D, L, M, R, T, or C, which stands for allocate, deallocate, list, modify, rename, transfer (move), and copy, respectively. The last two letters of the OPCODE can be CT, DR, or DS, which stand for catalog, directory, and data set, respectively.

The acceptable OPCODES are:

1. For catalog manipulation,
 - LCT - list all directory names and their disk addresses in the catalog.
2. For directory manipulation,
 - LDR - list all data set descriptors in a particular directory
 - ADR - allocate (create) a new directory
 - DDR - deallocate (destroy) all the data sets in a directory and the directory itself
 - RDR - rename an existing directory
 - MDR - modify the size of an existing directory.
3. For data set manipulation,
 - LDS - list the descriptor for a particular data set
 - ADS - allocate (create) a new data set in an existing directory
 - DDS - deallocate (destroy) a data set in an existing directory
 - RDS - rename an existing data set
 - MDS - modify (replace) the contents of an existing data set
 - TDS - transfer (move) the data set into another directory, i.e., original data set is destroyed
 - CDS - copy the data set into another directory, i.e., original data set is still present.

All other combinations of letters are presently ignored by DISKORG.

HOW TO USE DISKORG

The following is a sample execution of DISKORG. Responses that do not vary are given in capital letters. Responses that can vary are described by lower-case letters within parentheses. (EOT) stands for "control-D" and (SOM) stands for "control-A". All user responses except (SOM) must end with (EOT).

<u>DISKORG</u>	<u>User</u>
(no response)	(SOM)
REQ, INQ, OR ZAP?	REQ(EOT)
TYPE IN USER LIBRARY NAME?	DISK(EOT)
TYPE IN TASK NAME?	DISKORG(EOT)
USER ID IS ----- CORE ADDRESS IS -----	(no response)
TASK DISPATCHABLE	(no response)
DATE--YMD?	(Type in the current date, e.g., 770111 for January 11, 1977) (EOT)
YOUR NAME?	(Maximum of 9 characters)(EOT)
OPCODE?	

DISKORG is now ready to accept one of the OPCODES given above. The user may either type an OPCODE or (EOT). (EOT) terminates the execution of DISKORG. If the character string typed by the user is not an acceptable OPCODE, DISKORG will request another OPCODE.

A directory name is required for all OPCODES except LCT. If (EOT) is typed instead of a directory name, DISKORG will use the last directory name given. In this case, DISKORG will print the directory name that it will use so that the user can verify that it is the correct one.

Neither a directory name nor a data set name may begin with three or more blanks. The name of a data set or directory may not begin with an @ since this character is reserved for system use. If a name does not follow these rules, DISKORG will again ask for either a directory name or a data set name. If a directory name or data set name is more than nine characters long, only the first nine characters will be used.

Immediately before the OPCODE command is executed (except for 'LIST' commands), DISKORG will print UPDATE? This gives the user a chance to proofread what he/she has entered and stop the operation if something is incorrect. If the user responds YES(EOT), the specified command will be executed. If NO(EOT) is typed, DISKORG will request another OPCODE.

EXECUTING DISKORG OPERATIONS

All of the following illustrations show how to do the specific operation after the initial information is given to DISKORG as shown in the section, "HOW TO USE DISKORG".

Listing the CatalogDISKORGUser

OPCODE?

LCT(EOT)

This will produce a listing of the catalog consisting of the name and the octal disk address of each directory in the catalog.

DISKORG DIRECTORY OPERATIONS

A. Listing a DirectoryDISKORGUser

OPCODE?

LDR(EOT)

DIRECTORY?

(Type the name of
the directory to
be listed)(EOT)

DISKORG will print the directory's name, its date of creation, its creator, its disk address, the current number of data sets in the directory, and the maximum number of data sets allowed in the directory. DISKORG will then print:

(EOT) FOR ABBR. LIST?

If the user response here is (EOT), DISKORG will print the name, the octal address, the date of creation, and the disk number for each data set. If the data set is loadable (a TASK data set), the number of parameters it has and its octal size in words will also be printed. If the data set is normal (DATA data set), its record length in words will be printed.

If the user responds with a non-zero integer, DISKORG will print the name, the date of creation, the creator's name, the date the data set was last referenced, the status word, the record length in words, the end of file address, the octal address of the end of the data set, the disk number and address, and the allocation bit map for each data set. In addition, if the data set is a TASK data set, its octal size in words, number of relocation words, address of relocation words, and number of parameters will be printed for each data set in the directory.

B. Allocating a Directory

<u>DISKORG</u>	<u>User</u>
OPCODE?	ADR(EOT)
DIRECTORY?	(Type the name of the directory to be allocated)(EOT)
MAXIMUM NUMBER OF ENTRIES?	(Type the maximum number of data sets which will be allowed within the directory. It must be one of the following numbers: 6,13,21,28,35,43,50, or 57)(EOT)
UPDATE?	YES(EOT) or NO(EOT)

C. Deallocating a Directory and its Data Sets

Note: DISK, UNIVERSAL and @DS directories may not be deallocated.

<u>DISKORG</u>	<u>User</u>
OPCODE?	DDR(EOT)

DIRECTORY?

(Type the name of
the directory to be
deleted)(EOT)

UPDATE?

YES(EOT) or NO(EOT)

D. Renaming a Directory

Note: DISK, UNIVERSAL and @DS directories may not be renamed.

DISKORG

User

OPCODE?

RDR(EOT)

DIRECTORY?

(Type the current name
of the directory to
be renamed)(EOT)

NEW DIRECTORY NAME?

(Type the new name for
the directory)(EOT)

UPDATE?

YES(EOT) or NO(EOT)

E. Modifying the Size of a Directory

DISKORG

User

OPCODE?

MDR(EOT)

DIRECTORY?

(Type in name of
directory to be
modified)(EOT)

MAXIMUM NUMBER OF ENTRIES?

(Type in the maximum
number of entries
which will be allowed.
It must be one of the
following numbers:
6,13,21,28,35,43,50,
or 57)(EOT)

UPDATE?

YES(EOT) or NO(EOT)

DISKORG DATA SET OPERATIONS

A. Listing a Data Set Descriptor

<u>DISKORG</u>	<u>User</u>
OPCODE?	LDS(EOT)
DIRECTORY?	(Type the name of the directory where the desired data set is located)(EOT)
DATA SET?	(Type the name of the data set)(EOT)

DISKORG will print the name, date of creation, name of creator, the status word, the record length in words, the address of the end of file, the address of the end of the data set, the disk number, the address of the beginning of the data set, and the bit allocation map for the data set. If the data set is a task, DISKORG will also print the octal size in words of the task, both in core and on disk, the number of relocation words, the address of the relocation words, and the number of parameters the task has.

B. Allocating Data Sets

1. Allocating a TASK Data Set

<u>DISKORG</u>	<u>User</u>
OPCODE?	ADS(EOT)
DIRECTORY?	(Type in the directory name that should be associated with the task)(EOT)

DATA SET?	(Type in the name of the task)(EOT)
DATA SET TYPE?	TASK(EOT)
UPDATE?	YES(EOT) or NO(EOT)

If the card deck is out of order or cards are missing from the card deck, or the card reader determines an error has occurred, DISKORG will print out an error message, stop the operation, and ask for another OPCODE.

2. Allocating a NORMAL Data Set

<u>DISKORG</u>	<u>User</u>
OPCODE?	ADS(EOT)
DIRECTORY?	(Type in the directory name that should be associated with the data set)(EOT)
DATA SET?	(Type in the name of the data set)(EOT)
DATA SET TYPE?	NORM(EOT)
RECORD LENGTH?	(Type in the record length for the data set)(EOT)
NUMBER OF SECTORS?	(Type in the number of sectors, i.e., groups of 256 words, that the data set will require)(EOT)
UPDATE?	YES(EOT) or NO(EOT)

If the YES(EOT) option is selected DISKORG will perform the operation and then it will type:

GET INPUT FROM CARD READER? YES(EOT) or NO(EOT)

If the YES(EOT) option is selected then the user should read the section titled "READING IN CARDS". If the NO(EOT) option is selected DISKORG will ask for a new OPCODE.

3. Allocating an Experiment Data Set

The structure of an experiment data set is very system dependent. It basically defines the I/O addresses and memory locations for interfacing to an external device on the PDP-15 bus. Please contact systems personnel in charge of your system if you desire to use an experiment data set. The experiment data set probably already exists. If it doesn't exist, they will allocate it for you.

C. Modifying a Data Set

<u>DISKORG</u>	<u>User</u>
OPCODE?	MDS(EOT)
DIRECTORY?	(Type in the name of the directory containing the data set)(EOT)
DATA SET?	(Type in the name of the data set to be modified)(EOT)
UPDATE?	YES(EOT) or NO(EOT)

From this point, follow the instructions for allocating the particular type of data set which is being modified.

(For example, if a task is being modified, see the section, "Allocating a TASK Data Set.")

D. Renaming a Data Set

DISKORG

User

OPCODE?

RDS(EOT)

DIRECTORY?

(Type in the name of the directory containing the data set to be renamed)(EOT)

DATA SET?

(Type in the current name of the data set)(EOT)

NEW DATA SET NAME?

(Type in the new name for the data set)(EOT)

UPDATE?

YES(EOT) or NO(EOT)

E. Transferring (Moving) a Data Set

DISKORG

User

OPCODE?

TDS(EOT)

DIRECTORY?

(Type in the name of the directory containing the data set to be moved)(EOT)

DATA SET?

(Type in the name of the data set)(EOT)

DIRECTORY THE DATA SET IS TO
BE MOVED INTO?

(Type in the name of
the new directory
for the data set)
(EOT)

UPDATE?

YES(EOT) or NO(EOT)

Note: Data set is destroyed in old directory by this command.

F. Copying a Data Set

DISKORG

User

OPCODE?

CDS(EOT)

DIRECTORY?

(Type in the directory
name which contains
the data set to be
copied)(EOT)

DATA SET?

(Type in the name of
the data set to be
copied)(EOT)

DIRECTORY THE DATA SET IS TO
BE COPIED INTO?

(Type in the directory
name which is to
contain the data set)
(EOT)

UPDATE?

YES(EOT) or NO(EOT)

READING IN CARDS

In order to read in data via the card reader, DISKORG needs to have a description of the types of data that are being read in. There are four data types that can be used, these are: character, floating point, fixed, and octal. Each of these data types are coded in the form of a letter. These codes are as follows:

A	character
F	floating point
I	fixed (integer)
O	octal
X	skip factor

The code "X" is used to skip over columns on the card that are not being used. All of these codes must have a number called the field width following them. This number corresponds to the number of columns that are described by the code. To separate different codes a comma must follow every field width, even the last one. The following is a valid description:

F12,I2,O6,X3,F20,

This describes cards which contain a floating point number in columns 1-12, an integer in columns 13-14, an octal number in columns 15-20, columns 21-23 are skipped, and a floating point number in columns 24-43. Note that there can be no embedded blanks within or preceeding the description. As the reader has probably noticed, the sum of the field widths must be 80 or less since a card only has 80 columns.

Note: The field width of the character data type must be either 72 or 80, but all other field widths can be any reasonable number. Floating point numbers using the E representation are allowed, but not required. Right justification is not necessary.

Instead of repeating the same code and field width several times (for example I2,I2,I2,) a replication factor can be placed in front of the code (I2,I2,I2, would become 3I2,). This replication factor will cause the specified code and field width to be repeated the specified number of times. This is the only kind of replication factor that can be used, i.e., groups of codes can not be replicated.

When using DISKORG to read in cards DISKORG will type out: "TYPE IN THE COLUMN FORMAT.?" At this point the user should type in the set of codes that describe the data on the cards. A card containing a / in column 1 and an * in column 2 must be at the end of the data cards. The /* card is only used as a separator card. If the user has several different sets of codes to use for the data, these can be read in by dividing up the cards into several sections, each of which is separated by a /* card. Each of these sections will be read in sequentially into the data set. DISKORG will ask for another column format after it has read in the /* card. If all data has been read, type (EOT). This will cause DISKORG to ask for another OPCODE.